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Printed December 1984

Meteorological Design Parameters for the Candidate Site of a Radioactive-Waste Repository at Yucca Mountain, Nevada

Thomas W. Eglinton, Roberta J. Dreicer

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550
for the United States Department of Energy
under Contract DE-AC04-76DP00789

HYDROLOGY DOCUMENT NUMBER 191

SAND84-0440/2
Unlimited Release
Printed December 1984

Distribution
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METEOROLOGICAL DESIGN PARAMETERS FOR THE CANDIDATE SITE OF A RADIOACTIVE-WASTE REPOSITORY AT YUCCA MOUNTAIN, NEVADA

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ABSTRACT

This study presents a collection of meteorological information and data for the design and construction of installations at the candidate location of a repository for radioactive waste at Yucca Mountain, on the Nevada Test Site. Climate and weather data provided in this summary, essential to the proper architectural engineering of surface and subsurface facilities and scheduling of repository activities include: precipitation, lightning, temperature, relative humidity, solar radiation, cloud coverage, wind, and air pressure.

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ACKNOWLEDGMENTS

We gratefully acknowledge the assistance of, and technical expertise provided by H. W. Church (Division 6324, Sandia National Laboratories). We are indebted to D. Soule (National Oceanic and Atmospheric Administration/National Weather Service, Nuclear Support Office (NOAA/WSNSO), Las Vegas, Nevada, who expeditiously provided newly available climatological summary data recorded at Desert Rock, Nevada. We appreciate the information and data received from R. F. Quiring with permission to use several of his unpublished meteorological studies and NOAA/WSNSO internal reports that are included in the Appendices.

METEOROLOGICAL DESIGN PARAMETERS FOR THE CANDIDATE SITE OF A RADIOACTIVE-WASTE REPOSITORY AT YUCCA MOUNTAIN, NEVADA

1. INTRODUCTION

As part of the Civilian Radioactive Waste Management (CRWM) program, a feasibility study for determining the potential of Yucca Mountain, Nevada, as a repository site for radioactive waste, is being conducted under the direction of the Nevada Nuclear Waste Storage Investigations (NNWSI) Project of the U.S. Department of Energy (DOE). The objective of the program is to develop facilities, processes, and systems for safe handling and long-term containment of radioactive waste, in compliance with state and federal regulations, environmental standards, and technical requirements.

In support of the programmatic activities of the Nuclear Waste Engineering Projects Division, Sandia National Laboratories (SNL), this study provides meteorological parameters for the design of surface and subsurface facilities. Climate and weather data presented here, related to key areas of application which are essential for (1) the proper architectural/engineering design and construction of installations, as well as, (2) subsequent scheduling of all future repository activities, include for example:

- Precipitation - Storm drainage (for protection against against flash floods, debris flows, and subsurface influx); structural stability of all surface and subsurface installations, buildings, foundations, and roofs, etc.; choice of building materials, and siting, etc.

- Fog and Storms (thunder and lightning, snow and hail, blowing sand and dust) - Fire protection/prevention and control systems; electrical grounding systems; ventilation, filtration, and air pollution control systems; structural stability; access route and surface facility visibility and identification (outdoor lighting; etc.).

- Temperature and Humidity - Surface and underground ventilation, heating and cooling, etc.

- Solar Radiation and Cloud Coverage - Heating and cooling systems, energy conservation and use of renewable resources (solar systems); choice of building materials, etc.

- Wind - Structural stability (wind pressure and missile loads); ventilation, filtration, dispersal and air pollution control systems, and siting, etc.

- Surface and Upper Air Pressure Patterns - Ventilation, filtration, dispersal and air pollution control systems.

1.1 Candidate Location for Surface Facilities

1.1.1 Site Specifications

The provisional candidate site for the location of the repository and its surface facilities, shown in Figs. 1A, 1B, and 1C, is on the Nevada Test Site (NTS) in the south-central sector of the state. The candidate location for support installations is on the alluvial fan at the base of Yucca Mountain*, at approximately:

- 36°50' North Latitude
- 116°25' West Longitude
- Nevada state grid (central) coordinates:
  761,794 N 569,122 E
- Elevation at base of Yucca Mountain-Yucca Alluvial Site (YA):
  3700 feet above mean sea level (ft MSL)
  [1128 metres (m) MSL]
- Elevation at summit of Yucca Mountain-Yucca Ridge Site (YR):
  4800 ft MSL (1463 m)
- Standard atmospheric pressure at 3700 ft (1128 m):
  885 millibars (mbar) =
  [26.13 inches of mercury (in Hg)] =
  [12.84 pounds/square inch (psi)]

1.1.2 Regional Description

NTS is located (see Figs. 1A, 1B, and 1C) in the southern Nevada desert, one of the most arid regions in the entire United States; the climate at Yucca Mountain site and vicinity is classified as mid-latitude arid (Ref. 4, p. 1). Significant climatic features of this region are: large diurnal and seasonal ranges in temperature, low relative humidity, strong insolation, rapid radiation loss, sparce precipitation, and generally light wind velocities, with diurnal reversals and seasonal shifts in direction.

Nearly all of Nevada is in the Basin and Range province of the Intermountain Plateaus, a rugged elevated area between the Sierra Nevada and the Rocky Mountains (see Fig. 2A). The topography consists of alternating valleys and high mountain ranges oriented in a northerly-southerly direction (see Fig. 2B). Characteristic throughout the state, intensely irregular terrain and major relief differences are typical at

*Currently, meteorological data are being collected at Yucca Alluvial (YA) and Yucca Ridge (YR) Sites at Yucca Mountain, Nevada.

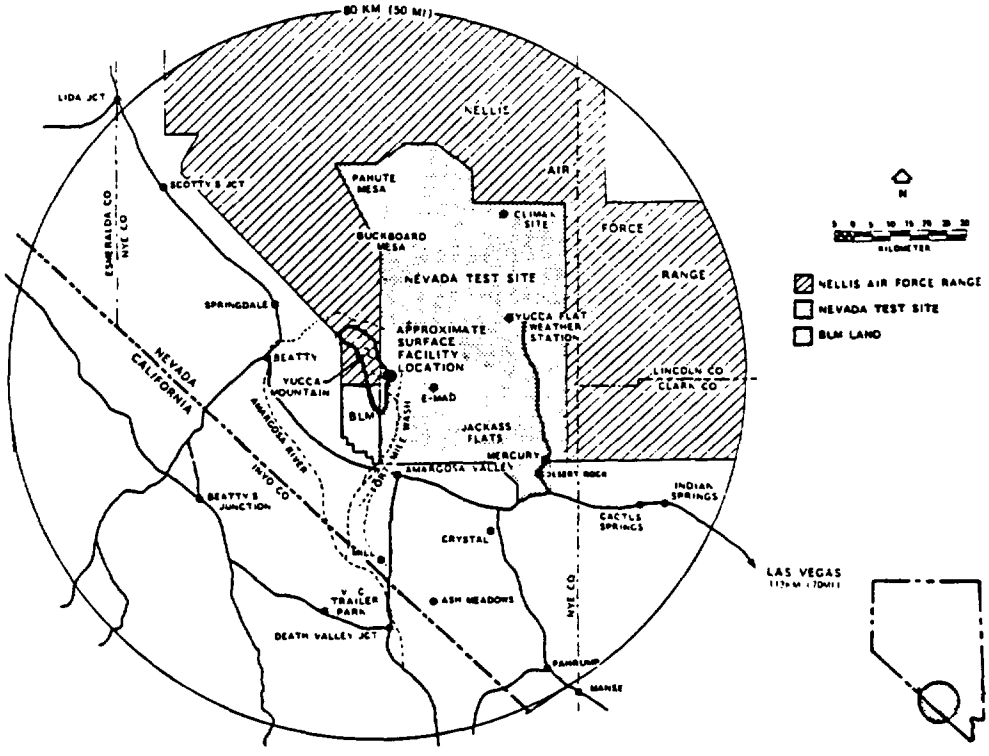


Figure 1A. General Location of the Candidate Area and Site (Source: Ref. 1, p. 2)

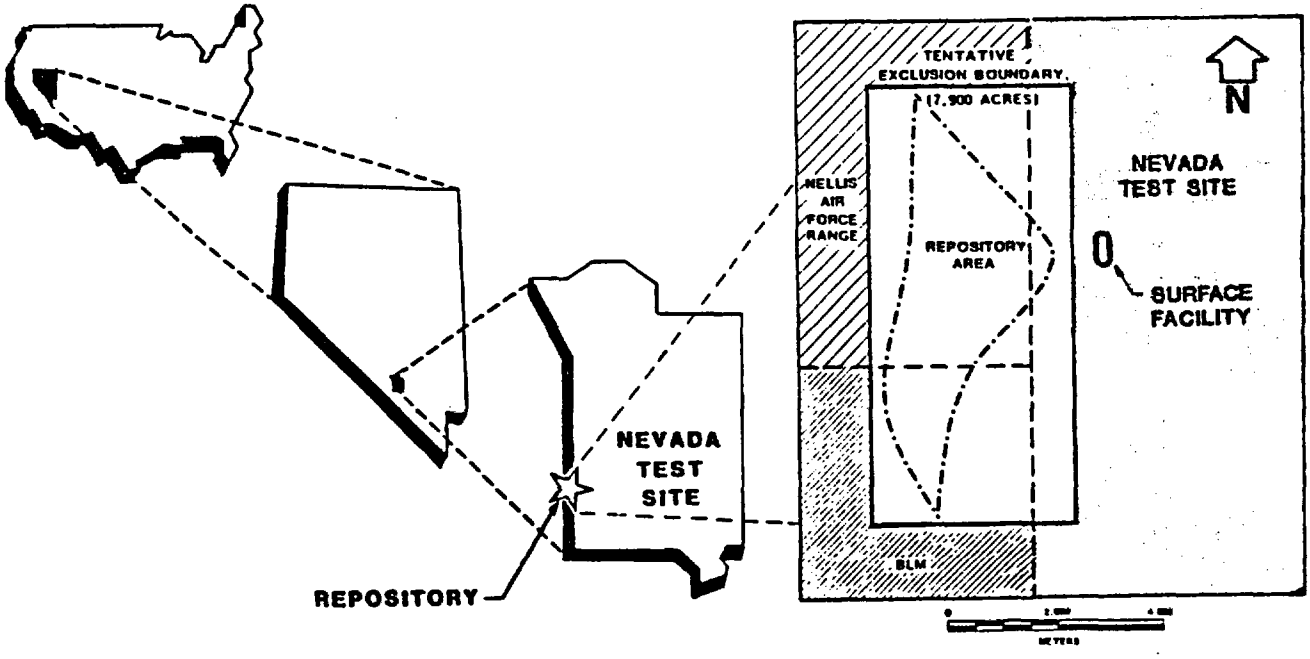
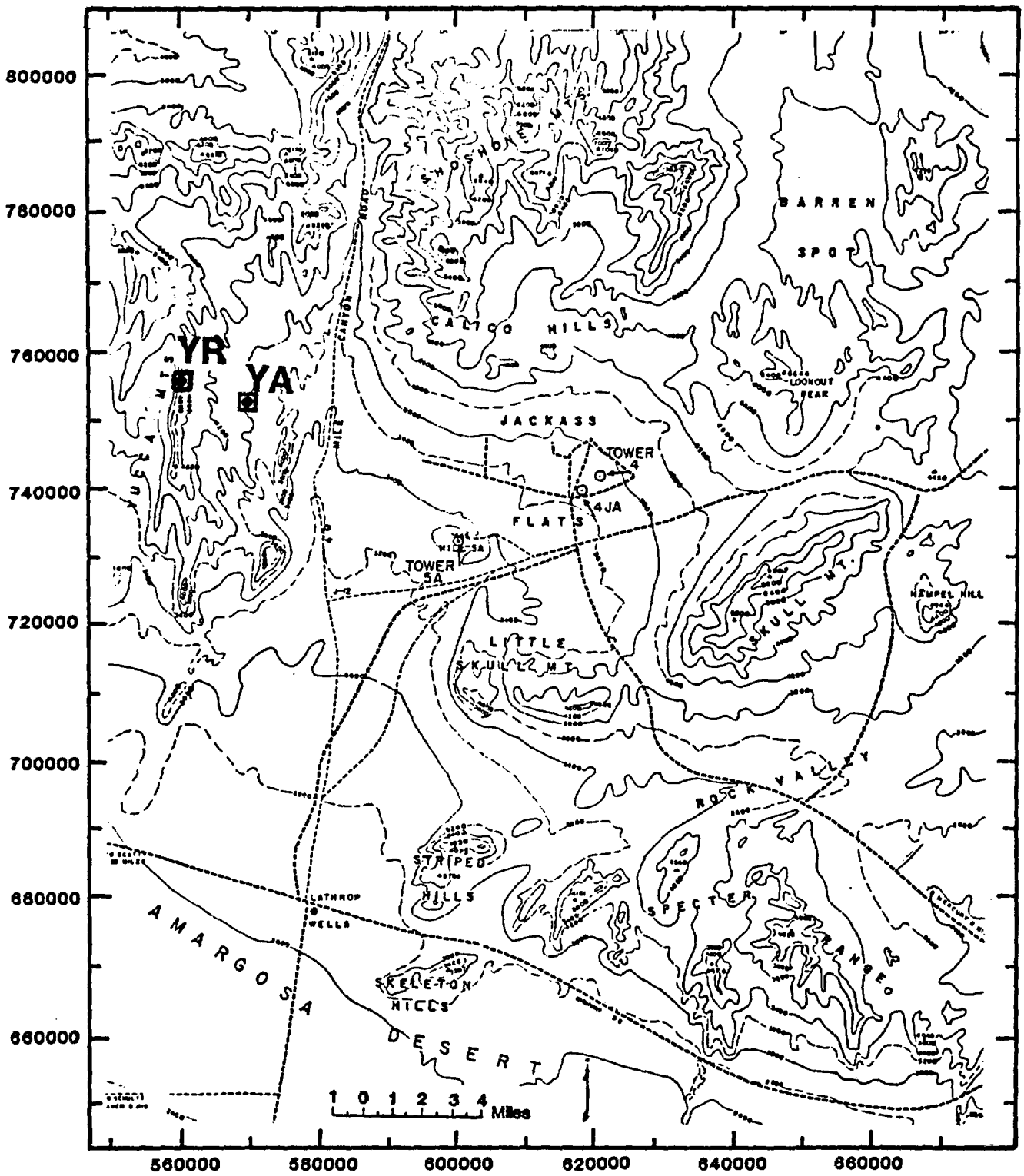


Figure 1B. Provisional Candidate Site for the Yucca Mountain Repository and Surface Facilities (Source: Ref. 2, xxxiv)



YA = Yucca Alluvial Site
YR = Yucca Ridge Site

Figure 1C. Topographic Overview of Candidate Area and Environs (Source: Ref. 3, Quiring 1968, p. I-7)

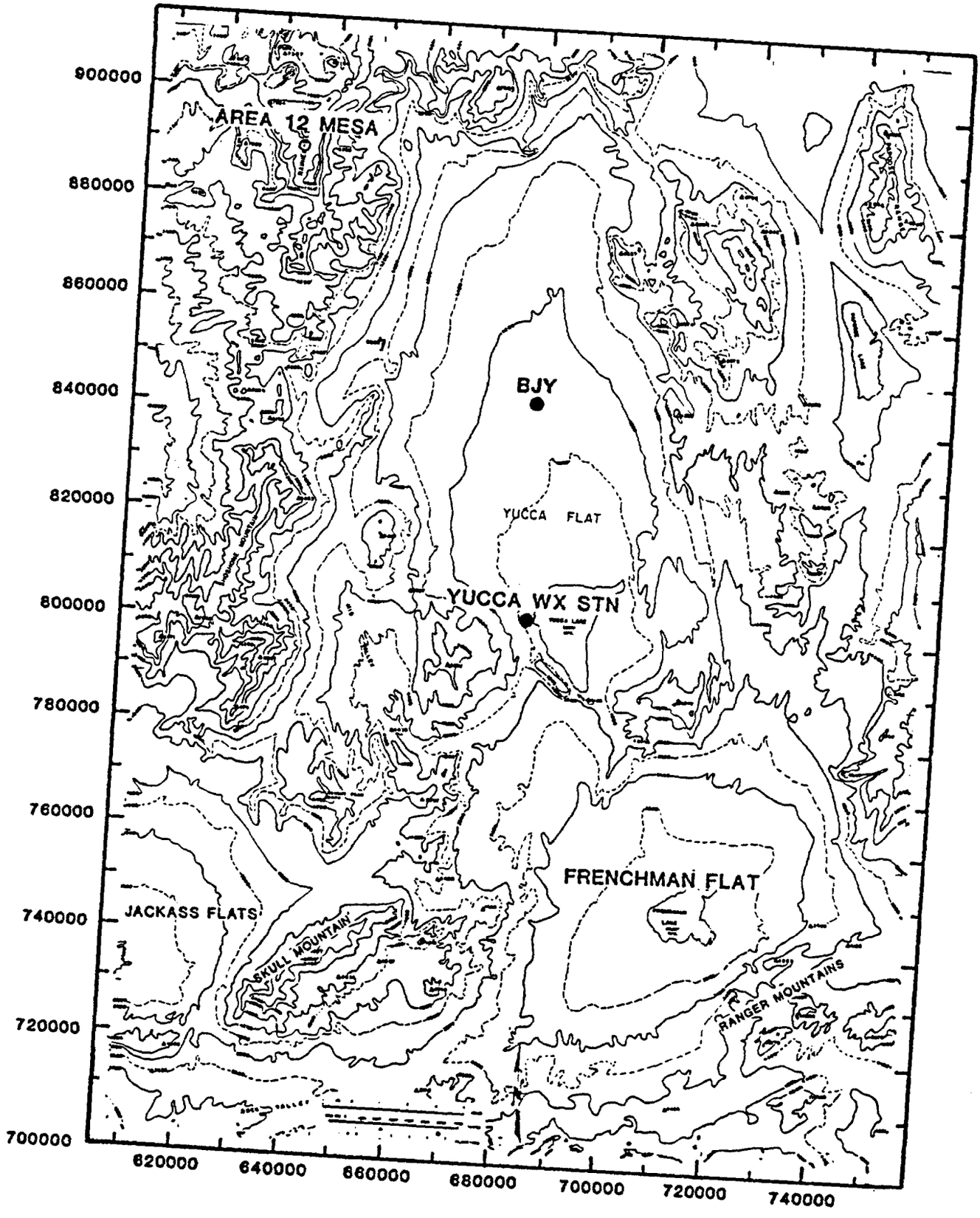


Figure 1C. (Continued) Topographic Overview of Candidate Area and Environs (Source: Ref. 3. Quiring 1968. p. I-8)

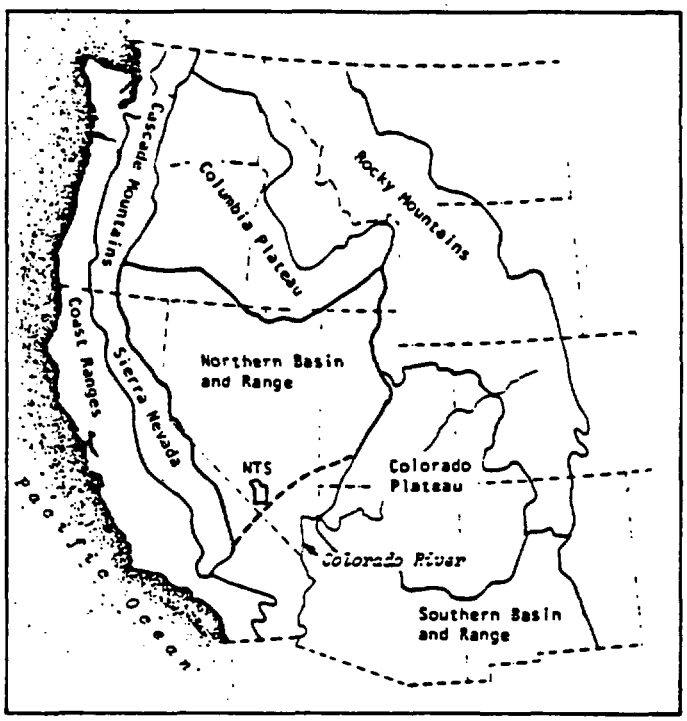


Figure 2A. Major Tectonic Provinces of the Western United States (Source: Ref. 5, p. 15)

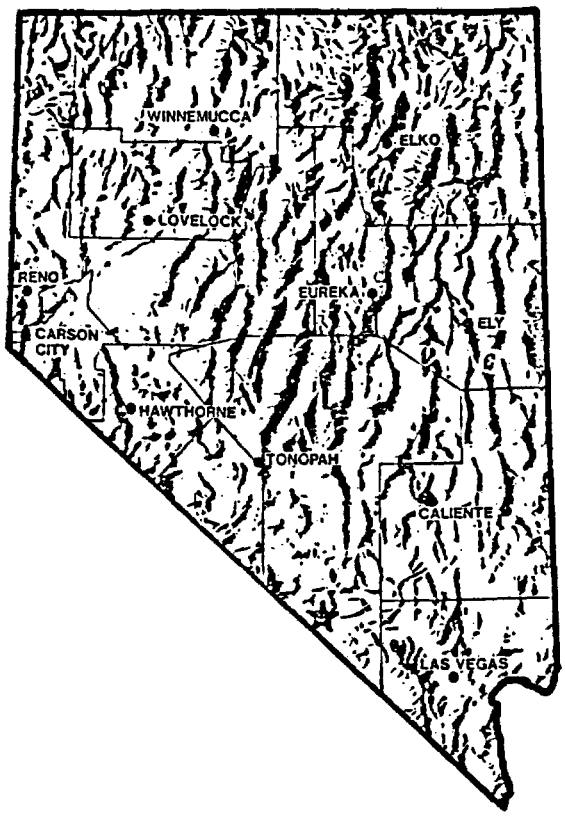


Figure 2B. Topographical Map of Land Forms in Nevada (Source: Ref. 4, p. 2)
*Approximate location of Yucca Mountain

the NTS and in the Yucca Mountain region. The area comprises north-south trending ridges and valleys (Fig. 2B), and a general, though often interrupted, descending slope in elevation, oriented as well, in a northerly-southerly direction. Altitudes range from 7000 ft (2134 m) MSL at the northern perimeter of NTS, to 2700 ft (823 m) in the south, near Amargosa Desert. Drainage patterns, including those for Fortymile Wash and its three main tributaries (Figs. 3A and 3B), in what are normally dry stream beds that contain wateronly after major rainstorms or snow-melt, also conform to the northerly-southerly directional trend.

Altitude and topography regulate to a large extent, the distributions of any individual meteorological parameter. Measurements taken at locations even relatively short distances apart, that differ however with respect to either of these features, can vary significantly. This is especially apparent at NTS and in the Yucca Mountain area.

Generally, temperature varies inversely and precipitation directly, with altitude. However, the exception to this trend is exhibited by daily minimum temperatures just before sunrise, recorded in closed basins-such as the locations of Desert Rock and Yucca Flat weather stations; at that time, topography, associated with air drainage characteristics, is paramount. The distributions of average daily minimum temperatures can be large though measurements are recorded at the same altitude, because of the pooling of cold air in basins from continuous movement down slopes and across ridges. However, at the time of maximum temperatures in mid-afternoon, elevation exerts major control. Temperature decreases, generally, from 3°F (1.7°C) in winter to 4°F (2.2°C) in summer, for every 1000 ft (305 m) increase in altitude (Ref. 3, p. III-1).

Temperature extremes from -30°F (-34.4°C) to 115°F (46.1°C), have been recorded at separate locations within the boundaries of the NTS. At Desert Rock and Yucca Flat, measurements of extreme temperatures of from 13°F (-10.6°C) and -14°F (-25.6°C), to 111°F (43.9°C) and 107°F (41.7°C), respectively, have been reported. The mean annual temperature averages for the NTS area, Desert Rock and Yucca Flat are, respectively, 60°F (15.6°C), 62°F (16.7°C), and 55°F (12.8°C).

Temperature distributions are based on records produced by thermographs or hygrothermographs, or combinations of both, placed approximately 5 ft (1.5 m) above ground, inside louvered shelters (Ref. 3, p. III-1).

Precipitation varies annually from about 4 in. (10 cm) at lower elevations, to 12 in. (30 cm) at higher altitudes on the NTS; at mid-altitudes, characteristic of the provisional

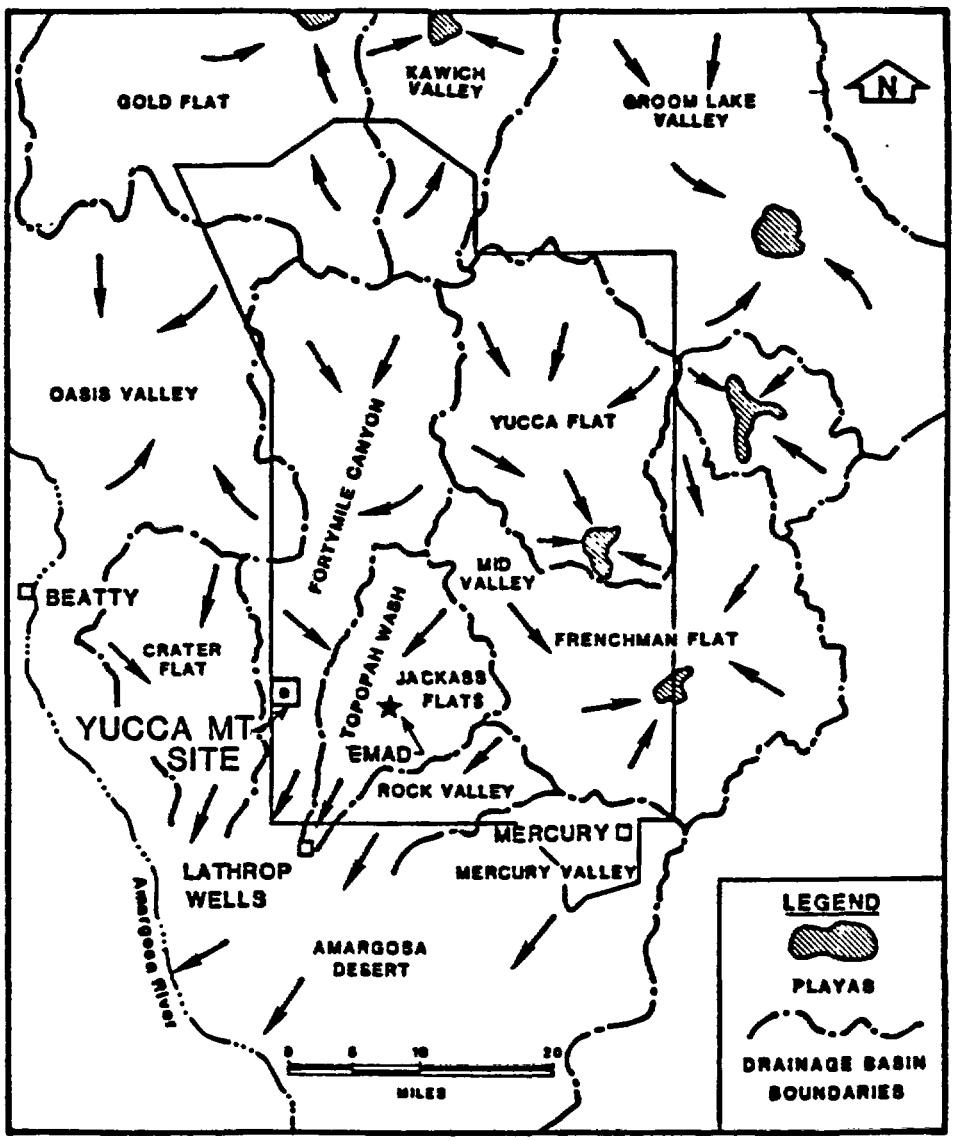


Figure 3A. Boundaries of Basins and Directions of NTS Surface Water Drainage (Sources: Ref. 6, pp. 3-21; and Ref. 1, pp. 6-41)

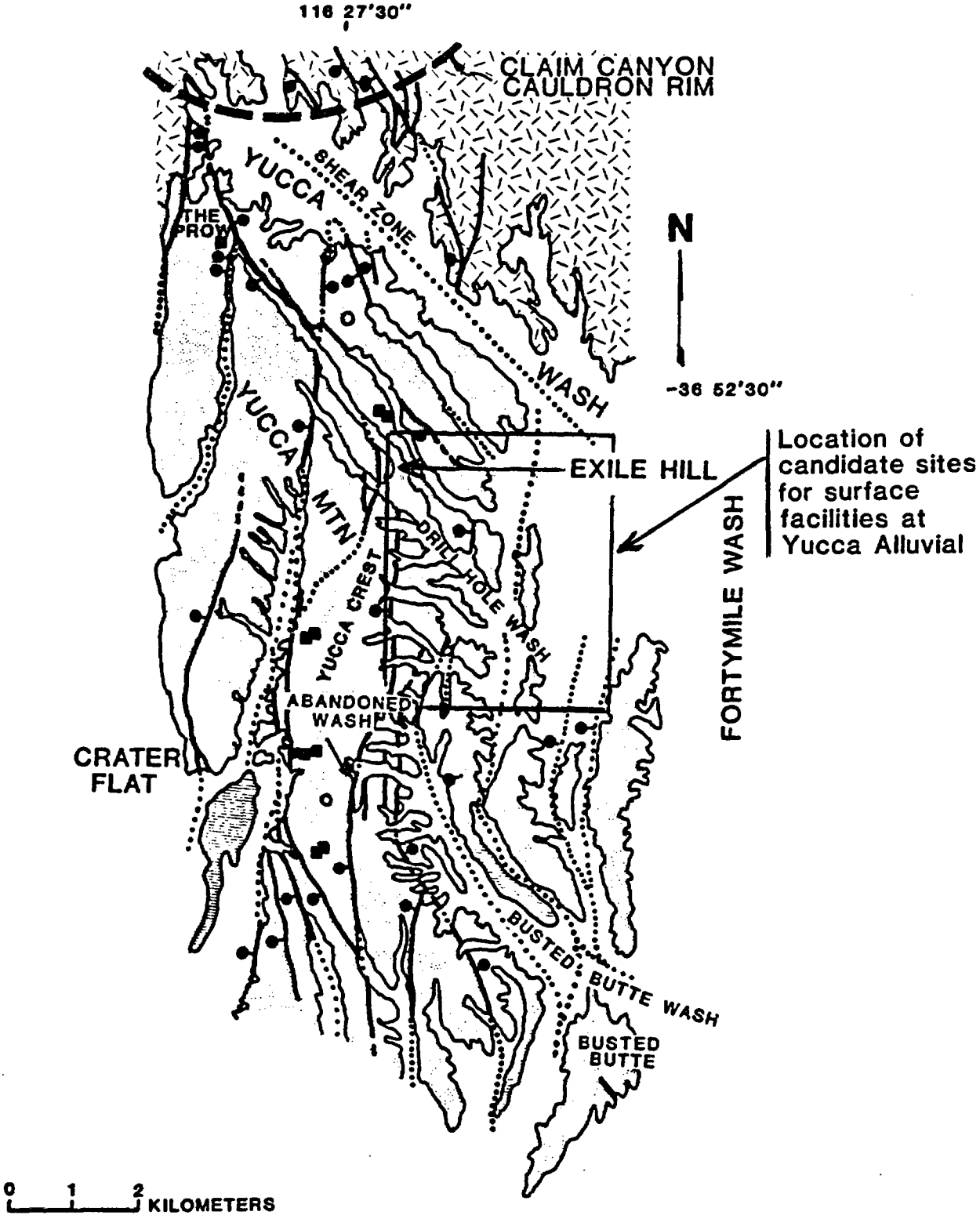


Figure 3B. Canyons, Channels, and Washes in the Vicinity of Yucca Alluvial Site (Source: Ref. 1)

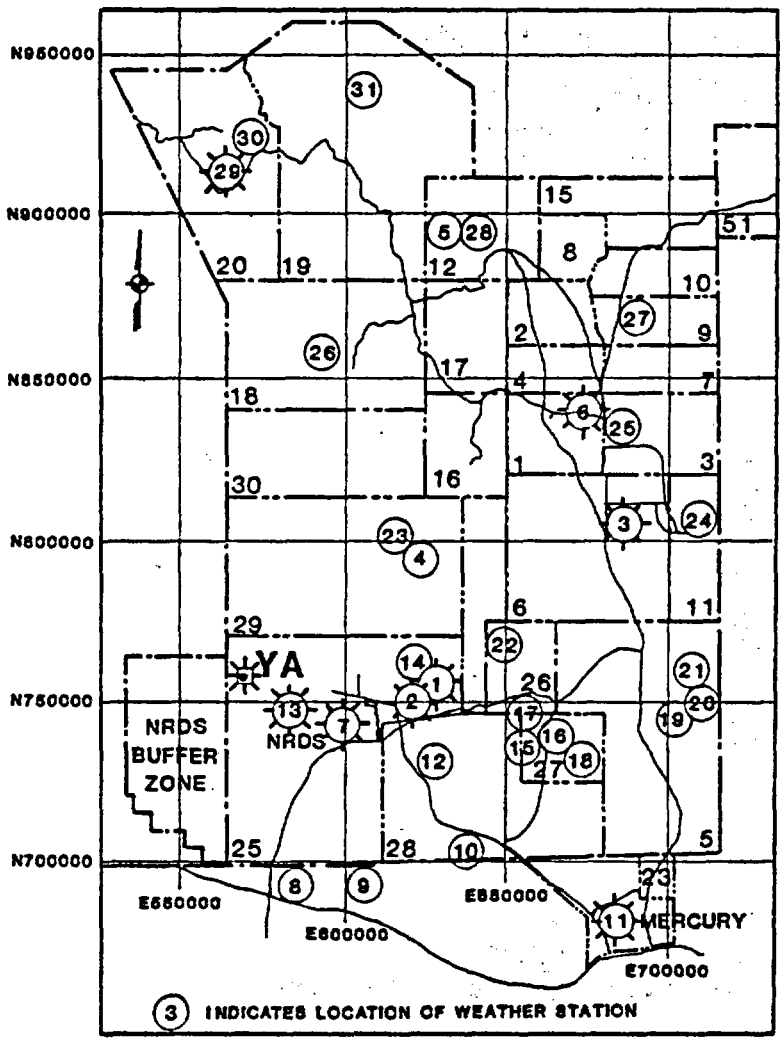
site, it can vary from 4 to 6 in. (10 to 15 cm) annually. The surface water evaporation rate, approximately 69 in. (175 cm) per year, is many times greater than that of annual rainfall in the region. No large bodies of surface water exist over the entire area, with the exception of Lake Mead, a man-made reservoir where evaporation is about 20 times that of precipitation (Ref. 4, p. 62).

Migrating storms from the Pacific produce widespread areas of light precipitation from November through April. In winter, the primary reason for the arid nature of the region is the so-called "rain shadow" effect, resulting from the Sierra Nevada Mountain range, which causes the eastward-moving Pacific storms to lose their moisture on the upwind western slopes. Low-pressure centers generally approach from the southwest or northwest, usually passing to the north of NTS. On the average, a storm system passes about once every 7 to 10 days during winter (Ref. 3, p. V-1, and Ref. 16, p. 2).

In summer, moisture is brought mainly from the Gulf of Mexico, with southerly winds sweeping northward over Nevada. Precipitation falls primarily in isolated showers and convective thunderstorms, which can be intense over a few square miles, with large variations within the area of the storm. Summer showers depend to a large extent on the degree of penetration of southerly winds into the state. In September or early October, an occasional tropical storm from the west coast of Mexico will bring widespread and heavy precipitation to southern Nevada. Thunderstorms occur, on the average, about 14 times annually at Yucca Flat (Ref. 7, p. 5).

The precipitation measurement network of recorded data from various meteorological stations on or adjacent to the NTS (see Figs. 4 and 5) is composed of standard equipment (weighing rain gages and tipping bucket gages) designed to identify the level of total precipitation, including the equivalent of melted snow. Short term measurement data are not suitable for evaluating precipitation levels for engineering design purposes. The precipitation probability curves provided in Section 2 (Figs. 10 and 11) and the linear and exponential regression curves (Fig. 9 in Section 2) are considered representative of the NTS, however, and may be used for design purposes (Refs. 3, p. V-4, and Ref. 9, p. 14).

A well-marked daily cycle of wind speed and direction, associated with mountain/valley topography, is evident in nearly all parts of Nevada. Three features of atmospheric interaction cause low-level wind distributions at the NTS. It is the movement of large-scale pressure systems that controls seasonal changes in wind direction frequencies, from the predominantly southerly in summer to northerly in winter. Thus, maximum daily wind reversal amplitudes occur in summer. The north-south descending slope in terrain creates the conditions responsible for diurnal wind reversals from southerly



* 1. TOWER 4 (4JAo)
* 2. 4JA (4JAn)
* 3. YUCCA WEATHER STATION
4. SHOSHONE BASIN
5. AREA 12 MESA
* 6. BYJ
* 7. TOWER 5A
8. LATHROP WELLS
9. HIGHWAY 95
10. ROCK VALLEY
* 11. DESERT ROCK
12. TOWER 5
* 13. TOWER 6
14. PHOTO TOWER
15. AREA 410 BASIN W
16. AREA 410 BASIN
17. AREA 410 BASIN NW
18. AREA 410 HILLTOP
19. WELL 5B
20. FRENCHMAN FLAT #1
21. K-BUNKER
22. LOOKOUT PEAK
23. SHON SHOSHONE MOUNTAIN
24. AREA 11
25. AREA 3
26. AREA 18
27. AREA 9
28. MESA SLOPE
* 29. PAHUTE MESA #1
30. PAHUTE MESA DR 1.H.
31. PAHUTE MESA #5
32. MID VALLEY
* YA YUCCA ALLUVIAL SITE

Figure 4. Weather Observation Network and Station Locator at the Nevada Test Site (Source: Ref. 8, p. 24) *Data from these stations were used in this study.

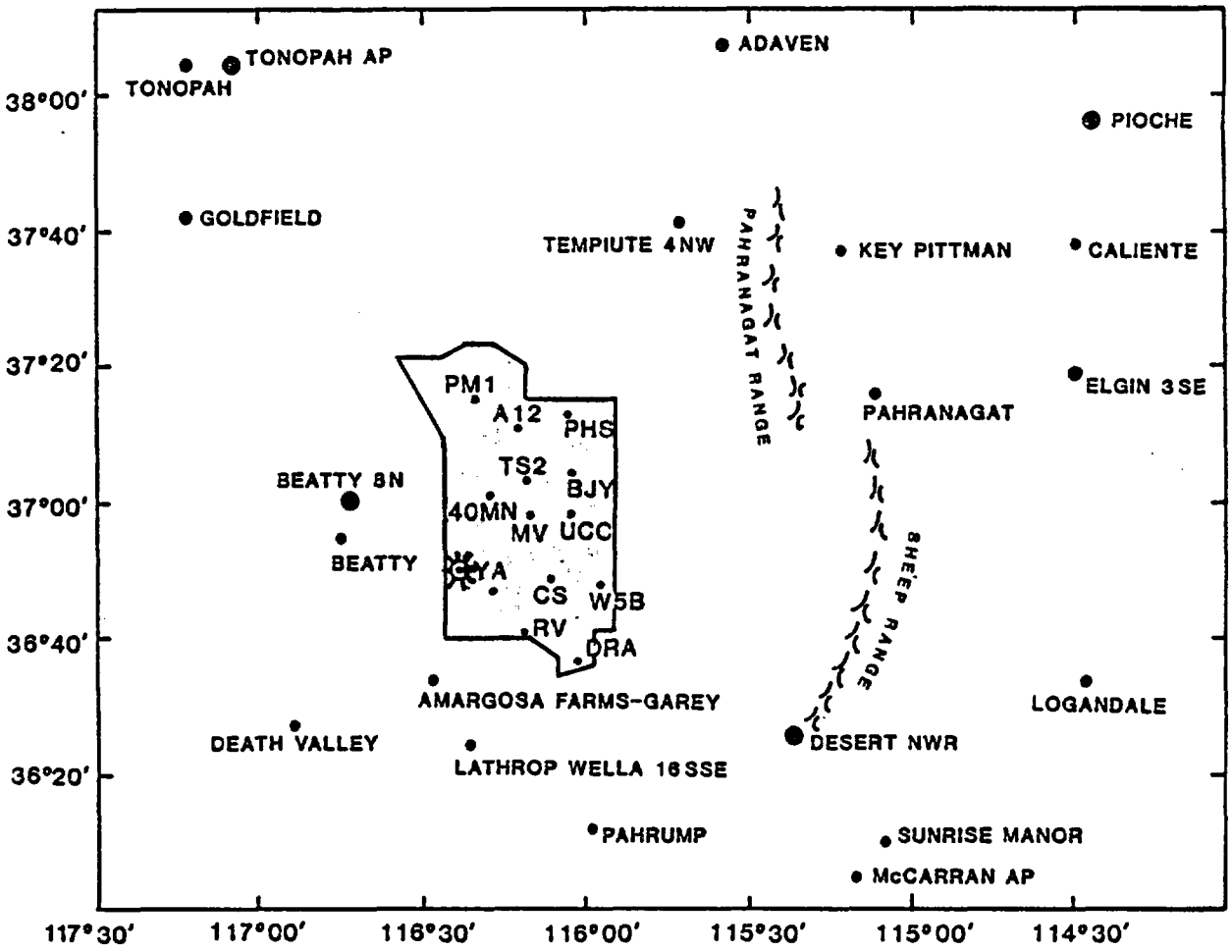


Figure 5. Location of 4 National Weather Service Reference Stations Relative to 13 Nevada Test Site Stations with Continuous Records Since October 1964 (Source: Ref. 9, see App. B, Fig. 2)
O NWS reference stations
*YA = Yucca Alluvial Site

(upslope) daytime directions, to northerly (downslope) night-time winds, resulting from non-uniform heating and cooling of the air near ground level. With regard to wind distributions, sensitivity to the orientation of slopes and valleys is large. Though small terrain induced turbulences-eddies and cellular convection-are important relative to diffusion characteristics, they have little effect on average hourly wind distributions because of their short duration and oscillation periods (Ref. 3, p. II-3).

Wind measurements for Desert Rock, Yucca Flat (measured at BJY Site), and Jackass Flats are based on analog records produced by wind sensors 96 ft (29 m) above ground, except as noted. The recording equipment was unable to measure speeds in excess of 60 mph (27 m/s), and therefore does not provide useful data for evaluating extreme windspeed occurrences. At

the Yucca Alluvial (YA) Site, wind measurements were taken at 10 ft (3 m) and 33 ft (10 m) above ground level (Ref. 3, p. II-9).

Much of the supplemental information in this study has been obtained from documents by R. F. Quiring, including Ref. 3 and the unpublished reports included in the Appendices, written for the National Oceanic and Atmospheric Administration/Weather Service, Nuclear Support Office, (NOAA/WSNSO), Las Vegas, Nevada.

1.2 Sources of Data

1.2.1 Identification of Measurement Sites

Though meteorological data collection began at YA Site in June 1982*, an adequate data base of site-specific measurements is not yet available for determining design parameters for the surface facilities. Consequently, regional data, recorded at nearby U.S. Weather Bureau** network stations and measurement sites (Figs. 4 and 5), on or adjacent to the NTS, as well as data obtained from other federally funded studies, have been collated for the parametric estimates.

Most of the measurements used in the study were recorded between 1956-with the onset of NTS activities-and 1978; in particular, this applies to data from Yucca Flat† and Jackass Flats. Yucca Flat data include two climatological summaries (Tables 1 and 2), 5- and 10-year averages of measurements, for 1962-1966, and 1962-1971, respectively. A recently completed preliminary 5-year summary (1978-1983),†† shown in Table 3, of data recorded at Desert Rock, is also provided. Jackass Flats data were collected at Towers 4 (4JAo-old) and 4JA (4JAn-new), between 1956 and 1981, at Towers 5A (1960-66) and 6 (wind and precipitation data 1956-60). Supplementary to the climatological summary, (1978-83) for Desert Rock, measurements recorded from 1956 to 1981 were also used. Data from other manned weather stations adjacent to NTS, at Beatty (1916-1969), Reno and Las Vegas, were used when pertinent long-term measurements from sites closer to, or more environmentally similar were unavailable, and also to provide a basis for comparison. Table 4 presents normalized summaries of means and extremes for Reno and Las Vegas, representative of the region.

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*Measurements recorded for July-September, 1982 are available in SAND83-1912, Quarterly Report, Sandia National Laboratories (H. W. Church et al., 1983, Ref. 10).

**Now the National Weather Service (NWS), National Oceanographic and Atmospheric Administration (NOAA).

†A Class I (NWS) manned weather station in operation until May 1978, when monitoring operations were relocated to their present position at Desert Rock.

††Personal communication from D. Soule (NOAA/WSNSO) Las Vegas, who provided a copy of the climatological data (Ref. 12).

Latitude 36° 57' N
Longitude 116° 03' W
Elevation 3,924 Feet

Table 1
Five-Year Climatological Summary (1962-1966)
Yucca Weather Station, Nevada Test Site, Nevada

Nevada State Grid (Central)
E680,500
N803,550

MONTH	Temperature (°F) Averages: DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	Extremes: HIGHEST	LOWEST	DEGREE DAYS (65°F BASE)	Precipitation (inches): AVERAGE	GREATEST MONTHLY	LEAST MONTHLY	GREATEST DAILY	Snow: AVERAGE	GREATEST MONTHLY	GREATEST DAILY	Relative Humidity %: 4:00 AM PST	10:00 AM PST	4:00 PM PST	10:00 PM PST	Wind(a): AVERAGE SPEED (MPH)	PREVAILING DIRECTION	Station Pressure (inches): AVERAGE	HIGHEST	LOWEST	(b) AVERAGE SKY COVER SUNRISE TO SUNSET	Average Number of Days: Sunrise to Sunset: CLEAR	PARTLY CLOUDY	CLOUDY	Precipitation: ≥ .01 inch	≥ .10 inch	≥ .50 inch	≥ 1.00 inch	THUNDERSTORMS	Temperature: MAX ≥ 90°F	MAX ≤ 32°F	MIN ≤ 32°F	MIN ≤ 0°F
JAN	52.0	19.0	35.5	70	0	908	.12	.18	.01	.18	1.4	4.3	4.3	61	44	30	54	10.0	360	26.11	26.54	25.42	4.1	15	9	7	2	*	0	0	*	0	1	29	*
FEB	56.6	24.4	40.5	77	5	683	.47	1.21	T	.73	0.2	1.0	1.0	63	41	28	50	10.6	010	26.05	26.38	25.56	4.4	13	7	8	3	1	*	0	0	0	*	24	0
MAR	60.3	26.0	43.2	87	10	668	.33	.47	.02	.23	2.4	6.7	4.0	56	28	21	42	11.5	350	25.98	26.35	25.48	5.1	12	9	10	4	1	0	0	1	0	0	26	0
APR	69.8	35.7	52.8	89	13	362	.66	2.57	.04	1.08	0.6	3.0	3.0	49	26	19	34	12.1	010	25.99	26.39	25.50	5.1	11	9	10	3	1	*	*	1	0	0	10	0
MAY	78.7	43.0	60.9	94	26	150	.12	.23	.01	.21	T	T	T	42	19	15	27	10.9	200	25.94	26.21	25.61	4.4	13	12	6	2	*	0	0	1	3	0	3	0
JUN	87.0	49.0	68.0	101	34	34	.11	.19	.02	.16	0	0	0	36	17	12	24	11.7	210	25.92	26.20	25.56	3.2	17	9	4	2	*	0	0	2	13	0	0	0
JUL	95.2	54.1	74.7	104	40	0	.51	1.34	0	.56	0	0	0	32	16	12	22	11.0	200	25.99	26.19	25.80	2.5	21	6	4	3	2	*	0	2	29	0	0	0
AUG	94.3	56.3	75.3	104	43	0	.37	1.04	0	.35	0	0	0	40	20	14	27	10.7	200	26.00	26.22	25.71	2.4	22	7	2	3	2	0	0	4	26	0	0	0
SEP	86.3	45.8	66.1	98	31	47	.66	2.30	0	.76	0	0	0	42	21	15	31	10.3	360	26.00	26.26	25.59	2.0	23	5	2	2	1	1	0	1	12	0	1	0
OCT	78.9	38.3	58.6	94	22	202	.13	.25	0	.25	0	0	0	45	22	17	35	9.8	360	26.08	26.39	25.59	2.6	21	6	4	2	1	0	0	*	3	0	8	0
NOV	61.7	27.7	44.7	82	13	603	.84	3.02	0	.80	1.0	4.8	2.3	62	39	33	53	8.5	360	26.07	26.39	25.64	5.1	12	8	10	4	3	1	0	*	0	0	24	0
DEC	53.5	21.8	37.7	70	1	841	.84	2.66	T	1.31	0.1	0.5	0.5	66	46	37	61	8.7	360	26.09	26.52	25.49	4.4	14	7	10	2	1	1	*	*	0	0	29	0
ANN.	72.9	36.8	54.8	104	0	4498	5.16	3.02	0	1.31	5.7	6.7	4.3	50	28	21	38	10.5	360	26.02	26.54	25.42	3.8	194	94	77	32	13	3	1	13	86	1	154	*

* One or more occurrences during the period of record but average less than 0.5 day

T Trace, an amount too small to measure

(a) Average wind speed is based on observations on the hour from towers of varying height during the period of record (BJY 100' tower 1-1-62 - 11-8-64 Yucca 9' tower 11-9-64 - 7-5-66 Yucca 30' tower 7-6-66 - 12-31-66) Prevailing wind direction was taken from the summary of 1-hour average winds for the BJY 100' tower for the period 7-11-57 - 12-31-64

(b) Sky cover is expressed in the range from 0 for no clouds to 10 for complete sky cover. Clear, partly cloudy, and cloudy days are based on average daytime cloudiness 0-3, 4-7, and 8-10 tenths respectively

(Source: Ref. 3, p. 3)

NARRATIVE SUMMARY

The Yucca Weather Station is located on the western edge of normally dry Yucca Lake in a basin which measures about 20 miles long by 10 miles wide with the long axis oriented NNW-SSE. The lowest point in the basin is at an elevation of about 3900 feet MSL. The rim of the basin varies in height from near 4000 feet MSL to the southeast of the station to 7800 feet to the northwest. The main topographic feature of the area surrounding the basin consists of a series of ridges and valleys oriented in a general N-S direction.

The climate reflected in the 5-year summary for the Yucca Weather Station is that of a typical high desert basin. The temperature fluctuates between wide limits under predominantly clear skies and low relative humidities. The average daily temperature range varies from near 40 degrees in summer to 32 degrees in winter. A daily temperature range of 50 to 55 degrees is not uncommon. Temperature extremes of 110 and -5 degrees were recorded prior to 1962.

The average annual precipitation of 5.16 inches is slightly less than normal for the area for an elevation of 3924 feet MSL; however, some of the monthly averages depart radically from expected normals due to the vagaries of precipitation in arid regions combined with the short period of record. The normal pattern of monthly precipitation amounts consists of a definite peak in January or February dipping to a pronounced low in June, then rising to a secondary peak in July or August with a secondary low in October. This pattern is only vaguely apparent in the Yucca record because some of the monthly averages have been distorted by exceptionally heavy precipitation in some years for some of the months.

The prevailing wind direction tabulated in the summary is on a 24-hour basis and shows predominantly northerly winds except for the months May through August when winds from the south-southwest predominate. Due to the prevalent mountain-valley winds in the Yucca basin, however, south to southwest winds predominate during daylight hours in nearly all months. During the winter months southerly winds have only a slight edge over northerly winds for a few hours during the warmest part of the day.

The user of this 5-year summary is cautioned that climatological conditions at other locations in the Nevada Test Site may be substantially different due to local terrain effects and differences in elevation.

Latitude 36° 57' N
Longitude 116° 03' W
Elevation 3,924 Feet

Table 2
Ten-Year Climatological Summary (1962-1971)
Yucca Flat, Nevada - Nevada Test Site

Nevada Coordinate System (Central)
E680,875
N803,600

MONTH	Temperature (°F) Averages: Daily Maximum	Daily Minimum	Monthly	Extremes: Highest	Year	Lowest	Year	Degree Days (Base 65°): Heating	Cooling	Precipitation (inches): Average	Greatest Monthly	Year	Least Monthly	Year	Greatest Daily	Year	Snow: Average	Greatest Monthly	Year	Greatest Daily	Year	Relative Humidity (%) Hour (PST): 04	10	16	22	Wind (a) (Speeds in mph): Average Speed	Peak Speed	Year	Resultant (Dir/Sp): 23-02 PST	11-14 PST	Station Pressure (inches): Averages	Highest	Lowest	(b) Average Sky Cover Sunrise to Sunset	Average Number of Days: Sunrise-Sunset: Clear	Partly Cloudy	Cloudy	Precip: .01 inch or more	.10 inch or more	.50 inch or more	1.00 inch or more	.10 or more of snow	Thunderstorms	Temp Max: 90°F or more	32°F or less	Temp Min: 32°F or less	0°F or less
JAN	52.1	20.8	36.5	73	1971	-2	1970	877	0	.53	4.02	1969	T	1971#	1.25	1969	0.9	4.3	1962	4.3	1962	67	49	35	60	6.6	58	1965	233/0.7	135/2.6	26.10	26.54	25.42	4.9	13	8	10	2	1	*	*	*	*	0	1	29	*
FEB	56.7	25.8	41.3	77	1963	5	1971#	662	0	.84	3.55	1969	T	1967#	1.16	1969	1.9	17.4	1969	6.2	1969	67	45	32	56	6.9	52	1967	275/1.1	118/2.7	26.05	26.42	25.56	5.0	11	8	9	3	2	*	*	1	0	0	*	23	0
MAR	60.9	27.7	44.3	87	1968	9	1969	634	0	.29	0.60	1969	.02	1966	.38	1969	2.0	7.5	1969	4.5	1969	58	31	23	44	8.4	55	1971	240/1.8	186/4.5	25.99	26.43	25.48	4.8	12	9	10	3	1	0	0	1	1	0	0	24	0
APR	67.8	34.4	51.1	89	1962	13	1966	411	1	.45	2.57	1965	T	1962	1.08	1965	0.7	3.0	1964	3.0	1964	52	27	21	38	9.1	60+	1970#	250/2.2	198/5.1	25.96	26.39	25.50	4.5	13	9	8	3	1	*	*	*	1	0	0	12	0
MAY	78.9	43.5	61.2	97	1967	25	1967	147	38	.24	1.62	1971	T	1970#	.86	1971	0	T	1964	T	1964	46	22	17	31	8.3	60+	1967	260/1.5	179/7.2	25.94	26.39	25.47	4.3	14	11	6	2	1	*	0	0	1	4	0	2	0
JUN	87.6	49.9	68.8	107	1970	29	1971#	35	154	.21	1.13	1969	T	1971	.45	1969	0	0		0		39	19	14	26	7.9	60+	1967	272/1.9	185/8.2	25.92	26.20	25.56	3.0	19	7	4	2	1	0	0	0	2	14	0	*	0
JUL	96.1	57.0	76.6	107	1967	40	1964#	0	368	.52	1.34	1966	0	1963	.77	1969	0	0		0		40	20	15	28	7.5	55	1971	278/0.9	185/12.0	26.00	26.19	25.68	3.0	19	9	3	3	2	*	0	0	4	29	0	0	0
AUG	95.0	58.1	76.6	107	1970	39	1968	1	368	.34	1.04	1965	0	1962	.35	1971#	0	0		0		44	23	16	30	6.7	60+	1968	222/1.5	182/12.0	26.00	26.22	25.71	3.0	20	8	3	3	1	0	0	0	4	27	0	0	0
SEP	86.4	46.7	66.5	105	1971	25	1971	51	103	.68	2.38	1969	0	1968#	2.13	1969	0	0		0		43	21	17	32	7.0	52	1970	281/1.3	163/6.4	26.00	26.36	25.56	2.1	22	6	2	2	1	1	*	0	2	11	0	1	0
OCT	76.1	36.9	56.5	94	1964+	12	1971	266	9	.13	0.45	1969	0	1967#	.42	1969	0	T	1971	T	1971	46	24	19	36	6.8	60	1971	286/1.3	138/3.7	26.06	26.40	25.52	2.9	20	7	4	1	1	0	0	0	*	2	0	9	0
NOV	61.8	27.6	44.7	82	1962	13	1966	602	0	.71	3.02	1965	0	1962	1.10	1970	0.5	4.8	1964	2.3	1964	61	39	31	52	6.1	51	1970	234/1.2	152/4.1	26.08	26.58	25.64	4.8	13	7	10	3	2	*	*	*	*	0	0	23	0
DEC	50.7	19.9	35.3	70	1964	-14	1967	914	0	.79	2.66	1965	T	1969#	1.31	1965	2.3	9.9	1971	7.4	1971	68	50	41	64	6.6	53	1970	288/1.9	109/1.0	26.07	26.59	25.49	4.6	14	8	9	3	1	1	*	1	*	0	1	29	1
ANN	72.5	37.4	54.9	107	AUG 1970♦	-14	DEC 1967	4600	1039	5.73	4.02	JAN 1969	0	SEP 1968♦	2.13	SEP 1969	8.3	17.4	FEB 1969	7.4	DEC 1971	53	31	23	41	7.4	60†	APR 1970♦	—	—	26.01	26.59	25.42	3.9	190	97	78	30	14	3	1	3	14	87	2	152	1

* One or more occurrences during the period of record but average less than 0.5 day

♦ Most recent of multiple occurrences

† Trace, an amount too small to measure

(a) Average and peak speed are for the period starting with December 1964. The direction of the resultant wind is from a summary covering the period December 1964 through May 1969

(b) Sky cover is expressed in the range from 0 for no clouds to 10 when the sky is completely covered with clouds. Clear, partly cloudy and cloudy are defined as average daytime cloudiness of 0-3, 4-7, and 8-10 tenths, respectively. Source: Air Resources Laboratory, Las Vegas, NV

(Source: Ref. 11, p. 10)

Latitude 36° 37' N
Longitude 116° 01' W
Elevation 3,298 Feet

Table 3
Five-Year Climatological Summary
(June 1978 - May 1983)
Desert Rock, Nevada - Nevada Test Site

Nevada Coordinate System (Central)
E687,100
N681,000

MONTH	Temperature (°F) Averages: Daily Maximum	Daily Minimum	Monthly	Extremes: Highest	Year	Lowest	Year	Degree Days (Base 65°): Heating	Cooling
JAN	54.1	33.2	43.6	71	1981	13	1979	653	0
FEB	58.9	35.8	47.3	78	1981	15	1979	491	0
MAR	61.2	39.1	50.1	78	1979	29	1979	453	0
APR	71.3	45.7	58.5	95	1981	30	1983	216	26
MAY	80.4	54.1	67.2	102	1983	37	1983	72	148
JUN	92.6	64.0	78.3	105	1981	49	1979	*	408
JUL	99.0	70.0	84.5	108	1980	51	1982	0	613
AUG	96.2	68.1	82.2	111	1981	56	1978	0	541
SEP	89.3	61.1	75.2	102	1979	39	1982	15	328
OCT	77.5	50.0	63.8	100	1980	33	1979	121	88
NOV	63.1	38.3	50.7	84	1980	25	1981	422	1
DEC	57.1	33.1	45.0	73	1980	17	1978	610	0
ANN.	75.1	49.4	62.2	111	AUG 1981	13	JAN 1979	3053	2153

MONTH	Precipitation (inches): Average	Greatest Monthly	Year	Least Monthly	Year	Greatest Daily	Year	Snow: Average	Greatest Monthly	Year	Greatest Daily	Year	Relative Humidity (%) Hour (PST): 04	10	16	22
JAN	.96	.52	1979	.30	1981	.52	1979	1.1	4.1	1979	3.0	1979	61	47	39	56
FEB	.77	.63	1980	.21	1981	.63	1980	0.4	1.7	1979	1.1	1979	62	44	33	54
MAR	1.66	2.14	1983	1.08	1980	.86	1982	0	T	1982	T	1982	63	43	33	53
APR	.15	.28	1982	.03	1979	.14	1982	0	T	1983	T	1983	44	27	19	33
MAY	.58	1.57	1981	.02	1979	1.53	1981	0	0		0		43	25	19	32
JUN	.04	.17	1980	0	1979	.17	1980	0	0		0		24	15	9	17
JUL	.60	1.72	1982	0	1981	1.57	1982	0	0		0		28	18	13	21
AUG	.42	1.43	1979	0	1980	.87	1979	0	0		0		36	22	16	25
SEP	.45	1.18	1982	T	1979	.59	1982	0	0		0		38	24	18	30
OCT	.20	.58	1978	T	1979	.36	1978	0	0		0		38	24	18	31
NOV	.61	1.59	1978	T	1980	.62	1978	0	T	1982	T	1982	48	32	25	42
DEC	.29	.88	1978	0	1981	.50	1978	0	0.3	1982	0.3	1982	55	38	30	48
ANN.	6.73	2.19	MAR 1983	0	DEC 1981◆	1.57	JUL 1982	1.5	4.1	JAN 1979	3.0	JAN 1979	45	30	23	37

MONTH	Wind (Speeds in mph): Average Speed	Peak Speed	Year	Vector Wind (dir spd): 23-02 PST	11-14 PST	Station Pressure (inches): Average	Highest	Lowest	Average Sky Cover Sunrise to Sunset
JAN	8.5	58	1980	059/03.4	162/02.9	26.64	27.15	26.11	5.6
FEB	9.2	66	1983	063/02.6	160/02.9	26.64	26.99	26.13	6.4
MAR	9.4	56	1983	100/01.7	212/03.10	26.54	26.98	25.91	5.3
APR	10.4	52	1982	062/01.7	216/05.11	26.55	26.97	26.17	4.4
MAY	9.6	64	1979	062/02.7	216/06.11	26.49	26.80	26.10	4.0
JUN	11.0	54	1979	087/01.7	218/08.12	26.52	26.84	26.21	2.4
JUL	9.4	63	1980	092/01.6	217/09.11	26.56	26.79	26.39	1.9
AUG	8.9	54	1979	105/01.6	211/09.11	26.56	26.79	26.29	2.4
SEP	8.6	49	1978	066/02.5	204/05.10	26.59	26.83	26.12	2.9
OCT	8.4	56	1982	060/02.6	200/03.9	26.63	27.10	26.19	3.1
NOV	8.2	52	1982	058/02.6	152/03.7	26.66	27.06	25.84	4.4
DEC	7.7	52	1981	050/03.6	111/02.8	26.70	27.10	26.02	4.8
ANN.	9.1	66	FEB 1983	066/02	205/04	26.54	27.15	25.84	4.0

MONTH	Average Number of Days: Sunrise Sunset: Clear	Partly Cloudy	Cloudy	Precip: .01 inch or more	.10 inch or more	.50 inch or more	1.00 inch or more	1.0 in or more of snow	Thunderstorms	Temp: Max: 90° F or more	32° F or less	Min: 32° F or less	0° F or less
JAN	10	7	14	6	4	*	0	1	0	0	0	13	0
FEB	7	7	14	5	2	1	0	*	*	0	0	8	0
MAR	10	11	10	7	5	1	0	*	1	0	0	2	0
APR	13	9	8	3	*	0	0	*	1	*	0	1	0
MAY	16	8	7	2	1	*	*	0	1	6	0	0	0
JUN	21	5	4	*	*	0	0	0	1	21	0	0	0
JUL	24	5	2	2	1	*	*	0	2	29	0	0	0
AUG	23	4	4	3	1	*	0	0	4	27	0	0	0
SEP	19	7	4	3	1	*	0	0	3	17	0	0	0
OCT	19	7	5	2	1	0	0	0	0	5	0	0	0
NOV	13	9	8	3	2	*	0	*	0	0	0	5	0
DEC	14	5	12	2	1	*	0	*	0	0	0	15	0
ANN.	189	84	92	38	19	3	*	1	13	106	0	44	0

* One or more occurrences during the period of record but average less than 0.5 day

◆ Most recent of multiple occurrences.

(Source: Ref. 12, NOAA/WSNSO)

Latitude 36° 05' N
Longitude 115° 10' W
Elevation (ground) 2,162 Feet

Table 4
Climatological Summaries for Las Vegas and Reno
Normals, Means and Extremes

Las Vegas, Nevada
Mc Carran Field

MONTH	Temperature (°F) Normal: Daily Maximum	Daily Minimum	Monthly	Extremes: Highest	Year	Lowest	Year	Normal Degree Days	Precipitation (inches): Normal Total	Maximum Monthly	Year	Minimum Monthly	Year	Maximum in 24 Hrs	Year	Snow, Sleet: Mean Total	Maximum Monthly	Year	Maximum in 24 Hrs	Year	Relative Humidity (%): 4:00 A PST	10:00 A PST	4:00 P PST	10:00 P PST	Wind[a]: Mean Hourly Speed	Prevailing Direction	Fastest Mile: Speed	Direction	Year	Pct of Possible Sunshine	Mean Sky Cover Sunrise to Sunset	Mean Number of Days: Sunrise to Sunset: Clear	Partly Cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet 1.0 inch or more	Thunderstorms	Heavy Fog	Temperature Max: 90° and Above	32° and Below	Temperature Min: 32° and Below	0° and Below
(a)	(b)	(b)	(b)	21		21		(b)	(b)	21		21		21		21	21		21		17	17	17	17	9	S				17	9	21	21	21	21	21	21	21	21	21	21	21
JAN	56.4	33.0	44.2	76	1948	8	1937	663	0.44	2.41	1949	0.00	1942	1.01	1952	1.0	16.7	1949	5.0	1949	61	41	34	54	6.6	W				74	5.4	13	6	12	3	*	*	*	0	*	19	0
FEB	62.1	38.6	50.4	82	1954	17	1938+	423	0.58	1.58	1941	0.00	1956+	1.01	1940	0.2	4.1	1939	4.1	1939	54	33	24	44	7.6	W				77	4.0	12	7	9	2	*	*	0	0	0	11	0
MAR	68.9	44.0	56.5	89	1940	19	1939	298	0.35	1.63	1941	0.00	1956	1.14	1952	T	T	1952+	T	1952+	45	25	19	35	9.7	SW				79	4.1	14	9	8	3	0	*	0	0	0	3	0
APR	78.6	52.6	65.6	99	1946+	31	1955+	92	0.24	1.68	1941	T	1954+	0.88	1941	0.0	0.0		0.0		40	21	16	29	10.1	SW				80	3.8	14	9	7	2	0	1	0	4	0	*	0
MAY	87.9	60.2	74.1	109	1951	38	1942	0	0.16	0.29	1949	0.00	1964+	0.23	1949	0.0	0.0		0.0		31	17	12	22	10.8	SW				86	3.3	18	8	4	1	0	1	0	17	0	0	0
JUN	98.9	68.2	83.5	118	1940	48	1939	0	0.13	0.39	1955	0.00	1956+	0.39	1955	0.0	0.0		0.0		25	13	10	16	10.6	SW				92	1.6	23	5	2	*	0	1	0	26	0	0	0
JUL	105.4	75.8	90.5	117	1942	56	1940+	0	0.46	1.68	1945	0.00	1948	1.32	1956	0.0	0.0		0.0		31	19	14	24	9.5	SW				85	2.8	21	7	3	3	0	5	0	31	0	0	0
AUG	103.3	73.5	88.4	116	1940+	54	1937	0	0.53	2.59	1957	0.00	1956+	2.59	1957	0.0	0.0		0.0		34	20	15	26	9.4	SW				86	2.1	21	7	3	2	0	3	0	30	0	0	0
SEP	96.2	65.1	80.7	113	1950	43	1948	0	0.34	3.39	1939	0.00	1956+	1.12	1939	0.0	0.0		0.0		29	17	12	22	8.2	SW				92	1.3	23	5	2	1	0	1	0	25	0	0	0
OCT	81.7	53.0	67.4	100	1947	32	1949+	61	0.32	1.13	1947+	0.00	1952+	1.08	1947	T	T	1956	T	1956	41	24	19	33	7.4	SW				84	2.3	21	6	4	2	0	1	0	7	0	*	0
NOV	67.1	40.6	53.9	84	1941+	15	1938	344	0.22	1.04	1946	0.00	1956+	0.58	1946	T	T	1953+	T	1953+	48	29	25	41	6.2	W				82	3.2	17	6	5	2	0	*	*	0	0	8	0
DEC	58.1	35.5	46.8	78	1940	14	1945+	564	0.58	1.78	1940	0.00	1958	0.87	1947	T	T	1941+	T	1941+	57	37	31	49	8.0	W				73	4.5	13	7	11	3	0	*	*	0	0	17	0
ANN	80.3	53.3	66.8	117	JUL 1942	8	JAN 1937	2425	4.35	3.39	SEPT 1939	0.00	DEC 1958+	2.59	AUG 1957	1.2	16.7	JAN 1949	5.0	JAN 1949	41	25	19	33	8.5	SW				83	3.2	210	85	70	25	*	13	*	140	*	58	0

Latitude 39° 30' N
Longitude 119° 47' W
Elevation (ground) 4,397 Feet

Reno, Nevada
Municipal Airport

MONTH	Temperature (°F) Normal: Daily Maximum	Daily Minimum	Monthly	Extremes: Highest	Year	Lowest	Year	Normal Degree Days	Precipitation (inches): Normal Total	Maximum Monthly	Year	Minimum Monthly	Year	Maximum in 24 Hrs	Year	Snow, Sleet: Mean Total	Maximum Monthly	Year	Maximum in 24 Hrs	Year	Relative Humidity (%): 4:00 A PST	10:00 A PST	4:00 P PST	10:00 P PST	Wind[a]: Mean Hourly Speed	Prevailing Direction	Fastest Mile: Speed	Direction	Year	Pct of Possible Sunshine	Mean Sky Cover Sunrise to Sunset	Mean Number of Days: Sunrise to Sunset: Clear	Partly Cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet 1.0 inch or more	Thunderstorms	Heavy Fog	Temperature Max: 90° and Above	32° and Below	Temperature Min: 32° and Below	0° and Below
(a)	(b)	(b)	(b)	16		16		(b)	(b)	16		16		16		16	16		16		18	18	18	18	15	15	16	16		15	16	16	16	16	16	16	16	16	16	16	16	16
JAN	45.7	16.6	31.2	68	1948+	-16	1949+	1048	1.04	4.05	1943	0.01	1948	2.37	1943	7.0	20.0	1956	12.0	1956	81	67	54	77	6.6	S	66	SW	1954	65	6.0	10	8	13	6	2	0	2	0	4	28	3
FEB	50.9	21.6	36.3	70	1950	-9	1956	804	1.05	1.88	1945	0.22	1953	1.18	1945	4.2	13.8	1944	6.2	1943	81	60	51	75	6.4	S	66	SW	1954+	68	5.7	9	6	11	6	2	*	1	0	1	26	1
MAR	56.5	24.6	40.6	77	1947	-2	1945	756	0.70	2.02	1952	0.05	1956	1.21	1943	5.0	29.0	1952	16.9	1952	77	45	35	64	7.9	WNW	68	S	1951	68	5.6	10	9	12	6	1	0	*	0	*	28	*
APR	65.6	30.3	47.7	87	1946	13	1956	519	0.46	1.63	1952	0.03	1947	1.60	1952	0.6	3.0	1953	2.0	1953	73	37	30	58	8.2	WNW	66	SW	1945	74	5.4	10	10	10	4	*	1	*	0	0	19	0
MAY	73.2	37.3	55.3	94	1954	20	1950+	318	0.48	1.64	1949	T	1943	0.80	1949	0.2	2.5	1955	2.5	1955	76	34	29	56	7.8	WNW	63	SW	1945	75	4.9	12	10	9	4	*	2	*	1	0	7	0
JUN	80.8	42.1	61.5	100	1954+	25	1954	165	0.42	0.87	1945	0.00	1946	0.66	1945	T	T	1954+	T	1954+	76	31	24	50	7.6	WNW	66	S	1945	81	3.2	18	8	4	3	0	2	0	4	0	2	0
JUL	91.8	47.3	69.6	104	1945	35	1955	27	0.23	0.84	1946	0.00	1951+	0.80	1949	0.0	0.0		0.0		72	25	19	43	6.8	WNW	54	S	1956	91	1.9	25	5	1	2	0	4	*	20	0	0	0
AUG	90.1	44.7	67.4	102	1946	32	1943	61	0.23	0.23	1945	0.00	1957+	0.17	1945	0.0	0.0		0.0		74	26	18	44	6.5	WNW	57	S	1951	92	1.7	25	4	2	1	0	2	*	15	0	*	0
SEP	82.3	38.7	60.5	101	1950	21	1950	165	0.22	1.02	1950	0.00	1954+	0.80	1950	T	T	1952+	T	1952+	78	31	21	55	5.5	WNW	48	S	1955	90	2.2	22	6	2	2	0	1	*	7	0	3	0
OCT	70.2	31.2	50.7	88	1947	13	1946	443	0.55	2.14	1945	T	1954	1.27	1945	0.3	2.0	1957	2.0	1957	79	43	31	66	5.7	WNW	66	S	1947	77	4.0	16	7	8	3	*	1	*	0	0	19	0
NOV	57.1	23.3	40.2	77	1949	7	1948	744	0.64	2.04	1946	T	1956+	1.23	1949	1.5	1.4	1946	3.0	1947+	81	54	43	75	5.1	S	59	SW	1945	69	5.3	11	8	11	4	1	0	1	0	0	27	0
DEC	47.2	19.1	33.2	69	1940	-5	1949	988	0.94	5.25	1955	0.01	1947	2.16	1955	4.0	1.2	1955	5.2	1943	83	67	58	78	5.2	S	72	S	1945	58	6.5	7	8	16	6	1	0	4	0	2	29	*
ANN	67.6	31.4	49.5	104	JUL 1945	-16	JAN 1949+	6036	6.96	5.25	DEC 1955	0.00	AUG 1957+	2.37	JAN 1943	22.8	29.0	MAR 1952	18.9	MAR 1952	77	43	34	62	6.6	WNW	72	S	DEC 1945	77	4.4	175	91	99	47	7	13	8	97	7	188	4

Means and extremes in the above table are from the existing or comparable NWS/NHS Annual extremes have been established at prior locations as follows: Highest temperature 108 on July 1931 lowest temperature 19 on January 1950 maximum monthly precipitation 6.78 in January 1916 maximum precipitation in 24 hours 2.71 in January 1943 maximum monthly snowfall 55.7 in January 1916 maximum snowfall in 24 hours 22.5 in January 1916

(Source: Ref. 11, p. 12)

Despite the small sampling of on-site (YA) measurements available for comparisons, there is evidence of a reasonably close correlation between them and data selected from nearby measurement sites. However, some accommodation should be made for relative differences in altitude or topography or any other requisite features for which adjustments would reasonably be expected, e.g., wind channeling and altitudinal variations in temperature and precipitation.

1.2.2 Description of Measurement Sites

1.2.2.1 Jackass Flats (JF) --

- Tower 4JAn (new:active) - 3422 ft (1043 m) MSL
  610,605 E 740,840 N

- Tower 4JAo (old:inactive) - 3610 ft (1100 m) MSL
  617,000 E 748,000 N

- Tower 4 and 4JA (old:inactive) - 3735 ft (1138 m) MSL
  600,000 E 752,000 N

These tower sites, approximately 10 mi (16 km) southeast of YA, are/were located in an elongated valley oriented along a northeasterly-southwesterly axis near the center of Jackass Flats. The terrain slopes gently downward from northeast to southwest and surrounding mountains form an almost elliptically-shaped valley opening into the Amargosa Desert to the southwest.

- Tower 5A (active) - 3644 ft (1111 m) MSL
  599,150 E 742,050 N

5A is located atop a knoll, about 4.5 mi (7.2 km) downvalley and southwest of Tower 4, at a point where the orientation of the valley changes from northeast/southwest to a more north/south direction.

- Tower 6 (inactive) - 3256 ft (992 m) MSL
  599,150 E 742,050 N

T6 was located about 2.5 mi (4 km) northwest of Tower 5A and was nearly aligned with Tower 4JA, west of it by about 6 mi (9.7 km). T6 was the closest of the Jackass Flats measurement sites to the candidate site, at approximately 5 mi (8 km) southeast of YA. The valley orientation at this point is northeast/southwest. Only wind and precipitation data are available from Tower 6 operations.

1.2.2.2 Yucca Flat (YF) --

- BJY (active) - 4070 ft (1241 m) MSL
  679,100 E 842,300 N

- UCC (active) - 3924 ft (1196 m) MSL
  680,875 E 803,600N

These tower sites are located close to the center of Yucca Flat, near the bottom of a closed basin, at the western edge of the normally dry Yucca Lake. The basin measures about 20 mi (32.2 km) long and 10 mi (16.1 km) wide, with valley orientation north-northwest, south-southeast. The lowest point in the basin is at about 3900 ft (1189 m) and elevations at the rim vary from 4000 ft (1219 m) MSL to the southeast, to 7800 ft (2377 m) to the northwest of the station. BJY and UCC are about 27 mi (43 km) and 24 mi (39 km), respectively, northeast of YA site.

Yucca Flat wind and temperature data for the 5- and 10-year summaries, represent measurements collected at BJY station, about 7 mi (11 km) north of UCC station on gently sloping terrain. BJY is located about 155 ft (47 m) above the bottom of the basin, where a distinct tendency toward air stagnation at night results in large average daily temperature ranges. The main topographic feature of the area surrounding the basin consists of a series of ridges and valleys oriented in a general north/south direction.

1.2.2.3 Desert Rock (DRA) --

- DRA (active) - 3220 ft (981 m) MSL
  690,040 E 682,790 N

DRA is located about 28 mi (45 km) almost directly south of UCC, in a closed basin with similar features to those found at Yucca Flat. Early wind data, 1963-1964 were recorded at 10 ft (3 m) above ground; all other wind measurements and meteorological data were monitored at 96 ft (29 m) above ground. DRA is located about 26 mi (42 km) southeast of YA site.

1.2.2.4 Yucca Alluvial Site (YA) --

- YA (active) - 3751 ft (1143 m) MSL
  569,122 E 761,794 N

YA site is located on the alluvial fan at the base of Yucca Mountain's eastern face, on gently sloping terrain. The major valley/ridge axis orientation is north/south, parallel to Yucca Mountain and Fortymile Wash. Measurements are taken at 10 ft (3 m) and 33 ft (10 m) above ground level.

2. METEOROLOGICAL DATA

2.1 Precipitation

The NTS, averaging less than 8 in. (20.3 cm) annually, experiences light precipitation throughout the year, as shown in the climatological summaries (Tables 1-4) and Table 5. From these tables, it is also evident that approximately 50% of annual precipitation generally occurs between November and February. Storms producing maximum cumulative levels of precipitation are most common in winter, but short-lived extremes of precipitation with maximum single-storm levels, can accompany thunderstorms in summer, causing flash floods. The maximum rainfall in one hour in the state, was recorded at Elko in August 1970, where 3.6 in. (9.1 cm) of rain fell during an intense thunderstorm. The maximum level of rainfall at Yucca Flat in one day was 2.13 in. (5.4 cm). Precipitation in Nevada occurs on relatively few days per year. At the NTS, approximately only 30 days annually receive 0.01 in. (0.02 cm) or more of rain. Normally, the heavier the total precipitation, the greater the number of days of precipitation (Ref. 4, p. 47).

Rainfall for any arid region is highly variable from year to year. At Las Vegas, where average annual precipitation is 3.76 in. (9.6 cm), levels have varied from 0.76 in. (1.9 cm) in 1948 to 10.7 in. (27.2 cm) in 1941. The upper bound represents 14 times the amount of rain that can fall in the driest year.

2.1.1 Annual Cycle

Data, representative of the annual precipitation cycle at NTS, as measured at 13 stations (see locator map, Fig. 5), are illustrated in Figs. 6A, 6B, and 6C as averaged over a cumulative period of 17 years (October 1964 through September 1981). The curves in Fig. 6A show a comparison of the data recorded as the averages of 4 NWS stations adjacent to NTS, during the same interval and for the 1951-1980 normal period. The precipitation ordinate, expressed as the ratio of the amount (in inches) to elevation, effectively suppresses substantial differences in precipitation due to elevation. The data selection is weighted (45%) in favor of elevations ranging from 3000-5000 ft (914-1524 m) MSL; by including only 2 out of 13 stations over 5000 ft (1524 m) MSL for the averages, the data are relatively characteristic of mid-elevations (Ref. 9, App. B) and, therefore, YA site as well.

The 13 NTS and 4 NWS stations conform to the usual averages of greater precipitation from November to March and lower levels from April to October. In Fig. 6B, the 4 station averages indicate that precipitation for October 1964-September 1981 was above normal (1951-1980) for most of the year, with greatest deviation in February and March. The annual cycle

Table 5

Average Monthly and Annual Precipitation (Inches) at Various Locations on or Adjacent to the Nevada Test Site

Location Near Station Coord. Lat. - Long. Elevation	Period of Record	Years of Record	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
BJY 679,100 E 842,300 N 37°3' N 116°2' W 4070 ft (1241 m) MSL	2/60-9/81	21[a]	0.76	0.87	0.73	0.34	0.33	0.21	0.48	0.45	0.53	0.36	0.50	0.57	6.03
UCC 680,875 E 803,600 N 36°57' N 116°2' W 3924 ft (1196 m) MSL	5/58-9/67	9[b]	0.32	0.38	0.24	0.54	0.12	0.14	0.48	0.43	0.52	0.24	0.82	0.71	4.94
	5/58-9/81	23[a]	0.91	0.92	0.72	0.36	0.28	0.24	0.48	0.41	0.49	0.35	0.59	0.59	6.34
	1962-71	10[c]	0.53	0.84	0.29	0.45	0.24	0.21	0.52	0.34	0.68	0.13	0.71	0.79	5.73
	1962-66	5[b]	0.12	0.47	0.33	0.66	0.12	0.11	0.51	0.37	0.66	0.13	0.84	0.84	5.16
DRA 690,040 E 682,790 N 36°37' N 116°1' W 3298 ft (1005 m)	9/62-9/67	5[b]	0.33	0.28	0.25	0.70	0.15	0.22	0.30	0.68	0.59	0.10	0.64	0.63	4.84
	10/63-9/81	19[a]	0.64	0.78	0.70	0.33	0.35	0.14	0.34	0.52	0.38	0.25	0.50	0.46	5.39
	78-83	5[c]	0.96	0.77	1.66	0.15	0.58	0.04	0.60	0.42	0.45	0.20	0.61	0.29	6.73
4JAn 610,605 E 740,840 N 36°47' N 116°17' W 3422 ft (1043 m) MSL	1/67-9/81	15	0.63	1.08	0.83	0.18	0.31	0.13	0.35	0.31	0.28	0.32	0.33	0.33	5.08

*Includes water equivalent of melted snow.
[a]Ref. 9, Quiring, App. B, p. 25.
[b]Ref. 3, Quiring, 1968, p. V, 10-12.
[c]Ref. 11, (Table 2), p. 10.
[d]Not averaged over a cumulative period of years; only one month each (July-Sept., 1982) of data are currently available (Ref. 10).
[e]U.S. Department of Agriculture "Climatic Summary of the United States; 1914-1930, Nevada" (Ref. 13).
[f]Ref. 3, as read from a line graph, p. V-5.

Table 5

Average Monthly and Annual Precipitation (Inches) at Various Locations on or Adjacent to the Nevada Test Site (continued)

Location Near Station Coord. Lat. - Long. Elevation	Period of Record	Years of Record	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
4JAo	12/57-1/67	9[a]	0.27	0.39	0.16	0.34	0.11	0.07	0.19	0.25	0.47	0.21	0.54	0.63	3.63
617,000 E 748,000 N 36°48' N 116°16' W 3610 ft (1100 m) MSL	1958-67	4[a]	0.31	0.35	0.15	0.37	0.14	0.08	0.22	0.27	0.45	0.21	0.54	0.63	3.72
T6 458,789 E 745,662 N 36°47' N 116°22' W 3256 ft (992 m) MSL	12/58-9/64	5[a]	0.37	0.59	0.16	0.10	0.15	0.14	0.50	0.22	0.50	0.22	0.61	0.44	4.00
YA[d] 569,722 E 761,794 N 36°50' N 116°25' W 3700 ft (1128 m) MSL	7/82-9/82[d]		Data Unavailable					0.28	0.18	0.76	Data Unavailable				
Beatty 37°05' N 116°25' W 4959 ft (1512 m)	1914-30	16[e]	0.85	0.70	0.54	0.50	0.48	0.17	0.22	0.18	0.16	0.31	0.21	0.48	4.80
3300 ft (1006 m)	1931-60	29[f]	0.60	0.71	0.49	0.48	0.23	0.12	0.21	0.21	0.21	0.30	0.44	0.59	4.59

*Includes water equivalent of melted snow.
[a]Ref. 9, Quiring, App. B, p. 25.
[b]Ref. 3, Quiring, 1968, p. V, 10-12.
[c]Ref. 11, (Table 2), p. 10.
[d]Not averaged over a cumulative period of years; only one month each (July-Sept., 1982) of data are currently available (Ref. 10).
[e]U.S. Department of Agriculture "Climatic Summary of the United States; 1914-1930, Nevada" (Ref. 13).
[f]Ref. 3, as read from a line graph, p. V-5.

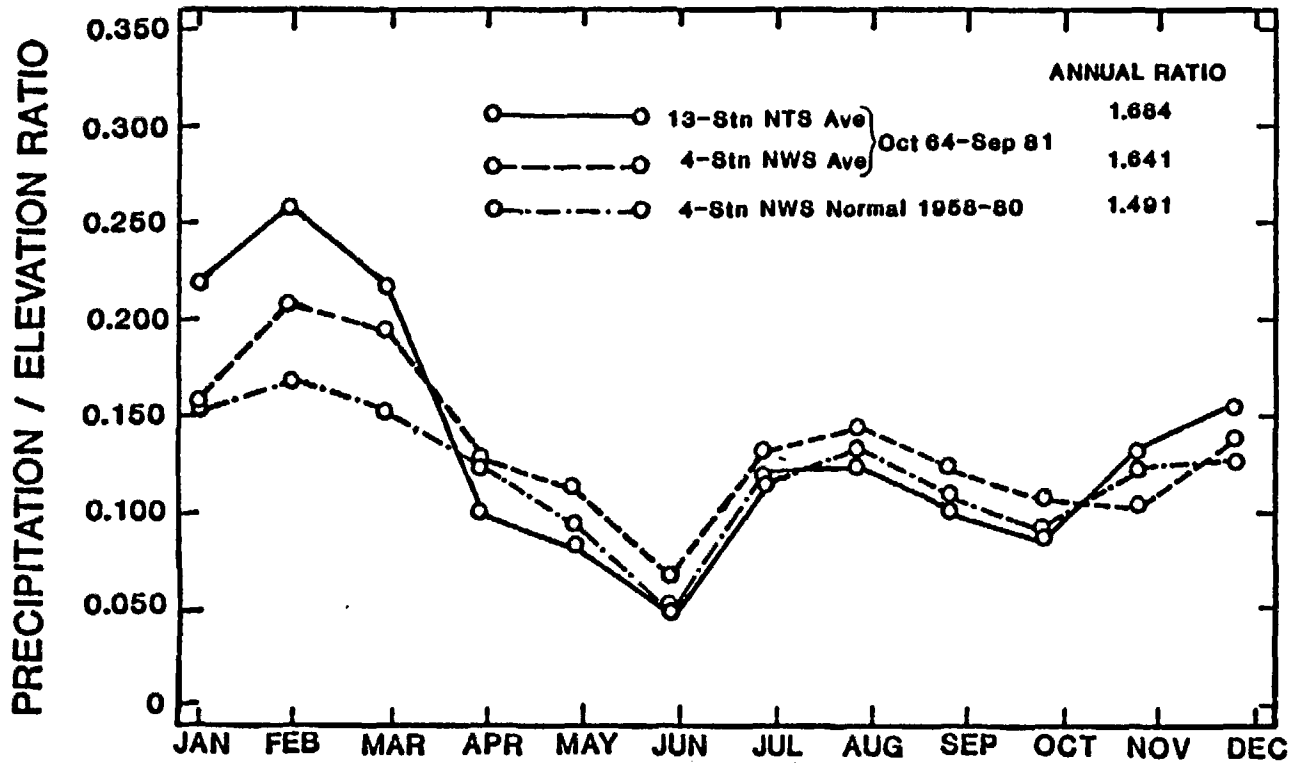

Figure 6A. Annual Precipitation Cycle Averaged for 13 NTS Stations in Comparison with Average of 4 Reference NWS Stations (Source: Ref. 9, see App. B, Fig. 3)

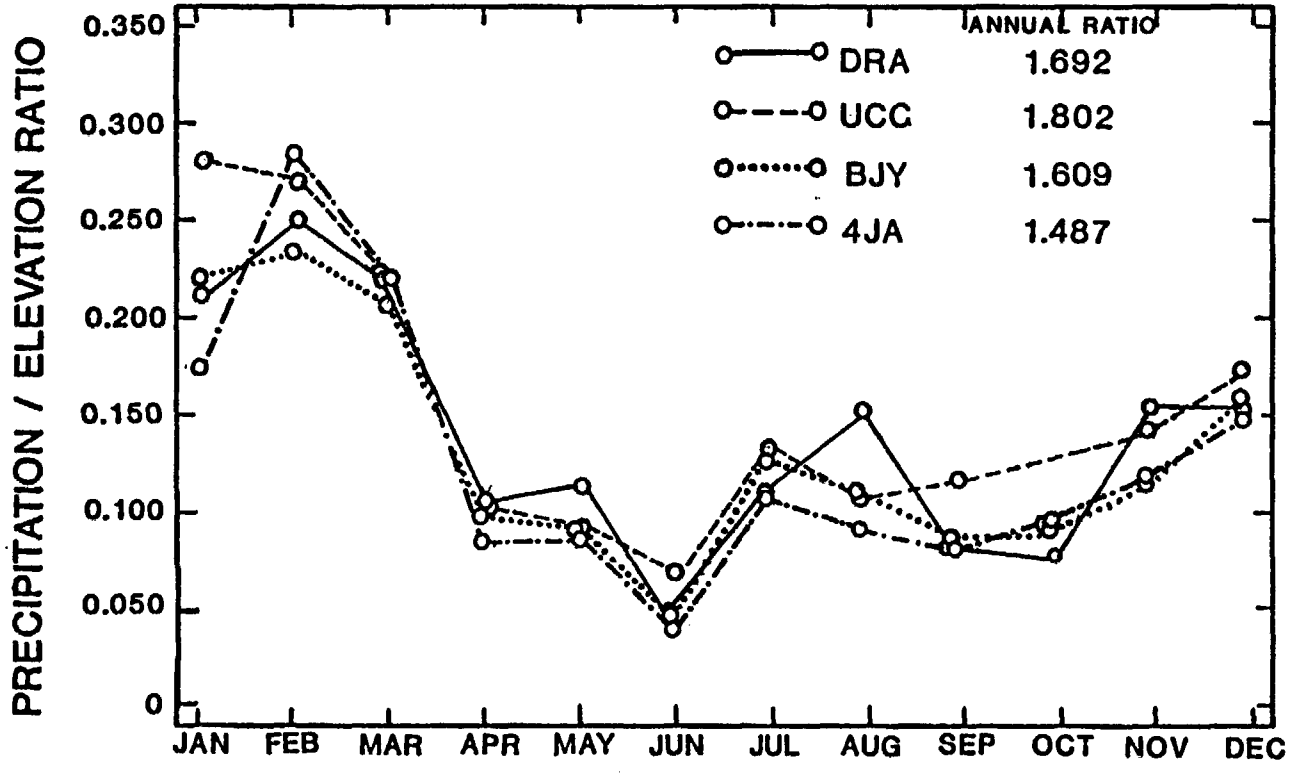

Figure 6B. Annual Precipitation Cycle for 4 NTS Stations, 1951-1980 Normal (Source: Ref. 9, App. B, Figs. 6, 7 and 8, a compilation)

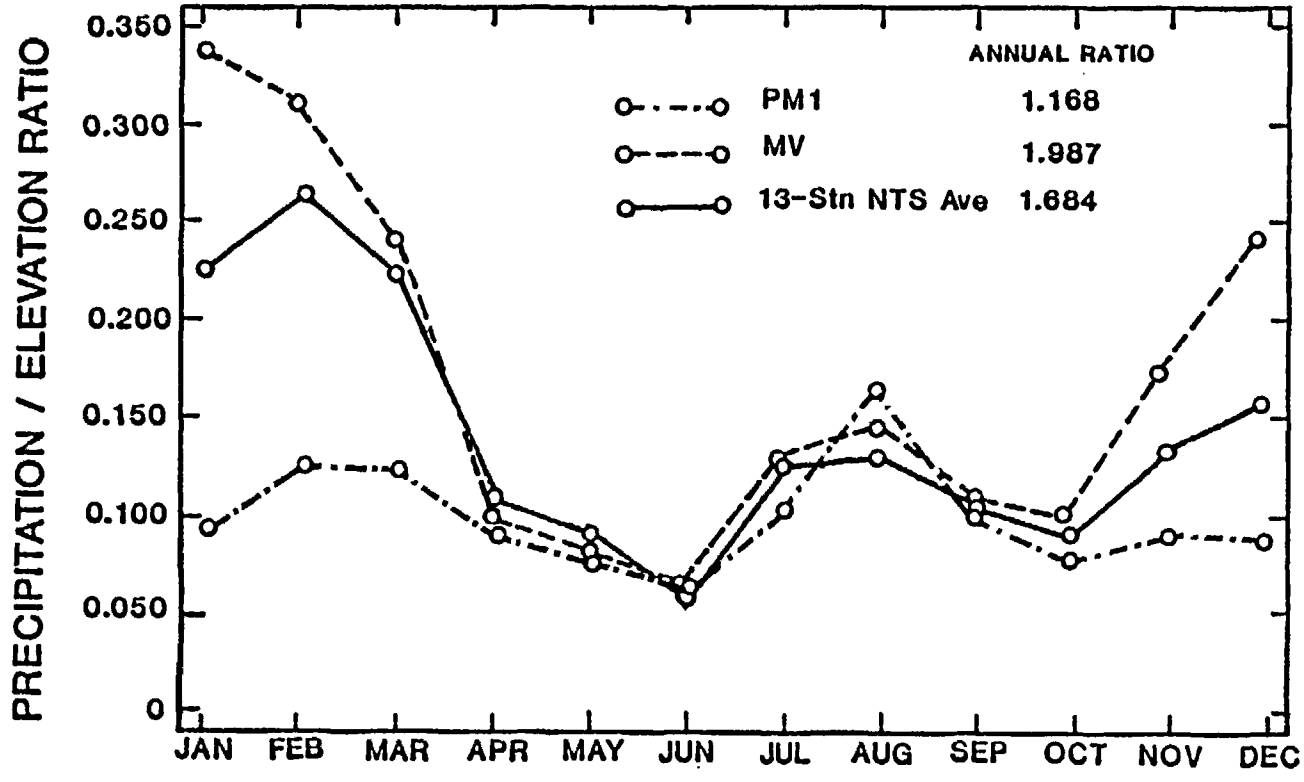

Figure 6C. Annual Precipitation Cycle for the NTS Station with the Lowest Annual Precipitation/Elevation Ratio in Comparison with the 13 Station Average and the NTS Station with the Highest Ratio (Source: Ref. 9, App. B, Fig. 9)

with winter maximum, a secondary summer maximum, and the minima during transitional seasons, is well established in the 17-year record, and is consistent with 30-year normals (Ref. 9, App. B, pp. 11-13). All of this is confirmed in Fig. 7 (the 1931-1970 drought index curves), Tables 5 and 6, and Figs. 8A, 8B, and 8C, the precipitation/elevation ratios, as well. At the NTS, the winter maximum is apparent at all stations, with a secondary maximum in July and August. The primary minimum occurs in June and a secondary minimum follows in September or October.

As indicated in Fig. 6A, individual stations experience pronounced differences from the average annual cycle. All groups have a summer peak of nearly the same magnitude. The magnitude of the winter peak corresponds to, and decreases with decreasing values of the annual precipitation/elevation ratio, shown in Figure 6b. The annual cycle for the NTS station with the greatest precipitation/elevation ratio, that of 1.987 at Mid-Valley* (MV) (Fig. 6C), is shown in comparison with the 13 station average and the station with the lowest ratio. This illustrates the variation in winter precipitation maximum; however, the secondary maximum in summer changes very little. The winter maximum is the predominant influence on levels of annual precipitation at NTS. It can be shown, furthermore, that in summer, for a given elevation, precipitation decreases from east to west due to the Sierra Nevada rain-shadow effect (Ref. 9, App. B, p. 3).

The linear regression of annual and seasonal precipitation on elevation in thousands of feet, is demonstrated in Fig. 9, for 11 stations, along with plotted values for 13 NTS stations and 4 NWS stations (Ref. 9, App. B, p. 14). The cool season includes October through April, and the warm, May through September. The valid range of elevations for the regression equation lies between 3000 and 5000 ft (914 to 1524 m) MSL. Linear and log-linear regressions in Fig. 9, fit the main body of data well, as indicated by the close correlation between estimates and actual measurement data for DRA and UCC shown in Tables 5 and 6, respectively. The recorded average annual precipitation levels for DRA and UCC, respectively, are 5.39 in (13.69 cm) and 6.34 in (16.10 cm), and the estimated levels, as read on the regression curve (Fig. 9), are 5.50 in (13.97 cm) and 6.40 in (16.26 cm), respectively. Other readings and measured values do not correlate as well as those for DRA and UCC, but the data are close enough to justify the use of this method and reliance on Fig. 9 to determine precipitation averages for areas where measurements are otherwise unavailable. The readings for warm season average precipitation, cool season, and average

*4660 ft (1420 m) MSL, 809,250 N, 644,500 E, 36°58'latitude, 116°10'longitude.

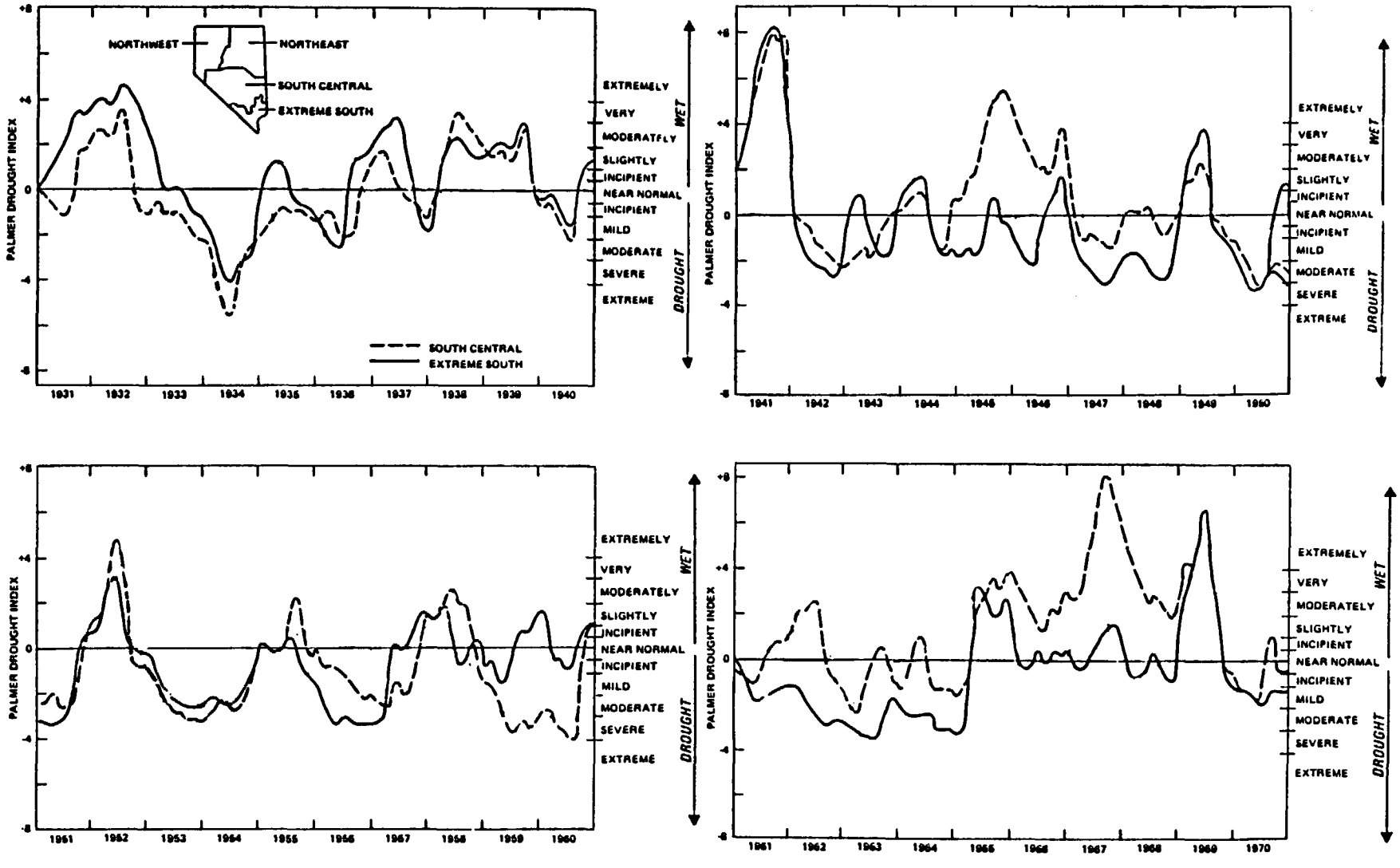

Figure 7. Wet and Dry Periods Between 1931 and 1970 (as Determined by Palmer Drought Index) in the South Central and Extreme Southern Sectors of Nevada (Source: Ref. 4, pp. 66-67)

Table 6

Correlation of Linear and Exponential Regressions with Recorded Averages for Annual Levels of Precipitation, and Estimates of Warm Season and Cool Season Values at Desert Rock, Yucca Flat, and Jackass Flats, Nevada

		Average Annual Precipitation			
			Estimated[c]		
Location	Elevation ft (m)	Recorded[d] at Stations in (cm)	Annual Curve in (cm)	Warm Season in (cm)	Cold Season in (cm)
Yucca Flat					
BJY 1960-81	4070 ft (1241 m)	6.03[a] (15.32)	7.00 (17.78)	2.00 (5.08)	5.00 (12.7)
UCC 1958-81	3924 ft (1196 m)	6.34[a] (16.10)	6.40 (16.26)	1.95 (4.95)	4.45 (11.30)
Jackass Flats					
4JAo 1959-67	3610 ft (1100 m)	3.63[a] (9.22)	6.10 (15.49)	1.70 (4.32)	4.40 (11.18)
4JAn 1967-81	3422 ft (1043 m)	5.08[a] (20.32)	5.80 (14.73)	1.60 (4.06)	4.20 (10.67)
T6 1958-64	3256 ft (992 m)	4.00[a] (10.16)	5.40 (13.72)	1.40 (3.56)	3.90 (9.91)
Desert Rock (DRA)	3298 ft (1005 m)	5.39[a] (13.69)	5.50 (13.97)	1.50 (3.81)	4.00 (10.16)
Yucca Alluvial (YA) (estimated)	3751 ft (1143 m)	Unknown[b]	6.30 (16.00)	1.80 (4.57)	4.50 (11.43)

[a]Reference 9, Quiring, App. B, Table 2.
[b]Insufficient data available (Ref. 10, July-Sept., 1982 data only.)
[c]Figure 9 (Ref. 9; App. B, Fig. 10) as read on regression curves.
[d]Table 5.

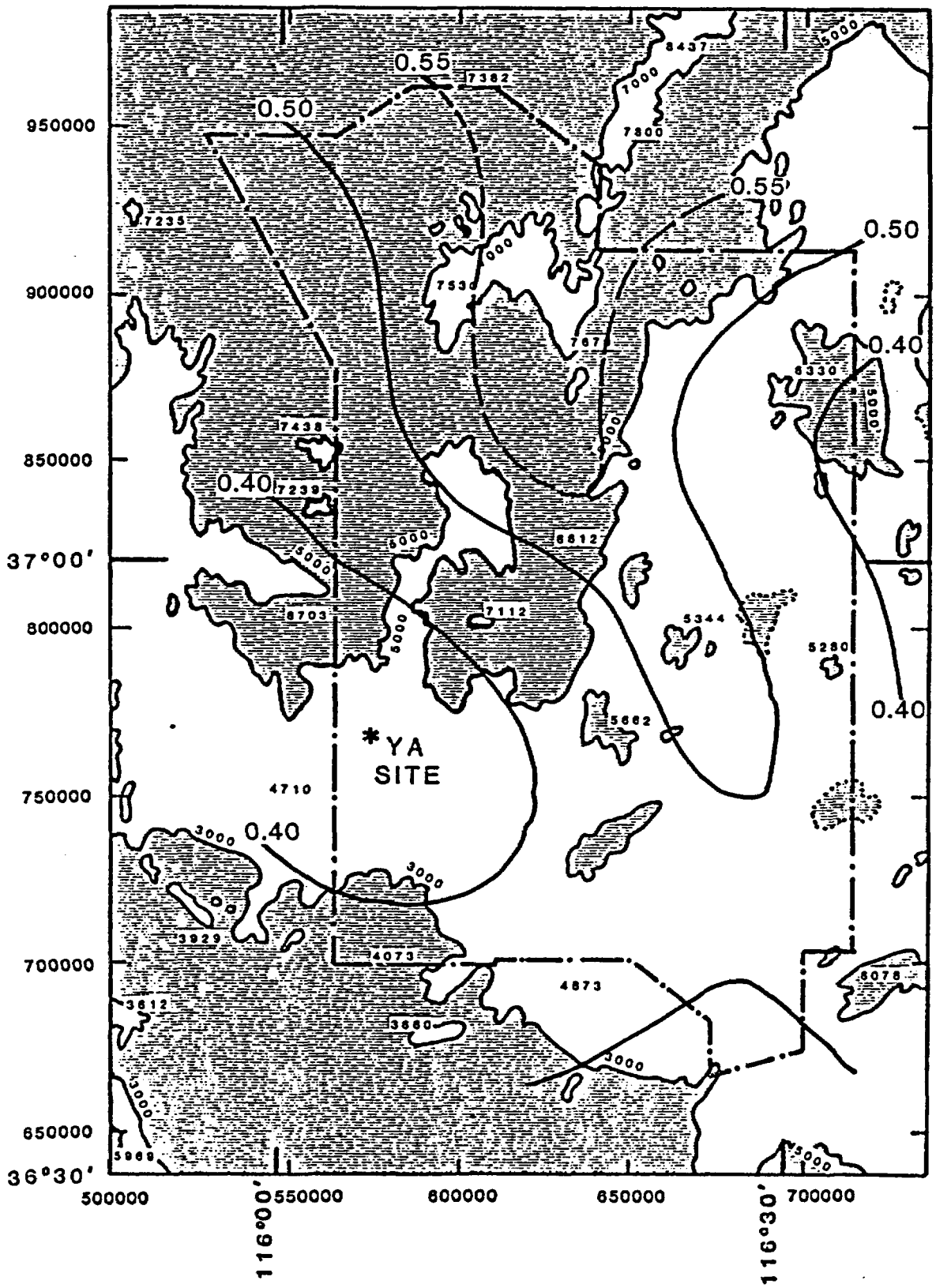

Figure 8A. Warm Season (May-Sept.) Precipitation/Elevation Ratio for the NTS, October 1964-September 1981 (Source: Ref. 9, p. 18, see App. B., Fig. 14) *Approximate location of Yucca Alluvial Site (YA).

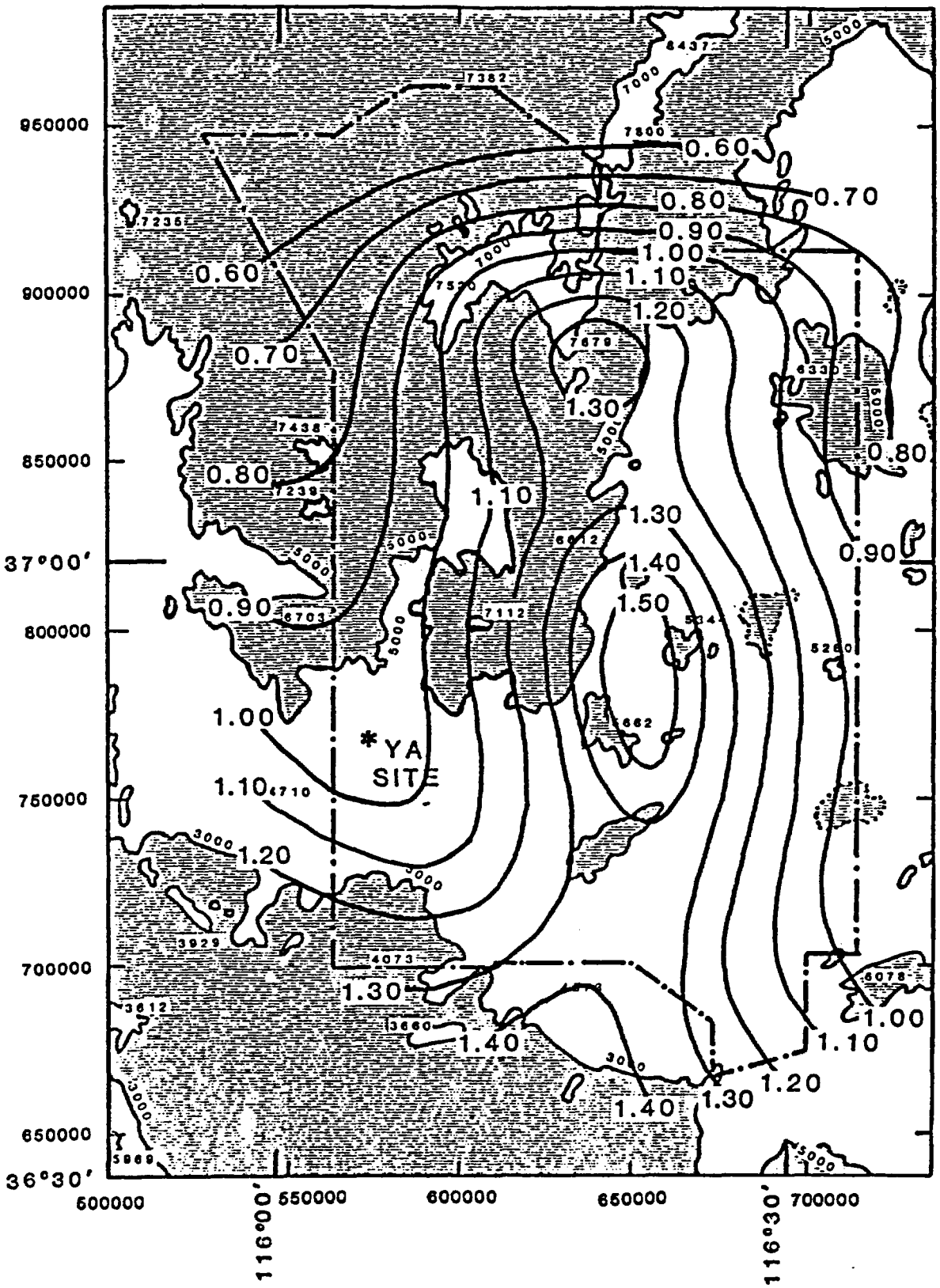

Figure 8B. Cool Season (Oct.-April) Precipitation/Elevation Ratio for the NTS, October 1964-September 1981 (Source: Ref. 9, p. 17, see App. B, Fig. 13) *Approximate location of Yucca Alluvial Site (YA).

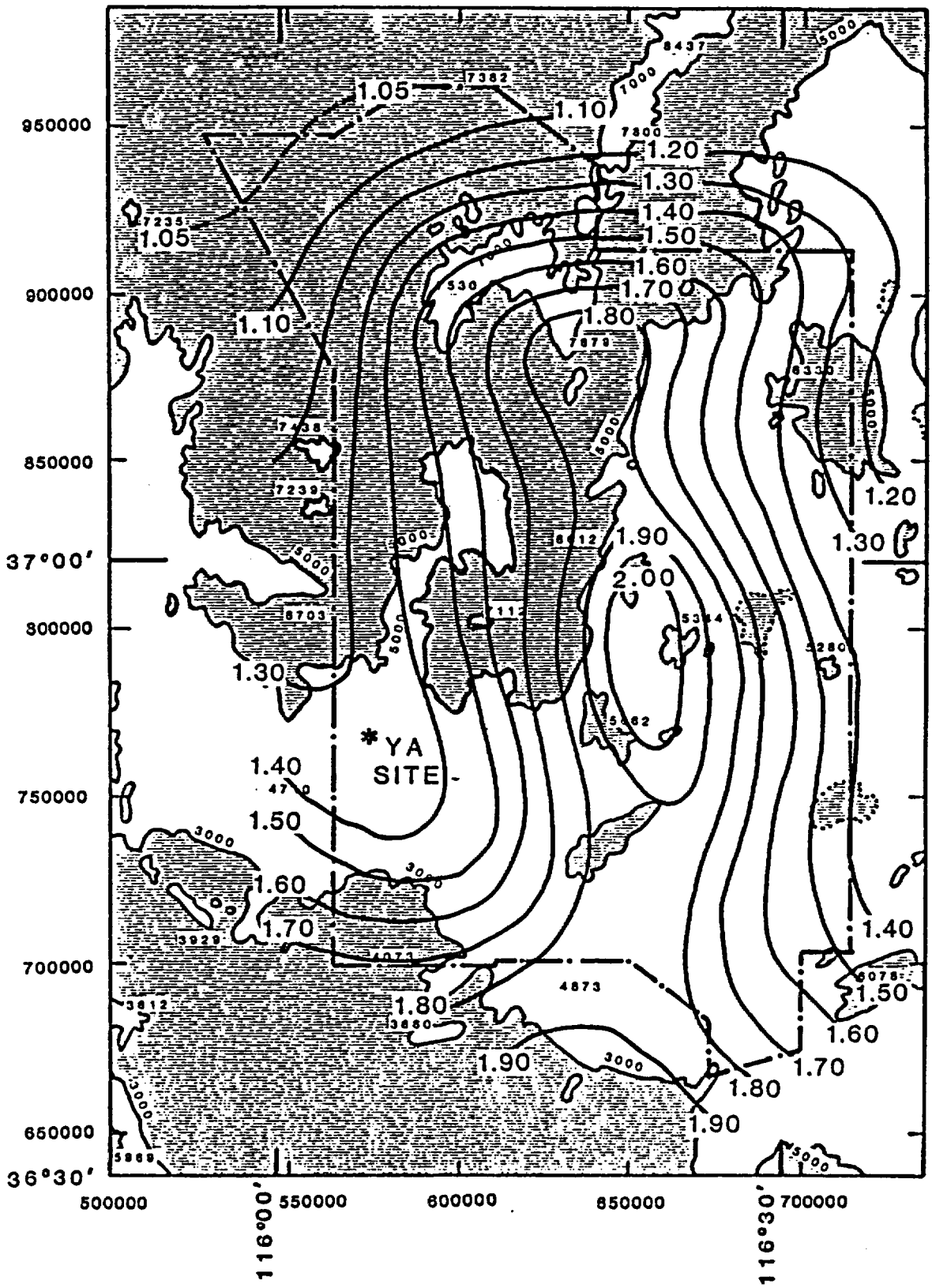

Figure 8C. Annual Precipitation/Elevation Ratio for the NTS, October 1964-September 1981 (Source: Ref. 9, p. 15, see App. B, Fig. 11)
*Approximate location of Yucca Alluvial Site (YA).

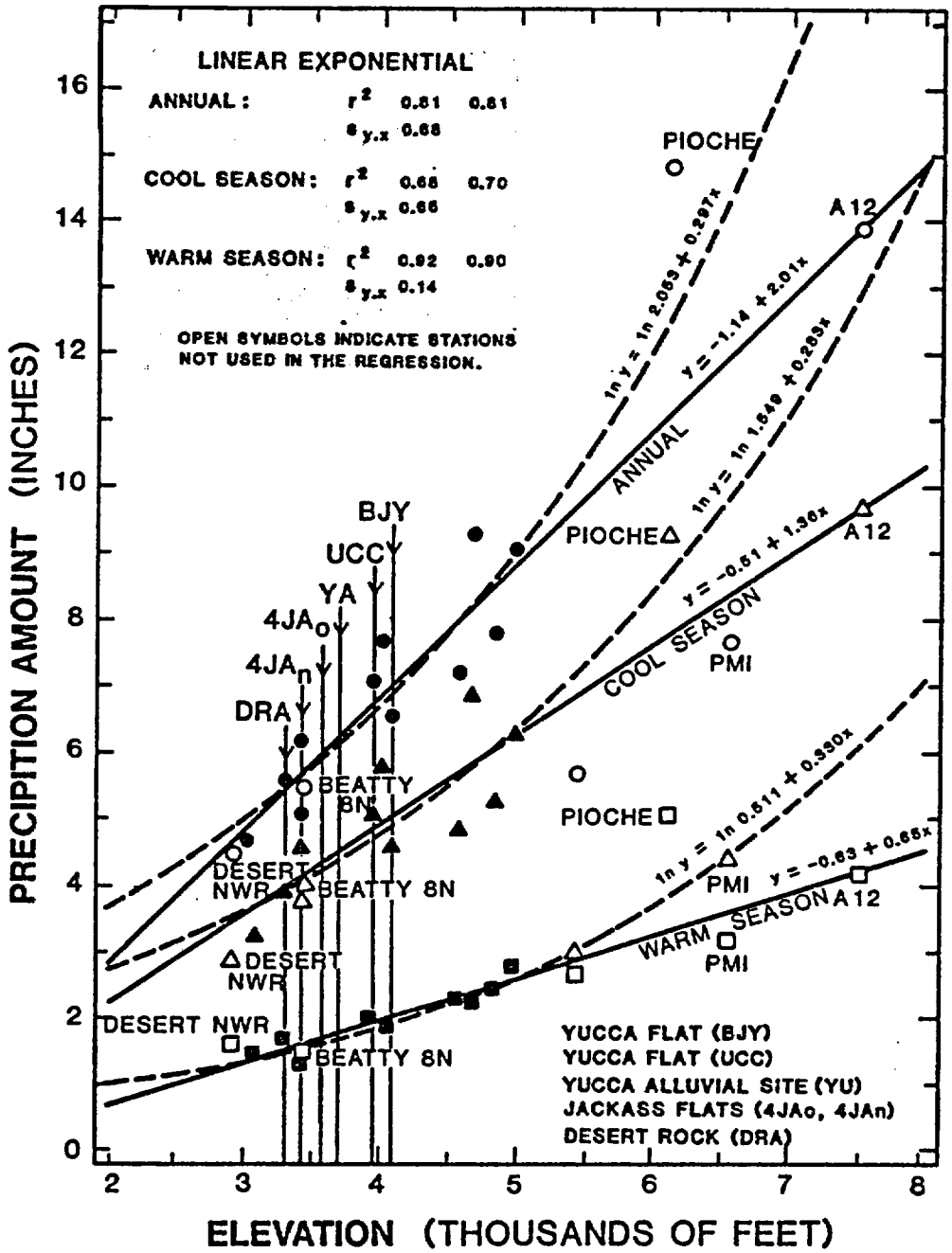

Figure 9. Linear and Exponential Regression of Precipitation Amount (inches) on Elevation (thousands of feet) Based on Data for 11 NTS Stations Below 5000 feet, October 1964-September 1981 (Source: Ref. 9, Fig. 10; see App. B, Fig. 10)

annual precipitation are shown in Table 6, respectively, for Yucca Flat, Desert Rock, and Jackass Flats. The estimates for Yucca Alluvial Site shown in Table 6 as read on the curves in Fig. 9, should prove to be consistent with future measurements of precipitation levels at YA, and may be used for design purposes. Because of rain-shadow effects and other locational influences, the values may be closer to those measured at Desert Rock, however, despite the slightly higher elevation at YA site.

2.1.2 Average Levels of Precipitation

Table 5, presented earlier, shows the average monthly and annual levels of precipitation for different cumulative periods, at stations adjacent to Yucca Alluvial Site. The data corresponding to periods of shorter cumulative durations, are useful for comparison with the averages for normalized periods, which show higher values for average precipitation, generally characteristic of, and relative to the decade trends shown in Fig. 7, of wet and dry climatic fluctuations between 1931 and 1970. The average monthly and annual number of days with measurable precipitation are shown in Table 7 for stations closest to Yucca Alluvial Site (Ref. 9, p. 27; see App. B, p. 27).

2.1.3 Extreme Value Precipitation

The annual series of extreme daily precipitation levels have been determined for selected NTS stations (4JA, UCC, PM1, MV, and A12) for observational, as opposed to calendar years, October through September, for a 17-year period (October 1964-September 1964), as shown in Fig. 10. Quiring points out that the variation in the distributions of daily extreme values is large, and appears to be related more to location than elevation, contrary to normal expectations; Station MV at an altitude of 4660 ft (1420 m) shows greater extremes than station A12 at an elevation of 7490 ft (2283 m), whereas extreme values of PM1 [6550 ft (1996 m)] do not differ significantly from UCC at an elevation of 3924 ft (1196 m) (Ref. 9, p. 20; see App. B, p. 20).

The maximum monthly and annual precipitation levels, with the year of occurrence for the period of record through 1981, are shown in Table 8, for measurement sites adjacent to YA.

Maximum daily precipitation with the year of occurrence for the period of record through 1981 is shown in Table 9 for stations adjacent to YA Site. The maximum amount of rainfall recorded at UCC in one day was 2.13 in (5.4 cm) in September 1969 at Yucca Flat (Table 2). The maximum monthly precipitation at UCC of 4.02 in (10 cm), occurred in January 1969 (Table 8). The maximum annual level of precipitation shown

Table 7

Average Monthly and Annual Number of Days with Measurable Precipitation for Period of Record through 1981

Location	Years of Record	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
BJY[a] 2/60-9/81 4070 ft (1240 m)	21	4	4	5	4	3	2	3	3	3	2	3	3	38
UCC[a] 5/58-9/81 3924 ft (1196 m)	23	4	4	5	3	2	2	3	3	2	2	3	2	34
DRA[a] 10/63-9/81 3300 ft (1005 m)	19	4	4	4	3	2	2	3	3	2	2	3	2	32
4JAn[a] 1/67-9/81 3422 ft (1043 m)	15	4	4	5	3	2	1	2	2	2	2	2	2	32
4JAo[a] 12/57-1/67 3610 ft (1100 m)	9	2	3	3	3	1	1	2	3	2	1	3	2	25
T6[a] 12/58-9/64 3256 ft (992 m)	5	2	4	3	2	1	2	2	2	2	2	3	1	25
YA[b] 7/82-9/82 3700 ft (1128 m)	3 months			Data Unavailable					5	4	9	Data Unavailable		

[a]Ref. 9, p. 27; see Quiring, App. B, p. 27.
[b]Not averaged over a cumulative period of years - only one month each of data for July-Sept., 1982 are currently available (Ref. 10).

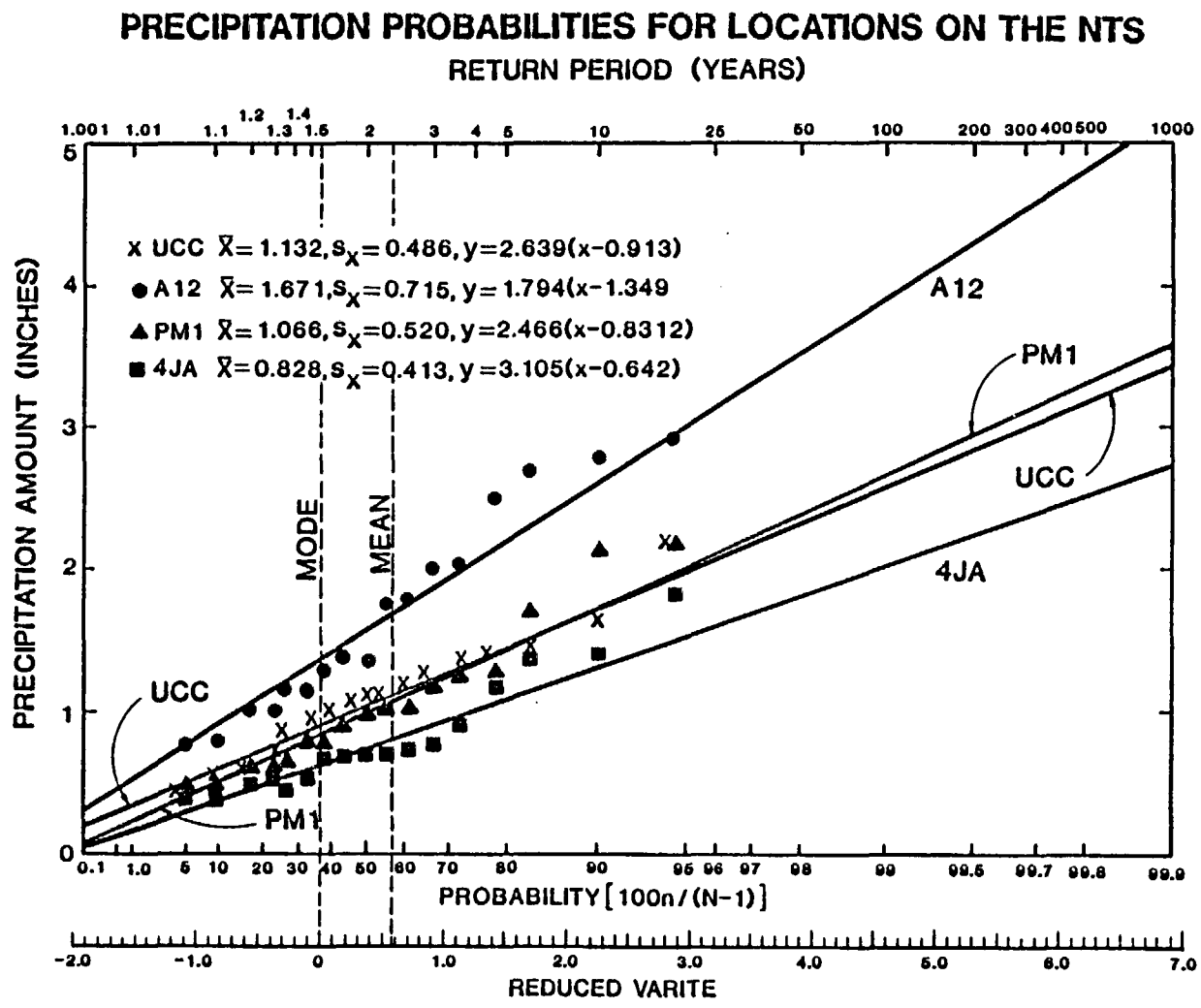

Figure 10. Annual Series of Extreme Daily Precipitation Amounts for Stations 4JA, UCC, PM1, and A12 (Source: Ref. 9; compiled from Figs. 15 and 16, App. B)

Table 8

Maximum Monthly and Annual Precipitation (Inches)

Location	Years of Record	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
BJY[a]	21	3.41	3.42	3.58	2.40	2.02	1.22	1.54	2.38	1.89	1.49	2.37	2.61	12.13
2/60-9/81		1969	1978	1973	1965	1977	1972	1965	1977	1963	1972	1965	1971	1978
4070 ft (1240 m)														
UCC[a]	23	4.02	3.60	3.50	2.70	1.62	2.66	1.87	2.52	2.38	1.69	3.02	2.66	14.05
5/58-9/81		1969	1978	1978	1965	1971	1972	1976	1977	1969	1976	1965	1965	1977
3924 ft (1196 m)														
DRA[a]	19	2.15	2.57	3.08	1.45	1.57	0.56	1.46	1.57	2.28	1.05	2.07	2.45	10.08
10/63-9/81		1966	1969	1973	1965	1981	1966	1968	1977	1963	1976	1965	1965	1978
3300 ft (1005 m)														
4JAn[a]	15	2.29	3.45	3.00	0.63	1.41	0.67	1.50	1.97	2.13	1.42	1.22	1.78	11.62
1/67-9/81		1978	1969	1978	1967	1977	1969	1978	1977	1976	1972	1972	1971	1978
3422 ft (1043 m)														
4JAo[a]	9	0.62	1.01	0.35	1.91	0.28	0.26	0.48	0.71	1.68	0.63	1.67	3.03	8.06
12/57-1/67		1960	1963	1963	1965	1963	1964	1966	1961	1963	1958	1965	1965	1965
3610 ft (1100 m)														
T6[a]	5	0.88	1.20	0.30	0.45	0.48	0.55	2.29	0.54	1.62	0.76	1.49	1.14	4.61
12/58-9/64		1960	1962	1964	1964	1963	1964	1964	1961	1963	1960	1960	1959	1963
3256 ft (992 m)														
YA[b]			Data Unavailable					0.27	0.18	0.76		Data Unavailable		
7/82-9/82								1982	1982	1982				
3700 ft (1128 m)														

[a]Ref. 9; see App. B, Table 4.
[b]Not averaged over a cumulative period of years - only one month each of measurement data, for July-Sept., 1982, are currently available (Ref. 10).

Table 9

Maximum Daily Amount of Precipitation with Year of Occurrence for the Period of Record through 1981 (Inches)

Location	Years of Record	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
BJY[a]	21	1.31	1.22	0.95	1.05	0.83	0.39	1.32	1.99	1.14	1.20	1.23	1.30	1.99
2/60-9/81		1969	1978	1978	1965	1971	1972	1965	1977	1969	1976	1960	1974	Aug. 1977
4070 ft (1240 m)														
UCC[a]	23	1.25	1.51	0.99	1.08	0.86	1.03	1.26	2.18	2.13	1.65	1.11	1.31	2.18
5/58-9/81		1969	1976	1978	1965	1971	1972	1959	1977	1969	1976	1960	1965	Aug. 1977
3924 ft (1196 m)														
DRA[a]	19	0.40	0.95	0.83	0.89	1.53	0.56	0.66	0.87	1.01	1.05	0.44	1.21	1.53
10/63-9/81		1967	1976	1973	1965	1981	1966	1979	1979	1976	1976	1965	1965	May 1978
3300 ft (1005 m)														
4JAn[a]	15	0.51	1.40	0.89	0.50	0.62	0.35	0.50	1.46	1.25	0.89	0.76	0.77	1.46
1/67-9/81		1978	1976	1978	1976	1981	1969	1968	1977	1976	1976	1970	1971	Aug. 1977
3422 ft (1043 m)														
4JAo[a]	9	0.42	0.90	0.20	0.47	0.26	0.26	0.24	0.50	0.86	0.51	0.89	1.85	1.85
12/57-1/67		1961	1963	1963	1965	1961	1964	1966	1959	1962	1958	1960	1965	Dec. 1965
3610 ft (1100 m)														
T6[a]	5	0.56	0.92	0.15	0.42	0.48	0.54	1.71	0.36	0.83	0.62	0.92	0.93	1.71
12/58-9/64		1959	1963	1964	1963	1963	1964	1964	1963	1962	1960	1960	1961	July 1963
3256 ft (992 m)														
YA[b]	-		Data Unavailable					0.08	0.12	0.23		Data Unavailable		
7/82/9/82								1982	1982	1982				
3700 ft (1128 m)														

[a]Ref. 9; see App. B, Table 5.
[b]Not averaged over a cumulative period of years - only one month each of data for July-Sept, 1982, are currently available (Ref. 10).

in Table 8, for a 23 year period, (occurring in 1977 at UCC) was 14.05 in (35.69 cm) (Ref. 9, pp. 29-31; see App. B, pp. 29-31).

Table 10 presents the maximum 24-hour precipitation probabilities for return periods of 2 to 100 years for UCC and combined averages for all stations on the NTS (Ref. 11, p. 27, and Ref. 3, p. II-10). Table 11 provides estimates of potential 100-year recurrence levels of maximum rainfall in Nye County (Ref. 6, pp. 3-22).

Potential precipitation frequency values for the NTS and UCC, for durations of 5 minutes to 24 hours are presented in Fig. 11. The probability curves show projections of the rainfall levels from storms with return periods varying from 1.1 to 1000 years. Quiring points out that the UCC data varies very little from that of 4JA (Ref. 9, p. 6): therefore, these probabilities reflect closely the potential conditions, as well, at Jackass Flats, adjacent to YA Site.

A comparison of Jackass Flats and Beatty precipitation data, shown in Table 12*, was used by Bowen and Egami to confirm that short-term data must be viewed with caution. The authors point out that data from Jackass Flats and Beatty for 1956-65, present evidence of a summer maximum not apparent in the longer 30-year (1931-60) normal (A) period. This is equally apparent for the 1914-30 normal (B) period, also. Correlation coefficients for both normalized and non-normalized averages are provided, for measurements from Jackass Flats and Beatty (Ref. 11, p. 15). Also evident in this comparison, are the differences in precipitation relative to elevation. For preliminary design purposes the precipitation data from Desert Rock can be considered relatively close to the average annual levels at Yucca Alluvial Site. For supplementary information on precipitation probabilities in relation to areal coverage and for other precipitation data, refer to App. B, Ref. 9 and App. C, Ref. 14.

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*Table 12 was compiled from several sources as designated.

Table 10

Maximum 24-Hour Precipitation and Return Periods for Selected Locations in Nevada - Inches (Centimeters)

Station	Elevation ft (m)	Return Period (years) 2	5	10	25	50	100
Las Vegas	2121 (659)	0.84 (2.13)	1.33 (3.38)	1.65 (4.19)	2.07 (5.26)	2.39 (6.07)	2.69 (6.83)
Boulder City	2526 (770)	0.90 (2.29)	1.34 (3.40)	1.62 (4.11)	2.01 (5.11)	2.27 (5.77)	2.52 (6.40)
Beatty	3313 (1010)	0.88 (2.24)	1.29 (3.28)	1.57 (3.99)	1.91 (4.85)	2.17 (5.51)	2.43 (6.17)
Yucca Flat[a]	3924 (1196)	1.00 (2.54)	1.25 (3.18)	1.50 (3.81)	1.75 (4.45)	2.00 (5.08)	2.25 (5.72)
Caliente	4402 (1342)	1.11 (2.82)	1.56 (3.96)	1.84 (4.67)	2.25 (5.720	2.52 (6.40)	2.81 (7.14)
Goldfield	5689 (1734)	1.03 (2.62)	1.60 (4.06)	1.99 (5.05)	2.46 (6.25)	2.84 (7.21)	3.19 (8.10)
Pioche	6109 (1862)	1.46 (3.71)	2.06 (5.23)	2.46 (6.25)	2.96 (7.52)	3.37 (8.56)	3.73 (9.47)
Adaven	6250 (1905)	1.38 (3.50)	1.86 (4.72)	2.16 (5.49)	2.58 (6.55)	2.85 (7.24)	3.15 (8.00)

[a]Ref. 3, p. II-10.

(Source: Ref. 11, p. 27, after Thomas et al.)

Table 11

Potential 100-Year Recurrence of Maximum Rainfall in Nye County

Duration (hr)	Total Rainfall in	(cm)	Intensity in/hr	(cm/hr)
0.5	0.75	(1.9)	1.5	(3.8)
1.0	1.00	(2.5)	1.0	(2.5)
2.0	1.25	(3.2)	0.6	(1.5)
3.0	1.50	(3.8)	0.5	(1.3)
6.0	1.80	(4.6)	0.3	(0.8)
12.0	2.00	(5.1)	0.2	(0.5)
24.0	2.50	(6.4)	0.1	(0.3)

(Source: Ref. 6, pp. 3-22)

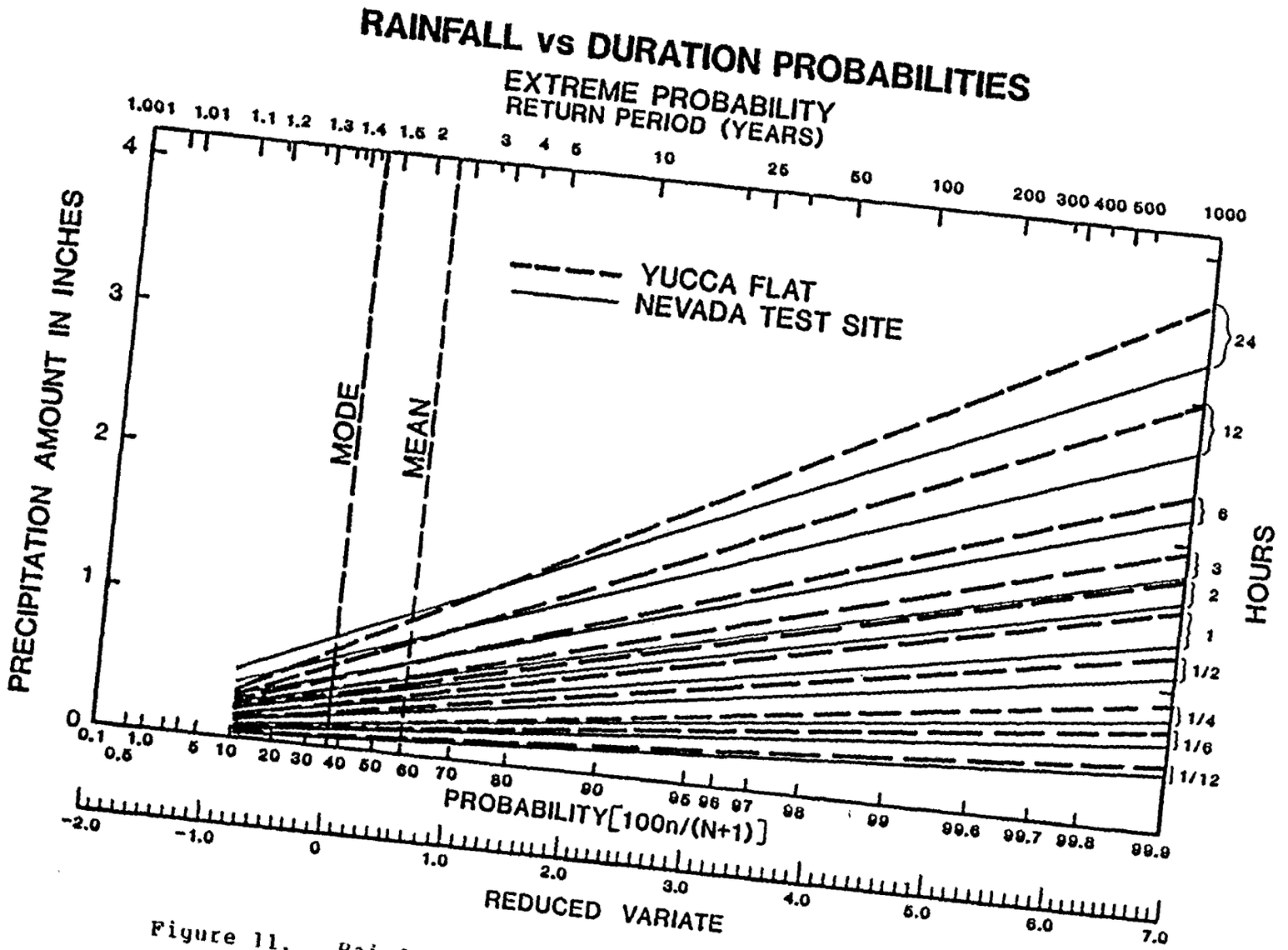

Figure 11. Rainfall vs Duration Probabilities for the Nevada Test Site and Yucca Flat (Sources: Ref. 3, pp. V-8 and Ref. 9; see App. B, p. 18)

Table 12

Comparison of Average Monthly and Annual Total Precipitation for Beatty, Jackass Flats, Yucca Flat, and Desert Rock, Nevada

Station	Years of Record	Precipitation - Inches (Centimeters) Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Jackass Flats 1958-65	8	0.26	0.42	0.18	0.39	0.13	0.08	0.16	0.26	0.51	0.24	0.60	0.64	3.87 (9.82)[a]
4JAn 1958-67 3422 ft	10	0.31	0.35	0.15	0.37	0.14	0.08	0.22	0.27	0.45	0.21	0.54	0.63	3.72 (9.45)[b]
4JAn 1967-81 3422 ft	15	0.63	1.08	0.83	0.18	0.31	0.13	0.35	0.31	0.28	0.32	0.33	0.33	5.08 (12.90)[c]
4JAo 1959-67 3610 ft	8	0.27	0.39	0.16	0.34	0.11	0.07	0.19	0.25	0.47	0.21	0.54	0.63	3.63 (9.22)[c]
T6 1958-64 3256 ft	7	0.37	0.59	0.16	0.10	0.15	0.14	0.50	0.22	0.50	0.22	0.61	0.44	4.00 (10.16)[c]
Beatty 1958-65 3300 ft	8	0.38	0.64	0.27	0.56	0.12	0.22	0.12	0.28	0.41	0.12	0.73	0.42	4.27 (10.85)[a]
Beatty - Normal-A 1931-60 (3300 ft)	30	0.60	0.70	0.48	0.47	0.23	0.09	0.20	0.20	0.19	0.30	0.43	0.58	4.27 (11.75)[a]
Normal-B 1914-30 (4959 ft)	30	0.85	0.70	0.54	0.50	0.48	0.17	0.22	0.18	0.16	0.31	0.21	0.48	4.80 (12.19)[d]
Correlation Coefficients[a]														
Jackass Flats (1958-65) - Beatty (1958-65)									0.71					
Jackass Flats (1958-65) - Beatty (Normal)									0.45					
Beatty (1958-65) - Beatty (Normal)								0.57						
Yucca Flat 1962-70 3924 ft	10	0.53	0.84	0.29	0.45	0.24	0.21	0.52	0.34	0.68	0.13	0.71	0.79	5.73 (14.61)[a]
1958-67	10	0.32	0.38	0.24	0.54	0.12	0.14	0.49	0.43	0.52	0.24	0.82	0.71	4.94 (12.55)[b]
1962-66	5	0.12	0.47	0.33	0.66	0.12	0.11	0.51	0.37	0.66	0.13	0.84	0.84	5.16 (13.11)[b]
1958-81 - Normal	23	0.91	0.92	0.72	0.36	0.28	0.24	0.48	0.41	0.49	0.35	0.59	0.59	6.34 (16.10)[c]
Desert Rock 1962-67 3300 ft	5	0.33	0.28	0.25	0.70	0.15	0.22	0.30	0.68	0.59	0.14	0.64	0.63	4.84 (12.29)[b]
1963-81 - Normal	19	0.64	0.78	0.70	0.33	0.35	0.14	0.34	0.52	0.38	0.25	0.50	0.46	5.39 (13.69)[b]
1978-83	5	0.96	0.77	1.66	0.15	0.58	0.04	0.60	0.42	0.45	0.20	0.61	0.29	6.37 (16.18)[b]

*Includes water equivalent of melted snow.
[a]Ref. 11, p. 13 (taken from Quiring, 1968).
[b]Ref. 3, Quiring, 1968.
[c]Ref. 9, Quiring, see App. B.
[d]Ref. 13.

2.2 Storms

2.2.1 Lightning and Thunder

Lightning strikes of some consequence occur in Nevada about 18 times annually on the average, as estimated over the 10-year cumulative period, 1968-1977 (Ref. 4, p. 49). Thunderstorms and lightning occur in conjunction with convective cumulonimbus cloud (CB) activity. Lightning cannot be generated without the presence of CB clouds, but all CB occurrences do not necessarily produce lightning flashes. Thunder is the audible evidence of a flash, and an observation of lightning when thunder is not heard would typically place the thunderstorm cell more than 10 mi (16 km) from the observer. All factors considered, from the observation point at Yucca Flat weather station, a report of thunder, lightning, or CB activity (not identified as distant*), places the phenomenon within a 25-mile (40 km) radius; consequently, the data may be regarded as closely representative of potential thunderstorm and lightning activity for nearly all of the NTS region (Ref. 7, Quiring, 1972; see App. A, p. 3); therefore, this would necessarily include Yucca Alluvial site, as well.

At NTS, as recorded at Yucca Flat station for the 9-year interval between 1962 and 1971, lightning was reported during 289 hours on 143 thunderstorm days, and during 143 hours for 351 CB days. Thunderstorms occur on the average of 14 days per year as shown in Table 13, with 85% of the incidences recorded between June and September. Thunderstorm activity is recorded for all months except February (see App. A, Table 1, Ref. 7), and during all hours of the day, with the highest frequencies (16%) occurring in July and August during the mid-afternoons and early evening. The greatest number of days, 24, with lightning per month, occurs in July (Ref. 7, App. A).

The potential for lightning is greater on thunderstorm days than on CB days, but frequency distributions are similar, with peaks in July and August during evening hours. CB activity generates a substantially greater number of lightning occurrences than it does shower activity, and much less convective activity than the number of days which qualify as thunderstorm days. The distributions** of lightning

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*An observation of distant lightning or CB activity could place the phenomena as much as 50 mi (80 km) away. Data for CB activity during hours of darkness are derived mainly in conjunction with observations of distant lightning (Ref. 7, Quiring, 1972, App. A).

**Comparison of annual diurnal cycles reveals a definite bias in lightning observations during hours of darkness (Table 13) (Ref. 7, p. 6).

frequencies on both thunderstorm and CB days, are shown in Table 13, indicating an average annual incidence of about 43.2 hours for a period 49.4 days, as derived for the 10-year period (1962-1971).

Table 13

Frequencies of Lightning on 143 Thunderstorm Days and 351 CB Days Expressed as the Number of Days Lightning Occurred During the Hour in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour	Month												Ann
(PST)[a]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01				1				2	4				7
02				1				3	4				8
03						1		2	4	2			9
04						1			3	1			5
05									3	1			4
06			1			1			2				4
07									2	1			3
08						1				1			2
09						1				1			2
10						2		1					3
11				1				1					2
12					2	2		2	1	2	1		8
13			1			1		8	8	4			22
14			1			5		2	8	3			19
15					1	1		2	10	1			15
16					1	1		5	3	1			11
17			1	2		1		4	5	3	1		17
18			1		2	3		12	6	8	1		33
19		1	2	2	1	2		18	19	6			51
20			2	2	3	4		21	18	4		1	1	56
21				1	2	4		24	20	3	1	1		56
22					1	6		24	14	2				47
23			1		1	4		12	12	2				32
24								7	6	1				16
Total Hours	0	1	10	0	14	43		149	153	46	3	2	1	143
Number of Days	4	7	20	25	57	56		102	145	46	11	12	9	494

(Source: Ref. 7, Quiring, (1972); see App. A, Table 5).
[a]PST - Pacific Standard Time.

The number of thunderstorm and CB days at Yucca Flat, annually averaged over the 10-year period, is shown in Table 14 as 14.3 and 35.1, respectively. Table 14 also provides data on the frequency of thunderstorm days at Desert Rock (1973-1983), and shows a total of 13 days annually, on the average, on which thunder was heard during the 5-year period, 1978-1983.

The frequency of lightning flashes which do not reach ground is about 10 times greater than that of cloud-to-ground strikes. Data in Table 15 (Quiring, Ref. 7, Table 6; see App. A) show that cloud-to-ground lightning flashes were observed during more hours, on more days than any other type, but with less frequency than all other types combined.

For additional information about CB, thunderstorm and lightning phenomena refer to App. A (Ref. 7).

2.2.2 Sand and Dust

The southern Nevada desert region experiences the highest incidence of dust storms in the state. However, relatively strong winds greater than 25 mph (11 m/s), which commonly stir up dust and sand, particularly in dry periods, occur only a small fraction of the time. These show little daily variation in frequency because they are generated by large-scale storms rather than by local topographical/diurnal effects.

Dust devils, local extreme-wind currents of a circular nature are common during summer months or at other times when surface temperatures are high, and are produced as a result of the unstable air at ground level. The turbulence, containing particulates of sand and dust, normally circulates vertically upward from 100 to 300 feet (30 to 91 m) and can also extend up to 3000 ft (914 m). Nevertheless, dust devils are both infrequent and short-lived when they do occur, and generally present no significant visibility or pollution problems.

2.2.3 Frozen Precipitation

Damaging forms of frozen precipitation other than hail and snow are rare in Nevada. Freezing rain, typical of humid areas, never occurs in consequential amounts. Sleet is uncommon, though small hailstones and graupel (snow pellets) occur in the cold seasons, at mid- or high elevations (Ref. 4, p. 53).

Table 14

Frequency of Thunderstorm and Cumulonimbus Days
at Yucca Flat (1962-1971) and Thunderstorm Days at Desert Rock (1978-1983)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Yucca Flat[b]													
Average Number of Thunderstorm Days[a] Annually	*	0	0.5	0.5	1.4	1.9	3.5	4.3	1.5	*	*	*	14.3
Average Number of Cumulonimbus Days Annually	*	0.7	1.5	2.0	4.3	3.7	6.7	10.2	3.1	1.0	0.9	0.7	35.1
Desert Rock[c]													
Average Number of Thunderstorm Days[a] Annually	0	*	1.0	1.0	1.0	1.0	2.0	4.0	3.0	0	0	0	13.0

*One or more occurrences during the period of record, but an average of less than 0.5 day.
[a]Represents a day on which thunder was heard but it does not necessarily signify the occurrence of showers.
[b]Ref. 7, Quiring, 1972; see App. A, Tables 3 and 4.
[c]Ref. 12, private communication, D. Soule, NOAA/WSNSO, Las Vegas, Nevada, Table 3.

Table 15

Frequencies of Lightning Expressed as the Number of Days/Number of Hours with Various Types of Lightning in Ten Years at Yucca Flat, Nevada, (1962-1971)

	On 143 Thunderstorm Days												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Number of Thunder Days	1	0	5	5	14	19	35	43	15	1	3	2	143
In Cloud			2/4		3/3	3/8	20/60	18/43	7/18				53/136
Cloud to Cloud			4/6	1/2	2/2	7/10	13/37	19/61	4/7		1/2	1/1	52/128
Cloud to Ground			3/3	3/4	6/8	9/18	25/62	27/72	7/15				80/182
No Spec					1/2	2/4	4/5	1/1	2/2				10/14
All Types[a]			5/10	4/6	7/11	12/27	29/97	33/106	9/29		1/2	1/1	101/289
Distant						1/1	12/26	17/41	5/9				35/77

	On 351 CB Days												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Number of CB Days	3	7	15	20	43	37	67	102	31	10	9	7	351
In Cloud		1/1				4/9	7/15	10/14	4/4	1/2			27/45
Cloud to Cloud					1/3		7/16	11/17	4/4				23/40
Cloud to Ground				2/4		3/5	11/24	15/31	4/6	1/1			36/71
No Spec						2/4	7/16	2/2	3/4	1/1			15/27
All Types[a]		1/1		2/4	1/31	7/16	20/52	24/47	12/17	2/3			69/143
Distant	1/1	1/1				5/6	22/39	28/49	5/11	3/6	2/2		67/115

(Source: Ref. 7, Quiring (1972); see App. A, Table 6).
[a]Does not include distant lightning.

2.2.3.1 Hail -- Hailstorms are a rare phenomena in Nevada and when they do occur, most stones are small, though occasionally some with diameters of 1/2-1 in (1.27-2.54 cm) have been reported in the state (Ref. 4, p. 50). The average annual hailstorm frequency throughout the state is shown in Fig. 12 (Ref. 4, p. 51). Severe thunderstorms and tornadoes are often accompanied by hail. During the period 1955-1967, Nevada experienced 7 days with hailstones of 0.75 in (1.9 cm) or larger, falling in the state (Ref. 4). For design purposes, one storm annually may be expected at the site. Hailstorms generally increase in incidence with elevation, and similar to snowfall, the highest frequencies are above the 5000 ft (1524 m) level.

2.2.3.2 Snow -- The summaries of snowfall levels at Yucca Flat and Desert Rock, provided in Tables 1-3, are reproduced also in Table 16. Similar to the incidence of rainfall and hail, snowfall activity is altitude dependent and normally very light; snow melts quickly, even while falling, and seldom accumulates for more than a day at elevations below 4000 ft (1219 m).

The average annual snowfall level at Desert Rock for the period 1978-1983 is 1.5 in (3.8 cm), with the maximum average of 1.1 in (2.8 cm) falling in January. For design purposes, average snowfall levels at Yucca Alluvial Site may conservatively be expected to approximate these, and in all probability not to exceed those at Yucca Flat, where levels of precipitation tend to be slightly higher, and temperatures somewhat lower, because of elevation and topography.

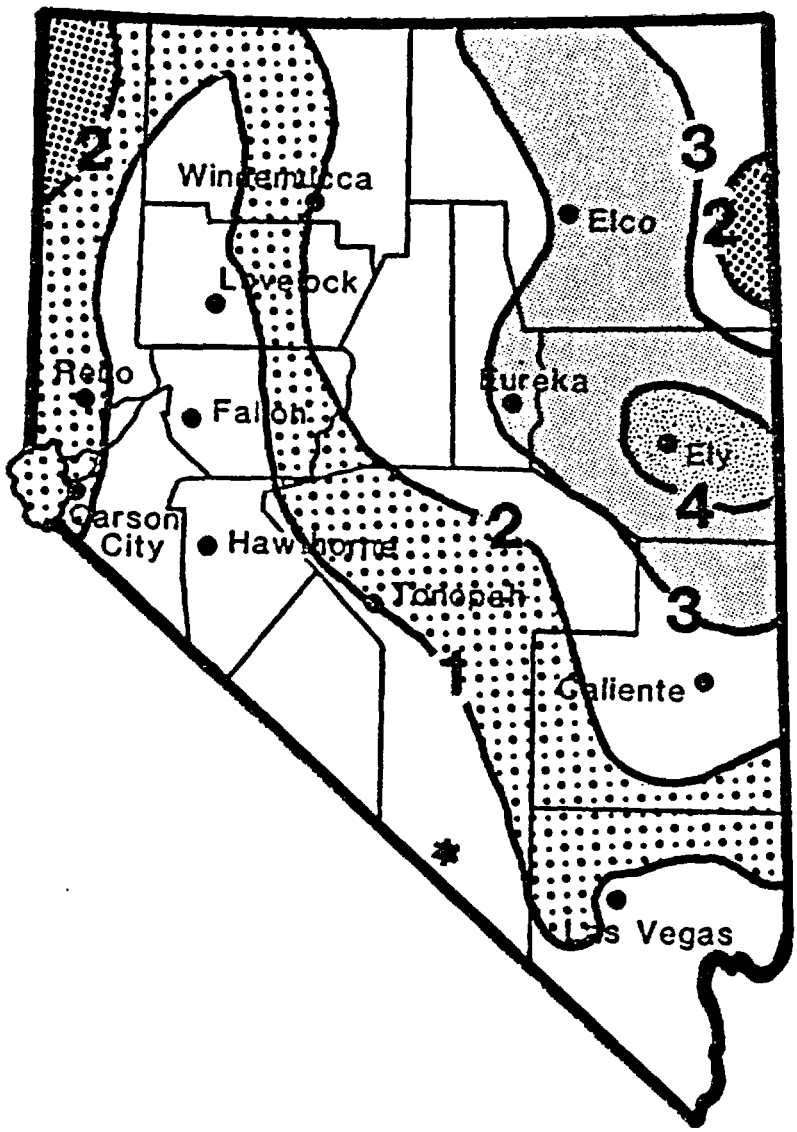


Figure 12. Average Frequency (Days Per Year) of Hailstorms in Nevada (Source: Ref. 4, p. 51.)
*Approximate location of Yucca Mountain.

Table 16

Average Annual and Monthly Snowfall Levels at Yucca Flat and Desert Rock-Inches (Centimeters)

	Yucca Flat-3924 ft (1196 m)									Desert Rock-3300 ft. (1006 m)[d]		
	Average			Greatest Monthly			Daily			Average	Greatest Monthly 1978 to 1983	Daily
Month	1962 - 1966 [a]	1962 - 1968 b	1962-1971[c]	1962 - 1966	1962 - 1968	1962-1971	1962 - 1966	1962 - 1968	1962-1971			
January	1.4 (3.6)	1.1 (2.8)	0.9 (2.3)	4.3 (10.9)	4.3 (10.9)	4.3 (10.9)	4.3 (10.9)	4.3 (10.9)	4.3 (10.9)	1.1 (2.8)	4.1 (10.4)	3.0 (7.6)
February	0.2 (0.5)	0.1 0.25	1.9 (4.8)	1.0 (2.5)	1.0 (2.5)	17.4 (44.2)	1.0 (2.5)	1.0 (2.5)	6.2 (15.7)	0.4 (1.0)	1.7 (4.3)	1.1 (2.8)
March	2.4 (6.1)	1.7 (4.3)	2.0 (5.1)	6.7 (17.0)	6.7 (17.0)	7.5 (19.1)	4.0 (10.1)	4.0 (10.1)	4.5 (11.4)	0	T	T
April	0.6 (1.5)	0.8 (2.0)	0.7 (1.8)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)	0	0	0
May	T	0	0	T	T	T	T	T	T	0	0	0
June	0	0	0	0	0	0	0		0	0	0	0
July	0	0	0	0	0	0	0		0	0	0	0
August	0	0	0	0	0	0	0		0	0	0	0
September	0	0	0	0	0	0	0		0	0	0	0
October	0	0	0	0	0	T	0		T	0	0	0
November	1.0 (2.5)	0.7 (1.2)	0.5 (1.3)	4.8 (12.2)	4.8 (12.2)	21.8 (12.2)	2.3 (5.8)	2.3 (5.8)	2.3 (5.8)	0	T	0
December	0.1 (0.25)	0.9 (2.3)	2.3 (5.8)	0.5 (1.2)	6.0 (15.0)	9.9 (25.1)	0.5 (1.2)	5.0 (12.7)	7.4 (18.8)	0	1.3 (3.3)	0.3 (0.76)
Annual	5.7 (14.5)	5.3 (13.5)	8.3 (21.1)	6.7 (15.2)	6.7 (15.2)	17.4 (44.2)	4.3 (10.9)	5.0 (12.7)	7.4 (18.8)	1.5 (3.8)	4.1 (10.4)	3.0 (7.62)

T = Trace, or an amount too small to measure.
[a]Ref. 3, see Table 1.
[b]Ref. 8, primary source unknown.
[c]Ref. 11, see Table 2.
[d]Ref. 12, see Table 3.

2.3 Temperature

Characteristic of midlatitude arid climate, annual and daily temperature ranges are large, reflecting the influence of continental air masses and deficiency of moisture. The wide daily range occurs because clear skies and lack of moisture in the air allow maximum penetration of solar energy to the surface, causing intense heating on the bare, dry ground. At night the same clear skies permit rapid radiational cooling and loss of energy. Local topographical and physical differences determine the ranges; there is no exact range of mean daily temperatures that covers the whole state. Because the presence of water helps to reduce extremes in temperature, and because summer is the season of lowest humidity and cloud cover, daily temperature ranges are greater then than in winter. On the NTS and in most areas of Nevada in January, nights average below freezing, and July highs average between 100°F (37.8°C) and 110°F (43.3°C). The topography, consisting of alternating mountain ranges and valleys provide excellent collection basins for retaining cold air.

Air cooled at the surface of the mountains flows down into the valleys at night, forming a temperature inversion in which normal temperature decreases, relative to elevation, are reversed. When winds are calm during the inversion, the air remains stable until it is heated by the ground during the morning. The minimum temperature at the valley floor may be 5 to 30°F (2.8 to 16.7°C) lower than adjacent slopes at higher altitudes. In most valleys in the state, inversions occur 45 percent of the time during the year, typically in late evening and morning hours. During fall and winter an inversion is present 50 percent of the time. Inversions produce stagnant, stable air near the surface that fails to rise and mix with the air above (Ref. 4, pp. 28-29).

2.3.1 Mean Temperature

The mean annual temperature at NTS is 60°F (16°C), and extremes of -30°F (-34°C) and 115°F (46°C) have been recorded at the site. Nocturnal air drainage has a pronounced influence on nighttime temperatures. Average daily minimum temperatures on sloping terrain are from 5 to 11°F warmer than those on the valley floors with a corresponding reduction in the average daily range. Average maximum and minimum monthly and annual temperatures are presented in Table 17, and Tables 1-4, for varying time periods and different measurement sites, on or adjacent to the NTS.

2.3.2 Extreme Temperatures

The highest monthly average temperature recorded at Yucca Flat for the 10-year period 1962-71, was 76.6°F (24.8°C), occurring in both July and August. The highest average

Table 17

Average Daily Maximum, Daily Minimum, and Monthly Temperatures for Yucca Flat, Jackass Flats, Desert Rock, and Beatty, Nevada [°F (°C)]

	Average Daily Maximum						Average Daily Minimum						Monthly Average					
	Yucca Flat[a] 3924 ft (1196 m)		Jackass Flats[b] 3735 ft (1138 m) 4JAo	Jackass Flats[b] 3644 ft (1110 m) 5A	Desert Rock[c] 3300 ft (1005 m)	Beatty[d] 3300 ft (1005 m)	Yucca Flat[a] 3924 ft (1196 m)		Jackass Flats[b] 3735 ft (1138 m) JAAo	Jackass Flats[b] 3644 ft (1110 m)	Desert Rock[c] 3300 ft (1005 m)	Beatty[d] 3300 ft (1005 m)	Yucca Flat[a] 3924 ft (1196 m)		Jackass Flats[b] 3735 ft (1138 m) 4JAo	Jackass Flats[b] 3644 ft (1110 m) 5A	Desert Rock[c] 3300 ft (1005 m)	Beatty[d] 3300 ft (1005 m)
Month	1962-1966	1962-1971	1956-1964	1959-1966	1978-1983	1922-1960	1962-1966	1962-1971	1956-1964	1959-1966	1978-1983	1922-1960	1962-1966	1962-1971	1956-1964	1959-1966	1978-1983	1922-1960
Jan.	52.0 (11.1)	52.1 (11.2)	53 (11.7)	53 (11.7)	54.1 (12.3)	57.5 (14.2)	19.0 (-7.2)	20.8 (-1.2)	36 (2.2)	38 (2.2)	33.2 (0.67)	26.7 (-2.9)	35.5 (1.9)	36.6 (2.6)	44.5 (6.9)	45.5 (7.5)	43.6 (6.4)	40.6 (4.8)
Feb.	56.6 (13.7)	57.7 (13.7)	57 (13.9)	56 (13.1)	58.9 (14.9)	58.2 (14.6)	24.4 (-4.2)	25.8 (-3.4)	38 (3.3)	39 (3.9)	35.8 (2.1)	24.6 (-4.1)	40.5 (4.7)	40.3 (4.6)	42.5 (8.6)	47.5 (8.6)	47.3 (8.5)	43.9 (6.6)
March	60.3 (15.7)	60.9 (16.1)	62 (16.7)	63 (17.2)	61.2 (16.2)	65.6 (18.7)	26.0 (-3.3)	27.7 (-2.4)	41 (5.01)	43 (6.1)	39.1 (3.9)	33.9 (1.1)	43.2 (6.2)	44.3 (6.8)	51.5 (10.8)	53.0 (11.7)	50.1 (10.1)	49.7 (9.8)
April	69.8 (21.0)	67.8 (19.9)	63 (17.2)	74 (23.3)	71.2 (21.8)	74.0 (23.3)	35.7 (2.06)	34.4 (1.3)	48 (8.9)	53 (11.7)	45.7 (7.6)	41.0 (5.0)	52.8 (11.6)	51.1 (10.6)	60.5 (15.8)	63.5 (17.5)	58.5 (14.7)	57.5 (14.2)
May	78.7 (25.9)	78.9 (26.1)	80 (26.7)	80 (26.7)	80.6 (26.9)	82.0 (27.8)	43.0 (6.1)	43.5 (6.4)	54 (12.2)	58 (14.4)	54.1 (12.3)	47.9 (8.8)	60.9 (16.1)	61.2 (16.2)	67.0 (19.4)	69.0 (20.6)	67.2 (19.6)	65.2 (18.4)
June	87.0 (30.6)	87.6 (30.9)	90 (32.2)	91 (32.8)	92.6 (33.7)	92.3 (33.5)	49.0 (9.4)	49.9 (9.9)	63 (17.2)	68 (20.0)	64.0 (17.8)	55.5 (13.1)	68.0 (20.0)	68.8 (20.4)	76.5 (24.7)	79.5 (26.4)	78.3 (25.7)	74.0 (23.3)
July	95.2 (35.1)	96.1 (35.6)	95 (35.0)	97 (36.1)	99.0 (37.2)	99.5 (37.5)	54.1 (12.3)	47.0 (13.9)	70 (21.1)	76 (24.4)	70.0 (21.1)	62.1 (16.7)	74.7 (23.7)	76.6 (24.8)	82.5 (28.1)	86.5 (30.3)	84.5 (29.2)	80.8 (27.1)
Aug.	94.3 (34.6)	95.0 (35.0)	93 (33.8)	95 (35.0)	96.2 (35.7)	97.2 (36.2)	56.3 (13.5)	58.1 (14.5)	68 (20.0)	75 (23.9)	68.1 (20.1)	59.9 (15.5)	75.3 (24.1)	76.6 (24.8)	80.5 (26.9)	85.0 (29.6)	82.2 (27.9)	78.6 (25.9)
Sept.	86.3 (30.2)	86.4 (30.2)	88 (31.1)	88 (31.1)	89.3 (31.8)	90.5 (32.5)	45.8 (7.7)	46.7 (8.2)	63 (17.2)	67 (19.4)	61.1 (16.1)	53.4 (11.9)	66.1 (7.7)	66.5 (8.2)	75.5 (17.2)	77.5 (19.4)	75.2 (16.3)	72.0 (11.9)
Oct.	78.9 (26.1)	76.1 (24.5)	78 (25.6)	79 (26.1)	77.5 (25.3)	77.4 (25.2)	38.1 (3.5)	36.9 (2.7)	54 (12.2)	59 (15.0)	50.0 (15.0)	43.6 (6.4)	58.6 (14.8)	56.6 (13.7)	66.0 (18.9)	69.0 (20.6)	63.8 (17.7)	60.5 (15.8)
Nov.	61.7 (16.5)	61.8 (16.6)	63 (17.2)	62 (16.71)	63.1 (12.3)	65.3 (18.5)	27.7 (-2.4)	27.6 (-2.4)	42 (5.6)	47 (8.3)	38.3 (3.5)	33.5 (0.8)	44.7 (7.1)	44.7 (7.1)	52.5 (11.4)	56.5 (12.5)	50.7 (10.4)	49.4 (9.7)
Dec.	53.5 (11.9)	50 (10.4)	58 (14.9)	56 (13.6)	57.1 (13.9)	56.3 (13.5)	21.8 (-5.7)	19.9 (-6.7)	38 (3.3)	41 (5.0)	33.1 (0.61)	28.0 (-2.2)	37.7 (3.2)	35.3 (1.8)	48.0 (8.9)	48.5 (9.2)	45.0 (7.2)	42.2 (5.7)
Annual	72.9 (22.7)	72.5 (22.5)	74 (23.3)	75 (23.9)	75.1 (23.9)	76.4 (24.7)	36.8 (2.7)	37.4 (3.0)	51 (10.6)	55 (12.8)	49.4 (9.7)	42.9 (6.1)	54.8 (12.7)	54.9 (12.7)	62.5 (16.9)	64.9 (18.3)	62.2 (16.8)	59.5 (15.3)

[a]Ref. 11, Bowen and Egami, 1983, Table 2.
[b]Ref. 3, Quiring, 1968. These data were read directly from thermograph curves, pp. II-29 to II-52.
[c]Ref. 12, D. Soule, private communication, Table 3.
[d]Ref. 15.

monthly temperatures measured at locations nearest to Yucca Alluvial (relative to altitude and environment, as well as proximity) for 9-year cumulative periods, were recorded at Towers 4JAo and 5A, respectively, of 82.5°F (28.1°C) and 86.5°F (30.3°C), in the month of July. Corresponding temperatures at Desert Rock and Beatty (both stations are at 3300 ft) for 5- and 39-year time-spans, though for different periods, show highest monthly averages occuring in July, of 84.5°F (29.2°C) and 80.8°F (27.1°C), respectively.

Table 18 presents the average monthly maximum and minimum extreme temperatures recorded at various locations on the NTS at measurement sites adjacent to Yucca Alluvial. Monthly averages of measurements taken each day of the three-month data collection period are also provided for a comparison of DRA and YA data; the maximum and minimum extreme temperatures for July-September 1982, at Desert Rock and Yucca Alluvial, are shown on Table 18 also, and provide some evidence of a close correlation between measurements recorded at the two sites. Therefore, the best approximation of extreme temperature values currently available, as averaged over a 5-year period, and applicable to Yucca Alluvial may be obtained from Table 3, as recorded at Desert Rock, 1978-1983.

2.3.3 Probability of Extreme Temperature

Extreme maximum and minimum temperatures and specified return periods for Beatty, based on data collected over a 39-year cumulative period, are shown in Table 19. Average monthly occurrences of extreme temperatures for Yucca Flat and Beatty are presented in Table 20; both tables can be regarded as relatively typical of Yucca Alluvial Site and applicable for use in the design of facilities.

Table 18

Extreme Temperatures - °F (°C) for Yucca Flat, Jackass Flats, Desert Rock, and Beatty, Nevada

Month	Yucca Flat, Elevation: 3924 ft (1196 m), 1961-1971[a] Max.	Yucca Flat 1961-1971[a] Min.	Yucca Flat, Elevation: 3924 ft (1196 m), 1962-1966[b] Max.	Yucca Flat 1962-1966[b] Min.	Jackass Flats, Elev.: 3924 ft (1196 m), Tower 4, 1956-1964 Max.	Jackass Flats Tower 4 1956-1964 Min.	Jackass Flats, Elev.: 3644 ft (1111 m), Tower 5A, 1958-1962 Max.	Jackass Flats Tower 5A 1958-1962 Min.	Desert Rock[c] (DRA), Elev.: 3300 ft (1006 m), 1970-1983 Max.	Desert Rock (DRA) 1970-1983 Min.	Beatty[d], Elev.: 3300 ft (1006 m), 1922-1969 Max.	Beatty 1922-1969 Min.	Yucca Alluvial*, Elevation: 3700 ft (1127 m), 3 metres 1982 Max.	Yucca Alluvial 3 metres 1982 Min.	Yucca Alluvial 10 metres 1982 Max.	Yucca Alluvial 10 metres 1982 Min.	Desert Rock***, Elevation: 3300 ft (1006 m), 1982 Max.	Desert Rock 1982 Min.
Jan.	73 (22.8)	-2 (-18.9)	70 (21.1)	0 (-18)	72 (22.2)	8 (-13.3)	73 (22.8)	9 (-12.8)	71 (21.7)	13 (-10.6)	78 (25.6)	7 (-13.9)						
Feb.	77 (25.0)	5 (-15)	77 (25)	5 (-15)	76 (24.4)	14 (-10.0)	77 (25.0)	15 (-9.4)	78 (25.6)	15 (-9.4)	80 (26.7)	1 (-17.2)						
March	87 (30.6)	9 (-12.8)	87 (30.6)	10 (-12)	80 (26.7)	23 (-5.0)	91 (3.28)	26 (-3.3)	78 (25.6)	29 (-1.67)	85 (29.4)	16 (-8.9)	Data unavailable					
April	89 (31.7)	13 (-10.6)	89 (31.7)	13 (-10.6)	91 (32.8)	28 (-2.2)	92 (33.3)	31 (-0.56)	95 (35.0)	30 (-1.11)	98 (36.7)	17 (-8.3)						
May	97 (36.1)	25 (-3.9)	94 (34)	26 (-3.3)	97 (36.1)	32 (0)	77 (25)	37 (2.78)	102 (38.9)	37 (2.8)	103 (39.4)	26 (-3.3)						
June	107 (42)	29 (-1.7)	101 (38)	34 (1.1)	109 (42.8)	43 (6.1)	113 (45)	42 (5.5)	105 (40.6)	49 (9.4)	112 (44.4)	33 (0.56)						
July	107 (42)	40 (4.4)	104 (40)	40 (4.4)	109 (42.8)	53 (11.7)	113 (45)	56 (13.3)	108 (42.2)	51 (10.6)	114 (45.6)	36 (2.2)	106 (4.06)	53 (11.7)	105 (40.6)	56 (40.9)	107 (41.7)	51 (10.6)
Aug.	107 (42)	39 (3.9)	104 (40)	43 (6.1)	106 (41.1)	50 (10.0)	110 (43.3)	50 (10.0)	111 (43.9)	56 (13.3)	113 (45.0)	41 (5.0)	100 (37.8)	64 (17.8)	100 (37.8)	69 (20.6)	100 (37.8)	62 (16.7)
Sept.	105 (40.6)	25 (-3.9)	98 (36.7)	31 (-0.6)	100 (37.8)	45 (7.2)	103 (39.4)	42 (5.56)	102 (38.9)	39 (3.9)	109 (42.8)	34 (1.1)	**	**	101 (38.3)	46 (7.8)	102 (38.9)	39 (3.9)
Oct.	94 (34.4)	12 (-11.1)	94 (34.4)	22 (-5.6)	94 (34.4)	34 (1.1)	97 (36.1)	36 (2.2)	108 (42.2)	33 (0.56)	98 (36.7)	22 (-5.6)						
Nov.	84 (28.9)	13 (-10.6)	82 (27.8)	13 (-10.6)	84 (28.9)	22 (-5.6)	84 (28.9)	21 (-6.1)	84 (28.9)	25 (-3.9)	86 (30.0)	10 (-12.2)	Data unavailable					
Dec.	70 (21.1)	-14 (-25.6)	70 (21.1)	1 (-17.2)	73 (22.8)	20 (-6.7)	74 (23.3)	18 (-7.78)	73 (22.8)	17 (-8.3)	80 (26.7)	4 (-15.5)						
Annual Average	91 (32.8)	16 (-8.9)	89 (31.7)	20 (-6.7)	91 (32.8)	33 (0.56)	92 (33.3)	31 (-0.56)	93 (33.9)	31 (-0.56)	96 (35.6)	21 (-6.1)						

[a]Ref. 11, Bowen and Egami, 1983, Table 2.
[b]Ref. 3, Quiring, 1968.
[c]Ref. 12, Table 3.
[d]Ref. 15.

*Data represents monthly averages for 1982, (Ref. 10), from July-September, and not cumulative data averaged over a period of years.
**Temperature data at 3 meters were unavailable for September because of equipment failure.
***These represent monthly data for DRA, July-September 1982, recorded at same time as measurements at Yucca Alluvial (Ref. 10).

Table 19

Extreme Maximum and Minimum Temperatures
and Return Periods for Beatty, Nevada

Return Period (Years)	Temperature °F (°C)	
	Maximum	Minimum
1	104.4 (40.2)	20.2 (-6.6)
2	108.2 (42.3)	13.7 (-10.2)
5	110.5 (43.6)	9.9 (-12.3)
10	112.0 (44.4)	7.4 (-13.7)
20	113.4 (45.2)	4.9 (-15.1)
25	113.9 (45.5)	4.2 (-15.4)
50	115.3 (46.2)	1.8 (-16.8)
100	116.7 (47.1)	-0.6 (-18.1)
200	118.0 (47.8)	-2.9 (-19.4)
500	119.9 (48.8)	-6.1 (-21.2)
1000	121.3 (49.6)	-8.4 (-22.4)
10000	125.9 (52.2)	-16.2 (-26.8)

(Source: U.S. Department of Commerce, "Extreme Maximum and Minimum Probability Data", National Climatic Center, Asheville, North Carolina, 1982. These values represent a statistical extrapolation of existing extreme temperature observations. Projections to 1,000 and 10,000 year return periods do not account for the possible effects of climatic changes, Ref. 16).

Table 20

Average Monthly Occurrences of Extreme Temperatures for Yucca Flat and Beatty, Nevada

	Average Number of Days					
	Maximum Temperature-°F (°C)			Minimum Temperature-°F (°C)		
	≥90 (32)		>32 (0)	≥32 (0)		≥ (-17.8)
Month	Yucca Flat[a]	Beatty[b]	Yucca Flat[a]	Yucca Flat[a]	Beatty[b]	Yucca Flat[a]
January	0	0	1	29	22	*
February	0	0	*	23	17	0
March	0	0	0	24	12	0
April	0	1	0	12	2	0
May	4	8	0	2	*	0
June	14	21	0	*	0	0
July	29	30	0	0	0	0
August	27	29	0	0	0	0
September	11	20	0	1	0	0
October	2	3	0	9	0	0
November	0	0	0	23	11	0
December	0	0	1	29	24	1
Annual	87	112	2	152	88	1

[a]Ref. 11.
[b]Ref. 15, Supplement for 1951 through 1960, Nevada, 1965.
*Average occurrences of less than 0.5.

2.4 Relative Humidity

Similar to other forms of moisture, the level of relative humidity at NTS is associated with migrating storms from the Pacific, and likewise is dependent upon the amount of precipitation that succeeds in crossing the barrier of the Sierra Nevada mountain range. Precipitation generally falls mainly on the western slopes of the Sierras, which results consequently, in the arid or semi-arid regional climate east of the range.

Relative humidity provides a measure of the amount of water vapor content of the air, in relation to the maximum amount possible (100%) at prevailing temperatures. If more vapor is added to saturated air, some of it will condense to form clouds of liquid droplets or ice crystals that may fall as rain or snow. If there are no clouds, relative humidity is less than 100 percent at all levels of the atmosphere. As temperature increases, the air capacity for more moisture increases, approximately doubling every 20°F (11.1°C) (Ref. 4, p. 59).

2.4.1 Mean Values of Relative Humidity

Monthly and annual averages of the percentages of relative humidity recorded for Yucca Flat and Desert Rock, are shown in Table 21, as obtained from Tables 1-3. The values indicate that a comparatively close correlation exists between them and the measurements recorded at Yucca Alluvial Site, despite the inconclusively small sampling of data available for assessment. The values are also consistent with expectations relative to altitude (in relation to temperature and precipitation) particularly for measurements averaged over periods of longer duration; an increase (decrease) in the percentage of relative humidity, varies directly with an increase (decrease) in elevation, and this tendency is apparent in Table 22.

Similar to all meteorological data, the extent to which average relative humidity can differ though measurements are taken at the same location and include a large proportion of data recorded during the same calendar period, is also evident in a comparison of the 5- and 10-year Climatological Summaries for Yucca Flat. The reason is clearly implied on the regional drought/wet index curves in Fig. 7. They show an abnormally high-moisture level for the last half of the decade (1965-70) that is reflected in the higher percentages of relative humidity during the 10-year summary period than those of the 5-year time-span (1962-71 and 1962-66, respectively).

Table 21

Average Values of Relative Humidity (%) at Desert Rock and Yucca Flat, Nevada

Month	Desert Rock[a] 1978-1983 Elev.: 3300 ft (1006 m) Hour				Yucca Alluvial* 1982 Elev.: 3700 ft (1128 m) Hour				Yucca Flat 1962-1971[b] Elev.: 3924 ft (1196 m) Hour				Yucca Flat 1962-1966[c] Hour			
	04	10	16	22	04	10	16	22	04	10	16	22	04	10	16	22
Jan	61	47	39	56	Data Unavailable				67	49	35	60	61	44	30	64
Feb	62	44	33	54	"				67	45	32	56	63	41	28	50
March	63	43	33	53	"				58	31	23	44	56	28	21	42
April	44	27	19	33	"				52	27	21	38	49	26	19	34
May	43	25	19	32	"				46	22	17	31	42	19	15	27
June	24	15	9	17	"				39	19	14	26	36	17	12	24
July	28	18	13	21	23	13	15	23	40	20	15	28	32	16	12	26
Aug	36	22	16	25	38	24	19	28	44	23	16	30	40	20	14	27
Sept	38	24	18	30	44	31	26	38	43	21	17	32	42	21	15	31
Oct	38	24	18	31	Data Unavailable				46	24	19	36	45	22	17	35
Nov	48	32	25	42	"				61	39	31	52	62	39	33	53
Dec	55	38	30	48	"				68	50	41	64	66	46	37	61
Annual	45	30	23	37	"				53	31	23	41	50	28	21	38

*Available data for Yucca Alluvial Site allows for averages of only one month each (July-Sept., 1982) of cumulative data (Ref. 10).
[a]Table 3, Ref. 12.
[b]Table 1, Ref. 11.
[c]Table 2, Ref. 3.

2.4.2 Diurnal Cycle of Relative Humidity

The daily pattern of relative humidity as shown in Table 21 is likewise indicative of the diurnal cycle shown by the data on Table 22 of average relative humidity for Las Vegas and Reno based on cumulative measurement periods, 11 and 8 years in length, respectively. As expected, lowest values of relative humidity occur in the afternoon and highest in the pre-dawn hours (Ref. 4, p. 59). The only long-term humidity readings recorded routinely at NTS are those for Yucca Flat. The reported averages in the climatological summaries, Tables 1-3 reflect the usual desert climatic conditions at NTS.. Annual averages at UCC, at 4:00 AM and 4:00 PM are, respectively, 53% and 23% (Ref. 11 and Table 21).

2.4.3 Dew-Point Temperature

Dew-point temperature, the saturation temperature reached by the air as it is cooled, is a relatively conservative and stable indicator of air moisture content. Though air temperatures vary greatly and relative humidity fluctuates widely with temperature variations, dew-point temperatures will not. Dew point is altered primarily by new air masses moving into an area. For a given air mass at constant dew point, relative humidity decreases as temperatures increase, and vice versa (Ref. 4, pp. 58-60).

2.4.4 Annual Cycle of Relative Humidity and Dew-Point Temperature

There are seasonal variations, relative to temperature, in both the humidity and dew-point values, as shown in Table 22, indicating that relative humidity is highest in winter and lowest in summer. Dew-point temperature values, however, are much more uniform than those for relative humidity. In a comparison of data from Las Vegas and Reno, between relative humidity and dew-point temperatures, the later appears to have a more modest seasonal variation. Dew points are higher in summer than in winter, though summer is the driest season, because warm air masses can hold much more water vapor than cold air masses. Condensation and precipitation are infrequent in summer compared to winter, when dew points and air temperatures are similar. For any individual month, dew points are very much the same all over the state as shown in Table 22 for Las Vegas and Reno--more so than are values for relative humidity (Ref. 4, p. 60).

Table 22

Average Relative Humidity (%) at Four Times a Day for
Las Vegas and Reno and Mean Monthly Dew-Point Temperatures-°F (°C)

Month	Las Vegas**[a] Relative Humidity Hour (PST)[b] 04	10	16	22	Dew-Point* Temp. °F (°C)	Reno** Relative Humidity Hour (PST) 04	10	16	22	Dew-Point* Temp. °F (°C)
Jan.	52	37	27	45	21 (-6)	72	65	48	68	20 (-7)
Feb.	48	35	25	41	22 (-6)	70	56	35	60	24 (-4)
March	40	26	18	32	20 (-7)	65	45	31	52	23 (-5)
April	35	21	15	26	24 (-4)	65	38	28	49	26 (-3)
May	31	18	13	22	26 (-3)	66	35	26	46	32 (0)
June	27	16	11	18	28 (-2)	70	37	27	46	37 (3)
July	29	20	15	22	39 (4)	68	30	20	39	40 (4)
Aug.	37	25	19	28	41 (5)	70	33	21	41	38 (3)
Sept.	33	21	16	25	33 (0.5)	70	35	22	47	35 (2)
Oct.	36	24	18	29	29 (-2)	71	40	25	54	31 (-0.6)
Nov.	48	35	28	43	25 (-4)	74	58	44	66	25 (-4)
Dec.	57	43	34	51	23 (-5)	73	65	55	69	22 (-6)
Annual	39	27	20	32	28 (-2)	70	45	32	53	29 (-1.5)

*Based on a 20-year period of observations.
**Based on an 11-year period of observations.
[a]Ref. 4, pp. 59-60. Taken from "Social Climatological Data, Annual Summary With Comparative Data, 1971."
[b]PST: Pacific Standard Time.

2.5 Fog

Fog is a rare phenomenon in Nevada, with occurrences generally confined to cooler nighttime and early morning hours, between November and March, when relative humidity is highest.

Figure 13 shows the average annual number of days on which heavy fog occurs--about twice a year--in the NTS region (Ref. 4, p. 60). Other sources of data (Ref. 17, p. 29, as taken from Ref. 18, p. 763) list the incidence at less than six days per year on the NTS. Heavy fog is defined by the National Weather Service, as that which reduces visibility to a quarter of a mile or less. Not all fog is heavy, and light ground fog with visibility greater than a quarter of a mile occurs occasionally.

Most frequent occurrences of fog are in winter, (Ref. 4, p. 60) although the trend is not pronounced. Usually, temperatures are below freezing when fog forms, causing a layer of rime or frozen condensation over all objects. Most fogs tend to dissipate by early afternoon as the sun heats the air above the dew-point level.

Another condition of poor visibility that infrequently occurs, may be caused by blowing snow or sand. It is not expected, however, that this will present any significant visibility problems.

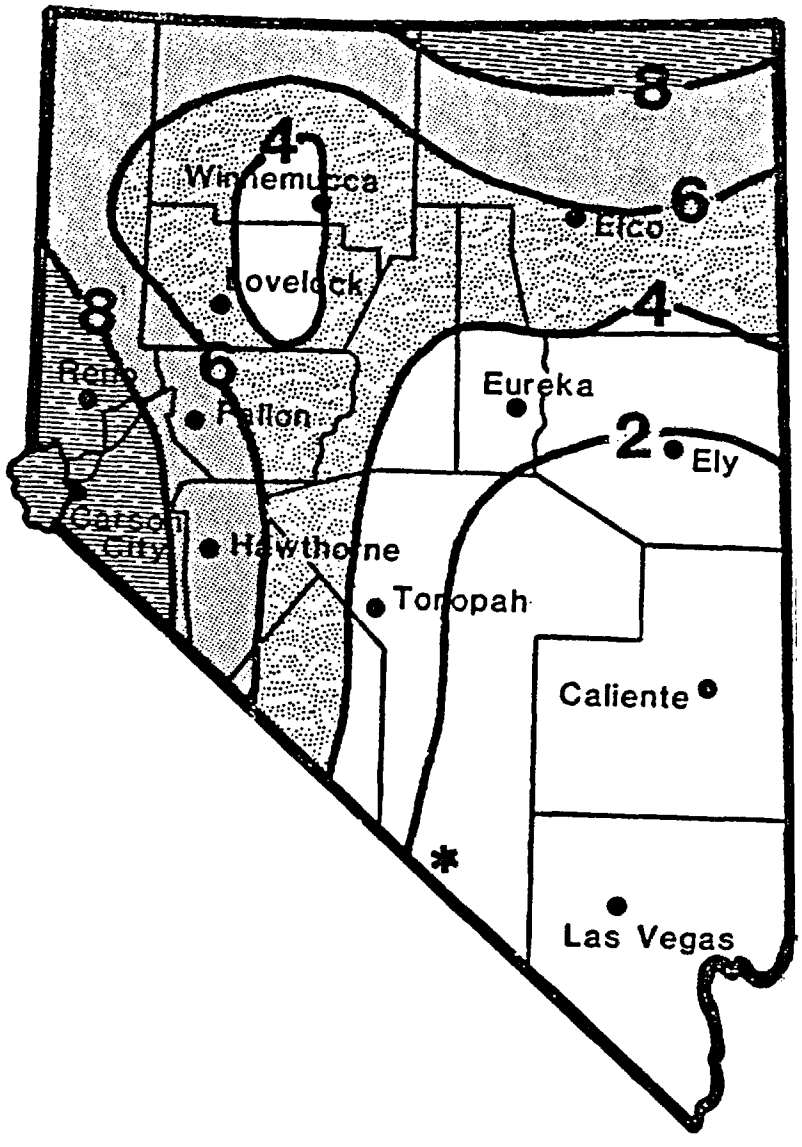


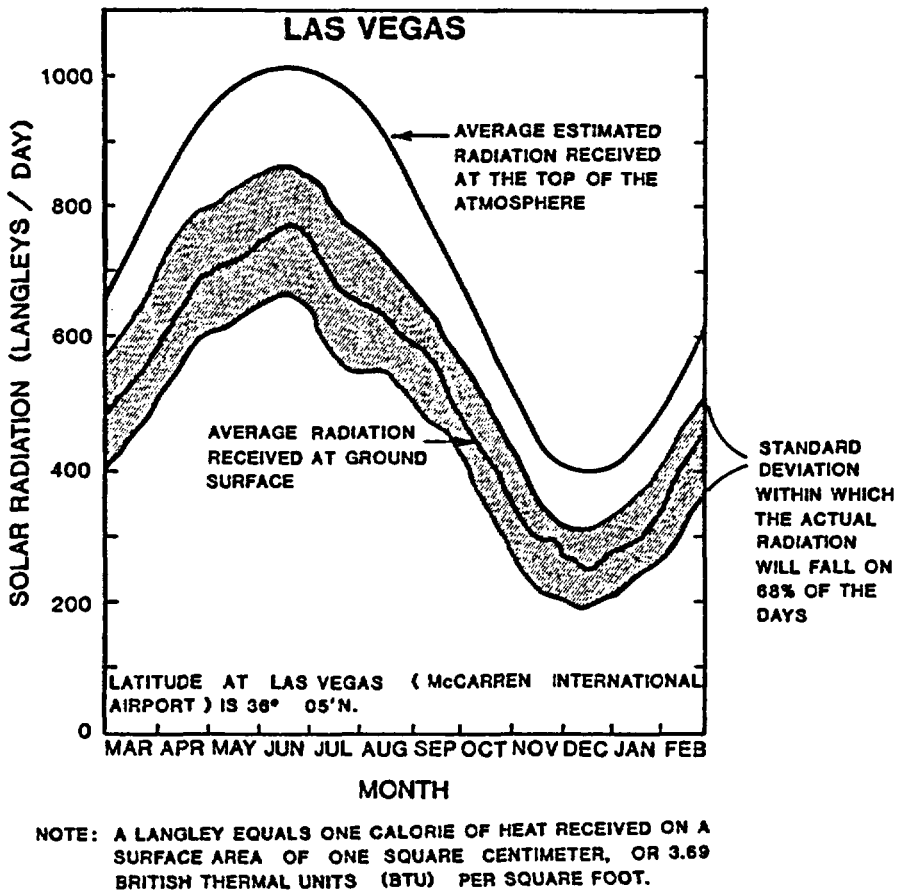
Figure 13. Average Number of Days Annually of Heavy Fog Incidence in Nevada (Source: Ref. 4, p. 61)
*Approximate location of Yucca Mountain.

2.6 Solar Radiation, Sunshine and Cloud Cover

2.6.1 Solar Radiation

Solar radiation is measured at three cities in Nevada: Ely, Reno, and Las Vegas. The unit of solar energy used is the Langley, equivalent to 1 calorie of thermal energy received on a surface area 1 square centimeter in size, equal to 3.69 British thermal units (Btu) per square foot, or 4.184 x 104 J/m^2.

2.6.1.1 Mean Levels of Solar Radiation -- In Fig. 14 (Ref. 4, p. 22), the average daily levels of solar radiation received at Las Vegas, as measured by a pyranometer, are shown on the lower curve. The standard deviation, indicated by the shaded area, is a measure of the variation around the mean, and the amount of solar energy received in a day can be expected to fall within the limits of one standard deviation 68% of the time. The lower curve represents the means and standard deviation for each week of the year, based on a weighted running average of the mean data, used to smooth out



NOTE: A LANGLEY EQUALS ONE CALORIE OF HEAT RECEIVED ON A SURFACE AREA OF ONE SQUARE CENTIMETER, OR 3.69 BRITISH THERMAL UNITS (BTU) PER SQUARE FOOT.

Figure 14. Average Daily Solar Radiation Levels at Las Vegas (Source: Ref. 4, p. 22)

random weekly changes without diminishing indications of seasonal variations. The amount of solar energy received at the earth's surface is lower than that at the top of the atmosphere, as illustrated by the upper curve (based on a theoretical estimate), because of absorption and scattering of radiation in the atmosphere. Typically, over 25% of incoming solar radiation in Nevada fails to reach ground level even on clear days (Ref. 4, p. 23).

Recorded measurements of mean daily solar radiation (horizontal surface insolation) at Las Vegas in Langleys, is shown in Table 23 for each month of the year.

Table 23

Mean Daily Solar Radiation at Las Vegas (Langleys)

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
277	384	519	621	702	748	675	627	551	429	318	258

(Source: Ref. 19, pp. 108-119)

2.6.1.2 Annual Cycle of Solar Radiation -- The annual cycle of solar radiation as illustrated in Fig. 14, shows maximum levels occurring from May to July, and peaking around June 21st, the longest day in the year.* Minimum levels of solar radiation, are also evident, occurring simultaneously with the period of the fewest daylight hours (and lowest solar angle), around December 22. The irregularities in the curve represent changes in atmospheric conditions throughout the year. Thus, periods of reduced solar radiation correspond to those of greater cloudiness and precipitation, such as the pronounced decrease during July and August, at the time of maximum thunderstorm activity (Ref. 4, p. 20).

2.6.1.3 Solar Position, Insolation, and Incident Angles -- Monthly and annual solar positions and clear-day insolation (incoming solar radiation) values for the 21st day of each month, at 32° and 40° north latitude are presented in Tables 24 and 25, respectively, which can be interpolated for Yucca Alluvial at 37° north latitude. Incident angles for horizontal and south-facing tilted surfaces at latitudes 32° and 40° north, which can be interpolated for latitude 37°N, are provided in Tables 26A and 26B, respectively (Ref. 19).

*At this time, the northern hemisphere is tilted toward the sun, and the sun's rays are directly overhead at the Tropic of Cancer (only 13° south of Las Vegas).

Table 24

Solar Position and Insolation Values for Latitude 32°N

Date	Solar Time AM	Solar Time PM	Solar Position ALT	Solar Position AZM	BTUH/Sq. Ft. Total Insolation on Surfaces: Normal	Horiz.	South Facing Surface Angle with Horiz. 22	32	42	52	90
Jan. 21	7	5	1.4	65.2	1	0	0	0	0	1	1
	8	4	12.5	56.5	203	56	93	106	116	123	115
	9	3	22.5	56.5	269	118	175	193	206	212	181
	10	2	30.6	33.1	295	167	235	256	269	274	221
	11	1	36.1	17.5	306	198	273	295	308	312	245
	12		38.0	0.0	310	209	285	308	321	324	253
Surface Daily Totals					2458	1288	1839	2008	2118	2166	1779
Feb. 21	7	5	7.1	73.5	121	22	34	37	40	42	38
	8	4	19.0	64.4	247	95	127	136	140	141	108
	9	3	29.9	53.4	288	161	206	217	222	220	158
	10	2	45.6	21.4	315	244	304	317	321	315	214
	12		48.0	0.0	317	255	316	330	334	328	222
Surface Daily Totals					2872	1724	2188	2300	2345	2322	1644
Mar. 21	7	5	12.7	81.9	185	54	60	60	59	56	32
	8	4	25.1	73.0	260	129	146	147	144	137	78
	9	3	36.8	62.1	290	194	222	224	220	209	119
	10	2	47.3	47.5	304	245	280	283	278	265	150
	11	1	55.0	26.8	311	277	317	321	315	300	170
	12		58.0	0.0	313	287	329	333	327	312	177
Surface Daily Totals					3012	2084	2378	2403	2358	2246	1276
Apr. 21	6	6	6.1	99.9	66	14	9	6	6	5	3
	7	5	18.8	92.2	206	86	78	71	62	51	10
	8	4	31.5	84.0	255	158	156	148	136	120	35
	9	3	43.9	74.2	278	220	225	217	203	183	68
	10	2	55.7	60.3	290	267	279	272	256	234	95
	11	1	65.4	37.5	295	297	313	306	290	265	112
	12		69.6	0.0	297	307	325	318	301	276	118
Surface Daily Totals					3076	2390	2444	2356	2206	1994	764
May 21	6	6	10.4	107.2	119	36	21	13	13	12	7
	7	5	22.8	100.1	211	107	88	75	60	44	13
	8	4	35.4	92.9	250	175	159	145	127	105	15
	9	3	48.1	84.7	269	233	223	209	188	163	33
	10	2	60.6	73.3	280	277	273	259	237	208	56
	11	1	72.0	51.9	285	305	305	290	268	237	72
	12		78.0	0.0	286	315	315	301	278	247	77
Surface Daily Totals					3112	2582	2454	2284	2064	1788	469
June 21	6	6	12.2	110.2	131	45	26	16	15	14	9
	7	5	24.3	103.4	210	115	91	76	59	41	14
	8	4	36.9	96.8	245	180	159	143	122	99	16
	9	3	49.6	89.4	264	236	221	204	181	153	19
	10	2	62.2	79.7	274	279	268	251	227	197	41
	11	1	74.2	60.9	279	306	299	282	257	224	56
	12		81.5	0.0	280	315	309	292	267	234	60
Surface Daily Totals					3084	2634	2436	2234	1990	1690	370

(Source: Ref. 19, pp. 159-160).

Table 24

Solar Position and Insolation Values for Latitude 32°N (continued)

Date	Solar Time AM	Solar Time PM	Solar Position ALT	Solar Position AZM	BTUH/Sq. Ft. Total Insolation on Surfaces: Normal	Horiz.	South Facing Surface Angle with Horiz. 22	32	42	52	90
July 21	6	6	10.7	107.7	113	37	22	14	13	12	8
	7	5	23.1	100.6	203	107	87	75	60	44	14
	8	4	35.7	93.6	241	174	158	143	125	104	16
	9	3	48.4	85.5	261	231	220	205	185	159	31
	10	2	60.9	74.3	271	274	269	254	232	204	54
	11	1	72.4	53.3	277	302	300	285	262	232	69
	12		78.6	0.0	279	311	310	296	273	242	74
Surface Daily Totals					3012	2558	2250	2030	1754	458	
Aug. 21	6	6	6.5	100.5	59	14	9	7	8	8	4
	7	5	19.1	92.8	190	85	77	69	60	50	12
	8	4	31.8	84.7	240	156	152	144	132	116	33
	9	3	44.3	75.0	263	216	220	212	197	178	65
	10	2	46.1	61.3	276	262	272	264	249	226	91
	11	1	66.0	38.4	282	292	305	298	281	257	107
	12		70.3	0.0	284	302	217	309	292	268	113
Surface Daily Totals					2902	2352	2388	2296	2144	1934	736
Sept. 21	7	5	12.7	81.9	163	51	56	56	55	52	30
	8	4	25.1	73.0	240	124	140	141	138	131	75
	9	3	36.8	62.1	272	188	213	215	211	201	114
	10	2	47.3	47.5	287	237	270	273	268	255	145
	11	1	55.0	26.8	294	268	306	309	303	289	164
	12		58.0	0.0	296	278	318	321	315	300	171
Surface Daily Totals					2608	2014	2288	2308	2264	2154	1226
Oct. 21	7	5	6.8	73.1	99	29	32	34	36	32	
	8	4	18.7	64.0	229	90	120	128	133	134	104
	9	3	29.5	53.0	273	155	198	208	213	212	153
	10	2	38.7	39.1	293	204	257	269	273	270	188
	11	1	45.1	21.1	301	236	294	307	311	306	209
	12		47.5	0.0	304	247	306	320	324	318	217
Surface Daily Totals					2696	1654	2100	2208	2252	2232	1588
Nov. 21	7	5	1.5	65.4	2	0	0	0	1	1	1
	8	4	12.7	56.6	196	55	91	104	113	119	111
	9	3	22.6	46.1	263	118	173	190	202	208	176
	10	2	30.8	33.2	289	166	233	252	265	270	217
	11	1	36.2	17.6	301	197	270	291	303	307	241
	12		38.2	0.0	304	207	282	304	316	320	249
Surface Daily Totals					2406	1280	1816	1980	2084	2130	1742
Dec. 21	8	4	10.3	53.8	176	41	77	90	101	108	107
	9	3	19.8	43.6	257	102	161	180	195	204	183
	10	2	27.6	31.2	288	150	221	244	259	267	226
	11	1	32.7	16.4	301	180	258	282	298	305	251
	12		34.6	0.0	304	190	271	295	311	318	259
Surface Daily Totals					2348	1136	1704	1888	2016	2086	1794

(Source: Ref. 19, pp. 159-160).

Table 25

Solar Position and Insolation Values for Latitude 40°N

Date	Solar Time AM	Solar Time PM	Solar Position ALT	Solar Position AZM	BTUH/Sq. Ft. Total Insolation on Surfaces: Normal	Horiz.	South Facing Surface Angle with Horiz.: 30	40	50	60	90
Jan. 21	8	4	8.1	55.3	142	28	65	74	81	85	84
	9	3	16.8	44.0	239	83	155	171	182	187	171
	10	2	23.8	30.9	274	127	218	237	249	254	223
	11	1	28.4	16.0	289	154	257	277	290	293	253
	12		30.0	0.0	294	164	270	291	303	306	263
Surface Daily Totals					2182	948	1660	1810	1906	1944	1726
Feb. 21	7	5	4.8	72.7	69	10	19	21	23	24	22
	8	4	15.4	62.2	224	73	114	122	126	127	107
	9	3	25.0	50.2	274	132	195	205	209	208	167
	10	2	32.8	35.9	295	178	256	267	271	267	210
	12		40.0	0.0	308	216	306	319	323	317	245
Surface Daily Totals					2640	1414	2060	2162	2202	2176	1730
Mar. 21	7	5	11.4	80.2	171	46	55	55	54	51	35
	8	4	22.5	69.6	250	114	140	141	138	131	89
	9	3	32.8	57.3	282	173	215	217	213	202	138
	10	2	41.6	41.9	297	218	273	276	271	258	176
	11	1	47.7	22.6	305	247	310	313	307	293	200
	12		50.0	0.0	307	257	322	326	320	305	208
Surface Daily Totals					2916	1852	2308	2330	2284	2174	1484
Apr. 21	6	6	7.4	98.9	89	20	11	8	7	7	4
	7	5	18.9	89.5	206	87	77	70	61	50	12
	8	4	30.3	79.3	252	152	153	145	133	117	53
	9	3	41.3	67.2	274	207	221	267	252	229	126
	10	2	51.2	51.4	286	250	275	267	252	229	126
	11	1	58.7	29.2	292	277	308	301	285	260	147
	12		61.6	0.0	293	287	320	313	296	271	154
Surface Daily Totals					3082	2274	2412	2320	2168	1956	1022
May 21	5	7	1.9	114.7	1	0	0	0	0	0	0
	6	6	12.7	105.6	144	49	25	15	14	13	9
	7	5	24.0	96.6	216	214	89	76	60	44	13
	8	4	35.4	87.2	250	175	158	144	125	104	25
	9	3	46.8	76.0	267	227	221	206	186	160	60
	10	2	57.5	60.9	277	267	270	255	233	205	89
	11	1	66.2	37.1	283	293	301	287	264	234	108
	12		70.0	0.0	284	301	312	297	243	114	
Surface Daily Totals					3160	2552	2442	2264	2040	1760	724
June 21	5	7	4.2	117.3	22	4	3	3	2	2	1
	6	6	14.8	108.4	155	60	30	18	17	16	10
	7	5	26.0	99.7	216	123	92	77	59	41	14
	8	4	37.4	90.7	246	182	159	142	121	97	16
	9	3	48.8	80.2	263	233	219	202	179	151	47
	10	2	59.8	65.8	272	272	266	248	224	194	74
	11	1	69.2	41.9	277	296	296	278	253	221	92
	12		73.5	0.0	279	304	306	289	263	230	98
Surface Daily Totals					3180	2648	2434	2224	1974	1670	610

(Source: Ref. 19, pp. 165-166).

Table 25

Solar Position and Insolation Values for Latitude 40°N (continued)

Date	Solar Time AM	Solar Time PM	Solar Position ALT	Solar Position AZM	BTUH/Sq. Ft. Total Insolation on Surfaces: Normal	Horiz.	South Facing Surface Angle with Horiz. 30	40	50	60	90
July 21	5	7	2.3	115.2	2	0	0	0	0	0	0
	6	6	13.1	106.1	138	50	26	17	15	14	9
	7	5	24.3	97.2	208	114	89	75	60	44	14
	8	4	35.8	87.8	241	174	157	142	124	102	24
	9	3	47.2	76.7	259	225	218	203	182	157	58
	10	2	57.9	61.7	269	265	266	251	229	200	86
	11	1	66.7	37.9	275	290	296	281	258	228	104
	12		70.6	0.0	276	298	307	292	269	238	111
Surface Daily Totals					3062	2534	2409	2230	2006	1728	702
Aug. 21	6	6	7.9	99.5	81	21	12	9	8	7	5
	7	5	19.3	90.0	191	87	76	69	60	49	12
	8	4	30.7	79.9	237	150	150	141	129	113	50
	9	3	41.8	67.9	260	205	216	207	193	173	89
	10	2	51.7	52.1	272	246	267	259	244	221	120
	11	1	59.3	29.7	278	273	300	292	276	252	140
	12		62.3	0.0	280	282	311	303	287	262	147
Surface Daily Totals					2916	2244	2354	2258	2104	1894	978
Sept. 21	7	5	11.4	80.2	149	43	51	51	49	47	32
	8	4	22.5	69.6	230	109	133	134	131	124	84
	9	3	32.8	57.3	263	167	206	208	203	193	132
	10	2	41.6	41.9	280	211	262	265	260	247	168
	11	1	47.7	22.6	287	239	298	301	295	281	192
	12		50.0	0.0	290	249	310	313	307	292	209
Surface Daily Totals					2708	1788	2210	2228	2182	2074	1416
Oct. 21	7	5	4.5	72.3	48	7	14	15	17	17	16
	8	4	15.0	61.9	204	68	106	113	117	118	100
	9	3	24.5	49.8	257	126	185	195	200	198	160
	10	2	32.4	35.6	280	170	245	257	261	257	203
	11	1	37.6	18.7	291	199	283	295	299	294	229
	12		39.5	0.0	294	208	295	308	312	306	238
Surface Daily Totals					2454	1348	1962	2060	2098	2074	1654
Nov. 21	8	4	8.2	55.4	136	28	63	72	78	82	81
	9	3	17.0	44.1	232	82	152	167	178	183	167
	10	2	24.0	31.0	268	126	215	233	245	249	219
	11	1	28.6	16.1	283	153	254	273	285	288	248
	12		30.2	0.0	288	163	267	287	298	301	258
Surface Daily Totals					2128	942	267	1778	1870	1908	1686
Dec. 21	8	4	5.5	53.0	89	14	39	45	50	54	56
	9	3	14.0	41.9	217	65	135	157	164	171	163
	10	2	20.7	29.4	261	107	200	221	235	242	221
	11	1	25.0	15.2	280	134	239	262	276	283	252
	12		26.6	0.0	285	143	253	275	290	296	263
Surface Daily Totals					1978	782	1480	1634	1740	1796	1646

(Source: Ref. 19, pp. 165-166).

Table 26A

Incident Angles for Horizontal and South-Facing Tilted Surfaces at Latitude 32°N

Date (Decl.)	AM	PM	Horiz.	Lat.-10	Lat.	Lat.+10	Lat.+20	Vert.
Dec. 21	8	4	79.7	67.5	62.7	58.6	55.4	54.5
(-23.45)	9	3	70.2	56.3	49.6	44.9	51.8	47.1
	10	2	62.4	44.5	37.4	31.6	28.0	40.7
	11	1	57.3	36.5	27.6	19.6	14.3	36.2
	12		55.4	33.4	23.4	13.5	3.5	34.5
Jan. 21	7	5	88.6	79.6	75.9	72.6	69.8	65.2
(-19.9)	8	4	77.5	66.2	62.0	58.5	56.0	57.4
and	9	3	67.5	53.5	48.4	44.5	42.2	50.0
Nov. 21	10	2	59.4	42.1	35.5	30.6	28.2	43.8
(-19.9)	11	1	53.9	33.4	24.8	17.6	14.1	39.6
	12		52.0	30.0	20.0	10.0	0.0	38.0
Feb. 21	7	5	82.9	77.2	75.2	73.7	72.6	73.6
(-10.6)	8	4	71.0	62.9	60.5	59.0	58.5	65.9
and	9	3	60.1	49.0	45.9	44.3	44.5	58.9
Oct. 21	10	2	50.9	35.9	31.5	29.5	30.6	53.2
(-10.7)	12		42.0	20.0	10.0	0.0	10.0	48.0
Mar. 21	7	5	77.3	75.2	75.0	75.2	75.9	82.1
(0.0)	8	4	64.9	60.5	60.0	60.5	62.0	74.6
and	9	3	43.2	45.9	45.0	45.9	48.4	68.0
Sep. 21	10	2	42.7	31.5	30.0	31.5	35.5	62.7
(0.0)	11	1	35.0	18.0	15.0	18.0	24.8	59.2
	12		32.0	10.0	0.0	10.0	20.0	58.0
Apr. 21	6	6	82.9	88.0	90.0	92.0	92.9	99.8
(+11.9)	7	5	71.2	73.5	75.3	77.6	80.2	92.1
and	8	4	58.5	58.9	60.7	63.4	67.0	84.9
Aug. 21	9	3	46.1	44.2	46.2	49.7	54.4	78.7
(+12.1)	10	2	34.3	29.5	32.0	36.8	43.2	3.8
	11	1	24.6	14.8	18.9	26.2	34.9	70.7
	12		20.4	1.6	11.6	21.6	31.6	69.6
May 21	6	6	79.6	86.6	90.0	93.4	96.7	106.9
(+20.3)	7	5	67.2	72.2	75.9	79.6	83.6	99.3
and	8	4	54.6	54.6	58.5	62.0	66.2	71.1
July 21	9	3	41.9	44.5	48.4	53.5	59.5	56.4
(+20.5)	10	2	29.4	30.6	35.5	42.1	49.6	81.9
	11	1	18.0	17.6	24.8	33.4	42.6	79.0
	12		12.0	10.0	20.0	30.0	40.0	78.0
June 21	6	6	77.8	86.0	90.0	94.0	97.8	109.7
(+23.45)	7	5	65.7	72.4	76.3	80.5	85.0	102.2
	8	4	53.1	58.6	62.7	67.5	72.8	95.4
	9	3	40.4	44.9	49.6	55.3	61.7	89.6
	10	2	27.8	31.6	37.4	44.5	52.4	85.2
	11	1	15.8	19.6	27.6	36.5	45.8	82.4
	12		8.6	13.4	23.4	33.4	43.4	81.4

(Source: Ref. 19, p. 165).

Table 26B

Incident Angles for Horizontal and South-Facing Tilted Surfaces at Latitude 40°N

Date (Decl.)	AM	PM	Horiz.	Lat.-10	Lat.	Lat.+10	Lat.+20	Vert.
Dec. 21	8	4	84.5	67.5	62.7	58.6	55.4	53.2
(-23.45)	9	3	76.0	55.3	49.6	44.9	41.8	43.8
	10	2	69.3	44.5	37.4	31.6	28.0	35.4
	11	1	65.0	36.5	27.6	19.6	14.3	29.0
	12		63.4	33.4	23.4	13.5	3.5	26.6
Jan. 21	8	4	81.9	66.2	62.0	58.5	56.0	56.7
(-19.9)	9	3	73.2	53.5	48.4	44.5	42.2	46.4
and	10	2	66.2	42.1	35.5	30.6	28.2	38.3
Nov. 21	11	1	61.6	33.4	24.8	17.6	14.1	32.3
(-19.9)	12		60.0	30.0	20.0	10.0	0.0	30.0
Feb. 21	7	5	85.2	77.2	75.2	73.7	72.6	72.7
(-10.6)	8	4	74.6	62.9	60.5	59.0	58.5	63.3
and	9	3	65.0	49.0	45.9	44.3	44.5	59.5
Oct. 21	10	2	57.2	35.9	31.5	29.5	30.6	47.1
(-10.7)	11	1	51.9	25.0	18.0	14.8	17.6	41.9
	12		50.0	20.0	10.0	0.0	10.0	40.0
Mar. 21	7	5	78.6	75.2	75.0	75.2	75.9-	80.4
(0.0)	8	4	67.5	60.5	60.0	60.5	62.0	71.3
and	9	3	57.2	45.9	45.0	45.9	48.4	63.0
Sep. 21	10	2	48.4	31.5	30.0	31.5	35.5	56.2
(0.0)	11	1	42.3	18.0	15.0	18.0	24.8	51.6
	12		40.0	10.0	0.0	10.0	20.0	50.0
Apr. 21	6	6	82.9	88.0	90.0	92.0	93.9	98.8
(+11.9)	7	5	71.1	73.5	75.3	77.6	80.2	89.5
and	8	4	59.7	58.9	60.7	63.4	67.0	80.7
Aug. 21	9	3	48.7	44.2	46.2	49.7	54.4	73.1
(+12.1)	10	2	38.8	29.5	32.0	36.8	43.2	67.0
	11	1	31.3	14.8	18.9	26.2	34.9	63.0
	12		28.4	1.6	11.6	21.6	34.9	61.6
May 21	5	7	88.1	100.4	104.1	107.4	110.2	114.7
(+20.3)	6	6	77.3	86.6	90.0	93.4	96.7	105.2
and	7	5	66.6	72.6	75.9	79.6	83.6	96.1
July 21	8	4	54.6	58.5	62.0	66.2	71.1	87.7
(+20.5)	9	3	43.2	44.5	48.4	53.5	59.5	80.5
	10	2	32.5	30.6	35.5	42.1	49.6	74.9
	11	1	23.8	17.6	24.8	33.4	42.6	71.2
	12		20.0	10.0	20.0	30.0	40.0	70.0
June 21	5	7	85.8	99.5	103.7	107.6	111.1	117.2
(+23.45)	6	6	75.2	86.0	90.0	94.0	97.8	107.7
	7	5	64.0	72.4	76.3	80.5	85.0	98.8
	8	4	52.6	58.6	62.7	67.5	72.8	90.6
	9	3	41.2	44.9	49.6	55.3	61.7	83.6
	10	2	30.2	31.6	37.4	44.5	52.4	78.1
	11	1	20.8	19.6	27.6	36.5	45.8	74.6
	12		16.6	13.4	23.4	33.4	43.4	73.4

(Source: Ref. 19, p. 166).

The values in Tables 24, 25, 26A, and 26B are based on data for the typical regional clearness numbers, as shown in Fig. 15. Note that a clearness number of 1.0 is assumed and that no ground-reflected radiation is included. The clearness number represents the mean U.S. atmospheric air mass, including dust and water vapor through which solar energy must pass and is partially absorbed. Air mass, dust, and water vapor vary according to location, therefore clearness factors also differ. The clearness factor, as defined, does not include smog conditions. Winter and summer clearness values for the NTS are 1.0 and 1.10, respectively.

2.6.2 Sunshine and Cloud Cover

High solar radiation levels in Nevada correspond to the abundance of sunshine annually. Seasonal variations in the number of sunny vs cloudy days correlates closely with variations in the types of air masses, and types of storms they give rise to that occur during the course of the year (i.e., Pacific fronts, Great Basin lows, and summer thunderstorms).

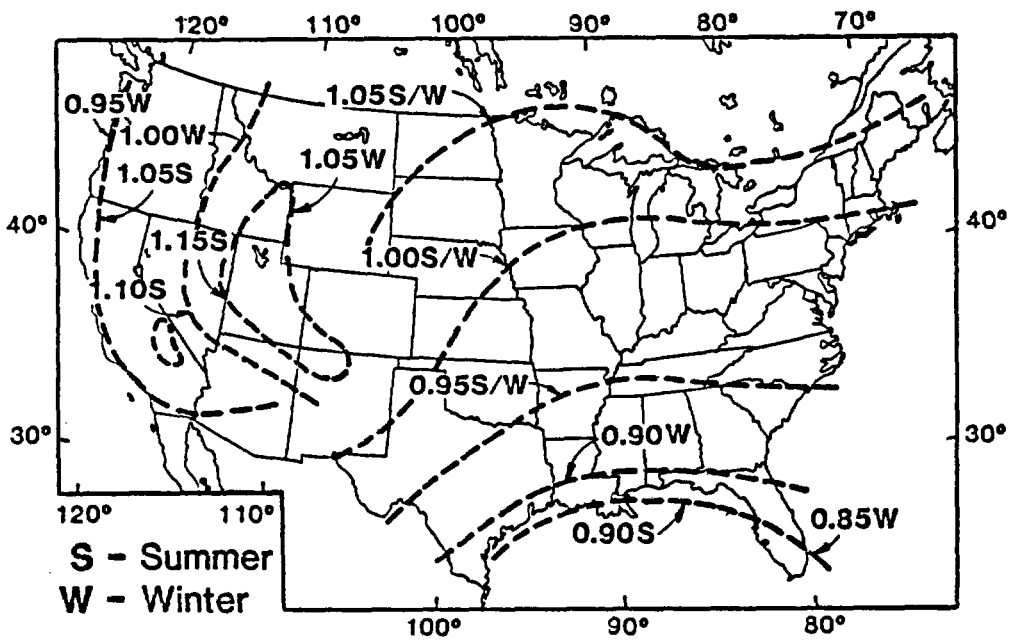


Figure 15. Clearness Numbers for Winter and Summer in U.S., and Approximate Average Annual Insolation (Langleys per day) (Source: Ref. 20)
Dashed Lines = Clearness Numbers
Solid Lines = Insolation

2.6.2.1 Frequency of Sunshine Days -- At Las Vegas, the incidence of occurrence of sunshine is 93% of the time during the sunniest months, June and September, and 73% during the least sunny month, December. The average annual incidence of sunshine is 83% of the time, ranking the region as one of the sunniest in the country. Table 27 shows the average number of clear and cloudy days annually at Las Vegas, based on data recorded during 1971. The Climatological Summaries, Tables 1-4, for Yucca Flats, Desert Rock, and adjacent areas, present data on cloud cover at measurement sites close to Yucca Alluvial, and are applicable for design purposes.

Figure 16 illustrates the potential average annual percentage of sunshine in regions across Nevada. The figure indicates that it is sunny approximately 85% of the time at Yucca Alluvial. Estimates were based on observations of solar radiation, minutes of sunshine, or cloud cover in 1972.

2.6.2.2 Diurnal and Annual Cycle and Percentages of Cloud Cover -- Cloudiness is expressed in one-tenth proportional units of the sky covered by clouds (determined visually without the aid of instruments). A clear day is one in which less than three-tenths of the sky is covered by clouds; partly cloudy skies comprise four to seven-tenths of cloud coverage; and cloudy conditions represent more than eight tenths of sky coverage. Table 28 shows the monthly average and annual cloud cover at Yucca Flat and Desert Rock for different time periods.

Cloud coverage has a diurnal pattern as well as seasonal one, with cloudiness increasing in the afternoon, reaching a maximum near 4:00 P.M. and decreasing again at night. Figure 17 illustrates the daily cyclical differences between Las Vegas and Reno.

Table 27

Average Number of Clear and Cloudy Days at Las Vegas in 1971

	On 143 Thunderstorm Days												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Clear	13	13	14	17	19	23	19	21	24	21	16	15	215
Cloudy	14	9	8	6	4	2	4	2	2	4	7	9	68

(Source: Ref. 4, p. 24).

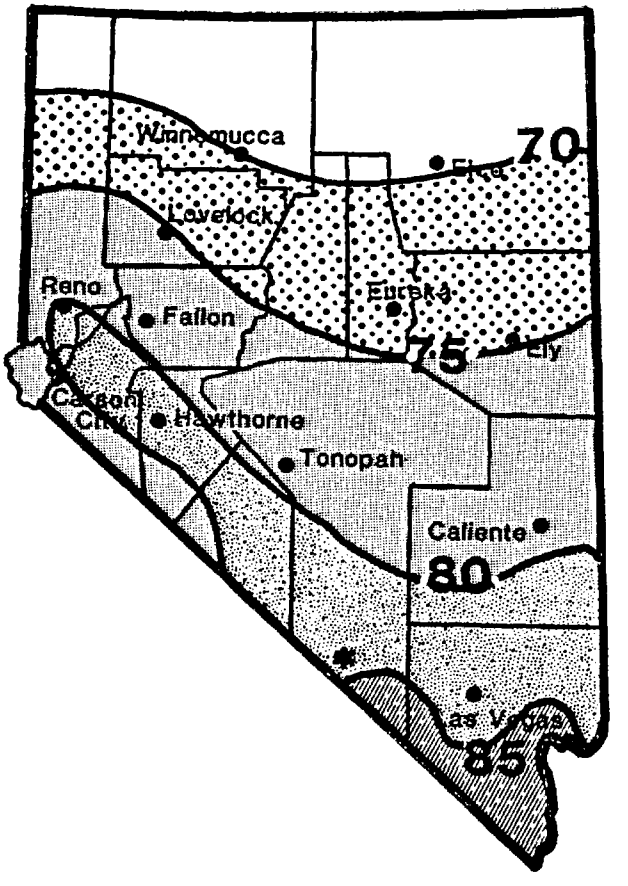


Figure 16. Average Annual Percentage of Possible Sunshine in Nevada, Based on Observations of Solar Radiation, Minutes of Sunshine, or Cloud Cover in 1972 (Source: Ref. 4, p. 23)
*Approximate location of Yucca Mountain.

Table 28

Cloud Coverage at Yucca Flat and Desert Rock for Different Time Periods Recorded Sunrise to Sunset (Number of Days)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Sky Coverage Sunrise to Sunset[a]													
Yucca Flat:													
1962-1966	4.1	4.4	5.1	5.1	4.4	3.2	2.5	2.4	2.0	2.6	5.1	4.4	3.8[b]
1962-1968	4.4	4.7	5.1	4.9	4.4	3.1	2.8	2.7	2.3	2.8	4.0	4.2	3.9[c]
1962-1971	4.9	5.0	4.8	4.5	4.3	3.0	3.0	3.0	3.1	2.9	4.8	4.6	3.9[d]
Desert Rock:													
1978-1983	5.6	6.4	5.3	4.4	4.0	2.4	1.9	2.4	2.9	3.1	4.4	4.8	4.0[e]
Clear Days													
Yucca Flat:													
1962-1966	15.0	13.0	12.0	11.0	13.0	17.0	21.0	22.0	23.0	21.0	12.0	14.0	194.0[b]
1962-1968	14.0	12.0	11.0	12.0	13.0	18.0	20.0	20.0	22.0	20.0	12.0	14.0	188.0[c]
1962-1971	13.0	11.0	12.0	13.0	14.0	19.0	19.0	20.0	22.0	20.0	13.0	14.0	190.0[d]
Desert Rock:													
1978-1982	10.0	7.0	10.0	13.0	16.0	21.0	24.0	23.0	19.0	19.0	13.0	14.0	159.0[e]
Partly Cloudy Days													
Yucca Flat:													
1962-1966	9.0	7.0	9.0	9.0	12.0	9.0	6.0	7.0	5.0	6.0	8.0	7.0	94.0[b]
1962-1968	9.0	7.0	9.0	9.0	11.0	8.0	7.0	8.0	5.0	7.0	8.0	8.0	96.0[e]
1962-1971	8.0	8.0	9.0	9.0	11.0	7.0	9.0	8.0	6.0	7.0	7.0	8.0	97.0[d]
Desert Rock:													
1978-1983	7.0	7.0	11.0	9.0	8.0	5.0	5.0	4.0	7.0	7.0	9.0	5.0	84.0[e]
Cloudy Days													
Yucca Flat:													
1962-1966	7.0	8.0	10.0	10.0	6.0	4.0	4.0	2.0	2.0	4.0	10.0	10.0	77.0[b]
1962-1968	8.0	9.0	10.0	10.0	6.0	4.0	4.0	3.0	2.0	4.0	10.0	10.0	81.0[c]
1962-1971	10.0	9.0	10.0	8.0	6.0	4.0	3.0	3.0	2.0	4.0	10.0	9.0	78.0[d]
Desert Rock:													
1978-1983	14.0	14.0	10.0	8.0	7.0	4.0	2.0	4.0	4.0	5.0	8.0	12.0	92.0[e]

[a]Cloudiness is expressed in tenths of sky coverage and is averaged from sunrise to sunset.
A clear day is one on which the average sky coverage is 0.0 to 0.3.
A partly cloudy day is one on which the average sky coverage is 0.4 to 0.7.
A cloudy day is one on which the average sky coverage is 0.8 to 1.0.
[b]Ref. 3, Quiring 1968; see Table 1.
[c]Ref. 8, primary source unknown, p. 33, Holmes and Narver, Inc., and Fenix and Scisson, Inc., 1970.
[d]Ref. 11, Bowen and Egami; see Table 2.
[e]Ref. 12, personal communication, D. Soule, NOAA/NWS; see Table 3.

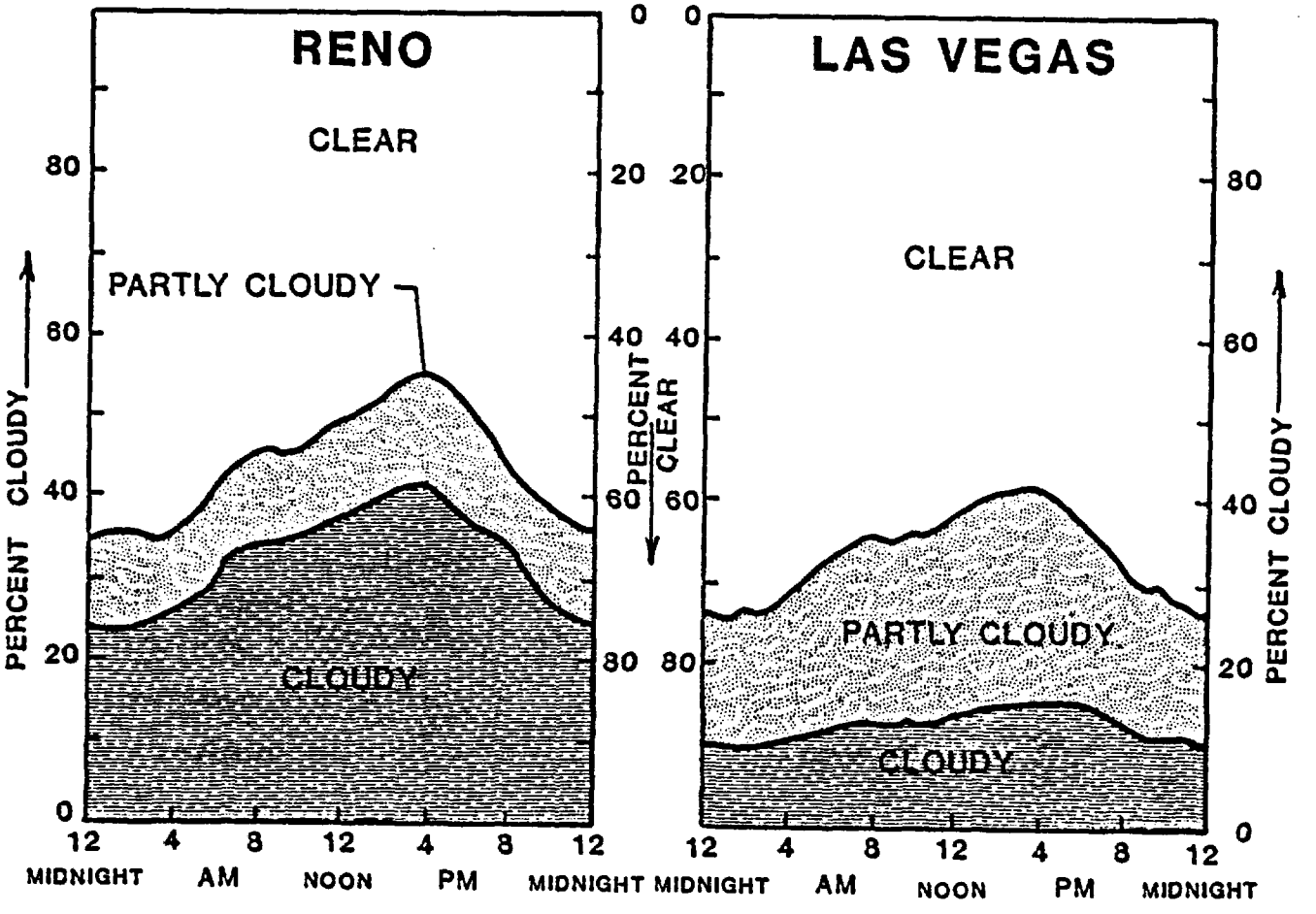


Figure 17. Daily Variation in Cloud Cover at Reno and Las Vegas (Source: Ref. 4, p. 25)

2.7 Wind

2.7.1 Dominant Characteristics of Normal Wind Activity

2.7.1.1 Direction -- The prevailing wind direction at NTS and in the Yucca Mountain region is predominantly from the south. Seasonal variations exhibit a shift in the predominant direction away from southerly in spring and summer, toward a northerly direction in fall and winter. A second significant feature of wind direction, typical of all months, is the diurnal wind reversal, with northerly/downslope/nighttime winds, and southerly/upslope/daytime wind directions (Ref. 3).

At the locations of Towers 4JAo and 4JAn, 5A and 6A, at Jackass Flats, and BJY and UCC at Yucca Flat, as well as at Desert Rock weather station, the orientation of the valleys corresponds to the directions indicated in Fig. 18.

Wind-rose graphs (Ref. 8, p. 26) in Fig. 19, illustrate the seasonal and annual variations in wind direction at Tower 4JAo, Jackass Flats. The graphs depict hourly averaged data recorded over short intervals of time, for three 10 mph (4.5 m/s) incremental speed classes. The bars point to the southerly direction from which the wind blows in summer, and toward the northerly direction from which it comes in winter.

2.7.1.2 Annual and Diurnal Cycles -- Seasonal shifts in direction and diurnal wind reversals are shown for Towers 4JAo, 5A and BJY, respectively, in Figs. 20A, B, and C (Ref. 3). The seasonal shift can clearly be seen by comparing the charts for January and July for each of the locations. At Tower 4, winds are aligned with the valley axis, and the distribution of northerly nighttime winds is near 40°, and southerly daytime winds, near 210°. At Tower 5A, the dominance of southerly daytime, and northeasterly nighttime winds is apparent in both months and for the seasons they represent. However, in summer the diurnal reversal is much less obvious than at other valley stations. Nocturnal northeasterly down-valley winds predominate with an anomolous distribution ranging from east to southeast. Quiring points out that this can be attributed to the proximity of the wind sensors to the top of the nocturnal inversion level in summer (Ref. 3, p. II-7 and 8).

At BJY, the chart for July reveals the tendency of the northerly nighttime winds to turn through east at dawn; by mid-morning the major portion of the distribution is at 170°, or close to south. Then the center of the distribution gradually shifts, reaching a maximum frequency at 5:00 P.M. Pacific Standard Time (PST), of 220°, with a slight tendency for the wind to return to the northerly nighttime direction through west, as the valley starts to cool. In January, the diurnal reversal is much less pronounced than in summer.

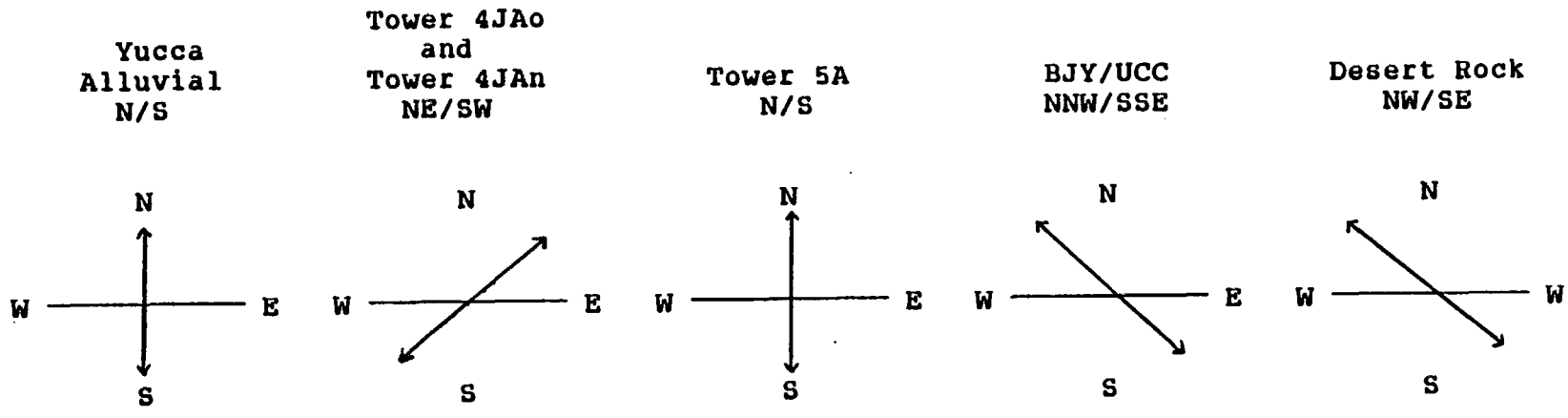


Figure 18. Directional Orientation of the Valleys at Tower Positions at Jackass Flats, Yucca Flat, and Desert Rock

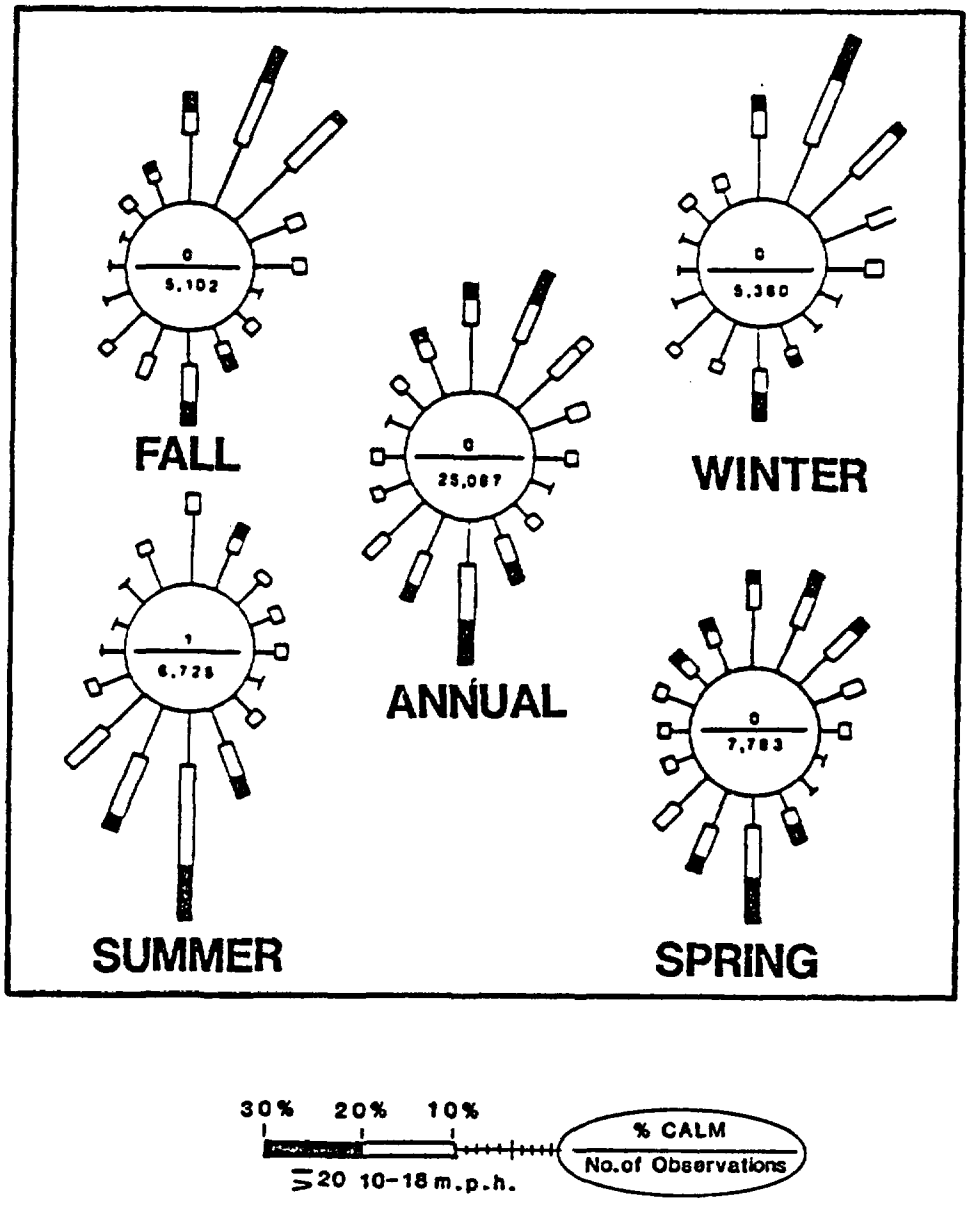


Figure 19*. Tower 4, Jackass Flats, Wind-Rose Graphs (Source: Ref. 8; primary source unknown) *The bar points toward the direction from which the wind blows.

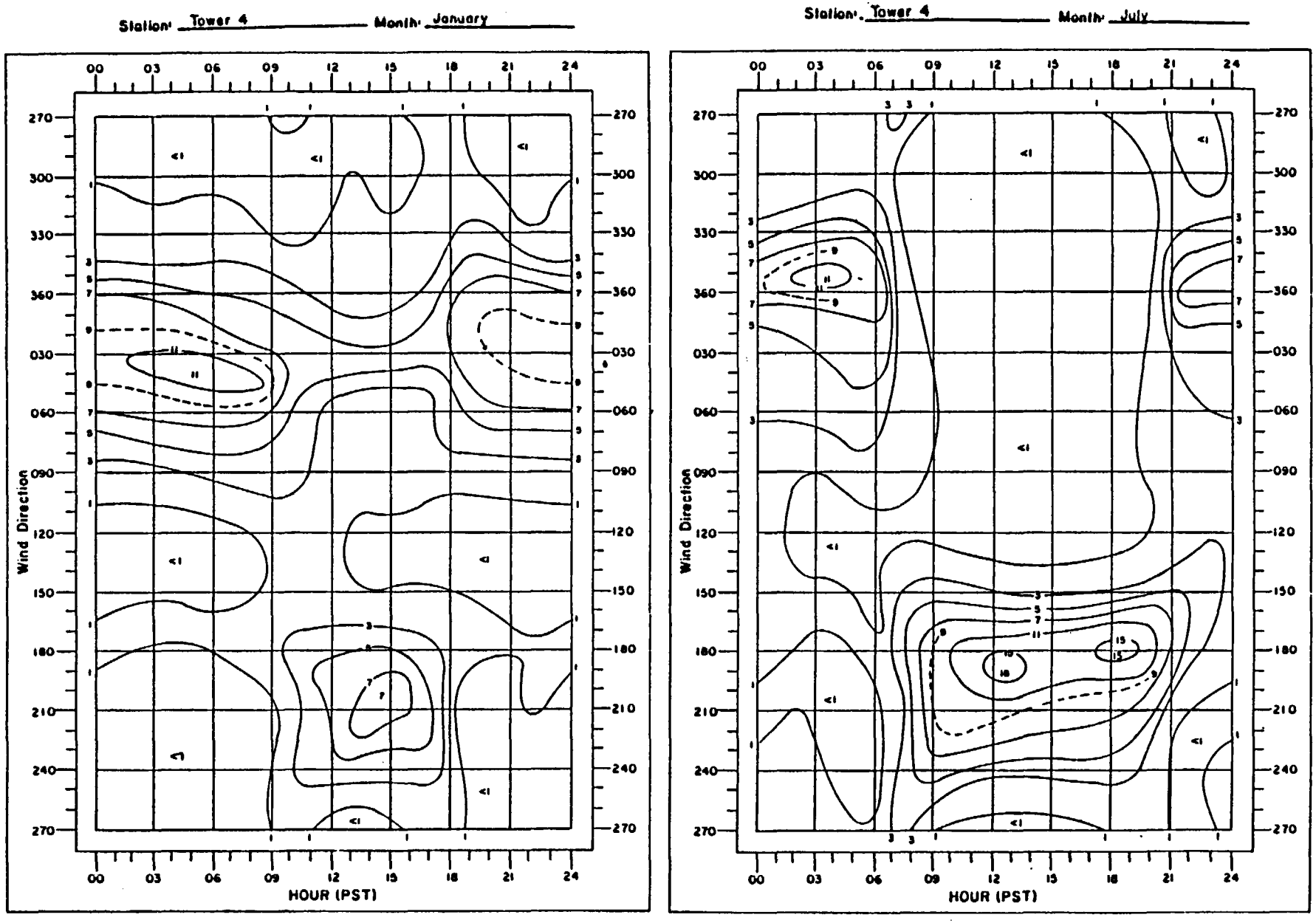
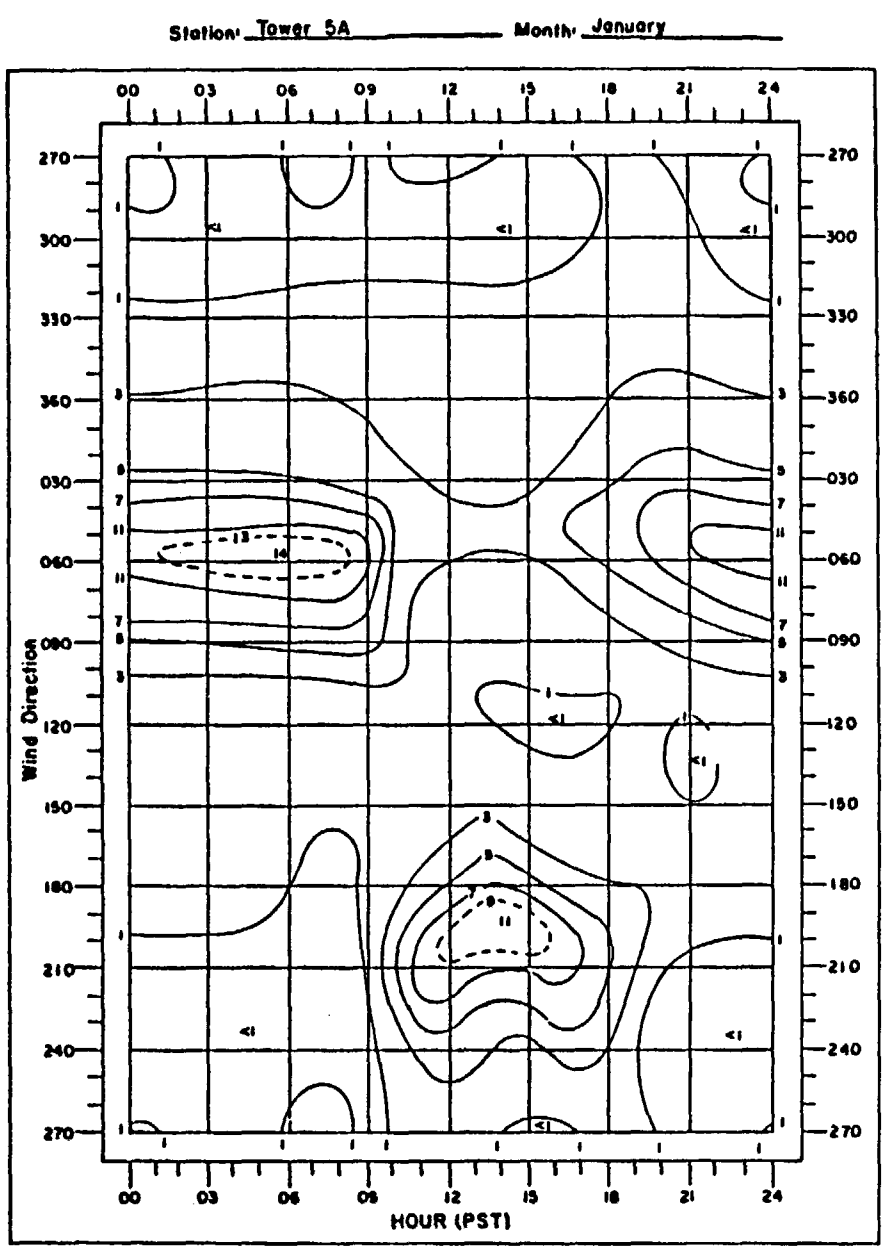


Figure 20A. Wind Direction Frequency (%) for 10° Increments of Direction (Source: Ref. 3, pp. II-25 to II-66)



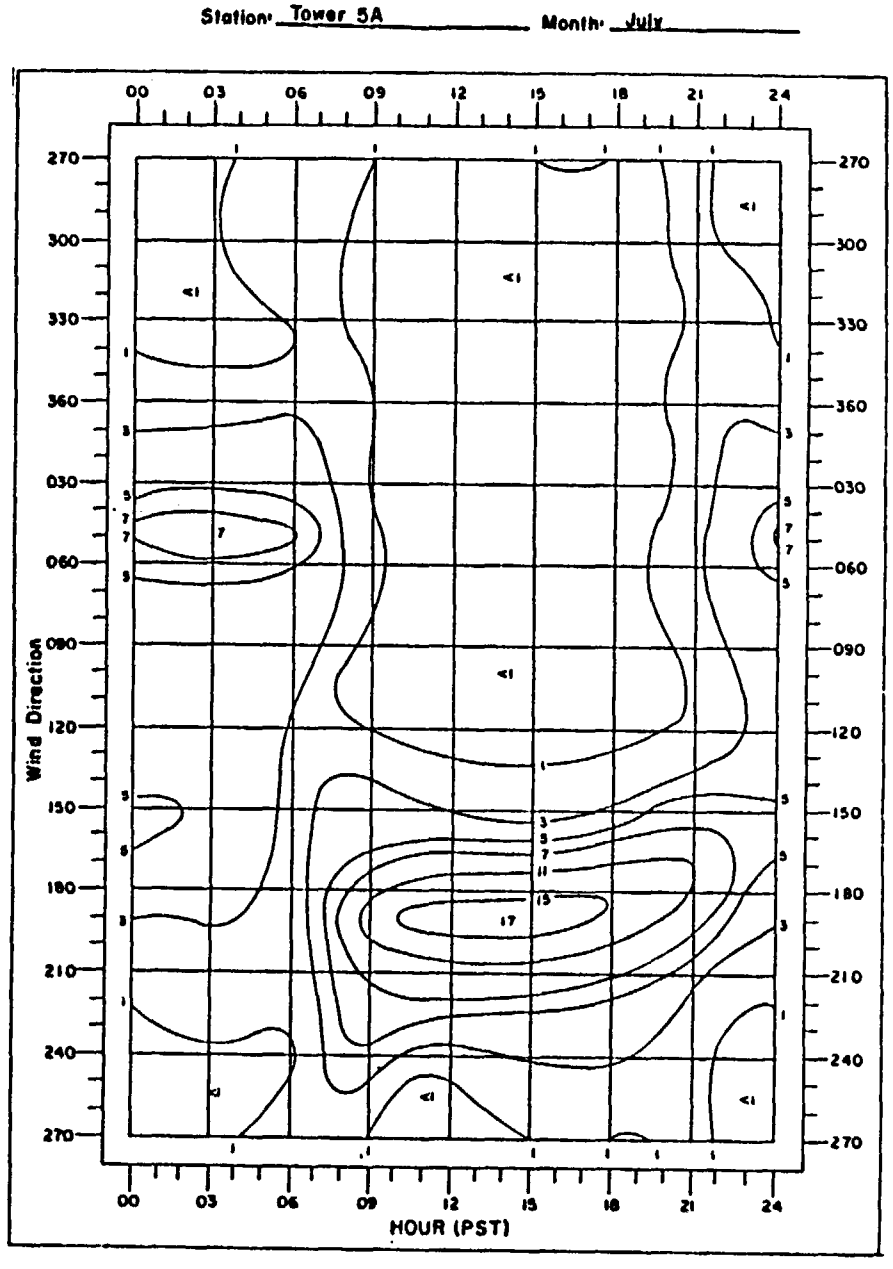


Figure 20B. Wind Direction Frequency (%) for 10° Increments of Direction (Source: Ref. 3, pp. II-25 to II-66)

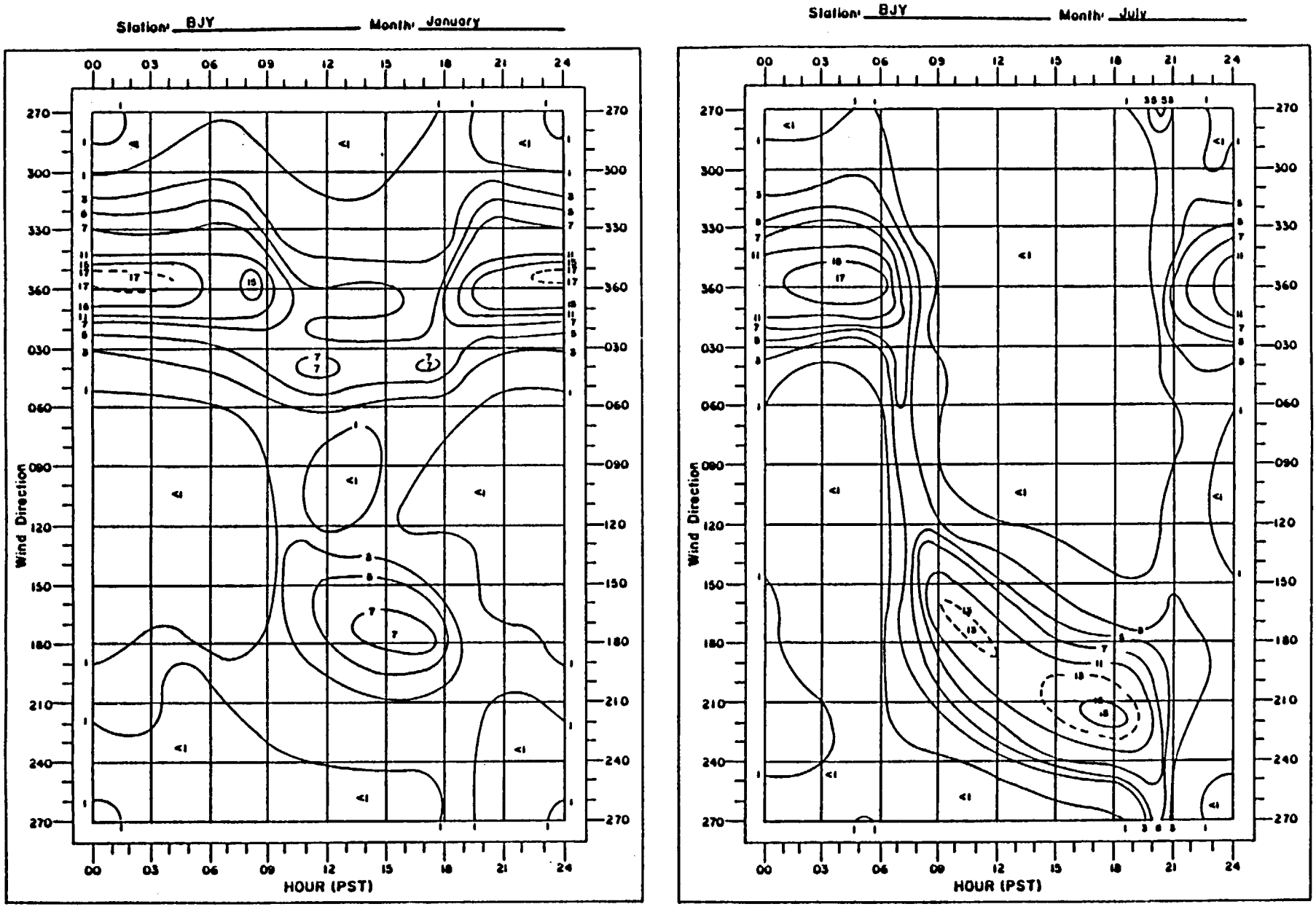


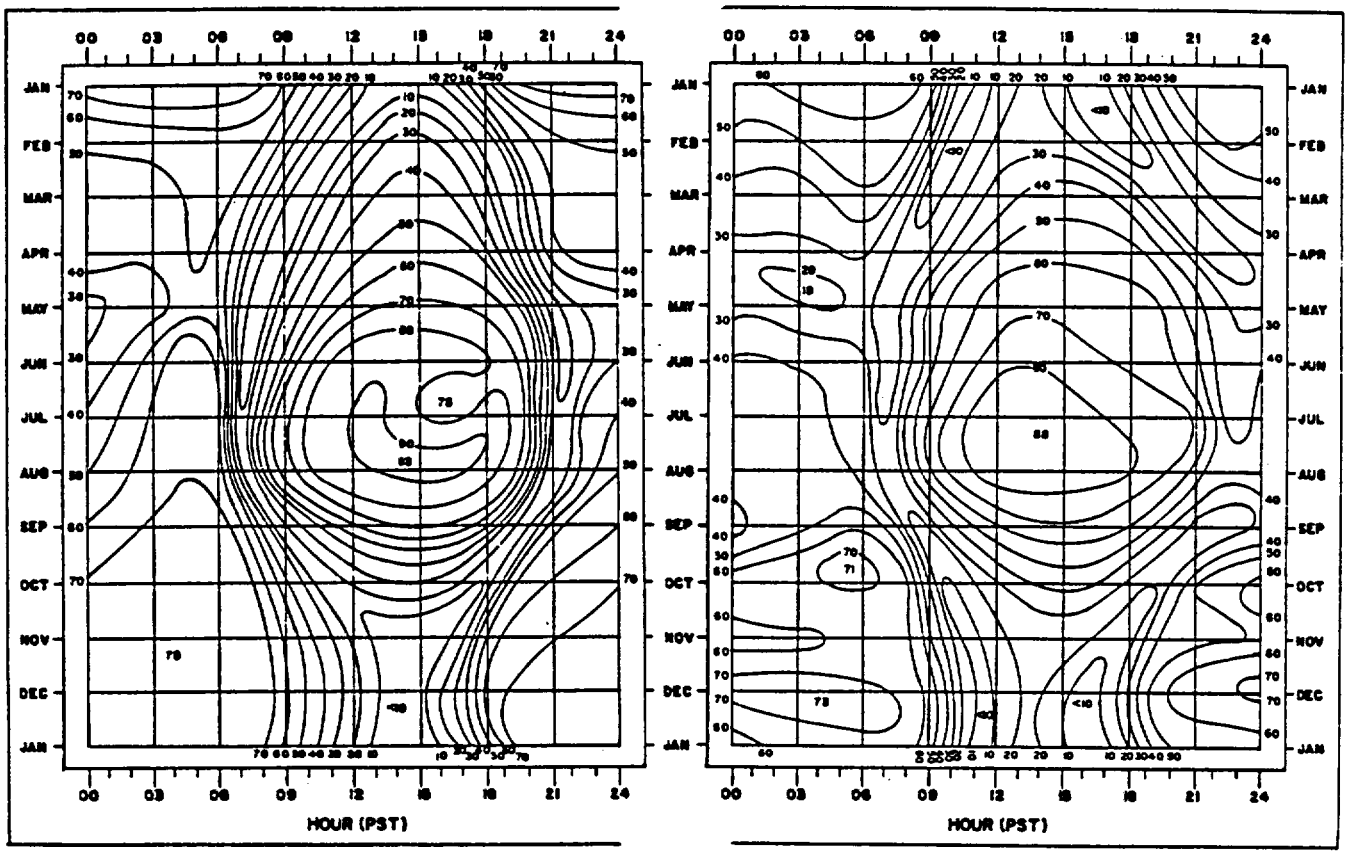
Figure 20C. Wind Direction Frequency (%) for 10° Increments of Direction (Source: Ref. 3, pp. II-25 to II-66)

Northerly winds predominate during all hours; however, the frequency of the southerly winds increases during daylight hours, reaching a maximum about 3:00 P.M., PST, with the center of the distribution at 170°-180° (Ref. 3, p. II-5 and 6).

Figures 21A, B, and C, show seasonal and diurnal fluctuations in the variability of the wind. Quiring indicates that the outstanding feature is the ring of low constancy values (the most variable winds) that defines, approximately, the average time of wind reversal, for each month. Southerly winds predominate inside the ring (least variable equals maximum constancy) during mid-afternoon in June through August. Relatively low afternoon values in July at Tower 4JAo are the result of increased variability of the predominantly southerly winds because of local terrain effects. Northerly winds are prevalent outside the ring of low constancy and are least variable near sunrise. The graphs confirm that at Tower 5A, the average time of reversal is in mid-afternoon as well, but considerably greater variability is shown in the wind at night, and thus a less prominant diurnal wind reversal results. At BJY, the reversal is also most pronounced in summer; this is reflected by low levels of variability (high constancy) of northerly down-valley winds near sunrise in July, followed by relatively low variability of southerly up-valley wind direction. A return to northerly down-valley wind direction occurs a few hours after sundown. Air movement from the north predominates during all hours in January when daytime heating is not sufficient to exert control over the large-scale air movement from that direction. There is a marked increase in variability during daylight hours with maximum low-constancy values in late afternoon (Ref. 3, p. II-8 and 9).

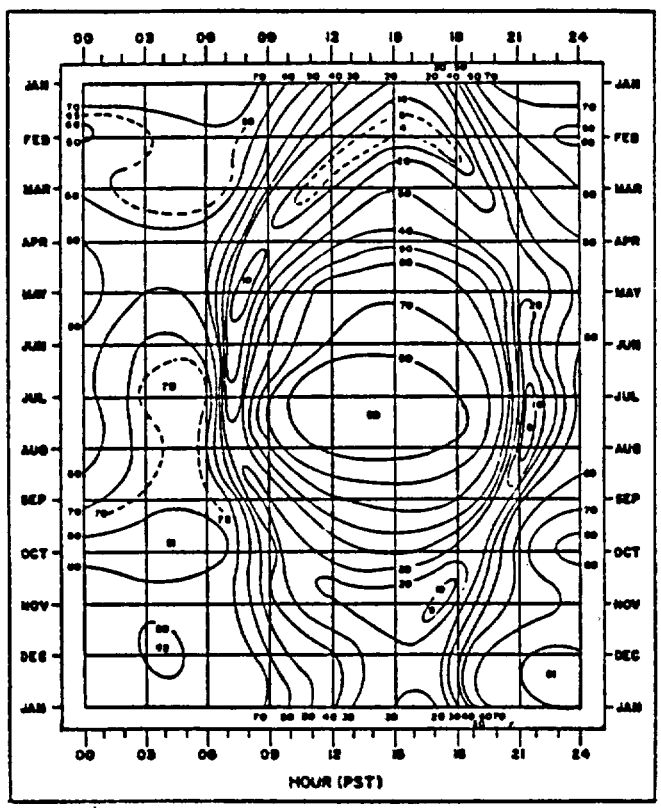
Quiring* points out that the southerly wind data recorded at Tower 6 (Table 29) have a slight easterly component, and the northerly, a slight westerly component. He notes that the relatively high frequency of winds from the 360° direction (Table 29) is a result of system bias and suggests that a shift away from the values shown for Tower 4 can be attributed, in part, to mountain/valley wind effects occurring between Yucca Mountain and Fortymile Wash. Quiring further states that it would be reasonable to expect this effect to increase as one advances up the eastern slope of Yucca Mountain. This appears to be corroborated by site-specific measurements recorded at YA (Ref. 10) as depicted in the windrose graphs for July-September, 1982, shown in Figs. 22A, B,

*R. F. Quiring, NOAA/WSNSO, private communication, October 16, 1981; see App. D, Ref. 21, p. 1. Surface Wind Data for Tower 6 and Tower 4 (4JA), and Upper Wind Data for Tower 6 were provided by Quiring (Ref. 21, Apps. E-G).



(A) Tower 4

(B) Tower 5A



(C) BJY

Figures 21A,B,C. Constancy of the Wind Expressed as the Percentage Ratio of the Mean Vector Wind Speed to the Mean Scalar Speed (Source: Ref. 3, pp. II-52 to II-66)

Table 29

Surface Wind Summary for Tower 6: Direction
3/20/1956 - 12/15/1969[a,b]

Elevation: 3256 ft (992 m) 584,789E 745,662W

Month	Resultant Vector Wind Direction (degrees)	Resultant Vector Windspeed mph (m/s)	Standard Deviation mph (m/s)	Average Windspeed Observations mph (m/s)	Constancy %
Jan.	343	3.9 (1.7)	9.5 (4.2)	8.3 (3.7)	48
Feb.	350	2.2 (1.0)	11.4 (5.1)	9.6 (4.3)	22
March	339	1.8 (0.8)	12.6 (5.6)	10.7 (4.8)	17
April	247	0.2 (0.1)	14.0 (6.3)	11.6 (5.4)	2
May	199	1.2 (0.5)	13.5 (6.0)	11.3 (5.1)	11
June	171	4.3 (1.9)	12.9 (5.8)	11.5 (5.1)	38
July	171	2.3 (1.1)	12.3 (5.5)	10.6 (4.7)	22
Aug.	170	2.8 (1.3)	11.4 (5.1)	10.1 (4.5)	28
Sept.	216	0.1 (0.04)	11.9 (5.3)	10.1 (4.5)	1
Oct.	348	3.0 (1.3)	11.5 (5.1)	9.9 (4.4)	30
Nov.	348	3.6 (1.6)	9.8 (4.4)	8.7 (3.9)	42
Dec.	342	4.2 (1.9)	10.3 (4.6)	8.6 (3.8)	47
Annual	332	0.7 (0.3)	12.1 (5.4)	10.1 (4.5)	7

[a]All hours combined.
[b]Source: R. F. Quiring, private communication, App. F, p. F-1. Enclosure from data file, NOAA/NWS, Las Vegas, NV, October 16, 1981, Ref. 21).

and C, though of course, these are representative of a very small sampling.

Table 30 reflects the characteristic diurnal wind reversal and seasonal shifts, recorded at Tower 4 (Ref. 8, p. 29) for 3/12/56 - 1/12/62, at Jackass Flats.

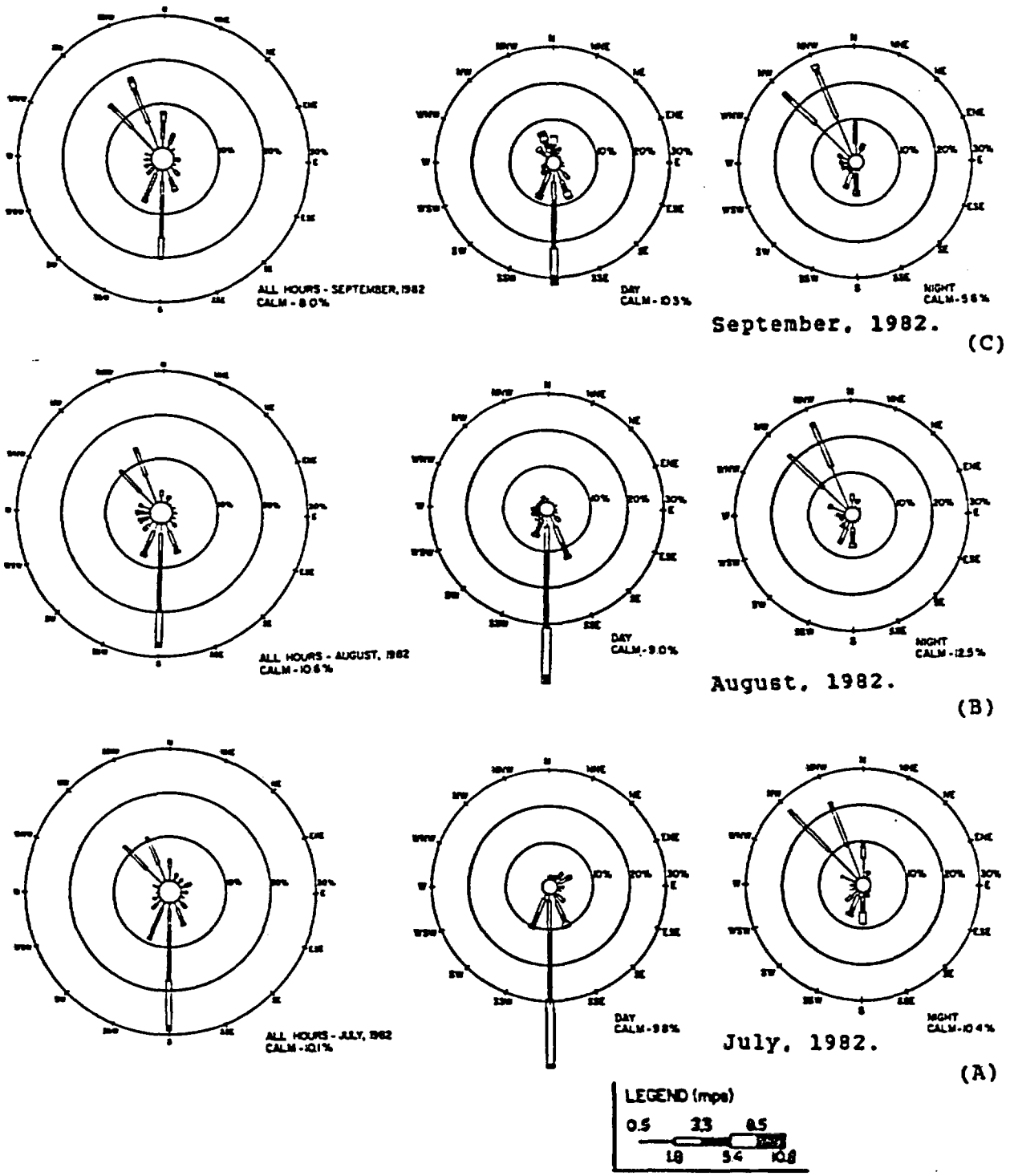


Figure 22A,B,C. Windroses for 10 m height, Yucca Mountain Alluvial Site, July, August, September, 1982. Bar points toward direction from which the wind blows. (Source: Ref. 10)

Table 30

Average and Standard Deviation of the Time of the Daily Wind Reversal and Percentage of Days on Which the Reversal Occurs[a,b]

Season	Shift from North to South Av. Time (PST)	Shift from North to South Std. Dev. (hours)	Percentage of Days	Shift from South to North Av. Time (PST)	Shift from South to North Std. Dev. (hours)
Spring	0840	2.5	67	1910	1.9
Summer	0655	1.0	88	2020	0.9
Fall	0905	1.9	66	1800	2.0
Winter	1015	2.0	59	1655	1.1
Month					
January	1030	2.0	52	1705	1.2
February	1050	1.8	46	1725	1.2
March	0945	3.1	61	1830	1.9
April	0900	2.1	53	1850	1.6
May	0745	1.8	87	2000	1.8
June	0710	1.6	80	2025	0.8
July	0635	0.5	94	2025	0.8
August	0710	0.6	90	2005	1.1
September	0905	2.4	73	1920	1.2
October	0905	1.3	64	1800	0.7
November	0900	1.7	63	1630	2.7
December	0945	2.0	77	1630	0.7

[a]Based on records for Tower 4 and vicinity from 1955 through 1962.
[b]Ref. 8, primary source unknown.
[c]Pacific Standard Time.

2.7.1.3 Speed -- Average monthly windspeed measurements as a function of the time of day, are shown in Figs. 23A, B, and C, for Towers 4, 5A, and BJY (Ref. 3). Maximum velocities occur in mid-afternoon, and minimum, a few hours after sunrise generally in all months, corresponding to periods of diurnal reversal when the wind is light and variable. At BJY there is a second minimum a few hours after sunset, as well. The highest average speeds occur in April and May. Minimum speeds occur in July (Ref. 3).

Frequency distributions of windspeeds at Towers 6 and 4JA, respectively, are shown in Table 31, for the period 1956-1960 and 1956-1962.

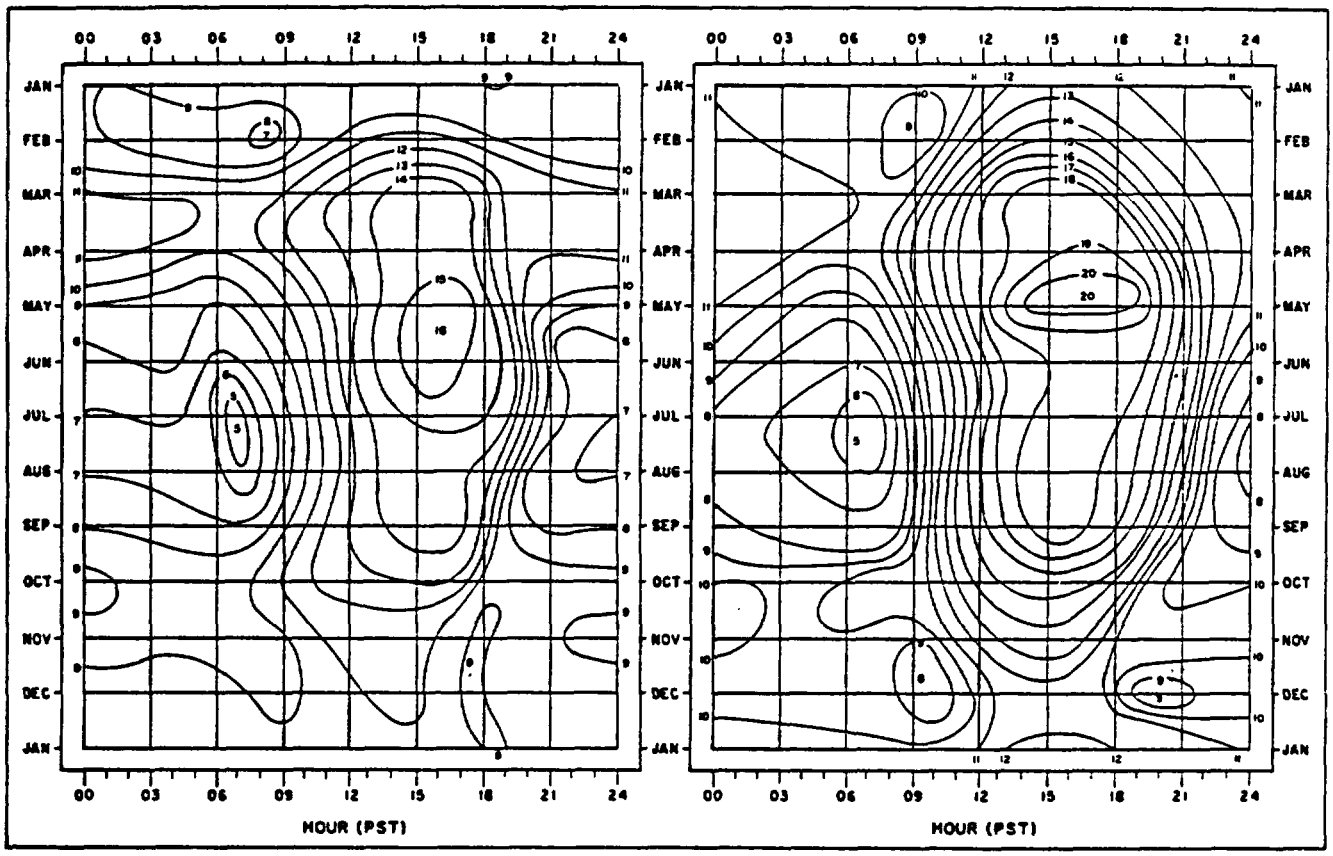
Wind velocities at the NTS are generally light, with average annual windspeeds for Jackass Flats, Yucca Flat, and Desert Rock, ranging inclusively from 7.4 mph (3.3 m/s) to 10.5 mph (4.7 m/s), as shown in Figs. 23A, B, and C and Tables 1-3 and 31. The maximum average annual windspeed recorded at the NTS was 20 mph (8.9 m/s) at Tower 5A (Ref. 3, p. II-65).

2.7.2 Extreme Windspeeds and Tornadoes

2.7.2.1 Fastest-Mile Winds and Peak Gusts -- Similar to the sources of precipitation, high-wind velocities are generally associated with migrating storms from the Pacific (Refs. 3 and 4). Though mostly prevalent in northern Nevada, extreme windspeeds do occasionally occur in the southern region. Table 32 provides estimates of selected return periods with intervals ranging from 2 to 100 years for recurrences of high windspeeds at NTS. Fastest-mile* wind velocities and maximum gusts can be expected to reach 82 mph (36.7 m/s) and 107 mph (47.8 m/s), respectively, for a return period of 100 years (Ref. 3, p. II-10, from H. G. S. Thom et al., 1959).

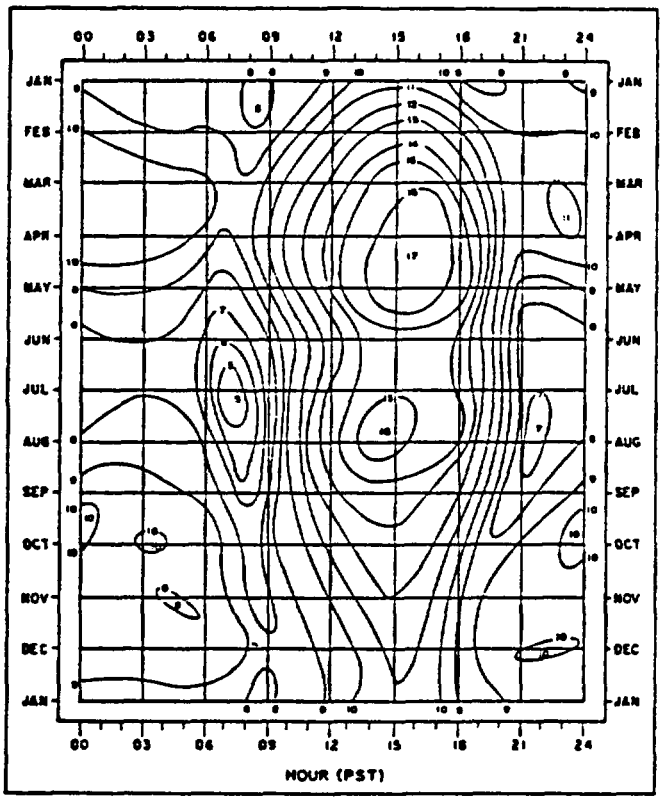
2.7.2.2 Tornadoes -- Tornado activity in Nevada is a rare occurrence. Conditions conducive to tornado formation are generally absent, because of insufficient moisture and the interruption of the flow of dry air currents resulting from irregularities in the terrain. Though tornado vortices are uncommon, and have never been observed on the NTS, a few have occurred within a 150 mi (250 km) radius of the site. Dust-devil formations, however, are frequent, relatively small, and last only a few minutes normally. Nevertheless, there are rare instances when some may reach tornadic proportions (Ref. 22, p. 3).

*Denotes the highest average wind velocity which occurs as one mile of air passes by the monitoring instrument.



(A) Tower 4

(B) Tower 5A



(C) BJY

Figure 23A,B,C. Average Monthly Wind Speed in Miles Per Hour as a Function of Time of Day and Month. Stations: Towers 4, 5A, and BJY.

Table 31

Frequency Distribution (%) of Windspeeds at Jackass Flats

Jackass Flats: Tower 4JA[a]

3731 ft (1137 m)
620,513 E
752,306 W
3/12/56 - 2/12/62

Speed (mph)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
0	2.3	1.9	0.4	0.8	*	0.8	1.9	3.9	6.8	1.3	1.4	0.8	1.9
1-4	20.0	18.0	11.9	13.0	14.1	12.5	17.0	16.0	15.1	17.2	22.6	25.3	16.9
5-9	35.7	31.2	29.5	33.6	33.4	32.8	36.9	34.6	36.3	37.3	37.1	35.5	34.4
10-14	20.3	24.0	24.1	24.1	24.8	26.8	24.5	24.5	21.7	20.1	18.4	14.8	22.3
15-19	11.0	14.2	14.2	14.0	12.6	13.4	13.7	11.7	12.6	12.2	12.0	12.4	12.8
20-29	8.7	8.7	15.3	13.8	11.3	12.3	10.0	5.9	7.8	10.5	7.6	9.2	10.1
30-39	1.2	1.2	3.0	4.7	3.6	0.8	0.9	1.0	1.5	2.2	0.8	1.8	1.9
40-49	0	0	0	0	0	0	0	0	0	0	0	0.1	*
50	0	*	*	0.1	*	*	0	0	0	0	0	0.1	*
Average Speed	9.6	10.1	12.1	12.2	11.5	11.1	10.4	9.5	9.8	10.5	9.4	9.7	9.7

Jackass Flats: Tower 6[b]

3256 ft (992 m)
548,789 E
745,662 W
3/20/56 - 12/15/60

Speed (mph)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
0	0.6	0.3	0.3	0	0.1	0.2	0.3	0.3	0.1	0.1	0.3	0.4	0.3
1-4	28.2	18.3	16.3	11.3	12.4	14.3	13.6	14.3	14.3	17.8	22.0	27.0	17.5
5-9	38.2	36.7	33.4	31.7	32.4	29.2	32.7	35.2	36.1	35.2	40.6	36.3	32.2
10-14	18.9	26.3	26.3	28.3	28.5	27.0	30.2	31.1	31.2	28.1	24.1	21.0	26.8
15-19	8.3	10.7	14.6	16.1	16.0	15.3	15.3	12.9	11.8	12.4	8.8	8.4	12.6
20-29	4.7	6.3	7.8	10.2	8.7	12.5	7.5	5.4	5.7	5.4	3.9	5.8	7.0
30-39	0.4	0.5	1.3	2.0	1.7	0.7	0.4	0.3	0.8	1.0	0.4	1.1	0.9
40-49	0	0	0	0	0	0	0	0	0	0	0	0	0.1
50	0	*	*	0.1	*	*	0	0	0	0	0	0.1	*
Average Speed	8.3	9.6	10.7	11.6	11.3	11.5	10.6	10.1	10.1	9.0	8.7	8.6	10.1

*Indicates less than 0.05.

[a]Source: Ref. 21, App. E.
[b]Source: Ref. 21, App. F.

Table 32

Extreme Windspeeds at NTS, Recorded at 30 ft (9.1 m) Above Ground

Return Period (years)	Fastest-Mile[a] m/s	mph	Maximum Gust m/s	mph
2	21	48	28	62
5	25	55	32	72
10	27	61	35	79
50	34	75	43	97
100	37	82	48	107

(Source: Ref. 3, R. F. Quiring, p. II-10).
[a]Approximately 1-min average.

Fujita (1973) suggests that strong dust-devils and peak gusts are more intense than at least 50% of confirmed tornado citings, with expected maximum speeds estimated to be in the F2* classification range [113-157 mph (50-70 m/s)] (Ref. 23, as mentioned in Ref. 22).

Fujita (1981) presents probability curves of high-winds and tornadoes with their crossover speed of 143 mph (63.9 m/s) as shown in Fig. 24, with a value of 1.48×10^{-7} per year for potential occurrences. According to Fujita, tornado winds are stronger than high winds, but only with this low probability, which suggests that high winds predominate at the NTS, with the exception of the 10^{-7} year^{-1} windspeed (Ref. 24, p. 5).

The DAPPLE** Tornado Tape data used by Fujita for the development of his probability equation, recorded no occurrences of tornadoes from 1916-1969 on the NTS, and only 4 incidences within a 100-150 mi (160-250 km) radius of the site, representing an area covered by 5 sub-boxes. Therefore, the area to be studied was extended (for statistical purposes) to include 320 subboxes, a 5°-latitudinal by 4°-longitudinal rectangular zone south of NTS. This larger statistical area provided information and data about 24 tornado occurrences between 1916 and 1979, which could be

*See App. H, p. 2, Table H-1 of Fujita-Pearson Tornado Scale, Ref. 22 (as taken from Ref. 24).
**Damage Area Per Path LEngth

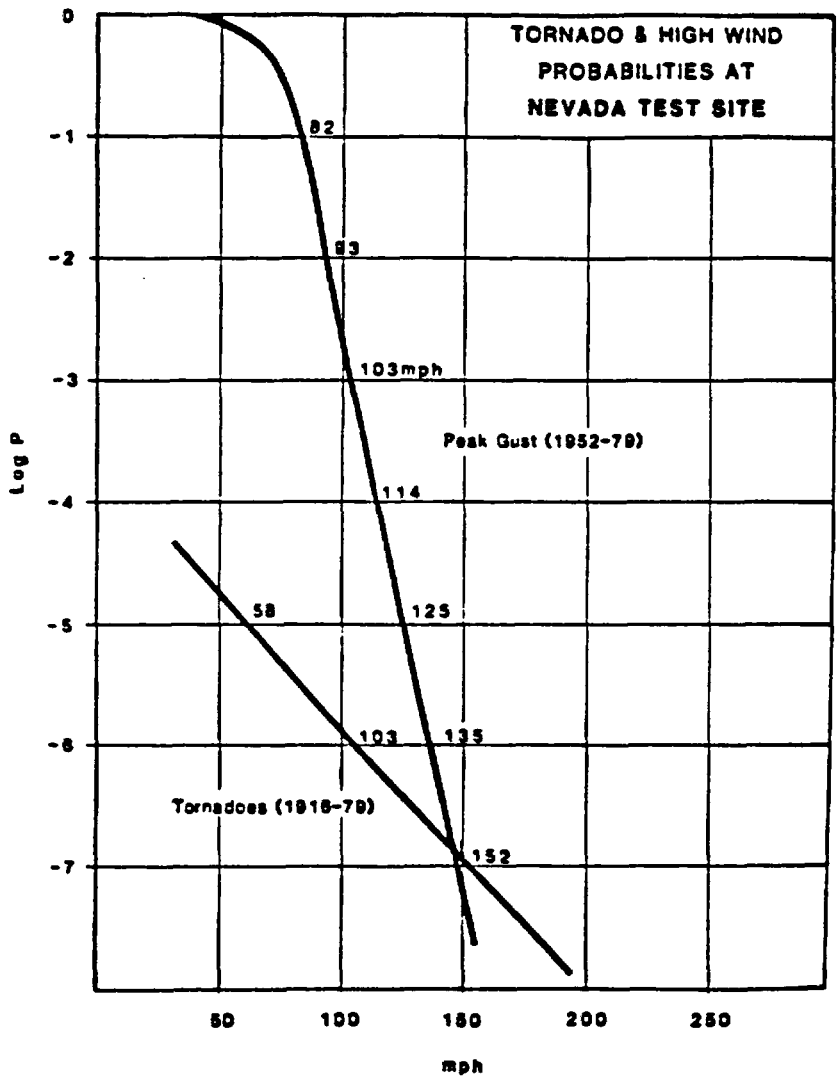


Figure 24. Tornado and High-Wind Probability at the Nevada Test Site (Source: Ref. 24)

examined for his analysis. These occurrences serve as a foundation for the Fujita probability equation and the design-basis tornado (DBT) derivations, shown in Table 33 (Ref. 24).

Tornado occurrences and intensities in Nevada and adjacent states for 1959-1973 are shown in Table 34. Previous to this period, since 1884, only a single occurrence in 1983, of tornado activity was recorded. Table 34 lists locations and incidences of tornadoes within a 5°-latitudinal/longitudinal square surrounding NTS, for intensities of F_0 to F_3 according to the Fujita-Pearson Scale (Ref. 22, p. 6).

Table 33

Parameters of Design-Basis Tornadoes Applicable to the Nevada Test Site, Nevada

	Design Basis Tornado	Tornado Probabilities Per Year			Unit
		10^{-5}	10^{-6}	10^{-7}	
Maximum Windspeed (final wind)		58.0	103.0	152.0	mph
Maximum Tangential Velocity (tornado)	DBT-77*	44.3	83.9	129.7	mph
	DBT-78**	41.2	71.7	103.9	mph
Core Radius (tornado)	DBT-77	35.4	67.1	103.8	m
	DBT-78	33.0	57.4	83.1	m
Translational Velocity (tornado)	DBT-77	14.8	28.0	43.2	mph
	DET-78	13.7	23.9	34.6	mph
Maximum Pressure Drop (tornado)	DBT-77	4.2	15.1	36.3	mbar
	DBT-78	3.7	11.9	23.2	mbar
Maximum Tangential Velocity (center vortex	DBT-77	--	--	--	
	DBT-78	20.6	35.8	51.9	mph
Core Radius (center vortex)	DBT-77	--	--	--	
	DBT-78	11.4	17.9	23.4	m
Translational Velocity (center vortex)	DBT-77	--	--	--	
	DBT-78	23.1	42.3	64.1	mph
Maximum Pressure Drop (center vortex)	DBT-77	--	--	--	
	DBT-78	0.9	2.7	5.8	mbar

KEY: mph = miles per hour; mbar = millibars; m = metres

(Source: Ref. 24).
*DBT-77 an axi-symmetric design-basis tornado.
**DBT-78 above design-basis tornado with suction.
Air density = 1.098 kg/m³ at 3700 ft (1128 m).

The conversion factor for millibars (mbar) is:
1013.25 mb = 29.921 in Hg

Table 34

Tornado Occurrences and Intensities in a 4 State Area and a 5-Degree Square Surrounding NTS (1959-73)

[Sources: NDAA (Storm Data), NSSFA 1974]

	Tornado Intensity (Fujita 1971)				
State	F0	F1	F2	F3	TOTAL
4 State Area					
Arizona	23	20	18	4	65
California	18	11	4	-	33
Nevada	8	3	1	-	12
Utah	12	9	5	-	26
	61	43	28	4	136
5°-Latitudinal/Longitudinal Square					
Arizona	-	2	-	1	3
California	1	1	-	-	2
Nevada	3	-	-	-	3
Utah	-	-	-	-	0
	4	3	0	1	8

(Source: Ref. 22, p. 6).
[a]Ref. 24; see App. H.

Tornado occurrences, locations, and relative windspeed intensities presented according to the Fujita scale are shown in Fig. 25 (Ref. 22, p. 6).

McDonald, Minor, and Mehta have used commonly accepted statistical techniques to estimate extreme winds from severe weather conditions; the risk model involved the following four basic steps (Ref. 22, pp. 8-9):

1. Determination of the mean area of tornado damage based upon tornadoes which occurred in the four state area surrounding NTS.

2. Determination of the average number of tornadoes per year for each F-Scale intensity classification in a 5°-square surrounding the NTS.

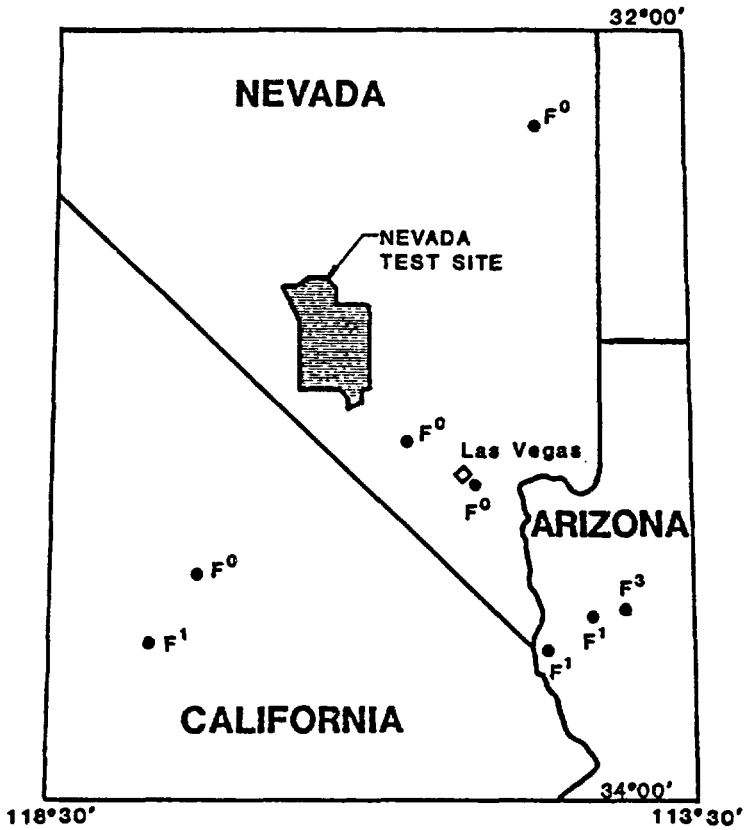


Figure 25. Tornado Occurrences in a 5°-Latitudinal/ Longitudinal Square Surrounding the Nevada Test Site (Ref. 22, p. 6)

3. Calculation of the probability of occurrence of tornadoes exceeding a threshold windspeed within the 5°-square area.

4. Determination of the probability that windspeeds in tornadoes will exceed the threshold value.

They suggest a maximum design windspeed for NTS from tornadoes of 63 mph (28 m/s), with a recurrence interval of 10^6 years. Their extreme "straight-line" design-windspeed--which could occur in conjunction with other meteorological phenomena, such as thunderstorms--is 210 mph (94 m/s) for the same recurrence interval (Ref. 22).

Table 35 contains a summary of the results of the McDonald, Minor, and Mehta study to identify the tornado-occurrence probability distribution.

Table 35

Computations: Tornadic Wind Occurrence Probability Distribution

	Threshold Windspeed (mph)					
	50	100	150	200	250	300
Number of tornadoes exceeding threshold windspeed	6.5	2.2	0.8	0.3	0.90	0.03
Number of tornadoes in the threshold interval	4.3	1.5	0.5	0.17	0.058	0.020
Number of tornadoes per year, P_i	0.28	0.097	0.033	0.011	0.0039	0.0014
Mean damage area, A (sq mi)	0.39	0.39	0.39	0.39	0.39	0.39
Geographic area, A (sq mi)	96,000	96,000	96,000	96,000	96,000	96,000
Probability of occurrence of threshold value, P_i (per year)	1.1×10^{-6}	3.9×10^{-7}	1.3×10^{-7}	4.6×10^{-8}	1.6×10^{-8}	5.5×10^{-9}
Probability of exceeding threshold value, P_E (per year)	1.7×10^{-6}	5.9×10^{-7}	2.0×10^{-7}	6.7×10^{-8}	2.1×10^{-8}	5.5×10^{-9}

(Source: Ref. 22, p. 13).

Probability estimates for straight-wind distribution, tornado distribution, and combined distributions are given in Table 36. Potential probabilities of exceedances for tornado windspeeds of 100 mph (45 m/s) and 300 mph (134 m/s) are 5.9×10^{-7} and 5.5×10^{-9}, respectively. Straight-wind probabilities are 1.0×10^{-3} and 4.0×10^{-8}, respectively. Similarly, Fig. 26 shows plotted values for probability of exceedances at these velocities as provided by McDonald, Minor, and Mehta (Ref. 22, p. 16).

Table 36

Probability Distributions for Nevada Test Site
(Straight Winds, Tornadoes, and Combined)

Windspeed	Straight-Wind Distribution	Tornado Distribution	Combined Distribution
50	4.5×10^{-1}	1.7×10^{-6}	4.5×10^{-1}
100	1.0×10^{-3}	5.9×10^{-7}	1.0×10^{-3}
150	2.4×10^{-5}	2.0×10^{-7}	2.4×10^{-5}
200	1.7×10^{-6}	6.7×10^{-8}	1.8×10^{-6}
250	2.2×10^{-7}	2.1×10^{-8}	2.4×10^{-7}
300	4.0×10^{-8}	5.5×10^{-9}	4.6×10^{-8}

(Source: Ref. 22, p. 16).

Wind parameters derived by McDonald, Minor, and Mehta are shown in Table 37.

According to calculations performed by Thom (Ref. 25) for the same region used in determining probabilities in the Fujita and the McDonald, Minor, and Mehta studies, the potential for a tornado strike at the NTS is approximately 7.5×10^{-4} during any year, or once in 1,333 years.

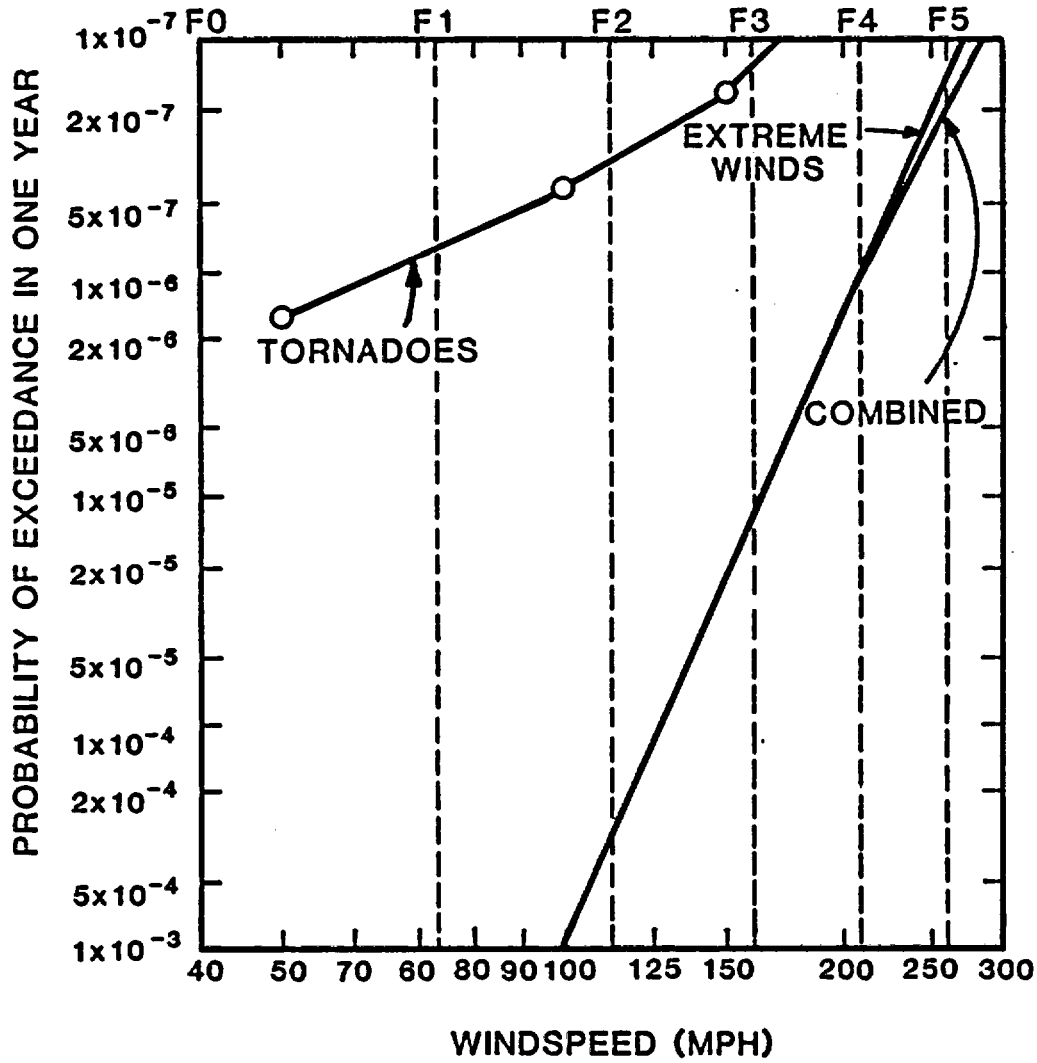


Figure 26. Probability of Exceedance vs Windspeed--Nevada Test Site (Source: Ref. 22, p. 17)

Table 37

Recommended Wind Parameters--NTS

RISK: 1×10^{-6} Occurrence/Year		
Maximum Windspeed*		210 mph
Missiles:	4 x 12, 12 ft long timber, 139 lbs, area 41.7 in.^{2}	90 mph (horizontal) 60 mph (vertical)
	4000 lb automobile	25 mph (tumbling on ground)
RISK: 1×10^{-4} Occurrence/Year		
Maximum Windspeed*		130 mph
Missile:	2 x 4, 12 ft long timber, 20 lb, area 5.9 in.^{2}	70 mph (horizontal)

*The design basis tornadoes associated with the 1×10^{-4} and 1×10^{-6} levels of risk will pose no threat to critical facilities designed to withstand the maximum (straight) wind. Hence, no parameters for translational, rotational, tangential, radial, or vertical windspeeds, for atmospheric pressure change, or for tornado-generated missiles are advanced.

(Source: Ref. 22, p. 20).

2.8 Atmospheric Conditions

2.8.1 Surface and Upper Air Pressure Patterns

In Nevada, regional air masses develop over the heated land surface during summer, and periodic outbreaks of polar air occur in winter. In the colder months, the synoptic pattern of a low-pressure center and the associated cold fronts, replaces the continental high-pressure centers, and produces precipitation. Normally, the regional summer synoptic feature is a thermally induced low-pressure area.

The movement of upper air over the earth's surface is diurnally and seasonably variable, and has an annually recurring pattern which is of primary importance in controlling weather conditions. Prevailing winds are strongest and most constant in the atmosphere above the earth's surface at heights of 100 ft (30.5 m) or more. They move eastward from the Pacific Coast in winter, and from the south and southwest in summer bringing moisture, respectively, from the Gulf of California and the tropical (south) Pacific. Table 38 shows the annual and average number of days per month of moist upper air from these directions, vs the average number of days per month with closed lows over the intermountain states, which show maximum frequency from April to June, and minimum during mid- and late summer.

The average annual number of days with migrating low- and high-pressure systems crossing over Nevada is about 15 and 8, respectively, as presented in Figs. 27A and B (Ref. 4, p. 11), where only the seasons of maximum frequency levels of highs and lows, are shown.

The Climatological Summary Tables 1-3 provide values for monthly and annual averages and maximum/minimum levels of air pressure at Desert Rock and Yucca Flat. Table 39 presents, along with these, monthly averages recorded at Yucca Alluvial Site and Desert Rock over the same period of time and averaged over exactly the same days during July-September 1982, for purposes of comparison and to provide some evidence of the relatively close correlation that appears to exist between their respective data.

Upper wind summary data taken at 7000 ft (2134 m) is provided in App. G (Ref. 21) as recorded at Yucca Flat from 1958 to 1969.

2.8.2 Diffusion Characteristics

Diffusion characteristics at NTS can be assessed from mixing height data analysis, from the summaries of meteorological conditions associated with upper air pollution events, and from climatological analysis of atmospheric stability categories.

Table 38

Average Flow of Moist Air from the Pacific Ocean and Gulf of California vs Closed Lows Over the Intermountain States

	(Days Per Month)													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Number of Days	Monthly Average
Westerly Winds from the Pacific Ocean	20	19	21	20	17	12	1	1	6	17	21	21	176.	14.7
Southerly and South-westerly Winds from Gulf of California and Tropical Southern Pacific	0.75	0.75	0.75	0.75	0.75	6	21	24	16	3	0.75	0.75	75.3	6.3
Closed lows over the Intermoun-tain States (Great Basin lows)	6	5	6	8	9	9	2	2	3	6	5	6	67	5.6

(Source: Ref. 4, pp. 15-18, as read from bar graphs).

Isolines indicate the average number of days each year in which high-pressure centers occur in any given area of the western U.S. Seasons of maximum frequency are shown.

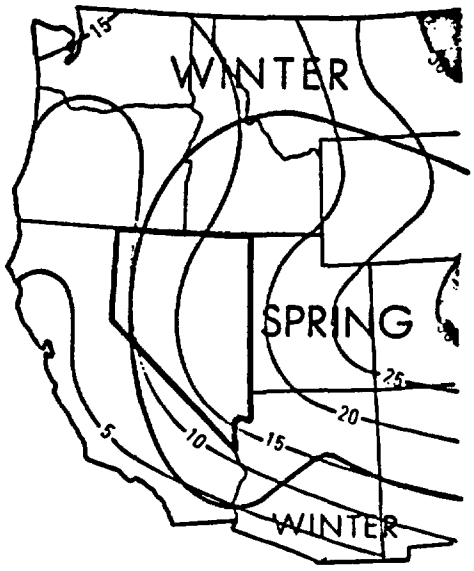


Figure 27A. Average Number of Days Annually of Low-Pressure Centers and the Seasons of Maximum Frequency (Source: Ref. 4, p. 11, as adapted from Hosler and Gamage 1956)
*Approximate location of the NTS.

Isolines indicate the average number of days each year in which migratory low-pressure centers cross any given area in the western U.S. The thermal low over the southwestern U.S. in summer is not included. Seasons of maximum frequency are shown.

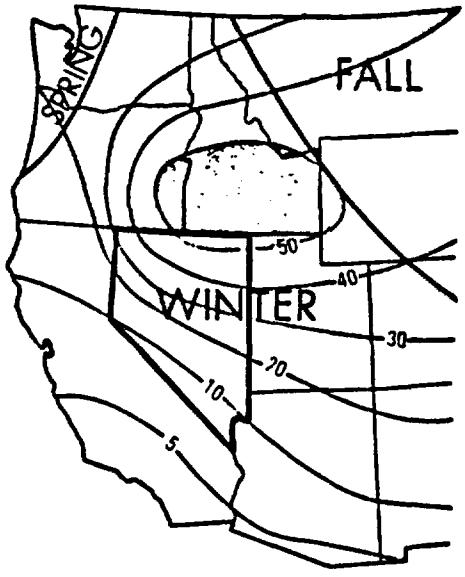


Figure 27B. Average Number of Days Annually of High-Pressure Centers and Seasons of Maximum Frequency (Source: Ref. 4, p. 11, as adapted from Hosler and Gamage 1956)
*Approximate location of the NTS.

Table 39

Average Monthly and Annual Air-Pressure Measurements at Yucca Flat and Desert Rock, Nevada

	YUCCA FLAT						DESERT ROCK						YUCCA ALLUVIAL SITE[a]		
	Latitude 36°57'N Longitude 116°03'W Elevation 3,924 ft (1196 m)						Latitude 36°37'N Longitude 116°01'W Elevation 3298 ft (1105 m)						Latitude 36°50'N Longitude 16°25'W Elevation 3700 ft (1128 m)		
	(1962 - 1966)[c] Pressure (inches)			(1962 - 1971)[d] Pressure (inches)			(1978 - 1983)[e] Pressure (inches)			July-Sept. 1982[bf] Pressure (inches)			July-Sept. 1982[b] Pressure (inches)		
Month	Average	Highest	Lowest	Average	Highest	Lowest	Average	Highest	Lowest	Average	Highest	Lowest	Average	Highest	Lowest
Jan.	26.11	26.54	25.42	26.10	26.54	25.42	26.64	27.15	26.11						
Feb.	26.05	26.38	25.56	26.05	26.42	25.56	26.64	26.99	26.13						
March	25.98	26.35	25.48	25.99	26.43	25.48	26.54	26.98	25.91						
April	25.99	26.39	25.50	25.96	26.39	25.50	26.55	26.97	26.17						
May	25.94	26.21	25.61	25.94	26.39	25.47	26.49	26.80	26.10						
June	25.92	26.20	25.56	25.92	26.20	25.56	26.52	26.84	26.21				Data unavailable		
July	25.99	26.19	25.80	26.00	26.19	25.68	26.56	26.79	26.37	26.64	26.74	26.53	26.00	26.25	26.81
Aug.	26.00	26.22	25.71	26.00	26.22	25.71	26.56	26.79	26.29	25.59	26.76	26.42	26.03	26.16	26.81
Sept.	26.00	26.26	25.59	26.00	26.36	25.56	26.59	26.83	26.12	26.49	26.76	26.22	26.03	26.19	26.81
Oct.	26.08	26.39	25.59	26.06	26.40	25.52	26.63	27.10	26.19						
Nov.	26.07	26.39	25.64	26.08	26.58	25.64	26.66	27.06	25.84						
Dec.	26.09	26.52	25.49	26.07	26.59	25.49	26.70	27.10	26.02				Data unavailable		
Annual	26.02	26.54	25.42	26.01	26.59	25.42	26.54	27.15	25.84						

[a]Source: Ref. 10 (H. W. Church, et al.).
[b]Data are averaged over exactly the same period (for Desert Rock and Yucca Alluvial Site): July-Sept., 1982.
[c]Table 1, Ref. 3.
[d]Table 2, Ref. 11.
[e]Table 3, D. Soule NOAA/WSNSO, Las Vegas, NV.
[f]From NOAA/NWSMO, Desert Rock, Nevada; (microfiche of monthly data).

The mixing height of the atmosphere is the level above the surface below which relatively active vertical mixing takes place; pollutants released in this layer will be diffused and more easily dispersed than releases above the mixing level. Dispersion of an air pollutant depends on wind speed, stability level, mixing height, and topography. Low-mixing heights and low-windspeeds limit dispersion and a period of increased air pollution potential is usually associated with them.

Dispersion increases with increasing windspeed. The stability level of the air determines mixing characteristics. Heating of the lower layer causes convective overturning, vertical mixing, and decreased stability. Mixing height summaries have been compiled for Las Vegas, Nevada, however, Bowen and Egami (Ref. 11, p. 32) caution that terrain dependence on wind direction is site specific, and although the Las Vegas summaries may be similar to the dispersion conditions in the vicinity of the site, the wind frequency distributions probably are not.

Mixing heights and windspeeds are determined from rawinsonde soundings. Mean daily, seasonal and annual mixing heights for Las Vegas, developed by Holzworth (Ref. 26) from five years (1960-1964) of surface and upper air observations, are presented in Table 40. Annual morning mixing heights were at approximately 1000 ft (305 m), with lowest ranges occurring in the autumn. Average afternoon mixing heights are at elevations of more than 6562 ft (2,000 m), with maximum heights observed in the summer.

Table 40

Seasonal and Annual Average Morning and Afternoon Mixing Heights for Las Vegas, Nevada - Feet (Metres)

Season	Morning	Afternoon
Winter	1053 (321)	3782 (1153)
Spring	1420 (433)	9137 (2785)
Summer	958 (292)	12116 (3693)
Fall	906 (276)	6909 (2106)
Annual	1086 (331)	7986 (2434)

(Source: Ref. 26).

Mixing heights of 4921 ft (1,500 m) or less, with wind speeds of 4 m/s or less are the critical meteorological conditions for limiting diffusion and producing high air pollution potential (Ref. 27). Using this criterion, the potential incidence of occurrence for upper air pollution episodes in the environs of the NTS was estimated to be about 40 days during an eight-year period (1963-1970).

The dispersion characteristics of the region can also be estimated from an atmospheric stability classification method developed by Pasquill and modified by Gifford. This classification system categorizes the diffusion rate of the atmosphere from measurements of cloud cover, solar radiation, and wind speed. Stability classification ranges from extremely unstable to extremely stable. A climatological analysis of the annual Pasquill-Gifford stability class distribution for Yucca Flat is presented in App. I. Atmospheric stability was estimated from wind-direction traces made during 1968. The method outlined by Slade (Ref. 11, p. 41) was used for determining these (Pasquill-Gifford) stabilities. A description of these stability categories is given in Table 41. Stable conditions (E, F, G categories) were the most prevalent at Yucca Flat, with the annual occurrence averaging 44 percent of the time. Unstable (A, B, C categories) and neutral (D category) conditions were less frequent, averaging 32 percent and 23 percent of the time, respectively.

2.8.3 Influences Affecting Atmospheric Dispersion

The dispersion of atmospheric pollutants is affected by regional topographic features. Most terrain influences produce winds as a result of local differences in heating or cooling. Mountain-valley breezes are created by the differential heating and cooling of mountain slopes. During clear nights, ground surfaces radiate heat and cool the air in contact with it. On sloping mountain surfaces, the cool air drains down into the adjacent valleys and lowlands.

If the mountain breeze flowing down the slope has cooled enough, the valley will be colder than the higher elevations. This produces a temperature inversion in the valley which limits vertical mixing and causes poor dispersion conditions. The topographic features of mountain-valley terrain also force the wind to flow along the valley axis. This limits the dispersion of atmospheric pollutants by causing the highest concentrations to be extended along the valley axis.

The only stability analyses that have been documented for data from Yucca Flat are those concerning inversions (stability) carried out by R. F. Quiring, and can be found in App. J (Ref. 28).

Table 41

Description of Atmospheric Stability Categories
(Pasquill-Gifford)

Category	Degree of stability	Angular Spread of wind direction (30-min period)	Description
A	Extremely unstable	150°	Rapid mixing; usually occurs on hot afternoons.
B	Moderately unstable	120°	Moderate mixing; usually occurs on warm days.
C	Slightly unstable	90°	Usually occurs in daytime.
D	Neutral stability	60°	Occurs day or night, often during overcast skies.
E	Slightly stable	30°	Slow dilution; can occur day or night.
F	Moderately stable	15°	Very slow dilution; occurs at night with clear skies.

(Source: Ref. 17, p. 13).

A comparison between Yucca Flat and other adjacent locations, of surface based inversion frequencies determined from rawinsonde observations, is shown in Table 42. Inversion frequencies at Jackass Flats and Yucca Alluvial correlate closely with those of Las Vegas and Yucca Flat because of their similar topography (Ref. 11, p. 42). Table 43 shows the median depths of surface inversions and median heights of the base level of elevated inversions at Yucca Flat. The medium depth is below 984 ft (300 m), which is lower than most of the surrounding terrain.

By comparing statistics of pollution event days at Las Vegas and Ely, it is apparant that local conditions, such as nocturnal drainage winds, influence both statistics and dispersion. More than 250 episode-days over a five year period

Table 42

Surface Based Inversion Frequencies (%)

	Las Vegas[1]		Ely[1]		Winnemucca[1]		Yucca Flat[2]	
Season	0000 GMT	1200 GMT	0000 GMT	1200 GMT	0000 GMT	1200 GMT	0000 GMT	1200 GMT
Winter	2	92	22	86	6	82	3	89
Spring	0	86	0	78	0	88	0	84
Summer	1	89	1	96	0	92	1	93
Fall	0	90	9	91	1	91	1	91

(Source: Ref. 11, p. 43).
[1]From Hosler (1961): Two years of data: 6/57 - 5/59.
[2]From Quiring (1973): see Ref. 28, App. J.

are recorded for Las Vegas, a maximum of 25 two-day occurrences annually; Yucca Alluvial, however, is on sloping terrain which may be favorable to the dispersion of pollutants (Ref. 11, p. 47).

Table 43

Inversion Statistics for Yucca Flat

Elevation of Yucca Flat is 3923 ft (1.196 m) MSL

		Surface Based		Elevated Inversions with Surface Based Present		Elevated Inversions with Surface Based Not Present	
Sounding GMT	Season	Frequency (%)	Ht. above Station (m)	Frequency (%)	Ht. above Station (m)	Frequency (%)	Ht. above Station (m)
0000	Winter	2.6	145	1.6	1,346	64.9	1,422
0000	Spring	0.2	152	0	---	38.6	2,674
0000	Summer	0.9	168	0.2	4,380	20.8	2,416
0000	Fall	0.7	191	0.2	823	49.7	2,189
1200	Winter	89.0	283	57.7	1,271	6.7	1,423
1200	Spring	84.2	206	35.1	2,036	6.8	1,676
1200	Summer	93.1	247	23.0	3,193	2.9	1,143
1200	Fall	91.2	276	46.7	1,978	5.0	1,920

(Source: Quiring, (1973). Taken from Ref. 11, p. 44, see App. J).

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APPENDIX A

Frequency of Occurrences and Duration of Thunderstorms and Associated Phenomena at Yucca Flat, Nevada

by R. F. Quiring

APPENDIX A

FREQUENCY OF OCCURRENCE AND DURATION OF THUNDERSTORMS AND ASSOCIATED PHENOMENA AT YUCCA FLAT, NEVADA

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Introduction

The objective of this report is to present a realistic appraisal of the potential for thunderstorm activity at the NTS. Various phenomena are examined which provide evidence that convective activity has reached the stage where lightning is imminent or already occurring. Emphasis is placed on observations of cumulonimbus clouds (CB) because CB, the dynamos that generate the potential for lightning, are usually the first evidence that a threat of lightning exists. Lightning cannot occur without a CB (with the possible exception of warm cumulus in the tropics) but all CB do not necessarily produce lightning. Thunder is the audible evidence that lightning has occurred.

All of the phenomena considered may escape detection. Thunder may be beyond the range of audibility, or the noise level of other activities in the vicinity of the station may prevent the observer from recognizing thunder unless there are multiple occurrences. Lightning may go undetected, especially when the flashes are infrequent, because the attention of the observer often is distracted by other essential duties. Even when the observer hears thunder and is alerted to look for lightning he may still not observe any flashes. CB cannot always be positively identified and may at times be hidden from the view of the observer by other cloud layers. Cloud observations are made routinely once each hour, however, and CB go through an extended life cycle, as opposed to the momentary flash of lightning, so CB are less likely to go undetected than either lightning or thunder.

The Observation

Surface weather observations recorded at the Yucca Flat weather station from 1962 through 1971 provided the basic data for this report. These observations were made in accordance with instructions in FMH #1 (formerly Circular N) and recorded on meteorological forms MF1-10A and MF1-10B (formerly WBAN forms 10A and 10B). Observations were made on an hourly schedule and were usually completed by 5 minutes to the hour.

The record of hourly observations is very nearly complete for the 10-year period except for an occasional missing day and two extended periods. The station was closed for 11

days in July 1962 and 15 days in December 1967. The July period was dry with only two days on which there may have been convective activity. One of these days could have been a thunderstorm day if there had been an observer to hear the thunder. Observations made at the Jackass Flat weather station during the December closure are accepted as an adequate description of convective activity as it would have been observed from the Yucca Flat station.

Missing observations appear to be insignificant in comparison with the high degree of subjectivity in observing and recording weather elements associated with convective activity. There is therefore little justification for attempting to adjust for missing data and thereby complicating the analysis. The observational record was accepted as being serially complete and the evaluation proceeded on this basis.

Interpretation of the Observation

As a general rule, the elements reported in a scheduled observation are observe during the 15-minute period preceding the time the observation is completed and recorded. Scheduled observations are augmented with special observations when significant events or changes in weather conditions, as defined in FMH #1, occur.

A thunderstorm occurrence requires that thunder be heard at the station. The beginning and ending times of each occurrence are recorded in columns 82-84 of MF1-10B. A thunderstorm begins when thunder is first heard, continues as long as the interval between thunder claps is not more than 15 minutes, and ends 15 minutes after thunder is last heard. It is therefore possible for a day to have multiple thunderstorm occurrences with the minimum duration of a thunderstorm period set at 15 minutes by definition.

Thunder is always preceded by lightning, but lightning by itself does not officially constitute a thunderstorm. Lightning within sight of the station is recorded in column 13 of MF1-10A and may be identified as in cloud (IC), cloud to cloud (CC), cloud to air (CA), or cloud to ground (CG). Lightning frequency and direction from the station are also reported. An observation of lightning may be qualified as distant. The significance of this qualification is difficult to evaluate since it is extremely subjective and depends to a high degree upon the training and experiences of the observer.

Lightning and thunder occur in association with CB. Observations of CB are recorded in an appropriate sequence with other clouds in columns 22-35 of MF1-10B and are often qualified by remarks in column 13 of MF1-10A. CB may escape detection at times because of the presence of other clouds. The ability to observe CB in the distance depends to a large extent upon the degree of development along with the clarity

of the air. Observations of distinct CB during hours of darkness occur mainly in conjunction with observations of distant lightning.

The extent of the area covered by observations of thunder, lightning or CB is rather poorly defined. The typical range of audibility for thunder is 10 miles. Thunder is seldom heard beyond 15 miles from the station but may be heard out to 25 miles. An observation of lightning when thunder is not heard would place the thunderstorm cell typically more than 10 miles from the station. The distinction between distant and close in lightning is highly subjective but probably on the order of 25 miles. CB can be qualified in essentially the same manner as lightning with respect to distance from the point of observation. All factors considered, a report of thunder, lightning or CB (not qualified as distant) probably means that the phenomenon is occurring within a 25-mile radius of the observing station. In the case of the Yucca Flat weather station, this radius pretty well covers the NTS except for the area beyond Rainier Mesa. An observation of distant lightning or distant CB could, at times, place the phenomenon as much as 50 miles from the station.

Tabulation Procedures

Days with convective activity were categorized as either thunderstorm days or CB days. The hours with lightning and hours with CB were tabulated for each category of day along with a count of the number of hours during which the various types of lightning were reported. The beginning and ending times of thunderstorm periods were tabulated for thunderstorm days.

The following criteria were established in order to make the tabulation as objective as possible and to overcome a few inconsistencies in the observational record:

(1) An entry in columns 82-84, MF1-10B, for the beginning and ending of thunder established the day as a thunderstorm day.

(2) An entry of CB in columns 22-35, MF1-10B, was the primary consideration in establishing an occurrence of CB.

(3) An entry of distant CB or distant lightning in column 13, MF1-10A, was considered as an occurrence of CB even though such entries were sometimes not substantiated by entries in columns 22-35, MF1-10B. This was necessary to compensate for observer differences. Most observers record CB when distant lightning is observed but some do not.

(4) An entry of CB or lightning (distant or otherwise) in a special observation was considered as qualifying the next record observation as an hour with CB.

(5) CB were considered to be present when thunder or lightning were reported and cloud conditions precluded the observation of CB.

(6) Lightning of a given type was counted as having occurred if it was reported in the record observation or in a special observation during the hour preceding. A type was counted only once each hour regardless of the frequency reported or the number of times reported in special observations during the hour preceding the record observation.

Thunderstorm Frequency and Duration

There were 15,338 minutes of thunder recorded during 186 thunderstorm periods on 143 thunderstorm days in 10 years of observations at the Yucca Flat weather station. The frequency of occurrence of thunder is given in Table 1 by month and time of day in half-hour increments. Thunder was counted as having occurred during the half-hour period if the thunderstorm began during, included, or ended during the period. On an annual basis, thunder has been heard in all months except February and during all hours of the day. Thunder was heard with the greatest frequency in August during the afternoon and early evening.

The duration of thunderstorm periods is given in Table 2. The shortest duration is set at 15 minutes by definition. The longest duration was 485 minutes with a median duration, on an annual basis, near 60 minutes for the 10-year period. Thunderstorm periods occur most frequently in July and August and also last longer. The median duration for these months is near 90 minutes.

Lightning Frequency

The frequency with which lightning was observed is given by month and time of day for thunderstorm days in Table 3 and for CB days in Table 4. Observations of lightning which were qualified as distant are not included in these tabulations. In 10 years, lightning was reported during 289 hours on 143 thunderstorm days and during 143 hours on 351 CB days. While the likelihood of lightning is much greater on thunderstorm days than on CB days, the shapes of the distributions are very similar with peak frequencies in July and August during late evening. CB days contribute a substantial number of lightning occurrences but substantially less convective activity than the days which qualify as thunderstorm days. Since the distinction between thunderstorm days and CB

days appears to be largely a function of the degree of convective activity, the distributions are combined in Table 5 to give a composite picture of lightning frequency. Lightning was observed during 432 hours on 494 days with convective activity. Thunder was heard on 143 of these days to qualify them officially as thunderstorm days. Comparison of the annual diurnal cycles in Tables 1 and 5 reveals a definite bias in the lightning observations for hours of darkness.

The number of days with lightning and the number of hours during which lightning of various types was observed on these days are recorded in Table 6, by month, for thunderstorm days and for CB days. The statistics are interesting but not very revealing. The literature suggests that the frequency of lightning flashes which do not reach the ground is about 10 times as great as cloud to ground flashes. The established procedures for routinely observing and recording lightning provide observations which cannot be interpreted with regard to flash frequency. While flash frequency cannot be inferred from the Yucca Flat observations, the data in Table 6 show that cloud to ground lightning was observed during more hours and on more days than any other type but with lesser frequency than all other types combined.

CB Frequency and Duration

The number of thunderstorm days and the number of hours with CB on thunderstorm days are given in Table 7 by month for each year. Pronounced variations in the frequency of convective activity for any month and from year to year are apparent. August is the most active month with 43 thunderstorm days in 10 years and an average of nearly 11 hours with CB per thunderstorm day.

The number of CB days and the number of hours with CB on these days are given in Table 8 by month for each year. The variation in the number of CB days by month and year follows much the same pattern as on thunderstorm days but the frequencies are on the order of 2 1/2 times as great--on the average anyway--with 351 CB days in 10 years as opposed to only 143 thunderstorm days. There are slightly more than half as many hours with CB on the average CB day (4.7 hours) than there are on the average thunderstorm day (8.3 hours). In 10 years there were 494 days with convective activity and on these days there were 2825 hours with CB within visual range of the station. The 143 days which qualified as official thunderstorm days accounted for 1184 of the hours with CB.

The frequency of occurrence of CB as a function of time of day is given in Table 9 for thunderstorm days and Table 10 for CB days. Except for a few subtle differences, the diurnal variations follow essentially the same pattern, with CB being most prevalent during the afternoon hours in all

months and with the peak occurrence in August. This pattern also conforms to the variations in the frequency with which thunder is heard (Table 1). On the basis of the similarities in the distributions, the frequencies of occurrence of CB on thunderstorm and on CB days are combined in Table 11 to provide the frequency of occurrence of CB on days with convective activity.

The frequency distributions of the number of hours per day with CB on thunderstorm days and on CB days are given by month in Tables 12 and 13, respectively. On an annual basis, the median values are 8 hours of CB per thunderstorm day and 4 hours of CB per CB day. The indications are the same as in the preceding tables; that is, the more hours with CB on a given day, the greater the likelihood that the day will qualify as a thunderstorm day. Since the distinction between CB days and thunderstorm days seems to be closely associated with the degree of CB activity, the distributions are combined in Table 14 to provide the frequency distribution of hours per day with CB on days with convective activity. The median number of hours per day with CB on a day with convective activity is 5 hours.

Summary

Statistics derived from standard thunderstorm observations underestimate the threat of severe weather conditions which occur in association with such storms because an occurrence is based on the requirement that thunder be heard at the station. This requirement typically places a thunderstorm occurrence within about a 10-mile radius of the station. Also, a thunderstorm may easily escape detection if the noise level at the station is high or if the attention of the observer is distracted by other essential activities.

The radius of observation can be expanded by considering occurrences of lightning. The outer limit for an observation of lightning, not qualified as distant, is probably on the order of about 25 miles. Lightning may escape detection and the peak occurrence during hours of darkness (see Table 5) suggests that it frequently does--at least during daylight hours.

Statistics based on observations of cumulonimbus clouds (CB) expand the scope of thunderstorm statistics to include potential thunderstorm occurrence. Observations of distant lightning and distant CB were considered as qualifying as CB occurrences. This expands the radius of observation out to about 50 miles and smooths out the bias for hours of darkness in the lightning observations. Statistics derived from CB observations very likely overestimate the thunderstorm hazard because of the expanded radius of observation and the failure of some CB to develop into fullfledged storms.

The frequency and duration statistics, presented as number of occurrences in 10 years, are tabulated separately for thunderstorm and CB days to provide greater versatility of interpretation. CB days do not include days on which thunder was heard, so the CB and thunderstorm day statistics can be combined to provide statistics pertaining to days with convective activity. Although the combined statistics tend to overestimate the thunderstorm hazard, they provide a realistic appraisal of the daily and annual cycles of the potential for thunderstorms in the vicinity of the NTS.

Table 1

Thunderstorm Frequencies Expressed as the Number of Times in Ten Years that the Specified Half-Hour Period was Part of a Thunderstorm Period Observed at Yucca Flat, Nevada, (1962-1971)

Time (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0000-0030						1	2	3					6
0030-0100				1			1	3					5
0100-0130				1				3	1				5
0130-0200				1			1	3	2				7
0200-0230				1			2	1	2				6
0230-0300				1		1	1	1	2				6
0300-0330						1	1	1	2				5
0330-0400								1	2				3
0400-0430								1	2				3
0430-0500					1			1	2				4
0500-0530			1		1			2	2				6
0530-0600			1		1			3	2				7
0600-0630			1					1	1				3
0630-0700			1					3	1				5
0700-0730								2	1				3
0730-0800								1	1				2
0800-0830								1	1				2
0830-0900								1	1				2
0900-0930						1		2	1				4
0930-1000	1					2	2	2	2				9
1000-1030	1			1		3	2	1	2	1			11
1030-1100				1	1	3	2	1	1	1			10
1100-1130					3	3	2	1	2		1		12
1130-1200					4	3	4	4	4				19
1200-1230					4	4	4	6	5				23
1230-1300			1		2	5	4	5	6		1		24
1300-1330			2	1	2	7	3	8	6		1		30
1330-1400			1	2	2	7	8	12	7				39
1400-1430				2	3	7	6	11	5				34
1430-1500					2	5	7	13	5				32
1500-1530				1	2	2	10	14	5				34
1530-1600				1	2	2	9	9	4				27
1600-1630					4	3	11	8	3		1		30
1630-1700			1		2	4	10	7	3		1		28
1700-1730			1	1	1	2	9	7	2				23
1730-1800				1	2	4	9	9	2				27
1800-1830					2	3	9	10	1				25
1830-1900			1		1	3	10	13	1			1	30
1900-1930			1	1		1	10	12				1	26
1930-2000			1	1			11	7				1	21
2000-2030			1				9	5				1	16
2030-2100							7	2	1			1	11
2100-2130							3	5	1				9
2130-2200							4	4	1				9
2200-2230						1	5	6	1				13
2230-2300			1			1	4	6	1				13
2300-2330			1				2	5	1				9
2330-2400						1	3	4					8

Table 2

Frequencies of Durations of Thunderstorm Periods Expressed as the Number of Occurrences in Ten Years at Yucca Flat, Nevada, (1962-1971)

Duration (minutes)	Month												Ann	Cum	Cum
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
15	1		1	3	2	1	3	1	1		1		14	14	7
16-30			2	2	7	5	6	6	2	1	1	1	33	47	25
31-45			2		3	8	4	8	1		1		27	74	39
46-60			1	2	4	1	3	5	1			1	18	92	49
61-75				1	1	2	3	6	3				16	108	58
76-90			1			2	6	3	2				14	122	65
91-105					2	2	2	4	3				13	135	72
106-120							3	6	1				10	145	78
121-135							4	4	1				9	154	82
136-150							4	3					7	161	86
151-165							3	1	1				5	166	89
166-180						1	1		1				3	169	90
181-195						1	1	1					3	172	92
196-210							2	2	1				5	177	95
211-225							1	2					3	180	96
226-240													0	180	96
>240						1		3	2				6	186	100
Total Occurrences	1	0	7	8	19	24	46	55	20	1	3	2	186		
Total Duration (minutes)	15	0	278	274	777	1641	4263	5500	2409	25	79	77	15338		

Table 3

Frequencies of Lightning on 143 Thunderstorm Days Expressed as the Number of Days Lightning Occurred During the Hour in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
01				1			2	3					6
02				1			2	2					5
03						1	1	2	1				5
04						1		2	1				4
05								3	1				4
06			1			1		2					4
07								2	1				3
08						1			1				2
09						1			1				2
10						2	1						3
11				1			1						2
12					2	1	1	2	1				7
13			1			1	6	5	4				17
14			1			5	1	6	3				16
15					1	1	2	6	1				11
16					1	1	5	3	1				11
17			1	1		1	3	5	1				12
18			1		2	3	11	5	1				23
19			2	1	1	2	14	12	3				35
20			2	1	2	1	13	14	3		1	1	38
21					1		13	9	2		1		26
22						1	12	9	1				23
23			1		1	1	5	8	1				17
24						2	4	6	1				13
Total Hours	0	0	10	6	11	27	97	106	29	0	2	1	289
Number of Thunderstorm Days	1	0	5	5	14	19	35	43	15	1	3	2	143

Table 4

Frequencies of Lightning on 351 CB Days Expressed as the Number of Days Lightning Occurred During the Hour in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01								1					1
02							1	2					3
03							1	2	1				4
04								1					1
05													
06													
07													
08													
09													
10													
11													
12						1							1
13							2	3					5
14							1	2					3
15								4					4
16													
17				1			1		2	1			5
18							1	1	7	1			10
19		1		1			4	7	3				16
20				1	1	3	8	4	1				18
21				1	1	4	11	11	1	1			30
22					1	5	12	5	1				24
23						3	7	4	1				15
24							3						3
Total Hours	0	1	0	4	3	16	52	47	17	3	0	0	143
Number of CB Days	3	7	15	20	43	37	67	102	31	10	9	7	351

Table 5

Frequencies of Lightning on 143 Thunderstorm Days and 351 CB Days Expressed as the Number of Days Lightning Occurred During the Hour in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01				1			2	4					7
02				1			3	4					8
03						1	2	4	2				9
04						1		3	1				5
05								3	1				4
06			1			1		2					4
07								2	1				3
08						1			1				2
09						1			1				2
10						2	1						3
11				1			1						2
12					2	2	1	2	1				8
13			1			1	8	8	4				22
14			1			5	2	8	3				19
15					1	1	2	10	1				15
16					1	1	5	3	1				11
17			1	2		1	4	5	3	1			17
18			1		2	3	12	6	8	1			33
19		1	2	2	1	2	18	19	6				51
20			2	2	3	4	21	18	4		1	1	56
21				1	2	4	24	20	3	1	1		56
22					1	6	24	14	2				47
23			1		1	4	12	12	2				32
24						2	7	6	1				16
Total Hours	0	1	10	10	14	43	149	153	46	3	2	1	432
Number of Days	4	7	20	25	57	56	102	145	46	11	12	9	494

Table 6

Frequencies of Lightning Expressed as the Number of Days/Number of Hours with Various Types of Lightning in Ten Years at Yucca Flat, Nevada, (1962-1971)

	On 143 Thunderstorm Days												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Number of Thunder. Days	1	0	5	5	14	19	35	43	15	1	3	2	143
In Cloud			2/4		3/3	3/8	20/60	18/43	7/18				53/13
Cloud to Cloud			4/6	1/2	2/2	7/10	13/37	19/61	4/7		1/2	1/1	52/12
Cloud to Ground			3/3	3/4	6/8	9/18	25/62	27/72	7/15				80/18
No Spec					1/2	2/4	4/5	1/1	2/2				10/14
All Types*			5/10	4/6	7/11	12/27	29/97	33/106	9/29		1/2	1/1	101/28
Distant						1/1	12/26	17/41	5/9				35/77

	On 351 CB Days												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Number of CB Days	3	7	15	20	43	37	67	102	31	10	9	7	351
In Cloud		1/1				4/9	7/15	10/14	4/4	1/2			27/45
Cloud to Cloud					1/3		7/16	11/17	4/4				23/40
Cloud to Ground				2/4		3/5	11/24	15/31	4/6	1/1			36/71
No Spec						2/4	7/16	2/2	3/4	1/1			15/27
All Types*		1/1		2/4	1/3	7/16	20/52	24/47	12/17	2/3			69/14
Distant	1/1	1/1				5/6	22/39	28/49	5/11	3/6	2/2		67/11

* Does not include distant lightning

Table 7

Frequencies of CB on Thunderstorm Days Expressed as Number of Days/Number of Hours with CB at Yucca Flat, Nevada, (1962-1971)

Year	Month													Hrs.
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	per
1962			1/1				4/39		3/35				8/75	9.4
1963					4/25	5/19		3/27	3/21		1/2		16/94	5.9
1964			1/1	3/7	1/1	1/7		3/47		1/1			10/64	6.4
1965	1/1		2/18		1/6	3/17	3/24	9/101					19/167	8.8
1966					1/7	1/18	3/21	5/49	1/11			1/1	12/107	8.9
1967					2/18	2/19	6/69	6/65	6/53		1/1		23/225	9.8
1968			1/4			1/7	8/75	1/13					11/99	9.0
1969				1/2	1/6	4/14	4/42	2/25	2/18		1/5		15/112	7.5
1970					1/3	2/13	3/30	6/47					12/93	7.8
1971				1/4	3/7		4/43	8/93				1/1	17/148	8.7
All Years	1/1		5/24	5/13	14/73	19/114	35/343	43/467	15/138	1/1	3/8	2/2	143/1184	8.3
Hr/ Day	1.0	—	4.8	2.6	5.2	6.0	9.8	10.9	9.2	1.0	2.7	1.0	8.3	

Table 8

Frequencies of CB on CB Days Expressed as Number of Days/ Number of Hours with CB at Yucca Flat, Nevada, (1962-1971)

Year	Month													Hrs.
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	per
1962		2/6	2/8	3/5	8/29	5/27	4/17	2/9	5/27	1/2	2/2		34/132	3.9
1963		1/4	2/7		2/10	4/14	2/3	12/49	2/4	3/11	2/3	1/6	31/111	3.6
1964				3/15	6/22	2/7	8/37	8/22	2/4		1/8	3/5	33/120	3.6
1965	1/1	1/4	5/24	6/34	5/14	5/42	7/53	5/21	4/21		1/1	2/6	42/221	5.3
1966		1/3		1/4	3/20	1/15	1/3	7/22	3/12	4/26			21/105	5.0
1967	1/5			2/12	5/20	8/25	9/47	20/133	7/33		1/3		53/278	5.2
1968			2/9	2/3	2/7	1/3	6/40	8/52	1/3	1/4	1/1	1/1	25/123	4.9
1969	1/1				4/8	4/8	7/38	11/49	3/12				30/116	3.9
1970		1/1	4/8	3/13	2/9	4/15	15/73	15/85		1/4	1/1		46/209	4.5
1971		1/1			6/23	3/12	8/75	14/92	4/23				36/226	6.3
All Years	3/7	7/19	15/56	20/86	43/162	37/168	67/386	102/534	31/139	10/47	9/19	7/18	351/1641	4.7
Hr/ Day	2.3	2.7	3.7	4.3	3.8	4.5	5.8	5.2	4.5	4.7	2.1	2.6	4.7	

Table 9

Frequencies of CB on Thunderstorm Days Expressed at the Number of Observations with CB in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01				1		1	3	7	1				13
02				1		1	4	7	1				14
03				1		1	2	5	3				12
04					1	1	1	3	4				10
05					2	3	2	6	3				16
06			2			3	2	5	1				13
07						3	3	8	1				15
08						5	4	7	1				17
09						4	4	10	4				22
10	1				2	4	6	14	6				33
11				2	3	4	13	23	8				53
12			1	1	6	8	22	33	11	1	1		84
13			2	1	6	9	26	34	11		1		90
14			2	2	7	10	27	37	14		1		100
15			2	1	6	12	29	37	12		1		100
16			2		9	12	27	37	11		1		99
17			3		8	8	26	37	11		1		94
18			2	1	8	11	28	35	9				94
19			2		6	5	26	30	6			1	76
20			3	1	5	2	24	25	6		1	1	68
21			1	1	3	2	22	23	4		1		57
22						2	19	19	4				44
23			1		1	1	14	14	5				36
24			1			2	9	11	1				24
Total Hours with CB	1	0	24	13	73	114	343	467	138	1	8	2	1184
Number of Thunder-storm Days	1	0	5	5	14	19	35	43	15	1	3	2	143
Hours of CB per Thunder-storm Day	1.0	--	4.8	2.6	5.2	6.0	9.8	10.9	9.2	1.0	2.7	1.0	8.3

Table 10

Frequencies of CB on CB Days Expressed as the Number of Observations with CB in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01						1	4	1		1			7
02						1	5	3	1	1			11
03							5	3	1		1		10
04						2	3	4					9
05						2	2	3	3				10
06						1	2	1	5	1	1		11
07			1		2	2	1		6		1		13
08			2	1	1	2	2	1	3	1	1	2	16
09			1	1	3	4	3	1	3				16
10			1	4	7	5	11	5	6	1		1	41
11			2	7	9	9	14	20	8	1	1	1	72
12	1		4	7	10	11	26	36	6	1		1	103
13	1		5	11	14	11	26	55	9	3	1		136
14	1	3	6	10	23	14	28	52	10	4	3	2	156
15	1	2	9	11	21	12	30	56	10	5	3	3	163
16	1	5	9	10	21	14	36	55	12	7	3	4	177
17	1	4	9	9	21	15	37	52	13	6	2	2	171
18		2	5	8	15	13	29	49	10	3	1	1	136
19		2	2	5	9	13	30	42	15	2		1	121
20	1			1	4	14	25	30	10	1			86
21				1	1	7	21	29	4	2			65
22					1	6	22	17	2	3	1		52
23		1				6	15	15	1	3			41
24						3	9	4	1	1			18
Total Hours with CB	7	19	56	86	162	168	386	534	139	47	19	18	1641
Number of Days with CB	3	7	15	20	43	37	67	102	31	10	9	7	351
Hours of CB Per CB Day	2.3	2.7	3.7	4.3	3.8	4.5	5.8	5.2	4.5	4.7	2.1	2.6	4.7

Table 11

Frequencies of CB on Thunderstorm and CB Days Combined, Expressed as the Number of Observations with CB in Ten Years at Yucca Flat, Nevada, (1962-1971)

Hour (PST)	Month												Ann
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
01				1		2	7	8	1	1			20
02				1		2	9	10	2	1			25
03				1		1	7	8	4		1		22
04					1	3	4	7	4				19
05					2	5	4	9	6				26
06			2			4	4	6	6	1	1		24
07			1		2	5	4	8	7		1		28
08			2	1	1	7	6	8	4	1	1	2	33
09			1	1	3	8	7	11	7				38
10	1		1	4	9	9	17	19	12	1		1	74
11			2	9	12	13	27	43	16	1	1	1	125
12	1		5	8	16	19	48	69	17	2	1	1	187
13	1		7	12	20	20	52	89	20	3	2		226
14	1	3	8	12	30	24	55	89	24	4	4	2	256
15	1	2	11	12	27	24	59	93	22	5	4	3	263
16	1	5	11	10	30	26	63	92	23	7	4	4	276
17	1	4	12	9	29	23	63	89	24	6	3	2	265
18		2	7	9	23	24	57	84	19	3	1	1	230
19		2	4	5	15	18	56	72	21	2		2	197
20	1		3	2	9	16	49	55	16	1	1	1	154
21			1	2	4	9	43	52	8	2	1		122
22					1	8	41	36	6	3	1		96
23		1	1		1	7	29	29	6	3			77
24			1			5	18	15	2	1			42
Total Hours with CB	8	19	80	99	235	282	729	1001	277	48	27	20	2825
Number of Days with CB	4	7	20	25	57	56	102	145	46	11	12	9	494
Hours of CB Per Day	2.0	2.7	4.0	4.0	4.1	5.0	7.1	6.9	6.0	4.4	2.3	2.2	5.7

Table 12

Frequencies of Durations of CB on Thunderstorm Days Expressed as the Number of Occurrences in Ten Years at Yucca Flat, Nevada, (1962-1971)

Duration (hours)	Month												Ann	Cum	Cum %
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	1		2	1	3	1		1		1	1	2	13	13	9.1
2				1		4	1				1		7	20	14.0
3				2	1	2		1					6	26	18.2
4			1	1		3	3	1	1				10	36	25.2
5					2	1	1	1	2		1		8	44	30.8
6			1		4	1	2						8	52	36.4
7					2	4	2	2	3				13	65	45.5
8							5	5	1				11	76	53.1
9					2		1	6	1				10	86	60.1
10							4	3	2				9	95	66.4
11							7	2	2				11	I06	74.1
12			1			1	2	7					11	117	81.8
13							3	4	1				8	125	87.4
14								3	1				4	129	90.2
15							1	3	1				5	134	93.7
16								3					3	137	95.8
17													0	137	95.8
18						2	3						5	142	99.3
19													0	142	99.3
20								1					1	143	100
Total	1	0	5	5	14	19	35	43	15	1	3	2	143		

Table 13

Frequencies of Durations of CB on CB Days Expressed as the Number of Occurrences in Ten Years at Yucca Flat, Nevada, (1962-1971)

Duration (hours)	Month												Ann	Cum	Cum %
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	2	3	5	3	8	6	10	10	3		6	3	59	59	16.8
2			3	4	10	6	2	12	7	2	1	2	49	108	30.8
3		1		3	4	5	9	19	3	1	1		46	154	43.9
4		2	1	4	4	6	8	13	4	4			46	200	57.0
5	1	1	1		8	4	5	7	3	1		1	32	232	66.1
6			2	1	3	4	7	6	1			1	25	257	73.2
7			2	1	3	1	7	4	7				25	282	80.3
8					1	1	6	11	1		1		21	303	86.3
9				3	1	1	2	8	1	1			17	320	91.2
10			1	1	1	1	2	7	1	1			15	335	95.4
11							3	1					4	339	96.6
12							1	1					2	341	97.2
13							4	3					7	348	99.1
14							1						1	349	99.4
15						1							1	350	99.7
16													0	350	99.7
17													0	350	99.7
18						1							1	351	100
Total	3	7	15	20	43	37	67	102	31	10	9	7	351		

Table 14

Frequencies of Durations of CB on Thunderstorm and CB Days Combined, Expressed as Number of Occurrences in Ten Years at Yucca Flat, Nevada, (1962-1971)

Duration (hours)	Month												Ann	Cum	Cum %
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	3	3	7	4	11	7	10	11	3	1	7	5	72	72	14.6
2			3	5	10	10	3	12	7	2	2	2	56	128	25.9
3		1		5	5	7	9	20	3	1	1		52	180	36.4
4		2	2	5	4	9	11	14	5	4			56	236	47.8
5	1	1	1		10	5	6	8	5	1	1	1	40	276	55.9
6			3	1	7	5	9	6	1			1	33	309	62.5
7			2	1	5	5	9	6	10				38	347	70.2
8					1	1	11	16	2		1		32	379	76.7
9				3	3	1	3	14	2	1			27	406	82.2
10			1	1	1	1	6	10	3	1			24	430	87.0
11							10	3	2				15	445	90.1
12			1			1	3	8					13	458	92.7
13							7	7	1				15	473	95.7
14							1	3	1				5	478	96.7
15						1	1	3	1				6	484	98.0
16								3					3	487	98.6
17													0	487	98.6
18						3	3						6	493	99.8
19													0	493	99.8
20								1					1	494	100
Total	4	7	20	25	57	56	102	145	46	11	12	9	494		

APPENDIX B

Precipitation Climatology of the Nevada Test Site

by R. F. Quiring

APPENDIX B

WSNSO 351-88

PRECIPITATION CLIMATOLOGY OF THE NEVADA TEST SITE

R. F. Quiring

Introduction

The National Weather Service (Weather Bureau at the time) began the systematic collection of daily precipitation data on the Nevada Test Site (NTS) in December 1957 with the installation of a weighing rain gage in Jackass Flats. The number of stations gradually increased and by early 1964 there were 20 stations scattered throughout the NTS. In September 1964 an effort was made to organize the 20-station network into the semblance of a grid within the limits imposed by accessibility and the need for measurements at specific locations. Wind shields were installed at the windiest locations and the practice of using a solution of antifreeze and oil in the bucket was started. The use of this solution made the record easier to interpret by eliminating evaporation and thus making the record cumulative.

Tipping-bucket rain gages, in conjunction with mechanical weather stations, were introduced at some locations in the network in August 1966. These stations presented a few problems in addition to not recording snowfall reliably and were augmented with storage gages. The storage gages provided a measure of the total precipitation between service dates which served as a check on the tipping-bucket gages and provided a means of estimating amounts for individual precipitation events, or series of events, when the tipping-bucket gage failed.

Data reduction has consisted of tabulating daily precipitation amounts, midnight to midnight, for each location. A station locator is provided in Figure 1 and identifying information for each location is given in Table 1.

Summary of Daily and Monthly Precipitation Amounts

Data for all stations, active and discontinued, are summarized in Tables 2 through 6 under the following headings:

Table 2. Average monthly and annual precipitation.
Table 3. Average monthly and annual number of days with measurable precipitation.
Table 4. Greatest monthly and annual precipitation amounts with the year of occurrence.

Table 5. Greatest daily precipitation amount with the year of occurrence.
Table 6. Greatest monthly and annual number of days with measurable precipitation with the year of occurrence.

Some stations existed for brief periods of time for specific purposes. The summarized data for these locations serves only as documentation of precipitation events during the specified period of time and have no other significance. A word of caution is in order with respect to the Lookout Peak station (Area 26, LP). The rain gage was exposed near the highest point on the mountain on a sharp ridge normal to the prevailing winds. This exposure resulted in precipitation amounts on teh order of 60% of expectations for the elevation and location of the station. an anomalously high monthly precipitation amount for station TS2 (Area 17), initially recorded as 8.65 inches for September 1975, cannot be supported in retrospect and has been downgraded to 3.65 inches. The initial amount was based on the observation that the bucket was near brimful and is within the realm of possibility, but seems improbable in consideration of the synoptic situation and the characteristics of the widely scattered thunderstorms over a period of several days.

Measurable precipitation is defined as an amount that is detectable in the recorder trace produced by the rain gage. The minimum detectable amount for tipping-bucket rain gages is one hundredth of an inch. This limit also applies in general to the weighting rain gages; however, in many cases lesser amounts may have been recorded as precipitation events when supported by evidence in the trace of a hygrothermograph co-located with a rain gage.

The Annual Precipitation Cycle

The locations of 4 National Weather Service (NWS) stations used to represent the characteristics of the annual precipitation cycle in southern Nevada are shown in Figure 2 relative to 13 active NTS stations with continuous records since October 1964. The record for Tonopah AP includes data for Tonopah prior to July 1954 and the Beatty station was moved to Beatty 8N in December 1972. Elevations at these locations was weighted in proportion to the applicable periods of record when station relocations occurred during the time period specified by a data sample under analysis.

The annual precipitation cycle is shown in Figure 3 as the average of 13 NTS stations during the 17-year period October 1964 through September 1981 in comparison with the average of the 4 surrounding NWS stations during the same period and for the 1951-80 normal period. The precipitation ordinate is expressed as the ratio of precipitation amount in

inches to station elevation in thousands of feet. This ratio effectively suppresses substantial differences in precipitation amount due to differences in elevation. The 13-station NTS average conforms to the 4-station NWS average with greater precipitation during the November-March period and lesser precipitation during the April-October period. The 4-station NWS average shows that precipitation during the October 1964-September 1981 period was above normal (1951-80) for most of the year with the greatest departure in February and March. The annual cycle with a winter maximum, a secondary maximum in summer and minima during the transition seasons is well established in the 17-year record and consistent with the 30-year normal.

The individual stations show rather pronounced variations on the average annual cycle. The annual cycle for the 4 NWS stations for the 1951-80 normal period are shown in Figure 4. The precipitation/elevation ratios at Pioche, the most easterly station, are highest both winter and summer. The indication is that summer precipitation, for a given elevation, decreases from east to west. Winter precipitation is more erratic but also shows a decrease from east to west for a given elevation. Tonopah AP is unique in that the winter maximum disappears entirely.

The annual cycle for 13 NTS stations during the October 1964-September 1981 period are grouped in Figures 5 to 9, in descending order, on the basis of the annual precipitation/elevation ratio. All of the groups have a summer peak with very nearly the same magnitude. The magnitude of the winter peak decreases with decreasing values of the annual precipitation/elevation ratio and has become secondary at station PM1 in the northwest corner of the NTS and the station with the lowest annual precipitation/elevation ratio. The annual cycle at station PM1 is very similar to that of Tonopah AP (see Figure 4). The annual cycle for the NTS station with the greatest precipitation/elevation ratio and the NTS 13-station average have been repeated in Figure 9 to emphasize the pronounced variation in the winter precipitation maximum while the secondary maximum in summer changes very little. The NTS 13-station average clearly shows that the winter maximum dominates the annual precipitation cycle over the NTS. Comparison of the PM1 annual cycle with that for the nearest NTS station (see Figure 5, station A12) indicates that the disappearance of the winter precipitation maximum occurs very abruptly in the northwestern extremities of the NTS.

Precipitation in Relation to Elevation

Approximately 45% of the NTS is at an elevation greater than 5000 feet but only 2 of the 13 NTS stations shown in Figure 2 are above 5000 feet, A12 (Area 12) and PM1 (Area 20). The 11 remaining stations range in elevation from 3000

to 5000 feet. The linear regression of annual and seasonal precipitation amounts on elevation in thousands of feet is shown in Figure 10 for these 11 stations along with the plotted values for 13 NTS stations and 4 NWS stations. The cool season is defined as October through April and the warm season as May through September. Station A12 at an elevation of 7490 feet in Area 12 fits the regression well in both seasons and for the year. Station PM1 at an elevation of 6550 feet in Area 20, along with Tonopah AP (elevation of 5426 feet), fits the warm season regression well but exhibits a pronounced precipitation deficit for th ecool season and for the year. These stations are outside the valid range of elevations for the regression equations; however, they are indicative of the rapid decrease in cool season precipitation in the northwestern portion of the NTS. Pioche at an elevation of 6110 feet is clearly in a heavier precipitation regime than the NTS with excessive precipitation in both seasons and for the year. Beatty at an adjusted elevation of 3437 feet and Desert NWR at an elevation of 2920 feet fit the seasonal and annual regressions well.

While linear regression describes the relationship between precipitation amount and elevation reasonably well for the range of elevations encountered on the NTS, it drops off much too rapidly at elevations below 3000 feet. This difficulty can be resolved with an exponential fit to the data for which the logarithm of precipitation increases linearly with elevation. Exponential curves fitted to the data for 11 NTS stations between 3000 and 5000 feet are shown in Figure 10. These curves fall off to reasonable values for a station in Death Valley at an elevation of 194 feet below sea level but, with reference to station A12 at 7490 feet, appear to increase too rapidly at higher elevations and rapidly approach unrealistically high values above the range of elevations of the data sample. The linear and log-linear regressions fit the main body of the data between 3000 and 5000 feet equal well. A combination of the two should provide a reasonable climatological estimate of seasonal and annual precipitation at an unsampled point on the NTS. There is a high degree of uncertainty with regard to such an estimate for a point on the high mesas in the northwest of the NTS due to the strong gradient in the cool season precipitation deficit between stations A12 and PM1.

An areal analysis of the annual precipitation/elevation ratio is presented in Figure 11. The analysis near the NTS boundaries is highly subjective but has been guided by information from limited data samples for the surrounding area. Precipitation records with continuity over extended time periods for a dense network of stations surrounding the NTS do not exist. An analysis for a 10-year period (1972081) is shown in Figure 12 for comparison. Data in parentheses indicate that one year of data was missing during the period and values were adjusted to the 10-year period. The area to

the northwest is clearly an area of diminished precipitation for a given elevation (low ratio). The area between the NTS and the Pahranagat and Sheep ranges to the east appears also to be an area of diminished precipitation with a sharp increase in the ratio to the east of these ranges. The area of large ratios oriented north-south over the NTS stands out as an anomaly within the larger area in the 10-year sample and is clearly an organized characteristic of the 17-year sample for the NTS. The anomaly appears to be a consequence of enhanced precipitation in this portion of the NTS during the cool season (Oct-Apr) as shown in Figure 13. The pattern is almost identical to the annual pattern (see Figure 11) and in marked contrast to the flat gradient in the precipitation/ elevation ratio during the warm season (May-Sept) shown in Figure 14. This reflects the excellent correlation between warm season precipitation and elevation, as seen in Figure 10, and the substantially reduced correlation for cool season precipitation.

Extreme Value Precipitation

Annual series of extreme daily precipitation amount have been determined for selected NTS stations for observational years (October through September) as opposed to calendar years, for the 17-year period October 1964-September 1981. These annual series have been plotted on extreme probability paper is Figures 15 and 16 and have been fitted with the exponential function proposed by Gumbel,

$$F(cx) = \exp(-e^{-y})$$

in which $y = (a(x - u)$

$1/a - x_x\sqrt{6}/\pi$

and $u = x - 0.4505sx$

The mean ($\bar{x}$) and standard deviation (s_x) are derived from the series of annual values.

The variation in the distributions of daily extreme values is very great and appears to be keyed to location more than to elevation. Station MV at an elevation of 4660 feet in the area of the precipitation/elevation anomaly of Figure 11 has experienced greater extreme values than station A12 at an elevation of 7490 feet (compare Figures 15 and 16), while extreme values at station PM1 at an elevation of 6550 feet are not much different than at station UCC at an elevation of 3924 feet.

Precipitation-frequency values for durations of 5 minutes to 1440 minutes have been derived from NOAA Atlas 2 for points corresponding to the locations of stations 4JA, A12, and UCC. Values from the atlas are for n-minute durations, as opposed to observational days or clock-hour

amounts, and apply to partial-duration series rather than annual series. A partial-duration series consists of, at least, the N highest independent values in N years as opposed to the highest value each year in the annual series. An n-minute duration interval can start at any minute, a clock-hour amount can start at any hour while an observational day starts at a fixed hour. Statistical values for the 1440-minute duration series from NOAA Atlas 2 are equal to 1.13 times the values for the observational day series for a given return period. This relationship is empirical and not built on causal relationships. Data from the atlas for locations corresponding to stations A12 and UCC were adjusted to the annual series and are presented in Figures 17 and 18 respectively. Data for station 4JA differed little from that for station UCC and are not shown. The adjustment of atlas data to the annual series converts the data to a straight line on extreme probability paper but does not alter the 1.13 ratio of the 1440-minute duration series to the observational day series. Comparison of the 1440-minute duration lines of Figures 17 and 18 with the observational day representation in Figures 15 and 16 indicates that NOAA Atlas 2 falls far short of being able to provide the high degree of variability in the frequency of precipitation extremes that is evident in the 17-year sample, October 1964-September 1981.

References

Gumbel, E. J., 1958; Statistics of Extremes. Columbian University Press, New York.

National Oceanic and Atmospheric Administration, National Weather Service, 1973; Precipitation-Frequency Atlas of the Western United States, NOAA Atlas 2, Volume VII - Nevada. Washington, D.C.

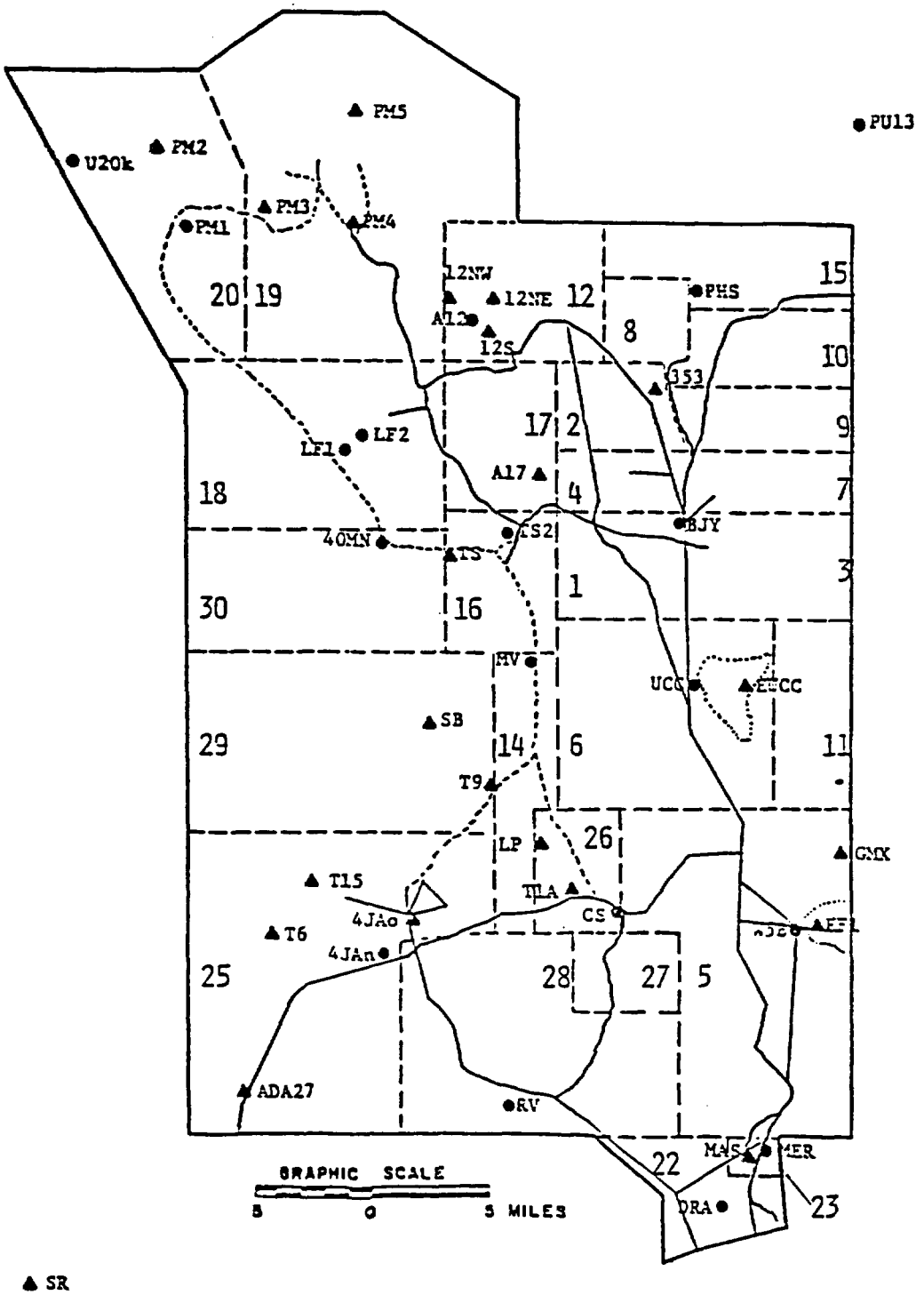


Figure 1. Station Locator. See Table 1 for identifying information.
● Active Stations
▲ Inactive Stations } as of 4/1/83

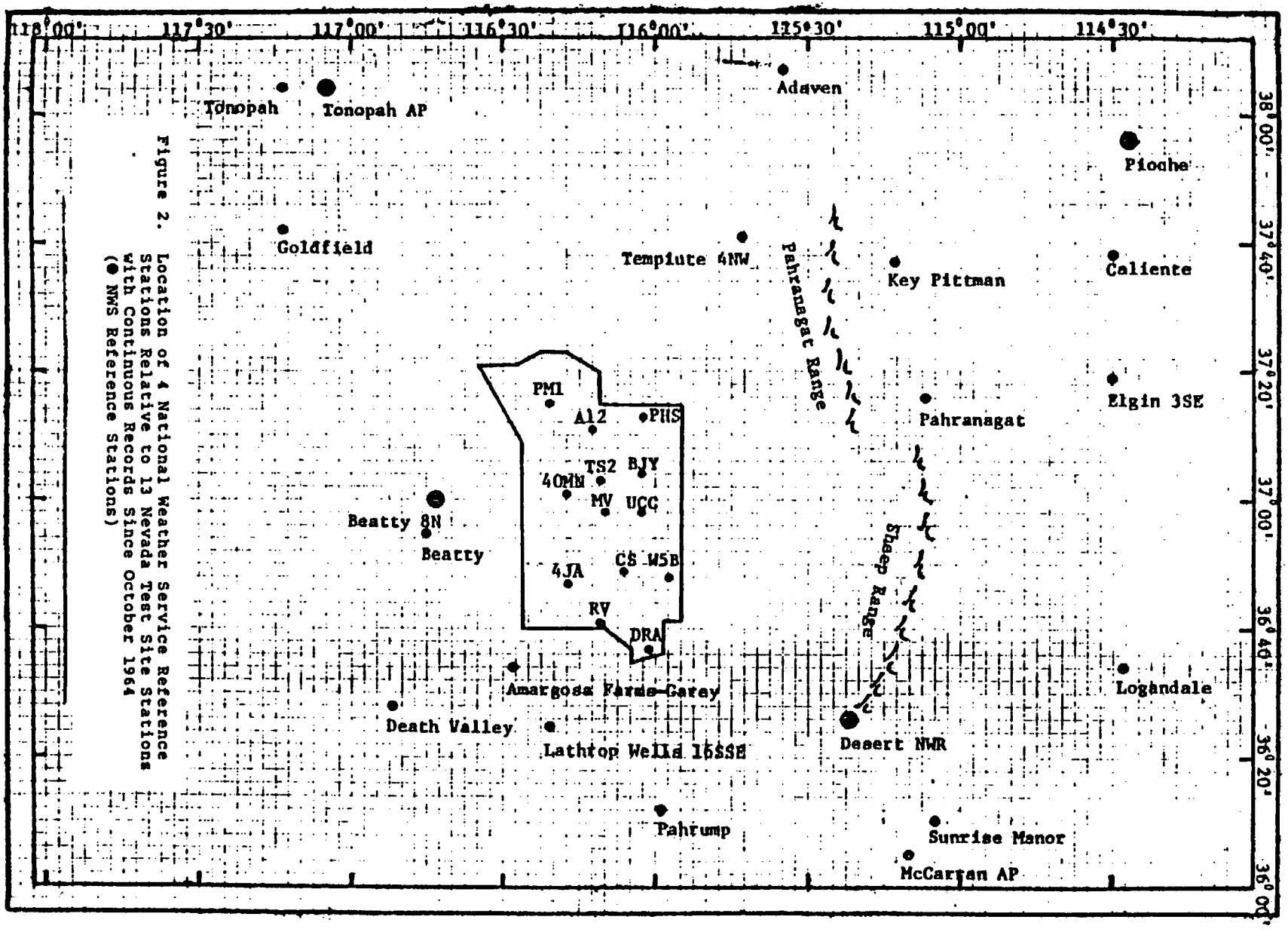


Figure 2. Location of 4 National Weather Service Reference Stations Relative to 13 Nevada Test Site Stations with Continuous Records Since October 1964 (● NWS Reference Stations)

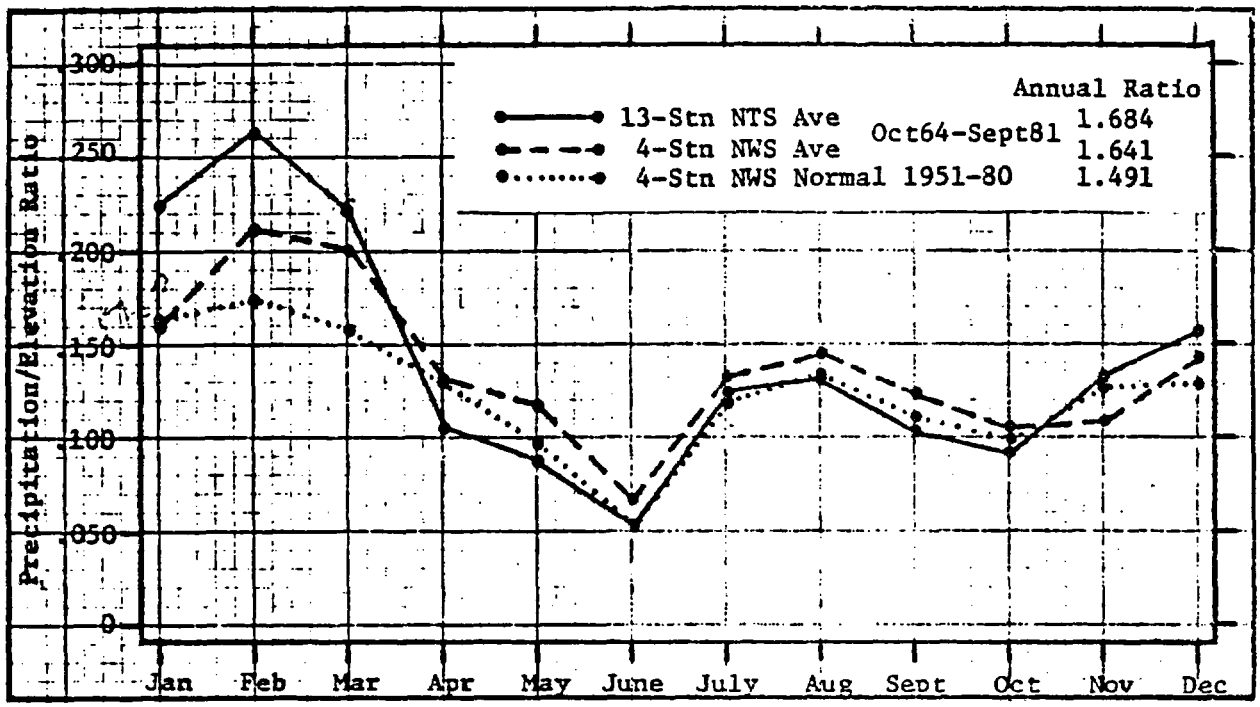


Figure 3. The Annual Precipitation Cycle Averaged for 13 NTS Stations in Comparison with the Average of 4 References NWS Stations

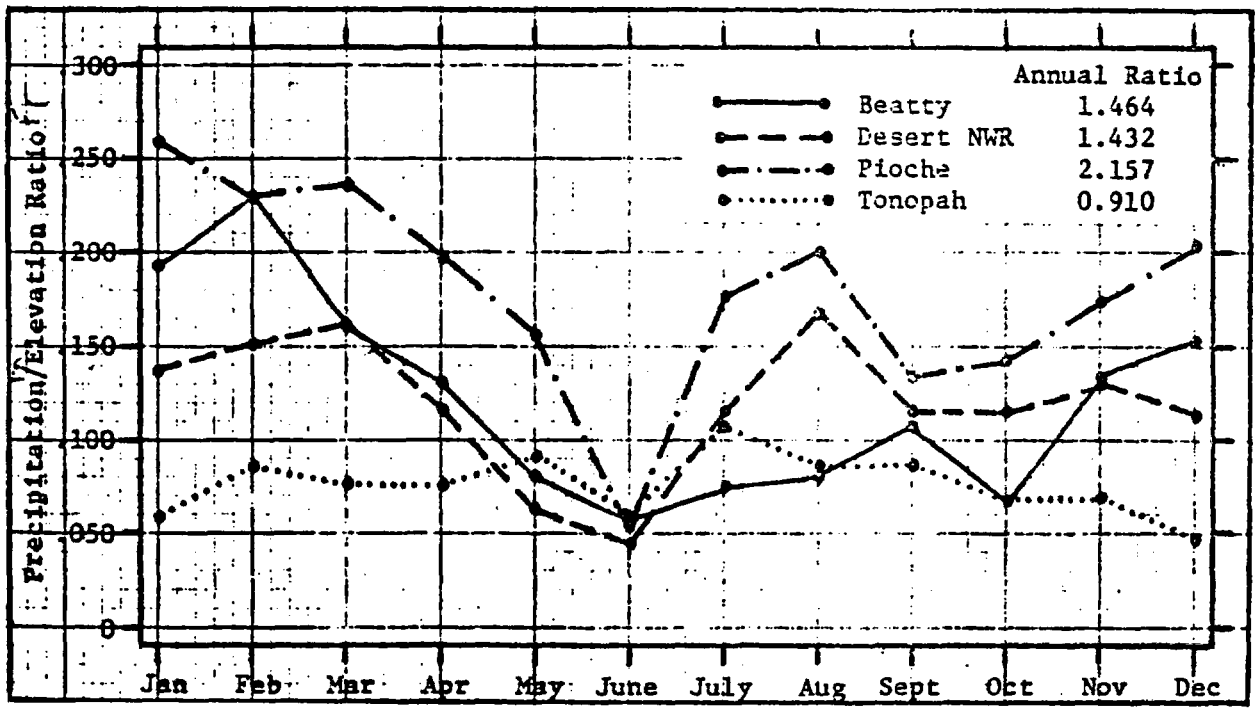


Figure 4. Annual Precipitation Cycle for 4 NWS Reference Stations, 1951-80 Normal

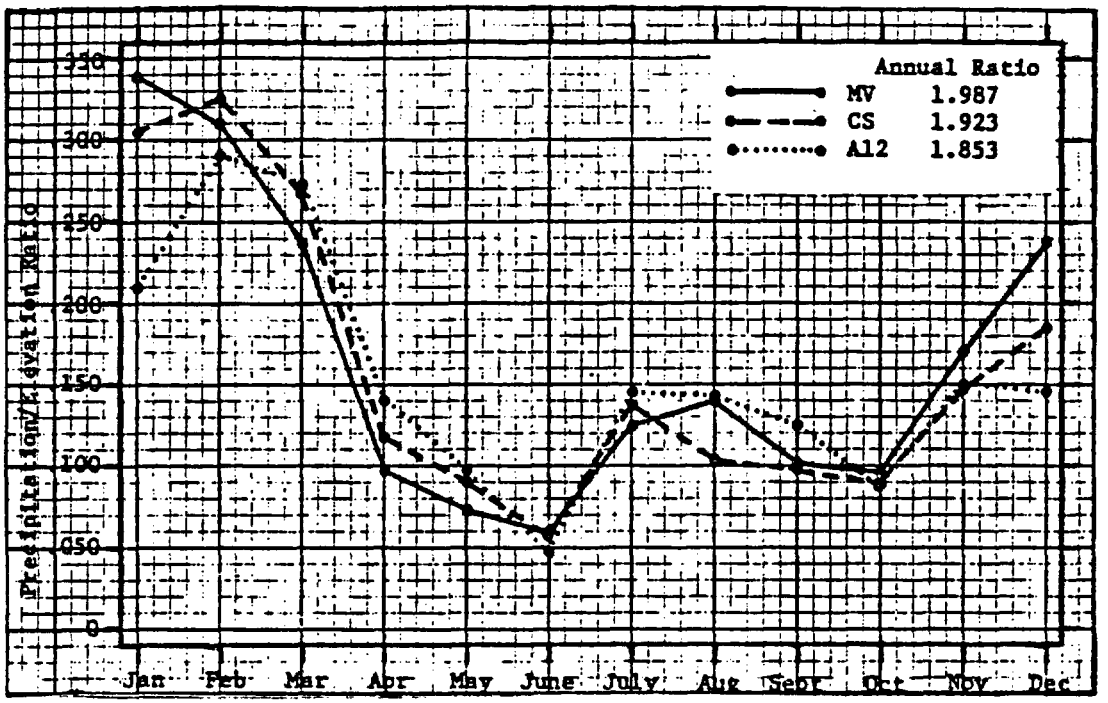


Figure 5. Annual Precipitation Cycle for 13 NTS Stations with the Highest Annual Precipitation/Elevation Ratio, October 1964-September 1981

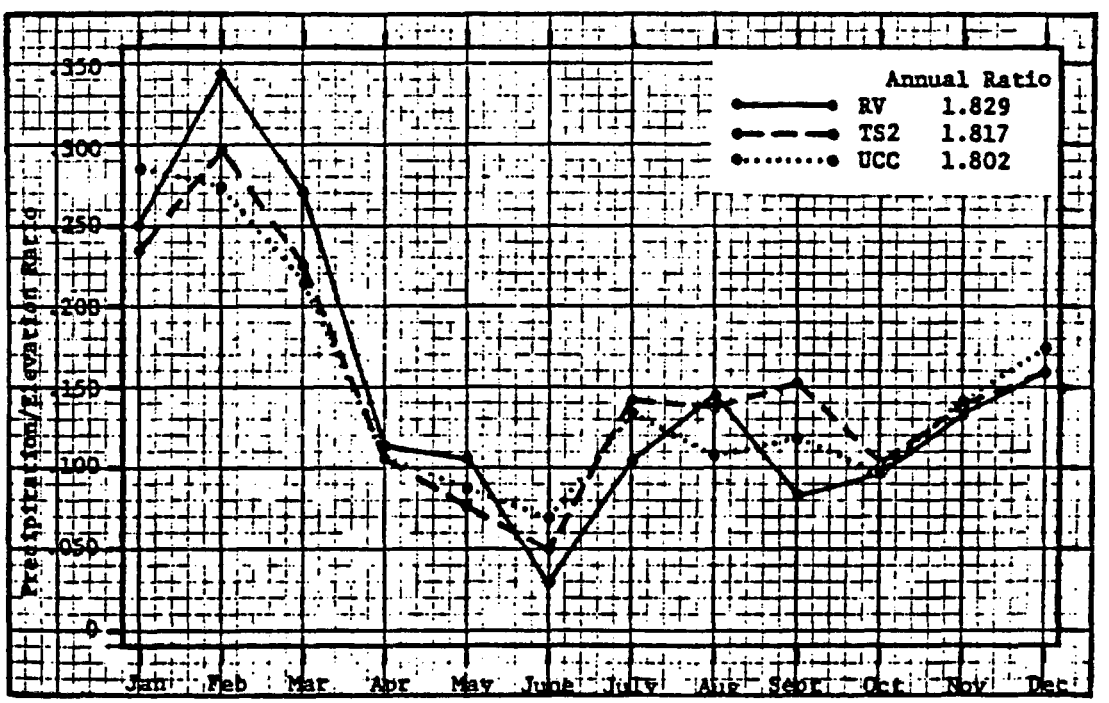


Figure 6. Same as Figure 5 for the Second Highest Group of 3 NTS Stations

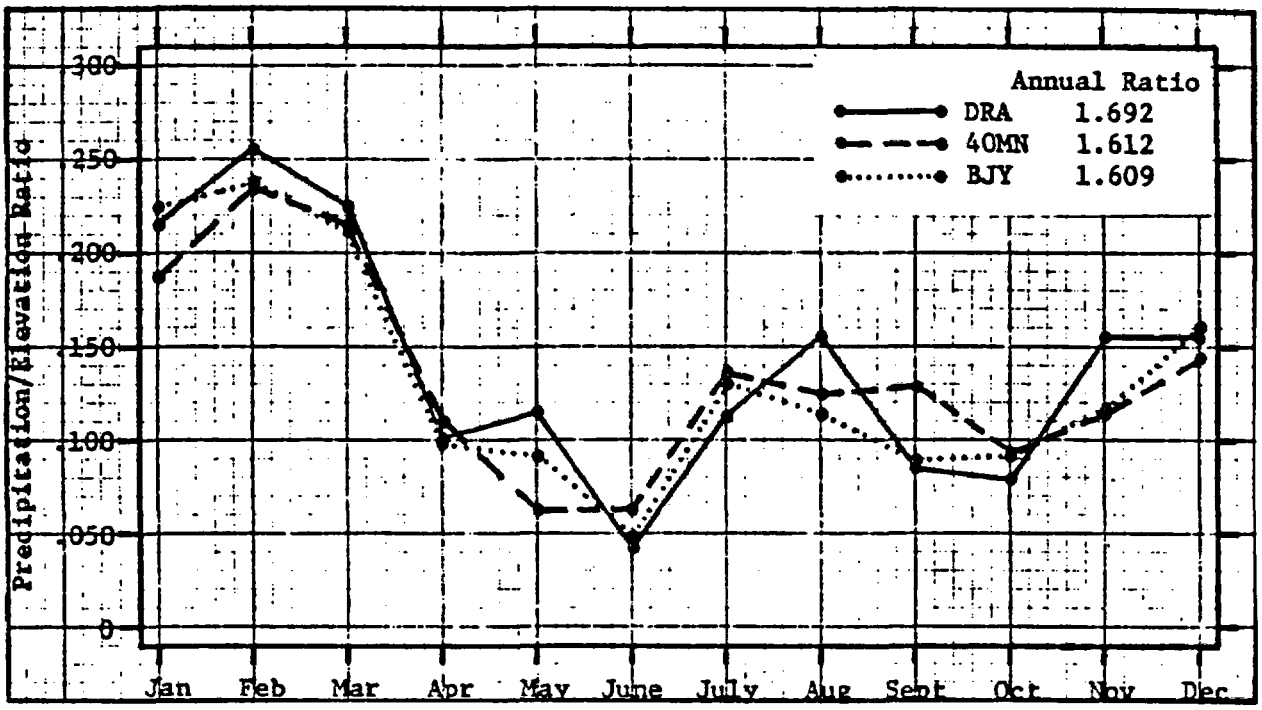


Figure 7. Same as Figure 5 for the Third Highest Group of NTS Stations

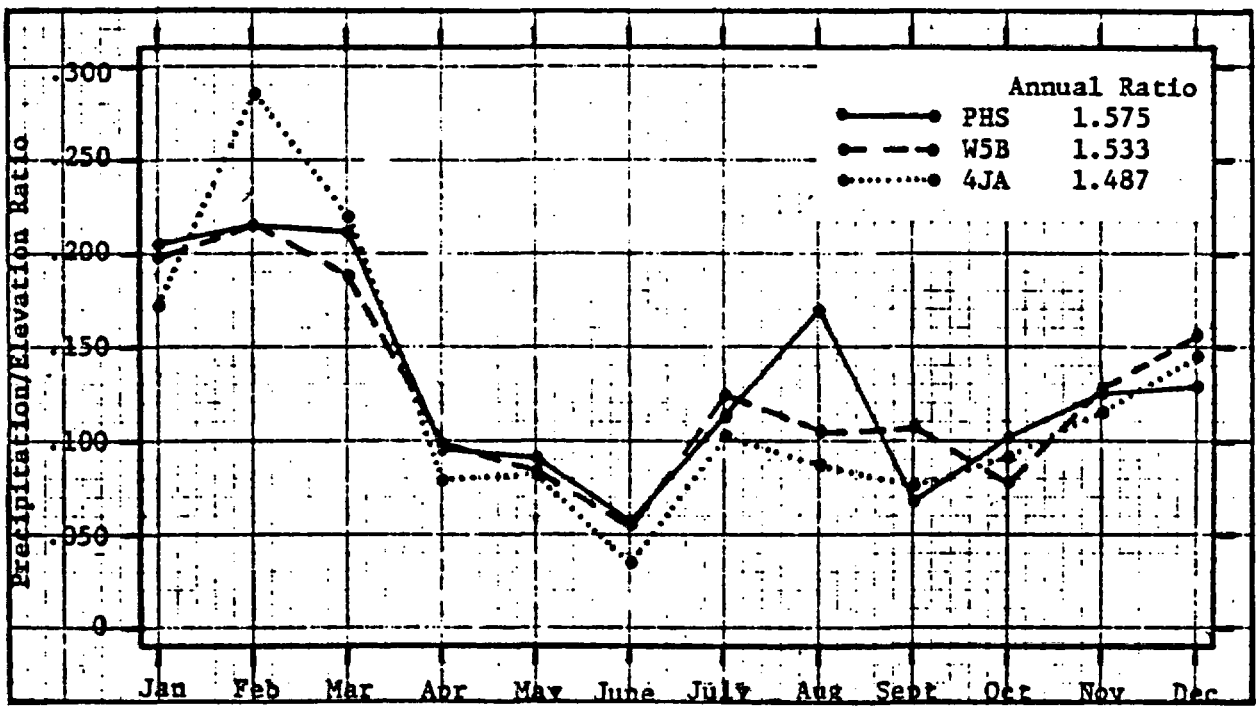


Figure 8. Same as Figure 5 for the Fourth Highest Group of 3 NTS Stations

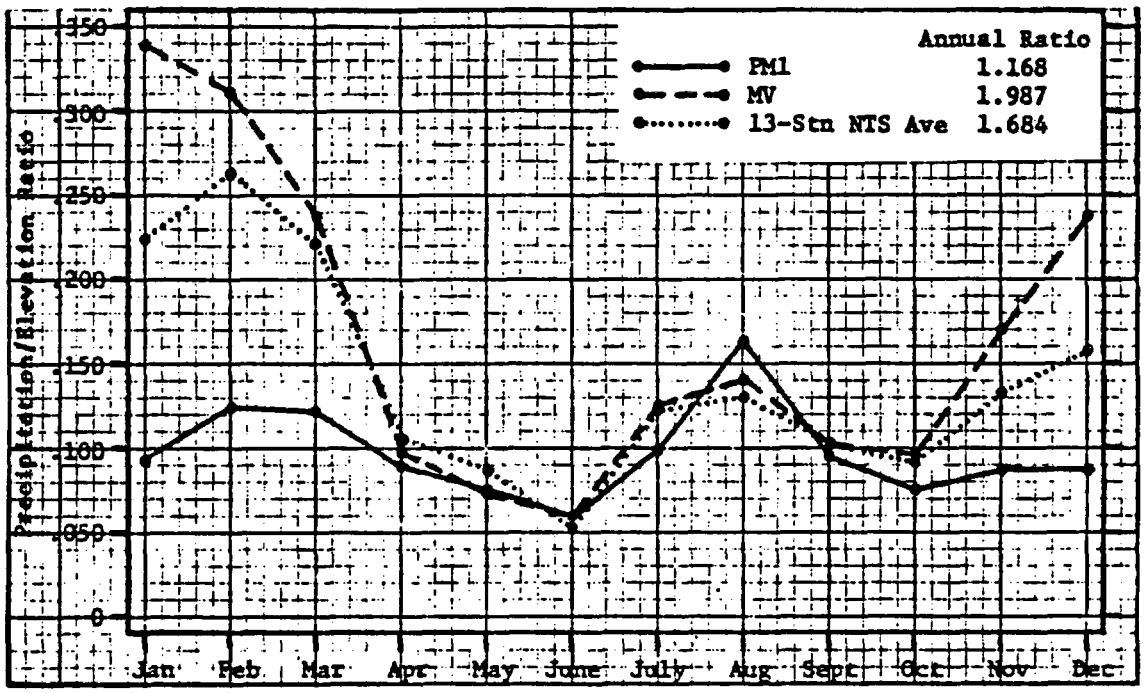


Figure 9. Annual Precipitation Cycle for the NTS Station with the Lowest Annual Precipitation/Elevation Ratio in Comparison with the 13-Station Average and the NTS Station with the Highest Ratio

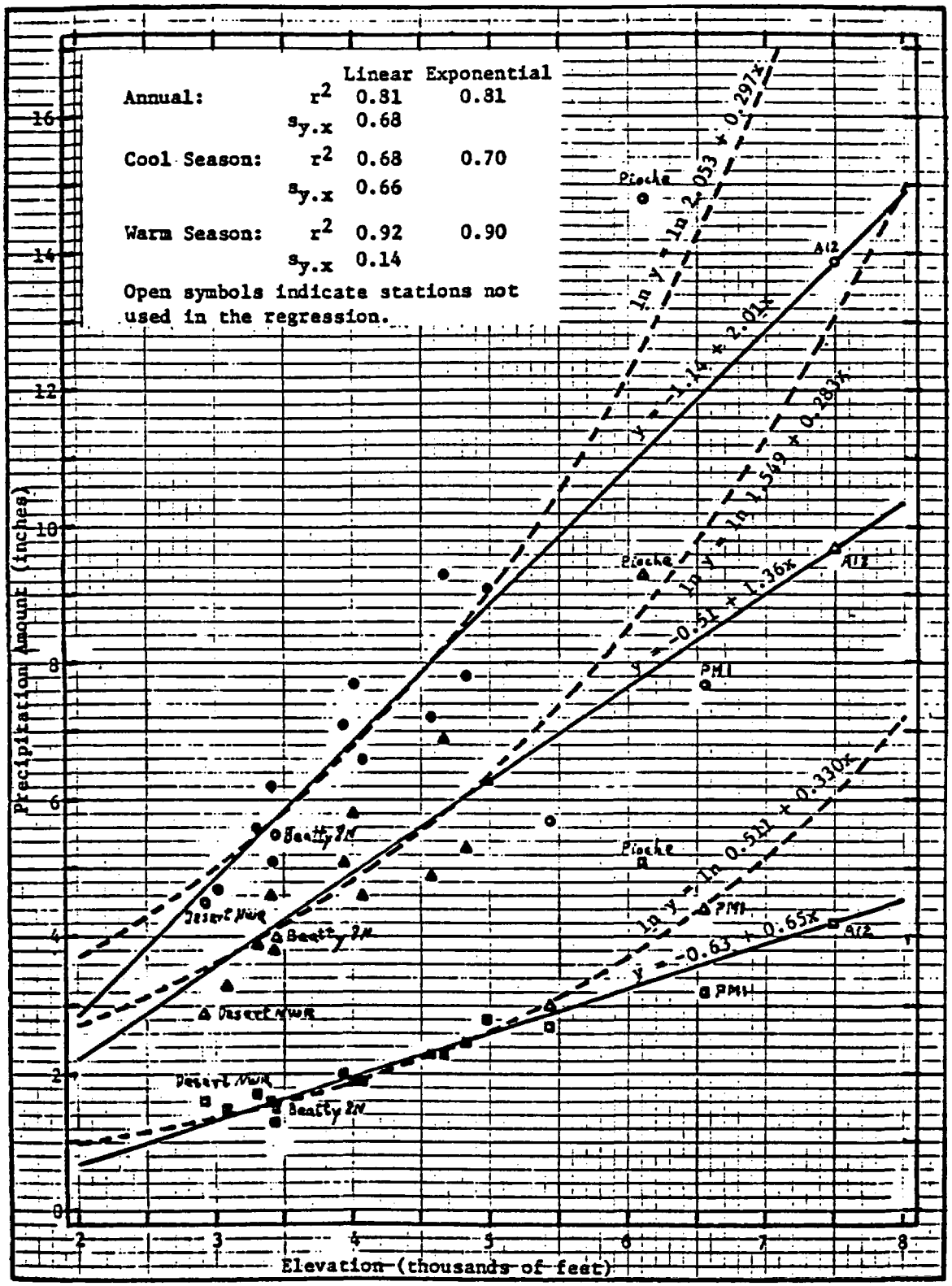


Figure 10. Linear and Exponential Regression of Precipitation Amount (Inches) on Elevation (Thousands of Feet) Based on Data for 11 NTS Stations Below 5000 feet, October 1964-September 1981

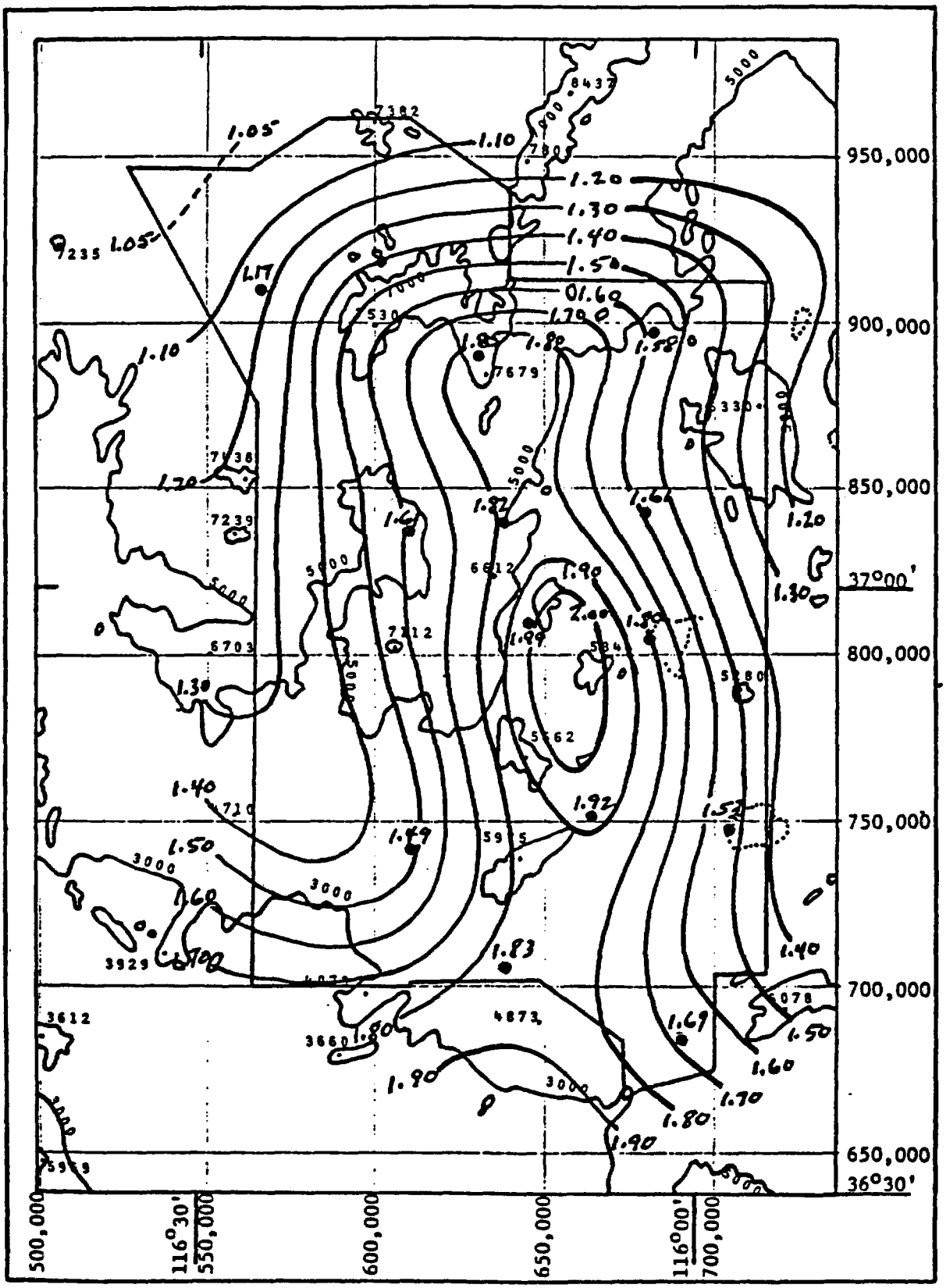
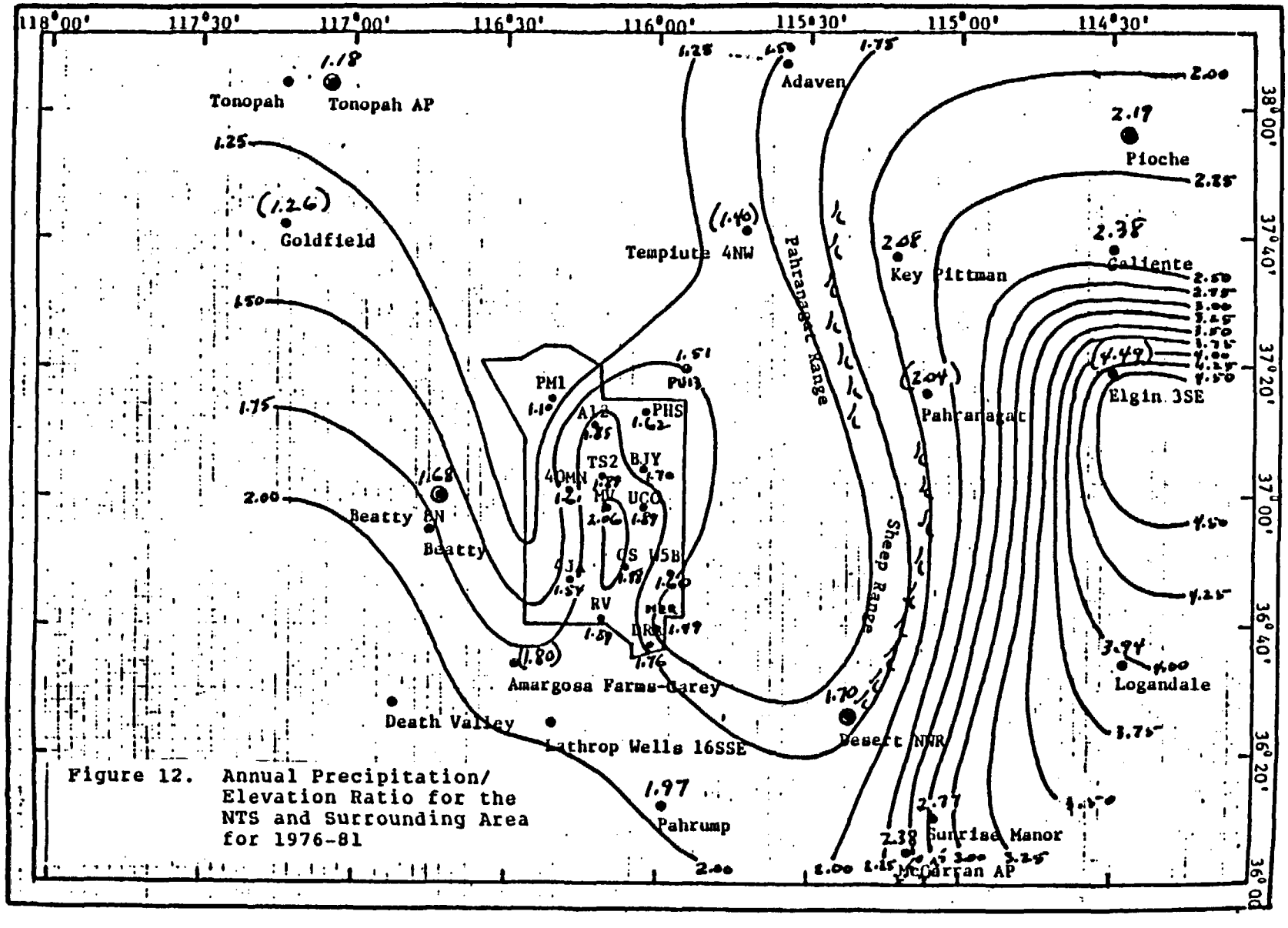


Figure 11. Annual Precipitation/Elevation Ratio for the NTS, October 1964-September 1981


118°00'
117°30'
117°00'
116°30'
116°00'
115°30'
115°00'
114°30'
38°00'
37°40'
37°20'
37°00'
36°40'
36°20'
36°00'
Tonopah
Tonopah AP
Goldfield
Tempiute 4NW
Adaven
Pioche
Caliente
Key Pittman
Pahranagat
Elgin 3SE
Logandale
Beatty 8N
Beatty
Amargosa Farms-Carey
Death Valley
Lathrop Wells 16SSE
Pahrump
Desert NWR
Sunrise Manor
McCarran AP
Pahranagat Range
Sheep Range
PM1
A12
PHS
TS2
BJY
40MN
MU
UCO
CS
U5B
RV
DRS
MBR
Figure 12. Annual Precipitation/ Elevation Ratio for the NTS and Surrounding Area for 1976-81

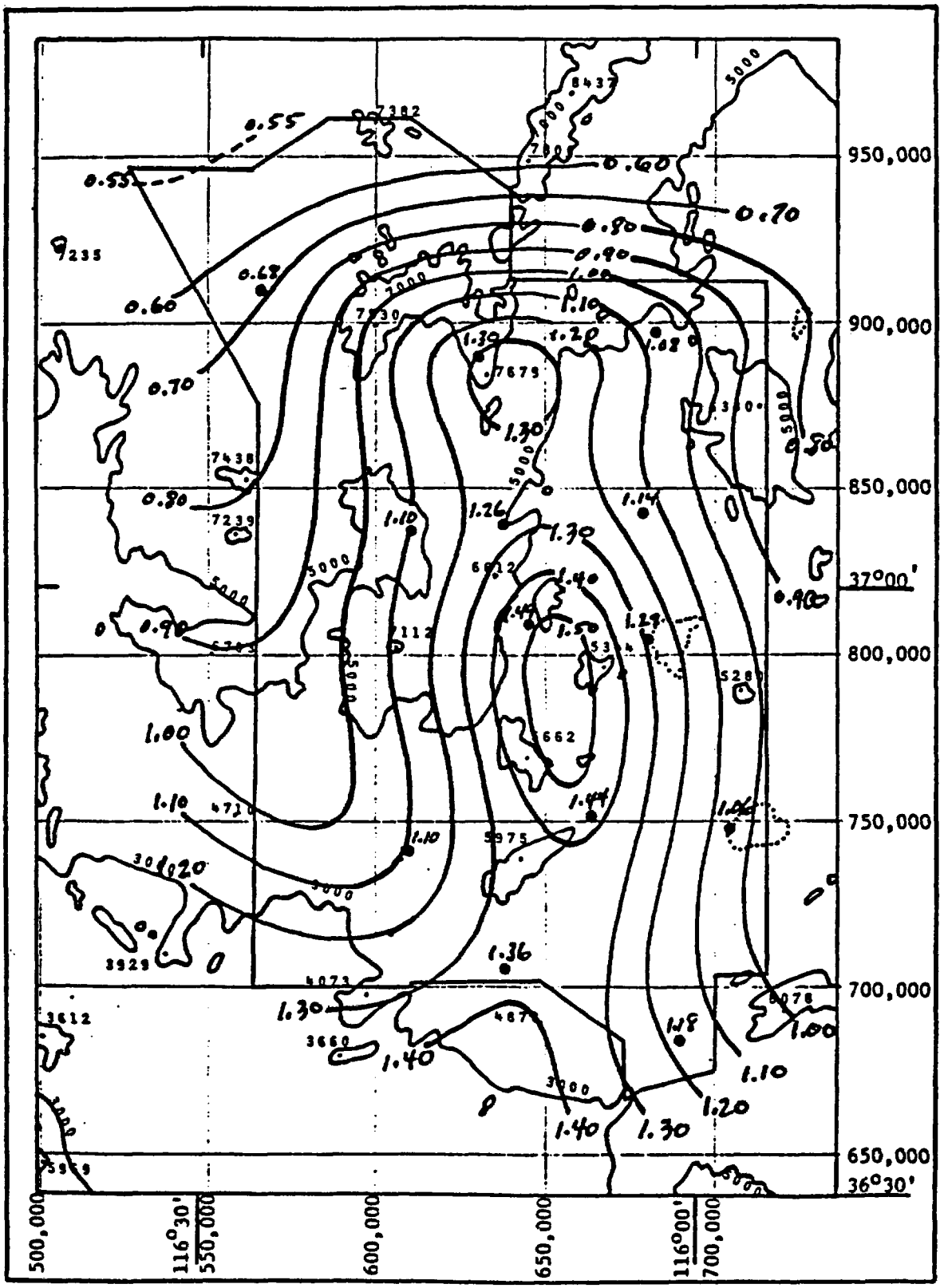


Figure 13. Cool Season (Oct-Apr) Precipitation/Elevation Ratio for the NTS, October 1964-September 1981

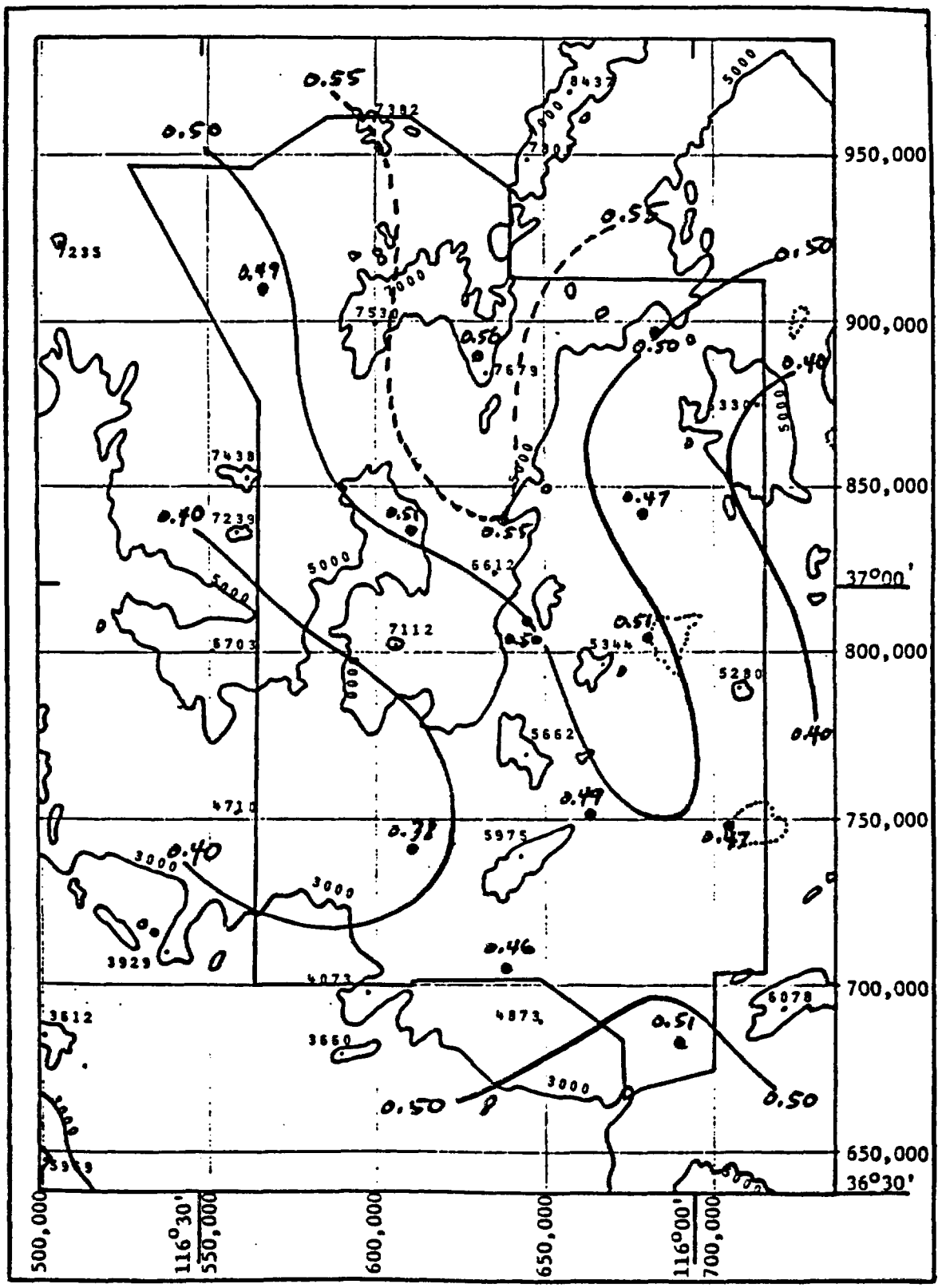


Figure 14. Warm Season (May-Sept) Precipitation/Elevation Ratio for the NTS, October 1964-September 1981

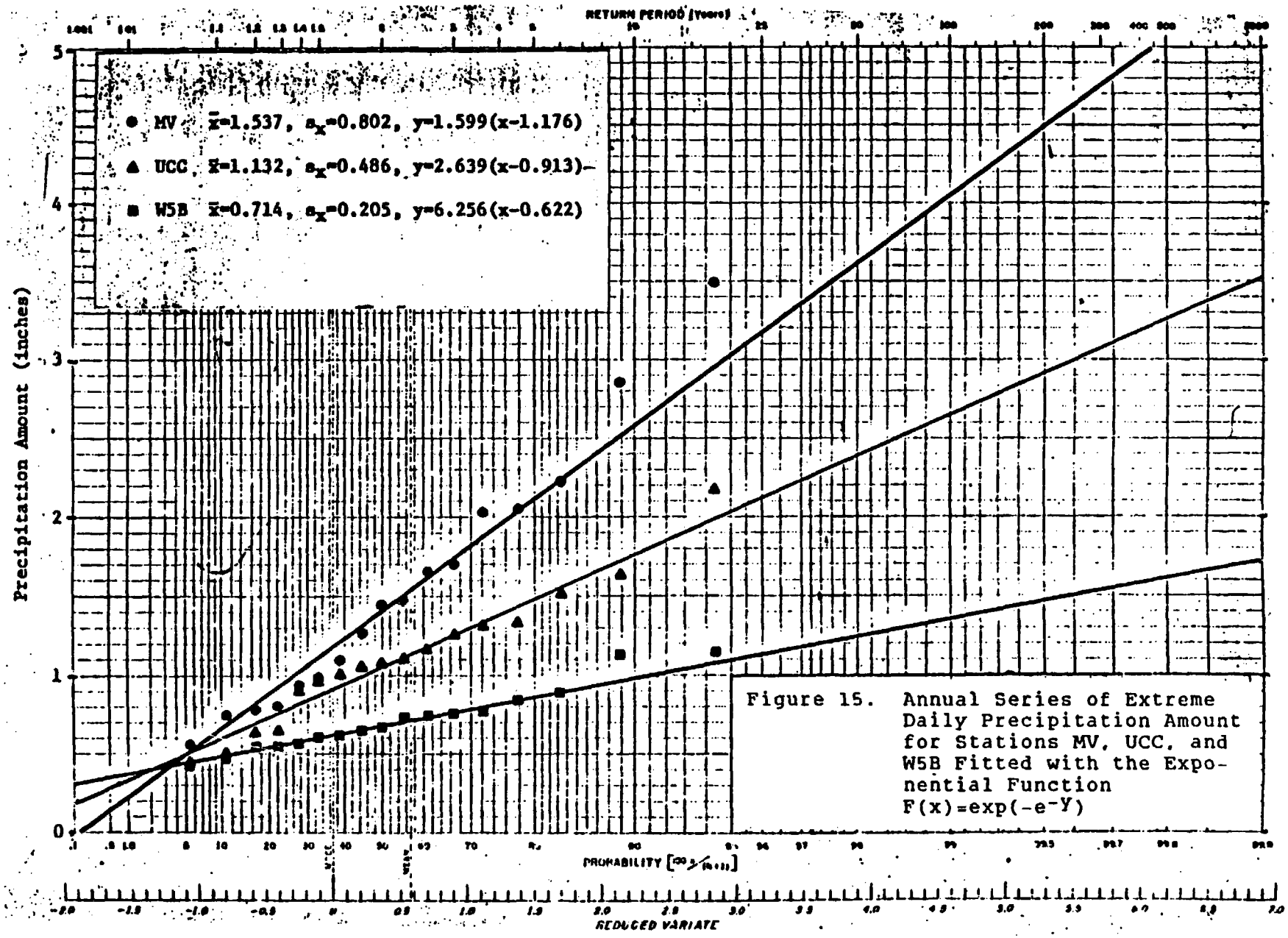


Figure 15. Annual Series of Extreme Daily Precipitation Amount for Stations MV, UCC, and W5B Fitted with the Exponential Function $F(x)=\exp(-e^{-y})$

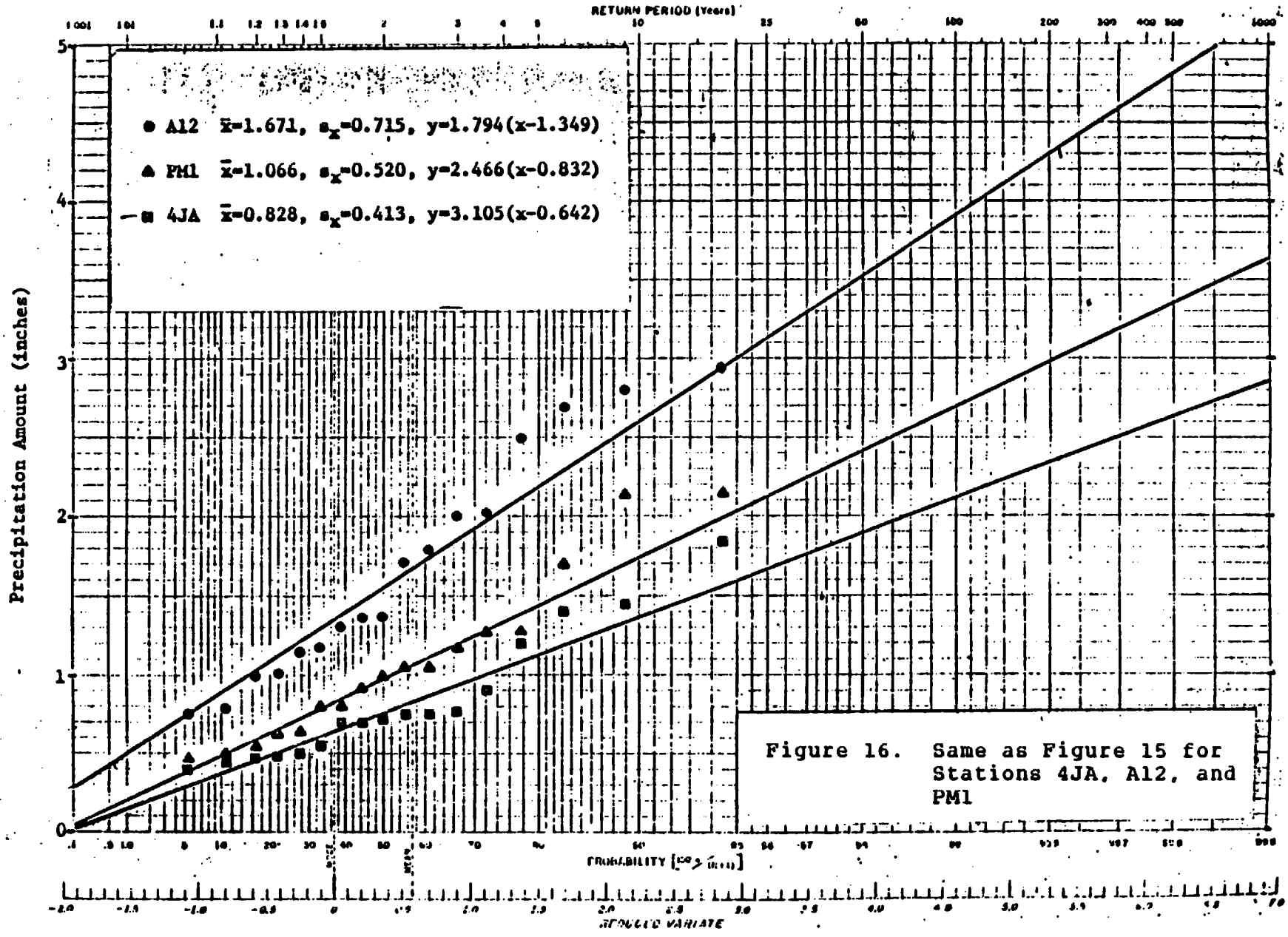


Figure 16. Same as Figure 15 for Stations 4JA, A12, and PM1

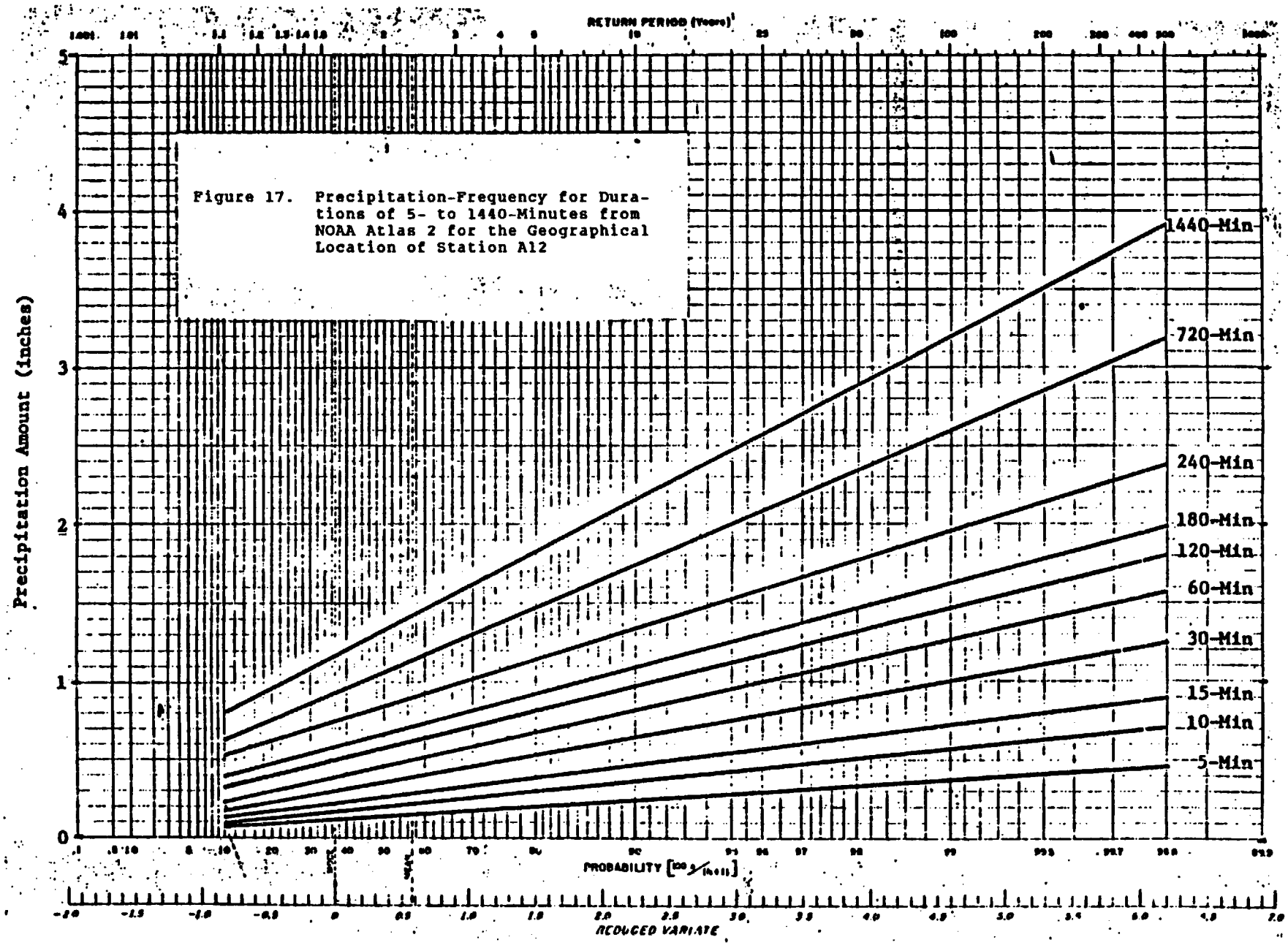


Figure 17. Precipitation-Frequency for Durations of 5- to 1440-Minutes from NOAA Atlas 2 for the Geographical Location of Station A12

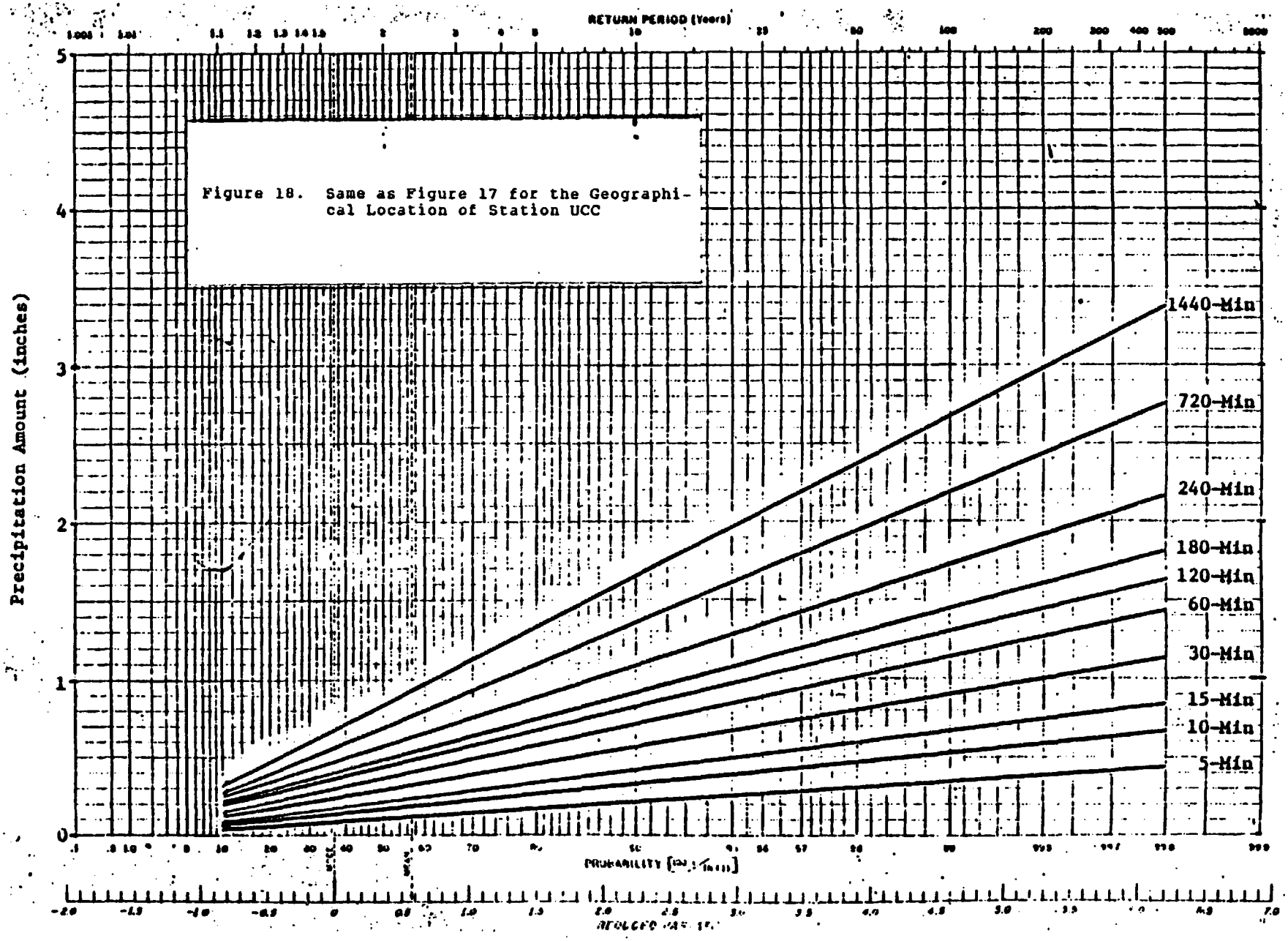


Figure 18. Same as Figure 17 for the Geographical Location of Station UCC

Table 1

Identifying Information for NTS Precipitation Stations

NTS Area	Station Name	Map ID	Type of Gage[1]	Elev (ft)	Nevada Coordinate System (Central) East	North	Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Record Starts	Ends
1	BJY	BJY	W	4070	679,100	842,300	37	03	46	116	03	09	2/17/60	
2	Station 353	353	W	4360	672,619	873,094	37	08	50	116	04	27	2/17/60	9/21/64
5	Frenchman Flat #1	FF1	W	3079	709,450	748,400	36	48	15	115	57	05	6/25/62	9/9/63
5	GMX	GMX	TB	3180	715,390	764,310	36	50	50	115	55	50	2/24/71	2/11/80
5	Well 5B	W5B	W	3080	705,200	747,600	36	48	07	115	57	55	9/9/63	
6	East Yucca	EUCC	W	3920	693,382	804,596	36	57	32	116	00	18	2/15/60	9/23/64
6	Yucca	UCC	W[2]	3924	680,875	803,600	36	57	23	116	02	51	5/11/58	
12	Area 12 Mesa	A12	W	7490	631,400	888,900	37	11	28	116	12	55	3/11/59	
12	Area 12 Mesa NE	12NE	W	7240	635,900	894,000	37	12	19	116	12	00	3/14/60	9/21/64
12	Area 12 Mesa NW	12NW	W	7670	625,800	896,000	37	12	39	116	14	04	3/14/60	9/21/64
12	Area 12 Mesa S	12S	W	7640	633,695	885,800	37	10	58	116	12	29	3/14/60	9/21/64
13	PU13	PU13	TB	4580	720,000	935,000	37	19	00	115	54	36	1/6/72	
14	Mid Valley	MV	W[3]	4660	644,500	809,250	36	58	21	116	10	19	9/28/64	
15	PHS Farm	PHS	TB[4]	4565	682,870	895,640	37	12	32	116	02	19	10/1/64	
16	Tippipah Spring	TS	W	5470	625,882	834,368	37	02	30	116	14	07	2/15/60	9/28/64
16	Tippipah Spring #2	TS2	W	4980	638,650	838,600	37	03	11	116	11	29	9/28/64	
17	Area 17	A17	TB	4932	646,488	853,330	37	05	36	116	09	51	4/21/78	3/26/79
18	Little Feller #1	LF1	TB	5160	602,000	858,520	37	06	30	116	19	02	8/4/76	
18	Little Feller #2	LF2	W	5120	605,850	862,100	37	07	05	116	18	14	8/4/76	
19	Pahute Mesa #3	PM3	W	6490	583,900	914,750	37	15	47	116	22	42	9/10/64	7/17/73
19	Pahute Mesa #4	PM4	W	6900	604,250	911,500	37	15	15	116	18	30	10/12/64	7/17/73
19	Pahute Mesa #5	PM5	W	6750	604,750	937,800	37	19	33	116	18	22	9/10/64	7/3/73
20	Pahute Mesa #1	PM1	TB[5]	6550	566,700	909,700	37	14	56	116	26	15	1/17/64	
20	Pahute Mesa #2	PM2	W	6340	560,000	928,700	37	18	04	116	27	36	9/10/64	7/17/73
20	U20K 1 Mi N	U20k	S	6070	541,300	926,000	37	17	37	116	31	29	8/10/77	

Table 1

Identifying Information for NTS Precipitation Stations (continued)

NTS Area	Station Name	Map ID	Type of Gage[1]	Elev (ft)	Nevada Coordinate System (Central) East	North	Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Record Starts	Ends
22	Desert Rock	DR	M[6]	3298	690,040	682,790	36	37	27	116	01	08	10/17/63	
23	Mercury Airstrip	MAS	W	3640	694,100	694,300	36	39	21	116	00	19	9/17/62	10/17/63
23	Mercury	MER	W	3770	696,738	695,045	36	39	29	115	59	45	3/12/71	
25	ADA27	ADA27	W	2840	580,500	708,000	36	41	42	116	23	31	2/4/65	10/15/69
25	4JA (old)	4JAo	W	3610	617,000	748,000	36	48	16	116	16	02	12/10/57	1/11/67
25	4JA (new)	4JAn	TB[7]	3422	610,605	740,840	36	47	05	116	17	20	1/11/67	
25	Tower 6	T6	W	3256	584,789	745,662	36	47	53	116	22	38	12/19/58	9/17/64
25	Tower 15	T15	TB	3740	594,000	758,000	36	49	56	116	20	44	9/1/66	4/30/68
26	Cane Spring	CS	W	4000	663,600	751,000	36	48	44	116	06	29	9/24/64	
26	Lookout Peak	LP	W	5644	646,150	766,750	36	51	20	116	10	02	2/16/60	5/15/67
26	Tower 1A[10]	T1A	W	4355	653,452	755,673	36	49	30	116	08	33	10/29/59	6/25/62
28	Rock Valley	RV	TB[8]	3400	639,050	704,700	36	41	07	116	11	33	2/26/63	
29	Shoshone Basin	SB	W	5660	620,700	795,000	36	56	01	116	15	14	10/22/59	7/23/73
29	Tower 9	T9	W	4868	636,195	780,510	36	53	36	116	12	03	12/18/58	9/17/64
30	40MN	40MN	W[9]	4820	610,600	837,100	37	02	57	116	17	15	2/15/60	
Other	Schultz Ranch	SR	W	2390	527,840	665,210	36	34	39	116	34	24	1/19/64	9/15/70

Reference Notes:

1. Type of gage -- W = Weighing, TB = Tipping Bucket, S = Storage, M = Manual (6-hourly readings).
2. Yucca -- Manual raingage 6/3/66 to 5/15/78.
3. Mid Valley -- Tipping bucket raingage 8/30/66 to 7/12/71.
4. PHS Farm -- Weighing raingage prior to 7/31/73.
5. Pahute Mesa #1 -- Weighing raingage prior to 8/2/68.
6. Desert Rock -- Weighing raingage prior to 4/12/66, tipping bucket raingage 4/12/66 to 5/15/78. Location prior to 5/15/78 was approximately 2200 feet WSW at an elevation of 3250 feet.
7. 4JA (new) -- Weighing raingage prior to 7/19/73.
8. Rock Valley -- Weighing raingage prior to 8/25/66.
9. 40MN -- Tipping bucket raingage 9/15/66 to 7/7/71.
10. Tower 1A -- Raingage moved to E655,131 N756,000 at an elevation of 4299 feet on 12/19/61.

Table 2

Average Monthly and Annual Precipitation for the Period of Record through 1981

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1	BJY	21	.76	.87	.73	.34	.33	.21	.48	.45	.43	.36	.50	.57	6.03
2	353	4	.27	.43	.27	.13	.17	.14	.35	.71	.68	.31	.64	.37	4.47
5	FF1	1	(Included with W5B)												
5	GMX	9	.68	.64	.64	.16	.38	.12	.31	.40	.25	.37	.28	.48	5.23
5	W5B	18	.55	.62	.54	.30	.25	.18	.36	.32	.43	.22	.38	.44	4.59
6	EUCC	4	.13	.44	.24	.16	.11	.28	.19	.48	.81	.41	.73	.40	4.38
6	UCC	23	.91	.92	.72	.36	.28	.24	.48	.41	.49	.35	.59	.59	6.34
12	A12	22	1.39	1.92	1.72	.87	.62	.35	.93	1.05	.93	.60	1.12	.88	12.38
12	12NE	4	.49	.79	.46	.26	.24	.29	.51	.71	.90	.32	.84	.23	6.04
12	12NW	4	.62	1.03	.60	.33	.38	.38	.57	1.07	1.04	.36	1.02	.34	7.74
12	12S	4	.51	.93	.70	.44	.36	.35	.56	.87	.95	.41	1.02	.31	7.41
13	PU13	10	1.06	.86	1.06	.27	.42	.25	.63	.78	.38	.60	.37	.23	6.91
14	MV	17	1.58	1.45	1.11	.45	.34	.28	.58	.65	.47	.43	.81	1.05	9.20
15	PHS	17	.93	.98	.96	.44	.41	.26	.51	.77	.31	.46	.56	.56	7.15
16	TS	4	.37	.69	.51	.27	.13	.22	.50	.78	.79	.40	.84	.53	6.03
16	TS2[1]	17	1.17	1.48	1.12	.53	.38	.25	.70	.68	.75	.50	.71	.75	9.02
17	A17	0	(Less than 1 year)												
18	LF1	5	1.26	.89	1.60	.43	.39	.06	.33	.64	.80	.30	.23	.29	7.22
18	LF2	5	1.69	1.10	2.00	.54	.56	.14	.35	.64	1.04	.39	.29	.33	9.07
19	PM3	8	.86	1.25	.68	1.01	.53	.94	1.48	1.59	.52	.43	1.13	1.15	11.57
19	PM4	8	1.12	1.68	.91	1.08	.56	.63	1.75	1.37	.42	.43	1.68	1.51	13.14
19	PM5	8	.52	.79	.47	.80	.44	.69	1.57	.75	.34	.56	.76	.78	8.47
20	PM1	17	.58	.78	.77	.58	.51	.38	.67	1.06	.59	.50	.56	.54	7.50
20	PM2	8	.63	.84	.66	.90	.44	.69	.84	1.08	.44	.42	.87	.91	8.72
20	U20k	4	1.40	1.19	1.96	1.03	.80	.03	.79	.82	.77	.22	.32	.40	9.73

Table 2

Average Monthly and Annual Precipitation for the Period of Record through 1981 (continued)

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
22	DRA	19	.64	.78	.70	.33	.35	.14	.34	.52	.38	.25	.50	.46	5.39
23	MAS	1	(Included with DRA)												
23	MER	10	.78	.80	.88	.25	.47	.13	.30	.36	.39	.35	.35	.49	5.53
25	ADA27	4	.50	.85	.18	.48	.09	.38	.83	.27	.14	.09	.83	.63	5.27
25	4JAn	15	.63	1.08	.83	.18	.31	.13	.35	.31	.28	.32	.33	.33	5.08
25	4JAo	9	.27	.39	.16	.34	.11	.07	.19	.25	.47	.21	.54	.63	3.63
25	T6	5	.37	.59	.16	.10	.15	.14	.50	.22	.50	.22	.61	.44	4.00
25	T15	1	(Record unreliable)												
26	CS	17	1.22	1.30	1.07	.47	.36	.23	.55	.41	.39	.35	.60	.70	7.65
26	LP[2]	7	.26	.37	.23	.42	.08	.13	.35	.73	.46	.20	.75	.57	4.55
26	T1A	2	.40	.74	.36	.13	.14	.10	.27	.45	.63	.49	1.03	.80	5.54
28	RV	18	.81	1.11	.86	.37	.33	.11	.36	.49	.32	.31	.47	.48	6.02
29	SB	13	.90	1.23	.72	.51	.30	.31	.65	.98	.62	.41	1.17	1.13	8.93
29	T9	5	.52	1.03	.26	.26	.10	.19	.37	.55	.93	.26	.67	.66	5.80
30	40MN	21	.78	1.05	.88	.46	.26	.28	.64	.62	.70	.43	.61	.60	7.31
Other	SR	6	.31	.78	.10	.34	.07	.15	.40	.38	.06	.04	.39	.35	3.37

Reference Notes:

1. Excessive precipitation initially recorded for September 1975 has been downgraded from 8.65 to 3.65 inches.

2. Precipitation amounts at this location are about 60 percent of expectations due to extreme windiness.

Table 3

Average Monthly and Annual Number of Days with Measurable Precipitation for the Period of Record through 1981

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1	BJY	21	4	4	5	4	3	2	3	3	3	2	3	3	38
2	353	4	3	3	4	4	3	3	3	3	2	3	3	1	35
5	FF1	1	(Included with W5B)												
5	GMX	9	4	4	5	2	3	1	2	2	2	2	2	3	31
5	W5B	18	4	4	4	3	2	2	3	2	2	2	3	2	32
6	EUCC	4	1	2	3	3	2	2	2	3	2	2	3	1	28
6	UCC	23	4	4	5	3	2	2	3	3	2	2	3	2	34
12	A12	22	5	6	7	5	4	3	5	5	3	3	4	4	54
12	12NF	4	3	4	6	5	4	3	4	5	3	4	4	2	46
12	12NW	4	3	5	6	5	4	4	3	6	2	4	4	2	47
12	12S	4	3	4	7	5	4	4	3	5	2	4	5	2	49
13	PU13	10	6	4	7	4	3	2	3	3	3	3	3	2	42
14	MV	17	5	5	6	4	3	2	3	4	2	2	3	4	42
15	PHS	17	5	5	6	4	3	2	4	4	3	2	3	3	42
16	TS	4	2	4	5	4	3	3	3	5	3	4	4	2	41
16	TS2	17	6	5	6	4	4	2	4	4	3	3	3	4	46
17	A17	0	(Less than 1 year)												
18	LF1	5	7	5	9	4	3	1	1	3	3	2	2	3	45
18	LF2	5	8	5	10	4	5	1	2	3	4	3	2	3	49
19	PM3	8	4	5	4	6	4	4	6	6	3	3	5	6	56
19	PM4	8	4	6	5	6	3	4	7	6	3	3	6	6	59
19	PM5	8	4	5	4	6	3	4	6	5	3	3	5	6	53
20	PM1	17	5	5	6	5	4	2	4	4	3	2	4	4	48
20	PM2	8	4	5	4	6	4	4	5	6	3	2	5	5	54
20	U20k	4	(Data not available)												

Table 3

Average Monthly and Annual Number of Days with Measurable Precipitation for the Period of Record through 1981 (continued)

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
22	DRA	19	4	4	4	3	2	2	3	3	2	2	3	2	32
23	MAS	1	(Included with DRA)												
23	MER	10	5	4	6	3	3	1	2	3	2	3	3	3	35
25	ADA27	4	3	3	2	3	2	3	3	3	1	1	3	2	30
25	4JAn	15	4	4	5	3	2	1	2	2	2	2	2	2	32
25	4JAo	9	2	3	3	3	1	1	2	3	2	1	3	2	25
25	T6	5	2	4	3	2	1	2	2	2	2	2	3	1	25
25	T15	1	(Record unreliable)												
26	CS	17	5	4	5	3	2	2	3	3	2	2	2	3	36
26	LP	7	2	2	3	5	1	2	3	3	2	1	4	2	31
26	T1A	2	3	4	4	2	2	2	2	4	2	3	4	2	32
28	RV	18	4	4	4	3	2	2	2	2	2	2	3	2	31
29	SB	13	3	5	5	5	3	3	4	4	2	3	4	4	43
29	T9	5	3	4	4	3	2	3	3	2	2	3	3	2	33
30	40MN	21	5	5	6	4	3	2	3	3	3	3	3	3	43
Other	SR	6	2	3	2	4	1	2	3	3	1	1	3	2	24

Table 4

Greatest Monthly and Annual Precipitation Amounts, with the Year Occurrence (Most Recent Year if More than One), for the Period of Record through 1981

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1	BJY	21	3.41/69	3.42/78	3.58/73	2.40/65	2.02/77	1.22/72	1.54/65	2.38/77	1.89/63	1.49/72	2.37/65	2.61/71	12.13/78
2	353	4	.47/61	1.33/62	.45/63	.20/63	.30/64	.27/60	.96/64	1.53/61	1.53/63	.88/60	1.50/60	1.30/61	5.22/61
5	FF1	1	(Included with W5B)												
5	GMX	9	1.86/78	2.27/78	2.40/73	.48/78	1.16/77	.98/72	1.29/74	1.51/77	.90/72	1.09/76	1.09/72	1.32/71	8.22/78
5	W5B	18	1.93/78	2.79/69	2.40/73	1.66/65	1.03/77	.88/69	1.63/74	1.51/77	2.16/63	1.13/76	1.39/65	2.28/65	8.72/78
6	EUCC	4	.35/61	1.15/62	.32/62	.39/64	.19/61	.83/63	.40/64	1.39/63	2.04/63	1.06/60	1.57/60	1.17/61	6.12/63
6	UCC	23	4.02/69	3.60/78	3.50/78	2.70/65	1.62/71	2.66/72	1.87/76	2.52/77	2.38/69	1.69/76	3.02/65	2.66/65	14.05/77
12	A12	22	6.21/69	8.45/69	7.82/78	5.67/65	2.60/77	1.35/69	3.24/68	3.85/77	3.82/76	2.90/74	4.67/65	4.33/65	26.79/78
12	12NE	4	.74/62	2.48/62	.64/64	.51/64	.58/64	.74/63	1.44/61	1.64/61	2.18/63	.52/60	2.43/60	.69/61	6.12/63
12	12NW	4	.81/62	3.20/62	.90/64	.72/64	.84/64	.90/63	1.36/61	2.97/61	2.60/63	.48/60	2.89/60	.94/61	8.65/62
12	12S	4	.76/62	2.98/62	.91/62	.72/60	.74/64	1.06/63	1.13/61	2.25/61	2.06/63	.71/60	2.80/60	.93/61	7.43/62
13	PU13	10	2.84/78	2.75/78	2.80/78	.75/78	2.14/77	1.39/72	2.03/76	4.05/77	1.21/76	1.37/74	1.33/72	.76/77	13.14/78
14	MV	17	7.45/69	5.05/69	4.70/78	2.97/65	1.70/71	1.61/72	1.65/66	2.44/77	3.19/76	2.02/72	5.50/65	4.00/71	18.45/78
15	PHS	17	3.69/69	3.52/78	3.70/78	3.15/65	2.10/77	1.32/72	1.66/68	2.44/71	1.95/76	1.67/72	2.66/65	2.68/65	15.01/78
16	TS	4	.50/64	1.96/62	.75/62	.45/63	.20/63	.40/60	1.31/64	1.54/61	1.73/63	.78/60	2.13/60	1.60/61	6.26/63
16	TS2[1]	17	4.91/69	6.15/69	4.04/78	2.88/65	1.61/71	1.15/69	3.67/69	2.74/77	3.65/75	2.51/72	3.41/65	2.92/65	19.36/69
17	A17	0	(Less than 1 year)												
18	LF1	5	2.64/78	2.70/78	3.08/78	1.50/78	1.33/77	.26/77	1.41/79	2.63/77	1.64/76	1.07/76	.62/78	.60/77	13.43/78
18	LF2	5	3.30/78	3.37/78	3.70/78	1.69/78	1.63/77	.39/77	1.53/79	2.94/77	2.00/76	1.30/76	.93/78	.79/78	15.78/78
19	PM3	8	4.70/69	4.05/69	1.95/73	3.06/65	1.90/73	3.18/72	3.50/68	2.92/67	2.88/67	2.33/72	2.72/65	2.75/65	19.05/69
19	PM4	8	6.60/69	6.00/69	2.75/73	2.98/65	2.14/71	1.40/72	4.91/68	2.85/71	1.00/72	2.43/72	5.56/65	4.25/71	24.56/69
19	PM5	8	2.55/69	2.86/68	1.55/73	2.37/65	1.70/71	1.84/72	2.93/69	1.92/65	1.11/66	2.79/72	1.57/65	1.83/71	11.31/69
20	PM1	17	2.50/69	2.73/68	3.20/78	2.24/67	2.04/77	2.36/72	1.62/74	3.24/71	1.95/78	1.84/74	2.51/65	1.84/65	11.91/65
20	PM2	8	2.70/69	2.55/68	3.35/73	2.33/67	1.80/71	2.61/72	1.91/68	1.89/71	1.74/67	2.02/72	1.99/65	2.24/65	10/76/65
20	U20k	4	2.20/80	2.80/78	3.65/78	2.70/78	1.55/80	.05/80	1.50/79	2.25/77	1.95/78	.55/81	.79/77	.95/78	16.75/78

Table 4

Greatest Monthly and Annual Precipitation Amounts, with the Year Occurrence (Most Recent Year if More than One), for the Period of Record through 1981 (continued)

MTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
22	DRA	19	2.15/66	2.57/69	3.08/73	1.95/65	1.57/81	.56/66	1.46/68	1.57/77	2.28/63	1.05/76	2.07/65	2.45/65	10.08/78
23	MAS	1	(Included with DRA)												
23	MER	10	2.07/80	2.03/78	2.63/73	.79/78	1.18/77	1.19/72	.96/76	1.83/72	1.67/76	1.07/72	1.67/78	1.42/71	9.62/78
25	ADA27	4	1.21/69	2.68/69	.52/69	1.20/65	.35/67	1.00/69	1.46/69	.55/67	.27/69	.28/68	2.00/65	2.39/65	7.34/65
25	4JAn	15	2.29/78	3.45/69	3.00/78	.63/67	1.41/77	.67/69	1.50/68	1.97/77	2.13/76	1.42/72	1.22/72	1.78/71	11.62/78
25	4JAo	9	.62/60	1.01/63	.35/63	1.91/65	.28/63	.26/64	.48/66	.71/61	1.68/63	.63/58	1.67/65	3.03/65	8.06/65
25	T6	5	.88/60	1.20/62	.30/64	.45/64	.48/63	.55/64	2.29/64	.54/61	1.62/63	.76/60	1.49/60	1.14/59	4.61/63
25	T15	1	(Record unreliable)												
26	CS	17	4.31/69	4.70/69	3.89/78	2.94/65	1.62/71	1.82/69	3.16/68	1.93/72	3.54/76	1.46/74	2.36/65	2.38/65	16.31/78
26	LP	7	.50/61	1.29/62	.46/65	2.24/65	.18/63	.45/63	.99/66	1.57/63	1.23/63	.60/60	2.47/65	1.70/65	8.87/65
26	T1A	2	.63/60	1.57/62	.49/62	.31/60	.24/61	.16/62	.47/61	.87/61	1.26/60	.80/60	1.63/60	1.55/61	5.80/60
28	RV	18	2.68/69	4.06/69	3.02/73	2.37/65	1.80/77	.48/69	2.01/68	2.34/77	2.01/76	1.37/76	1.94/65	2.46/65	13.78/78
29	SB	13	7.03/69	4.61/69	3.40/73	2.36/65	1.73/71	.95/72	2.41/68	3.21/71	2.48/63	2.01/72	6.31/65	3.95/65	18.63/69
29	T9	5	.96/61	2.07/62	.41/64	1.13/64	.27/63	.50/64	.92/64	1.17/64	1.79/63	.77/60	1.39/60	1.47/59	6.13/59
30	40MN	21	4.15/69	4.63/76	3.55/78	2.69/65	1.45/77	1.96/69	2.52/69	2.84/77	3.23/76	2.18/74	2.42/65	2.17/65	14.69/78
Other	SR	6	.92/69	2.27/69	.23/65	1.04/65	.29/64	.60/69	1.39/64	1.13/67	.18/67	.13/68	.89/67	1.51/65	5.17/65

Reference Note:

1. Value for September uncertain because chart drive had stopped and chart limit had been exceeded. Value could have been as great as 8.65 inches based on the observation that the bucket was near brimful.

Table 5

Greatest Daily Precipitation Amount, with the Year of Occurrence (Most Recent Year if More than One), for the Period of Record through 1981

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1	BJY	21	1.31/69	1.22/78	.95/78	1.05/65	.83/71	.39/72	1.32/65	1.99/77	1.14/69	1.20/76	1.23/60	1.30/74	1.99/Aug. 77
2	353	4	.47/61	.47/62	.42/63	.12/64	.25/61	.27/60	.88/64	.97/63	.92/60	.65/60	1.20/60	1.28/61	1.28/Dec. 61
5	FF1	1	(Included with W5B)												
5	GMX	9	.48/78	.74/78	.55/78	.37/75	.48/77	.53/72	.46/74	1.05/77	.85/72	1.09/76	.55/78	.71/71	1.09/Oct. 76
5	W5B	18	.78/67	.77/69	.74/78	.57/65	.52/71	.47/69	.65/74	1.04/77	.89/81	1.13/76	.61/70	1.16/65	1.16/Dec. 65
6	EUCC	4	.35/61	.57/63	.25/60	.25/64	.17/61	.72/63	.27/61	1.22/63	1.23/60	.98/60	1.33/60	1.17/61	1.33/Nov. 60
6	UCC	23	1.25/69	1.51/76	.99/78	1.08/65	.86/71	1.03/72	1.26/59	2.18/77	2.13/69	1.65/76	1.11/60	1.31/65	2.18/Aug. 77
12	A12	22	1.86/69	2.95/69	1.79/65	1.37/65	.82/71	.73/69	1.57/69	2.80/77	2.69/76	1.56/76	1.87/60	2.50/65	2.95/Feb. 69
12	12NE	4	.55/61	.68/62	.22/64	.23/60	.43/64	.30/63	.63/61	.45/63	1.10/60	.40/60	1.10/60	.58/61	1.10/Nov. 60
12	12NW	4	.68/61	.83/62	.40/62	.33/60	.72/64	.28/60	.63/64	.97/63	1.11/62	.40/60	1.25/60	.85/61	1.25/Nov. 60
12	12S	4	.60/61	.77/62	.50/62	.40/64	.59/64	.28/63	.72/64	.65/64	1.12/60	.48/60	1.18/60	.71/61	1.18/Nov. 60
13	PU13	10	1.00/80	.85/78	.85/78	.58/81	.68/77	.64/72	1.07/78	3.64/77	.79/76	.95/81	.50/81	.66/74	3.64/Aug. 77
14	MV	17	3.50/69	2.10/69	1.45/78	.99/65	.88/71	.80/72	1.06/80	2.05/77	1.60/76	1.64/76	1.75/65	2.87/66	3.50/Jan. 69
15	PHS	17	1.23/69	1.27/73	1.12/78	1.09/65	.72/71	.67/80	1.28/68	1.77/77	.88/76	1.18/75	1.10/70	.84/71	1.77/Aug. 77
16	TS	4	.45/61	.78/62	.53/62	.30/60	.20/61	.23/61	.45/61	.75/63	1.20/62	.40/60	1.08/60	1.52/61	1.52/Dec. 61
16	TS2[1]	17	1.35/69	1.98/69	1.37/78	.86/65	.71/71	.54/80	2.28/69	1.95/77	2.03/76	.42/76	1.95/70	1.62.65	2.28/July 69
17	A17	0	(Less than 1 year)												
18	LF1	5	.80/78	.93/78	.73/78	.35/78	.66/77	.24/77	.70/79	2.05/77	1.40/78	1.04/76	.30/81	.30/76	2.05/Aug. 77
18	LF2	5	.98/78	.88/78	.95/78	.38/78	.82/77	.35/77	.69/79	2.34/77	1.20/78	1.24/76	.36/81	.33/78	2.34/Aug. 77
19	PM3	8	1.45/69	1.40/69	.75/69	.77/65	1.06/73	.82/69	1.99/69	2.32/67	.97/67	.90/72	1.29/70	1.47/71	2.32/Aug. 67
19	PM4	8	2.05/69	2.05/69	.90/69	.80/65	.72/71	.64/72	1.74/69	1.61/69	.83/72	.82/72	1.88/70	2.44/71	2.44/Dec. 71
19	PM5	8	.80/69	1.35/68	.35/73	.63/65	.55/71	.72/69	2.13/66	1.23/65	.68/66	1.10/72	.90/70	.98/66	2.13/July 66
20	PM1	17	.78/69	1.05/68	.95/78	.45/67	.63/77	1.05/72	.92/69	2.15/77	1.70/78	1.44/76	.88/70	1.28/66	2.15/Aug. 77
20	PM2	8	.85/69	1.00/68	.75/73	.50/71	.66/71	1.17/72	1.06/69	1.27/66	.50/69	.92/68	.88/70	1.02/66	1.27/Aug. 66
20	U20K	4	(Data not available)												

Table 5

Greatest Daily Precipitation Amount, with the Year of Occurrence (Most Recent Year if More than One), for the Period of Record through 1981 (continued)

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
22	DRA	19	.90/67	.95/76	.83/73	.89/65	1.53/81	.56/66	.66/79	.87/79	1.01/76	1.05/76	.94/65	1.21/65	1.53/May 81
23	MAS	1	(Included with DRA)												
23	MER	10	.63/78	.84/76	.79/78	.46/75	1.10/81	.58/72	.57/79	1.52/72	1.03/72	.82/76	.70/78	.92/74	1.52/Aug. 72
25	ADA27	4	.51/69	.60/69	.21/69	.47/67	.29/67	.50/69	1.33/69	.40/67	.24/67	.26/68	.58/65	1.20/65	1.33/July 69
25	4JAn	15	.51/78	1.40/76	.89/78	.50/76	.62/81	.35/69	.50/68	1.46/77	1.25/76	.89/76	.76/70	.77/71	1.46/Aug. 77
25	4JAo	9	.42/61	.90/63	.20/63	.47/65	.26/61	.26/64	.24/66	.50/59	.86/62	.51/58	.89/60	1.85/65	1.85/Dec. 65
25	T6	5	.56/59	.92/63	.15/64	.42/64	.48/63	.54/64	1.71/64	.36/63	.83/62	.62/60	.92/60	.93/61	1.71/July 64
25	T15	1	(Record unreliable)												
26	CS	17	1.57/69	1.81/78	.88/73	1.05/65	1.01/71	1.04/69	1.79/68	1.55/72	1.78/76	1.15/76	.95/70	1.18/66	1.81/Feb. 78
26	LP	7	.50/62	.75/63	.30/62	.52/65	.16/63	.23/63	.53/66	1.10/63	.88/62	.40/60	.95/60	1.12/65	1.12/Dec. 65
26	T1A	2	.40/61	.48/62	.40/60	.15/60	.22/61	.14/62	.40/61	.25/61	.77/60	.65/60	1.20/60	1.48/61	1.48/Dec. 61
28	RV	18	.90/67	1.54/76	1.39/78	.61/67	1.13/81	.43/67	.94/68	2.16/77	1.60/76	1.37/76	.74/70	1.26/65	2.16/Aug. 77
29	SB	13	2.30/69	1.44/69	.72/73	.68/65	.74/71	.62/67	2.05/69	1.61/70	1.75/62	.59/73	2.50/65	2.40/65	2.50/Nov. 65
29	T9	5	.82/61	1.31/63	.27/63	1.06/64	.14/61	.48/64	.46/61	1.13/64	1.48/62	.51/60	1.03/60	1.44/61	1.48/Sept. 62
30	4OMN	21	1.27/69	1.38/76	1.15/78	.85/65	.64/77	1.15/67	1.95/69	2.07/77	2.00/76	1.45/76	1.20/60	1.56/74	2.07/Aug. 77
Other	SR	6	.32/69	.93/70	.20/65	.27/65	.29/64	.54/69	.99/64	.65/67	.18/67	.11/68	.30/65	.87/65	.99/July 64

Reference Note:

1. Value for September may have been exceeded in 1975.

Table 6

Greatest Monthly and Annual Number of Days with Measurable Precipitation, with the Year of Occurrence (Most Recent Year if More than One), for the Period of Record through 1981

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1	BJY	21	12/79	11/73	10/81	11/65	8/77	8/72	7/67	8/65	8/76	8/74	9/65	8/77	59/78
2	353	4	3/64	9/62	7/61	9/63	6/64	7/63	5/62	10/61	7/63	4/63	5/61	2/62	49/63
5	FF1	1	(Included with W5B)												
5	GMX	9	9/79	8/73	11/75	7/78	5/77	4/72	5/76	8/79	6/76	8/74	8/72	6/74	48/78
5	W5B	18	10/69	9/78	11/78	9/67	5/77	6/72	5/80	8/65	7/76	6/74	8/78	7/65	51/78
6	EUCC	4	2/62	6/62	6/62	6/63	5/63	4/63	3/64	7/61	5/63	3/62	4/61	2/62	40/63
6	UCC	23	12/79	12/73	11/73	10/78	6/77	8/72	8/76	9/65	7/76	8/74	9/65	7/77	52/65
12	A12	22	14/78	13/73	14/79	14/67	10/80	9/72	10/68	12/61	8/67	11/74	9/72	12/77	77/78
12	12NE	4	5/62	10/62	10/61	8/63	6/64	10/63	7/62	13/61	6/63	4/63	7/60	4/61	54/63
12	12NW	4	6/62	11/62	8/61	9/63	7/64	10/63	5/62	12/61	6/63	5/61	6/63	4/61	59/63
12	12S	4	5/62	11/62	10/61	9/63	6/64	10/63	7/62	11/61	6/63	5/63	6/63	4/61	62/63
13	PU13	10	13/79	8/80	14/79	11/78	7/77	6/72	6/76	6/79	8/76	7/74	9/78	7/77	65/78
14	MV	17	12/79	13/69	13/73	11/78	8/77	7/69	8/68	9/65	9/76	9/74	8/65	8/77	60/65
15	PHS	17	13/79	13/69	15/79	11/78	8/77	7/72	8/65	9/71	10/76	9/72	9/65	7/77	65/78
16	TS	4	3/62	9/62	7/62	7/63	4/63	7/63	6/62	11/61	6/63	6/63	5/63	6/61	53/63
16	TS2	17	12/79	13/73	13/73	12/67	8/77	9/69	9/68	9/71	7/67	10/74	9/65	10/77	65/78
17	A17	0	(Less than 1 year)												
18	LF1	5	11/78	10/78	13/79	11/78	6/80	3/77	3/79	6/78	6/80	4/81	5/78	10/77	65/78
18	LF2	5	13/79	10/78	13/79	11/78	10/80	3/77	3/80	6/78	5/80	7/81	6/78	10/77	68/78
19	PM3	8	11/69	13/73	12/73	15/67	10/71	8/72	9/68	14/71	10/67	11/72	9/72	10/65	68/67
19	PM4	8	13/69	14/73	13/73	15/67	8/71	7/72	11/68	15/71	10/67	9/72	9/65	11/71	74/67
19	PM5	8	10/69	11/73	12/73	16/67	8/71	7/72	11/70	11/71	8/67	10/72	9/65	10/65	64/67
20	PM1	17	13/79	12/73	13/79	15/67	9/77	8/72	9/65	13/71	9/67	8/74	8/72	9/77	66/78
20	PM2	8	10/69	12/73	13/73	15/67	10/71	8/72	8/68	13/71	6/72	9/72	8/65	9/71	68/71
20	U20k	4	(Data not available)												

Table 6

Greatest Monthly and Annual Number of Days with Measurable Precipitation, with the Year of Occurrence (Most Recent Year if More than One), for the Period of Record through 1981 (continued)

NTS Area	Map ID	Yrs of Rec	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
22	DRA	19	11/79	10/69	11/78	8/65	5/77	6/63	5/80	7/67	9/76	8/74	8/78	7/71	54/78
23	MAS	1	(Included with DRA)												
23	MER	10	10/78	9/78	11/75	7/78	6/77	5/72	7/76	6/79	7/76	8/74	9/78	8/71	47/65
25	ADA27	4	10/69	9/69	5/67	8/65	5/65	5/65	6/68	4/67	3/69	2/68	7/65	4/67	47/65
25	4JAn	15	11/79	10/73	11/79	9/78	6/71	5/72	7/68	6/77	5/76	7/74	8/78	7/71	58/78
25	4JAo	9	4/65	6/62	5/65	9/65	2/64	4/65	5/65	7/61	6/63	3/63	7/65	5/65	47/65
25	T6	5	3/60	7/62	4/64	5/63	2/61	3/63	3/64	6/61	6/63	3/63	4/63	4/59	36/63
25	T15	1	(Record unreliable)												
26	CS	17	11/79	12/73	13/79	9/67	5/77	7/72	8/76	8/65	7/76	8/74	8/72	8/71	55/65
26	LP	7	4/65	6/62	7/65	12/65	3/62	5/63	6/65	8/65	6/63	2/63	7/65	7/65	57/65
26	T1A	2	5/60	6/62	6/62	3/60	3/62	2/62	2/61	7/61	3/60	4/61	4/61	4/59	32/61
28	RV	18	10/79	10/73	12/73	10/65	4/81	5/72	6/68	5/81	6/76	8/74	9/78	7/71	53/78
29	SB	13	11/69	11/69	13/73	12/65	5/73	8/63	7/68	10/71	5/67	7/72	8/72	10/71	62/65
29	T9	5	4/62	10/62	7/61	5/63	3/64	5/63	5/62	5/61	6/63	4/62	5/61	4/59	41/61
30	40MN	21	14/79	11/73	16/79	11/78	9/77	6/72	8/68	9/61	8/67	10/74	8/72	12/77	62/78
Other	SR	6	4/69	8/69	3/65	8/67	2/67	3/65	5/65	7/67	1/69	2/68	8/65	4/65	43/65

APPENDIX C

Precipitation Probability in Relation to Areal Coverage at the Nevada Test Site

by R. F. Quiring

U. S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service

Nuclear Support Office
Las Vegas, Nevada
March 1979

APPENDIX C

WSNSO-351-73

PRECIPITATION PROBABILITY IN RELATION TO AREAL COVERAGE AT THE NEVADA TEST SITE

R. F. Quiring

Introduction

The objectives of this report are 1) to examine the probability of measurable precipitation over an area in relation to a network of stations within the area, and 2) to examine the implications of this relationship with respect to daily precipitation forecasts for the NTS. Probability is taken to be synonymous with relative frequency for a specified 10-year period. Measurable precipitation is defined as a daily precipitation amount (midnight to midnight) of one-hundredth of an inch or more. A precipitation event is defined as a day on which one or more stations received measurable precipitation. A station is considered to have participated in an even if it received measurable precipitation during the event.

The Data Sample

The data base consists of daily precipitation amounts for 10 stations on the NTS from October 1964 through September 1974. Based on data for three stations surrounding the NTS, average annual precipitation during this period was about five percent above the 1941-1970 normal and the annual precipitation cycle was characteristic of the longer period. Figure 1 shows a comparison of the annual cycle, in terms of monthly precipitation as a percentage of annual, for the NTS 10-station average, the surrounding 3-station average for the sample period and teh 3-station 1941-1970 normal. IT does not necessarily follow that the frequency of occurrence of precipitation events was normal; however, the number of days with precipitation does correlate well with precipitation amount so that one might expect the frequency of occurrence statistics to be reasonably representative of normal conditions. Correlation coefficients for the NTS 10-station sample for winter, summer, adn annual are 0.83, 0.97, and 0.90, respectively. The seasons are divided in the middle of the May/June and September/October transition periods between the winter and summer precipitation maxima so that summer includes June through September and winter consists of October through May.

The NTS Network

The NTS 10-station network is shown in Figure 2. The stations were selected from 13 candidate stations in the NTS network on the basis of data reliability during the period and to provide as uniform a grid as possible. There were a

few precipitation events for which some data were missing. The missing data were filled in by substitution from a nearby station or interpolation from an analysis of the precipitation event. The network is definitely biased in favor of elevations below 5000-feet. Roughly 45 percent of the area of the NTS is above 5000-feet but only two of the stations in the 10-station network are above 5000-feet. The area of the NTS is approximately 1350 square miles.

Probability of Precipitation

Probability of Precipitation at a Point. The number of times during the 10-year period that each station participated in a precipitation event, with a specified number of stations participating, is given in Table 1. The average point probability of precipitation, is the number of participating stations divided by the number of station-days in the record:

$$\text{Summer } \frac{1217}{12200} = 0.100$$

$$\text{Winter } \frac{2767}{24320} = 0.114$$

$$\text{Annual } \frac{3985}{36520} = 0.109$$

This is also the average areal coverage when days with zero coverage are included. In other words, the average point probability of precipitation and the average unconditional areal coverage are the same.

The probability of precipitation at a point as a function of elevation is shown in Figure 3 by season and for the year. It is interesting to note that elevation not only accounts for on the order of 95 percent or more of the variance in the point probability of precipitation, the slope of the regression lines is essentially the same in both summer and winter. The probability of precipitation at a point on Ranier Mesa at an elevation of 7500 feet is on the order of twice as great as at a point in the low-lands at an elevation near 3000 feet.

Areal Coverage on Precipitation Days. The average coverage on precipitation days (i.e., the conditional areal coverage) is the number of participating stations divided by the number of precipitation events:

$$\text{Summer } \frac{1218}{278} = 4.46 \text{ stations/event}$$

$$\text{Winter } \frac{2767}{488} = 5.67 \text{ stations/event}$$

$$\text{Annual } \frac{3985}{761} = 5.24 \text{ stations/event}$$

If one accepts the 10-station network as representative of the NTS, the average areal coverages on precipitation days, expressed as the fraction of the area covered, are 0.446 in summer, 0.567 in winter and 0.524 for the year.

Probability as a function of areal coverage on precipitation event days is shown in Figure 4. The highest probability in summer is for a single station event indicating the tendency for isolated convective type precipitation as opposed to a tendency for more generalized precipitation events in winter as indicated by the probability of a 10-station event being the highest. On an annual basis the result is a fairly symmetrical U-shaped distribution with single-station and 10-station events occurring with essentially equal probability.

Probability of a Precipitation Event. The probability of precipitation occurring somewhere within the area is the number of precipitation events divided by the number of days of record:

$$\text{Summer } \frac{273}{1220} = 0.224$$

$$\text{Winter } \frac{488}{2432} = 0.201$$

$$\text{Annual } \frac{761}{3652} = 0.208$$

The areal precipitation probability provides the proportionality factor needed to relate the conditional areal coverage (the condition being that a precipitation event occurs) to the average point probability of precipitation:

Summer	0.224 x 0.446 = 0.100
Winter	0.201 x 0.567 = 0.114
Annual	0.208 x 0.524 = 0.109

These results conform to the widely publicized relationship $R_p = P_a \times C$ where P_p is the average point probability of precipitation, P_a is the probability of a precipitation event, occurring and C is the expected areal coverage given that a precipitation event occurs. See, for example, Curtiss (1968) for a non-meteorologist's philosophical discussion and mathematical proof, and Smith (1977) with an application of radar to the problem of areal coverage during summer convective activity in Alabama, and Williams and Heck (1970) who apply the concept to precipitation networks on two scales in north-western Utah. The 10-year, 10-station sample clearly demonstrates that the relationship is valid for the NTS.

Relevance to the Daily NTS Forecast

NWS Policy. It is the policy of the NWS that all local forecasts incorporate numerical statements of probability which will permit the user to ascertain the probability of occurrence of a precipitation event at any point in the forecast area (NWSOM C-91, 3). The Regional Director has excluded zone forecasts in the western region from this requirement (ROML W-31-77). The NWS also specifies that a uniform probability for all points in the forecast area will be used. An exception may be made when large variations due to topography are known to occur within the local forecast area. The permissible numerical probability values are given in Table 2a.

The NWS allows the Regional Director to establish a threshold value at which numerical probability statements may be dropped from the forecast. This threshold value should be the same as that established for any mention of precipitation in the text of the forecast. A value of 20-30% is suggested. The Regional Director has specified (ROML W-73-16) that in the western region the numerical precipitation probability be placed in an additive statement at the end of the local forecast. If the probability is less than 10%, precipitation will not be mentioned in the worded forecast. If the probability is 10 to 20%, precipitation may be mentioned in the worded forecast at the discretion of the forecaster (or the MIC/OIC may set either 10 or 20% as the lower limit). If the forecaster desires to qualify the mention of precipitation in the worded text with an expression of uncertainty, the terms given in Table 2b will be used.

Ordinarily, adjectives to denote distribution of showers should not be used in local forecasts, but may be needed at times in a zone forecast. If so, it is best not to combine them with adjectives denoting uncertainty. Permissible terms to describe distribution (areal coverage) are given in Table 2c.

The NTS Forecast. The mandate for stating the numerical point probability of precipitation in local forecasts is clear. The roughly 30 by 50 mile rectangular area of the NTS is vastly smaller than the NEvada forecast zones within which it is embedded so that one must assume that the Western Region zone forecast exclusion does not apply. The relationship between point probability of precipitation, probability of precipitation in the area and conditional areal coverage has been validated for the NTS by the 10-station network precipitation sample. The data sample also demonstrates that stating the average point probability of precipitation is equivalent to stating the expected areal coverage, unconditionally. It should be a fairly simple matter to incorporate the NWS prescribed forecast into the daily routine.

The forecaster has the option of stating the average point probability of precipitation in the forecast area or expressing the variations in the point probability if he feels that it varies significantly over the area. The guidance available to the forecaster is generally oriented toward the point probability of precipitation and should provide a realistic starting point. The MOS POP facsimile product provides a good example. There is a substantial amount of smoothing (a form of averaging) that goes into this product; station data are pooled for a climatologically homogenous area to develop the equations, various degrees of smoothing are applied to some MOS predictors when an equation is used to compute a station POP and station values are objectively analyzed to produce a smooth analysis for transmission of facsimile. It seems reasonable to expect that a value interpolated from such a chart is an average point probability of precipitation for the area immediately surrounding the point of interpolation. Kennedy (1978) has demonstrated with a limited sample during a period of changing models that this approach provides a fairly reliable forecast for a point on the NTS. It is difficult for many forecasters, however, to accept the fact on any given occasion, that such a forecast is also an expression of the unconditional expected areal coverage. The probable reason for this is that the forecaster is not willing to admit that he is forecasting with near certainty that precipitation will occur somewhere within the forecast area (i.e., $P_a = 1$). It is my observation, after many years of listening to forecasters justify and verify their "weasel worded" forecasts, that when a forecaster mentions precipitation in his local forecast he expects precipitation to occur somewhere within the forecast area. Even with a forecast of a slight chance of precipitation, he feels better about his forecast if it precipitates than if it doesn't, or at least is a close call -- precipitation nearby, threatening clouds, virga, etc. There is little doubt, no matter how the forecaster arrives at a point probability of precipitation forecast on any given occasion, that he is implicitly stating the expected areal coverage at the same time.

Forecast Verification

The equivalence of areal coverage and point probability makes it possible to verify individual probability of precipitation forecasts for the NTS, with about a month's delay with the existing network, instead of having to wait for a collection of forecasts over an extended period of time. Eventually, when precipitation is reported as one of the MEDA channels, it will be possible to verify precipitation forecasts in real time. An important feature of such an approach is that verification can be based on the distribution of precipitation over the forecast area and does not have to rely on a single, possibly non-representative, reporting point. Various aspects of the verification of probability forecasts

can be monitored on a continuing basis and over an extended period of time can be compared with verification by the conventional Brier Score.

Summary

Average point probability of precipitation and unconditional areal coverage are synonymous for the NTS. The actual values derived from 10 years of data for the 10-station NTS precipitation network are very likely too low because of a low-elevation bias in the network.

The probability of precipitation varies as a function of elevation and is about twice as great at 7500 feet as it is at 3000 feet, both winter and summer. About 95 percent of the variance in the point probability of precipitation is accounted for by differences in elevation.

The policy of the NWS with regard to probability of precipitation statements in local forecasts is clear -- they are point probabilities and a numerical statement is required. Incorporation of numerical probability of precipitation statements in our daily NTS forecasts will put us in compliance with NWS policy and enhance the clarity of our precipitation forecasts.

A forecast of the point probability of precipitation is unequivocally a statement of the unconditional expected areal coverage.

The equivalence of point probability of precipitation and areal coverage provides a practical means of verifying individual forecasts on the basis of the distribution of precipitation over the forecast area.

REFERENCES

Curtiss, J. H., 1968: An elementary mathematical model for the interpretation of precipitation probability forecasts. J. Appl. Meteor., 7, 3-17.

Smith, D. L., 1977: An examination of probability of precipitation forecasts in light of rainfall areal coverage. National Weather Digest, 2, 15-26.

Williams, P. Jr. and W. J. Heck, 1970: Areal coverage of precipitation in Northwestern Utah. ESSA Tech. Memo, WBTM WR 56, 19 pp.

Kennedy, N. C., 1978: Verification of NMC precipitation guidance for the NTS. NOAA Weather Service Nuclear Support Office, WSNSO-351-72, 12 pp.

Table 1

Number of Times During the 10-year Period (October 1964-September 1974) that Each Station Participated in a Precipitation Event with the Specified Number of Stations Participating

Number of Stations	DR	4JA	CS	W5B	MV	4OMN	BJY	A12	PHS	PM1	Number of Events	÷ 273
Summer (June - September)												
1	4	1	2	4	3	5	4	18	4	19	64	.234
2	8	4	3	3	3	8	5	13	10	13	35	.168
3	11	5	7	6	5	9	7	17	10	19	32	.117
4	4	6	6	8	12	13	10	20	16	17	28	.103
5	2	3	4	5	7	8	10	15	9	12	15	.055
6	2	8	12	8	17	15	14	19	9	16	20	.073
7	9	9	9	12	18	14	17	17	14	14	19	.070
8	11	12	16	11	13	15	14	16	15	13	17	.062
9	13	15	17	14	18	18	17	18	16	16	18	.066
10	25	25	25	25	25	25	25	25	25	25	25	.092
Total	89	88	101	96	121	130	123	178	128	164	273	1.000
÷ 1220	.073	072	.083	.079	.099	.107	.101	.146	.105	.134	.224	

273 precipitation events
1218 station participations
1220 days of record (12200 station-days)

Winter (October-May)												÷ 488
1	2	2	1	2	4	8	1	36	5	20	81	.166
2	6	1	7	2	10	17	2	44	9	34	66	.135
3	6	4	5	6	13	14	6	28	15	20	39	.080
4	4	11	16	7	10	12	6	26	12	16	30	.061
5	3	6	11	5	14	15	11	21	15	19	24	.049
6	14	10	20	13	24	23	18	26	15	23	31	.064
7	6	14	16	10	20	21	24	24	19	21	25	.051
8	13	18	23	13	23	24	24	24	17	21	25	.051
9	28	26	34	27	33	33	32	34	25	34	34	.070
10	133	133	133	133	133	133	133	133	133	133	133	.273
Total	215	225	266	218	284	300	257	396	265	341	488	1.000
÷ 2432	.088	.093	.109	.090	.117	.123	.105	.163	.109	.140	.201	

488 precipitation events
2767 station participations
2432 days of record (24320 station-days)

Annual												÷ .761
1	6	3	3	6	7	13	5	54	9	39	145	.191
2	14	5	10	5	13	25	7	57	19	47	101	.133
3	17	9	12	12	18	23	13	45	25	39	71	.093
4	8	17	22	15	22	25	16	46	28	33	58	.076
5	5	9	15	10	21	23	21	36	24	31	39	.051
6	16	18	32	21	41	38	32	45	24	39	51	.067
7	15	23	25	22	38	35	41	41	33	35	44	.058
8	24	30	39	24	36	39	38	40	32	34	42	.055
9	41	41	51	41	51	51	49	52	41	50	52	.068
10	158	158	158	158	158	158	158	158	158	158	158	.208
Total	304	313	367	314	405	430	380	574	393	505	761	1.000
÷ 3652	.083	.086	.100	.086	.111	.118	.104	.157	.108	.138	.208	

761 precipitation events
3985 station participations
3652 days of record (36520 station-days)

Table 2

Listing of Permissible Probability of Precipitation Values and Terms

a. Permissible values for probability of precipitation (WSOM C-91, 3d)

Value	Range
near 0%	less than 2
2%	2 to 4
5%	5 to 7
10%	8 to 14
20%	15 to 24
30%	25 to 34
--	--
--	--
--	--
90%	85 to 94
near 100%	95 or greater

b. Relationship between subjective terms and probability (ROML W-73-6)

Term	Permissible Values Included
No mention of participitation	less than 10%
Slight or small chance	10, 20%
Chance	30, 40%
Likely	50, 60, 70%
Unqualified	80, 90, 100%

c. Subjective terms for areal coverage* (NWSOM D-20, 4,6)

Term	Areal Coverage
Isolated	extremely small number
Few	up to 15%
Widely scattered	16 to 30%
Scattered	31 to 45%
Numerous	more than 45%

*Apply to showers and thunderstorms.

Note: It is <u>not</u> permissible to mix probability and areal coverage terms.

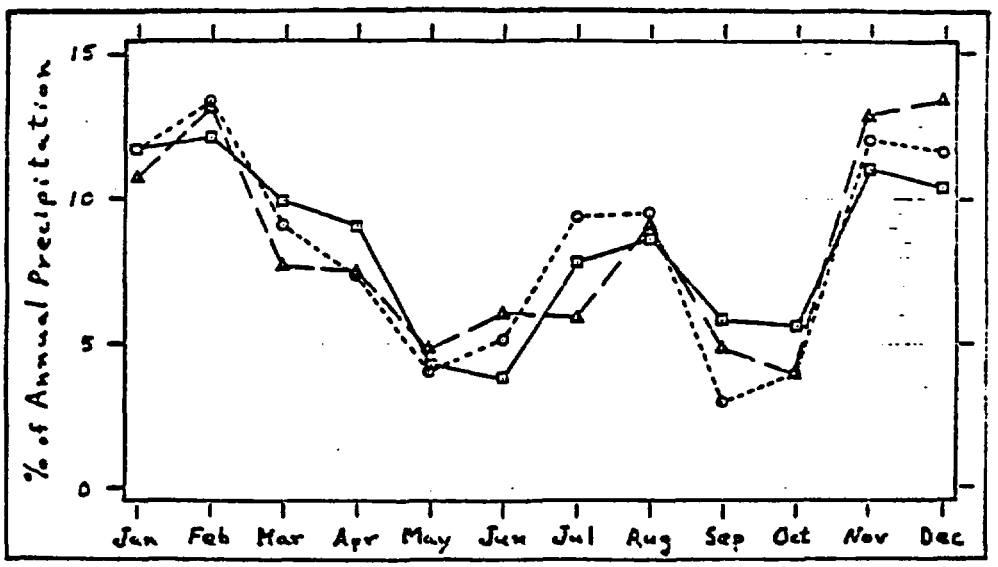


Figure 1. Annual Precipitation Cycle

O---O	NTS 10-Station Average
Δ---Δ	Surrounding 3-Station Average
□---□	Surrounding 3-Station Normal (1941-1970)

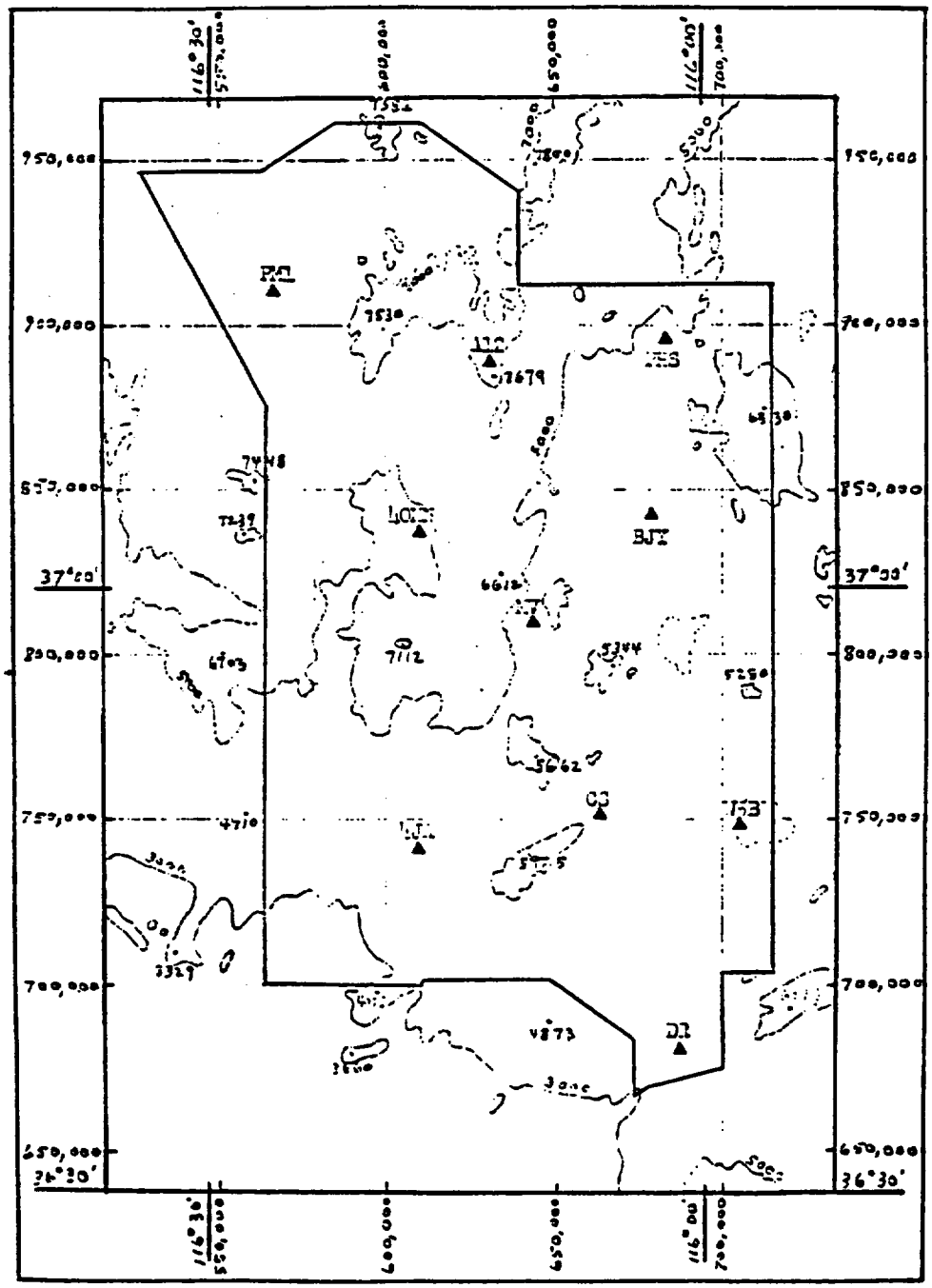


Figure 2. NTS 10-Station Precipitation Grid

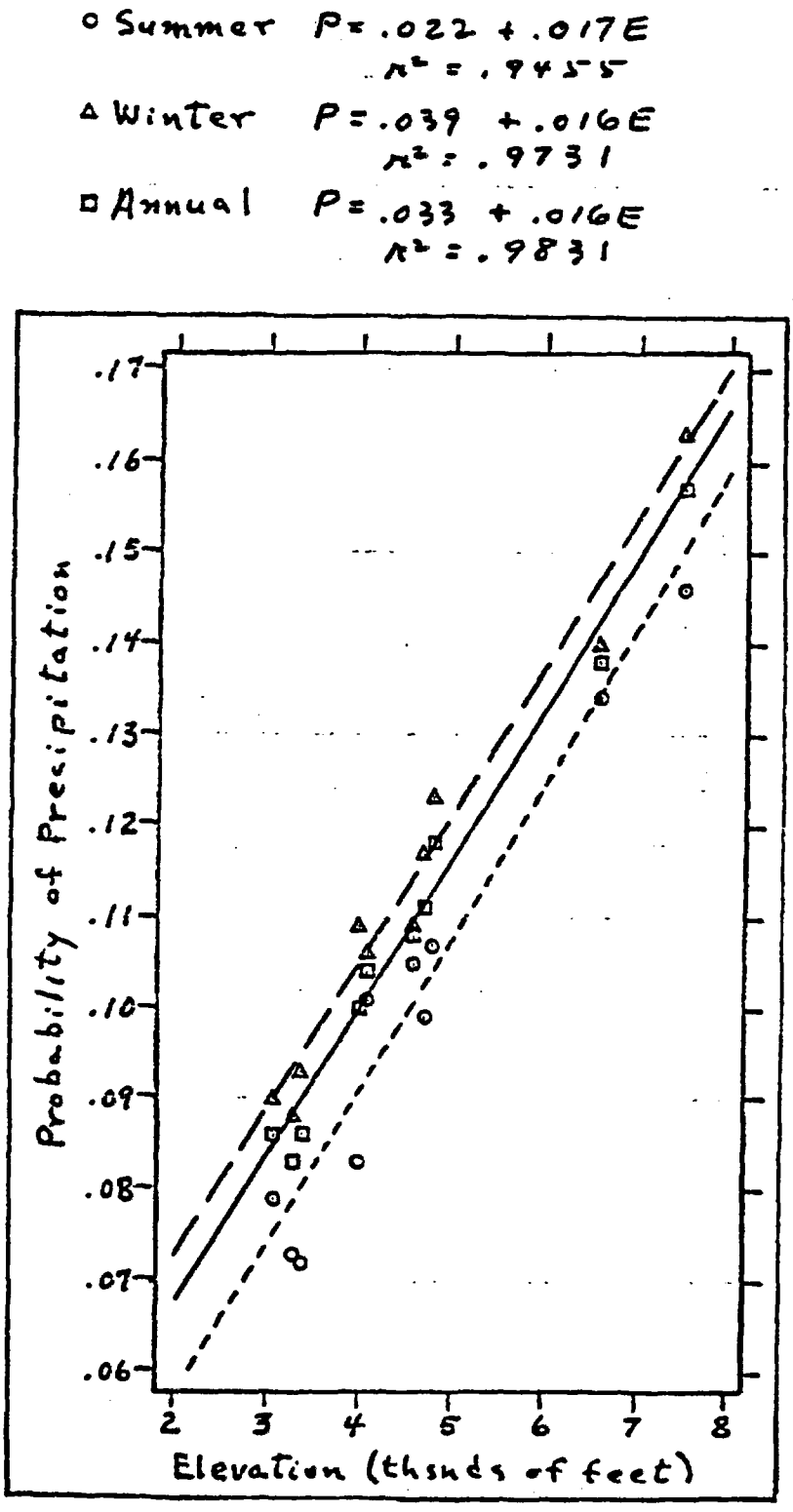


Figure 3. Probability of Precipitation as a Function of Elevation

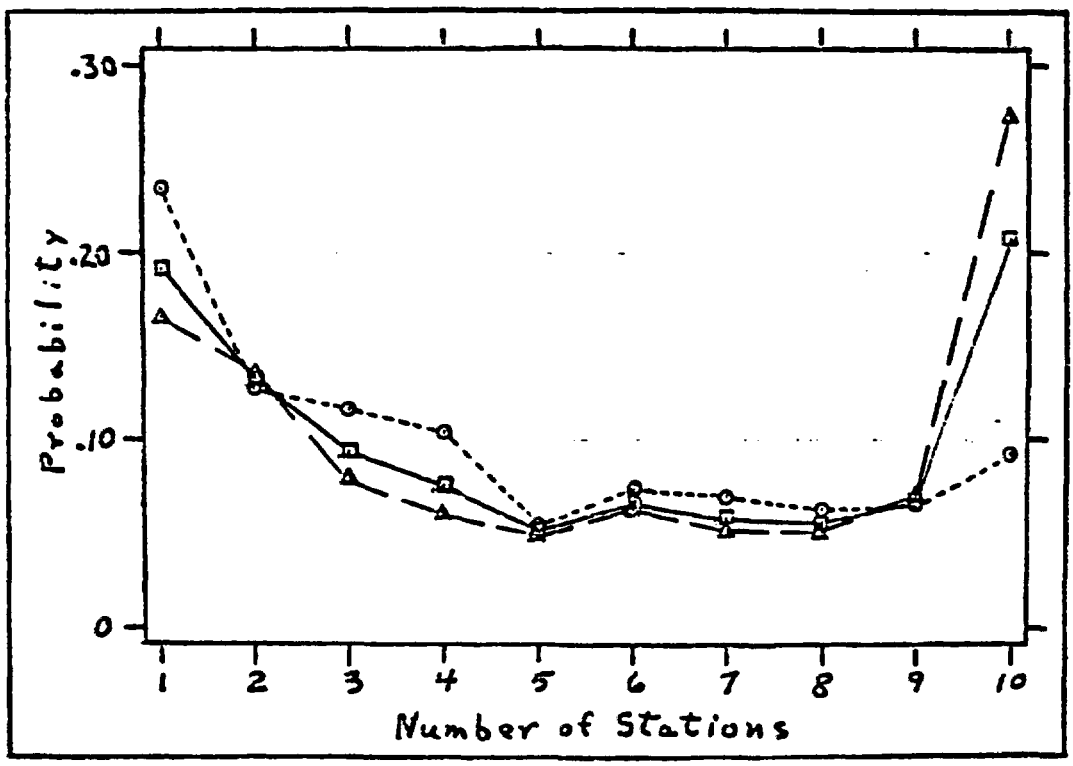


Figure 4. Probability of Areal Coverage on Precipitation Event Days

O---O Summer
Δ---Δ Winter
□---□ Annual

APPENDIX D

Private Communication, R. F. Quiring, NOAA/WSNSO

APPENDIX D

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service Western Region
Weather Service Nuclear Support Office
Post Office Box 14985
Las Vegas, Nevada 89114

October 16, 1981

Tom Eglinton
Nuclear Waste Investigation Group
Sandia National Laboratory
P.O. Box 50800
Albuquerque, NM 87185

Dear Mr. Eglinton,

The enclosed data are submitted in response to our telephone conversation of October 9, 1981. The differences between Tower 6 and Tower 4 are more subtle than I recalled, however, if you look carefully you will note that the southerly winds at Tower 6 have a slight easterly component and the northerly winds have a slightly westerly component. The relatively high frequency of winds from direction 360 is the result of a system bias. This shift from what you see for Tower 4 in the NTS climatology can be attributed, at least in part, to mountain-valley wind effects between the Yucca Mountains and Forty Mile Wash. One could reasonably expect that this effect would increase as one advances up the eastern slopes of the Yucca Mountains. There are, of course, other factors which have to be considered. Serious consideration should be given to starting observations in the area of interest if wind is critical to the facility you are planning.

The Yucca Flat upper wind summaries for 7000 feet above mean sea level at four times of day are submitted as the best guess of what one might expect at mountain top level in the Yucca Mountains. There are local terrain effects incorporated in the distributions of direction and speed which I am not prepared to specify at this time.

Sincerely,

Ralph F. Quiring
Climatologist

Enclosures

APPENDIX E

Surface Wind Summary, Tower 4JA (Tower 4), Jackass Flats, Nevada, 1956-1962

4JA (TOWER 4) JACKASS FLATS, NEVADA
ANNUAL SURFACE WIND SUMMARY
ALL HOURS COMBINED

	Speed (mph)								ROW	Row Percentages				AVERAGE
DIR	1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	TOT	OBS	(1)	(2)	(3)	SPEED
360	624	1475	530	232	225	71	0	1	3224	7.6	14.8	22.8	31.4	9.3
350	198	623	331	112	111	32	0	0	1397	3.3	13.4	19.5	25.9	10.1
340	134	452	271	100	79	30	0	0	1066	2.5	7.9	17.6	22.9	10.4
330	132	340	171	87	83	32	0	0	905	2.1	6.7	11.3	20.0	10.5
320	145	379	156	70	86	29	0	0	865	2.0	5.5	9.1	13.1	10.3
310	127	247	99	55	42	7	0	0	577	1.4	4.5	7.3	10.6	9.2
300	137	137	73	35	22	1	0	1	456	1.1	3.1	5.9	9.2	8.0
290	36	135	39	24	12	1	0	0	236	.7	2.5	5.0	8.1	7.9
280	98	134	52	22	9	0	0	0	315	.7	2.6	4.7	7.3	7.5
270	150	242	67	18	14	0	0	0	491	1.2	2.9	4.3	7.5	6.8
260	135	199	61	18	5	0	0	0	418	1.0	3.4	5.7	9.4	6.8
250	150	275	89	15	13	1	0	0	544	1.3	3.8	8.0	12.3	7.2
240	149	345	132	30	7	2	0	0	665	1.6	5.8	10.4	14.6	7.5
230	224	691	324	79	31	8	0	0	1267	3.0	8.1	12.5	17.4	8.5
220	224	719	395	122	33	10	0	0	1503	3.6	9.6	15.2	21.0	8.8
210	192	628	404	137	44	9	0	0	1317	3.1	10.6	13.2	25.4	9.6
200	202	591	526	249	101	9	0	0	1677	4.0	11.6	21.9	29.3	10.4
190	139	503	559	375	262	35	0	0	1923	4.5	15.2	22.4	29.2	12.5
180	263	524	728	606	612	110	0	0	2848	6.7	15.7	22.6	27.2	14.3
170	142	240	336	350	543	149	0	0	1909	4.5	14.1	20.1	25.2	16.0
160	140	251	276	214	260	75	0	0	1223	2.9	8.9	16.7	22.2	14.4
150	122	157	146	89	95	26	0	0	645	1.5	5.6	10.9	13.3	11.8
140	158	175	80	39	25	10	0	0	497	1.1	3.6	7.1	12.3	8.3
130	146	164	50	22	4	0	0	0	386	.9	2.7	4.9	5.9	6.4
120	113	111	34	11	7	0	0	0	262	.7	2.2	4.4	7.6	6.4
110	111	117	41	10	4	0	0	0	283	.7	2.3	5.0	7.9	6.5
100	148	173	64	19	7	1	0	0	412	1.0	3.4	5.9	9.2	6.9
90	222	318	153	40	10	1	0	0	744	1.3	4.6	7.6	11.9	7.4
80	133	311	195	63	16	0	0	0	774	1.9	6.0	9.6	14.1	8.2
70	213	373	302	99	29	0	1	0	1017	2.4	6.9	12.5	16.9	9.0
60	241	468	237	93	29	5	0	0	1133	2.7	8.9	16.1	24.4	8.5
50	345	536	436	204	74	4	1	1	1631	3.8	11.9	20.9	23.0	9.3
40	332	678	477	433	266	38	0	0	2284	5.4	15.7	23.3	30.1	11.3
30	371	652	527	639	496	60	1	1	2747	6.5	17.3	25.1	35.3	13.1
20	306	637	377	475	448	50	1	1	2305	5.4	15.8	26.9	35.0	13.0
10	269	614	300	243	213	26	0	1	1665	3.9	17.0	26.7	34.6	11.1
CALMS									724	1.7	IN COLUMNS ABOVE			
COLTOT	7257	14634	9192	5429	4327	840	4	6	42417		(1) = + OR - 10 DEGREES			
COLPER	17.1	34.5	21.7	12.8	10.2	2.0	.9	.0			(2) = + OR - 20 DEGREES			
											(3) = + OR - 30 DEGREES			

RESULTANT VECTOR WIND DIRECTION = 63 RESULTANT VECTOR WIND SPEED = 1.0 MPH VECTOR STANDARD DEVIATION = 13.1 MPH
AVERAGE WIND SPEED ALL OBS. = 10.5 MPH CONSTANCY = 10

Location: 600,000 E, 752,000 N Tower Height: 96 feet
Elevation: 3735 feet Period of Record: 3/12/1956 - 2/12/1962

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF JANUARY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	60	160	75	26	18	5	0	0	344	8.4	16.5	26.7	37.9	9.0
350	14	55	19	16	16	2	0	0	121	3.0	14.1	20.9	30.0	10.9
340	17	39	22	19	12	1	0	0	110	2.7	7.4	17.4	23.5	11.0
330	11	33	11	9	5	1	0	0	70	1.7	6.0	10.0	13.3	9.9
320	21	24	10	5	6	0	0	0	65	1.6	4.3	7.9	11.3	8.4
310	9	13	6	8	5	0	0	0	41	1.0	3.5	5.7	9.1	10.4
300	18	10	4	2	3	0	0	0	37	.9	2.4	4.7	7.4	7.3
290	4	12	1	2	0	0	0	0	19	.5	2.1	4.1	6.6	7.3
280	15	11	2	0	1	0	0	0	29	.7	2.2	4.0	6.1	5.9
270	12	25	2	0	1	0	0	0	40	1.0	2.7	4.2	6.4	5.4
260	23	13	3	1	0	0	0	0	40	1.0	3.0	5.0	7.7	5.2
250	17	27	0	0	0	0	0	0	44	1.1	3.3	6.5	9.3	5.0
240	17	34	0	2	0	0	0	0	53	1.3	4.6	7.5	10.6	5.7
230	28	60	2	0	0	0	0	0	90	2.2	5.6	8.6	12.0	5.4
220	27	51	7	0	0	0	0	0	85	2.1	6.2	9.9	13.2	5.9
210	31	40	7	1	1	0	0	0	80	2.0	6.4	10.9	15.1	6.0
200	30	49	12	5	1	0	0	0	97	2.4	6.6	11.6	15.8	6.7
190	29	38	17	5	3	1	0	0	93	2.3	7.6	11.5	15.0	7.7
180	39	46	13	9	12	0	0	0	119	2.9	7.2	11.0	13.8	8.7
170	20	24	15	6	15	1	0	0	81	2.0	6.3	9.5	12.5	11.1
160	7	20	4	3	15	6	0	0	58	1.4	4.3	7.8	10.8	15.0
150	14	9	2	4	4	3	0	0	36	.9	2.9	5.6	9.2	10.1
140	16	5	2	1	0	1	0	0	26	.6	2.2	4.3	7.2	5.8
130	14	14	1	0	0	0	0	0	29	.7	2.0	3.8	6.3	4.9
120	12	10	4	1	0	0	0	0	27	.7	2.2	4.0	7.2	6.2
110	17	15	4	0	0	0	0	0	36	.9	2.6	5.7	9.7	5.4
100	18	21	5	1	0	0	0	0	45	1.1	4.3	8.3	13.2	6.0
90	27	47	20	2	0	0	0	0	96	2.3	6.8	11.9	16.4	6.8
80	25	52	49	10	0	0	0	0	136	3.3	9.9	15.4	22.5	8.7
70	17	71	73	12	0	0	0	0	173	4.2	12.0	20.5	29.9	9.3
60	26	80	65	6	3	0	0	0	180	4.4	14.9	26.4	38.3	8.5
50	40	114	70	22	9	0	0	0	255	6.2	13.9	32.6	43.4	8.9
40	42	119	78	62	29	7	0	0	337	8.2	24.0	35.8	45.2	11.1
30	35	83	72	100	83	15	0	0	383	9.5	25.2	36.6	45.4	14.5
20	44	69	52	65	72	3	0	0	305	7.5	22.1	38.7	47.9	13.4
10	23	67	36	43	39	3	0	0	211	5.2	21.0	33.5	44.4	12.7
CALMS									94	2.3	IN COLUMNS ABOVE			
COLTOT	819	1561	764	448	354	51	0	0	4091		(1) = + OR - 10 DEGREES			
COLPCT	20.0	38.2	18.7	11.0	8.7	1.2	0.0	0.0			(2) = + OR - 20 DEGREES			
											(3) = + OR - 30 DEGREES			

RESULTANT VECTOR WIND DIRECTION = 30 RESULTANT VECTOR WIND SPEED = 5.1 MPH VECTOR STANDARD DEVIATION = 11.0 MPH
AVERAGE WIND SPEED ALL OBS. = 9.6 MPH CONSTANCY = 54

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF FEBRUARY
ALL HOURS COMBINED

	Speed (mph)								ROW	Row Percentages				AVERAGE
DIR	1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	TOT	OBS	(1)	(2)	(3)	SPEED
360	39	101	58	42	24	3	0	0	267	8.4	15.4	22.7	32.4	10.6
350	14	47	30	16	9	1	0	0	117	3.7	14.5	19.9	26.6	10.5
340	7	33	23	10	4	0	0	0	77	2.4	9.2	18.4	23.2	10.1
330	12	29	9	10	1	4	0	0	65	2.0	6.3	11.5	21.2	10.1
320	6	33	12	1	2	2	0	0	58	1.8	5.4	9.1	13.6	8.8
310	13	26	2	4	2	0	0	0	47	1.5	4.6	7.5	10.7	7.7
300	12	19	2	6	2	0	0	1	42	1.3	3.6	6.2	9.8	9.0
290	7	14	1	3	0	0	0	0	25	.8	2.9	5.9	8.8	6.9
280	3	6	7	3	4	0	0	0	25	.8	3.1	5.5	9.0	11.2
270	11	22	6	2	7	0	0	0	48	1.5	3.4	6.1	9.1	9.9
260	15	12	6	2	0	0	0	0	35	1.1	4.6	7.0	10.3	6.2
250	15	25	13	4	5	0	0	0	62	2.0	4.7	8.7	12.1	9.1
240	12	24	11	3	2	0	0	0	52	1.6	6.1	9.9	14.0	7.7
230	22	30	11	6	6	2	0	0	73	2.5	6.7	11.4	15.4	8.3
220	13	49	8	3	6	3	0	0	82	2.6	7.8	12.3	16.7	9.3
210	18	42	10	9	5	1	0	0	85	2.7	8.2	13.2	19.7	8.8
200	17	35	23	13	5	0	0	0	93	2.9	8.1	15.6	22.2	9.5
190	13	30	13	10	10	2	0	0	78	2.5	10.3	17.2	22.6	11.0
180	21	34	38	37	26	0	0	0	156	4.9	11.5	17.3	21.5	12.7
170	21	21	27	15	43	5	0	0	132	4.2	12.0	15.9	19.8	14.9
160	11	22	20	16	19	3	0	0	91	2.9	9.5	14.4	17.8	13.9
150	10	17	8	4	7	0	0	0	46	1.5	5.4	10.4	16.0	10.1
140	11	16	4	2	0	0	0	0	33	1.0	3.4	6.9	12.0	6.8
130	12	12	4	0	0	0	0	0	28	.9	2.6	5.0	9.0	6.5
120	11	4	5	0	0	0	0	0	20	.6	2.5	4.7	8.6	5.5
110	12	14	5	0	0	0	0	0	31	1.0	2.8	6.1	10.0	5.9
100	12	15	7	2	1	0	0	0	37	1.2	4.6	8.0	11.4	7.4
90	17	39	19	4	0	0	0	0	79	2.5	6.4	9.9	13.9	7.6
80	17	36	23	10	2	0	0	0	88	2.8	7.8	12.3	17.8	8.8
70	15	29	21	13	1	0	0	0	79	2.5	8.6	15.7	23.2	9.3
60	20	42	35	9	1	0	0	0	107	3.4	10.4	19.6	23.6	8.6
50	32	48	39	19	7	0	0	0	145	4.6	14.3	24.4	32.1	9.2
40	28	55	55	47	16	0	0	0	202	6.4	19.5	25.8	32.6	11.3
30	32	56	49	61	33	3	0	0	240	7.6	18.9	26.7	30.5	13.0
20	16	51	20	45	13	4	0	0	156	4.9	15.8	30.6	38.3	12.2
10	20	48	19	17	8	0	0	0	104	3.3	16.6	27.9	36.7	9.9
CALMS									60	1.9	IN COLUMNS ABOVE			
											(1) = + OR - 10 DEGREES			
COLTOT	571	1131	643	450	276	39	0	1	3171		(2) = + OR - 20 DEGREES			
COLPER	18.0	35.7	20.3	14.2	8.7	1.2	0.0	.0			(3) = + OR - 30 DEGREES			

RESULTANT VECTOR WIND DIRECTION = 36 RESULTANT VECTOR WIND SPEED = 2.1 MPH VECTOR STANDARD DEVIATION = 12.4 MPH
AVERAGE WIND SPEED ALL OBS. = 10.1 MPH CONSTANCY = 21

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF MARCH
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
350	37	106	73	41	58	20	0	1	336	8.7	14.4	21.9	30.1	13.0
340	10	38	28	14	20	6	0	0	116	3.0	14.5	19.9	27.8	12.9
330	6	32	31	16	19	6	0	0	111	2.9	8.5	20.4	25.1	13.6
320	11	35	15	13	25	5	0	0	104	2.7	8.7	13.7	24.0	13.4
310	11	39	25	14	26	8	0	0	123	3.2	7.9	12.4	16.6	13.6
300	14	23	16	7	14	4	0	0	78	2.0	6.9	10.8	14.6	12.4
290	11	23	15	6	8	0	0	0	63	1.6	4.9	9.0	12.7	10.5
280	12	27	3	0	7	0	0	0	49	1.3	3.8	6.8	10.9	8.9
270	5	15	10	4	3	0	0	0	37	1.0	3.2	5.7	8.9	9.9
260	7	16	7	3	4	0	0	0	37	1.0	2.8	5.3	7.9	9.4
250	7	20	3	4	0	0	0	0	34	.9	3.1	5.0	9.5	7.7
240	6	19	14	7	2	0	0	0	48	1.2	3.1	7.3	12.2	9.9
230	7	19	8	2	1	0	0	0	37	1.0	5.5	10.3	14.5	8.5
220	11	54	37	13	10	2	0	0	127	3.3	8.2	12.7	18.2	10.6
210	11	56	56	21	7	1	0	0	152	3.9	10.5	16.0	21.6	10.5
200	11	42	50	17	6	0	0	0	126	3.3	11.8	19.4	25.5	10.5
190	11	54	61	36	17	0	0	0	179	4.6	12.2	22.3	31.2	11.7
180	11	46	43	31	34	1	0	0	166	4.3	15.1	24.0	31.2	13.1
170	13	52	51	42	67	15	0	0	240	6.2	16.2	24.0	28.5	15.2
160	15	30	52	27	79	17	0	0	220	5.7	15.1	20.6	26.1	16.5
150	7	25	27	17	39	10	0	0	125	3.2	10.1	17.2	22.3	16.5
140	10	15	6	6	7	2	0	0	46	1.2	5.3	11.9	18.7	11.5
130	13	10	8	0	2	2	0	0	35	.9	2.9	6.8	13.1	8.5
120	7	16	5	3	0	0	0	0	31	.8	2.4	4.2	8.3	7.7
110	10	12	4	1	1	0	0	0	28	.7	2.1	3.9	6.8	6.9
100	7	8	3	1	2	0	0	0	21	.5	2.2	4.7	7.0	7.9
90	8	19	8	1	1	0	0	0	37	1.0	3.2	5.3	8.8	7.4
80	18	26	14	4	3	0	0	0	65	1.7	4.1	7.3	10.5	8.3
70	18	16	13	7	1	0	0	0	55	1.4	5.8	9.3	13.6	8.3
60	12	32	35	16	8	0	0	0	103	2.7	6.6	12.1	17.7	11.1
50	12	38	22	19	6	2	0	0	99	2.6	9.0	15.1	22.3	11.1
40	20	50	41	24	10	0	0	0	145	3.7	11.0	19.2	25.3	10.4
30	35	59	37	33	25	3	0	0	183	4.7	14.0	21.2	25.6	11.3
20	22	46	43	57	42	4	0	0	214	5.5	14.9	21.4	32.6	13.6
10	24	53	40	30	23	5	0	0	181	4.7	12.9	26.3	33.0	12.4
	9	47	26	9	11	2	0	0	104	2.7	16.0	24.6	32.2	10.3
CALMS									17	.4				
COLTOT	459	1209	930	548	593	115	0	1	3872					
COLPER	11.9	31.2	24.0	14.2	15.3	3.0	0.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 17 RESULTANT VECTOR WIND SPEED = .6 MPH VECTOR STANDARD DEVIATION = 14.1 MPH
AVERAGE WIND SPEED ALL OBS. = 12.1 MPH CONSTANCY = 5

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF APRIL
ALL HOURS COMBINED

	Speed (mph)								ROW	Row Percentages				AVERAGE
DIR	1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	TOT	OBS	(1)	(2)	(3)	SPEED
360	57	149	73	30	33	11	0	0	352	3.9	17.4	25.0	32.2	10.3
350	18	45	46	13	19	5	0	0	146	3.7	15.7	22.8	29.6	11.6
340	10	35	33	19	13	12	0	0	122	3.1	9.1	20.4	25.8	13.4
330	13	17	21	19	12	9	0	0	91	2.3	7.7	13.1	23.6	14.3
320	9	22	26	13	12	9	0	0	91	2.3	6.3	11.0	15.7	14.0
310	8	17	23	13	5	1	0	0	67	1.7	5.6	8.9	12.6	11.8
300	10	27	19	3	2	0	0	0	61	1.5	4.2	7.2	10.8	8.6
290	8	12	11	7	0	1	0	0	39	1.0	3.2	6.1	9.6	9.9
280	5	6	9	5	0	0	0	0	25	.6	2.9	5.6	6.7	9.5
270	13	18	12	6	1	0	0	0	50	1.3	3.0	5.4	5.4	7.9
260	15	16	8	5	0	0	0	0	44	1.1	3.8	5.9	10.2	7.3
250	7	32	15	0	1	0	0	0	55	1.4	4.0	8.5	12.3	7.6
240	9	24	19	4	0	1	0	0	57	1.4	6.1	10.4	14.7	8.8
230	19	58	38	10	2	3	0	0	130	3.3	7.9	12.4	17.0	9.2
220	20	53	41	10	2	2	0	0	125	3.2	9.5	15.4	21.6	9.2
210	10	45	36	18	10	1	0	0	120	3.0	10.7	18.3	27.9	11.2
200	7	55	73	27	12	1	0	0	175	4.4	12.3	23.1	31.0	11.5
190	9	43	52	34	36	16	0	0	190	4.8	16.9	24.5	31.5	14.8
180	25	39	56	49	37	35	0	0	301	7.6	17.1	25.3	30.1	17.1
170	10	23	26	32	53	32	0	0	181	4.6	15.0	22.6	27.9	18.6
160	9	28	25	26	45	17	0	0	150	3.9	10.2	18.7	24.7	16.9
150	7	15	15	9	22	2	0	0	70	1.8	6.4	12.2	20.6	14.5
140	10	14	5	1	3	0	0	0	33	.9	3.8	8.4	13.4	8.8
130	17	19	5	5	1	0	0	0	47	1.2	2.8	5.0	9.8	7.0
120	4	11	7	2	1	0	0	0	30	.8	2.4	4.3	7.2	7.8
110	3	8	4	1	0	0	0	0	16	.4	2.2	4.5	6.7	8.3
100	12	20	8	1	1	0	0	0	42	1.1	2.6	4.7	7.5	7.2
90	12	18	10	2	2	0	0	0	44	1.1	3.5	5.5	8.0	7.9
80	8	22	19	4	0	0	0	0	53	1.3	4.1	6.9	10.3	8.7
70	10	17	23	10	3	0	0	0	63	1.6	4.7	8.8	14.8	10.4
60	19	23	16	10	0	0	0	0	68	1.7	6.3	12.6	19.6	6.6
50	26	34	30	15	12	2	0	0	119	3.0	9.7	16.1	22.0	10.4
40	26	40	45	43	33	7	0	0	194	4.9	12.8	19.0	25.4	13.4
30	22	53	35	44	33	4	0	0	191	4.8	14.3	22.1	32.7	12.7
20	18	47	32	34	40	7	0	0	179	4.5	14.1	28.0	34.7	13.9
10	24	62	35	27	32	7	0	1	188	4.8	18.2	26.8	34.8	12.6
CALMS									32	.8	IN COLUMNS ABOVE			
COLTOT	514	1163	951	551	543	185	0	1	3940		(1) = + OR - 10 DEGREES			
COLPER	13.0	29.5	24.1	14.0	13.8	4.7	0.0	.0			(2) = + OR - 20 DEGREES			
											(3) = + OR - 30 DEGREES			

RESULTANT VECTOR WIND DIRECTION = 105 RESULTANT VECTOR WIND SPEED = .3 MPH VECTOR STANDARD DEVIATION = 15.2 MPH
AVERAGE WIND SPEED ALL OBS. = 12.2 MPH CONSTANCY = 2

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF MAY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	36	119	36	8	13	4	0	0	216	5.3	11.0	17.4	24.5	8.6
350	17	61	30	13	13	3	0	0	137	3.4	11.5	16.6	22.6	10.5
340	17	49	40	9	6	1	0	0	116	2.8	8.9	16.7	20.6	9.9
330	20	40	26	7	15	2	0	0	111	2.7	8.1	13.0	19.4	10.8
320	13	45	18	8	12	5	0	0	101	2.5	6.8	10.7	15.0	11.3
310	13	32	9	7	3	1	0	0	65	1.6	5.1	8.8	12.7	8.8
300	13	13	9	4	3	1	0	0	43	1.1	3.6	7.1	11.6	9.6
290	13	15	5	3	1	0	0	0	37	.9	3.0	6.4	10.3	7.7
280	15	20	8	1	0	0	0	0	44	1.1	3.7	6.2	9.1	7.0
270	17	42	9	2	0	0	0	0	70	1.7	4.2	6.5	9.5	6.4
260	10	29	15	4	1	0	0	0	59	1.4	4.5	7.6	12.1	8.2
250	12	31	10	0	0	0	0	0	53	1.3	4.8	10.1	15.5	7.0
240	11	41	23	7	0	0	0	0	82	2.0	7.0	12.7	18.3	8.6
230	22	58	51	13	4	0	0	0	148	3.6	9.9	15.1	21.8	9.2
220	17	69	52	26	9	2	0	0	175	4.3	11.8	19.0	25.5	10.4
210	18	44	63	19	8	5	0	0	157	3.9	13.4	23.2	35.3	11.3
200	12	57	71	46	23	4	0	0	213	5.2	15.2	29.6	36.9	12.7
190	15	42	82	62	43	6	0	0	250	6.1	21.5	31.0	39.1	14.2
180	22	64	121	94	83	29	0	0	412	10.1	21.9	30.9	37.4	15.3
170	14	23	44	35	74	40	0	0	230	5.6	19.5	28.3	35.4	18.7
160	10	30	42	27	29	15	0	0	153	3.8	12.0	24.0	31.2	15.3
150	11	17	27	14	24	14	0	0	107	2.6	8.2	14.9	25.5	15.4
140	21	25	11	7	10	1	0	0	75	1.8	5.5	9.8	16.2	9.5
130	10	17	13	3	0	0	0	0	43	1.1	3.4	6.8	11.5	7.9
120	5	12	3	0	0	0	0	0	20	.5	2.3	5.1	9.0	6.4
110	11	15	3	1	0	0	0	0	30	.7	2.2	4.5	7.4	6.4
100	13	14	7	2	3	0	0	0	39	1.0	3.0	4.5	6.9	7.7
90	13	28	10	2	0	0	0	0	53	1.3	3.3	5.3	7.5	6.8
80	12	15	12	1	2	0	0	0	42	1.0	3.6	6.3	9.7	8.0
70	19	17	10	6	1	0	0	0	53	1.3	4.0	8.0	12.4	7.9
60	20	24	19	3	1	1	0	0	68	1.7	5.6	10.1	15.8	8.0
50	19	55	26	8	0	0	0	0	108	2.7	7.8	13.5	18.1	8.0
40	28	51	26	13	16	6	0	0	140	3.4	10.5	15.7	19.4	10.7
30	19	55	38	30	35	4	0	0	181	4.4	11.4	16.4	23.4	13.0
20	22	51	26	20	23	2	0	0	144	3.5	10.3	19.0	25.1	11.7
10	17	50	13	9	5	0	0	0	94	2.3	11.2	19.0	25.3	8.8
CALMS									2	.0	IN COLUMNS ABOVE (1) = + OR - 10 DEGREES (2) = + OR - 20 DEGREES (3) = + OR - 30 DEGREES			
COLTOT	572	1369	1005	514	461	145	0	0	4071					
COLPCT	14.1	33.6	24.8	12.6	11.3	3.6	0.0	0.0						

RESULTANT VECTOR WIND DIRECTION = 185 RESULTANT VECTOR WIND SPEED = 2.9 MPH VECTOR STANDARD DEVIATION = 13.9 MPH
AVERAGE WIND SPEED ALL OBS. = 11.5 MPH CONSTANCY = 26

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF JUNE
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	34	116	41	6	3	2	0	0	202	7.1	12.9	18.7	23.5	7.9
350	7	44	32	7	3	0	0	0	93	3.3	12.8	17.4	22.6	9.4
340	12	32	22	2	0	0	0	0	68	2.4	7.8	16.8	20.4	7.7
330	11	33	14	2	0	0	0	0	60	2.1	6.4	10.8	15.1	7.8
320	6	33	10	3	1	0	0	0	53	1.3	5.1	8.7	12.6	8.1
310	5	18	6	2	0	0	0	0	31	1.1	4.2	7.0	10.2	7.8
300	8	15	8	3	1	0	0	0	35	1.2	3.0	5.7	9.0	6.1
290	5	7	3	2	1	0	0	0	18	.6	2.7	5.0	7.6	8.3
280	3	14	5	2	0	0	0	0	24	.8	2.7	4.9	7.9	8.3
270	6	20	6	1	1	0	0	0	34	1.2	3.0	5.6	9.2	7.5
260	3	18	6	0	0	0	0	0	27	1.0	4.1	7.3	12.1	7.1
250	13	27	15	1	0	0	0	0	56	2.0	5.3	10.6	17.2	7.4
240	9	28	26	1	2	0	0	0	66	2.3	9.4	15.2	21.4	8.9
230	12	50	44	10	1	0	0	0	117	4.1	12.3	19.2	25.8	9.2
220	11	64	66	17	6	0	0	0	164	5.8	14.9	23.9	33.8	10.1
210	6	43	54	26	12	0	0	0	141	5.0	17.4	29.5	43.0	11.9
200	7	53	71	37	21	0	0	0	189	6.7	19.6	36.5	46.8	12.4
190	11	39	77	39	58	0	0	0	224	7.9	25.7	36.9	45.1	14.4
180	14	42	88	43	89	8	0	0	315	11.1	25.3	35.4	42.1	15.5
170	9	22	35	43	57	10	0	0	176	6.2	20.8	30.4	38.7	16.7
160	12	16	24	22	22	1	0	0	97	3.4	11.4	24.1	33.0	13.7
150	7	4	15	10	13	0	0	0	49	1.7	6.7	14.0	25.6	14.2
140	10	18	5	11	1	0	0	0	45	1.6	4.3	8.2	15.0	6.9
130	12	14	1	0	1	0	0	0	28	1.0	3.1	5.3	9.5	5.9
120	7	5	0	2	0	0	0	0	14	.5	2.0	4.3	7.5	6.1
110	6	7	1	1	0	0	0	0	15	.5	1.7	4.2	6.7	6.3
100	8	9	1	2	0	0	0	0	20	.7	2.7	4.1	5.9	6.6
90	12	13	9	5	2	0	0	0	41	1.4	3.1	4.5	5.8	8.2
80	10	11	3	1	1	0	0	0	26	.9	3.2	4.8	5.6	6.6
70	4	11	6	2	1	0	0	0	24	.8	2.6	5.4	5.0	8.9
60	7	11	6	1	0	0	0	0	25	.9	3.0	5.5	10.0	7.2
50	13	11	7	4	2	0	0	0	37	1.3	4.1	7.5	11.8	5.1
40	16	14	14	2	7	0	0	0	53	1.9	5.9	10.1	13.4	9.4
30	15	18	14	8	21	0	0	0	76	2.7	7.9	11.7	19.7	12.4
20	11	30	13	16	22	2	0	0	94	3.3	8.5	17.5	22.1	13.2
10	12	35	11	6	7	0	0	0	71	2.5	13.0	18.9	23.2	9.7
CALMS									23	.8				
COLTOT	354	945	759	380	347	23	0	0	2831					
COLPER	12.5	33.4	26.8	13.4	12.3	.8	0.0	0.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 192 RESULTANT VECTOR WIND SPEED = 4.3 MPH VECTOR STANDARD DEVIATION = 12.7 MPH
AVERAGE WIND SPEED ALL OBS. = 11.1 MPH CONSTANCY = 39

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF JULY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	OBS	Row Percentages (1)	(2)	(3)	AVERAGE SPEED
360	51	101	19	7	12	1	0	0	190	6.0	10.8	15.7	21.1	7.9
350	13	54	18	0	7	0	0	0	97	3.1	11.7	15.8	19.5	8.4
340	10	41	25	0	5	0	0	0	81	2.6	8.1	15.4	18.5	8.9
330	14	47	12	0	3	1	0	0	77	2.4	6.3	10.9	17.6	8.0
320	11	24	4	1	1	0	0	0	41	1.3	5.1	8.5	12.2	6.5
310	12	21	6	1	3	0	0	0	43	1.4	3.5	6.5	10.0	7.8
300	11	13	1	0	0	0	0	0	25	.8	2.8	5.0	6.9	5.3
290	5	11	3	0	1	0	0	0	20	.6	2.3	5.1	7.7	6.9
280	10	13	4	1	0	0	0	0	28	.9	3.0	5.1	7.9	6.2
270	18	21	6	0	0	0	0	0	45	1.4	3.7	5.7	6.5	5.7
260	12	19	10	0	1	0	0	0	42	1.3	4.2	7.1	11.9	7.3
250	11	22	9	0	2	1	0	0	45	1.4	4.8	10.3	16.0	8.1
240	11	24	18	7	2	1	0	0	63	2.0	7.6	13.7	18.7	9.5
230	16	41	60	8	5	1	0	0	131	4.2	11.0	16.0	22.4	9.3
220	12	51	63	18	5	2	0	0	151	4.8	12.5	19.7	28.0	10.5
210	6	31	52	21	3	0	0	0	113	3.6	13.5	24.6	37.2	11.3
200	13	47	60	35	6	0	0	0	161	5.1	15.6	31.0	42.3	11.1
190	18	41	72	60	26	1	0	0	218	6.9	22.7	33.4	43.2	12.9
180	17	44	102	87	77	8	0	0	335	10.6	24.7	34.8	40.9	15.0
170	15	35	41	59	69	5	0	0	224	7.1	22.8	32.2	34.2	15.7
160	22	35	37	30	36	0	0	0	160	5.1	14.6	27.1	35.7	13.2
150	10	26	24	12	5	0	0	0	77	2.4	9.4	18.2	23.7	10.5
140	12	13	22	4	3	0	0	0	59	1.9	6.0	12.0	14.6	9.1
130	18	17	7	8	2	0	0	0	52	1.7	4.5	7.4	13.3	8.0
120	14	11	2	1	2	0	0	0	30	1.0	3.1	5.8	9.9	6.8
110	5	4	3	4	0	0	0	0	16	.5	2.3	5.6	8.6	8.9
100	15	6	1	3	1	0	0	0	26	.8	3.0	5.1	8.1	6.2
90	24	11	12	4	1	0	0	0	52	1.7	3.6	5.5	9.1	6.9
80	12	14	5	2	3	0	0	0	36	1.1	4.2	6.6	9.2	7.3
70	13	14	11	2	4	0	0	0	44	1.4	4.1	7.9	11.0	8.9
60	17	15	5	8	0	2	0	0	50	1.6	5.1	5.6	13.1	8.9
50	11	27	10	13	5	0	0	0	66	2.1	6.0	10.3	13.8	10.1
40	24	21	15	9	5	0	0	0	74	2.3	7.4	11.3	14.4	8.9
30	21	33	15	18	5	0	0	0	92	2.9	7.6	11.4	19.0	9.5
20	17	25	9	8	10	4	0	0	73	2.3	7.0	15.3	20.5	11.0
10	11	30	6	1	4	2	0	0	54	1.7	10.1	16.1	21.0	8.6
CALMS	59								59	1.9				
COLTOT	537	1009	771	432	314	29	0	0	3150					
COLPER	17.0	32.0	24.5	13.7	10.0	.9	0.0	0.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 163 RESULTANT VECTOR WIND SPEED = 4.0 MPH VECTOR STANDARD DEVIATION = 12.2 MPH
AVERAGE WIND SPEED ALL OBS. = 10.4 MPH CONSTANCY = 39

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF AUGUST
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	47	182	50	2	1	0	0	0	282	9.5	15.4	19.8	24.1	7.3
350	12	71	28	0	0	0	0	0	111	3.7	15.5	19.9	24.3	7.7
340	6	51	13	0	0	0	0	0	70	2.3	8.2	20.0	23.6	7.5
330	11	45	8	0	0	0	0	0	64	2.1	6.9	11.9	22.1	6.7
320	15	46	7	1	2	0	0	0	71	2.4	5.8	8.9	13.0	6.8
310	12	20	5	0	1	0	0	0	38	1.3	4.4	6.9	9.7	6.4
300	8	12	1	1	0	0	0	0	22	.7	2.4	5.2	8.3	5.8
290	5	5	0	1	0	0	0	0	11	.4	1.6	3.9	6.7	6.0
280	9	4	1	0	0	0	0	0	14	.5	1.7	3.0	5.0	4.8
270	14	11	2	0	0	0	0	0	27	.9	1.9	3.0	5.2	5.2
260	5	10	1	0	0	0	0	0	16	.5	2.1	4.1	7.0	6.1
250	10	9	2	0	0	0	0	0	21	.7	2.7	6.9	12.0	5.4
240	9	24	11	0	0	0	0	0	44	1.5	5.5	10.6	16.2	6.0
230	13	47	34	5	0	0	0	0	99	3.3	9.4	14.7	21.4	8.6
220	15	66	42	13	1	0	0	0	137	4.6	12.5	20.2	29.0	9.0
210	20	54	54	9	1	0	0	0	138	4.6	15.4	26.8	40.3	9.1
200	23	66	64	25	6	0	0	0	184	6.2	18.9	35.5	46.7	9.9
190	22	59	95	55	11	1	0	0	242	8.1	26.3	38.8	47.3	11.6
180	24	63	113	98	59	2	0	0	359	12.0	28.0	38.1	45.0	13.5
170	21	30	75	55	46	9	0	0	236	7.9	23.8	34.2	41.5	14.4
160	11	22	36	26	12	8	0	0	117	3.9	14.0	27.2	36.1	13.8
150	10	16	19	12	4	5	0	0	66	2.2	7.3	16.0	28.5	12.0
140	7	11	3	6	2	6	0	0	35	1.2	4.2	8.5	17.1	13.3
130	7	11	2	3	0	0	0	0	23	.8	2.4	5.3	9.6	6.6
120	5	9	0	0	0	0	0	0	14	.5	1.9	3.5	6.4	5.4
110	12	5	2	0	0	0	0	0	19	.6	1.5	3.1	4.9	4.7
100	5	6	1	0	0	0	0	0	12	.4	1.9	3.0	4.7	6.1
90	9	8	6	0	0	0	0	0	23	.8	1.8	3.5	5.1	6.4
80	6	11	2	1	0	0	0	0	20	.7	2.4	4.0	6.1	6.0
70	7	5	11	4	2	0	0	0	29	1.0	2.8	5.1	7.2	9.9
60	8	9	9	6	2	0	0	0	34	1.1	3.6	6.0	9.0	10.0
50	20	12	6	6	1	0	0	0	45	1.5	4.4	7.5	10.2	7.4
40	17	18	7	6	3	0	0	0	51	1.7	5.4	8.6	11.8	8.0
30	19	21	12	6	3	0	0	0	66	2.2	5.9	9.7	20.3	9.4
20	16	25	3	5	11	0	0	0	60	2.0	6.5	17.6	22.9	9.8
10	16	39	6	2	4	0	0	0	67	2.2	13.7	19.6	23.7	7.8
CALMS									117	3.9				
COLTOT	476	1102	731	350	176	31	0	0	2983					
COLPCT	16.0	36.9	24.5	11.7	5.9	1.0	0.0	0.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 185 RESULTANT VECTOR WIND SPEED = 3.4 MPH VECTOR STANDARD DEVIATION = 11.1 MPH
AVERAGE WIND SPEED ALL OBS. = 9.5 MPH CONSTANCY = 40

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF SEPTEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	CBS	Row Percentages (1)	(2)	(3)	AVERAGE SPEED
360	51	91	31	3	7	5	0	0	187	5.6	13.6	20.2	23.0	8.0
350	14	50	29	1	3	2	0	0	99	3.5	11.8	17.0	22.9	9.0
340	8	32	5	1	1	1	0	0	48	1.7	6.9	15.4	20.1	7.9
330	11	24	7	3	3	0	0	0	44	1.7	5.3	10.0	17.4	8.5
320	12	25	9	4	4	0	0	0	53	1.9	4.8	7.2	11.2	8.2
310	7	22	4	1	0	0	0	0	34	1.2	3.9	6.0	9.1	6.7
300	6	11	2	1	0	0	0	0	22	.9	2.4	4.7	7.2	6.0
290	0	7	3	2	0	0	0	0	12	.4	1.6	3.6	6.1	9.2
280	4	4	0	2	1	0	0	0	11	.4	1.7	3.0	4.9	9.1
270	10	11	2	1	0	0	0	0	24	.8	1.8	2.9	5.0	6.0
260	6	7	1	0	1	0	0	0	17	.6	2.1	3.3	6.3	5.8
250	7	3	1	2	0	0	0	0	13	.7	2.6	5.5	9.8	6.8
240	8	25	3	1	0	0	0	0	37	1.3	4.0	7.5	11.6	6.5
230	8	29	15	5	1	0	0	0	58	2.1	6.3	10.2	14.9	9.0
220	14	35	23	9	1	0	0	0	82	2.9	8.2	13.6	21.2	8.8
210	14	39	29	9	1	1	0	0	92	3.3	10.3	19.2	29.1	9.4
200	11	34	49	15	5	2	0	0	116	4.1	14.3	25.7	32.5	11.0
190	9	46	59	46	29	7	0	0	196	6.9	19.6	27.5	33.6	13.8
180	22	35	74	60	39	8	0	0	242	8.6	20.2	27.5	32.6	14.0
170	19	22	36	34	28	3	0	0	133	4.7	16.4	25.2	30.5	14.3
160	17	23	21	18	11	0	0	0	90	3.2	9.7	19.5	27.1	11.3
150	10	19	14	6	3	0	0	0	52	1.8	6.2	11.6	20.8	9.6
140	10	15	7	2	0	0	0	0	34	1.2	3.7	7.6	13.0	7.3
130	9	8	3	0	0	0	0	0	20	.7	2.5	5.1	9.0	5.3
120	5	6	5	1	1	0	0	0	13	.6	2.1	4.0	7.4	8.4
110	4	12	3	0	2	0	0	0	21	.7	2.1	4.3	7.2	7.9
100	4	9	4	2	0	0	0	0	19	.7	3.0	5.3	7.9	8.2
90	9	13	12	5	1	0	0	0	45	1.6	3.9	6.5	9.1	8.0
80	9	17	15	5	0	0	0	0	46	1.6	5.1	7.7	11.4	8.4
70	13	17	15	7	1	0	0	0	53	1.9	5.4	9.9	16.3	8.7
60	7	25	11	9	3	0	0	0	55	1.9	6.7	14.0	21.7	9.7
50	18	27	24	10	3	0	0	0	82	2.9	10.5	19.5	25.1	9.3
40	22	52	31	39	15	2	0	0	161	5.7	14.7	21.6	26.9	11.6
30	24	57	28	32	30	2	0	0	173	6.1	16.7	23.1	31.7	12.8
20	19	65	21	13	16	5	0	0	139	4.9	14.5	26.9	33.2	10.8
10	11	49	18	6	11	4	0	0	99	3.5	15.0	24.6	32.0	10.6
CALMS									131	6.8	IN COLUMNS ABOVE (1) = + OR - 10 DEGREES (2) = + OR - 20 DEGREES (3) = + OR - 30 DEGREES			
COLTOT	428	978	613	355	221	42	0	0	2323					
COLPCT	15.1	34.5	21.7	12.6	7.8	1.5	0.0	0.0						

RESULTANT VECTOR WIND DIRECTION = 130 RESULTANT VECTOR WIND SPEED = 1.3 MPH VECTOR STANDARD DEVIATION = 12.2 MPH
AVERAGE WIND SPEED ALL OBS. = 9.8 MPH CONSTANCY = 13

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF OCTOBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-24	30-39	40-49	50+	TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	49	103	44	28	26	9	0	0	264	7.8	15.3	25.8	35.4	10.5
350	14	42	30	9	7	2	0	0	104	3.1	13.4	20.2	22.3	10.3
340	11	34	23	5	7	4	0	0	84	2.5	7.4	16.4	22.7	10.9
330	10	23	13	4	5	5	0	0	60	1.8	6.3	9.4	15.4	11.2
320	12	23	8	3	7	4	0	0	57	1.7	4.3	7.5	11.1	10.9
310	5	14	4	1	2	1	0	0	27	.8	3.2	5.5	7.5	9.4
300	8	14	2	1	0	0	0	0	25	.7	2.1	4.2	7.0	6.0
290	7	4	3	0	0	0	0	0	15	.5	1.7	3.6	6.2	5.7
280	7	7	1	1	0	0	0	0	16	.5	2.0	3.7	5.4	5.5
270	13	13	6	2	0	0	0	0	34	1.0	2.5	3.3	5.7	6.5
260	11	13	6	2	1	0	0	0	33	1.0	2.8	4.5	7.2	7.7
250	8	14	5	1	1	0	0	0	29	.9	3.0	6.2	10.0	7.1
240	10	21	7	1	0	0	0	0	39	1.2	4.2	8.5	12.0	6.8
230	13	41	16	2	1	0	0	0	73	2.2	6.6	10.0	15.9	7.6
220	23	64	20	4	1	0	0	0	112	3.3	6.0	12.1	16.4	7.4
210	15	46	22	1	1	0	0	0	85	2.5	8.8	14.4	21.3	7.9
200	13	52	27	3	3	1	0	0	99	2.9	9.0	15.0	23.9	8.5
190	19	46	23	22	8	0	0	0	118	3.5	12.2	18.3	23.9	10.1
180	15	52	48	26	46	6	0	0	193	5.7	12.8	17.0	21.8	13.8
170	11	19	27	18	36	11	0	0	122	3.6	11.6	16.3	26.4	16.4
160	10	15	20	9	15	6	0	0	76	2.3	7.1	14.0	19.5	14.2
150	5	15	9	6	2	0	0	0	41	1.2	4.7	9.2	15.9	9.1
140	11	20	6	2	1	0	0	0	40	1.2	3.4	6.5	10.7	6.7
130	14	14	5	0	0	0	0	0	33	1.0	3.1	4.9	6.7	5.7
120	9	15	2	2	2	0	0	0	30	.9	2.5	5.2	5.8	7.8
110	7	7	5	1	0	0	0	0	20	.6	3.0	6.4	9.9	7.1
100	15	23	11	5	0	0	0	0	52	1.5	4.5	7.7	11.4	7.8
90	24	44	6	5	0	0	0	0	81	2.4	6.2	9.5	13.4	6.8
80	20	31	17	8	1	0	0	0	77	2.3	7.4	11.9	16.7	8.2
70	20	34	31	3	0	0	0	0	92	2.7	8.0	14.6	23.1	8.3
60	20	48	24	7	1	0	0	0	100	3.0	9.9	19.2	30.4	8.2
50	24	55	39	19	4	0	0	0	141	4.2	14.2	25.7	35.4	9.5
40	32	64	48	42	42	5	0	0	234	7.1	20.0	39.4	35.1	12.4
30	40	60	53	78	60	5	0	0	296	8.9	23.2	32.5	43.2	13.5
20	26	65	37	58	53	11	0	0	250	7.4	21.2	36.1	43.4	13.9
10	26	56	28	31	25	4	0	0	170	5.0	20.3	32.1	41.7	11.9
CALMS									45	1.3				
OBSTOT	542	1226	678	410	359	74	0	0	3374					
OBSPER	17.2	36.3	20.1	12.2	10.5	2.2	0.0	0.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 38 RESULTANT VECTOR WIND SPEED = 3.1 MPH VECTOR STANDARD DEVIATION = 12.8 MPH
AVERAGE WIND SPEED ALL OBS. = 10.5 MPH CONSTANCY = 30

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF NOVEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	70	111	42	16	7	1	0	0	247	6.2	15.2	26.2	35.4	7.8
350	20	63	24	9	5	6	0	0	130	3.3	11.9	19.5	29.9	10.1
340	19	36	23	11	5	3	0	0	97	2.4	7.5	15.6	22.5	9.9
330	5	37	20	3	6	0	0	0	71	1.8	5.1	10.6	17.8	10.0
320	17	32	14	10	2	0	0	0	75	1.9	4.9	8.3	12.1	8.8
310	10	17	11	6	2	0	0	0	46	1.2	4.0	6.3	9.5	9.5
300	10	13	7	6	1	0	0	0	37	.9	2.7	5.3	7.9	8.5
290	7	7	3	2	2	0	0	0	21	.5	2.2	4.2	6.8	9.1
280	5	18	3	2	0	0	0	0	28	.7	2.1	3.7	6.2	7.1
270	11	18	4	0	0	0	0	0	33	.8	2.2	4.0	5.7	6.1
260	12	13	1	0	1	0	0	0	27	.7	2.8	5.2	8.5	5.7
250	19	30	0	0	2	0	0	0	51	1.3	3.7	7.2	10.8	5.3
240	22	45	2	0	0	0	0	0	69	1.7	5.7	9.3	12.4	5.6
230	30	65	11	0	1	0	0	0	107	2.7	7.3	10.9	13.9	6.2
220	23	75	9	1	1	0	0	0	114	2.9	7.9	11.9	15.2	6.2
210	20	47	21	3	0	0	0	0	91	2.3	7.5	12.2	16.3	7.4
200	25	48	12	6	0	0	0	0	91	2.3	6.6	11.8	16.8	6.9
190	17	37	15	10	2	0	0	0	81	2.0	6.7	11.2	15.4	8.4
180	24	29	15	12	13	0	0	0	93	2.3	6.6	10.2	13.3	9.9
170	21	20	14	11	19	4	0	0	89	2.2	5.9	8.7	12.0	12.7
160	9	13	12	9	7	2	0	0	52	1.3	4.4	7.7	10.6	12.6
150	14	7	7	1	3	0	0	0	32	.8	3.1	6.2	9.1	8.0
140	16	13	6	2	3	0	0	0	40	1.0	2.6	4.6	7.6	7.5
130	15	13	4	0	0	0	0	0	32	.8	2.4	4.0	6.3	5.1
120	13	9	2	1	0	0	0	0	25	.6	2.2	4.2	7.2	5.7
110	12	12	6	0	0	0	0	0	30	.8	2.4	5.3	8.7	6.1
100	20	11	9	0	0	0	0	0	40	1.0	3.9	6.9	11.4	5.8
90	22	38	22	3	0	0	0	0	85	2.1	5.5	10.0	15.3	7.6
80	27	40	14	9	4	0	0	0	94	2.4	8.2	13.9	20.8	8.0
70	38	64	30	12	4	0	0	0	148	3.7	16.8	19.0	26.3	8.1
60	40	59	40	18	6	0	0	0	185	4.7	14.5	25.2	37.7	8.0
50	62	94	51	37	10	0	0	0	244	6.1	19.1	33.2	44.1	9.0
40	64	97	64	62	40	2	0	0	329	8.3	24.8	35.9	47.5	11.1
30	61	87	92	96	69	8	0	0	413	10.4	27.2	39.1	50.0	13.0
20	52	73	66	82	61	5	0	0	339	8.5	24.7	39.2	45.6	12.9
10	40	62	56	44	24	1	0	0	227	5.7	20.5	34.2	44.9	11.0
CALMS									54	1.4				
COLTOT	897	1473	732	478	303	32	0	0	3963					
COLPCT	22.6	37.1	18.4	12.0	7.6	.8	0.0	0.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 29 RESULTANT VECTOR WIND SPEED = 4.6 MPH VECTOR STANDARD DEVIATION = 10.8 MPH
AVERAGE WIND SPEED ALL OBS. = 5.4 MPH CONSTANCY = 49

4JA
SURFACE WIND SUMMARY FOR THE MONTH OF DECEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	93	133	55	23	23	10	0	0	337	8.1	17.9	29.2	41.3	8.9
350	30	53	15	14	5	5	0	0	125	3.0	13.2	21.9	33.1	9.4
340	16	39	11	6	8	2	0	0	82	2.0	7.1	17.0	25.1	9.5
330	23	17	15	17	7	5	0	0	84	2.0	5.8	10.3	15.5	11.5
320	10	33	14	7	11	1	0	0	76	1.8	5.3	8.3	12.0	11.1
310	19	24	7	3	5	0	0	0	58	1.4	4.3	7.0	9.8	8.0
300	20	17	3	2	2	0	0	0	44	1.1	3.1	5.8	8.0	6.1
290	13	10	2	2	0	0	0	0	27	.7	2.5	5.1	8.0	6.0
280	17	14	2	1	0	0	0	0	34	.8	2.7	4.8	7.7	5.0
270	18	25	5	1	0	0	0	0	49	1.2	3.1	5.2	7.9	6.0
260	14	29	1	0	0	0	0	0	44	1.1	3.7	6.1	9.4	5.5
250	25	31	5	0	0	0	0	0	61	1.5	4.1	7.0	11.9	5.6
240	24	36	4	2	0	0	0	0	66	1.6	5.7	9.3	13.2	5.8
230	30	68	5	5	0	0	0	0	108	2.6	7.3	11.0	14.0	6.2
220	33	59	8	0	0	0	0	0	130	3.1	7.9	11.4	14.7	5.8
210	23	56	6	4	0	0	0	0	89	2.2	7.2	11.6	15.2	6.4
200	32	41	3	1	2	0	0	0	80	1.9	5.8	11.0	15.5	5.8
190	20	34	10	1	2	0	0	0	73	1.8	5.7	9.7	14.2	6.5
180	26	25	9	9	14	0	0	0	84	2.0	5.6	8.9	11.6	10.1
170	15	11	4	15	19	12	0	0	76	1.8	5.2	7.5	10.2	16.5
160	15	9	8	5	8	5	0	0	54	1.3	3.7	6.5	8.8	12.8
150	10	7	0	5	1	0	0	0	23	.5	2.6	5.0	7.6	8.0
140	21	9	1	1	0	0	0	0	32	.8	1.8	3.7	6.3	4.6
130	11	9	0	0	0	0	0	0	20	.5	1.9	3.1	5.5	4.3
120	14	7	0	0	0	0	0	0	26	.6	1.8	3.6	6.1	3.4
110	15	10	2	1	0	0	0	0	28	.7	2.3	4.8	8.1	5.5
100	17	23	2	0	0	1	0	0	43	1.0	3.6	6.3	11.1	5.9
90	35	28	11	4	1	1	0	0	80	1.9	5.5	10.0	14.5	6.8
80	29	46	23	5	2	0	0	0	105	2.5	8.2	13.2	19.8	7.6
70	45	53	36	12	4	0	1	0	156	3.8	10.2	18.1	26.9	8.0
60	45	64	42	5	6	0	0	0	162	3.9	13.6	23.3	35.0	7.9
50	60	79	63	27	11	2	1	1	244	5.9	17.6	31.4	45.3	9.6
40	58	91	57	75	35	6	0	0	322	7.8	23.8	37.0	47.5	11.4
30	61	83	76	109	77	9	1	1	417	10.1	27.2	39.4	51.8	13.5
20	39	83	58	99	93	12	1	1	386	9.3	26.1	42.0	51.0	14.6
10	60	77	46	48	43	3	0	0	277	6.7	24.2	37.3	47.1	11.4
CALMS									34	.8				
COLTOT	1048	1469	612	513	380	74	4	3	4137					
COLPER	25.3	35.5	14.8	12.4	9.2	1.8	.1	.1						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 25 RESULTANT VECTOR WIND SPEED = 5.3 MPH VECTOR STANDARD DEVIATION = 11.4 MPH
AVERAGE WIND SPEED ALL OBS. = 9.7 MPH CONSTANCY = 54

APPENDIX F

Surface Wind Summary, Tower 6, Jackass Flats, Nevada, 1956-1960

TOWER 6 JACKASS FLATS, NEVADA
ANNUAL SURFACE WIND SUMMARY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	472	956	500	196	124	1	0	0	2249	7.0	16.0	27.7	36.6	8.6
350	232	872	845	319	124	20	1	1	2414	7.5	24.6	33.7	40.8	10.7
340	244	942	1413	589	144	12	0	0	3264	10.1	25.1	37.7	42.4	11.1
330	252	798	829	379	140	17	1	0	2416	7.5	23.2	33.0	42.5	11.0
320	218	611	587	262	111	23	1	0	1813	5.6	16.2	29.1	36.5	10.0
310	166	340	284	142	55	11	0	0	998	3.1	10.4	18.0	29.6	10.1
300	162	175	121	70	22	3	0	0	553	1.7	5.7	12.0	20.2	8.0
290	85	112	49	30	18	0	0	0	294	.9	3.3	7.1	13.3	8.5
280	63	73	34	16	5	1	0	0	212	.7	2.3	4.6	8.3	7.2
270	109	70	36	18	2	0	0	0	235	.7	1.9	3.5	6.0	6.2
260	84	59	27	4	2	0	0	0	176	.5	1.9	3.3	5.3	5.9
250	84	70	40	10	3	0	0	0	207	.6	2.0	3.7	5.5	6.9
240	74	102	53	12	3	1	0	0	249	.8	2.4	4.1	6.2	7.5
230	111	105	72	25	10	3	0	0	326	1.0	2.9	5.0	7.0	8.0
220	100	121	97	20	5	1	0	0	360	1.1	3.6	6.6	10.7	8.0
210	105	204	105	35	11	0	0	0	460	1.4	4.9	9.3	15.7	8.2
200	147	352	173	54	19	2	0	0	747	2.3	7.1	13.9	21.4	9.3
190	164	517	296	83	29	2	0	0	1091	3.4	11.3	19.3	26.0	8.9
180	260	765	501	107	89	12	1	0	1815	5.6	15.5	24.2	30.6	9.6
170	197	601	506	336	250	20	0	0	2094	6.5	18.5	26.0	32.6	12.1
160	200	544	501	301	377	60	4	0	2067	6.4	17.0	26.9	32.1	13.4
150	167	443	351	274	301	46	1	0	1583	4.9	14.0	23.1	29.0	13.1
140	179	360	221	152	174	31	0	0	1117	3.5	10.2	17.7	25.0	11.0
130	134	212	109	75	44	4	0	0	570	1.0	6.4	12.1	19.4	9.4
120	125	154	43	20	10	0	0	0	352	1.1	3.7	8.1	14.1	6.9
110	105	113	20	13	1	0	0	0	260	.0	2.0	5.7	10.1	6.3
100	107	121	47	13	6	1	0	0	295	.9	2.0	4.0	7.0	6.9
90	147	137	42	14	5	0	0	0	345	1.1	2.9	4.9	7.3	6.3
80	114	123	43	23	3	0	0	0	306	.9	3.2	5.4	7.0	7.0
70	126	127	02	32	9	0	0	0	376	1.2	3.4	6.1	0.5	7.0
60	90	137	109	50	10	0	0	0	420	1.3	4.1	6.6	9.1	9.1
50	170	163	95	64	16	0	0	0	516	1.6	4.4	7.1	9.5	8.1
40	170	174	60	50	10	0	0	0	496	1.5	4.6	7.4	10.1	7.0
30	156	159	09	44	17	0	0	0	465	1.4	4.5	7.7	16.0	8.0
20	140	196	02	56	11	0	0	0	493	1.5	4.5	13.1	22.1	7.9
10	140	203	96	40	17	0	0	0	504	1.6	10.1	19.0	30.7	8.1
CALMS									02	.3				
COLTOT	5663	11299	8654	4032	2201	279	17	1	32226					
COLPER	17.6	35.1	26.9	12.5	6.8	.9	.1	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 332 RESULTANT VECTOR WIND SPEED = .7 MPH VECTOR STANDARD DEVIATION = 12.1 MPH
AVERAGE WIND SPEED ALL OBS. = 10.1 MPH CONSTANCY = 7

Location: 584,789E, 745,662N
Elevation: 3256 feet

Tower Height: 96 feet
Period of Record: 3/20/1956-12/15/1960

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF JANUARY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	75	97	40	22	13	0	0	0	247	9.5	20.3	35.3	46.5	8.0
350	36	88	60	36	18	2	0	0	232	8.9	30.9	42.3	51.3	10.5
340	37	94	122	46	26	1	0	0	326	12.5	31.0	47.0	53.2	11.2
330	36	95	62	34	21	1	0	0	249	9.6	28.6	41.9	53.0	10.6
320	27	60	43	26	10	4	0	0	170	6.5	20.5	35.4	45.4	10.5
310	27	39	34	11	3	0	0	0	114	4.4	13.3	24.0	37.5	8.7
300	22	27	7	7	0	0	0	0	63	2.4	7.9	15.4	25.7	6.9
290	7	13	8	2	0	0	0	0	30	1.2	4.5	9.6	16.8	7.9
280	9	11	2	2	0	0	0	0	24	.9	2.8	5.9	10.8	6.5
270	13	5	2	0	0	0	0	0	20	.8	2.4	4.0	6.9	4.4
260	13	5	0	0	0	0	0	0	18	.7	1.9	3.3	5.2	3.9
250	10	2	0	0	0	0	0	0	12	.5	1.7	3.1	4.8	3.7
240	6	7	0	0	0	0	0	0	13	.5	1.7	3.1	5.0	4.5
230	12	7	0	0	0	0	0	0	19	.7	1.9	3.6	5.8	4.1
220	12	4	2	0	0	0	0	0	18	.7	2.6	4.6	6.9	4.7
210	14	15	2	0	0	0	0	0	31	1.2	3.4	5.9	9.[illegible]	5.3
200	10	23	6	0	0	0	0	0	39	1.5	4.5	8.1	12.2	6.0
190	16	29	2	1	0	0	0	0	48	1.8	6.3	10.0	15.0	6.0
180	27	46	3	0	0	0	0	0	76	2.9	8.1	13.1	17.0	5.6
170	17	47	16	4	3	0	0	0	87	3.3	9.8	14.4	18.7	7.9
160	22	51	14	3	2	0	0	0	92	3.5	9.6	15.3	19.1	7.5
150	27	29	6	3	6	0	0	0	71	2.7	9.1	14.3	18.5	7.7
140	20	28	10	3	12	1	0	0	74	2.8	7.4	12.2	16.7	9.7
130	15	19	5	2	7	1	0	0	49	1.9	6.0	9.8	14.2	9.2
120	15	16	2	0	0	0	0	0	33	1.3	4.2	7.9	11.9	5.3
110	11	16	1	0	0	0	0	0	28	1.1	3.2	6.4	10.4	5.3
100	12	9	1	0	0	0	0	0	22	.8	3.2	5.7	9.2	4.6
90	21	10	3	0	0	0	0	0	34	1.3	3.3	6.0	8.7	5.1
80	16	14	0	1	0	0	0	0	31	1.2	4.1	6.3	9.1	5.1
70	21	12	9	0	0	0	0	0	42	1.6	4.2	7.2	9.6	5.8
60	13	15	5	3	0	0	0	0	36	1.4	4.7	7.4	10.4	6.8
50	24	15	6	0	0	0	0	0	45	1.7	4.6	7.9	11.6	5.7
40	17	20	2	1	0	0	0	0	40	1.5	5.0	8.0	12.3	5.3
30	25	12	2	5	0	0	0	0	44	1.7	5.7	9.3	20.2	5.8
20	33	22	6	3	1	0	0	0	65	2.5	6.1	17.1	27.7	5.9
10	18	19	10	2	0	0	0	0	49	1.9	13.9	24.4	38.5	6.8
CALMS									15	.6				
COLTOT	736	1013	493	217	122	10	0	0	2606					
COLPER	28.2	38.9	18.9	8.3	4.7	.4	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 343 RESULTANT VECTOR WIND SPEED = 3.9 MPH VECTOR STANDARD DEVIATION = 9.5 MPH
AVERAGE WIND SPEED ALL OBS. = 8.3 MPH CONSTANCY = 48

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF FEBRUARY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	24	67	34	14	10	0	0	0	149	7.7	16.0	28.3	38.1	9.0
350	8	56	45	17	5	1	0	0	132	6.8	25.2	34.8	44.5	10.3
340	15	65	86	30	7	2	0	0	205	10.6	25.6	41.4	46.7	11.0
330	15	57	52	22	8	2	0	0	156	8.1	26.8	37.5	47.0	10.7
320	14	61	53	14	12	2	0	0	156	8.1	20.0	32.5	40.1	10.3
310	8	21	33	11	1	0	0	0	74	3.8	13.7	22.7	34.2	10.1
300	11	12	8	3	1	0	0	0	35	1.8	6.5	15.5	24.2	8.1
290	6	6	2	1	1	0	0	0	16	.8	3.6	8.0	17.0	7.6
280	8	5	2	2	1	0	0	0	18	.9	2.4	5.0	9.1	6.9
270	7	5	0	0	0	0	0	0	12	.6	2.4	3.5	5.9	4.5
260	8	5	3	0	0	0	0	0	16	.8	1.7	3.3	4.7	5.4
250	3	2	0	0	0	0	0	0	5	.3	1.7	2.9	4.5	4.8
240	5	5	2	0	0	0	0	0	12	.6	1.5	2.9	4.1	5.9
230	2	4	1	2	2	0	0	0	11	.6	1.8	2.6	5.0	10.5
220	3	5	2	1	1	0	0	0	12	.6	1.8	3.9	5.9	9.2
210	4	4	0	2	1	0	0	0	11	.6	2.7	5.0	9.8	8.4
200	13	11	2	2	1	0	0	0	29	1.5	3.8	8.6	14.1	6.2
190	7	20	4	3	0	0	0	0	34	1.8	7.4	12.9	20.0	7.1
180	18	41	13	5	3	0	0	0	80	4.1	10.8	18.8	24.9	7.8
170	9	39	34	6	7	0	0	0	95	4.9	15.6	22.8	26.6	10.1
160	16	45	20	16	25	3	0	0	125	6.5	16.9	23.3	26.9	12.4
150	16	29	18	15	28	0	0	0	106	5.5	14.2	21.0	26.2	13.0
140	8	14	12	6	3	0	0	0	43	2.2	9.5	17.1	22.8	9.6
130	7	20	6	2	0	0	0	0	35	1.8	5.1	11.4	19.4	7.5
120	5	10	5	1	0	0	0	0	21	1.1	3.7	7.4	14.7	7.3
110	6	6	3	0	0	0	0	0	15	.8	3.4	7.0	10.4	6.1
100	14	11	4	0	0	0	0	0	29	1.5	4.0	6.3	9.8	5.6
90	17	10	6	1	0	0	0	0	34	1.8	4.5	6.9	10.1	5.9
80	8	10	4	0	1	0	0	0	23	1.2	4.6	8.2	10.3	7.5
70	7	13	8	4	0	0	0	0	32	1.7	4.9	8.5	11.8	8.6
60	9	11	14	6	0	0	0	0	40	2.1	5.5	8.5	11.9	8.9
50	12	10	8	5	0	0	0	0	35	1.8	5.7	9.0	11.8	7.7
40	13	10	3	6	2	0	0	0	34	1.8	5.2	9.0	12.1	9.4
30	8	17	6	1	0	0	0	0	32	1.7	5.1	8.4	18.2	7.1
20	7	11	9	4	1	0	0	0	32	1.7	4.8	14.3	22.9	9.1
10	11	7	5	4	1	0	0	0	28	1.5	10.8	19.3	31.7	9.6
CALMS									6	.3				
COLTOT	352	725	507	206	122	10	0	0	1928					
COLPER	18.3	37.6	26.3	10.7	6.3	.5	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 350 RESULTANT VECTOR WIND SPEED = 2.2 MPH VECTOR STANDARD DEVIATION = 11.4 MPH
AVERAGE WIND SPEED ALL OBS. = 9.6 MPH CONSTANCY = 22

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF MARCH
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	53	98	57	42	13	0	0	0	263	9.6	20.1	30.0	37.9	9.5
350	21	68	95	41	18	4	0	1	248	9.1	27.3	35.4	43.7	12.1
340	17	51	96	51	16	2	0	0	233	8.5	24.3	41.0	45.8	12.3
330	15	57	44	48	24	3	0	0	183	6.7	22.3	34.8	46.1	12.7
320	22	61	58	26	19	5	0	0	191	7.0	17.2	27.4	37.6	11.9
310	14	33	25	14	5	3	0	0	94	3.4	12.1	20.0	29.1	10.9
300	10	15	7	10	4	0	0	0	46	1.7	6.3	13.9	21.2	10.2
290	7	15	1	4	4	0	0	0	31	1.1	3.4	7.5	15.0	9.9
280	9	1	5	2	0	0	0	0	16	.6	2.4	4.5	8.7	7.9
270	11	4	2	1	0	0	0	0	18	.7	1.7	3.6	5.9	5.7
260	8	3	2	0	0	0	0	0	13	.5	1.9	3.0	4.7	5.0
250	11	6	1	1	1	0	0	0	20	.7	1.7	3.0	4.6	6.0
240	4	8	1	1	0	0	0	0	14	.5	1.8	3.4	5.4	7.0
230	5	5	5	1	0	0	0	0	16	.6	2.2	4.3	7.3	7.7
220	10	12	5	2	0	0	0	0	29	1.1	3.0	6.0	9.6	7.0
210	2	16	15	3	1	0	0	0	37	1.4	4.9	8.3	14.4	10.1
200	16	28	17	8	0	0	0	0	69	2.5	6.7	13.3	19.6	8.5
190	10	38	23	3	2	0	0	0	76	2.8	10.9	18.0	25.4	8.8
180	23	68	47	11	0	2	0	0	151	5.5	14.1	23.0	29.2	9.0
170	17	48	55	19	16	2	0	0	157	5.8	17.7	25.3	31.3	11.5
160	12	40	39	44	31	9	0	0	175	6.4	17.0	26.0	30.6	14.5
150	19	27	27	25	29	4	0	0	131	4.8	14.7	22.3	28.7	13.5
140	14	40	16	3	21	1	0	0	95	3.5	10.1	17.4	23.7	11.4
130	15	23	8	2	2	0	0	0	50	1.8	6.2	11.5	18.5	7.4
120	8	12	2	0	1	0	0	0	23	.8	3.3	7.3	13.1	6.0
110	7	7	2	0	0	0	0	0	16	.6	2.0	4.8	9.3	5.3
100	6	7	3	0	0	0	0	0	16	.6	2.1	4.0	7.0	5.9
90	11	11	3	1	0	0	0	0	26	1.0	2.6	4.3	6.5	5.7
80	11	7	6	4	0	0	0	0	28	1.0	3.2	5.1	7.0	8.2
70	12	11	6	1	2	0	0	0	32	1.2	3.5	5.9	8.0	7.7
60	0	11	14	8	3	0	0	0	36	1.3	3.9	6.4	8.6	12.4
50	11	15	6	6	0	0	0	0	38	1.4	4.2	6.6	9.0	8.1
40	15	18	5	2	1	0	0	0	41	1.5	4.1	6.8	9.3	6.9
30	8	13	9	4	0	0	0	0	34	1.2	4.1	6.9	17.8	8.5
20	8	13	5	10	0	0	0	0	36	1.3	4.0	15.1	25.6	9.6
10	4	22	5	7	0	0	0	0	38	1.4	12.4	22.7	32.7	8.7
CALMS									8	.3				
COLTOT	445	912	717	397	213	35	0	1	2728					
COLPER	16.3	33.4	26.3	14.6	7.8	1.3	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 339 RESULTANT VECTOR WIND SPEED = 1.8 MPH VECTOR STANDARD DEVIATION = 12.6 MPH
AVERAGE WIND SPEED ALL OBS. = 10.7 MPH CONSTANCY = 17

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF APRIL
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	20	76	55	14	10	1	0	0	180	7.4	15.6	25.3	31.6	9.8
350	7	53	48	35	15	2	0	0	160	6.6	22.1	30.5	38.4	12.2
340	7	39	92	46	11	0	0	0	195	8.0	21.5	35.2	40.0	12.2
330	7	36	64	43	14	0	1	0	165	6.8	21.2	31.0	40.5	12.8
320	8	43	55	27	16	3	1	0	153	6.3	16.3	26.5	34.3	12.5
310	7	27	23	5	13	3	0	0	78	3.2	11.6	19.7	28.4	12.2
300	20	16	8	6	0	0	0	0	50	2.1	6.6	13.5	21.3	7.3
290	6	12	5	3	5	0	0	0	31	1.3	4.0	8.1	15.0	10.3
280	5	7	3	1	0	0	0	0	16	.7	2.8	5.5	9.6	6.6
270	4	8	6	4	0	0	0	0	22	.9	2.1	4.3	6.9	9.3
260	5	5	3	1	0	0	0	0	14	.6	2.4	3.5	5.9	7.1
250	3	13	5	0	0	0	0	0	21	.9	2.0	4.0	5.7	7.4
240	2	6	3	1	1	0	0	0	13	.5	2.5	4.1	6.3	9.6
230	6	10	3	2	3	2	0	0	26	1.1	2.6	4.8	7.5	10.9
220	5	5	10	5	0	0	0	0	25	1.0	3.4	6.1	9.7	9.8
210	5	16	6	4	1	0	0	0	32	1.3	4.5	8.3	14.2	9.1
200	9	27	14	1	0	0	0	0	51	2.1	6.1	12.6	19.9	7.8
190	6	29	14	8	7	2	0	0	66	2.7	10.3	17.8	27.1	11.5
180	8	54	42	21	4	2	1	0	132	5.4	14.4	24.8	32.1	10.8
170	11	46	39	23	21	8	2	0	150	6.2	19.9	29.7	34.9	13.4
160	7	37	42	39	59	16	1	0	201	8.3	20.5	30.0	34.4	16.8
150	2	30	33	30	42	8	1	0	146	6.0	18.4	26.2	32.3	16.3
140	11	30	16	19	21	2	0	0	99	4.1	11.7	20.7	27.5	12.9
130	4	10	16	7	2	0	0	0	39	1.6	6.4	13.0	22.2	10.9
120	6	7	1	2	0	0	0	0	16	.7	2.9	7.9	15.3	6.9
110	5	8	3	0	0	0	0	0	16	.7	2.2	5.2	10.2	6.1
100	8	9	4	0	0	0	0	0	21	.9	2.9	4.5	7.6	6.3
90	16	11	6	0	1	0	0	0	34	1.4	3.2	5.4	7.1	6.3
80	3	12	2	5	0	0	0	0	22	.9	3.8	5.8	8.1	8.8
70	13	10	8	6	0	0	0	0	37	1.5	3.5	6.6	9.7	7.9
60	3	10	11	2	0	0	0	0	26	1.1	4.3	6.5	9.4	9.0
50	11	14	9	6	1	0	0	0	41	1.7	4.0	7.1	9.6	8.4
40	6	13	8	4	0	0	0	0	31	1.3	4.5	7.1	10.2	8.8
30	14	10	10	2	0	0	0	0	36	1.5	4.4	7.6	16.1	7.4
20	7	14	13	5	0	0	0	0	39	1.6	4.7	13.4	21.7	9.2
10	8	16	6	8	0	0	0	0	38	1.6	10.6	18.7	28.0	8.7
CALMS									1	.0				
COLTOT	275	769	696	389	247	49	7	0	2423					
COLPER	11.3	31.7	28.8	16.1	10.2	2.0	.3	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 247 RESULTANT VECTOR WIND SPEED = .2 MPH VECTOR STANDARD DEVIATION = 14.0 MPH
AVERAGE WIND SPEED ALL OBS. = 11.6 MPH CONSTANCY = 2

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF MAY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	28	49	32	12	7	0	0	0	128	4.1	10.2	19.2	27.6	9.2
350	10	53	54	19	9	3	0	0	148	4.8	16.5	24.4	32.2	11.3
340	20	55	95	49	14	0	0	0	233	7.6	19.0	29.5	34.4	11.7
330	20	58	58	51	16	2	0	0	205	6.6	20.6	28.9	35.2	12.0
320	15	57	65	47	11	2	0	0	197	6.4	16.6	26.2	32.3	11.9
310	9	43	33	12	13	0	0	0	110	3.6	12.0	20.0	28.5	11.1
300	12	16	18	14	4	0	0	0	64	2.1	6.9	14.3	21.7	10.9
290	9	15	10	3	3	0	0	0	40	1.3	4.3	8.7	15.7	9.2
280	8	9	9	2	1	0	0	0	29	.9	3.0	5.7	10.2	8.6
270	6	14	4	1	0	0	0	0	25	.8	2.3	4.6	8.1	7.1
260	6	5	4	1	2	0	0	0	18	.6	2.3	4.7	7.5	8.5
250	8	8	10	3	0	0	0	0	29	.9	3.0	5.3	7.8	9.3
240	8	22	13	2	0	0	0	0	45	1.5	3.9	6.1	9.0	7.9
230	9	12	18	6	1	0	0	0	46	1.5	4.6	7.6	10.8	9.7
220	4	18	20	7	1	0	0	0	50	1.6	5.2	9.2	14.1	10.3
210	12	26	18	8	1	0	0	0	65	2.1	6.3	11.7	18.7	9.1
200	6	29	29	8	7	0	0	0	79	2.6	8.6	15.7	25.3	10.7
190	13	51	35	19	3	0	0	0	121	3.9	12.0	22.2	31.7	9.9
180	13	58	53	29	16	2	0	0	171	5.5	17.5	28.0	35.1	11.5
170	15	51	82	50	42	2	6	0	248	8.0	21.5	30.4	37.3	14.3
160	18	52	59	47	48	17	3	0	244	7.9	20.9	30.8	36.5	15.2
150	8	38	39	32	28	9	0	0	154	5.0	17.2	27.1	33.8	14.4
140	11	51	30	19	10	12	0	0	133	4.3	11.1	20.2	28.9	12.6
130	12	25	4	6	7	2	0	0	56	1.8	7.3	12.9	21.7	10.2
120	13	13	6	2	2	0	0	0	36	1.2	3.6	8.8	14.8	7.5
110	4	8	3	4	1	0	0	0	20	.6	2.7	5.5	10.7	9.9
100	4	13	6	5	0	0	0	0	28	.9	2.5	4.6	7.6	8.8
90	6	18	3	3	0	0	0	0	30	1.0	2.8	4.6	7.0	7.3
80	7	13	4	1	2	0	0	0	27	.9	3.1	5.2	7.4	9.1
70	12	19	5	2	0	0	0	0	38	1.2	3.3	5.8	8.1	7.0
60	7	14	9	4	3	0	0	0	37	1.2	4.0	6.3	9.0	9.3
50	11	17	13	4	3	0	0	0	48	1.6	4.1	7.2	9.5	8.9
40	18	15	6	7	5	0	0	0	43	1.4	4.7	7.4	9.9	9.9
30	10	24	10	4	7	0	0	0	55	1.8	4.6	7.5	12.8	9.6
20	9	18	9	7	1	0	0	0	44	1.4	4.5	10.0	16.4	8.9
10	9	13	13	3	2	0	0	0	40	1.3	6.9	13.4	22.4	8.9
CALMS									2	.1				
COLTOT	382	1088	879	493	278	51	9	0	3086					
COLPER	12.4	32.4	28.5	16.0	8.7	1.7	.3	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 199 RESULTANT VECTOR WIND SPEED = 1.2 MPH VECTOR STANDARD DEVIATION = 13.5 MPH
AVERAGE WIND SPEED ALL OBS. = 11.3 MPH CONSTANCY = 11

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF JUNE
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	21	37	24	6	0	0	0	0	88	4.2	10.1	17.7	23.3	7.8
350	12	30	40	18	0	0	0	0	100	4.8	15.7	21.6	25.4	10.1
340	11	41	50	34	4	0	0	0	140	6.7	16.2	23.5	27.3	11.3
330	9	31	36	17	4	1	0	0	98	4.7	14.5	21.9	27.3	11.1
320	11	20	18	7	7	0	0	0	63	3.0	10.4	19.2	23.7	10.9
310	11	21	15	9	0	0	0	0	56	2.7	6.8	12.2	19.7	8.9
300	6	11	4	1	1	0	0	0	23	1.1	4.5	8.3	13.7	7.9
290	3	5	5	0	1	0	0	0	14	.7	2.5	6.0	9.5	9.2
280	5	3	3	4	1	0	0	0	16	.8	2.2	3.8	7.2	10.5
270	8	4	2	1	0	0	0	0	15	.7	2.0	3.5	5.4	5.7
260	4	4	3	0	0	0	0	0	11	.5	2.0	3.6	5.8	6.0
250	6	5	4	0	1	0	0	0	16	.8	2.1	4.3	7.2	7.4
240	4	8	3	2	0	0	0	0	17	.8	3.1	5.7	8.2	8.2
230	7	13	4	6	1	0	0	0	31	1.5	4.4	7.0	11.4	8.6
220	5	17	17	4	0	0	0	0	43	2.1	5.4	10.1	15.5	9.2
210	6	15	9	6	2	0	0	0	38	1.8	7.8	13.9	23.0	9.9
200	9	31	28	11	1	1	0	0	81	3.9	10.4	20.7	32.9	9.9
190	5	41	39	8	4	0	0	0	97	4.7	16.8	29.3	43.0	10.4
180	12	44	75	20	20	1	0	0	172	8.3	23.6	39.1	49.5	12.0
170	12	42	56	46	62	5	0	0	223	10.7	30.5	42.8	50.2	15.5
160	9	43	56	50	79	4	0	0	241	11.6	29.9	41.7	48.1	15.8
150	14	28	41	32	43	1	0	0	159	7.6	22.7	35.1	44.3	14.3
140	12	13	16	15	17	0	0	0	73	3.5	12.9	25.3	37.0	13.4
130	9	15	5	4	3	0	0	0	36	1.7	6.1	14.7	27.0	8.9
120	3	10	2	2	1	0	0	0	18	.9	3.6	7.8	16.7	8.3
110	7	12	1	0	0	0	0	0	20	1.0	2.6	5.5	9.5	6.3
100	5	5	3	2	0	1	0	0	16	.8	2.9	4.3	7.0	9.0
90	9	7	3	4	2	0	0	0	25	1.2	2.4	4.4	6.1	8.9
80	6	3	1	0	0	0	0	0	10	.5	2.6	4.3	6.5	5.9
70	8	9	2	0	1	0	0	0	20	1.0	2.4	4.8	6.2	6.8
60	9	5	3	2	0	0	0	0	19	.9	3.1	4.3	6.4	7.2
50	11	6	2	5	1	0	0	0	25	1.2	2.8	4.8	6.0	8.2
40	6	6	1	0	2	0	0	0	15	.7	2.9	4.6	6.7	7.7
30	7	6	3	3	1	0	0	0	20	1.0	2.5	4.8	9.9	8.4
20	6	7	3	0	1	0	0	0	17	.8	2.9	7.8	13.8	7.1
10	10	11	2	0	0	0	0	0	23	1.1	6.1	11.9	19.3	5.2
CALMS									4	.2				
COLTOT	298	609	579	319	260	14	0	0	2043					
COLPER	14.3	29.2	27.8	15.3	12.5	.7	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 171 RESULTANT VECTOR WIND SPEED = 4.3 MPH VECTOR STANDARD DEVIATION = 12.9 MPH
AVERAGE WIND SPEED ALL OBS. = 11.5 MPH CONSTANCY = 38

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF JULY
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	24	63	28	5	2	0	0	0	114	4.0	10.4	18.3	25.7	7.6
350	17	50	65	14	4	0	0	0	150	5.3	15.8	23.4	29.4	9.9
340	13	63	72	38	5	0	0	0	193	6.5	18.3	26.9	31.5	10.7
330	21	71	69	22	3	0	0	0	186	6.6	17.6	26.4	32.2	9.7
320	17	50	42	18	2	0	0	0	129	4.6	14.6	22.9	29.0	9.6
310	13	30	40	16	0	1	0	0	100	3.5	9.8	17.2	24.2	9.9
300	7	20	11	7	5	0	0	0	50	1.8	6.1	11.2	18.4	10.5
290	8	9	3	2	1	0	0	0	23	.8	3.1	7.3	12.6	7.5
280	3	8	2	1	0	1	0	0	15	.5	2.0	4.5	8.9	8.6
270	5	6	5	2	0	0	0	0	18	.6	1.9	3.6	6.5	8.6
260	9	5	5	2	0	0	0	0	21	.7	2.2	4.0	6.0	7.4
250	4	9	8	3	0	0	0	0	24	.8	2.8	4.7	6.6	9.3
240	11	12	9	1	1	0	0	0	34	1.2	3.3	5.4	8.2	7.8
230	9	10	14	2	0	0	0	0	35	1.2	3.8	6.8	10.7	8.5
220	7	9	17	5	1	0	0	0	39	1.4	4.8	9.1	15.0	9.9
210	9	26	22	2	2	0	0	0	61	2.2	6.6	12.9	20.8	8.8
200	7	41	25	10	5	0	0	0	88	3.1	10.3	18.3	26.9	10.2
190	8	53	56	21	5	0	0	0	143	5.0	14.8	24.3	32.7	10.7
180	17	58	61	39	11	3	0	0	189	6.7	19.0	29.2	38.0	11.3
170	13	47	77	49	23	0	0	0	208	7.3	21.0	32.8	41.7	12.6
160	15	39	57	51	37	0	0	0	199	7.0	21.1	33.5	41.3	13.7
150	6	49	50	42	41	2	0	0	190	6.7	19.5	29.6	37.6	14.0
140	16	29	40	39	37	3	0	0	164	5.8	15.2	23.6	31.9	13.9
130	14	14	20	18	12	0	0	0	78	2.8	9.9	17.6	25.5	11.9
120	10	20	8	1	0	0	0	0	39	1.4	5.1	11.8	19.2	7.1
110	12	11	3	1	0	0	0	0	27	1.0	3.2	6.7	13.3	5.8
100	9	8	5	2	2	0	0	0	26	.9	2.5	4.7	8.5	8.7
90	8	6	5	0	0	0	0	0	19	.7	2.4	4.4	6.9	6.0
80	9	10	2	2	0	0	0	0	23	.8	2.5	4.6	7.3	6.4
70	11	9	7	2	0	0	0	0	29	1.0	3.0	5.4	7.9	7.2
60	4	13	5	7	3	0	0	0	32	1.1	3.9	6.3	7.8	11.0
50	13	17	8	7	5	0	0	0	50	1.8	4.4	6.3	8.6	9.5
40	10	19	9	4	2	0	0	0	44	1.6	4.2	6.8	8.9	8.6
30	10	7	2	4	2	0	0	0	25	.9	3.9	6.7	11.9	8.3
20	10	21	6	4	1	0	0	0	42	1.5	3.4	9.0	16.0	7.6
10	7	16	6	0	1	0	0	0	30	1.1	6.6	12.7	20.7	7.3
CALMS									8	.3				
COLTOT	386	928	856	434	213	10	0	0	2835					
COLPER	13.6	32.7	30.2	15.3	7.5	.4	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 171 RESULTANT VECTOR WIND SPEED = 2.3 MPH VECTOR STANDARD DEVIATION = 12.3 MPH
AVERAGE WIND SPEED ALL OBS. = 10.6 MPH CONSTANCY = 22

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF AUGUST
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	44	98	24	1	1	0	0	0	168	5.5	14.9	25.5	31.4	6.5
350	26	100	94	24	1	0	0	0	245	8.0	23.2	29.5	33.8	9.5
340	22	104	129	37	1	0	0	0	293	9.6	22.7	31.5	33.9	10.1
330	22	62	53	15	0	0	0	0	152	5.0	17.9	27.1	33.5	9.2
320	12	46	33	10	0	0	0	0	101	3.3	9.4	19.9	28.6	9.0
310	12	14	3	3	1	0	0	0	33	1.1	5.3	11.0	20.8	7.1
300	9	7	8	2	1	0	0	0	27	.9	2.7	6.2	11.8	8.3
290	8	7	5	1	0	0	0	0	21	.7	1.8	3.4	7.1	7.4
280	4	3	1	0	0	0	0	0	8	.3	1.5	2.7	4.1	5.5
270	10	6	0	0	0	0	0	0	16	.5	1.1	2.1	3.8	4.1
260	2	7	0	0	0	0	0	0	9	.3	1.2	2.3	3.9	6.0
250	5	4	2	0	0	0	0	0	11	.4	1.5	3.0	4.4	6.0
240	8	8	8	1	0	0	0	0	25	.8	2.1	3.6	5.4	7.6
230	11	5	11	2	0	0	0	0	29	1.0	2.9	4.6	7.6	8.2
220	7	17	9	2	0	0	0	0	35	1.1	3.4	7.0	12.2	7.8
210	5	20	10	4	0	0	0	0	39	1.3	5.2	11.1	21.4	8.5
200	11	41	29	3	1	0	0	0	85	2.8	9.0	19.6	31.7	9.3
190	10	61	61	14	3	0	0	0	149	4.9	17.2	29.6	40.7	9.9
180	27	88	113	37	23	1	0	0	289	9.5	25.5	38.2	46.3	11.2
170	24	87	112	77	38	1	0	0	339	11.1	30.6	42.2	48.3	12.5
160	14	60	109	72	46	2	0	0	303	9.9	27.8	40.6	46.6	13.7
150	5	54	59	52	32	4	0	0	206	6.8	20.0	32.2	42.7	13.8
140	13	38	29	12	9	0	0	0	101	3.3	11.1	22.1	33.7	10.6
130	7	12	6	7	0	0	0	0	32	1.1	5.4	12.6	23.2	9.4
120	11	12	6	1	0	0	0	0	30	1.0	2.5	6.5	14.1	6.5
110	5	6	3	1	0	0	0	0	15	.5	2.2	4.0	7.9	7.7
100	10	6	3	1	1	0	0	0	21	.7	2.0	3.6	5.2	6.6
90	11	13	0	1	0	0	0	0	25	.8	2.1	3.2	5.4	5.3
80	4	8	4	2	0	0	0	0	18	.6	2.0	3.9	5.2	7.4
70	7	6	3	2	0	0	0	0	18	.6	2.4	4.0	5.8	7.2
60	9	10	8	7	3	0	0	0	37	1.2	2.6	4.3	6.0	9.9
50	12	10	1	0	1	0	3	0	24	.8	3.1	4.6	6.2	5.8
40	16	12	4	1	0	0	0	0	33	1.1	2.8	5.0	6.9	5.8
30	18	7	3	0	1	0	0	0	29	1.0	3.0	5.1	11.9	5.7
20	14	14	1	0	0	0	0	0	29	1.0	3.3	9.8	18.7	4.8
10	19	18	3	1	0	0	0	0	41	1.3	7.8	16.8	27.5	5.5
CALMS									10	.3				
COLTOT	454	1071	947	393	163	8	0	0	3046					
COLPER	14.9	35.2	31.1	12.9	5.4	.3	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 170 RESULTANT VECTOR WIND SPEED = 2.8 MPH VECTOR STANDARD DEVIATION = 11.4 MPH
AVERAGE WIND SPEED ALL OBS. = 10.1 MPH CONSTANCY = 28

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF SEPTEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	28	78	39	8	4	0	0	0	149	5.3	12.9	24.4	33.4	8.3
350	14	84	60	17	6	1	0	0	182	6.5	22.1	30.7	37.1	9.9
340	8	86	153	38	9	1	0	0	287	10.3	24.3	34.7	39.5	10.9
330	18	62	97	28	6	0	0	0	211	7.5	22.9	33.2	40.1	10.7
320	18	48	46	25	5	1	0	0	143	5.1	16.4	28.3	35.5	10.4
310	15	29	29	26	6	0	0	0	105	3.8	10.5	18.8	29.6	11.0
300	12	12	9	13	0	0	0	0	46	1.6	6.1	11.8	19.9	9.5
290	6	6	3	5	0	0	0	0	20	.7	2.9	7.1	12.7	9.3
280	7	6	1	1	1	0	0	0	16	.6	1.8	3.9	8.4	6.8
270	6	3	4	0	0	0	0	0	13	.5	1.5	3.0	5.5	6.3
260	6	6	1	0	0	0	0	0	13	.5	1.8	3.1	5.1	4.8
250	10	6	7	0	0	0	0	0	23	.8	2.1	3.8	5.4	6.6
240	10	10	2	0	0	1	0	0	23	.8	2.9	4.4	6.2	6.7
230	13	12	5	2	2	1	0	0	35	1.3	3.1	5.3	8.1	8.5
220	11	7	8	0	1	1	0	0	28	1.0	3.6	6.8	10.9	7.9
210	7	16	11	2	3	0	0	0	39	1.4	4.7	9.2	15.3	9.3
200	13	31	14	4	3	0	0	0	65	2.3	7.0	13.2	21.4	8.8
190	12	46	26	3	4	0	0	0	91	3.3	10.8	19.2	26.8	9.0
180	16	70	43	12	5	1	0	0	147	5.3	15.5	24.4	30.5	9.6
170	7	72	58	32	25	9	0	0	195	7.0	18.9	26.8	33.7	13.0
160	11	42	62	34	31	6	0	0	186	6.6	18.3	28.1	34.8	13.5
150	12	34	44	25	15	0	0	0	130	4.6	15.9	26.3	33.1	12.1
140	11	41	41	17	18	0	0	0	128	4.6	12.7	20.9	29.8	11.5
130	14	32	27	17	8	0	0	0	98	3.5	9.6	15.2	22.4	10.5
120	9	24	5	4	0	0	0	0	42	1.5	6.0	11.5	17.2	7.5
110	10	11	5	2	0	0	0	0	28	1.0	3.4	8.0	13.9	7.2
100	11	8	5	1	0	0	0	0	25	.9	3.0	5.8	10.3	6.6
90	8	16	6	1	0	0	0	0	31	1.1	3.3	5.3	8.1	7.1
80	8	18	9	1	0	0	0	0	36	1.3	3.4	5.6	8.2	7.4
70	5	12	8	2	1	0	0	0	28	1.0	3.6	6.3	9.9	8.8
60	10	13	13	1	0	0	0	0	37	1.3	3.9	6.8	9.3	7.8
50	16	11	13	3	1	0	0	0	44	1.6	4.5	6.9	9.5	7.8
40	14	19	5	5	2	0	0	0	45	1.6	4.6	7.2	9.3	8.2
30	15	12	9	3	1	0	0	0	40	1.4	4.3	7.0	13.6	7.6
20	4	21	5	4	2	0	0	0	36	1.3	3.8	10.7	18.8	9.0
10	4	15	8	3	0	0	0	0	30	1.1	7.7	15.6	27.5	8.6
CALMS									4	.1				
COLTOT	399	1011	873	331	159	22	0	0	2799					
COLPER	14.3	36.1	31.2	11.8	5.7	.8	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 216 RESULTANT VECTOR WIND SPEED = .1 MPH VECTOR STANDARD DEVIATION = 11.9 MPH
AVERAGE WIND SPEED ALL OBS. = 10.1 MPH CONSTANCY = 1

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF OCTOBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	OBS	Row Percentages (1)	(2)	(3)	AVERAGE SPEED
360	33	76	52	24	17	0	0	0	202	7.3	21.3	36.4	47.0	10.1
350	23	95	127	53	29	3	0	0	330	11.9	32.9	44.1	50.5	11.8
340	26	103	169	61	18	1	0	0	378	13.7	34.8	47.0	50.9	11.2
330	22	76	110	36	9	1	0	0	254	9.2	27.8	41.5	50.0	10.9
320	14	33	63	18	2	2	0	0	136	4.9	15.9	30.7	43.2	10.7
310	12	12	12	11	2	1	0	0	50	1.8	7.9	17.5	31.9	10.4
300	13	9	7	1	0	1	0	0	31	1.1	3.4	9.0	19.1	7.5
290	7	4	1	1	1	0	0	0	14	.5	2.3	5.0	10.4	7.3
280	9	6	4	0	0	0	0	0	19	.7	2.1	3.7	6.2	6.3
270	9	9	5	1	0	0	0	0	24	.9	2.0	3.2	5.0	6.5
260	6	5	2	0	0	0	0	0	13	.5	2.0	3.4	4.9	5.5
250	9	8	2	0	0	0	0	0	19	.7	1.8	3.7	5.3	5.7
240	5	5	7	2	0	0	0	0	19	.7	2.4	3.8	6.0	8.9
230	11	10	6	1	0	0	0	0	28	1.0	2.6	4.7	7.0	6.4
220	13	8	3	1	0	0	0	0	25	.9	3.3	5.9	9.6	5.8
210	10	21	5	3	0	0	0	0	39	1.4	4.2	8.2	14.1	7.1
200	11	28	4	7	0	1	0	0	51	1.8	6.3	12.4	18.4	9.0
190	16	48	17	2	1	0	0	0	84	3.0	10.1	16.5	21.7	7.3
180	27	80	27	8	2	0	0	0	144	5.2	13.2	19.4	24.7	7.7
170	16	64	39	10	9	0	0	0	138	5.0	14.5	21.5	26.5	9.7
160	21	51	25	12	7	2	0	0	118	4.3	13.2	21.6	26.0	9.7
150	10	58	10	7	16	9	0	0	110	4.0	11.4	17.8	24.0	12.0
140	12	27	7	15	19	8	0	0	88	3.2	8.5	13.8	19.4	14.2
130	10	17	5	5	1	0	0	0	38	1.4	5.5	10.1	15.6	8.2
120	12	9	2	3	1	0	0	0	27	1.0	2.9	7.3	12.6	7.0
110	8	3	1	4	0	0	0	0	16	.6	2.7	5.4	9.5	7.7
100	8	14	6	2	3	0	0	0	33	1.2	3.0	4.9	7.2	8.8
90	17	11	3	2	2	0	0	0	35	1.3	3.4	4.9	7.2	6.6
80	7	11	5	2	0	0	0	0	25	.9	3.1	5.6	7.6	7.5
70	9	3	9	5	0	0	0	0	26	.9	3.1	5.9	8.4	9.8
60	12	9	10	4	1	0	0	0	36	1.3	3.7	5.9	8.6	8.5
50	13	10	7	8	2	0	0	0	40	1.4	4.1	6.4	8.4	9.3
40	13	9	4	9	2	0	0	0	37	1.3	4.2	6.9	9.9	9.5
30	12	6	8	11	2	0	0	0	39	1.4	4.2	7.6	16.2	10.5
20	13	15	5	6	0	0	0	0	39	1.4	4.8	13.5	26.9	7.9
10	18	21	7	8	2	0	0	0	56	2.0	10.7	24.1	39.1	8.0
CALMS									3	.1				
COLTOT	491	974	776	343	148	29	0	0	2764					
COLPER	17.8	35.2	28.1	12.4	5.4	1.0	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 348 RESULTANT VECTOR WIND SPEED = 3.0 MPH VECTOR STANDARD DEVIATION = 11.5 MPH
AVERAGE WIND SPEED ALL OBS. = 9.9 MPH CONSTANCY = 30

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF NOVEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	59	138	78	18	10	0	0	0	303	9.7	20.5	34.7	45.4	8.5
350	27	189	100	24	11	2	0	0	273	8.7	30.6	41.7	50.1	10.0
340	31	115	175	58	14	0	0	0	385	12.3	29.9	46.0	51.1	10.8
330	32	182	88	39	17	2	0	0	280	8.9	27.7	39.2	50.9	10.7
320	20	74	70	26	11	3	0	0	204	6.5	18.3	32.5	41.8	10.7
310	14	33	22	13	7	1	0	0	90	2.9	11.3	20.8	33.6	10.3
300	23	14	19	2	4	0	0	0	62	2.0	5.4	12.4	22.1	8.3
290	5	9	1	2	0	0	0	0	18	.6	3.0	6.7	13.6	5.6
280	7	7	1	0	0	0	0	0	15	.5	1.8	4.3	7.5	5.1
270	13	9	0	0	2	0	0	0	24	.8	1.7	2.6	5.1	5.3
260	8	5	2	0	0	0	0	0	15	.5	1.6	2.5	4.0	5.6
250	8	3	0	0	0	0	0	0	11	.4	1.3	2.9	4.4	3.8
240	6	7	0	1	0	0	0	0	14	.4	1.7	3.1	5.2	6.0
230	15	9	1	1	1	0	0	0	27	.9	2.3	4.0	6.3	5.8
220	17	10	2	1	1	0	0	0	31	1.0	3.2	5.5	9.2	5.7
210	15	20	5	1	0	0	0	0	41	1.3	4.2	8.4	13.0	5.8
200	25	32	3	0	0	0	0	0	60	1.9	6.5	11.7	16.9	5.1
190	29	64	11	0	0	0	0	0	104	3.3	9.4	15.0	19.5	6.2
180	38	74	16	1	3	0	0	0	132	4.2	11.8	17.2	21.4	6.7
170	23	70	19	14	8	1	0	0	135	4.3	11.9	18.2	22.3	8.9
160	26	55	13	8	5	1	0	0	108	3.4	10.6	17.1	21.7	8.1
150	20	46	14	6	4	1	0	0	91	2.9	8.6	14.2	19.8	8.2
140	28	36	3	3	1	0	0	0	71	2.3	6.5	11.3	16.8	6.3
130	14	17	4	4	2	0	0	0	41	1.3	4.9	9.1	13.8	7.5
120	18	14	3	3	5	0	0	0	43	1.4	3.9	7.5	11.4	7.8
110	16	20	2	1	0	0	0	0	39	1.2	3.9	6.3	9.4	5.6
100	10	25	6	0	0	0	0	0	41	1.3	3.6	5.9	8.4	6.2
90	13	15	4	1	0	0	0	0	33	1.1	3.2	5.8	8.6	6.2
80	15	5	3	5	0	0	0	0	28	.9	3.2	6.0	9.5	7.2
70	9	13	7	6	5	0	0	0	40	1.3	3.7	7.0	10.5	10.0
60	10	11	8	13	5	0	0	0	47	1.5	5.0	8.1	11.0	11.1
50	21	21	15	12	2	0	0	0	71	2.3	6.0	9.0	11.8	9.2
40	31	16	15	6	1	0	0	0	69	2.2	6.3	9.7	13.1	7.3
30	12	25	15	3	2	0	0	0	57	1.8	5.9	10.3	21.5	8.4
20	17	26	11	5	0	0	0	0	59	1.9	5.9	17.7	29.7	7.2
10	16	25	20	6	1	0	0	0	68	2.2	13.7	24.2	38.7	8.6
CALMS									9	.3				
COLTOT	692	1274	756	275	122	11	0	0	3139					
COLPER	22.0	40.6	24.1	8.8	3.9	.4	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 348 RESULTANT VECTOR WIND SPEED = 3.6 MPH VECTOR STANDARD DEVIATION = 9.8 MPH
AVERAGE WIND SPEED ALL OBS. = 8.7 MPH CONSTANCY = 42

TOWER 6
SURFACE WIND SUMMARY FOR THE MONTH OF DECEMBER
ALL HOURS COMBINED

DIR	Speed (mph) 1-4	5-9	10-14	15-19	20-29	30-39	40-49	50+	ROW TOT	Row Percentages OBS	(1)	(2)	(3)	AVERAGE SPEED
360	63	87	45	26	37	0	0	0	258	9.2	19.2	35.7	47.5	10.0
350	31	94	57	21	8	2	1	0	214	7.7	31.5	43.6	51.7	9.6
340	37	126	174	45	19	5	0	0	406	14.5	32.1	47.5	53.1	10.9
330	35	91	98	32	18	5	0	0	277	9.9	30.6	41.6	52.8	10.9
320	36	58	41	18	16	1	0	0	170	6.1	19.4	35.9	44.9	10.1
310	24	38	15	11	4	2	0	0	94	3.4	11.5	22.7	37.9	8.9
300	17	16	15	4	2	2	0	0	56	2.0	6.7	13.5	24.4	9.2
290	12	11	5	6	2	0	0	0	36	1.3	4.0	8.4	15.0	8.8
280	10	7	1	1	1	0	0	0	20	.7	3.0	5.6	9.5	6.3
270	17	5	6	0	0	0	0	0	28	1.0	2.3	4.1	6.8	5.7
260	9	4	2	0	0	0	0	0	15	.5	2.1	3.5	5.7	4.7
250	7	4	1	3	1	0	0	0	16	.6	1.8	3.7	5.3	7.9
240	9	4	5	1	1	0	0	0	20	.7	2.1	3.5	5.5	7.5
230	11	8	4	0	0	0	0	0	23	.8	2.4	4.0	6.3	5.4
220	14	9	2	0	0	0	0	0	25	.9	2.7	5.2	8.6	5.0
210	16	9	2	0	0	0	0	0	27	1.0	3.7	7.3	12.7	4.5
200	17	30	2	0	1	0	0	0	50	1.8	5.6	11.2	16.3	5.7
190	32	37	8	1	0	0	0	0	78	2.8	9.3	14.5	19.1	5.6
180	34	84	8	4	2	0	0	0	132	4.7	11.8	16.3	20.4	6.4
170	33	68	7	7	4	0	0	0	119	4.3	11.7	17.7	21.2	7.0
160	29	29	5	5	7	0	0	0	75	2.7	10.1	16.6	20.3	7.5
150	25	21	10	5	17	8	0	0	89	3.2	7.6	12.8	18.4	12.3
140	23	13	1	1	6	4	0	0	48	1.7	5.8	9.4	14.4	9.5
130	13	8	3	1	0	1	0	0	26	.9	3.5	7.4	10.7	6.9
120	15	7	1	1	0	0	0	0	24	.9	2.5	4.8	9.7	5.0
110	14	5	1	0	0	0	0	0	20	.7	2.2	3.9	6.8	4.3
100	10	6	1	0	0	0	0	0	17	.6	2.0	4.1	6.3	4.4
90	10	9	0	0	0	0	0	0	19	.7	2.5	4.5	6.7	4.7
80	20	12	3	0	0	0	0	0	35	1.3	3.2	5.1	7.8	4.6
70	12	10	10	2	0	0	0	0	34	1.2	3.8	6.4	9.4	7.2
60	12	15	9	1	0	0	0	0	37	1.3	4.5	8.1	10.7	6.5
50	23	17	7	8	0	0	0	0	55	2.0	5.6	8.7	12.0	7.0
40	27	17	6	13	1	0	0	0	64	2.3	6.2	9.5	13.0	7.8
30	17	20	12	4	1	0	0	0	54	1.9	6.2	10.4	21.0	7.4
20	20	14	9	8	4	0	0	0	55	2.0	6.2	17.7	27.3	8.8
10	16	20	11	6	10	0	0	0	63	2.3	13.5	23.1	39.9	10.2
CALMS									12	.4				
COLTOT	753	1013	585	235	162	30	1	0	2791					
COLPER	27.0	36.3	21.0	8.4	5.8	1.1	.0	.0						

IN COLUMNS ABOVE
(1) = + OR - 10 DEGREES
(2) = + OR - 20 DEGREES
(3) = + OR - 30 DEGREES

RESULTANT VECTOR WIND DIRECTION = 342 RESULTANT VECTOR WIND SPEED = 4.2 MPH VECTOR STANDARD DEVIATION = 10.3 MPH
AVERAGE WIND SPEED ALL OBS. = 8.8 MPH CONSTANCY = 47

APPENDIX G

Upper Wind Summary, Yucca Flat, Nevada, 1955-1969

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JANUARY THRU JANUARY - 1958 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.4	3.8	.8									4.9	13	14.0	14.4	22.1	33.8
20	2.3	1.5	.4									4.2	11	10.3	13.7	22.4	30.4
30	2.3	2.3										4.6	12	11.1	12.2	22.1	28.5
40	.4	2.7	.4									3.4	9	14.0	12.3	18.3	25.1
50	2.3	2.7										4.9	13	10.2	9.5	16.0	23.9
60		1.1										1.1	3	13.0	8.3	12.2	17.5
70	1.5	.4										1.9	5	7.6	3.8	9.5	13.3
80	.4	.4										.8	2	9.0	3.4	4.9	11.0
90	.8											.8	2	4.0	1.9	4.9	6.1
100	.4											.4	1	3.0	2.3	3.0	6.1
110	.4	.4										1.1	3	7.3	1.5	3.4	4.6
120												0.0	0		2.3	3.0	4.2
130	.8	.4										1.1	3	8.3	1.5	3.0	3.8
140	.4											.4	1	2.0	1.9	2.3	4.9
150	.4											.4	1	4.0	1.1	3.8	8.0
160	.4											.4	1	3.0	2.3	6.8	11.8
170	.4	1.1										1.5	4	10.2	6.1	10.3	19.8
180	2.3	1.9										4.2	11	10.6	9.5	19.0	24.0
190	.8	1.1	1.1	.8								3.8	10	20.6	17.1	23.2	29.7
200	.4	2.7	4.2	1.1	.4	.4						9.1	24	25.0	17.5	27.8	33.1
210	1.1	1.9	.4	1.1								4.6	12	16.9	19.8	27.4	35.4
220	1.9	1.1	2.3	.4	.4							6.1	16	18.5	14.4	27.4	32.3
230	1.5	1.9	.4									3.8	10	11.5	13.7	19.4	29.3
240	1.1	2.3	.4									3.8	10	12.3	8.7	15.6	21.3
250	.8			.4								1.1	3	11.7	5.7	10.6	17.9
260	.4	.4										.8	2	11.0	3.3	8.0	13.7
270	1.1											1.1	3	4.3	3.0	6.1	12.5
280	.4	.8										1.1	3	9.0	4.2	7.6	12.2
290	.8	1.1										1.9	5	9.4	5.7	16.3	14.1
300	1.5	1.1										2.7	7	7.9	8.0	12.2	17.1
310	1.9	1.1		.4								3.4	9	13.1	9.1	14.8	21.3
320	1.5	.8	.8									3.0	8	12.4	10.3	18.3	23.2
330	1.5	1.5	.8									3.8	10	13.5	12.2	18.6	26.6
340	1.1	2.7	1.1	.4								5.3	14	15.4	12.2	20.5	28.3
350	1.9	1.1										3.0	8	9.5	13.7	22.4	29.7
360	1.9	2.7	.4	.4								5.3	14	14.6	13.3	22.8	31.2
CALM												0.0	0				
TOT OBS	99	113	35	13	2	1	0	0	0	0	0		263		IN CUM PERCENTAGES COLUMNS		
PERCENT	37.6	43.0	13.3	4.9	.8	.4						100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 261 RES WIND SP = 2.6 STD VECTOR DEV = 16.0 CONSTANCY = 21
MN SP ALL OBS = 13.7 MEAN VALUE OF X COMP = 2.8 STD DEV OF X COMP = 7.6
MEAN VALUE OF Y COMP = .4 STD DEV OF Y COMP = 14.0

Location: 680,500E, 803,550N Tower Height: 96 feet
Elevation: 3124 feet

*Note: Period of Record varies with each month.

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JANUARY THRU JANUARY - 1958 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.5	2.7	2.3	.4								6.9	18	16.2	22.0	29.0	35.1
20	1.5	3.5	1.5	.4								6.9	18	16.3	17.0	30.1	39.4
30	.4	1.2	1.2	.4								3.1	8	19.0	15.1	27.4	37.5
40	1.5	1.9	1.5									5.0	13	13.6	13.5	22.4	30.9
50	.8	3.5	1.2									5.4	14	15.6	12.4	17.0	25.5
60	.8		.8	.4								1.9	5	18.6	8.9	15.4	18.9
70	1.5											1.5	4	6.3	5.0	10.8	16.6
80	.8	.8										1.5	4	9.8	3.5	6.2	12.0
90	.4											.4	1	9.0	2.7	4.6	8.1
100	.4	.4										.8	2	8.5	1.5	4.6	6.9
110	.4											.4	1	6.0	2.7	3.9	6.6
120	1.2	.4										1.5	4	6.8	2.7	4.6	5.8
130	.8											.8	2	3.0	3.5	4.6	6.2
140	.8	.4										1.2	3	7.0	2.7	5.0	6.9
150		.8										.8	2	11.0	2.7	5.0	10.4
160	.4	.4										.8	2	9.5	3.1	8.1	15.4
170	.8	.8										1.5	4	7.8	6.2	13.5	22.0
180	1.9	1.5	.4									3.9	10	9.7	12.0	20.1	27.8
190	.8	2.3	2.3	1.2								6.6	17	20.4	17.8	26.3	30.1
200	.8	1.2	3.5	1.9								7.3	19	23.8	20.8	27.8	31.3
210	.8	3.1	1.2	1.9								6.9	18	19.9	17.4	25.9	31.7
220		.8	1.5	.4	.4							3.1	8	24.6	12.0	21.2	30.5
230	.4	.8	.4	.4								1.9	5	18.8	6.9	16.6	25.1
240	.8		1.2									1.9	5	17.0	6.6	10.8	18.1
250	2.3	.4										2.7	7	5.9	5.8	8.1	12.4
260	.8	.4										1.2	3	6.3	4.2	7.3	10.0
270	.4											.4	1	8.0	2.7	6.2	11.2
280	1.2											1.2	3	6.7	2.3	6.6	10.8
290	.4	.4										.8	2	7.0	5.0	6.9	9.7
300	1.2	1.5	.4									3.1	8	11.9	5.4	8.1	10.4
310	.8	.8										1.5	4	9.0	6.2	8.9	11.2
320	.8	.8										1.5	4	9.5	5.0	9.3	13.9
330	.4	1.2			.4							1.9	5	18.6	4.6	10.0	21.2
340	.4	.4	.4									1.2	3	14.7	6.9	16.6	25.1
350	1.5	1.2	.4	.8								3.9	10	15.3	13.1	22.0	30.5
360	1.5	4.6	1.9									8.1	21	14.6	18.9	27.0	32.0
CALM												.4	1				
TOT OBS	80	98	57	21	2	0	0	0	0	0	0		259	IN CUM PERCENTAGES COLUMNS			
PERCENT	30.9	37.8	22.0	8.1	.8							99.6		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 306			RES WIND SP = 1.1			STD VECTOR DEV = 17.9					CONSTANCY = 7			(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 15.2			MEAN VALUE OF X COMP = .9								STD DEV OF X COMP = 8.7			
						MEAN VALUE OF Y COMP = -.6								STD DEV OF Y COMP = 15.6			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JANUARY THRU JANUARY - 1958 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.2	2.2	1.2	.3		.3						5.3	17	18.1	18.4	29.0	35.5
20	.6	3.4	2.8	.6								7.5	24	19.1	17.1	26.2	38.0
30	.3	2.2	1.6	.3								4.4	14	19.0	15.3	26.2	33.3
40	.6	.9	1.9									3.4	11	19.1	13.4	22.4	28.3
50	1.2	3.1	1.2									5.6	18	15.1	10.6	15.6	24.3
60	.3	.9	.3									1.6	5	13.2	7.8	12.5	18.7
70	.3	.3										.6	2	9.0	3.4	10.9	14.6
80	.3	.9										1.2	4	13.5	3.7	5.6	12.1
90	1.2	.6										1.9	6	7.8	3.4	5.0	6.9
100	.3											.3	1	7.0	3.1	4.7	5.6
110	.6	.3										.9	3	8.3	1.6	3.7	5.6
120	.3											.3	1	4.0	1.6	2.5	5.0
130	.3											.3	1	8.0	1.2	2.8	4.4
140	.3	.3										.6	2	12.0	1.6	3.1	5.3
150	.6											.6	2	7.0	2.5	4.0	6.2
160	.9	.3										1.2	4	5.0	3.1	5.6	12.8
170	.9	.3										1.2	4	5.8	4.4	11.8	22.4
180	.3	1.6										1.9	6	12.2	10.0	21.2	27.1
190	.3	2.2	3.7		.3		.3					6.9	22	22.9	18.7	25.2	29.6
200	.6	2.5	4.7	1.2	.9							10.0	32	24.1	22.1	27.1	30.2
210	.6	1.9	1.2	1.6								5.3	17	20.9	18.4	27.1	30.8
220	.6	1.2	.6	.3	.3							3.1	10	19.8	10.3	22.1	30.8
230		1.2	.6									1.9	6	18.0	6.9	14.0	25.9
240	.3	.9	.3		.3							1.9	6	18.7	5.6	10.6	17.1
250	1.2	.3	.3									1.9	6	9.3	5.6	8.7	13.4
260	1.2	.6										1.9	6	7.8	5.0	8.4	12.5
270	.9		.3									1.2	4	10.7	4.7	8.7	13.4
280	.6	.9										1.6	5	11.6	5.0	9.7	13.1
290	1.9	.3										2.2	7	5.6	6.5	9.3	13.1
300	1.6	.6	.6									2.8	9	11.0	6.5	10.0	13.4
310	.6	.3	.3	.3								1.6	5	17.6	6.2	10.6	15.3
320	.6	1.2										1.9	6	11.8	5.6	11.5	19.9
330	.3	1.2	.3	.3								2.2	7	17.3	7.2	15.0	23.4
340	.9	1.6	.6									3.1	10	14.0	11.5	19.0	25.9
350	.3	4.4	1.2	.3								6.2	20	16.6	15.0	22.4	31.8
360	1.2	2.2	1.6	.3	.3							5.6	18	17.2	17.1	27.7	34.3
CALM												0.0	0				
TOT OBS	80	132	82	18	7	1	1	0	0	0	0		321				
PERCENT	24.9	41.1	25.5	5.6	2.2	.3	.3					100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 309 RES WIND SP = 2.0 STD VECTOR DEV = 19.2 CONSTANCY = 12
MN SP ALL OBS = 16.7 MEAN VALUE OF X COMP = 1.5 STD DEV OF X COMP = 9.2
MEAN VALUE OF Y COMP = -1.2 STD DEV OF Y COMP = 16.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JANUARY THRU JANUARY - 1958 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.3	2.7	1.7	.3								6.1	18	16.4	18.5	26.9	35.4
20	2.0	3.4	1.7									7.1	21	14.1	17.5	27.6	35.4
30	1.3	2.7	.3									4.4	13	12.4	16.2	25.9	37.4
40	1.0	2.7	1.0									4.7	14	13.9	12.8	25.9	34.0
50		2.4	1.3									3.7	11	18.9	14.5	20.9	29.0
60	1.7	2.7	1.3	.3								6.1	18	14.6	11.8	17.5	23.9
70	1.0	.3	.7									2.0	6	12.7	9.1	14.8	19.9
80	.7	.3										1.0	3	8.7	5.1	11.4	15.8
90	1.0	1.0										2.0	6	8.8	3.4	6.1	12.5
100	.3											.3	1	3.0	3.3	4.4	6.7
110	.3	.3										.7	2	9.0	1.3	3.7	5.1
120	.3											.3	1	7.0	1.3	2.0	4.7
130	.3											.3	1	8.0	1.0	2.4	4.0
140		.3										.3	1	17.0	1.3	3.0	7.1
150	.7											.7	2	6.0	2.4	6.1	8.8
160	.7	.7										1.3	4	9.0	5.4	8.1	13.1
170	2.0	1.3										3.4	10	7.8	7.1	12.5	22.6
180	.7	1.0	.7									2.4	7	15.3	10.4	21.5	28.6
190	1.3	1.7	1.0	.3	.3							4.7	14	17.3	16.8	26.6	30.3
200		4.4	4.0	.7	.3	.3						9.8	29	22.5	20.9	25.6	30.3
210	.3	2.7	2.4	.7			.3					6.4	19	22.0	18.5	24.6	29.0
220	.3	1.7	.3									2.4	7	13.7	10.1	21.9	28.3
230	1.0	.3										1.3	4	4.8	5.7	13.8	23.9
240	1.3	.3	.3									2.0	6	8.8	5.1	7.7	15.8
250	.3	1.0	.3									1.7	5	14.0	4.0	7.1	10.1
260		.3										.3	1	19.0	3.7	6.4	9.4
270	.7	.7	.3									1.7	5	11.8	2.7	6.1	9.1
280	.7											.7	2	5.5	4.0	5.4	9.4
290	1.0	.7										1.7	5	7.0	3.4	7.4	9.8
300	.3	.7										1.0	3	14.0	5.1	7.7	11.4
310	.3	1.7	.3									2.4	7	13.6	5.4	9.1	13.5
320	.3	.7	1.0									2.0	6	16.7	6.4	11.1	16.8
330	.3	1.0	.7									2.0	6	15.3	7.7	14.1	20.5
340	.7	2.7		.3								3.7	11	14.8	9.8	17.2	25.6
350	1.3	1.3	1.3									4.0	12	13.8	13.1	21.2	30.3
360	1.7	2.0	1.3	.3								5.4	16	15.2	15.5	26.3	32.7
CALM												0.0	0				
TOT OBS	92	136	66	9	2	1	1	0	0	0	0		297		IN CUM PERCENTAGES COLUMNS		
PERCENT	27.6	45.8	22.2	3.0	.7	.3	.3					100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 343 RES WIND SP = 1.2 STD VECTOR DEV = 17.1 CONSTANCY = .8
MN SP ALL OBS = 14.9 MEAN VALUE OF X COMP = .4 STD DEV OF X COMP = 8.7
MEAN VALUE OF Y COMP = -1.2 STD DEV OF Y COMP = 14.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: FEBRUARY THRU FEBRUARY - 1955 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.6	2.0	1.2									4.7	12	13.8	19.0	27.7	31.6
20	3.2	2.8	1.6									7.5	19	12.3	14.6	21.7	29.6
30	1.2	1.2										2.4	6	9.3	10.3	16.6	23.3
40	.4											.4	1	2.0	4.3	11.9	17.0
50	.8	.8										1.6	4	9.8	2.0	4.7	13.0
60												0.0	0		2.0	3.2	5.5
70	.4											.4	1	7.0	1.2	2.8	3.6
80	.8											.8	2	7.0	1.2	1.6	3.6
90												0.0	0		1.2	2.0	2.4
100		.4										.4	1	10.0	.8	2.0	3.6
110	.4											.4	1	2.0	1.2	2.4	3.6
120	.4											.4	1	8.0	2.0	2.8	3.6
130	1.2											1.2	3	6.7	2.0	3.2	4.3
140	.4											.4	1	9.0	2.4	3.6	5.5
150	.8											.8	2	6.0	2.0	4.7	8.3
160	.8											.8	2	3.0	3.2	6.7	13.0
170	.4	1.2										1.6	4	13.0	5.5	11.5	20.2
180	1.6	.8	.8									3.2	8	12.6	9.9	19.0	26.1
190		2.4	1.6	.4	.8							5.1	13	22.2	16.6	24.5	30.8
200	2.8	3.6	1.2	.4	.4							8.3	21	14.6	19.8	28.5	33.6
210	2.4	2.8	1.2									6.3	16	11.7	20.2	28.9	37.2
220	2.0	2.4	.8			.4						5.5	14	16.4	15.4	28.9	35.2
230	2.0	.8	.8									3.6	9	11.9	14.2	21.7	31.2
240	4.0	.8	.4									5.1	13	7.8	9.9	16.6	26.9
250	.8	.4										1.2	3	9.7	7.5	15.0	22.5
260	.8	.4										1.2	3	8.3	6.3	13.4	18.2
270	2.8	1.2										4.0	10	9.4	7.1	9.5	17.4
280	1.6	.4										2.0	5	7.4	7.1	11.1	15.4
290	.8	.4										1.2	3	9.7	5.9	13.0	16.6
300	1.2	1.6										2.8	7	10.1	7.1	11.5	20.2
310	.8	2.4										3.2	8	11.9	8.3	14.2	19.8
320		1.2	1.2									2.4	6	20.2	10.3	16.6	24.1
330	.4	2.8	.4	1.2								4.7	12	18.0	10.7	20.2	29.6
340	.8	2.4	.4									3.6	9	13.3	14.6	23.7	31.6
350	.8	4.0	.8	.8								6.3	16	16.6	16.6	26.1	36.0
360	1.2	4.3	1.2									6.7	17	14.9	17.8	28.9	36.0
CALM												0.0	0				
TOT OBS	99	109	34	7	3	1	0	0	0	0	0		253				
PERCENT	39.1	43.1	13.4	2.8	1.2	.4						100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 284 RES WIND SP = 3.8 STD VECTOR DEV = 15.1 CONSTANCY = 29
MN SP ALL OBS = 13.1 MEAN VALUE OF X COMP = 3.7 STD DEV OF X COMP = 6.4
MEAN VALUE OF Y COMP = -.9 STD DEV OF Y COMP = 13.7

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: FEBRUARY THRU FEBRUARY - 1955 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.5	2.7	1.5	1.1	.8							7.7	20	19.8	19.9	28.7	33.3
20	.8	1.9	2.7									5.4	14	18.6	16.5	25.7	33.0
30	.4	1.9	.8	.4								3.4	9	17.8	11.1	20.7	28.7
40		1.5	.8									2.3	6	16.7	7.7	14.2	22.2
50		1.5	.4									1.9	5	16.4	5.4	9.2	15.7
60	.8	.4										1.1	3	8.0	3.4	6.9	11.1
70	.4											.4	1	3.0	2.7	5.4	8.4
80	1.1											1.1	3	5.0	2.3	4.2	6.5
90	.8											.8	2	5.0	2.7	3.4	5.0
100	.4	.4										.8	2	9.0	1.9	3.4	4.6
110	.4											.4	1	6.0	1.5	3.1	5.4
120		.4										.4	1	12.0	1.5	3.4	4.2
130	.4	.4										.8	2	9.5	2.3	2.7	5.7
140	.4	.8										1.1	3	12.0	1.9	4.6	7.7
150												0.0	0		3.4	6.9	9.2
160	1.9	.4										2.3	6	7.0	5.0	8.0	16.1
170	.8	1.5	.4									2.7	7	14.3	6.9	14.2	21.5
180	.8	.8	.4									1.9	5	12.6	11.9	20.3	28.7
190	1.5	2.3	2.3	.4	.4	.4						7.3	19	20.6	15.3	26.4	33.0
200	.8	1.5	2.3	1.5								6.1	16	22.4	21.8	28.0	33.0
210	2.3	3.4	1.9		.8							8.4	22	16.3	18.8	28.4	31.0
220	.8	3.1	.4									4.2	11	13.4	14.9	21.8	33.0
230	.8	.4	.8		.4							2.3	6	19.3	7.3	19.5	26.4
240	.4	.4										.8	2	8.5	6.9	11.9	22.2
250	3.1	.8										3.8	10	7.3	5.4	9.6	15.7
260	.4	.4										.8	2	8.5	6.5	9.2	13.8
270	1.5	.4										1.9	5	7.8	4.6	10.7	13.4
280	1.1	.8										1.9	5	9.4	6.1	8.8	15.3
290	1.1	1.1										2.3	6	8.5	6.1	10.7	13.8
300	1.1	.8										1.9	5	8.4	6.9	11.1	16.1
310	1.5	.8	.4									2.7	7	10.7	6.9	12.3	16.5
320	.4		1.9									2.3	6	20.0	8.0	12.3	19.9
330	.4	1.9		.4	.4							3.1	8	19.5	7.7	15.7	24.5
340		1.5	.8									2.3	6	16.7	10.7	19.9	30.3
350	.8	3.8	.8									5.4	14	16.1	14.6	25.3	33.0
360	.8	3.4	1.9	.8								6.9	18	18.4	19.9	27.6	34.1
CALM												1.1	3				
TOT OBS	77	108	53	12	7	1	0	0	0	0	0		261				
PERCENT	29.5	41.4	20.3	4.6	2.7	.4						98.9					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 302 RES WIND SP = 2.6 STD VECTOR DEV = 17.8 CONSTANCY = 17
MN SP ALL OBS = 15.4 MEAN VALUE OF X COMP = 2.2 STD DEV OF X COMP = 7.6
MEAN VALUE OF Y COMP = -1.4 STD DEV OF Y COMP = 16.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: FEBRUARY THRU FEBRUARY - 1955 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.3	2.3	6.3	1.0	.3							10.3	31	22.5	24.8	31.1	37.4
20	1.7	2.6	1.7	.7								6.6	20	17.6	19.2	29.8	35.4
30	.7	.7	1.0									2.3	7	13.7	11.6	23.5	32.5
40	1.0	1.0	.7									2.6	8	13.6	6.6	14.2	25.5
50	.3	1.3	.3									1.7	5	12.4	5.3	8.6	15.9
60		.7	.3									1.0	3	15.3	3.6	7.0	9.6
70	.7	.3										1.0	3	8.3	2.6	4.6	8.6
80	.3	.3										.7	2	6.0	2.0	4.3	7.0
90	.3											.3	1	5.0	2.3	4.3	5.3
100	1.0	.3										1.3	4	8.0	2.6	3.3	6.0
110	.3	.7										1.0	3	9.3	2.3	4.3	6.3
120												0.0	0		2.6	5.3	6.6
130	.7	.7	.3									1.7	5	12.8	3.0	5.0	7.9
140	.3	1.0										1.3	4	10.5	4.0	5.6	7.9
150	.3	.7										1.0	3	9.7	4.0	7.0	10.9
160		1.3	.3									1.7	5	15.0	4.0	9.3	16.6
170	.3	1.0										1.3	4	13.2	7.0	13.6	23.5
180	1.3	1.3		1.3								4.0	12	17.1	10.9	21.2	28.1
190	.3	2.0	1.3	1.3	.7							5.6	17	24.8	18.2	25.5	31.1
200		4.0	2.3	2.0	.3							8.6	26	21.6	20.2	28.1	31.8
210	1.0	2.6	1.3	.7	.3							6.0	18	18.5	18.5	26.5	31.8
220	1.3	2.6		.3								4.0	12	14.1	12.3	22.2	29.1
230	.7	1.0	.3	.3								2.3	7	16.3	7.6	14.9	24.5
240	.3	.7	.3									1.3	4	13.8	5.0	9.9	16.9
250	1.3											1.3	4	5.8	3.6	7.0	12.9
260	.7	.3										1.0	3	6.3	3.3	6.6	10.9
270	.3	.7										1.0	3	10.3	4.0	7.3	9.6
280	.7	1.3										2.0	6	9.2	5.0	7.0	11.3
290	1.0	.7	.3									2.0	6	13.5	5.0	8.9	11.9
300		1.0										1.0	3	11.3	6.0	9.9	13.6
310	1.0	1.3	.7									3.0	9	12.6	6.0	10.6	16.2
320		1.3		.7								2.0	6	19.7	7.6	12.3	18.2
330	1.3	1.0	.3									2.6	8	11.9	8.3	15.2	24.2
340	1.0	2.0	.7									3.6	11	13.8	10.3	20.2	33.4
350	1.3	1.7	1.0	.3								4.0	12	15.3	15.6	28.5	37.1
360	1.0	3.3	2.3	1.3								7.9	24	19.3	22.2	32.5	37.4
CALM												1.0	3				
TOT OBS	67	131	56	30	5	0	0	0	0	0	0		302		IN CUM PERCENTAGES COLUMNS		
PERCENT	22.2	43.4	21.9	9.9	1.7							99.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 310 RES WIND SP = 2.2 STD VECTOR DEV = 18.7 CONSTANCY = 14
MN SP ALL OBS = 16.4 MEAN VALUE OF X COMP = 1.7 STD DEV OF X COMP = 7.6
MEAN VALUE OF Y COMP = -1.4 STD DEV OF Y COMP = 17.0

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: FEBRUARY THRU FEBRUARY - 1955 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.5	5.6	2.2	.7								10.0	27	17.5	23.4	31.6	37.5
20	1.5	4.1	1.1	.4								7.1	19	15.8	20.1	29.0	36.1
30		1.9	1.1									3.0	8	18.4	12.6	24.5	30.9
40		1.9	.7									2.6	7	18.4	7.4	14.5	26.0
50	.7	1.1										1.9	5	12.4	4.5	8.9	18.2
60												0.0	0		3.3	8.2	13.0
70		1.5										1.5	4	10.5	3.7	7.4	11.2
80	1.9	.4										2.2	6	7.7	5.6	6.7	8.9
90	1.5	.4										1.9	5	6.2	5.2	7.1	8.6
100	1.1											1.1	3	4.3	3.3	7.1	9.3
110		.4										.4	1	13.0	3.0	5.6	9.3
120	1.1	.4										1.5	4	7.8	2.6	5.2	10.0
130	.4	.4										.7	2	7.5	3.7	7.1	10.0
140	.4	1.1										1.5	4	13.5	5.2	8.6	11.5
150	1.1	1.9										3.0	8	12.0	6.3	9.7	14.9
160	1.1	.7										1.9	5	8.6	7.4	12.6	17.8
170	1.1	1.5										2.6	7	11.3	8.2	15.6	23.8
180	1.1	2.2	.4									3.7	10	12.7	10.8	19.3	26.0
190	.7	2.2	1.1	.4								4.5	12	16.7	14.9	21.2	26.4
200	.7	1.5	1.9	1.9	.7							6.7	18	24.8	14.9	21.9	29.4
210		2.6	.4	.4	.4							3.7	10	20.0	13.8	23.0	28.3
220	.7	1.5	1.1									3.3	9	16.2	11.9	20.1	25.3
230	1.9	2.6	.4									4.8	13	10.6	9.7	14.1	22.7
240	.7	.4	.4									1.5	4	12.0	7.1	12.3	16.7
250	.4	.4										.7	2	11.0	4.1	9.7	13.4
260	1.5	.4										1.9	5	7.6	3.3	5.2	11.2
270	.4		.4									.7	2	17.5	3.0	4.8	8.6
280	.4											.4	1	6.0	2.2	6.3	8.2
290	.4	.7										1.1	3	9.3	3.7	5.6	11.2
300	1.1	1.1										2.2	6	9.8	4.5	8.6	11.2
310		1.1										1.1	3	11.3	7.1	10.0	13.8
320	2.2	1.5										3.7	10	9.1	6.7	12.3	18.6
330		1.1	.4		.4							1.9	5	23.6	8.9	15.2	23.8
340	1.5	1.9										3.3	9	11.9	10.4	20.4	31.6
350	1.5	3.3	.4									5.2	14	14.2	14.9	26.8	37.5
360	2.6	3.3	.4									6.3	17	11.9	21.6	32.0	36.8
CALM												.4	1				
TOT OBS	84	137	33	10	4	0	0	0	0	0	0		269		IN CUM PERCENTAGES COLUMNS		
PERCENT	31.2	50.9	12.3	3.7	1.5							99.6			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
RES WIND DIR = 326			RES WIND SP = 1.5				STD VECTOR DEV = 16.3					CONSTANCY = 11			(3) = 70 DEG SECTORS		
			MN SP ALL OBS = 14.2				MEAN VALUE OF X COMP = .8					STD DEV OF X COMP = 7.5					
							MEAN VALUE OF Y COMP = -1.3					STD DEV OF Y COMP = 14.5					

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MARCH THRU MARCH - 1955 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.7	1.1	.7									2.5	7	13.4	9.6	16.4	21.8
20	.7	1.4	.7									2.9	8	14.4	8.9	14.6	18.6
30	1.8	1.4	.4									3.6	10	10.0	7.3	11.1	16.4
40	.7	.4		.4								1.4	4	15.0	5.7	9.6	12.9
50	.4	.4										.7	2	7.5	3.2	7.5	10.4
60	1.1											1.1	3	6.3	2.5	3.9	8.2
70	.4	.4										.7	2	7.0	1.8	3.2	4.6
80												0.0	0		1.4	2.5	3.6
90	.7											.7	2	5.0	.7	1.8	3.6
100												0.0	0		1.1	1.8	3.2
110		.4										.4	1	11.0	1.1	2.5	2.9
120	.7											.7	2	4.5	1.3	2.1	3.6
130	.4	.4										.7	2	6.5	1.8	2.9	5.4
140	.4											.4	1	7.0	1.8	5.0	7.5
150	.7											.7	2	6.5	3.6	6.4	10.7
160	1.8	.7										2.5	7	7.3	5.4	9.3	17.5
170	1.8		.4									2.1	6	9.8	8.2	16.4	28.6
180	2.1	.7	.4	.4								3.6	10	12.0	13.2	27.5	38.6
190	.7	3.9	2.5	.4								7.5	21	17.4	22.9	35.4	45.0
200	3.2	4.6	1.8	1.4	.4	.4						11.8	33	17.9	29.6	40.4	45.4
210	2.1	4.6	1.4	1.4	.7							10.4	29	18.7	29.3	39.6	46.1
220	2.1	3.2	1.4	.4								7.1	20	14.2	20.4	35.0	46.1
230	1.8	.7	.4									2.9	8	9.0	12.3	26.8	39.6
240	1.3	1.1										2.9	8	9.3	9.3	17.5	29.3
250	2.1	1.1	.4									3.6	10	10.1	7.5	11.8	20.4
260	1.1											1.1	3	6.3	6.1	10.4	14.6
270	.7	.7										1.4	4	10.0	3.9	8.9	12.5
280	1.1	.4										1.4	4	9.3	4.3	6.1	13.6
290	.7	.7										1.4	4	8.5	3.6	8.9	14.6
300		.7										.7	2	14.5	6.1	12.1	16.8
310	1.1	2.1	.4	.4								3.9	11	13.5	9.3	13.9	19.3
320	.7	1.4	2.5									4.6	13	18.2	11.8	16.4	21.1
330	1.4	1.1	.7									3.2	9	13.1	11.3	18.9	23.9
340	.4	3.2	.4									3.9	11	14.0	10.4	19.3	25.7
350	1.8	1.4										3.2	9	8.0	11.4	17.1	24.6
360	1.1	.4	2.1	.7								4.3	12	19.0	10.0	16.8	23.6
CALM	.4											0.0	0				
TOT OBS	107	108	46	15	3	1	0	0	0	0	0		280	IN CUM PERCENTAGES COLUMNS			
PERCENT	38.2	38.6	16.4	5.4	1.1	.4						100.0		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 238			RES WIND SP = 5.2				STD VECTOR DEV = 15.5					CONSTANCY = 37		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 13.8				MEAN VALUE OF X COMP = 4.4					STD DEV OF X COMP = 6.6					
							MEAN VALUE OF Y COMP = 2.8					STD DEV OF Y COMP = 14.0					

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MARCH THRU MARCH - 1955 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.4	2.9	.7	.7								4.7	13	17.9	14.1	17.7	26.0
20	.4	2.9	2.2	1.1	.4							6.9	19	21.4	13.0	18.8	22.4
30		.7	.7									1.4	4	19.2	11.6	17.7	20.9
40	.4	1.4	1.4									3.2	9	18.3	6.1	13.7	18.4
50	.4	1.1										1.4	4	10.2	5.4	6.9	15.2
60	.4	.4										.7	2	12.5	2.2	6.9	8.3
70												0.0	0		2.2	3.6	8.3
80	1.4											1.4	4	5.8	1.4	3.6	6.1
90												0.0	0		2.9	4.0	6.1
100	.7	.7										1.4	4	9.5	2.5	5.4	6.1
110	.7	.4										1.1	3	8.3	4.0	4.7	7.9
120	.7	.7										1.4	4	10.2	3.2	6.5	9.7
130	.7											.7	2	3.0	4.0	8.3	11.6
140	1.1	.7										1.8	5	10.6	5.8	9.0	11.9
150	2.5	.7										3.2	9	7.4	6.9	9.4	13.7
160	1.1	.7										1.8	5	7.0	6.9	11.6	19.5
170	.7	1.1										1.8	5	8.6	6.5	17.0	27.8
180	1.1	1.4		.4								2.9	8	13.9	11.9	22.7	33.9
190	1.4	1.8	1.8	2.2								7.2	20	20.5	19.1	28.9	40.8
200	.7	2.9	4.3	.4	.4	.4						9.0	25	22.4	24.2	37.2	41.9
210	.7	3.6	2.2	.4	.4	.7						7.9	22	22.4	27.1	37.2	41.5
220	1.1	7.9	.4	.7								10.1	28	15.8	20.9	31.4	39.0
230	.7	.7	1.4									2.9	8	14.5	14.4	22.7	32.5
240	.7	.7										1.4	4	11.7	4.7	15.5	25.3
250		.4										.4	1	15.0	2.5	7.2	17.3
260	.7											.7	2	6.5	2.9	4.3	9.0
270	1.8											1.8	5	5.0	2.5	4.7	7.6
280												0.0	0		3.6	5.8	8.7
290	1.[illegible]	.7										1.8	5	7.8	3.2	7.6	10.5
300	.4	1.1										1.4	4	9.8	5.8	7.9	14.1
310		1.1	1.4									2.5	7	17.6	6.1	12.3	17.3
320		.7	1.4									2.2	6	19.5	9.0	15.5	19.5
330	.7	1.4	1.8		.4							4.3	12	19.1	11.6	16.2	20.2
340	1.1	2.5	1.1	.4								5.1	14	16.2	11.6	16.2	23.5
350	.7	1.1				.4						2.2	6	18.2	9.7	18.8	27.8
360		2.2		.4								2.5	7	16.3	9.4	21.3	27.1
CALM												.4	1				
TOT OBS	58	124	58	18	4	4	0	0	0	0	0		277		IN CUM PERCENTAGES COLUMNS		
PERCENT	24.5	44.8	20.9	6.5	1.4	1.4						99.6			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 242 RES WIND SP = 3.4 STD VECTOR DEV = 18.8 CONSTANCY = 21
MN SP ALL OBS = 16.3 MEAN VALUE OF X COMP = 3.0 STD DEV OF X COMP = 8.3
MEAN VALUE OF Y COMP = 1.6 STD DEV OF Y COMP = 16.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MARCH THRU MARCH - 1955 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.9	1.8	2.1	.6								5.3	18	17.6	16.9	23.1	32.8
20		2.7	3.3	.3								6.2	21	20.3	15.1	24.3	29.3
30	.3	2.1	.9	.3								3.6	12	17.4	13.6	21.3	28.1
40	.9	2.4	.6									3.8	13	13.3	9.8	17.5	23.4
50	.9	.9	.6									2.4	8	14.0	7.7	11.8	18.9
60	.6	.9										1.5	5	11.4	4.4	9.2	13.6
70	.3	.3										.6	2	11.5	3.0	6.2	10.9
80	.6	.3										.9	3	7.0	2.4	4.7	7.1
90	.6	.3										.9	3	8.3	2.7	3.3	5.0
100	.9											.9	3	4.3	1.8	3.0	4.4
110												0.0	0		1.2	3.0	4.4
120	.3											.3	1	9.0	1.2	2.7	4.4
130	.3	.6										.9	3	11.7	1.8	2.7	6.2
140	.6											.6	2	7.0	2.4	5.3	8.0
150	.6	.3										.9	3	9.3	4.1	7.7	11.2
160	1.5	1.2										2.7	9	9.6	6.2	10.1	17.8
170	1.5	1.2										2.7	9	11.1	8.6	16.3	25.4
180	.9	1.8		.6								3.3	11	14.7	12.7	24.0	33.7
190	.9	.9	2.7	1.2	1.2							6.8	23	25.5	18.6	30.2	36.1
200	1.2	3.3	2.7	.9	.3		.3					8.6	29	20.7	24.3	30.8	36.1
210	2.7	3.6	1.8	.3	.6							8.9	30	16.6	20.7	30.2	36.1
220	1.2	1.8			.3							3.3	11	13.8	14.8	26.0	34.0
230	.3	1.8		.3	.3							2.7	9	17.9	8.6	18.6	28.7
240	.9	1.8										2.7	9	11.4	6.5	11.2	21.9
250	.3	.9										1.2	4	10.2	5.3	9.8	15.4
260	.9	.3		.3								1.5	5	15.0	4.4	9.5	12.7
270	1.2	.6										1.8	6	7.7	5.6	7.4	11.8
280	1.2	1.2										2.4	8	10.1	4.7	8.0	11.2
290		.6										.6	2	13.5	4.7	8.6	13.3
300	.9	.6	.3									1.8	6	10.7	4.4	10.1	13.3
310	.3	1.2	.3	.3								2.1	7	18.1	7.1	9.2	17.5
320	.3	.3	2.4	.3								3.3	11	22.2	6.8	14.5	17.8
330	.3	.3	.6	.3								1.5	5	20.8	10.7	15.4	22.5
340	2.4	2.4	1.2									5.9	20	12.8	10.1	18.6	26.0
350	.6	.9	.9				.3					2.7	9	21.0	13.9	20.7	30.2
360	1.5	1.2	1.2	1.2	.3							5.3	18	19.6	13.3	25.4	30.5
CALM												0.0	0				
TOT OBS	96	135	72	23	10	0	2	0	0	0	0		338		IN CUM PERCENTAGES COLUMNS		
PERCENT	28.4	39.9	21.3	6.8	3.0		.6					100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 273 RES WIND SP = 2.6 STD VECTOR DEV = 19.1 CONSTANCY = 16
MN SP ALL OBS = 16.3 MEAN VALUE OF X COMP = 2.6 STD DEV OF X COMP = 8.5
MEAN VALUE OF Y COMP = -.1 STD DEV OF Y COMP = 17.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MARCH THRU MARCH - 1955 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.9	2.3	1.3	.3								5.8	18	13.9	14.2	23.0	29.8
20	1.0	2.9	.6									4.5	14	13.4	14.6	21.7	28.2
30	1.3	2.6	.3									4.2	13	12.1	12.0	19.7	24.9
40	1.9	.6	.6									3.2	10	11.7	9.4	15.2	23.6
50	1.3	1.0										1.9	6	9.8	6.5	13.3	19.1
60	1.0	.3										1.3	4	7.3	5.8	10.4	15.9
70	2.6											2.6	8	6.5	5.2	8.4	12.3
80	1.0	.3										1.3	4	8.8	5.2	7.1	10.4
90	1.3											1.3	4	6.3	3.2	7.1	9.7
100	.6											.6	2	6.5	3.2	5.8	10.4
110	1.3											1.3	4	6.8	3.2	6.5	9.1
120	1.3											1.3	4	6.0	4.5	6.5	9.7
130	1.6	.3										1.9	6	8.2	4.5	7.8	9.4
140	.3	1.3										1.3	4	13.2	5.2	7.4	11.3
150	.6	1.3										1.9	6	11.7	4.2	8.7	15.2
160	.3	.6										1.0	3	11.3	5.5	12.0	18.1
170	1.0	1.3		.3								2.6	8	12.9	8.7	14.9	24.9
180	2.3	1.3	1.6									5.2	16	14.7	12.0	21.7	31.4
190	.6	1.0	2.3	.3								4.2	13	19.6	18.1	26.5	32.7
200	.6	4.2	2.9	.6	.3							8.7	27	20.7	20.7	29.1	35.3
210	1.6	2.6	2.9	.3	.3							7.8	24	17.9	19.7	27.5	34.3
220	1.3	1.3	.6									3.2	10	11.4	14.6	24.9	29.8
230	1.0	2.3	.3									3.6	11	13.1	8.4	16.8	27.5
240	1.3	.3										1.6	5	7.6	5.8	11.0	20.7
250		.6										.6	2	15.0	4.2	9.7	13.3
260	1.6	.3										1.9	6	7.5	4.5	6.5	12.0
270	1.9											1.9	6	5.0	4.2	6.8	10.0
280	.3											.3	1	3.0	4.2	7.8	10.7
290	1.0	.6	.3									1.9	6	13.0	3.9	8.1	12.0
300	.6	1.0										1.6	5	10.6	5.8	8.1	12.6
310	.6	1.6										2.3	7	10.6	5.8	10.4	14.2
320	.6	1.3										1.9	6	10.5	6.3	12.0	18.4
330	.3	1.9	.3									2.6	8	12.1	8.1	14.9	20.4
340	1.9	1.6										3.6	11	9.3	10.7	16.5	24.6
350	1.9	2.3		.3								4.5	14	12.2	12.0	20.4	26.9
360	.6	1.6	1.3	.3								3.9	12	17.6	14.2	22.3	29.1
CALM												.3	1				
TOT OBS	125	125	46	8	2	0	0	0	0	0	0		309		IN CUM PERCENTAGES COLUMNS		
PERCENT	40.5	40.5	15.5	2.6	.6							99.7			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
RES WIND DIR = 225			RES WIND SP = 2.1				STD VECTOR DEV = 15.0					CONSTANCY = 16			(3) = 70 DEG SECTORS		
			MN SP ALL OBS = 13.6				MEAN VALUE OF X COMP = 1.5								STD DEV OF X COMP = 6.8		
							MEAN VALUE OF Y COMP = 1.5								STD DEV OF Y COMP = 13.3		

UPPER WIND SUMMARY
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: APRIL THRU APRIL - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.9	2.2										4.1	11	9.8	10.7	13.7	17.8
20	1.1	1.5	1.1									3.7	10	12.7	9.3	13.3	15.9
30	.7		.7									1.5	4	13.0	6.3	11.5	15.6
40	1.1											1.1	3	6.3	3.7	8.5	13.0
50	1.1											1.1	3	6.7	3.3	5.2	8.9
60	.7	.4										1.1	3	9.7	2.6	3.7	6.3
70	.4											.4	1	9.0	1.5	3.7	4.8
80												0.0	0		1.5	2.6	4.1
90	1.1											1.1	3	4.3	1.1	1.9	3.3
100												0.0	0		1.5	1.9	2.6
110	.4											.4	1	3.0	.7	2.2	3.3
120	.4											.4	1	2.0	1.1	2.2	3.7
130	.4											.4	1	3.0	1.9	2.6	3.3
140	.7	.4										1.1	3	8.3	1.3	3.0	4.4
150	.4											.4	1	5.0	2.2	3.7	8.1
160	.7											.7	2	5.5	2.2	7.4	17.0
170	.7	.4										1.1	3	7.7	5.9	15.6	32.6
180	1.5	1.5	1.1									4.1	11	14.9	14.4	31.1	41.1
190	.7	3.7	3.0	1.5		.4						9.3	25	21.5	29.3	40.0	48.9
200	1.9	5.9	5.2	2.6	.4							15.9	43	20.9	34.8	47.0	53.0
210	1.5	5.2	2.2	.7								9.6	26	17.3	33.7	47.8	53.0
220	2.2	4.8	1.1									8.1	22	12.7	22.6	39.6	51.5
230	1.5	2.6	.7									4.8	13	13.0	14.1	26.3	42.6
240	.4	.4	.4									1.1	3	15.3	8.5	17.0	27.8
250	.4	1.9		.4								2.6	7	13.9	4.1	10.0	19.6
260	.4											.4	1	5.0	4.1	6.7	12.6
270	.7		.4									1.1	3	10.7	3.0	6.7	9.3
280	.4	1.1										1.5	4	12.7	3.7	5.6	12.6
290	.4	.7										1.1	3	11.3	4.1	9.6	14.1
300	.4	.7	.4									1.5	4	13.5	7.0	12.6	17.4
310	1.5	2.2	.7									4.4	12	11.7	10.0	14.8	19.3
320	1.5	1.5	.4	.4	.4							4.1	11	16.6	12.2	16.7	19.3
330	.7	1.9	1.1									3.7	10	13.7	10.7	16.7	21.1
340	.7	1.9	.4									3.0	8	13.1	9.1	15.2	23.7
350	.4	.7	.4									1.5	4	14.5	7.4	15.2	23.0
360	1.1	1.5		.4								3.0	8	13.0	8.5	15.2	20.4
CALM												.7	2				
TOT OBS	81	116	52	16	2	1	0	0	0	0	0		270	IN CUM PERCENTAGES COLUMNS			
PERCENT	30.0	43.0	19.3	5.9	.7	.4						99.3		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
														(3) = 70 DEG SECTORS			

RES WIND DIR = 224 RES WIND SP = 7.3 STD VECTOR DEV = 15.6 CONSTANCY = 49
MN SP ALL OBS = 14.8 MEAN VALUE OF X COMP = 5.1 STD DEV OF X COMP = 6.4
MEAN VALUE OF Y COMP = 5.2 STD DEV OF Y COMP = 14.2

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: APRIL THRU APRIL - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.5	.8	1.5	1.1								4.9	13	18.2	14.0	17.7	26.0
20	.4	2.3	2.3	.4								5.3	14	19.5	11.7	19.2	22.6
30	.4	.4	.8									1.5	4	17.2	10.6	16.6	21.5
40	.4	3.4										3.8	10	13.1	6.4	12.8	19.5
50	.8	.4										1.1	3	9.0	6.0	8.3	14.7
60	.4	.8										1.1	3	13.0	3.0	7.9	10.2
70	.8											.8	2	7.5	3.0	4.9	9.8
80		1.1										1.1	3	11.3	2.6	4.9	6.4
90	.4	.4										.8	2	7.0	3.0	4.2	6.0
100	.4	.8										1.1	3	10.7	2.3	4.2	4.9
110	.4											.4	1	3.0	2.3	3.0	4.9
120	.8											.8	2	5.5	1.1	3.0	4.5
130												0.0	0		1.5	2.6	4.2
140	.8											.8	2	7.5	1.5	2.6	4.5
150	.8											.8	2	3.5	1.9	3.4	7.5
160	.4											.4	1	5.0	2.6	6.8	17.4
170	1.1	.4										1.5	4	9.8	5.3	16.6	30.9
180	.8	1.1	1.5									3.4	9	17.4	15.5	29.4	41.9
190	1.1	1.9	5.7	1.5	.4							10.6	28	21.8	27.5	40.8	46.8
200	1.9	3.8	4.5	2.6		.8						13.6	36	22.6	35.8	44.9	50.6
210	.8	5.3	4.5	.8	.4							11.7	31	19.6	30.9	45.7	50.6
220	1.1	4.2	.4									5.7	15	12.2	21.5	36.6	48.7
230	1.1	2.6	.4									4.2	11	12.6	11.3	24.5	39.2
240	.4	.8	.4									1.5	4	16.3	7.2	14.0	26.0
250	.4	1.1										1.5	4	11.5	4.2	8.7	15.5
260	.4	.8										1.1	3	10.0	3.0	5.7	10.9
270		.4										.4	1	12.0	2.6	5.3	7.5
280	.8	.4										1.1	3	10.7	2.6	4.5	7.5
290	1.1											1.1	3	6.7	3.0	4.9	7.2
300	.4		.4									.8	2	13.5	3.4	5.7	10.2
310		.8	.8									1.5	4	18.5	3.4	8.7	14.3
320		.8	.4									1.1	3	17.3	6.8	12.1	15.5
330	.8	1.5	1.5	.4								4.2	11	18.4	9.8	13.6	18.1
340	.4	3.0	.8	.4								4.5	12	19.7	10.9	15.8	22.3
350	.4	.8	1.1									2.3	6	17.0	10.6	19.6	26.0
360	.8	1.5	1.1		.4							3.8	10	18.9	10.9	20.8	26.4
CALM												0.0	0				
TOT OBS	58	109	74	19	3	2	0	0	0	0	0		265				
PERCENT	21.9	41.1	27.9	7.2	1.1	.8						100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 227 RES WIND SP = 5.1 STD VECTOR DEV = 18.9 CONSTANCY = 29
MN SP ALL OBS = 17.2 MEAN VALUE OF X COMP = 3.7 STD DEV OF X COMP = 7.5
MEAN VALUE OF Y COMP = 3.5 STD DEV OF Y COMP = 17.3

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: APRIL THRU APRIL - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.6	1.6	.9	.9								4.1	13	19.8	16.3	24.1	31.0
20	.6	2.8	2.2	.6	.3							6.6	21	19.5	14.4	22.6	28.5
30	.6	1.9	1.3									3.8	12	16.3	12.9	18.8	25.7
40	.6	1.9										2.5	8	12.1	8.2	16.0	20.4
50	.9	.9										1.9	6	11.5	5.6	9.7	16.9
60	.6	.3	.3									1.3	4	11.5	3.4	6.6	11.0
70		.3										.3	1	11.0	2.2	4.7	7.5
80	.3	.3										.6	2	9.0	1.6	3.1	5.6
90	.3	.3										.6	2	9.5	1.6	2.5	4.7
100		.3										.3	1	11.0	1.6	3.1	3.8
110	.6											.6	2	3.5	1.9	2.8	4.4
120	.9											.9	3	3.7	1.9	3.1	4.7
130	.3											.3	1	2.0	2.2	3.8	4.4
140		.9										.9	3	12.7	2.2	3.4	5.6
150	.6	.3										.9	3	10.3	2.2	4.1	9.1
160	.3											.3	1	8.0	2.8	7.8	16.0
170	.9	.3		.3								1.6	5	12.4	6.0	14.7	25.4
180	.9	1.9	.3	.6	.3							4.1	13	18.0	13.5	23.5	34.2
190		3.1	2.2	2.2	.3							7.8	25	23.9	21.5	32.9	37.0
200	.9	2.5	3.8	2.2		.3						9.7	31	22.4	27.3	35.1	40.8
210	1.3	5.3	3.1									9.7	31	17.2	23.2	35.1	43.6
220	.9	2.2	.6									3.8	12	13.6	17.6	31.7	41.4
230	1.6	2.2	.3									4.1	13	12.5	12.2	23.8	35.1
240	1.9	1.9	.6									4.4	14	10.7	10.3	15.7	25.7
250	.6	.9	.3									1.9	6	11.8	7.3	12.2	18.2
260	1.3	.3										1.6	5	7.8	3.8	10.3	15.4
270	.3											.3	1	9.0	4.1	6.9	12.9
280	1.6	.6										2.2	7	5.6	3.4	6.6	10.7
290	.6	.3										.9	3	7.3	4.7	7.2	10.3
300	.6	.6	.3									1.6	5	13.2	4.7	8.5	11.3
310	.9	.6	.3	.3								2.2	7	14.4	5.3	8.8	15.4
320	.3	.6	.3	.3								1.6	5	19.8	6.3	12.2	17.2
330	.6	1.6	.3									2.5	8	15.0	8.5	14.7	21.9
340	1.3	2.5	.6									4.4	14	13.9	11.0	18.2	24.5
350	.3	2.5	.9		.3							4.1	13	17.4	14.1	20.7	28.8
360	.6	1.3	3.8									5.6	18	19.3	13.9	24.8	31.0
CALM												0.0	0				
TOT OBS	80	138	72	24	4	1	0	0	0	0	0		319				
PERCENT	25.1	43.3	22.6	7.5	1.3	.3						100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 246 RES WIND SP = 3.2 STD VECTOR DEV = 18.3 CONSTANCY = 20
MN SP ALL OBS = 16.2 MEAN VALUE OF X COMP = 2.9 STD DEV OF X COMP = 7.4
MEAN VALUE OF Y COMP = 1.3 STD DEV OF Y COMP = 16.7

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: APRIL THRU APRIL - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	(1)	(2)	(3)
10	1.4	1.7	1.7									4.8	14	14.9	14.8	23.0	27.8
20	2.1	3.8										5.8	17	11.9	14.1	21.3	28.5
30	2.4	1.0										3.4	10	7.6	12.4	19.6	26.5
40	1.0	1.7	.3									3.1	9	12.8	8.9	17.5	23.0
50	1.4	1.0										2.4	7	10.4	8.2	12.4	18.9
60	1.0	1.7										2.7	8	10.4	5.8	9.6	13.1
70		.7										.7	2	12.5	4.1	6.5	10.7
80	.7											.7	2	7.0	1.4	5.2	8.2
90												0.0	0		1.7	3.1	6.9
100	1.0											1.0	3	4.0	1.7	3.4	4.1
110	.7											.7	2	4.0	2.7	2.7	4.1
120	.7	.3										1.0	3	7.7	1.7	3.4	4.5
130												0.0	0		1.7	3.4	6.2
140	.3	.3										.7	2	8.0	1.7	4.5	7.9
150	.7	.3										1.0	3	10.0	3.4	6.2	11.3
160	.7	1.0										1.7	5	10.6	5.5	10.3	18.6
170	1.4	1.4										2.7	8	8.8	8.6	17.9	28.2
180	1.0	1.4	1.7									4.1	12	14.4	15.1	26.5	35.1
190	.3	4.1	2.4	1.0	.3							8.2	24	19.9	22.0	32.3	37.1
200	1.7	3.8	3.1	.7	.3							9.6	28	17.7	25.4	32.6	37.8
210	2.7	3.8	1.0									7.6	22	12.7	20.3	30.9	37.5
220	1.4	1.4				.3						3.1	9	15.4	13.1	25.1	35.1
230	1.4	1.0										2.4	7	8.6	7.9	17.2	27.8
240	1.4	1.0										2.4	7	9.6	6.5	10.7	20.3
250	.7	1.0										1.7	5	8.8	5.2	9.6	13.4
260	.7	.3										1.0	3	8.7	4.8	7.9	12.4
270	1.4	.3	.3									2.1	6	10.7	3.8	7.6	12.7
280	.3	.3										.7	2	8.0	4.8	8.6	12.0
290	1.7	.3										2.1	6	7.5	5.5	9.3	13.4
300	1.4	1.0	.3									2.7	8	10.7	6.5	10.3	16.5
310	1.0	.3	.3									1.7	5	9.4	7.6	13.7	16.2
320	1.4	1.4	.3									3.1	9	11.8	8.9	13.4	20.3
330	1.7	1.7	.7									4.1	12	12.1	8.9	15.5	22.3
340	.3	1.0	.3									1.7	5	16.8	10.7	17.9	24.4
350	1.7	2.4	.7									4.8	14	10.9	10.7	19.6	28.5
360	1.4	1.7	1.0									4.1	12	13.8	13.7	21.3	28.9
CALM												0.0	0				
TOT OBS	114	127	42	5	2	1	0	0	0	0	0		291				
PERCENT	39.2	43.6	14.4	1.7	.7	.3						100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 237 RES WIND SP = 2.5 STD VECTOR DEV = 14.4 CONSTANCY = 20
MN SP ALL OBS = 12.6 MEAN VALUE OF X COMP = 2.1 STD DEV OF X COMP = 6.5
MEAN VALUE OF Y COMP = 1.3 STD DEV OF Y COMP = 12.9

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MAY THRU MAY - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.4	1.1										1.5	4	12.2	3.7	5.9	8.5
20	.7											.7	2	5.0	3.0	6.7	8.9
30	.7											.7	2	4.5	3.7	5.9	7.8
40	1.9		.4									2.2	6	7.7	3.7	4.8	7.0
50	.7											.7	2	5.0	3.3	4.8	5.9
60			.4									.4	1	24.0	1.9	4.4	5.6
70	.4	.4										.7	2	9.5	1.5	2.6	4.8
80		.4										.4	1	10.0	1.5	1.9	3.0
90	.4											.4	1	5.0	.7	1.9	2.2
100												0.0	0		.7	1.1	2.6
110	.4											.4	1	8.0	.4	1.5	2.6
120												0.0	0		1.1	1.9	4.1
130	.4	.4										.7	2	8.0	1.5	3.7	6.3
140	.7											.7	2	6.0	3.3	5.9	8.5
150	1.5	.4										1.9	5	6.8	5.2	8.1	12.6
160	2.6											2.6	7	7.0	6.7	11.9	21.5
170	1.5	.4	.4									2.2	6	9.8	9.3	20.0	38.1
180	3.3	.7	.4									4.4	12	10.2	15.6	35.6	50.0
190	1.5	3.3	3.3	.4	.4							8.9	24	19.5	30.7	45.6	59.9
200	1.9	7.8	6.3	.4	1.1							17.4	47	19.4	38.9	54.1	63.7
210	1.5	7.4	3.3			.4						12.6	34	17.3	40.7	57.0	64.8
220	1.5	7.4	1.9									10.7	29	15.1	30.7	51.5	62.2
230	1.5	5.6	.4									7.4	20	12.9	21.5	35.9	56.3
240	1.5	1.9										3.3	9	12.1	12.6	26.3	41.5
250	.4	1.5										1.9	5	11.6	8.1	18.1	29.6
260	1.9	.7		.4								3.0	8	10.7	7.4	11.5	19.3
270	.7	1.9										2.6	7	10.1	6.3	6.5	13.3
280	.7											.7	2	4.5	3.7	8.1	12.6
290		.4										.4	1	11.0	2.6	7.8	11.5
300	1.1	.4										1.5	4	7.3	4.4	5.9	10.0
310	.4	1.9	.4									2.6	7	15.4	4.8	6.7	7.8
320		.4		.4								.7	2	20.0	4.8	6.7	8.5
330	.7	.7										1.5	4	8.3	2.6	6.7	9.6
340			.4									.4	1	29.0	3.3	5.6	9.6
350	.4	1.1										1.5	4	12.0	3.3	6.3	7.8
360	.7	.7										1.5	4	11.7	4.4	5.6	7.8
CALM												.7	2				
TOT OBS	86	126	47	4	4	1	0	0	0	0	0		270				
PERCENT	31.9	46.7	17.4	1.5	1.5	.4						99.3					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 212 RES WIND SP = 10.1 STD VECTOR DEV = 12.9 CONSTANCY = 71
MN SP ALL OBS = 14.2 MEAN VALUE OF X COMP = 5.4 STD DEV OF X COMP = 6.2
MEAN VALUE OF Y COMP = 8.6 STD DEV OF Y COMP = 11.3

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MAY THRU MAY - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.7	1.1										1.8	5	10.4	6.6	12.0	15.0
20	.4	.4	.7	.4								1.8	5	21.2	8.0	12.0	13.9
30	1.5	2.9										4.4	12	12.5	7.3	9.9	13.5
40	.7	.4										1.1	3	8.7	6.2	8.8	10.9
50	.4	.4										.7	2	11.0	2.6	7.3	9.9
60	.4	.4										.7	2	8.0	1.8	3.6	8.8
70	.4											.4	1	7.0	1.8	3.3	4.7
80	.7											.7	2	3.5	1.8	2.9	4.0
90	.4	.4										.7	2	9.0	1.8	2.6	3.6
100	.4											.4	1	7.0	1.5	2.6	4.0
110	.4											.4	1	5.0	1.1	2.9	4.4
120	.4											.4	1	5.0	1.9	2.9	4.7
130	1.1											1.1	3	5.7	2.2	3.6	5.8
140	.7											.7	2	7.0	2.3	5.1	6.6
150	.4	.7										1.1	3	11.3	3.6	5.8	8.8
160	1.5	.4										1.8	5	8.4	4.0	7.3	21.2
170	.4	.4	.4									1.1	3	16.3	5.3	19.3	33.2
180	.4	1.8	.4									2.6	7	15.1	16.4	31.4	48.2
190	1.5	2.9	5.8	1.5	1.1							12.8	35	22.6	28.5	45.3	56.2
200	1.8	4.4	5.8	1.1								13.1	36	20.4	41.5	53.3	59.1
210	1.1	10.2	2.9	1.5								15.7	43	17.1	38.0	55.5	61.7
220	3.3	4.0	1.8									9.1	25	14.1	29.6	46.4	61.7
230	1.5	2.6	.7									4.7	13	12.1	17.5	35.8	51.1
240	2.6	1.1										3.6	10	8.3	10.9	22.3	39.4
250	.7	1.8										2.6	7	10.1	8.4	14.6	24.5
260	1.5	.7										2.2	6	8.7	6.2	10.6	16.8
270	.7	.7										1.5	4	8.0	4.4	8.4	12.4
280	.4	.4										.7	2	7.5	3.6	6.2	10.6
290	.7	.7										1.5	4	8.8	2.6	5.8	9.9
300	.4											.4	1	7.0	3.5	6.2	8.4
310	.4	1.5										1.8	5	11.0	4.0	6.2	8.8
320		1.5	.4									1.8	5	17.4	4.4	6.6	9.1
330		.4	.4									.7	2	19.5	4.4	7.3	10.6
340	.4	.7	.4	.4								1.8	5	18.6	3.6	8.4	12.0
350		.7	.4									1.1	3	17.7	5.8	8.4	12.0
360	.7	.7	1.1	.4								2.9	8	17.9	5.8	9.5	14.6
CALM												0.0	0				
TOT OBS	78	121	58	14	3	0	0	0	0	0	0		274	IN CUM PERCENTAGES COLUMNS			
PERCENT	28.5	44.2	21.2	5.1	1.1							100.0		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
														(3) = 70 DEG SECTORS			

RES WIND DIR = 211 RES WIND SP = 8.8 STD VECTOR DEV = 15.2 CONSTANCY = 57
MN SP ALL OBS = 15.4 MEAN VALUE OF X COMP = 4.6 STD DEV OF X COMP = 6.1
MEAN VALUE OF Y COMP = 7.5 STD DEV OF Y COMP = 13.9

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MAY THRU MAY - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.7	.7	1.4	.4								3.2	9	18.6	12.1	15.7	20.4
20	1.8	2.9	1.1									5.7	16	13.2	10.7	16.8	19.6
30	.7	.7	.4									1.8	5	9.6	10.4	14.6	20.0
40	1.1	1.4		.4								2.9	8	13.8	5.7	13.6	17.9
50	.7	.4										1.1	3	7.3	6.1	8.9	16.1
60	1.4	.7										2.1	6	8.8	4.3	8.6	10.7
70	.7	.4										1.1	3	8.0	4.5	6.1	10.4
80	1.4											1.4	4	5.5	2.9	6.4	8.2
90	.4											.4	1	6.0	3.2	5.0	7.9
100	1.1	.4										1.4	4	7.5	2.5	4.6	5.7
110	.7											.7	2	2.5	2.9	3.2	5.0
120	.4	.4										.7	2	8.5	1.4	3.2	4.6
130												0.0	0		1.1	2.9	5.4
140	.4											.4	1	4.0	1.4	3.2	6.8
150	.7	.4										1.1	3	9.7	2.5	5.4	10.7
160		.7	.4									1.1	3	16.0	5.0	10.0	18.9
170	1.1	1.8										2.9	8	9.4	8.6	18.6	33.2
180	.7	2.1	1.8									4.6	13	15.8	16.4	31.8	40.0
190	1.1	3.9	2.5	1.1	.4							8.9	25	19.4	27.9	37.9	45.7
200	1.4	6.8	3.9	2.1								14.3	40	19.3	30.4	41.8	48.2
210	.7	5.0	1.4									7.1	20	15.2	28.2	40.7	48.2
220	.4	3.9	1.8	.7								6.8	19	17.5	17.5	34.6	46.4
230	2.5	1.1										3.6	10	8.2	13.2	23.2	40.0
240	1.8	1.1										2.9	8	8.5	9.3	18.6	27.1
250	1.4	1.4										2.9	8	9.8	8.2	13.2	20.7
260	1.1	.7	.7									2.5	7	11.9	6.8	10.4	15.4
270	.7		.4	.4								1.4	4	15.5	4.5	8.9	13.6
280	.4	.4										.7	2	10.0	3.6	7.9	12.1
290	1.4											1.4	4	5.8	3.9	6.8	11.1
300	1.4	.4										1.8	5	8.2	4.5	7.1	10.7
310	.4	1.1										1.4	4	13.2	5.0	8.6	11.1
320		1.1	.7									1.8	5	16.8	5.4	8.9	12.1
330	1.8	.4										2.1	6	7.2	5.7	8.9	13.9
340		1.8										1.8	5	15.8	5.7	10.7	15.4
350	.7	1.1										1.8	5	11.6	6.8	12.1	19.6
360	.7	1.8	.7									3.2	9	12.6	8.2	15.7	19.6
CALM												1.1	3				
TOT OBS	89	125	48	14	1	0	0	0	0	0	0		280				
PERCENT	31.8	44.6	17.1	5.0	.4							98.9					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 215 RES WIND SP = 5.5 STD VECTOR DEV = 15.1 CONSTANCY = 40
MN SP ALL OBS = 13.8 MEAN VALUE OF X COMP = 3.1 STD DEV OF X COMP = 6.9
MEAN VALUE OF Y COMP = 4.5 STD DEV OF Y COMP = 13.4

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: MAY THRU MAY - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	ROW TOTAL OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.4	.4	.4									2.1	6	10.3	8.5	12.5	14.9
20	1.4	1.8	.4									3.6	10	10.6	8.2	11.4	15.3
30	1.8	.7										2.5	7	7.6	6.4	11.0	14.6
40			.4									.4	1	24.0	5.3	9.6	13.2
50	1.8	.7										2.5	7	7.0	3.6	7.5	12.5
60	.4	.4										.7	2	6.5	4.6	6.4	9.6
70	1.4											1.4	4	6.3	3.6	6.8	8.5
80	1.4											1.4	4	4.8	3.6	5.7	10.3
90	.7											.7	2	4.5	3.6	7.1	9.6
100	1.4											1.4	4	3.5	4.3	7.5	11.0
110	1.4	.7										2.1	6	8.2	5.3	8.2	11.7
120	1.4	.4										1.8	5	6.0	6.0	9.6	13.2
130	1.8	.4										2.1	6	5.6	6.0	11.0	16.0
140	1.1	.7	.4									2.1	6	11.7	7.1	12.5	16.7
150	1.4	1.1	.4									2.8	8	10.0	8.5	12.8	22.4
160	1.4	2.1										3.6	10	9.8	8.5	18.5	33.5
170	.7	1.1	.4									2.1	6	13.0	13.5	29.2	42.0
180	3.9	2.5	1.1	.4								7.8	22	12.2	22.8	37.0	47.0
190	3.2	6.8	2.1	.7								12.8	36	15.0	31.3	40.6	47.3
200	4.3	3.6	2.5	.4								10.7	30	13.6	30.6	41.6	49.1
210	1.4	3.6	1.4	.7								7.1	20	15.6	21.0	39.1	49.8
220	1.4	1.8										3.2	9	9.9	15.7	29.2	43.1
230	3.2	1.8	.4									5.3	15	9.7	11.4	19.6	31.3
240	.7	2.1										2.8	8	10.4	9.3	13.5	22.1
250	.7	.4										1.1	3	9.0	5.0	11.7	15.3
260	.7	.4										1.1	3	6.0	3.6	6.8	13.5
270	1.1	.4										1.4	4	6.8	2.8	5.3	10.0
280	.4											.4	1	4.0	3.2	6.0	7.8
290	1.1	.4										1.4	4	5.5	3.6	5.7	7.5
300	1.8											1.8	5	3.8	3.3	5.0	7.8
310	.7											.7	2	6.0	3.2	6.0	8.5
320	.7											.7	2	8.5	2.8	6.8	9.6
330	1.4											1.4	4	6.0	4.3	6.4	11.0
340	1.4	.7										2.1	6	9.2	5.0	8.5	11.4
350	1.4											1.4	4	2.8	6.4	10.0	14.2
360	1.4	1.1	.4									2.8	8	10.1	6.4	12.1	16.0
CALM												.4	1				
TOT OBS	146	100	28	6	0	0	0	0	0	0	0		281				
PERCENT	52.0	35.6	10.0	2.1								99.6					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 193 RES WIND SP = 5.6 STD VECTOR DEV = 11.4 CONSTANCY = 53
MN SP ALL OBS = 10.6 MEAN VALUE OF X COMP = 1.3 STD DEV OF X COMP = 5.4
MEAN VALUE OF Y COMP = 5.5 STD DEV OF Y COMP = 10.0

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JUNE THRU JUNE - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.5	.7										2.2	6	9.3	3.3	5.2	7.4
20		.7										.7	2	14.5	4.4	5.6	7.0
30	.4		1.1									1.5	4	18.0	3.0	6.3	7.4
40	.7											.7	2	8.0	3.3	4.8	7.0
50	.7	.4										1.1	3	7.0	2.6	4.1	4.8
60	.7											.7	2	5.5	1.9	2.6	4.1
70												0.0	0		.7	1.9	3.0
80												0.0	0		0.0	1.1	2.6
90												0.0	0		.4	.7	2.2
100	.4											.4	1	4.0	.7	1.5	3.7
110	.4											.4	1	3.0	1.5	3.7	5.2
120	.7											.7	2	4.5	3.3	5.2	5.9
130	1.1	1.1										2.2	6	10.0	4.4	5.6	8.5
140	.7	.4	.4									1.5	4	10.7	4.4	7.8	10.4
150	.7											.7	2	6.0	4.8	9.3	15.9
160	1.5	1.1										2.6	7	8.4	5.6	13.0	21.9
170	.7	.4	.7	.4								2.2	6	15.8	10.7	18.1	37.4
180	2.6	2.6	.7									5.9	16	12.2	14.8	35.2	51.9
190	1.5	3.3	.7	.7	.4							6.7	18	17.9	30.4	48.5	61.1
200	3.3	3.1	4.4	1.5	.4							17.8	48	17.9	40.4	56.3	62.6
210	3.3	5.9	5.9	.7								15.9	43	16.9	43.7	54.4	62.6
220	2.6	5.2	2.2									10.1	27	14.0	30.0	50.0	60.0
230	1.1	2.6	.4									4.1	11	12.5	16.3	35.6	53.7
240	1.5	.4	.4									2.2	6	8.8	9.6	20.0	38.1
250	1.1	2.2										3.3	9	11.2	5.9	12.2	23.7
260		.4										.4	1	13.0	5.9	9.6	15.2
270	1.1	1.1										2.2	6	8.5	4.1	8.9	13.0
280	.7	.7										1.5	4	9.8	5.2	7.4	12.6
290	.7	.4	.4									1.5	4	12.2	4.8	8.9	11.9
300	1.1	.4	.4									1.9	5	11.0	5.2	9.3	13.3
310	.7	1.1										1.9	5	11.4	6.3	9.6	12.6
320	1.1	1.1	.4									2.6	7	10.0	6.3	9.6	11.5
330	1.1	.4	.4									1.9	5	10.4	5.9	8.1	10.4
340	1.1	.4										1.5	4	7.5	3.7	6.7	10.7
350		.4										.4	1	12.0	2.2	6.3	9.6
360		.4										.4	1	14.0	3.0	5.2	8.5
CALM												.4	1				
TOT OBS	95	113	50	9	2	0	0	0	0	0	0		270		IN CUM PERCENTAGES COLUMNS		
PERCENT	35.2	41.9	18.5	3.3	.7							99.6			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 210 RES WIND SP = 9.5 STD VECTOR DEV = 12.8 CONSTANCY = 69
MN SP ALL OBS = 13.7 MEAN VALUE OF X COMP = 4.8 STD DEV OF X COMP = 6.3
MEAN VALUE OF Y COMP = 8.2 STD DEV OF Y COMP = 11.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JUNE THRU JUNE - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.8	.8	.8	.4								2.7	7	17.7	6.9	12.7	18.1
20	1.2	1.2										2.3	6	9.7	6.9	11.5	16.9
30		1.2	.8									1.9	5	18.0	6.9	11.2	13.8
40	.8	1.5	.4									2.7	7	12.6	6.2	9.2	12.7
50	.8	.8										1.5	4	9.5	5.0	7.7	11.2
60		.8										.8	2	16.5	3.1	6.9	9.2
70	.8											.8	2	5.5	2.7	4.6	7.3
80	.8	.4										1.2	3	6.7	2.3	3.1	5.0
90	.4											.4	1	7.0	1.5	2.7	3.5
100												0.0	0		.8	1.9	3.5
110	.4											.4	1	8.0	.4	1.5	3.8
120												0.0	0		1.2	2.3	4.6
130	.4	.4										.8	2	8.5	1.9	4.2	4.6
140	.8	.4										1.2	3	6.0	3.8	4.2	5.8
150	1.2	.4	.4									1.9	5	11.8	3.5	5.4	8.5
160		.4										.4	1	10.0	3.5	7.7	17.7
170		.8		.4								1.2	3	18.3	4.6	15.8	28.1
180	.4	1.9	.8									3.1	8	15.1	13.5	25.0	44.2
190	.8	3.1	4.2	.8	.4							9.2	24	21.7	23.5	41.9	51.5
200	1.9	3.8	5.0	.4								11.2	29	19.3	37.7	50.0	54.6
210	2.7	8.5	5.8		.4							17.3	45	16.6	37.7	50.4	55.4
220	2.7	6.2	.4									9.2	24	11.3	30.0	43.1	53.8
230	2.3	.8	.4									3.5	9	9.9	14.6	33.5	46.2
240	.8	1.2										1.9	5	10.2	6.9	17.7	36.2
250	.8	.8										1.5	4	11.3	5.0	9.6	20.0
260	1.2	.4										1.5	4	8.8	4.2	7.3	11.9
270	.8	.4										1.2	3	7.3	3.8	6.5	10.4
280	1.2											1.2	3	7.0	3.5	6.9	11.9
290	.8	.4										1.2	3	10.0	4.2	8.8	12.7
300	1.2	.8										1.9	5	8.0	6.5	10.0	12.3
310	1.5	1.5	.4									3.5	9	13.4	7.7	10.0	13.8
320	1.2	.4	.8									2.3	6	14.5	6.9	11.5	16.5
330	.4	.8										1.2	3	9.3	6.2	13.5	17.3
340	.4	2.3										2.7	7	12.6	7.7	11.9	18.1
350	1.2	1.5	1.2									3.8	10	14.1	8.5	12.3	16.9
360	1.5		.4									1.9	5	10.0	8.5	13.5	16.5
CALM												.8	2				
TOT OBS	82	113	56	5	2	0	0	0	0	0	0		260				
PERCENT	31.5	43.5	21.5	1.9	.8							99.2					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 216 RES WIND SP = 6.7 STD VECTOR DEV = 14.8 CONSTANCY = 47
MN SP ALL OBS = 14.2 MEAN VALUE OF X COMP = 3.9 STD DEV OF X COMP = 6.4
MEAN VALUE OF Y COMP = 5.5 STD DEV OF Y COMP = 13.3

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JUNE THRU JUNE - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.0	1.4	.3	.7								3.5	10	16.7	10.5	16.7	23.3
20	.7	1.7	.7									3.1	9	13.9	9.1	17.4	22.0
30	.3	1.7	.3									2.4	7	15.3	10.1	14.3	18.5
40	.3	4.2										4.5	13	13.0	7.7	11.1	16.4
50	.7											.7	2	5.5	5.6	9.8	14.3
60	.3											.3	1	8.0	2.8	8.7	12.9
70	1.0	.7										1.7	5	8.2	3.5	5.9	11.1
80	.7	.7										1.4	4	8.0	4.9	5.9	7.3
90	1.4	.3										1.7	5	6.2	3.8	6.3	7.0
100	.3	.3										.7	2	12.0	3.1	4.9	8.7
110	.7											.7	2	3.0	1.7	5.6	7.3
120		.3										.3	1	11.0	3.1	4.2	5.9
130	1.7	.3										2.1	6	5.0	2.8	3.5	4.9
140	.3											.3	1	2.0	2.4	3.5	5.6
150												0.0	0		1.0	4.5	10.1
160		.7										.7	2	14.5	2.1	7.7	17.8
170		1.4										1.4	4	15.5	7.3	15.3	25.1
180	1.4	.7	3.1									5.2	15	17.1	14.6	24.7	33.4
190	1.0	3.5	3.5									8.0	23	17.4	22.6	32.8	42.9
200	1.0	3.8	3.8	.3	.3							9.4	27	19.1	26.1	40.8	46.3
210	1.7	5.2	1.7									8.7	25	14.3	27.5	39.7	48.1
220	.7	7.7	1.0									9.4	27	14.7	22.3	34.8	44.6
230	2.1	1.7	.3									4.2	12	10.5	16.7	27.2	38.3
240	1.4	1.4	.3									3.1	9	9.6	9.1	20.2	31.0
250	1.0	.7										1.7	5	8.6	6.6	12.9	24.7
260	1.7											1.7	5	6.6	5.6	11.1	16.4
270	1.7	.3										2.1	6	7.3	6.3	9.1	13.9
280	1.7	.7										2.4	7	7.1	5.6	9.1	12.2
290	1.0											1.0	3	5.7	5.2	8.7	11.8
300	1.4		.3									1.7	5	8.8	4.2	8.0	12.5
310	.7	.7										1.4	4	9.5	4.5	8.0	12.5
320	.3	1.0										1.4	4	10.2	5.2	9.1	13.9
330	1.0	1.4										2.4	7	9.7	5.9	11.1	16.7
340	.7	.7	.7									2.1	6	13.0	8.4	13.6	18.5
350	1.7	2.1										3.8	11	11.3	9.8	15.7	20.2
360	1.4	1.7	.7									3.8	11	12.5	11.1	16.4	21.3
CALM												.3	1				
TOT OBS	97	136	49	3	1	0	0	0	0	0	0		287	IN CUM PERCENTAGES COLUMNS			
PERCENT	33.8	47.4	17.1	1.0	.3							99.7		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 218			RES WIND SP = 4.4			STD VECTOR DEV = 14.0					CONSTANCY = 34			(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 12.9			MEAN VALUE OF X COMP = 2.7								STD DEV OF X COMP = 6.3			
						MEAN VALUE OF Y COMP = 3.5								STD DEV OF Y COMP = 12.5			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JUNE THRU JUNE - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.4	.3										1.7	5	7.4	6.9	10.3	13.1
20	1.7	1.7										3.4	10	8.6	6.6	9.7	14.8
30	1.0		.3									1.4	4	9.5	6.2	11.0	14.1
40	1.4											1.4	4	7.0	5.9	10.7	13.4
50	2.4	.7										3.1	9	7.9	5.9	8.3	12.1
60	1.0	.3										1.4	4	6.8	5.5	7.2	9.3
70	.7	.3										1.0	3	8.0	2.8	6.6	10.3
80	.3											.3	1	9.0	2.1	5.9	9.7
90	.7											.7	2	3.0	3.4	5.2	6.9
100	2.4											2.4	7	5.9	3.8	4.5	7.9
110	.7											.7	2	2.5	3.4	6.6	7.9
120	.3											.3	1	5.0	3.4	6.9	11.4
130	1.4	.7	.3									2.4	7	10.4	3.8	8.3	15.9
140	.7	.3										1.0	3	7.3	7.2	12.8	19.7
150	3.1	.7										3.8	11	6.4	10.0	18.6	26.2
160	2.1	3.1										5.2	15	10.3	15.2	23.4	36.2
170	3.4	2.8										6.2	18	8.9	18.6	32.8	46.6
180	3.1	3.4	.7									7.2	21	10.0	23.8	41.7	52.4
190	1.7	6.2	2.4									10.3	30	15.4	30.3	43.4	53.4
200	4.1	6.6	1.7	.3								12.8	37	13.9	30.0	42.1	52.1
210	2.4	3.4	1.0									6.9	20	12.3	24.5	38.6	46.9
220	3.8	1.0										4.8	14	6.9	15.5	29.3	40.7
230	2.8	1.0										3.8	11	7.3	9.7	17.6	32.1
240	.7	.3										1.0	3	8.3	5.9	12.4	20.0
250	1.0											1.0	3	4.7	3.8	8.3	14.5
260	1.4	.3										1.7	5	7.4	3.4	5.9	10.0
270	.3	.3										.7	2	10.0	3.8	5.2	7.6
280	.7	.7										1.4	4	8.8	2.4	5.5	7.9
290	.3											.3	1	5.0	3.1	5.2	8.3
300	.7		.7									1.4	4	13.0	3.1	5.9	7.9
310	1.0	.3										1.4	4	7.3	4.1	5.9	8.6
320	.7	.7										1.4	4	9.3	4.1	6.9	9.3
330	1.0	.3										1.4	4	8.3	4.1	7.6	10.7
340	1.4											1.4	4	4.3	4.8	7.9	11.0
350	1.0	.7	.3									2.1	6	9.8	5.2	8.3	13.1
360	1.0	.7										1.7	5	9.6	5.5	10.3	13.1
CALM												.7	2				
TOT OBS	157	108	22	1	0	0	0	0	0	0	0		290				
PERCENT	54.1	37.2	7.6	.3								99.3					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 132 RES WIND SP = 5.2 STD VECTOR DEV = 10.4 CONSTANCY = 53
MN SP ALL OBS = 9.9 MEAN VALUE OF X COMP = 1.1 STD DEV OF X COMP = 5.1
MEAN VALUE OF Y COMP = 5.1 STD DEV OF Y COMP = 9.0

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JULY THRU JULY - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)																
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	143	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.8		.4									1.1	3	12.7	1.1	1.9	1.9
20												0.0	0		1.5	1.5	2.3
30	.4											.4	1	7.0	.4	1.9	1.9
40												0.0	0		.8	.8	2.3
50		.4										.4	1	16.0	.4	1.1	1.1
60												0.0	0		.8	.8	1.1
70	.4											.4	1	4.0	.4	.8	.8
80												0.0	0		.4	.4	1.1
90												0.0	0		0.0	.8	2.3
100												0.0	0		.4	1.9	3.8
110	.4											.4	1	4.0	1.9	3.4	5.0
120	1.5											1.5	4	6.8	3.4	5.0	6.1
130	1.5											1.5	4	5.3	4.6	6.1	6.5
140	1.1	.4										1.5	4	7.3	4.2	6.1	9.6
150	.4	.8										1.1	3	10.0	3.1	7.7	16.1
160		.4										.4	1	11.0	4.6	13.0	23.8
170	1.1	1.9										3.1	8	11.5	10.3	20.7	46.7
180	3.4	3.4										6.9	18	9.3	19.2	44.1	67.0
190	1.9	5.4	1.5	.4								9.2	24	16.6	40.6	65.5	76.2
200	3.4	12.6	7.3	1.1								24.5	64	16.9	55.6	72.8	84.3
210	3.8	12.6	3.8	1.5								21.8	57	15.9	56.7	74.3	83.9
220	.8	6.9	2.7									10.3	27	15.6	40.6	67.8	77.4
230	3.1	4.6	.8									8.4	22	10.9	21.5	43.7	69.0
240	.8	1.9										2.7	7	12.6	11.5	22.6	45.2
250	.4											.4	1	5.0	3.8	13.0	23.8
260		.8										.8	2	12.0	1.9	5.0	13.8
270		.8										.8	2	15.0	1.9	2.7	5.4
280			.4									.4	1	20.0	1.5	2.3	2.7
290	.4											.4	1	4.0	.8	1.5	3.1
300												0.0	0		.4	1.5	2.7
310												0.0	0		.8	1.5	1.9
320	.8											.8	2	5.5	1.1	1.1	1.9
330	.4											.4	1	6.0	1.1	1.5	1.5
340												0.0	0		.8	1.5	2.7
350	.4											.4	1	4.0	.4	1.9	2.7
360												0.0	0		1.5	1.5	2.3
CALM												0.0	0				
TOT OBS	71	138	44	8	0	0	0	0	0	0	0		261	IN CUM PERCENTAGES COLUMNS			
PERCENT	27.2	52.9	16.9	3.1								100.0		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
														(3) = 70 DEG SECTORS			

RES WIND DIR = 205 RES WIND SP = 12.7 STD VECTOR DEV = 9.4 CONSTANCY = 90
MN SP ALL OBS = 14.1 MEAN VALUE OF X COMP = 5.3 STD DEV OF X COMP = 5.3
MEAN VALUE OF Y COMP = 11.5 STD DEV OF Y COMP = 7.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JULY THRU JULY - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	RCN PRCNT	TOTAL OBS	MEAN SPEED	(1)	(2)	(3)
10			.4									.4	1	25.0	1.7	3.7	5.8
20	.4	.8										1.2	3	11.0	3.7	4.1	4.6
30	.8	1.2										2.1	5	10.2	3.7	4.6	6.2
40	.4											.4	1	9.0	2.9	5.8	7.1
50		.4										.4	1	19.0	2.5	5.4	7.5
60	1.2	.4										1.7	4	9.8	2.9	4.1	6.2
70	.4	.4										.8	2	8.0	3.3	3.7	5.0
80	.8											.8	2	6.5	1.7	4.1	4.6
90												0.0	0		1.7	2.5	5.8
100	.8											.8	2	4.0	.8	3.3	4.1
110												0.0	0		2.5	2.5	5.8
120	.8	.4	.4									1.7	4	13.0	1.7	5.0	5.8
130												0.0	0		4.1	5.0	5.8
140	1.2	.8		.4								2.5	6	12.0	3.3	5.0	6.6
150	.4	.4										.8	2	12.5	3.3	5.0	10.4
160												0.0	0		2.5	8.7	24.5
170	1.2	.4										1.7	4	7.0	5.4	22.0	45.6
180	.4	1.7	1.2	.4								3.7	9	19.3	21.2	42.3	66.0
190	2.9	6.6	5.0	1.2								15.8	38	16.9	40.7	65.1	75.9
200	1.7	7.9	10.4	1.2								21.2	51	19.2	59.8	74.3	78.4
210	2.5	14.5	5.8									22.8	55	16.3	54.8	73.0	78.8
220	2.1	7.1	1.7									10.8	26	13.5	36.1	59.3	75.5
230	.8	1.7										2.5	6	9.7	15.4	38.6	59.8
240	1.7	.4										2.1	5	7.2	5.0	15.8	39.0
250		.4										.4	1	18.0	2.5	5.4	16.2
260												0.0	0		.8	2.9	5.4
270	.4											.4	1	6.0	.4	.8	3.3
280												0.0	0		.4	.8	1.2
290												0.0	0		.4	.8	1.7
300	.4											.4	1	5.0	.4	1.2	2.9
310												0.0	0		1.2	2.5	4.1
320	.4	.4										.8	2	10.5	2.1	4.1	4.1
330	1.2											1.2	3	4.3	3.7	3.7	4.1
340	.4	1.2										1.7	4	12.5	2.9	3.7	4.1
350												0.0	0		1.7	3.3	5.4
360												0.0	0		.4	3.3	6.6
CALM												.8	2				
TOT OBS	57	114	60	8	0	0	0	0	0	0	0		241				
PERCENT	23.7	47.3	24.9	3.3								99.2					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 200 RES WIND SP = 12.2 STD VECTOR DEV = 11.6 CONSTANCY = 80
MN SP ALL OBS = 15.1 MEAN VALUE OF X COMP = 4.2 STD DEV OF X COMP = 5.9
MEAN VALUE OF Y COMP = 11.4 STD DEV OF Y COMP = 10.0

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JULY THRU JULY - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10		.3										.3	1	14.0	2.8	4.5	4.5
20	.7	1.0										1.7	5	10.8	3.5	4.2	5.2
30	.3	1.0										1.4	4	12.5	3.1	4.2	5.6
40												0.0	0		2.1	4.5	5.6
50	.3	.3										.7	2	12.0	1.4	3.5	5.2
60	.7											.7	2	6.0	2.1	2.1	3.8
70		.7										.7	2	13.5	1.4	2.4	3.1
80												0.0	0		1.0	2.4	3.1
90	.3											.3	1	6.0	1.0	1.7	4.2
100	.7											.7	2	4.0	1.0	2.8	4.5
110												0.0	0		2.4	3.8	5.2
120	.7	.7		.3								1.7	5	14.2	2.8	4.9	6.6
130	1.0											1.0	3	6.3	4.2	5.6	8.0
140	.7	.7										1.4	4	8.5	3.8	7.3	9.8
150	.7	.7										1.4	4	8.5	4.5	8.0	16.0
160	1.0	.7										1.7	5	7.8	5.6	13.2	25.4
170	1.0	1.0	.3									2.4	7	10.3	10.5	23.0	42.9
180	1.0	3.8	1.4									6.3	18	15.7	19.9	40.1	56.8
190	1.0	4.5	4.2	1.4								11.1	32	19.2	35.9	53.7	67.2
200	1.0	11.1	5.6	.7								18.5	53	17.9	44.9	63.1	72.5
210	2.4	7.7	5.2									15.3	44	16.0	45.6	63.8	73.9
220	3.1	6.3	2.4									11.8	34	14.5	34.1	56.4	69.3
230	3.8	3.1										7.0	20	9.3	22.6	39.7	60.6
240	2.4	1.4										3.8	11	8.5	12.5	26.8	42.9
250	1.0	.7										1.7	5	8.8	8.0	15.7	29.3
260	1.0	1.4										2.4	7	9.6	4.9	10.5	17.8
270	.7											.7	2	2.0	4.9	7.0	10.8
280	1.0	.7										1.7	5	8.8	2.8	5.2	7.7
290	.3											.3	1	6.0	2.1	3.5	6.6
300												0.0	0		1.0	3.5	4.5
310	.3	.3										.7	2	6.5	1.4	2.1	3.8
320	.7											.7	2	6.0	1.7	1.7	2.4
330		.3										.3	1	10.0	1.0	2.1	2.8
340												0.0	0		.7	2.1	3.1
350	.3											.3	1	5.0	1.0	1.7	4.2
360	.7											.7	2	7.0	1.4	3.1	4.9
CALM												0.0	0				
TOT OBS	85	140	55	7	0	0	0	0	0	0	0		287				
PERCENT	29.6	48.8	19.2	2.4								100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 203 RES WIND SP = 11.2 STD VECTOR DEV = 10.9 CONSTANCY = 81
MN SP ALL OBS = 13.9 MEAN VALUE OF X COMP = 4.3 STD DEV OF X COMP = 5.9
MEAN VALUE OF Y COMP = 10.4 STD DEV OF Y COMP = 9.2

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: JULY THRU JULY - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	RCH TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.4											.4	1	5.0	1.8	2.5	2.8
20	.4											.4	1	5.0	1.1	2.5	3.5
30	.4											.4	1	2.0	1.1	2.1	3.2
40	.4											.4	1	1.0	1.4	1.8	2.1
50	.4	.4										.7	2	8.5	1.1	1.4	1.8
60												0.0	0		.7	1.1	2.5
70												0.0	0		0.0	1.8	2.5
80												0.0	0		1.1	1.4	2.8
90	1.1											1.1	3	4.0	1.4	2.1	3.5
100	.4											.4	1	6.0	2.1	3.5	6.0
110	.7											.7	2	4.0	2.5	6.0	8.8
120	.7	.7										1.4	4	9.5	4.6	7.7	11.6
130	2.1	.4										2.5	7	6.1	6.7	10.2	13.0
140	2.8											2.8	8	5.8	8.1	12.0	18.7
150	1.8	1.1										2.8	8	8.4	8.1	16.5	29.2
160	1.4	1.1										2.5	7	9.9	11.3	25.4	45.8
170	3.5	1.8	.4	.4								6.1	17	10.8	19.7	40.5	62.3
180	4.9	6.0	.4									11.3	32	10.5	35.2	56.7	70.4
190	4.2	10.2	3.5									18.0	51	13.5	48.2	65.1	72.9
200	4.9	11.6	2.5									19.0	54	13.3	47.9	64.4	72.9
210	4.6	4.9	1.1	.4								10.9	31	12.5	35.2	55.6	69.0
220	2.5	2.5	.4									5.3	15	9.9	18.7	39.8	60.6
230	1.4	1.1										2.5	7	8.3	9.9	23.6	43.3
240	2.1											2.1	6	5.7	7.4	13.4	25.0
250	1.8	1.1										2.8	8	8.1	5.6	8.8	14.8
260	.7											.7	2	3.5	4.2	7.0	10.2
270	.7											.7	2	4.0	2.1	5.6	8.5
280	.7											.7	2	4.5	2.1	3.5	7.0
290	.7											.7	2	5.0	2.1	3.5	4.2
300	.7											.7	2	4.0	2.1	2.8	3.9
310	.4	.4										.7	2	8.0	1.4	2.5	3.2
320												0.0	0		1.1	1.8	2.8
330	.4											.4	1	3.0	.4	1.4	3.2
340												0.0	0		.7	1.8	2.8
350	.4											.4	1	2.0	1.4	2.1	2.5
360	.7	.4										1.1	3	6.3	1.8	2.1	2.8
CALM												0.0	0				
TOT OBS	136	123	23	2	0	0	0	0	0	0	0		284		IN CUM PERCENTAGES COLUMNS		
PERCENT	47.9	43.3	8.1	.7								100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 193 RES WIND SP = 9.2 STD VECTOR DEV = 8.0 CONSTANCY = 87
MN SP ALL OBS = 10.6 MEAN VALUE OF X COMP = 2.1 STD DEV OF X COMP = 4.3
MEAN VALUE OF Y COMP = 9.0 STD DEV OF Y COMP = 6.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: AUGUST THRU AUGUST - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	RCW PRCNT	TOTAL OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.3											.3	1	3.0	.7	1.4	2.8
20		.3										.3	1	14.0	1.0	2.4	2.8
30	.3											.3	1	5.0	2.1	2.4	2.8
40	1.0		.3									1.4	4	8.8	1.7	2.4	2.8
50												0.0	0		1.7	2.1	3.1
60	.3											.3	1	1.0	.3	2.4	2.8
70												0.0	0		1.0	1.0	3.1
80	.7											.7	2	5.5	.7	1.7	1.7
90												0.0	0		1.4	1.4	2.1
100	.7											.7	2	7.5	.7	1.7	2.1
110												0.0	0		1.0	1.4	3.5
120	.3											.3	1	7.0	.7	2.8	3.5
130	.3											.3	1	6.0	2.1	2.8	4.8
140	.3	.7		.3								1.4	4	17.0	2.4	4.2	7.6
150	.7											.7	2	7.5	3.5	7.3	12.1
160	.7	.7										1.4	4	10.2	5.5	11.4	20.4
170	2.1	1.4										3.5	10	8.2	9.3	18.7	45.3
180	2.1	2.1	.3									4.5	13	10.0	16.6	43.3	62.6
190	1.7	5.2	1.4		.3							8.7	25	15.3	38.4	60.6	77.9
200	3.5	14.2	5.2	2.4								25.3	73	17.2	52.6	73.0	83.0
210	3.1	12.8	2.4	.3								18.7	54	15.1	59.9	75.1	80.6
220	2.8	10.7	2.4									15.9	46	13.6	41.2	67.5	77.5
230	1.4	4.8	.3									6.6	19	12.2	23.5	43.6	69.2
240	.7	.3										1.0	3	7.3	9.0	25.3	44.6
250	.7	.7										1.4	4	8.3	2.8	10.0	27.3
260	.3											.3	1	1.0	2.4	4.8	12.1
270	.7											.7	2	5.5	2.4	4.5	5.9
280	.7	.7										1.4	4	7.5	2.8	3.5	5.2
290		.7										.7	2	11.5	2.4	3.5	4.5
300	.3											.3	1	7.0	1.4	3.5	5.2
310	.3											.3	1	4.0	1.4	3.1	4.5
320		.7										.7	2	14.5	2.1	2.4	3.5
330	1.0											1.0	3	2.7	1.7	2.4	2.8
340												0.0	0		1.4	2.1	2.8
350		.3										.3	1	11.0	.3	1.7	2.8
360												0.0	0		.7	1.0	2.4
CALM												.3	1				
TOT OBS	79	163	36	9	1	0	0	0	0	0	0		289				
PERCENT	27.3	56.4	12.5	3.1	.3							99.7					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 205 RES WIND SP = 12.0 STD VECTOR DEV = 9.6 CONSTANCY = 88
MN SP ALL OBS = 13.6 MEAN VALUE OF X COMP = 5.0 STD DEV OF X COMP = 5.1
MEAN VALUE OF Y COMP = 10.9 STD DEV OF Y COMP = 8.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: AUGUST THRU AUGUST - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	RCH TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.7	1.1										1.8	5	9.6	3.2	4.2	6.0
20	.7	.4	.4									1.4	4	10.7	3.9	4.9	5.6
30	.4	.4										.7	2	8.5	3.2	5.3	5.3
40	.4	.4	.4									1.1	3	11.7	2.1	3.5	5.3
50		.4										.4	1	11.0	1.4	2.1	3.9
60												0.0	0		.4	1.8	3.2
70												0.0	0		.4	1.4	3.5
80	.4											.4	1	2.0	1.1	2.1	2.5
90	.7											.7	2	3.0	2.1	2.1	2.8
100	1.1											1.1	3	7.0	1.8	2.8	3.9
110												0.0	0		1.8	3.5	4.2
120	.7											.7	2	7.0	1.8	3.2	4.6
130	.7	.4										1.1	3	7.7	2.1	2.8	6.3
140			.4									.4	1	23.0	2.1	5.3	7.0
150	.4	.4										.7	2	10.0	3.5	6.3	11.6
160	1.8	.7										2.5	7	9.4	4.9	9.8	20.0
170	1.1	.7										1.8	5	8.6	8.8	18.6	37.9
180	2.5	.7	1.4									4.6	13	12.3	15.4	36.8	63.9
190	1.4	2.1	4.2	.7	.7							9.1	26	21.4	32.6	60.7	75.4
200	.7	8.8	7.7	1.8								18.9	54	20.0	54.4	71.2	78.9
210	2.5	14.4	9.1	.4								26.3	75	17.8	57.5	72.6	80.0
220	2.5	8.1	1.8									12.3	35	14.1	44.6	66.3	76.5
230	1.8	4.2										6.0	17	11.9	21.1	48.4	67.7
240	1.8	1.1										2.8	8	8.3	9.8	22.5	49.5
250	.7	.4										1.1	3	8.0	4.2	10.9	23.2
260	.4											.4	1	1.0	2.1	4.9	10.9
270	.4	.4										.7	2	12.0	1.1	2.1	6.0
280												0.0	0		.7	2.1	3.2
290												0.0	0		1.1	1.8	2.8
300	.7	.4										1.1	3	7.0	1.1	1.8	3.2
310												0.0	0		1.8	2.5	3.2
320		.7										.7	2	16.0	1.4	3.2	3.5
330		.7										.7	2	10.0	2.1	2.5	3.5
340		.4	.4									.7	2	20.5	1.8	2.5	4.2
350			.4									.4	1	21.0	1.1	3.5	5.6
360												0.0	0		2.1	4.2	5.6
CALM												0.0	0				
TOT OBS	68	133	74	8	2	0	0	0	0	0	0		285				
PERCENT	23.9	46.7	26.0	2.8	.7							100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 205 RES WIND SP = 13.0 STD VECTOR DEV = 11.4 CONSTANCY = 83
MN SP ALL OBS = 15.6 MEAN VALUE OF X COMP = 5.5 STD DEV OF X COMP = 5.3
MEAN VALUE OF Y COMP = 11.8 STD DEV OF Y COMP = 10.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: AUGUST THRU AUGUST - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW PRCNT	TOTAL OBS	MEAN SPEED	(1)	(2)	(3)
10	.3	.3										.6	2	9.5	1.9	4.5	7.5
20		.6										.6	2	16.0	2.6	4.9	6.2
30	.6	.3	.3									1.3	4	14.5	3.6	4.2	5.8
40	.6	1.0										1.6	5	10.4	2.9	4.5	5.5
50												0.0	0		2.6	4.2	5.5
60	.6	.3										1.0	3	5.7	1.3	3.6	5.2
70		.3										.3	1	17.0	1.9	2.3	3.9
80	.3	.3										.6	2	12.0	1.3	2.3	2.9
90	.3											.3	1	4.0	1.0	1.9	3.6
100												0.0	0		1.0	2.3	3.6
110	.6											.6	2	4.0	1.3	2.6	5.5
120	.3	.3										.6	2	7.0	2.3	4.5	5.5
130	.6	.3										1.0	3	9.0	3.9	5.2	6.2
140	1.9		.3									2.3	7	8.7	3.9	5.5	7.8
150	.6											.6	2	5.5	3.9	6.5	12.0
160	.6	.3										1.0	3	10.3	3.2	10.4	21.4
170	1.0	.6										1.6	5	9.8	7.5	18.2	37.7
180	1.3	1.6	1.3	.6								4.9	15	16.5	16.6	34.7	52.9
190	1.0	4.2	2.9	1.9								10.1	31	20.8	32.1	51.3	67.9
200	1.6	5.8	7.1	2.3	.3							17.2	53	21.4	44.8	65.3	73.1
210	2.3	12.3	2.9									17.5	54	15.9	50.3	66.6	72.7
220	4.5	8.4	2.6									15.6	48	13.6	39.3	57.8	69.8
230	3.2	2.9										6.2	19	9.1	23.1	42.5	61.4
240	.6	.6										1.3	4	10.5	9.4	26.6	45.8
250	.6	1.0	.3									1.9	6	11.5	4.9	12.7	29.2
260	1.6											1.6	5	6.8	5.2	7.5	14.6
270	1.0	.6										1.6	5	7.6	4.2	7.1	8.8
280	1.0											1.0	3	7.3	3.6	5.5	7.8
290	.3	.6										1.0	3	11.3	2.3	4.2	6.8
300	.3											.3	1	4.0	1.6	3.6	5.5
310	.3											.3	1	6.0	1.6	2.9	5.2
320	1.0											1.0	3	5.7	1.6	3.2	5.5
330	.3											.3	1	9.0	2.6	4.2	5.2
340	1.3											1.3	4	3.8	2.9	4.5	5.5
350	.3	.6	.3									1.3	4	14.0	3.2	4.2	5.8
360	.3	.3										.6	2	13.5	2.6	4.5	6.2
CALM												.6	2				
TOT OBS	98	136	56	15	1	0	0	0	0	0	0		308				
PERCENT	31.8	44.2	18.2	4.9	.3							99.4					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 205 RES WIND SP = 11.5 STD VECTOR DEV = 12.1 CONSTANCY = 79
MN SP ALL OBS = 14.6 MEAN VALUE OF X COMP = 4.8 STD DEV OF X COMP = 5.7
MEAN VALUE OF Y COMP = 10.5 STD DEV OF Y COMP = 10.7

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: AUGUST THRU AUGUST - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.0	.3										1.3	4	6.5	2.9	3.8	6.1
20	.6	1.0										1.6	5	10.4	3.8	5.8	5.8
30	1.0											1.0	3	4.7	4.5	5.8	6.4
40	1.9											1.9	6	5.2	2.9	5.1	6.7
50												0.0	0		2.6	3.8	6.4
60	.6											.6	2	6.5	1.0	3.8	5.8
70	.3											.3	1	1.0	1.9	2.9	5.1
80	.6	.3										1.0	3	9.0	2.2	3.2	3.5
90	1.0											1.0	3	5.3	2.2	2.9	3.8
100	.3											.3	1	4.0	1.6	2.9	4.8
110	.3											.3	1	5.0	1.0	3.5	7.7
120	.3											.3	1	5.0	2.2	5.8	9.3
130	1.3	.3										1.6	5	6.8	5.1	8.0	10.2
140	2.6	.6										3.2	10	7.0	7.3	9.6	12.8
150	1.9	.6										2.6	8	6.9	7.7	12.1	23.6
160	1.6	.3										1.9	6	7.7	7.3	21.7	43.8
170	1.3	1.6										2.9	9	10.9	16.0	39.0	57.5
180	5.1	4.8	1.0			.3						11.2	35	11.7	34.5	51.8	65.5
190	7.0	9.3	2.6	1.0	.3	.3						20.4	64	14.8	47.0	61.0	69.6
200	4.5	8.3	1.9	.3				.3				15.3	48	14.4	47.0	64.9	73.2
210	2.6	6.7	1.0	1.0								11.2	35	14.5	33.2	59.1	71.6
220	3.5	3.2										6.7	21	8.8	23.3	39.9	62.0
230	3.5	1.9										5.4	17	8.5	13.4	26.2	42.2
240	.6	.6										1.3	4	8.0	8.3	15.7	27.8
250	1.3	.3										1.6	5	7.6	3.5	9.9	17.3
260	.6											.6	2	2.5	3.2	5.1	11.2
270	1.0											1.0	3	2.7	2.2	4.5	6.1
280	.6											.6	2	3.5	2.2	3.2	5.1
290	.6											.6	2	6.5	1.6	2.9	4.2
300	.3											.3	1	2.0	1.3	2.6	3.5
310		.3										.3	1	11.0	1.3	1.9	2.9
320	.6											.6	2	6.5	1.0	1.6	2.2
330												0.0	0		1.0	1.3	1.6
340	.3											.3	1	6.0	.3	1.0	2.6
350												0.0	0		.3	1.6	3.8
360												0.0	0		1.3	3.2	4.2
CALM												.6	2				
TOT OBS	153	127	20	7	1	2	0	1	0	0	0		313				
PERCENT	48.9	40.6	6.4	2.2	.3	.6		.3				99.4					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 194 RES WIND SP = 9.3 STD VECTOR DEV = 10.6 CONSTANCY = 83
MN SP ALL OBS = 11.2 MEAN VALUE OF X COMP = 2.3 STD DEV OF X COMP = 4.6
MEAN VALUE OF Y COMP = 9.0 STD DEV OF Y COMP = 9.5

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: SEPTEMBER THRU SEPTEMBER - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10		1.3	.3									1.7	5	16.2	4.7	7.7	10.7
20	.7	1.0	.3									2.0	6	12.7	5.7	7.7	9.4
30	1.3	.7										2.0	6	7.5	5.0	7.4	10.7
40	.3	.7										1.0	3	10.7	3.7	8.0	10.0
50	.3	.3										.7	2	12.5	4.0	6.4	9.4
60	1.3	1.0										2.3	7	8.4	3.3	5.4	8.4
70	.3											.3	1	6.0	3.7	5.4	7.0
80	.7	.3										1.0	3	9.7	2.3	5.4	6.7
90	.3	.7										1.0	3	8.0	2.7	3.7	7.0
100	.7											.7	2	6.0	2.3	4.3	5.4
110	.3	.3										.7	2	11.0	2.3	4.0	6.4
120	.7	.3										1.0	3	9.3	2.3	4.3	7.0
130	.7											.7	2	7.0	3.0	5.4	8.0
140	1.0		.3									1.3	4	10.0	3.7	6.7	11.4
150	1.0	.7										1.7	5	8.2	5.0	9.7	16.1
160	1.7	.3										2.0	6	6.3	7.7	14.4	22.1
170	2.7	1.3										4.0	12	8.0	11.4	20.1	38.8
180	2.7	1.7	1.0									5.4	16	11.6	16.4	35.8	54.2
190	1.3	3.3	1.0	1.3								7.0	21	17.5	29.8	50.5	62.9
200	1.3	8.0	5.7	1.0	.3							17.4	52	18.3	41.1	56.9	64.5
210	5.0	9.4	2.0	.3								16.7	50	13.9	44.5	55.2	62.9
220	2.7	5.7	2.0									10.4	31	13.8	30.8	50.5	59.5
230	.7	2.7	.3									3.7	11	13.2	16.4	35.1	52.8
240	1.7	.7										2.3	7	8.4	8.0	18.7	36.5
250	.7	1.3										2.0	6	10.7	4.7	9.4	20.4
260		.3										.3	1	10.0	3.3	6.4	10.0
270	1.0											1.0	3	7.7	2.0	4.0	7.7
280	.7											.7	2	4.0	1.7	3.3	6.0
290												0.0	0		2.0	3.7	5.4
300	.7	.7										1.3	4	10.2	2.0	4.0	6.0
310		.7										.7	2	12.5	3.3	4.3	7.0
320		1.3										1.3	4	17.7	3.0	6.4	7.4
330	.7	.3										1.0	3	6.3	4.3	6.0	8.4
340	1.0	1.0										2.0	6	8.0	4.0	6.4	8.7
350	.7	.3										1.0	3	5.7	4.0	6.7	10.0
360	.7		.3									1.0	3	10.3	3.7	7.7	10.7
CALM												.7	2				
TOT OBS	106	139	43	8	1	0	0	0	0	0	0		299	IN CUM PERCENTAGES COLUMNS			
PERCENT	35.5	46.5	14.4	2.7	.3							99.3		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 204			RES WIND SP = 8.4				STD VECTOR DEV = 12.2					CONSTANCY = 65		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 12.9				MEAN VALUE OF X COMP = 3.5							STD DEV OF X COMP = 6.1			
							MEAN VALUE OF Y COMP = 7.7							STD DEV OF Y COMP = 10.5			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: SEPTEMBER THRU SEPTEMBER - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	(1)	(2)	(3)
10	.3	1.0	.7	.7	.3							3.0	9	24.4	6.6	9.3	12.0
20	.3	1.0	1.0									2.3	7	18.3	6.0	9.6	15.0
30		.7										.7	2	16.0	5.3	11.6	13.0
40		2.0		.3								2.3	7	15.7	6.3	8.6	13.3
50	1.7	.3	1.3									3.3	10	14.3	5.6	8.0	11.6
60												0.0	0		5.0	8.6	10.3
70	.3	1.3										1.7	5	11.0	3.0	7.3	10.0
80		1.3										1.3	4	12.2	4.0	4.3	9.0
90	.3	.7										1.0	3	11.0	2.7	5.6	7.3
100	.3											.3	1	6.0	2.7	5.6	8.3
110	.7	.7										1.3	4	10.2	3.3	5.3	8.3
120	1.0	.7										1.7	5	9.8	4.0	6.0	7.6
130	.7	.3										1.0	3	10.7	4.3	6.3	6.6
140	1.3	.3										1.7	5	7.6	3.3	5.0	9.6
150	.3	.3										.7	2	7.0	2.3	6.6	11.3
160												0.0	0		4.0	8.6	18.3
170	2.0	1.0	.3									3.3	10	9.4	6.3	15.6	33.9
180	1.0	2.0										3.0	9	12.4	15.0	31.6	51.5
190	1.7	2.3	3.7	.3	.7							8.6	26	20.1	28.2	50.8	59.8
200	2.0	8.0	4.7	2.0								15.6	50	18.7	44.5	56.5	63.8
210	4.3	10.0	4.3	.7								19.3	58	15.3	44.9	57.5	63.1
220	1.3	5.6	2.0									9.0	27	14.9	32.2	51.5	60.8
230	2.3	1.3	.3									4.0	12	9.7	15.6	35.5	53.8
240	1.7	1.0										2.7	8	8.5	7.3	17.9	37.9
250		.7										.7	2	14.5	5.0	9.6	18.9
260	.7	1.0										1.7	5	8.0	3.0	6.0	11.3
270		.7										.7	2	12.5	2.7	4.7	8.3
280		.3										.3	1	14.0	2.3	5.0	5.6
290	.7	.7										1.3	4	8.5	2.7	3.3	5.6
300	1.0											1.0	3	6.3	2.3	3.3	5.3
310												0.0	0		1.7	4.3	5.0
320	.3		.3									.7	2	13.0	2.0	3.3	6.6
330	.3	.3	.7									1.3	4	17.0	2.3	4.3	6.6
340	.3											.3	1	8.0	3.7	5.6	8.6
350	.7	1.0	.3									2.0	6	15.2	3.7	8.0	11.0
360	.3		1.0									1.3	4	21.7	6.3	9.0	11.0
CALM												0.0	0				
TOT OBS	84	140	52	12	3	0	0	0	0	0	0		301		IN CUM PERCENTAGES COLUMNS		
PERCENT	27.9	46.5	20.6	4.0	1.0							100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 204 RES WIND SP = 7.4 STD VECTOR DEV = 15.2 CONSTANCY = 49
MN SP ALL OBS = 15.0 MEAN VALUE OF X COMP = 3.0 STD DEV OF X COMP = 7.4
MEAN VALUE OF Y COMP = 6.8 STD DEV OF Y COMP = 13.3

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: SEPTEMBER THRU SEPTEMBER - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)																
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	.9	.3	.6									1.9	6	13.7	7.3	11.4	14.8
20	.6	.3	.6									1.6	5	16.2	6.9	13.2	17.0
30	.3	1.6	1.6									3.5	11	17.8	7.6	12.6	18.0
40	.6	1.3	.6									2.5	8	15.9	9.1	12.3	15.1
50	1.3	1.6	.3									3.2	10	11.3	7.3	11.7	15.1
60	.6	.6	.3									1.6	5	12.6	5.7	10.1	14.5
70	.6	.3										.9	3	9.7	4.4	8.5	11.0
80	.3	1.3	.3									1.9	6	14.5	3.8	5.4	9.5
90	.6	.3										.9	3	8.7	2.8	4.7	6.9
100												0.0	0		1.9	4.4	6.9
110	.6	.3										.9	3	8.3	1.6	4.1	7.6
120	.6											.6	2	5.5	3.2	4.7	6.9
130	.9	.6										1.6	5	8.6	3.8	6.0	7.9
140	.9	.6										1.6	5	9.6	4.4	6.9	11.0
150	.9	.3										1.3	4	7.0	4.7	9.5	14.2
160	1.3	.6										1.9	6	9.0	6.3	12.0	23.3
170	1.9	.9		.3								3.2	10	10.6	9.1	20.2	34.4
180	.3	1.6	1.3	.6	.3							4.1	13	21.6	17.0	31.5	46.4
190	.3	4.1	3.5	1.9								9.8	31	20.3	26.5	43.2	53.0
200	2.5	4.1	5.0	.9								12.6	40	18.0	36.0	47.9	54.6
210	2.8	6.3	3.5	.9								13.6	43	16.0	34.1	47.3	52.7
220	1.3	5.7	.9									7.9	25	12.9	24.9	38.8	50.8
230	1.6	1.3	.6									3.5	11	12.0	12.6	28.4	42.6
240	.3	.9										1.3	4	10.7	6.9	16.4	31.9
250	1.6	.6										2.2	7	8.1	5.0	10.4	18.9
260	1.6											1.6	5	6.4	5.7	7.6	11.7
270	1.6	.3										1.9	6	4.2	4.1	6.9	9.8
280	.6											.6	2	7.5	3.2	6.3	9.1
290	.3	.3										.6	2	13.0	2.8	5.4	9.5
300	1.6											1.6	5	5.0	2.8	6.0	8.8
310	.3	.3										.6	2	9.5	4.7	6.3	7.9
320	1.3	1.3										2.5	8	10.6	4.1	6.6	7.9
330	.6	.3										.9	3	8.0	4.4	5.7	11.0
340	.3		.6									.9	3	19.0	2.5	8.8	11.4
350	.3		.3									.6	2	16.5	5.4	8.2	12.3
360	.9	1.9	.9									3.8	12	14.6	6.3	8.8	13.2
CALM												.3	1				
TOT OBS	106	127	67	15	1	0	0	0	0	0	0		317	IN CUM PERCENTAGES COLUMNS			
PERCENT	33.4	40.1	21.1	4.7	.3							99.7		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 199			RES WIND SP = 6.3			STD VECTOR DEV = 15.1				CONSTANCY = 44				(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 14.2			MEAN VALUE OF X COMP = 2.0								STD DEV OF X COMP = 7.2			
						MEAN VALUE OF Y COMP = 5.9								STD DEV OF Y COMP = 13.3			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: SEPTEMBER THRU SEPTEMBER - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.3	2.6										3.9	12	11.2	8.9	13.5	17.4
20	1.3	2.0										3.3	10	11.8	9.9	14.1	17.4
30	1.3	1.0	.3									2.6	8	10.4	8.6	13.8	17.8
40	1.0	1.6										2.6	8	12.0	6.6	12.2	18.4
50	.3	1.0										1.3	4	11.7	6.2	11.2	17.8
60	1.6	.3	.3									2.3	7	8.7	5.9	11.8	16.1
70	1.6	.7										2.3	7	8.1	7.9	10.9	14.1
80	2.3	1.0										3.3	10	7.1	7.2	10.2	12.2
90	1.0	.7										1.6	5	9.4	5.6	8.6	12.8
100	.7											.7	2	5.0	3.0	8.2	13.5
110	.7											.7	2	5.5	3.3	7.9	12.5
120	1.6	.3										2.0	6	6.8	5.6	7.6	12.2
130	1.6	1.3										3.0	9	8.7	6.2	9.9	12.5
140	1.0	.3										1.3	4	7.8	7.2	11.2	15.5
150	2.0	1.0										3.0	9	7.3	6.2	12.8	22.0
160	2.0											2.0	6	6.5	8.6	17.1	32.6
170	2.0	1.3	.3									3.6	11	9.9	12.8	28.3	43.1
180	2.6	3.3	1.0	.3								7.2	22	14.4	23.4	38.8	48.7
190	2.6	5.9	3.0	.7		.3						12.5	38	16.4	33.2	43.7	49.3
200	2.0	6.3	4.9	.3								13.5	41	17.0	32.9	43.7	48.7
210	1.3	4.6	1.0									5.9	21	15.3	24.0	37.8	47.0
220	1.3	2.3										3.6	11	11.4	11.8	27.3	41.1
230	1.0	.3										1.3	4	8.3	6.9	15.1	29.3
240	.3	1.6										2.0	6	12.7	4.6	8.9	17.8
250	.7	.7										1.3	4	8.5	3.9	7.2	11.8
260	.7											.7	2	3.5	3.9	6.9	8.9
270	1.6	.3										2.0	6	6.0	3.6	5.6	8.2
280	.3	.7										1.0	3	10.7	3.6	4.9	7.2
290	.3	.3										.7	2	7.5	2.3	5.3	5.9
300	.3	.3										.7	2	8.5	2.3	3.3	5.9
310	.7		.3									1.0	3	13.7	1.6	3.0	5.3
320												0.0	0		1.6	3.6	6.2
330	.3		.3									.7	2	13.0	2.0	4.9	7.2
340	1.0	.3										1.3	4	8.0	3.9	5.6	10.5
350	1.0	1.0										2.0	6	8.2	4.9	9.5	12.8
360	.7	.3	.3		.3							1.6	5	19.0	7.6	12.2	15.5
CALM												.7	2				
TOT OBS	126	132	36	4	1	1	0	0	0	0	0		304	IN CUM PERCENTAGES COLUMNS			
PERCENT	42.1	43.4	11.8	1.3	.3	.3						99.3		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 188			RES WIND SP = 5.4				STD VECTOR DEV = 13.1					CONSTANCY = 44		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 12.1				MEAN VALUE OF X COMP = .8					STD DEV OF X COMP = 6.2					
							MEAN VALUE OF Y COMP = 5.3					STD DEV OF Y COMP = 11.6					

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: OCTOBER THRU OCTOBER - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.0	1.0	.7	.3								3.0	9	15.8	12.3	21.2	25.2
20	2.3	2.3	.3	.3								5.3	16	12.0	13.2	19.5	26.5
30	2.6	2.3										5.0	15	9.9	12.6	18.5	25.5
40	1.0	1.3										2.3	7	9.0	10.3	18.5	22.5
50	2.0	1.0										3.0	9	9.7	8.3	14.2	20.5
60	1.7	1.3										3.0	9	8.2	7.0	10.3	15.2
70	1.0											1.0	3	5.3	5.0	7.9	11.6
80	1.0											1.0	3	5.3	2.0	6.3	10.6
90												0.0	0		2.3	4.6	8.9
100	.7	.7										1.3	4	9.0	2.6	5.0	7.0
110	1.3											1.3	4	5.0	4.0	5.0	7.0
120	1.0	.3										1.3	4	8.5	3.6	6.0	7.6
130	.3	.7										1.0	3	10.7	3.3	6.3	8.9
140	1.0											1.0	3	3.3	3.6	6.3	10.9
150	1.7											1.7	5	4.2	4.0	8.3	11.3
160	1.3											1.3	4	5.0	6.3	8.9	16.9
170	2.0	1.3										3.3	10	8.0	6.3	14.9	24.8
180	1.3	.3										1.7	5	6.2	11.9	22.2	37.1
190	1.3	3.0	2.6									7.0	21	16.6	17.5	34.1	40.7
200	2.3	3.5	2.0	.3	.7							9.9	27	16.8	29.1	36.1	44.7
210	5.3	6.0	1.7	.3								13.2	40	12.5	27.5	39.7	42.7
220	3.3	1.3	.7									5.3	16	9.6	23.8	34.1	42.1
230	3.3	2.0										5.3	16	8.3	11.9	26.2	36.1
240	1.0		.3									1.3	4	10.0	7.6	13.9	28.1
250	1.0											1.0	3	6.0	3.3	9.6	15.2
260	.3	.7										1.0	3	10.3	3.0	4.6	10.9
270	.7	.3										1.0	3	6.7	2.3	4.3	7.3
280	.3											.3	1	4.0	2.3	5.0	7.0
290	.7		.3									1.0	3	9.7	3.0	5.0	7.9
300	.7	.7	.3									1.7	5	12.0	3.6	6.0	9.9
310	.7	.3										1.0	3	8.3	4.6	8.6	10.6
320	1.0	.7		.3								2.0	6	12.5	6.0	9.3	14.2
330	2.0	.3	.7									3.0	9	9.4	6.6	11.6	17.2
340	1.0	.3	.3									1.7	5	10.8	8.6	14.6	18.5
350	2.6	1.3										4.0	12	8.6	9.6	15.6	22.8
360	1.7	1.7	.7									4.0	12	13.2	10.9	17.9	25.8
CALM												0.0	0				
TOT OBS	158	105	32	5	2	0	0	0	0	0	0		302		IN CUM PERCENTAGES COLUMNS		
PERCENT	52.3	34.8	10.6	1.7	.7							100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 221 RES WIND SP = 2.4 STD VECTOR DEV = 12.9 CONSTANCY = 22
MN SP ALL OBS = 11.0 MEAN VALUE OF X COMP = 1.6 STD DEV OF X COMP = 6.1
MEAN VALUE OF Y COMP = 1.8 STD DEV OF Y COMP = 11.4

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: OCTOBER THRU OCTOBER - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10		1.0	2.0	.3	.3							3.6	11	23.2	10.9	18.9	23.8
20	1.0	1.3	2.0									4.3	13	17.0	14.2	19.9	24.5
30	.7	2.6	2.3	.7								6.3	19	18.9	13.2	19.9	27.5
40	.3	2.3										2.6	8	12.2	11.9	20.9	27.2
50	1.3	1.7										3.0	9	11.2	10.3	19.2	25.8
60	2.3	1.0	1.0	.3								4.6	14	12.6	10.3	15.2	24.8
70	1.7	1.0										2.6	8	8.5	9.6	15.9	20.9
80	1.3	1.0										2.3	7	9.3	8.3	15.2	19.2
90	3.0	.3										3.3	10	6.6	7.9	11.6	16.9
100	.7	1.7										2.3	7	10.1	6.6	9.6	13.2
110	1.0											1.0	3	6.7	4.0	8.3	10.9
120	.3	.3										.7	2	9.0	2.6	5.3	9.6
130	.7		.3									1.0	3	10.0	2.0	4.0	7.6
140	.3											.3	1	7.0	2.3	4.3	7.0
150	1.0											1.0	3	6.0	2.6	5.3	8.6
160	1.0	.3										1.3	4	6.8	4.0	7.0	15.9
170	1.7											1.7	5	5.0	5.6	14.6	26.2
180	2.0	.7										2.6	8	7.3	12.3	24.8	34.8
190	1.3	2.3	2.6	1.3	.3							7.9	24	21.1	21.9	32.5	38.7
200	1.3	3.6	3.6	1.7	.7	.3						11.3	34	22.7	28.1	35.8	40.1
210	2.0	4.6	2.3									8.9	27	15.4	25.2	35.8	40.4
220	2.0	2.6	.3									5.0	15	10.7	16.6	29.8	38.7
230	1.3	.7	.7									2.6	8	11.3	9.6	19.5	32.5
240	1.3	.7										2.0	6	7.5	5.6	12.3	22.5
250	.7	.3										1.0	3	7.3	4.6	8.6	14.6
260	1.0	.7										1.7	5	10.4	4.0	7.0	9.6
270	1.3											1.3	4	5.5	4.0	5.0	7.6
280	1.0											1.0	3	6.7	2.3	4.6	8.3
290												0.0	0		1.7	5.6	8.3
300	.3	.3										.7	2	10.5	3.3	5.3	7.9
310	1.0	1.3	.3									2.6	8	11.4	4.3	5.6	8.9
320	.7	.3										1.0	3	8.3	5.0	7.9	9.6
330	.3	.7	.3									1.3	4	12.7	4.6	8.9	12.6
340	.3	1.0	1.0									2.3	7	17.4	5.3	9.3	15.6
350	1.0	.7										1.7	5	9.0	7.0	11.9	17.2
360	1.7	1.0	.3									3.0	9	12.6	8.3	14.9	22.5
CALM												0.0	0				
TOT OBS	117	109	58	13	4	1	0	0	0	0	0		302		IN CUM PERCENTAGES COLUMNS		
PERCENT	38.7	36.1	19.2	4.3	1.3	.3						100.0			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 192 RES WIND SP = 1.9 STD VECTOR DEV = 16.7 CONSTANCY = 13

MN SP ALL OBS = 14.1 MEAN VALUE OF X COMP = .4 STD DEV OF X COMP = 7.9

MEAN VALUE OF Y COMP = 1.8 STD DEV OF Y COMP = 14.7

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: OCTOBER THRU OCTOBER - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)											ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.6	1.3	.9	.9								5.4	17	17.9	15.8	24.7	31.0
20	2.8	2.5	2.2	.3								7.9	25	14.8	20.3	27.5	34.2
30	1.6	3.5	1.9									7.0	22	14.5	19.6	29.7	35.4
40	1.9	1.6	.6	.3	.3							4.7	15	15.5	16.5	27.5	34.5
50	1.6	1.9	1.3									4.7	15	13.9	12.7	21.2	32.0
60	1.6	1.3	.3									3.2	10	11.5	9.5	17.1	25.0
70	.6	.5	.3									1.6	5	11.0	7.6	13.3	19.3
80	1.9	.9										2.8	9	9.0	5.4	9.8	16.1
90	.3	.5										.9	3	11.7	5.1	8.2	11.7
100	1.3											1.3	4	5.8	3.8	7.0	10.1
110	1.6											1.6	5	4.0	3.2	5.7	9.5
120	.3											.3	1	8.0	3.5	5.7	8.5
130	.9	.6										1.6	5	7.6	2.8	6.3	7.9
140	.9											.9	3	6.3	4.4	5.1	7.6
150	1.3	.3	.3									1.9	6	8.3	3.2	5.7	12.0
160	.3											.3	1	6.0	3.2	10.1	18.7
170	.6	.3										.9	3	7.7	7.3	16.1	24.4
180	2.2	1.9	1.3	.6								5.0	19	15.1	13.9	21.5	26.9
190	.6	1.3	4.1	.6	.3							7.0	22	22.4	20.3	24.7	29.7
200	.9	3.5	1.9	.3	.3	.3						7.3	23	19.3	17.7	28.5	31.3
210	.9	1.3	.6	.6								3.5	11	16.6	15.5	24.4	32.3
220	.9	2.8	.6	.3								4.7	15	15.2	10.1	19.3	28.5
230	.9	.9										1.9	6	9.5	8.5	14.2	22.2
240	1.3	.5										1.9	6	9.3	6.0	11.4	16.5
250	1.3	.6	.3									2.2	7	9.7	4.7	8.2	13.6
260	.3	.3										.6	2	8.5	4.4	7.0	11.1
270	.9	.6										1.6	5	9.8	2.8	7.3	10.4
280	.3	.3										.6	2	8.0	4.4	6.3	9.5
290	2.2											2.2	7	5.6	4.1	6.6	10.4
300	.9	.3										1.3	4	8.5	4.4	8.2	11.7
310	.6	.3										.9	3	7.7	5.4	9.5	11.7
320	2.5	.6										3.2	10	8.1	6.0	8.9	13.0
330	.9	.9										1.9	6	10.2	6.6	9.5	13.3
340	.6	.9										1.6	5	13.8	5.4	11.1	17.4
350	1.3	.6										1.9	6	7.7	6.0	13.3	24.4
360	1.6	.9										2.5	8	7.9	9.8	19.3	28.2
CALM												0.0	0				
TOT OBS	135	111	53	13	3	1	0	0	0	0	0		316				
PERCENT	42.7	35.1	16.8	4.1	.9	.3						100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 121 RES WIND SP = .5 STD VECTOR DEV = 16.0 CONSTANCY = 4
MN SP ALL OBS = 13.4 MEAN VALUE OF X COMP = -.4 STD DEV OF X COMP = 7.8
MEAN VALUE OF Y COMP = .2 STD DEV OF Y COMP = 14.0

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: OCTOBER THRU OCTOBER - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	(1)	(2)	(3)
10	.9	2.1	.6									3.7	12	13.1	14.7	21.7	29.1
20	2.1	4.0	1.2									7.3	24	12.7	14.7	25.1	33.0
30	1.8	1.2	.6									3.7	12	11.8	17.7	26.0	33.0
40	1.8	4.3	.3	.3								6.7	22	12.8	15.0	25.7	31.8
50	2.1	2.4										4.6	15	10.1	14.7	20.8	30.9
60	.6	2.8										3.4	11	10.8	10.4	19.9	24.2
70	1.5	.6	.3									2.4	8	8.5	8.6	13.8	22.3
80	2.4	.3										2.8	9	7.6	5.8	11.0	17.4
90	.6											.6	2	3.5	5.2	9.5	14.7
100	1.8											1.8	6	5.0	4.3	8.9	11.6
110	1.5	.3										1.8	6	4.7	5.5	6.4	11.9
120	1.2	.3	.3									1.8	6	8.8	4.0	8.6	11.3
130	.3											.3	1	4.0	4.9	8.9	11.9
140	2.1	.3	.3									2.8	9	8.7	5.2	8.3	13.1
150	1.2	.9										2.1	7	9.4	6.1	9.5	15.3
160	.9	.3										1.2	4	8.5	6.4	13.1	20.5
170	1.5	1.2	.3									3.1	10	10.5	8.3	17.4	29.1
180	1.8	2.1										4.0	13	10.9	14.1	24.2	30.6
190	2.1	2.4	1.2	1.2								7.0	23	16.6	19.9	27.2	32.4
200	1.2	3.7	3.7	.3								8.9	29	16.9	20.2	28.1	33.3
210	1.2	1.8	.6	.6								4.3	14	14.8	17.1	26.3	31.5
220	2.1	1.5	.3									4.0	13	10.2	10.4	20.5	28.7
230	.6	1.5										2.1	7	12.1	7.3	12.8	22.3
240	1.2											1.2	4	5.5	4.6	9.2	15.3
250	.6	.6										1.2	4	8.5	3.1	7.0	11.6
260	.6											.6	2	5.5	3.7	5.5	8.6
270	1.2	.6										1.8	6	7.7	3.1	5.2	7.3
280	.6											.6	2	4.5	3.4	4.9	8.0
290	.6	.3										.9	3	6.3	2.4	6.1	8.6
300	.3	.6										.9	3	8.3	3.7	6.1	8.9
310	.9	.6	.3									1.8	6	11.7	4.6	6.4	7.6
320	1.5	.3										1.8	6	6.8	4.6	6.1	10.4
330	.9											.9	3	5.0	3.4	8.6	13.1
340	.3			.3								.6	2	19.0	4.9	10.4	15.9
350	1.2	1.8		.3								3.4	11	12.9	7.6	12.2	21.4
360	1.2	.9	1.2	.3								3.7	12	14.7	10.7	18.7	23.2
CALM												0.0	0				
TOT OBS	148	131	37	11	0	0	0	0	0	0	0		327				
PERCENT	45.3	40.1	11.3	3.4								100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 137 RES WIND SP = .8 STD VECTOR DEV = 13.6 CONSTANCY = 7
MN SP ALL OBS = 11.6 MEAN VALUE OF X COMP = -.6 STD DEV OF X COMP = 6.5
MEAN VALUE OF Y COMP = .6 STD DEV OF Y COMP = 11.9

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: NOVEMBER THRU NOVEMBER - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.5	1.8	.7									4.0	11	12.5	13.6	20.5	26.7
20	1.1	3.7	1.1	.4								6.2	17	14.5	14.3	21.6	28.6
30	1.8	2.2										4.0	11	10.0	14.3	22.3	27.8
40	3.3	.7										4.0	11	7.2	12.1	20.5	25.6
50	1.8	1.5	.7									4.0	11	11.6	10.3	15.4	22.3
60	1.5	.7										2.2	6	7.7	7.3	12.1	16.5
70	.7	.4										1.1	3	10.0	4.0	8.4	13.9
80	.7											.7	2	8.5	2.2	5.9	11.4
90	.4											.4	1	2.0	2.6	5.1	7.7
100	1.1	.4										1.5	4	7.8	3.3	4.4	5.9
110	1.5											1.5	4	4.0	3.3	4.0	7.0
120	.4											.4	1	6.0	2.2	5.9	7.0
130	.4											.4	1	7.0	2.9	5.1	8.1
140	2.2											2.2	6	5.8	3.3	5.1	8.4
150	.7											.7	2	4.0	4.4	6.6	10.3
160	.7	.7										1.5	4	7.8	4.0	9.5	15.8
170	1.1	.7										1.8	5	9.6	6.6	13.2	27.8
180	1.1	1.1	.7	.4								3.3	9	16.1	11.0	24.9	31.9
190	1.1	3.3	.7	.7								5.9	16	16.5	21.6	29.7	37.4
200	3.3	5.5	1.8	.7	1.1							12.5	34	17.2	24.5	34.1	37.4
210	1.5	3.7	1.1									6.2	17	15.1	24.9	32.2	38.1
220	4.0	.7	.7	.4	.4							6.2	17	12.5	13.9	28.9	36.3
230	1.5											1.5	4	6.0	10.3	17.9	32.6
240	1.5	1.1										2.6	7	8.7	5.5	13.9	22.3
250	1.5											1.5	4	5.0	6.2	9.9	16.8
260	1.5	.7										2.2	6	10.0	5.9	9.2	12.8
270	1.1	1.1										2.2	6	9.2	5.1	8.8	12.1
280	.4	.4										.7	2	8.0	5.1	8.1	11.7
290	1.8	.4										2.2	6	8.5	3.7	8.1	12.8
300	.4	.4										.7	2	8.0	5.1	8.4	13.2
310	1.8	.4										2.2	6	6.2	5.5	10.3	13.2
320	1.1	1.5										2.6	7	11.0	7.3	10.3	15.4
330	1.5	.4	.7									2.6	7	12.0	7.3	12.5	16.5
340	.4	1.8										2.2	6	12.3	7.7	13.6	19.8
350	1.8	.7		.4								2.9	8	12.7	8.4	15.0	23.8
360		1.1	2.2									3.3	9	19.6	10.3	18.7	25.3
CALM												0.0	0				
TOT OBS	131	101	29	8	4	0	0	0	0	0	0		273				
PERCENT	48.0	37.0	10.6	2.9	1.5							100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 231 RES WIND SP = 2.1 STD VECTOR DEV = 14.4 CONSTANCY = 18
MN SP ALL OBS = 12.1 MEAN VALUE OF X COMP = 1.7 STD DEV OF X COMP = 6.5
MEAN VALUE OF Y COMP = 1.3 STD DEV OF Y COMP = 12.8

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: NOVEMBER THRU NOVEMBER - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)																
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10		1.1	2.6	.4								4.1	11	24.6	12.3	19.4	24.6
20	.7	2.2	2.2	.7								5.0	16	19.9	14.2	19.8	27.6
30	.7	1.9	1.5									4.1	11	16.0	13.4	22.4	26.9
40	1.5	1.1	.7									3.4	9	12.6	12.3	20.5	26.1
50		2.5	1.9	.4								4.9	13	18.5	10.4	16.0	23.9
60	.4	1.5	.4									2.2	6	12.8	8.6	13.8	20.9
70	1.1		.4									1.5	4	10.0	5.6	13.4	17.9
80	1.1	.4	.4									1.9	5	10.2	6.3	9.7	15.3
90	1.9	1.1										3.0	8	9.5	6.0	8.2	10.8
100	1.1											1.1	3	4.3	4.9	7.1	10.8
110	.7											.7	2	6.0	2.2	7.5	11.2
120		.4										.4	1	10.0	3.4	6.3	10.4
130	1.5	.7										2.2	6	8.3	4.5	6.3	8.6
140	1.5	.4										1.9	5	7.0	5.2	6.7	10.1
150	.7	.4										1.1	3	7.3	4.1	9.0	16.4
160	.7	.4										1.1	3	8.3	4.9	13.8	22.4
170	1.1	1.1	.4									2.6	7	11.1	10.8	18.3	30.2
180	2.6	2.5	1.5	.4								7.1	19	14.4	16.0	27.2	35.4
190	1.1	2.2	1.5	1.5								5.3	17	20.5	23.5	33.2	36.2
200	1.5	4.1	3.7	.7								10.1	27	19.2	23.5	32.5	37.3
210	.4	4.5	.7	1.5								7.1	19	19.2	19.0	27.6	36.9
220	1.1	.4			.4							1.9	5	14.8	11.2	23.5	31.0
230	1.1	.7	.4									2.2	6	11.0	6.3	14.6	25.4
240	1.9	.4										2.2	6	7.3	5.6	8.2	16.0
250	.7	.4										1.1	3	6.7	4.1	7.1	10.1
260	.4	.4										.7	2	6.5	2.6	6.0	9.7
270	.4	.4										.7	2	7.0	2.6	5.2	10.1
280	.4	.7										1.1	3	12.7	3.4	6.7	9.0
290	.7	.7										1.5	4	8.5	5.2	7.1	9.3
300	1.5	1.1										2.6	7	7.3	5.2	7.8	11.9
310	.4	.4	.4									1.1	3	12.3	5.2	10.1	13.1
320	.7	.4	.4									1.5	4	10.0	6.0	10.4	14.9
330	1.5	1.5	.4									3.4	9	10.7	6.7	10.8	15.7
340	.7	1.1										1.9	5	11.0	8.2	11.9	17.2
350	1.1	1.1	.7									3.0	8	12.9	7.1	14.6	22.0
360	.4	1.1	.7									2.2	6	17.7	9.3	17.2	24.6
CALM												0.0	0				
TOT OBS	90	105	56	15	1	0	0	0	0	0	0		268				
PERCENT	33.6	39.5	20.9	5.6	.4							100.0					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 181 RES WIND SP = 1.0 STD VECTOR DEV = 17.1 CONSTANCY = 7
MN SP ALL OBS = 14.6 MEAN VALUE OF X COMP = .0 STD DEV OF X COMP = 8.0
MEAN VALUE OF Y COMP = 1.0 STD DEV OF Y COMP = 15.1

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: NOVEMBER THRU NOVEMBER - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)															
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN	CUM PERCENTAGES		
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.6	1.3	2.5	.3								5.7	18	16.3	15.2	23.7	29.1
20	1.6	1.3	2.8									5.7	18	17.1	17.1	24.7	30.1
30	.6	2.5	2.5									5.7	18	17.3	15.2	23.4	31.3
40	.9	1.6	1.3									3.8	12	17.0	12.0	21.8	30.4
50	.6	1.3	.6									2.5	8	13.9	10.4	19.0	27.2
60	1.6	2.2	.3									4.1	13	11.5	9.5	15.8	22.5
70	.6	1.9	.3									2.8	9	12.6	9.5	13.0	18.0
80	1.6	.9										2.5	8	9.0	6.3	11.7	14.6
90	.3	.6										.9	3	10.3	4.7	7.9	12.3
100	.9		.3									1.3	4	10.0	2.5	5.4	8.2
110		.3										.3	1	13.0	1.9	2.8	7.3
120	.3											.3	1	1.0	.6	3.8	6.6
130												0.0	0		2.2	4.4	7.0
140	1.6	.3										1.9	6	5.3	3.8	5.4	9.8
150	1.9											1.9	6	5.7	5.1	9.2	13.6
160	.9		.3									1.3	4	10.7	7.3	13.3	18.4
170	2.2	1.9										4.1	13	9.4	9.5	16.5	30.1
180	1.6	1.6	.6	.3								4.1	13	13.9	13.3	26.3	32.9
190		2.8	.6	1.6								5.1	16	21.7	20.9	29.7	34.8
200	2.5	3.2	3.5	1.6	.9							11.7	37	20.5	21.5	29.4	35.1
210	.3	2.2	1.3	.6	.3							4.7	15	19.4	20.3	26.9	32.0
220	2.2	.6	.9									3.8	12	13.2	10.1	22.8	28.8
230	.3	1.3										1.6	5	11.6	6.3	12.0	25.6
240	.6	.3										.9	3	9.7	3.5	9.2	14.9
250	.6	.3										.9	3	8.7	3.8	6.3	11.4
260	.9	.9										1.9	6	9.5	3.8	6.0	8.9
270	.6	.3										.9	3	6.7	4.1	6.3	10.1
280	1.3											1.3	4	5.5	3.5	8.2	10.8
290	.6	.6										1.3	4	8.5	5.4	7.9	11.1
300	1.6	1.3										2.8	9	9.9	5.7	8.2	12.0
310	1.3		.3									1.6	5	10.2	5.7	9.8	12.7
320	.3	.9										1.3	4	12.5	5.7	10.1	14.2
330	.6	.9	1.3									2.8	9	15.7	5.7	10.1	16.8
340		1.3	.3									1.6	5	16.8	7.3	12.3	19.6
350	.9	.9	.9									2.8	9	15.2	8.2	16.8	23.7
360	.6	2.5	.6									3.8	12	15.1	12.3	19.6	28.2
CALM												0.0	0				
TOT OBS	109	121	58	14	4	0	0	0	0	0	0		316	IN CUM PERCENTAGES COLUMNS			
PERCENT	34.5	38.3	21.5	4.4	1.3							100.0		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 235			RES WIND SP = .3				STD VECTOR DEV = 16.9					CONSTANCY = 2		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 14.5				MEAN VALUE OF X COMP = .2							STD DEV OF X COMP = 8.1			
							MEAN VALUE OF Y COMP = .2							STD DEV OF Y COMP = 14.9			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: NOVEMBER THRU NOVEMBER - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	1.6	3.2	1.0									5.7	18	14.0	13.4	21.3	28.0
20	.6	2.5	.6									3.8	12	15.1	15.0	23.2	30.6
30	1.6	2.5	1.3									5.4	17	14.8	13.7	24.2	31.2
40	1.6	2.5	.3									4.5	14	11.6	14.6	21.7	30.3
50	1.3	2.5	1.0									4.8	15	13.6	12.4	20.7	27.4
60	1.3	1.9										3.2	10	10.8	10.8	18.2	24.5
70	1.3	1.0	.6									2.9	9	13.4	8.9	14.6	20.4
80	1.9	1.0										2.9	9	8.0	6.7	11.1	17.5
90	.6	.3										1.0	3	6.3	5.1	9.6	13.1
100	1.0	.3										1.3	4	8.3	3.8	7.0	10.8
110	1.6											1.6	5	4.6	3.2	5.1	8.6
120	.3											.3	1	8.0	2.9	4.8	8.0
130	.6	.3										1.0	3	8.7	1.9	5.7	9.9
140	.6											.6	2	3.5	3.8	7.0	10.8
150	1.0	1.3										2.2	7	9.1	5.7	8.9	13.1
160	1.3	1.6										2.9	9	9.8	7.3	11.8	20.4
170	1.0	1.3										2.2	7	11.1	8.9	18.8	27.4
180	1.0	1.9	1.0									3.8	12	13.8	13.7	24.5	31.2
190	.6	5.7	1.0	.3								7.6	24	15.4	19.4	26.1	31.5
200	1.6	1.9	4.1	.3								8.0	25	18.7	20.1	26.4	30.6
210	1.9	1.3	.3	1.0								4.5	14	16.2	15.0	24.5	30.3
220	.6	1.9										2.5	8	12.0	8.9	18.8	27.7
230	.3	1.3	.3									1.9	6	14.2	6.4	12.1	20.7
240	1.0	1.0										1.9	6	10.7	5.1	8.3	14.0
250	1.0		.3									1.3	4	11.0	3.8	7.0	10.5
260	.3	.3										.6	2	8.5	3.2	6.1	9.6
270	1.0	.3										1.3	4	7.5	2.9	5.7	9.6
280	1.0											1.0	3	5.3	3.8	6.4	10.2
290	1.3	.3										1.6	5	7.6	4.5	8.3	11.8
300	1.0	1.0										1.9	6	11.2	6.1	9.9	12.7
310	1.0	1.0	.3	.3								2.5	8	14.2	7.3	10.5	13.7
320	1.0	1.6	.3									2.9	9	12.3	7.0	11.1	15.3
330	1.3	.3										1.6	5	7.6	6.7	11.8	17.5
340	.6	1.3	.3									2.2	7	12.4	6.4	13.1	21.3
350	1.6	1.0										2.5	8	10.6	8.6	15.9	22.6
360	1.0	1.9	.6	.3								3.8	12	13.8	12.1	18.2	25.2
CALM												.3	1				
TOT OBS	119	145	42	7	0	0	0	0	0	0	0		314				
PERCENT	37.9	46.2	13.4	2.2								99.7					

IN CUM PERCENTAGES COLUMNS
(1) = 30 DEG SECTORS
(2) = 50 DEG SECTORS
(3) = 70 DEG SECTORS

RES WIND DIR = 163 RES WIND SP = .1 STD VECTOR DEV = 14.4 CONSTANCY = 1
MN SP ALL OBS = 12.7 MEAN VALUE OF X COMP = -.0 STD DEV OF X COMP = 7.6
MEAN VALUE OF Y COMP = .1 STD DEV OF Y COMP = 12.2

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: DECEMBER THRU DECEMBER - 1957 TO 1969
HOUR 0000 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN			
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PCNT	OBS	SPEED	(1)	(2)	(3)
10	1.8	4.0	1.8									7.6	21	14.1	21.2	28.1	34.5
20	1.4	4.0	.4	.7								6.5	18	14.8	18.0	26.6	33.1
30	2.2	1.8										4.0	11	8.4	11.9	23.0	33.1
40		1.4										1.4	4	13.0	9.0	18.3	27.0
50	1.8	1.4		.4								3.6	10	11.3	7.9	12.9	20.1
60	1.8	1.1										2.9	8	9.1	7.6	9.7	14.4
70	.7	.4										1.1	3	9.3	4.7	9.0	11.2
80	.4	.4										.7	2	9.5	2.5	6.1	10.1
90	.4	.4										.7	2	7.5	2.2	3.6	6.5
100	.7											.7	2	8.0	1.8	2.5	5.4
110	.4											.4	1	2.0	1.1	3.6	4.3
120												0.0	0		2.2	2.9	4.0
130	1.4	.4										1.8	5	7.0	1.8	2.5	5.4
140												0.0	0		2.2	4.3	5.8
150		.4										.4	1	10.0	2.5	5.4	7.2
160	1.4	.7										2.2	6	7.0	3.6	5.4	13.3
170	.7	.4										1.1	3	8.0	5.0	11.5	19.1
180		1.4	.4									1.8	5	16.4	9.0	18.7	25.5
190	1.4	3.2	1.1	.4								6.1	17	15.1	15.5	23.0	26.6
200	1.4	1.8	3.2	1.1								7.6	21	19.8	20.1	23.4	27.7
210	.7	2.9	1.4	1.1	.4							6.5	18	19.0	15.5	24.8	28.1
220		.4	.7	.4								1.4	4	24.5	11.2	20.1	27.7
230	2.2	.4		.4		.4						3.2	9	14.1	6.1	14.0	23.0
240	.4	.7		.4								1.4	4	16.3	6.1	9.0	17.3
250	1.4											1.4	4	8.3	4.3	9.4	12.6
260	.7	.4	.4									1.4	4	12.7	4.7	7.9	12.6
270	.7	1.1										1.8	5	8.2	5.0	7.9	11.2
280	1.1	.7										1.8	5	7.0	5.0	8.3	14.4
290	.7	.7										1.4	4	7.0	5.0	11.5	14.4
300	1.1	.7										1.8	5	8.4	7.9	11.2	18.7
310	2.9	1.1	.7									4.7	13	9.7	7.9	15.1	21.9
320	.7	.7										1.4	4	10.2	11.9	18.7	23.0
330	1.1	4.0	.7									5.8	16	14.2	12.2	19.8	28.8
340	1.8	2.5	.4	.4								5.0	14	11.4	13.7	22.3	34.5
350	1.4	.7	.7									2.9	8	13.1	15.1	28.4	36.3
360	2.2	3.2	1.4	.4								7.2	20	14.5	17.6	29.1	38.8
CALM												.4	1				
TOT OBS	103	120	37	15	1	1	0	0	0	0	0		278	IN CUM PERCENTAGES COLUMNS			
PERCENT	37.1	43.2	13.3	5.4	.4	.4						99.6		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 293			RES WIND SP = 2.5				STD VECTOR DEV = 15.3					CONSTANCY = 19		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 13.1				MEAN VALUE OF X COMP = 2.2					STD DEV OF X COMP = 7.3					
							MEAN VALUE OF Y COMP = -1.2					STD DEV OF Y COMP = 13.5					

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: DECEMBER THRU DECEMBER - 1957 TO 1969
HOUR 0600 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-143	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	(1)	(2)	(3)
10	1.8	2.2	2.2	2.2								8.4	23	20.0	17.6	27.8	36.6
20	.7	2.9	.7	.4								4.8	13	16.8	19.0	28.6	37.7
30	.7	4.4	.7									5.9	16	13.8	15.8	28.9	36.3
40	1.8	3.3										5.1	14	10.8	15.8	23.4	34.1
50	.7	2.5	1.1	.4								4.8	13	16.2	12.8	20.9	27.1
60	1.8	1.1										2.9	8	9.9	9.9	16.5	22.7
70	.7	1.5										2.2	6	11.2	6.6	11.7	18.3
80	1.1	.4										1.5	4	6.5	4.0	8.4	14.3
90	.4											.4	1	8.0	3.3	6.6	11.4
100	1.5											1.5	4	5.3	2.9	6.2	9.5
110	.7	.4										1.1	3	7.0	4.4	5.9	8.4
120	1.5	.4										1.8	5	6.6	4.0	6.6	8.4
130	1.1											1.1	3	4.0	4.0	6.6	9.2
140	.7	.4										1.1	3	11.0	3.7	6.6	9.9
150	.7	.7										1.5	4	9.0	3.7	7.0	12.1
160	.7	.4										1.1	3	7.0	4.8	9.2	14.7
170	1.8		.4									2.2	6	9.3	6.6	12.5	20.1
180	1.8	1.5										3.3	9	8.9	9.9	17.6	23.8
190	1.1	1.1	1.5	.7								4.4	12	17.6	14.3	21.2	25.3
200	.4	2.5	2.2	1.1	.4							6.6	18	22.4	15.8	22.0	25.3
210		2.5	1.8		.4							4.8	13	20.3	14.3	19.8	25.3
220	.4	1.5	1.1									2.9	8	16.0	8.8	17.6	23.4
230			1.1									1.1	3	23.0	6.2	12.5	20.1
240	1.1	.4	.7									2.2	6	12.8	4.8	8.8	13.9
250	.7	.7										1.5	4	10.2	4.8	6.2	10.3
260	.4	.7										1.1	3	12.7	2.9	6.2	8.1
270	.4											.4	1	2.0	2.6	4.8	8.8
280	.7	.4										1.1	3	9.3	2.2	5.1	8.4
290	.4	.4										.7	2	12.0	3.7	5.9	8.1
300	1.1	.7										1.8	5	10.0	4.4	6.6	11.7
310	1.1	.4	.4									1.8	5	12.8	4.8	10.3	15.0
320	.7		.4									1.1	3	9.3	7.7	13.2	18.3
330	2.2	1.1	1.5									4.8	13	12.7	9.5	15.8	22.0
340	1.1	1.5	.7	.4								3.7	10	14.4	12.8	18.3	28.6
350	1.1	2.9	.4									4.4	12	12.4	12.5	25.6	31.5
360		2.9	1.1			.4						4.4	12	19.0	17.2	25.6	36.3
CALM												.7	2				
TOT OBS	91	114	49	14	2	1	0	0	0	0	0		273		IN CUM PERCENTAGES COLUMNS		
PERCENT	33.3	41.8	17.9	5.1	.7	.4						99.3			(1) = 30 DEG SECTORS		
															(2) = 50 DEG SECTORS		
															(3) = 70 DEG SECTORS		

RES WIND DIR = 352 RES WIND SP = 2.4 STD VECTOR DEV = 16.4 CONSTANCY = 17

MN SP ALL OBS = 14.2 MEAN VALUE OF X COMP = .3 STD DEV OF X COMP = 7.9

MEAN VALUE OF Y COMP = -2.4 STD DEV OF Y COMP = 14.3

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: DECEMBER THRU DECEMBER - 1957 TO 1969
HOUR 1200 GMT LEVEL 7,000 FT MSL

	SPEED (KNOTS)														CUM PERCENTAGES		
		10-	20-	30-	40-	50-	60-	75-	100-	150-		ROW TOTAL		MEAN			
DIR	1-9	19	29	39	49	59	74	99	149	199	200+	PRCNT	OBS	SPEED	(1)	(2)	(3)
10	1.2	2.5	1.9	.6								5.2	20	17.1	21.0	29.0	34.3
20	1.5	4.5	2.8	.3								9.3	30	17.3	21.3	30.2	36.4
30	.9	2.8	1.9	.3								5.9	19	17.5	18.5	28.7	35.8
40	1.2	2.2										3.4	11	11.5	13.3	24.1	31.2
50	.9	1.9	1.2									4.0	13	14.6	9.0	15.7	26.5
60	.6	.5	.3									1.5	5	12.4	6.5	11.4	19.1
70	.3	.5										.9	3	9.0	4.0	9.9	14.2
80	1.2	.3										1.5	5	6.2	4.3	6.8	11.4
90	1.9											1.9	6	6.3	4.3	5.9	7.4
100	.9											.9	3	5.0	3.4	4.9	6.5
110	.6											.6	2	3.0	1.5	4.0	5.9
120												0.0	0		1.2	2.5	5.9
130	.6											.6	2	7.5	.9	3.1	6.2
140	.3											.3	1	3.0	2.5	4.6	8.0
150	1.5											1.5	5	5.6	4.0	7.4	10.8
160	1.5	.5										2.2	7	8.7	6.5	10.2	15.4
170	2.2	.3	.3									2.8	9	8.3	8.3	14.5	22.8
180	1.2	1.5	.3	.3								3.4	11	13.1	10.8	21.0	26.2
190	.6	2.2	.9	.9								4.6	15	17.2	16.0	22.5	28.4
200	.3	4.3	2.2	.6	.6							8.0	26	21.3	16.4	23.5	28.4
210		1.2	2.2	.3								3.7	12	20.7	15.4	22.2	26.5
220	.3	1.2	1.9	.3								3.7	12	20.4	9.6	18.5	25.3
230	.6	.9	.3	.3								2.2	7	15.0	6.8	12.7	20.7
240	.6	.3										.9	3	8.7	5.2	9.0	14.2
250	.9	.5	.6									2.2	7	14.7	3.1	6.8	12.7
260												0.0	0		3.7	6.8	10.8
270	1.2	.3										1.5	5	7.2	3.7	7.7	11.7
280	1.9	.3										2.2	7	9.0	5.6	8.6	13.9
290	.6	1.2										1.9	6	10.3	7.1	11.7	14.2
300	1.5	1.5										3.1	10	9.2	8.0	12.7	17.6
310	1.2	.5	.9	.3								3.1	10	15.3	8.6	13.9	17.9
320	.6	.9	.9									2.5	8	14.2	9.0	13.9	17.9
330	1.5	1.2	.6									3.4	11	11.1	7.7	13.0	21.6
340	.6	.6	.6									1.9	6	15.2	7.4	15.4	24.7
350	.9		1.2									2.2	7	16.3	9.6	19.1	30.9
360	.9	2.2	1.9	.6								5.6	18	17.6	13.9	25.0	34.3
CALM												.6	2				
TOT OBS	108	122	74	16	2	0	0	0	0	0	0		324	IN CUM PERCENTAGES COLUMNS			
PERCENT	33.3	37.7	22.8	4.9	.6							99.4		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
RES WIND DIR = 329			RES WIND SP = 2.3				STD VECTOR DEV = 16.7					CONSTANCY = 16		(3) = 70 DEG SECTORS			
			MN SP ALL OBS = 14.6				MEAN VALUE OF X COMP = 1.2							STD DEV OF X COMP = 8.1			
							MEAN VALUE OF Y COMP = -2.0							STD DEV OF Y COMP = 14.6			

UPPER WIND SUMMARY*
STATION UCC-YUCCA FLAT, NEVADA
PERIOD OF RECORD: DECEMBER THRU DECEMBER - 1957 TO 1969
HOUR 1800 GMT LEVEL 7,000 FT MSL

SPEED (KNOTS)

DIR	1-9	10-19	20-29	30-39	40-49	50-59	60-74	75-99	100-149	150-199	200+	ROW TOTAL PRCNT	OBS	MEAN SPEED	CUM PERCENTAGES (1)	(2)	(3)
10	.3	3.0	3.0									6.3	19	20.2	16.3	25.3	32.3
20	1.0	3.3	1.7									6.0	18	16.7	15.3	22.3	34.7
30	1.0	1.3		.7								3.0	9	16.0	12.0	24.7	30.3
40	.7	1.7	.7									3.0	9	14.3	12.3	20.0	29.0
50	1.7	4.0	.7									6.3	19	12.7	11.0	16.7	25.3
60	.7	1.0										1.7	5	9.2	10.7	16.3	20.3
70	1.7	.7	.3									2.7	8	9.8	7.0	14.3	18.7
80	1.7	1.0										2.7	8	9.1	6.3	9.3	15.7
90	1.0											1.0	3	6.3	5.0	7.7	10.0
100	1.0	.3										1.3	4	4.5	2.3	5.7	9.0
110												0.0	0		2.0	3.7	8.7
120	.7											.7	2	5.5	1.3	5.0	8.0
130		.7										.7	2	14.0	3.7	5.7	9.0
140	2.0	.3										2.3	7	6.7	5.0	7.7	9.3
150	1.3	.7										2.0	6	10.0	6.3	8.7	11.3
160	1.0	1.0										2.0	6	9.7	5.7	10.0	17.0
170	.7	1.0										1.7	5	11.6	5.7	14.0	24.3
180	.3	1.7										2.0	6	12.8	10.0	20.0	26.3
190	1.3	3.3	1.3	.3								6.3	19	14.4	16.3	22.3	27.0
200	1.0	3.3	3.3	.3								8.0	24	17.8	18.7	23.3	25.7
210		1.7	2.0	.7								4.3	13	22.0	15.0	22.0	26.3
220	.7	.3	1.0	.3	.3							2.7	8	21.1	7.7	18.0	24.7
230	.3	.3										.7	2	10.0	5.7	10.3	19.3
240	1.7	.7										2.3	7	8.0	3.3	7.0	13.3
250	.3											.3	1	8.0	3.7	6.3	11.3
260	.3	.3	.3									1.0	3	12.7	3.3	8.0	10.0
270	1.7		.3									2.0	6	5.8	5.3	7.0	11.3
280	1.3	1.0										2.3	7	7.9	5.7	8.7	10.7
290	.7	.3			.3							1.3	4	17.0	5.7	9.3	13.7
300	1.7	.3										2.0	6	7.2	5.0	10.7	15.0
310	.3	1.3										1.7	5	11.6	7.0	10.7	17.0
320	1.7	1.7										3.3	10	9.6	7.3	13.3	20.7
330	1.3	1.0										2.3	7	10.0	9.7	17.3	23.3
340	2.7	1.3										4.0	12	8.8	12.3	19.7	27.7
350	2.7	2.3	.7	.3								6.0	18	12.1	14.0	22.7	32.0
360	1.3	1.7	1.0									4.0	12	13.8	16.3	26.3	31.7
CALM												0.0	0				
TOT OBS	113	128	49	8	2	0	0	0	0	0	0		300	IN CUM PERCENTAGES COLUMNS			
PERCENT	37.7	42.7	16.3	2.7	.7							100.0		(1) = 30 DEG SECTORS			
														(2) = 50 DEG SECTORS			
														(3) = 70 DEG SECTORS			

RES WIND DIR = 345 RES WIND SP = 1.4 STD VECTOR DEV = 15.2 CONSTANCY = 10
MN SP ALL OBS = 13.2 MEAN VALUE OF X COMP = .4 STD DEV OF X COMP = 7.7
MEAN VALUE OF Y COMP = -1.3 STD DEV OF Y COMP = 13.1

APPENDIX H

Table of Fujita-Pearson Tornado Scale

APPENDIX H

TABLE OF FUJITA-PEARSON TORNADO SCALE. Characteristics of a tornado can be expressed as a combination of Fujita-scale windspeed and Pearson-scale path length and width. This scale permits us to classify tornadoes between two extreme FPPP Scales, 0,0,0 and 5,5,5.

F-Scale Maximum Windspeed				P-Scale Path Length				P-Scale Path Width			
Scale	mph	kts	m/s	Scale	miles	km		Scale	ft	yds	meters
F 0.0	40	35	18	P 0.0	0.3	0.5		P 0.0	17	6	5
0.1	43	37	19	0.1	0.4	0.6		0.1	19	6	6
0.2	46	40	21	0.2	0.4	0.6		0.2	21	7	6
0.3	49	43	22	0.3	0.5	0.7		0.3	24	8	7
0.4	52	46	23	0.4	0.5	0.8		0.4	26	9	8
0.5	56	48	25	0.5	0.6	0.9		0.5	30	10	9
0.6	59	51	26	0.6	0.6	1.0		0.6	33	11	10
0.7	63	54	28	0.7	0.7	1.2		0.7	37	13	11
0.8	66	57	30	0.8	0.8	1.3		0.8	42	14	13
0.9	70	60	31	0.9	0.9	1.4		0.9	47	16	14
F 1.0	73	64	33	P 1.0	1.0	1.6		P 1.0	53	18	16
1.1	77	67	34	1.1	1.1	1.8		1.1	59	20	18
1.2	81	70	36	1.2	1.3	2.0		1.2	66	22	20
1.3	84	73	38	1.3	1.4	2.3		1.3	74	25	23
1.4	88	77	40	1.4	1.6	2.6		1.4	84	28	26
1.5	92	80	41	1.5	1.8	2.9		1.5	94	31	29
1.6	96	84	43	1.6	2.0	3.2		1.6	105	35	32
1.7	100	87	45	1.7	2.2	3.6		1.7	118	39	36
1.8	104	91	47	1.8	2.5	4.0		1.8	133	44	40
1.9	109	94	49	1.9	2.8	4.5		1.9	149	50	45
F 2.0	113	98	50	P 2.0	3.2	5.1		P 2.0	167	56	51
2.1	117	102	52	2.1	3.5	5.7		2.1	187	62	57
2.2	121	105	54	2.2	4.0	6.4		2.2	210	70	64
2.3	126	109	56	2.3	4.5	7.2		2.3	235	78	72
2.4	130	113	58	2.4	5.0	8.1		2.4	265	88	81
2.5	135	117	60	2.5	5.6	9.0		2.5	297	99	90
2.6	135	121	61	2.6	6.5	10.2		2.6	333	111	102
2.7	144	125	64	2.7	7.1	11.4		2.7	374	125	114
2.8	148	129	66	2.8	7.9	12.8		2.8	419	140	128
2.9	153	132	68	2.9	8.9	14.3		2.9	470	157	143

TABLE OF FUJITA-PEARSON TORNADO SCALE
(continued)

F-Scale Maximum Windspeed				P-Scale Path Length				P-Scale Path Width			
Scale	mph	kts	m/s	Scale	miles	km		Scale	ft	yds	meters
3.0	158	137	70	P 3.0	10.0	16.1		P 3.0	328	176	161
3.1	162	141	73	3.1	11.2	18.0		3.1	591	197	180
3.2	167	145	75	3.2	12.6	20.0		3.2	665	222	203
3.3	172	149	77	3.3	14.1	22.7		3.3	744	248	227
3.4	177	154	79	3.4	15.9	25.6		3.4	837	279	256
3.5	182	158	81	3.5	17.8	28.6		3.5	940	313	286
3.6	187	162	83	3.6	20.0	32.2		3.6	1054	351	322
3.7	192	167	86	3.7	22.4	36.0		3.7	1183	394	360
3.8	197	171	88	3.8	25.1	40.4		3.8	1326	442	404
3.9	202	175	90	3.9	28.2	45.4		3.9	1489	496	454
F 4.0	207	180	93	P 4.0	31.6	50.9		P 4.0	1670	557	509
4.1	212	184	95	4.1	35.5	57.1		4.1	1874	625	571
4.2	218	189	97	4.2	39.8	64.1		4.2	2102	701	641
4.3	223	194	100	4.3	44.7	71.8		4.3	2354	785	718
4.4	228	198	102	4.4	50.1	80.6		4.4	2646	882	806
4.5	233	203	104	4.5	56.2	90.4		4.5	2967	989	904
4.6	238	207	107	4.6	63.1	102		4.6	3332	1111	1.0 km
4.7	244	212	109	4.7	70.8	114		4.7	3738	1246	1.1
4.8	250	217	112	4.8	79.4	128		4.8	4194	1398	1.3
4.9	255	222	114	4.9	89.1	143		4.9	4704	1568	1.4
F 5.0	261	227	117	P 5.0	100	161		P 5.0	1.0 mi	1760	1.6
5.1	267	232	119	5.1	112	181		5.1	1.1	1971	1.8
5.2	272	236	122	5.2	126	203		5.2	1.3	2218	2.0
5.3	278	241	124	5.3	141	227		5.3	1.4	2482	2.3
5.4	284	246	127	5.4	159	255		5.4	1.6	2798	2.6
5.5	289	251	129	5.5	178	286		5.5	1.8	3133	2.9
5.6	295	256	132	5.6	200	321		5.6	2.0	3520	3.2
5.7	301	261	135	5.7	224	360		5.7	2.2	3941	3.6
5.8	307	265	137	5.8	251	404		5.8	2.5	4418	4.0
5.9	313	272	140	5.9	282	454		5.9	2.8	4963	4.5

Source: Ref. 22.

APPENDIX I

Surface Wind Summary, Yucca Flat, 1961-1978, Seasonal, and Annual Frequency Distributions According to Stability Classes A-G

YUCCA FLAT SURFACE WINDS 1961-1978
SPRING FREQUENCY DISTRIBUTION (IN PERCENT)
37036 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.01	2.82	2.64	2.05	1.12	0.42	0.16	10.23	11.03
NNE	0.00	0.51	1.28	0.81	0.87	0.46	0.16	0.03	4.15	10.43
NE	0.00	0.72	1.46	0.72	0.48	0.24	0.08	0.01	3.69	8.12
ENE	0.00	0.32	0.63	0.25	0.11	0.03	0.01	0.00	1.34	6.40
E	0.00	1.67	2.41	0.56	0.13	0.03	0.01	0.00	4.81	4.76
ESE	0.00	0.73	1.59	0.43	0.12	0.02	0.01	0.00	2.70	5.40
SE	0.00	1.02	2.16	1.26	0.58	0.14	0.03	0.00	5.17	7.10
SSE	0.00	0.52	1.42	1.26	0.82	0.26	0.12	0.02	4.41	9.48
S	0.00	0.87	2.67	3.41	3.43	2.32	1.73	0.45	14.89	14.20
SSW	0.00	0.32	1.33	1.99	2.31	1.44	0.77	0.21	8.38	14.35
SW	0.00	0.50	1.37	1.85	1.68	0.72	0.20	0.04	6.36	11.47
WSW	0.00	0.28	0.68	0.60	0.50	0.14	0.03	0.00	2.22	9.40
W	0.00	0.89	1.63	0.85	0.39	0.14	0.02	0.02	3.93	7.07
WNW	0.00	0.60	1.72	1.18	0.43	0.19	0.10	0.02	4.24	8.27
NW	0.00	1.00	3.31	2.26	1.05	0.64	0.32	0.05	8.64	9.28
NNW	0.00	0.67	1.91	1.62	1.06	0.53	0.30	0.12	6.22	10.67
CALM	8.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.64	0.00
TOTAL	8.64	11.62	28.17	21.70	16.00	8.43	4.31	1.12	100.00	9.45

YUCCA FLAT SURFACE WINDS 1961-1978
SUMMER FREQUENCY DISTRIBUTION (IN PERCENT)
34976 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.09	2.60	1.87	1.16	0.31	0.10	0.03	7.15	8.43
NNE	0.00	0.50	1.24	0.63	0.52	0.18	0.05	0.02	3.15	8.46
NE	0.00	0.81	1.33	0.52	0.30	0.12	0.07	0.01	3.17	7.17
ENE	0.00	0.41	0.69	0.21	0.09	0.02	0.01	0.01	1.44	5.92
E	0.00	2.16	2.80	0.50	0.18	0.04	0.01	0.01	5.69	4.63
ESE	0.00	1.02	1.39	0.51	0.14	0.03	0.02	0.01	3.13	5.49
SE	0.00	1.22	2.17	1.62	0.74	0.24	0.07	0.01	6.08	7.80
SSE	0.00	0.65	1.41	1.62	0.99	0.24	0.05	0.02	4.98	9.22
S	0.00	0.85	2.68	4.27	4.21	2.14	0.35	0.17	15.08	12.67
SSW	0.00	0.41	1.85	3.27	3.31	1.71	0.61	0.09	11.25	13.17
SW	0.00	0.54	2.08	2.96	2.51	1.11	0.39	0.08	9.67	11.92
WSW	0.00	0.35	0.74	1.01	0.63	0.22	0.08	0.01	3.04	10.06
W	0.00	0.91	1.61	0.82	0.44	0.11	0.03	0.00	3.91	8.92
WNW	0.00	0.52	1.46	0.57	0.16	0.04	0.01	0.00	2.76	6.21
NW	0.00	0.99	2.31	0.89	0.31	0.11	0.07	0.02	4.71	6.63
NNW	0.00	0.63	1.67	0.72	0.29	0.06	0.04	0.01	3.41	6.75
CALM	11.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.39	0.00
TOTAL	11.39	13.05	28.04	21.99	15.99	6.67	2.58	0.49	100.00	8.38

YUCCA FLAT SURFACE WINDS 1961-1978
AUTUMN FREQUENCY DISTRIBUTION (IN PERCENT)
34878 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.53	3.57	2.80	2.33	0.91	0.30	0.03	11.47	9.63
NNE	0.00	0.72	1.42	0.96	0.93	0.45	0.13	0.03	4.64	9.81
NE	0.00	0.97	1.80	0.93	0.60	0.29	0.12	0.03	4.74	8.25
ENE	0.00	0.52	0.75	0.26	0.12	0.08	0.04	0.00	1.77	6.52
E	0.00	2.33	2.72	0.46	0.15	0.03	0.01	0.01	5.71	4.39
ESE	0.00	1.06	1.74	0.39	0.11	0.03	0.01	0.01	3.35	4.97
SE	0.00	1.69	2.63	1.32	0.54	0.09	0.05	0.01	6.33	6.38
SSE	0.00	0.78	1.78	1.42	0.60	0.15	0.03	0.01	4.77	7.88
S	0.00	1.11	3.05	2.79	2.26	1.33	0.68	0.14	11.35	11.43
SSW	0.00	0.47	1.12	1.27	1.43	0.79	0.38	0.07	5.52	12.56
SW	0.00	0.61	1.28	1.22	0.87	0.42	0.18	0.03	4.62	10.24
WSW	0.00	0.45	0.58	0.47	0.24	0.08	0.02	0.00	1.84	7.75
W	0.00	1.26	1.46	0.55	0.18	0.04	0.01	0.00	3.50	5.30
WNW	0.00	0.71	1.90	1.09	0.29	0.05	0.01	0.00	4.06	6.69
NW	0.00	1.35	3.31	1.87	0.61	0.20	0.09	0.01	7.44	7.20
NNW	0.00	0.91	2.21	1.33	0.68	0.33	0.07	0.01	5.74	8.32
CALM	13.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.14	0.00
TOTAL	13.14	16.48	31.51	19.14	12.14	5.30	2.11	0.40	100.00	7.34

YUCCA FLAT SURFACE WINDS 1961-1978
WINTER FREQUENCY DISTRIBUTION (IN PERCENT)
36047 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.69	4.07	2.59	2.34	1.28	0.70	0.17	12.85	10.57
NNE	0.00	0.71	1.40	0.98	0.93	0.72	0.34	0.09	5.17	11.49
NE	0.00	0.82	1.60	0.94	0.10	0.39	0.22	0.03	4.71	9.42
ENE	0.00	0.52	0.69	0.20	0.09	0.02	0.01	0.00	1.54	5.37
E	0.00	1.88	1.80	0.23	0.06	0.01	0.00	0.00	3.96	3.82
ESE	0.00	0.90	1.27	0.14	0.04	0.00	0.00	0.00	2.35	3.99
SE	0.00	1.41	2.29	0.82	0.27	0.04	0.01	0.00	4.84	5.53
SSE	0.00	0.75	1.68	1.10	0.46	0.10	0.04	0.00	4.13	7.38
S	0.00	1.34	2.91	2.28	1.65	1.11	0.66	0.16	10.11	10.98
SSW	0.00	0.47	0.95	0.67	0.66	0.38	0.26	0.07	3.46	11.41
SW	0.00	0.54	0.94	0.54	0.36	0.14	0.05	0.00	2.58	8.06
WSW	0.00	0.54	0.51	0.18	0.14	0.04	0.01	0.00	1.41	5.84
W	0.00	1.19	1.66	0.64	0.15	0.02	0.01	0.00	3.68	5.38
WNW	0.00	0.84	2.42	1.87	0.41	0.07	0.02	0.01	5.65	7.17
NW	0.00	1.52	4.80	3.33	1.06	0.35	0.11	0.02	11.20	7.73
NNW	0.00	1.01	2.96	1.99	1.19	0.51	0.19	0.05	7.89	8.97
CALM	14.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.47	0.00
TOTAL	14.47	16.12	31.96	18.53	10.51	5.18	2.62	0.61	100.00	7.27

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
142937 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.9 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.33	3.26	2.48	1.97	0.91	0.38	0.10	10.44	10.08
NNE	0.00	0.61	1.33	0.85	0.81	0.45	0.17	0.04	4.28	10.23
NE	0.00	0.83	1.55	0.78	0.52	0.26	0.12	0.02	4.08	8.36
ENE	0.00	0.44	0.69	0.23	0.10	0.04	0.01	0.00	1.52	6.06
E	0.00	2.00	2.42	0.44	0.13	0.03	0.01	0.00	5.03	4.44
ESE	0.00	0.92	1.44	0.37	0.10	0.02	0.01	0.00	2.87	5.01
SE	0.00	1.33	2.31	1.29	0.53	0.13	0.04	0.00	5.59	6.75
SSE	0.00	0.67	1.57	1.35	0.71	0.19	0.06	0.01	4.57	8.52
S	0.00	1.04	2.83	3.19	2.89	1.73	0.96	0.23	12.87	12.53
SSW	0.00	0.42	1.31	1.80	1.92	1.08	0.51	0.11	7.15	13.19
SW	0.00	0.55	1.41	1.64	1.35	0.60	0.20	0.04	5.79	11.03
WSW	0.00	0.40	0.63	0.56	0.37	0.12	0.03	0.00	2.12	8.68
W	0.00	1.06	1.59	0.72	0.29	0.08	0.02	0.00	3.76	6.22
WNW	0.00	0.67	1.88	1.18	0.33	0.09	0.04	0.01	4.19	7.19
NW	0.00	1.21	3.44	2.10	0.76	0.33	0.15	0.03	8.03	7.88
NNW	0.00	0.80	2.19	1.42	0.86	0.36	0.15	0.05	5.84	8.97
CALM	11.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.88	0.00
TOTAL	11.88	14.29	29.86	20.34	13.67	6.42	2.87	0.66	100.00	8.13

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS A
738 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	0.41	1.63	0.00	0.00	0.00	0.00	0.00	2.03	3.95
NNE	0.00	1.08	3.25	0.00	0.00	0.00	0.00	0.00	4.34	4.08
NE	0.00	1.08	4.88	0.00	0.00	0.00	0.00	0.00	5.96	4.28
ENE	0.00	0.68	1.90	0.00	0.00	0.00	0.00	0.00	2.57	4.14
E	0.00	5.56	13.01	0.00	0.00	0.00	0.00	0.00	18.56	3.84
ESE	0.00	0.95	5.56	0.00	0.00	0.00	0.00	0.00	6.50	4.41
SE	0.00	1.36	8.94	0.00	0.00	0.00	0.00	0.00	10.30	4.43
SSE	0.00	0.41	5.28	0.00	0.00	0.00	0.00	0.00	5.69	4.74
S	0.00	2.44	7.72	0.00	0.00	0.00	0.00	0.00	10.16	4.21
SSW	0.00	0.27	4.88	0.00	0.00	0.00	0.00	0.00	5.15	4.81
SW	0.00	0.81	4.07	0.00	0.00	0.00	0.00	0.00	4.88	4.57
WSW	0.00	0.14	1.22	0.00	0.00	0.00	0.00	0.00	1.36	4.41
W	0.00	0.81	3.12	0.00	0.00	0.00	0.00	0.00	3.93	3.96
WNW	0.00	1.08	0.68	0.00	0.00	0.00	0.00	0.00	1.76	3.29
NW	0.00	0.54	1.49	0.00	0.00	0.00	0.00	0.00	2.03	3.85
NNW	0.00	0.41	0.68	0.00	0.00	0.00	0.00	0.00	1.08	3.47
CALM	13.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.69	0.00
TOTAL	13.69	18.02	68.29	0.00	0.00	0.00	0.00	0.00	100.00	3.62

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS B
8734 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.21	2.68	0.57	0.03	0.00	0.00	0.00	4.50	4.51
NNE	0.00	0.79	2.00	0.53	0.01	0.01	0.01	0.00	3.35	4.96
NE	0.00	0.98	3.38	0.80	0.01	0.00	0.00	0.00	5.18	5.10
ENE	0.00	0.60	1.83	0.41	0.00	0.00	0.00	0.00	2.84	4.99
E	0.00	2.77	6.84	1.19	0.03	0.00	0.00	0.00	10.83	4.70
ESE	0.00	1.23	3.40	1.19	0.01	0.00	0.00	0.00	5.83	5.21
SE	0.00	2.02	6.88	2.46	0.06	0.00	0.00	0.00	11.42	5.42
SSE	0.00	0.92	4.48	2.18	0.01	0.00	0.00	0.00	7.58	5.87
S	0.00	2.03	7.69	4.19	0.13	0.01	0.01	0.00	14.06	6.02
SSW	0.00	0.89	4.10	2.81	0.07	0.00	0.00	0.00	7.87	6.36
SW	0.00	0.96	4.04	2.47	0.06	0.00	0.00	0.00	7.53	6.07
WSW	0.00	0.89	1.66	0.97	0.01	0.00	0.00	0.00	3.33	5.64
W	0.00	1.17	2.14	0.66	0.03	0.01	0.00	0.00	4.02	4.74
WNW	0.00	0.53	0.84	0.21	0.01	0.00	0.00	0.00	1.58	4.31
NW	0.00	0.84	1.68	0.31	0.00	0.01	0.00	0.00	2.84	4.29
NNW	0.00	0.56	1.37	0.25	0.02	0.00	0.00	0.00	2.21	4.51
CALM	5.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.04	0.00
TOTAL	5.04	18.17	55.81	21.20	0.50	0.05	0.02	0.00	100.00	5.12

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS C
23887 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	0.75	2.33	1.99	0.37	0.14	0.03	0.00	5.61	7.45
NNE	0.00	0.33	1.31	1.33	0.27	0.05	0.01	0.00	3.29	7.73
NE	0.00	0.39	1.65	1.72	0.25	0.04	0.00	0.00	4.05	7.48
ENE	0.00	0.21	0.67	0.58	0.08	0.00	0.00	0.00	1.54	6.92
E	0.00	0.09	2.24	1.11	0.14	0.00	0.00	0.00	4.59	5.93
ESE	0.00	0.38	1.26	0.93	0.14	0.01	0.00	0.00	2.72	6.73
SE	0.00	0.54	2.51	3.32	0.57	0.13	0.03	0.00	7.11	8.32
SSE	0.00	0.28	1.78	3.20	0.78	0.13	0.04	0.00	6.22	9.15
S	0.00	0.50	4.91	7.90	3.44	1.69	0.72	0.22	19.39	11.30
SSW	0.00	0.21	2.72	5.51	2.82	1.49	0.51	0.09	13.30	11.89
SW	0.00	0.30	3.24	5.07	2.16	0.78	0.28	0.04	11.87	10.62
WSW	0.00	0.21	1.02	1.66	0.58	0.15	0.07	0.00	3.70	9.67
W	0.00	0.58	1.48	1.00	0.36	0.08	0.02	0.00	3.52	7.34
WNW	0.00	0.42	1.29	0.73	0.15	0.03	0.01	0.00	2.63	6.59
NW	0.00	0.70	2.16	1.15	0.29	0.11	0.05	0.02	4.48	7.04
NNW	0.00	0.55	1.33	0.83	0.16	0.03	0.02	0.00	2.93	6.57
CALM	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	0.00
TOTAL	3.23	7.29	31.89	38.04	12.57	4.87	1.79	0.36	100.00	9.02

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS D
46175 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	0.32	1.43	1.86	5.57	2.70	1.17	0.30	13.35	15.47
NNE	0.00	0.18	0.63	0.81	2.25	1.34	0.52	0.15	5.86	15.65
NE	0.00	0.24	0.71	0.83	1.42	0.78	0.37	0.06	4.42	14.13
ENE	0.00	0.13	0.29	0.21	0.28	0.11	0.04	0.01	1.07	10.87
E	0.00	0.55	1.16	0.34	0.31	0.08	0.02	0.01	2.46	6.95
ESE	0.00	0.25	0.78	0.30	0.22	0.06	0.03	0.01	1.65	7.77
SE	0.00	0.34	1.36	1.17	1.23	0.30	0.11	0.01	4.52	10.31
SSE	0.00	0.19	1.06	1.47	1.67	0.50	0.17	0.04	5.11	12.06
S	0.00	0.32	1.92	3.40	6.74	4.38	2.58	0.60	19.92	16.39
SSW	0.00	0.11	0.66	1.53	4.34	2.53	1.28	0.32	10.79	16.93
SW	0.00	0.12	0.61	1.37	2.96	1.42	0.48	0.09	7.06	15.14
WSW	0.00	0.11	0.28	0.50	0.83	0.29	0.07	0.00	2.08	12.90
W	0.00	0.32	0.82	0.65	0.65	0.20	0.04	0.01	2.69	9.86
WNW	0.00	0.26	1.15	0.88	0.83	0.25	0.11	0.02	3.48	10.19
NW	0.00	0.36	1.80	1.41	2.07	0.94	0.43	0.07	7.08	12.33
NNW	0.00	0.20	0.99	0.97	2.43	1.09	0.45	0.16	6.29	14.44
CALM	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.00
TOTAL	2.16	5.99	15.67	13.69	33.80	16.97	7.87	1.86	100.00	13.94

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS E
20071 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	0.86	3.88	10.33	0.69	0.12	0.01	0.00	15.89	8.58
NNE	0.00	0.39	1.54	2.30	0.26	0.08	0.01	0.00	4.59	8.09
NE	0.00	0.66	1.55	1.13	0.11	0.01	0.00	0.00	3.49	6.43
ENE	0.00	0.36	0.73	0.26	0.01	0.00	0.00	0.00	1.37	5.12
E	0.00	1.96	3.05	0.43	0.03	0.00	0.00	0.00	5.48	4.10
ESE	0.00	0.78	1.92	0.24	0.03	0.00	0.00	0.00	2.98	4.48
SE	0.00	1.05	2.59	1.01	0.20	0.03	0.01	0.00	4.90	5.90
SSE	0.00	0.46	1.52	1.32	0.26	0.01	0.00	0.00	3.58	7.19
S	0.00	0.51	2.52	3.36	0.70	0.18	0.04	0.00	7.32	8.60
SSW	0.00	0.17	1.03	1.38	0.20	0.08	0.03	0.00	2.90	8.71
SW	0.00	0.35	0.92	1.34	0.18	0.04	0.01	0.00	2.86	8.03
WSW	0.00	0.19	0.47	0.43	0.05	0.00	0.00	0.00	1.16	6.88
W	0.00	0.65	1.91	1.95	0.10	0.02	0.00	0.00	4.63	6.83
WNW	0.00	0.40	2.27	5.08	0.19	0.01	0.01	0.00	7.97	8.15
NW	0.00	0.61	4.23	9.58	0.28	0.06	0.02	0.00	14.79	8.24
NNW	0.00	0.48	2.63	6.46	0.27	0.02	0.01	0.00	9.88	8.39
CALM	6.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.20	0.00
TOTAL	6.20	9.89	32.79	46.60	03.61	0.70	0.18	0.01	100.00	7.13

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS F
19942 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.5 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	1.90	9.46	0.42	0.12	0.01	0.00	0.01	11.90	5.06
NNE	0.00	0.77	3.01	0.07	0.03	0.01	0.00	0.00	3.88	4.67
NE	0.00	1.13	2.97	0.10	0.03	0.00	0.00	0.00	4.22	4.32
ENE	0.00	0.65	1.26	0.03	0.00	0.00	0.00	0.00	1.93	3.99
E	0.00	3.08	3.51	0.07	0.00	0.00	0.00	0.00	6.66	3.45
ESE	0.00	1.58	2.10	0.07	0.00	0.01	0.00	0.00	3.76	3.61
SE	0.00	1.86	2.79	0.19	0.03	0.00	0.00	0.00	4.86	3.88
SSE	0.00	1.06	1.97	0.15	0.06	0.01	0.01	0.00	3.24	4.31
S	0.00	1.42	2.70	0.25	0.18	0.03	0.02	0.00	4.59	4.89
SSW	0.00	0.61	1.15	0.09	0.08	0.03	0.02	0.00	1.97	5.06
SW	0.00	0.69	1.35	0.07	0.03	0.01	0.00	0.00	2.15	4.28
WSW	0.00	0.52	0.99	0.03	0.02	0.00	0.00	0.00	1.56	4.15
W	0.00	1.40	3.32	0.18	0.02	0.00	0.00	0.00	4.92	4.40
WNW	0.00	0.94	5.47	0.38	0.06	0.01	0.00	0.00	6.85	5.28
NW	0.00	1.68	10.47	0.65	0.06	0.01	0.01	0.00	12.86	5.27
NNW	0.00	1.11	6.59	0.34	0.03	0.02	0.00	0.00	8.08	5.08
CALM	16.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.57	0.00
TOTAL	16.57	20.40	59.10	3.05	0.72	0.11	0.04	0.01	100.00	3.88

YUCCA FLAT SURFACE WINDS 1961-1978
ANNUAL FREQUENCY DISTRIBUTION (IN PERCENT)
STABILITY CLASS G
23298 OBSERVATIONS

WIND SPEED (MPH)

	CALM	.9 - 3	3 - 7	7 - 12	12 - 18	18 - 24	24 - 32	32	%	AVG. SPEED (MPH)
N	0.00	3.91	2.29	0.00	0.00	0.00	0.00	0.00	6.20	2.64
NNE	0.00	1.73	0.84	0.00	0.00	0.00	0.00	0.00	2.57	2.58
NE	0.00	2.26	1.09	0.00	0.00	0.00	0.00	0.00	3.35	2.56
ENE	0.00	1.14	0.50	0.00	0.00	0.00	0.00	0.00	1.64	2.55
E	0.00	4.74	1.67	0.00	0.00	0.00	0.00	0.00	6.41	2.48
ESE	0.00	2.27	1.10	0.00	0.00	0.00	0.00	0.00	3.37	2.57
SE	0.00	3.64	1.38	0.00	0.00	0.00	0.00	0.00	5.02	2.53
SSE	0.00	1.79	0.85	0.00	0.00	0.00	0.00	0.00	2.64	2.57
S	0.00	2.75	0.88	0.00	0.00	0.00	0.00	0.00	3.63	2.46
SSW	0.00	1.11	0.34	0.00	0.00	0.00	0.00	0.00	1.46	2.46
SW	0.00	1.53	0.55	0.00	0.00	0.00	0.00	0.00	2.08	2.47
WSW	0.00	1.15	0.33	0.00	0.00	0.00	0.00	0.00	1.48	2.43
W	0.00	3.04	1.22	0.00	0.00	0.00	0.00	0.00	4.26	2.52
WNW	0.00	1.78	0.94	0.00	0.00	0.00	0.00	0.00	2.73	2.60
NW	0.00	3.70	2.05	0.00	0.00	0.00	0.00	0.00	5.75	2.64
NNW	0.00	2.37	1.66	0.00	0.00	0.00	0.00	0.00	4.03	2.71
CALM	43.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.40	0.00
TOTAL	43.40	38.90	17.69	0.00	0.00	0.00	0.00	0.00	100.00	1.45

APPENDIX J

Summary of Inversion Statistics

by R. F. Quiring

U. S. Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Research Laboratories

Air Resources Laboratory
Las Vegas, Nevada
January 1973

APPENDIX J

ARLV-351-37

SUMMARY OF INVERSION STATISTICS

R. F. Quiring

Computer program INVERS was developed to generate inversion statistics for definable inversion parameters from the MDSAR System's CPD and SLD data bases; that is, from the Yucca Flat rawinsonde data. The definition of an inversion, for purposes of this summary, is consistent with observational procedures in that an inversion is defined as a segment of the temperature profile in which the temperature decrease with height is at a rate of 1°C per kilometer or less.

Frequency of occurrence of inversions and distributions of the various parameter values are provided as a function of season, time of day, wind bearing and wind speed. Inversions are categorized in four classes (shown schematically in Figure 1) which are defined as follows: SFC, surface based inversion; E1, first elevated inversion in the absence of a surface based inversion; E1*, first elevated inversion when a surface based inversion exists; E2, second elevated inversion. Categorization as a function of wind is accomplished through the mean vector wind between the surface and the 500 millibar level. Four bearing classes and three speed classes are formed. Speed classes are established by the upper and lower quartile values of speed. The extreme values of speed for each class are given in summaries.

The various inversion parameters considered in this summary are defined as follows:

<u>Inversion Base</u>. The height above ground level of the base of a layer which qualifies as an inversion.

<u>Inversion Depth</u>. The difference in height between the base and the top of the inversion layer.

<u>Inversion Intensity</u>. Derived from the expression,

$$\text{Stability} = \frac{g}{\bar{T}}\left(\frac{\Delta T}{\Delta Z} + A\right) ,$$

in which g = acceleration of gravity (9.80616 m/sec²),
T = average temperature for the layer in degrees Kelvin,
AT = temperature at the top of the layer minus the temperature at the bottom of the layer,
AZ = depth of the layer in meters,
A = dry adiabatic lapse rate (-.009767°C/m).

Stabilities for individual layers are weighted proportionately in the case of complex inversions composed of several qualifying layers. The lower limit of stability for inversions is approximately 30 x 10^{-5} sec^{-2}.

Wind Shear. The change in the magnitude of the vector wind per unit depth through the inversion layer. The computer program works with the u and v components of the wind which are assumed to change linearly with height between CPD levels for which winds are given in the data base.

Direction Change. The angular change in the direction of the wind between the base and the top of the inversion. Veering of the wind with height is indicated by positive changes; backing by negative changes. The determination of wind direction at the base and top of the inversion is based on the assumption of linearity in the same manner as for wind shear.

The output from computer programs INVERS is in four summary formats. Figures 2 through 5 are sample formats. The format in Figure 2 is based on observations with complete wind data from the surface through the 500 millibar level and summarizes inversion statistics by season and time of day as a function of wind bearing and wind speed. The format in Figure 3 includes observations without wind and provides summaries by month and time of day. This provides more precise definition of the annual cycle. The wind shear and direction change portions of this summary do, however, require the wind data be available in and near an inversion layer. This requirement leads to a discrepancy in the bottom portion of the summary, where the percentage is based on N1 rather than N1 minus the number of observations without wind. The format in Figure 4 provides the joint frequency of occurrence of inversion depth and intensity by month and time of day for each class of inversion. The format in Figure 5 extends the range of stability beyond inversions all the way to superadiabatic. In this summary, distributions are provided by month and time of day for individual 1500-foot layers between the surface and 19,000 feet MSL and by successively incrementing the surface based layer by 1500 feet.

The computer output for two observations per day consists of 318 pages. This rather voluminous output was considered essential in order to provide sufficient detail to answer the great variety of questions that are asked concerning inversions and stability. The large volume has the undesirable effect of obscuring the major features of the daily and annual cycles of inversion frequency and the inversion parameter values. The condensed tabulation in Tables 1 through 10 are provided to highlight these features.

The condensed tabulations are for the most part self explanatory; however, there is one major departure from the computer output. Median values for the various distributions replace the mean and standard deviation given in the computer summaries. The median, determined by linear interpolation in each distribution, provides a better measure of the central tendency than the mean because of the skewness of the distributions.

Rather than attempt to describe the tables as they apply to the countless questions for which answers are sought in an inversion summary, the user is left to his wiles to find the best answer possible to the specific question which he may have at the moment. The reader should keep in mind that the tabulations presented here are a summary of a part of a summary and that much greater detail can be obtained from the 318 pages of computer output if needed.

Frequencies of occurrence are expressed as percentages in the condensed tabulations. This facilitates comparing frequencies for a given month, hour, or category with another but obscures the number of observations on which the frequencies and inversion parameter values are based. This is especially important in the seasonal tabulations where stratification of the data results in very few observations in some categories so that apparent differences may be due to the unreliability of small samples rather than being indicative of real differences. In Tables 1 and 6, the percentages in a given column are based on the number of observations at the bottom of the column. In the remaining tables, percentages within a given bearing category are based on the number of observations in each speed category. For example, in Table 2, there are 427 observations for the winter season (December-February), of which 39.3% (168 observations) are in the 001 to 090 bearing category. One fourth of these observations (42), are in the speed range 2.2 to 14.1 knots, one-half (84 observations) are in the speed range 14.2 to 31.5 knots, and the remaining fourth (42 observations) are in the speed range 32.2 to 62.1 knots. The number of observations with surface based inversions in each speed category are respectively, 0 = 0% x 42, 3 = 3.6% x 84, and 3 = 7.1% x 42. There are 6 surface based inversions in this bearing category which is 3.6% of the 168 observations in this category as shown by the inversion frequency for all speeds of the bearing category. Comparison of median values of surface based inversion parameters with respect to the bearing and speed of the wind is risky for the hour 00Z during the winter season because of the small samples upon which the median values are based.

Figure 6 is provided to facilitate interpretation of inversion intensity by enabling the determination of an equivalent uniform lapse rate as a function of stability and average temperature. For example, the median intensity and

depth of surface based inversions given in Table 6 for June are 142 x 10^{-5} sec^{-2} and 700 feet. An average temperature near 15°C for the inversion layer is reasonable for June. Entering Figure 6 with 142 and 15, yields a temperature increase of about 10°C per thousand feet which is about 7°C through the median depth of surface based inversions at 1200Z in June. This should not be construed as a median lapse rate because the intensity and depth were not based on joint distributions. These joint distributions, which are included in the computer output in format shown by Figure 4, can be examined if greater precision or detail is required.

This informal report is intended for ARL-LV use only. I am considering more formal publication for broader dissemination and therefore solicit critical comments and suggestions toward that end.

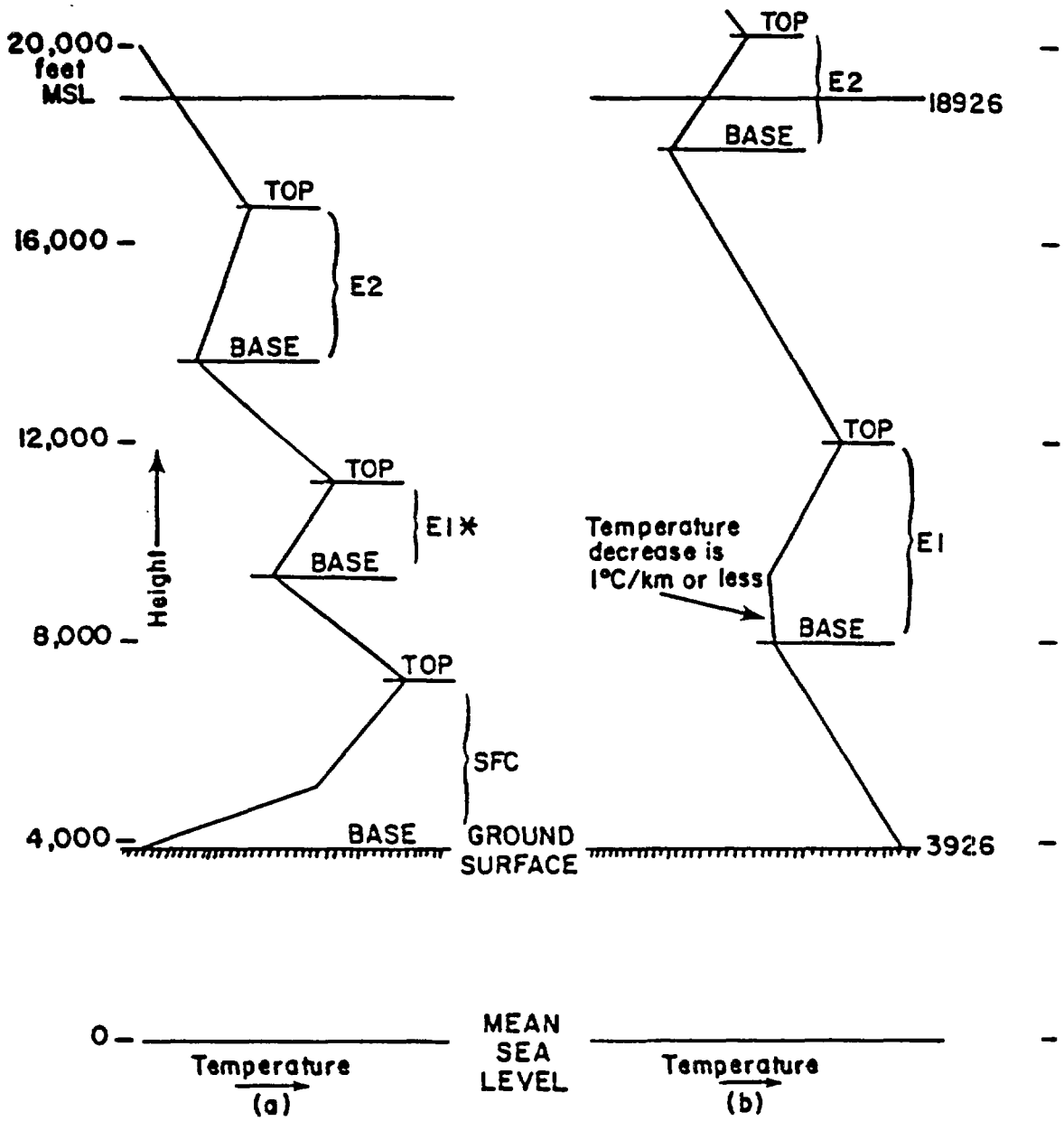


Figure 1. Schematic Representation of Inversion Classes. (a) With surface based inversion. (b) Without surface based inversion.

WEATHER STATION UCC
SUMMARY OF INVERSION STATISTICS

MONTHS = DEC-JAN-FEB HOUR = 1200 GMT

MEAN VECTOR WIND (SURFACE TO 500MB LEVEL) BEARING = 001-090 SPEED = 3.0 - 12.9 KNOTS

CUMULATIVE PERCENTAGE FREQUENCY INVERSION BASE BELOW SPECIFIED HEIGHT ABOVE SURFACE (FEET X 100)

HGT	E1	E1*	E2
5	33.3	.0	.0
10	33.3	.0	.0
15	33.3	10.0	.0
20	33.3	10.0	.0
25	33.3	13.3	.0
30	33.3	13.3	.0
35	33.3	20.0	10.0
40	33.3	43.3	10.0
45	33.3	60.0	20.0
50	33.3	76.7	40.0
55	33.3	80.0	40.0
60	33.3	80.0	50.0
65	33.3	80.0	50.0
70	66.7	86.7	60.0
75	66.7	90.0	60.0
80	66.7	93.3	63.0
85	66.7	93.3	60.0
90	66.7	96.7	80.0
95	66.7	96.7	80.0
100	66.7	96.7	80.0
105	66.7	96.7	80.0
110	66.7	96.7	80.0
115	66.7	96.7	80.0
120	66.7	100.0	80.0
125	100.0	.0	80.0
130	.0	.0	80.0
135	.0	.0	80.0
140	.0	.0	100.0
145	.0	.0	.0
150	.0	.0	.0
N3	3	30	10
PCT	4.5	44.8	14.9
AV	63.6	45.7	74.3
SD	40.5	21.0	36.6

CUMULATIVE PERCENTAGE FREQUENCY INVERSION DEPTH LESS THAN SPECIFIED VALUE (FEET X 100)

DEP	SFC	E1	E1*	E2
1	.0	.0	3.3	.0
2	.0	.0	3.3	.0
3	.0	.0	3.3	.0
4	3.3	.0	16.7	.0
5	6.7	.0	26.7	.0
6	16.0	.0	33.3	10.0
7	13.3	.0	43.3	50.0
8	13.3	.0	56.7	50.0
9	23.3	.0	63.3	80.0
10	33.3	33.3	63.3	80.0
11	40.3	33.3	63.3	90.0
12	50.3	33.3	70.0	90.0
13	65.0	33.3	76.7	90.0
14	75.0	33.3	76.7	90.0
15	80.0	33.3	80.0	100.0
16	93.3	33.3	83.0	.0
17	86.7	66.7	80.0	.0
18	96.7	66.7	83.3	.0
19	96.7	66.7	83.3	.0
20	80.3	66.7	86.7	.0
25	95.0	66.7	90.0	.0
30	95.0	100.0	96.7	.0
35	30.3	.0	96.7	.0
40	30.3	.0	100.0	.0
45	100.0	.0	.0	.0
50	.0	.0	.0	.0
55	.0	.0	.0	.0
60	.0	.0	.0	.0
65	.0	.0	.0	.0
70	.0	.0	.0	.0
N3	60	3	30	16
PCT	89.6	4.5	44.8	14.9
AV	12.0	10.0	10.0	8.1
SD	6.9	0.3	9.6	2.6

CUMULATIVE PERCENTAGE FREQUENCY INTENSITY OF INVERSION LAYER LESS THAN SPECIFIED VALUE (SEC E-2 X 10E-5)

INT	SFC	E1	E1*	E2
40	1.7	66.7	20.0	30.0
60	5.0	66.7	66.7	100.0
80	16.7	100.0	80.0	.0
100	33.3	.0	36.7	.0
120	38.3	.0	100.0	.0
140	50.0	.0	.0	.0
160	66.7	.0	.0	.0
180	70.3	.0	.0	.0
200	85.0	.0	.0	.0
220	93.3	.0	.0	.0
240	93.3	.0	.0	.0
260	98.3	.0	.0	.0
280	100.0	.0	.0	.0
300	.0	.0	.0	.0
350	.0	.0	.0	.0
400	.0	.0	.0	.0
450	.0	.0	.0	.0
500	.0	.0	.0	.0
550	.0	.0	.0	.0
600	.0	.0	.0	.0
650	.0	.0	.0	.0
700	.0	.0	.0	.0
750	.0	.0	.0	.0
N3	60	3	30	10
PCT	89.6	4.5	44.8	14.9
AV	138.	43.	58.	44.
SD	55.	15.	20.	0.

CUMULATIVE PERCENTAGE FREQUENCY WIND SHEAR THRU INVERSION LAYER LESS THAN SPECIFIED VALUE (SEC E-1 X 10E-4)

SHEAR	SFC	E1	E1*	E2
25	11.7	33.3	13.3	20.0
50	46.7	33.3	26.7	40.0
75	78.3	66.7	46.7	60.0
100	88.3	100.0	76.7	100.0
125	93.3	.0	90.0	.0
150	95.0	.0	100.0	.0
175	96.7	.0	.0	.0
200	98.3	.0	.0	.0
225	98.3	.0	.0	.0
250	98.3	.0	.0	.0
275	100.0	.0	.0	.0
300	.0	.0	.0	.0
325	.0	.0	.0	.0
350	.0	.0	.0	.0
375	.0	.0	.0	.0
400	.0	.0	.0	.0
425	.0	.0	.0	.0
450	.0	.0	.0	.0
475	.0	.0	.0	.0
500	.0	.0	.0	.0
550	.0	.0	.0	.0
600	.0	.0	.0	.0
650	.0	.0	.0	.0
700	.0	.0	.0	.0
750	.0	.0	.0	.0
800	.0	.0	.0	.0
850	.0	.0	.0	.0
900	.0	.0	.0	.0
950	.0	.0	.0	.0
1000	.0	.0	.0	.0
1050	.0	.0	.0	.0
N3	60	3	30	10
PCT	89.6	4.5	44.8	14.9
AV	57.	58.	73.	59.
SD	44.	25.	39.	26.

CUMULATIVE PERCENTAGE FREQUENCY WIND DIRECTION CHANGE BASE TO TOP OF INVERSION LAYER LESS THAN SPECIFIED VALUE (DG)

CHG	SFC	E1	E1*	E2
-155	8.3	.0	.0	.0
-135	13.3	.0	.0	.0
-115	15.0	.0	.0	.0
-95	23.0	.0	.0	.0
-85	21.7	.0	.0	.0
-75	25.0	.0	.0	.0
-65	25.0	.0	.0	.0
-55	25.0	.0	.0	.0
-45	30.0	.0	.0	.0
-35	30.0	.0	.0	.0
-25	31.7	.0	6.7	.0
-15	35.0	.0	6.7	.0
-5	36.7	.0	16.0	16.0
5	43.3	33.3	36.7	30.0
15	51.7	33.3	46.7	70.0
25	61.7	33.3	63.3	90.0
35	65.0	66.7	73.3	90.0
45	68.3	66.7	76.7	90.0
55	73.3	66.7	83.3	90.0
65	80.0	66.7	86.7	90.0
75	83.3	66.7	90.0	100.0
85	85.0	66.7	90.0	.0
95	90.0	66.7	93.3	.0
115	93.3	66.7	100.0	.0
135	95.0	100.0	.0	.0
155	96.7	.0	.0	.0
180	100.0	.0	.0	.0
N3	60	3	30	10
PCT	89.6	4.5	44.8	14.9
/AV/	71.	50.	29.	16.
/SD/	55.	50.	29.	18.

INVERSION CLASSES ARE
SFC = INVERSION WITH BASE AT GROUND SURFACE.
E1 = FIRST ELEVATED INVERSION IN THE ABSENCE OF A SURFACE BASED INVERSION.
E1* = FIRST ELEVATED INVERSION WITH A SURFACE BASED INVERSION PRESENT.
E2 = SECOND ELEVATED INVERSION (INVERSION ABOVE EITHER E1 OR E1*).

NUMBER OF OBSERVATIONS
N1 = 800 TOTAL OBSERVATIONS FOR THE PERIOD INCLUDING ONLY THOSE WITH WIND DATA.
N2 = 67 THIS BEARING AND SPEED CATEGORY = 8.4 PERCENT OF N1.
N3 = NUMBER USED IN COMPUTING CUMULATIVE PERCENTAGES (SEE COLUMN SUMMARY).
PCT = N3 EXPRESSED AS PERCENT OF N2 (SEE COLUMN SUMMARY).

Figure 2. Sample Format 1 -- Summary of Inversion Statistics by Season as a Function of Wind Bearing and Speed

WEATHER STATION UCC
SUMMARY OF INVERSION STATISTICS

MONTHS = JANUARY HOUR = 1200 GMT

MEAN VECTOR WIND (SURFACE TO 500MB LEVEL) BEARING = ALL SPEED = ALL

CUMULATIVE PERCENTAGE FREQUENCY INVERSION BASE BELOW SPECIFIED HEIGHT ABOVE SURFACE (FEET X 100)

HGT	E1	E1*	E2
5	4.8	.0	.0
10	14.3	2.3	.0
15	14.3	5.6	.0
20	19.0	7.3	.0
25	23.8	15.3	.0
30	30.1	26.6	3.0
35	47.6	38.4	4.5
40	47.6	53.1	9.1
45	61.9	65.8	13.6
50	66.7	71.8	16.7
55	71.4	75.7	24.2
60	71.4	79.1	27.3
65	81.0	84.2	36.4
70	81.0	85.9	40.9
75	81.0	87.0	53.0
80	90.5	88.7	59.1
85	95.2	90.4	66.7
90	95.2	92.7	68.2
95	95.2	93.0	72.7
100	100.0	94.4	78.0
105	.0	95.5	81.0
110	.0	96.0	86.4
115	.0	96.6	86.4
120	.0	97.7	86.4
125	.0	98.9	89.4
130	.0	99.4	90.9
135	.0	99.4	92.4
140	.0	100.0	97.0
145	.0	.0	97.0
150	.0	.0	100.0
N3	21	177	66
PCT	7.0	59.4	22.1
AV	42.6	45.4	70.7
SD	25.5	25.5	29.0

CUMULATIVE PERCENTAGE FREQUENCY INVERSION DEPTH LESS THAN SPECIFIED VALUE (FEET X 100)

DEP	SFC	E1	E1*	E2
1	.0	.0	.0	.0
2	.4	4.8	.3	.0
3	3.0	9.3	.6	1.5
4	17.0	9.3	4.0	5.1
5	23.4	14.3	15.8	10.6
6	31.6	19.0	23.7	19.7
7	37.5	23.8	31.6	31.8
8	42.8	33.3	40.7	49.5
9	48.8	42.9	49.7	55.1
10	59.1	47.6	57.6	63.6
11	62.8	52.4	62.1	63.7
12	68.4	61.9	65.8	72.7
13	74.3	65.7	70.6	78.8
14	77.0	65.7	73.4	83.3
15	79.6	90.5	76.3	83.3
16	81.8	90.5	78.8	83.3
17	84.8	90.5	81.9	86.4
18	85.5	95.2	81.9	89.4
19	86.6	95.2	83.1	89.4
20	87.0	95.2	86.4	93.9
25	90.7	100.0	93.2	98.5
30	94.1	.0	98.9	98.5
35	95.9	.0	100.0	98.5
40	97.4	.0	.0	100.0
45	98.9	.0	.0	.0
50	99.3	.0	.0	.0
55	99.6	.0	.0	.0
60	99.6	.0	.0	.0
65	100.0	.0	.0	.0
70	.0	.0	.0	.0
N3	269	21	177	66
PCT	90.3	7.0	59.4	22.1
AV	11.4	10.2	11.3	10.2
SD	9.5	4.9	6.7	5.0

CUMULATIVE PERCENTAGE FREQUENCY INTENSITY OF INVERSION LAYER LESS THAN SPECIFIED VALUE (SEC E-2 X 10E-5)

INT	SFC	E1	E1*	E2
40	2.6	42.9	28.8	30.3
60	10.0	71.4	74.0	80.3
80	23.4	85.7	92.1	98.9
100	37.5	95.2	96.6	97.0
120	49.4	95.2	98.9	100.0
140	59.1	95.2	100.0	.0
160	71.0	95.2	.0	.0
180	79.2	95.2	.0	.0
200	86.2	95.2	.0	.0
220	90.3	100.0	.0	.0
240	92.6	.0	.0	.0
260	94.8	.0	.0	.0
280	97.4	.0	.0	.0
300	97.8	.0	.0	.0
350	99.3	.0	.0	.0
400	100.0	.0	.0	.0
450	.0	.0	.0	.0
500	.0	.0	.0	.0
550	.0	.0	.0	.0
600	.0	.0	.0	.0
650	.0	.0	.0	.0
700	.0	.0	.0	.0
750	.0	.0	.0	.0
N3	269	21	177	66
PCT	90.3	7.0	59.4	22.1
AV	132.	57.	53.	52.
SD	65.	36.	18.	18.

CUMULATIVE PERCENTAGE FREQUENCY WIND SHEAR THRU INVERSION LAYER LESS THAN SPECIFIED VALUE (SEC E-1 X 10E-4)

SHEAR	SFC	E1	E1*	E2
25	3.6	5.3	8.9	5.0
50	19.9	5.3	23.8	16.7
75	41.0	31.6	39.9	46.7
100	58.2	47.4	57.1	60.0
125	61.4	52.6	72.0	68.3
150	67.3	73.7	79.2	78.3
175	73.7	73.7	82.7	85.0
200	77.7	73.7	85.7	88.3
225	81.3	84.2	88.1	93.0
250	82.5	84.2	88.7	90.0
275	85.3	84.2	89.3	91.7
300	86.5	84.2	91.1	93.3
325	87.6	84.2	91.1	95.0
350	88.4	84.2	91.1	95.0
375	88.8	89.5	91.7	95.0
400	90.0	89.5	91.7	95.0
425	93.4	89.5	93.5	95.0
450	93.8	89.5	93.5	95.0
475	92.0	89.5	93.5	95.0
500	92.0	94.7	94.0	95.0
550	93.6	100.0	94.0	95.0
600	94.8	.0	95.8	96.7
650	95.6	.0	96.4	96.7
700	96.4	.0	97.0	96.7
750	96.8	.0	97.6	96.7
800	97.2	.0	97.6	96.7
850	98.4	.0	97.6	96.7
900	98.4	.0	98.2	96.7
950	98.4	.0	98.8	96.7
1000	98.8	.0	98.8	96.7
1050	100.0	.0	100.0	100.0
N3	251	19	168	60
PCT	84.2	6.4	56.4	20.1
AV	167.	158.	141.	149.
SD	197.	138.	181.	250.

CUMULATIVE PERCENTAGE FREQUENCY WIND DIRECTION CHANGE BASE TO TOP OF INVERSION LAYER LESS THAN SPECIFIED VALUE (DG)

CHG	SFC	E1	E1*	E2
-155	3.2	5.3	1.2	.0
-135	7.2	5.3	2.4	.0
-115	11.2	5.3	2.4	1.7
-95	17.9	5.3	4.2	1.7
-85	21.5	5.3	4.8	1.7
-75	24.3	5.3	4.8	1.7
-65	27.9	5.3	6.0	1.7
-55	30.3	5.3	6.5	1.7
-45	32.7	5.3	6.5	1.7
-35	33.9	5.3	6.5	1.7
-25	35.9	5.3	7.7	1.7
-15	37.5	5.3	11.9	6.7
-5	39.8	15.8	16.1	20.0
5	53.4	63.2	47.0	73.3
15	59.4	89.5	73.8	96.0
25	64.9	94.7	82.7	95.0
35	70.1	100.0	86.3	95.0
45	71.3	.0	89.9	95.0
55	74.1	.0	91.1	95.0
65	75.7	.0	92.3	96.7
75	78.5	.0	92.9	96.7
85	80.1	.0	93.5	96.7
95	83.7	.0	95.2	98.3
115	88.0	.0	96.4	98.3
135	91.2	.0	97.6	100.0
155	95.0	.0	98.2	.0
180	100.0	.0	100.0	.0
N3	251	19	168	60
PCT	84.2	6.4	56.4	20.1
/AV/	71.	15.	26.	12.
/SD/	54.	34.	43.	25.

INVERSION CLASSES ARE
SFC = INVERSION WITH BASE AT GROUND SURFACE.
E1 = FIRST ELEVATED INVERSION IN THE ABSENCE OF A SURFACE BASED INVERSION.
E1* = FIRST ELEVATED INVERSION WITH A SURFACE BASED INVERSION PRESENT.
E2 = SECOND ELEVATED INVERSION (INVERSION ABOVE EITHER E1 OR E1*).

NUMBER OF OBSERVATIONS
N1 = 298 TOTAL OBSERVATIONS FOR THE PERIOD INCLUDING THOSE WITHOUT WIND DATA.
N2 = 298 THIS BEARING AND SPEED CATEGORY = 100.0 PERCENT OF N1.
N3 = NUMBER USED IN COMPUTING CUMULATIVE PERCENTAGES (SEE COLUMN SUMMARY).
PCT = N3 EXPRESSED AS PERCENT OF N2 (SEE COLUMN SUMMARY).

Figure 3. Sample Format 2 -- Summary of Inversion Statistics by Month

WEATHER STATION UCC
INVERSION INTENSITY VERSUS DEPTH OF INVERSION

INVERSION CLASS = SFC NUMBER OF OBSERVATIONS = 269

MONTH = JANUARY HOUR = 1200 GMT

INTENSITY

	40	60	80	100	120	140	160	180	200	220	240	260	280	300	350	400	450	500	550	600	650	700	750	ROW SUM	CUM
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.0	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	.4
3	.0	.0	.7	.4	.0	.0	.4	.0	.0	.6	.0	.0	.4	.4	.0	.4	.0	.0	.4	.0	.0	.0	.0	2.6	3.0
4	.0	.7	.6	1.9	1.5	2.2	1.5	.7	2.2	.7	.4	1.1	1.1	.0	.7	.0	.0	.4	.0	.0	.0	.0	.0	14.9	17.8
5	1.1	.4	.7	.4	1.1	.4	.0	.0	.4	.4	.4	.0	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	5.6	23.4
6	.4	1.9	.0	.4	.7	.4	.7	.4	.7	.7	.4	.4	.7	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	8.2	31.6
7	.7	.4	.7	.0	1.1	.0	.7	.4	.0	.7	.4	.4	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	5.9	37.5
8	.0	.0	1.9	.7	.0	.0	.4	.7	.0	.4	.4	.4	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.2	42.8
9	.0	.4	.7	.0	.0	1.1	.7	.7	1.1	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.2	48.0
10	.0	.0	1.1	1.9	.7	.4	2.6	2.2	1.5	.4	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	11.2	59.1
11	.4	.0	.7	.0	.4	.7	1.1	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	3.7	62.8
D 12	.0	.4	.7	.4	.4	.7	1.1	.7	.7	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.6	68.4
E 13	.0	1.1	.0	.7	1.9	1.1	.4	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.9	74.3
P 14	.0	.0	.0	.7	.4	.4	.7	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	77.0
T 15	.0	.0	.0	.7	.7	.4	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	79.6
H 16	.0	.0	.0	.4	.4	.4	.4	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.2	81.8
17	.0	.4	.4	.0	.4	.7	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.2	84.0
18	.0	.4	.4	.4	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.5	85.5
19	.0	.0	.0	.7	.0	.4	.0	.0	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1	86.6
20	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	87.0
25	.0	.0	.4	1.5	1.5	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	3.7	90.7
30	.0	.0	1.5	1.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	3.3	94.1
35	.0	.0	.7	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.9	95.9
40	.0	.4	.7	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.5	97.4
45	.0	.4	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.5	98.9
50	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	99.3
55	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	99.6
60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	99.6
65	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	100.0
70	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
COL SUM	2.6	7.4	13.4	14.1	11.9	9.7	11.9	8.2	7.1	4.1	2.2	2.2	2.6	.4	1.5	.7	.0	.0	.0	.0	.0	.0	.0	100.0	
CUM	2.6	10.0	23.4	37.5	49.4	59.1	71.0	79.2	85.2	90.3	92.6	94.8	97.4	97.8	99.3	100.0	.0	.0	.0	.0	.0	.0	.0		

ORDINATES ARE UPPER LIMITS OF CLASS INTERVALS:
INTENSITY UNITS ARE SECONDS(EXP-2) TIMES 10(EXP-5).
DEPTH UNITS ARE FEET TIMES 100.

TABLE ENTRIES ARE PERCENT FREQUENCY:
(.0) INDICATES TRUE ZERO
(0.0) INDICATES AT LEAST ONE OCCURRENCE
BUT LESS THAN .05 PERCENT

Figure 4. Sample Format 3 -- Joint Frequency of Occurrence of Inversion Depth and Intensity by Inversion Classes

WEATHER STATION UCC
STABILITY SUMMARY - CUMULATIVE PERCENTAGE FREQUENCY

LAYER = 3924 TO 5380FT MSL HOUR = 1200 GMT

STABILITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
-200	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
-150	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
-100	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0
-80	.0	.6	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
-60	.0	.0	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
-40	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	6.0
-30	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	8.0
-20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	8.0
-10	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.4	.1
0	.3	.0	1.0	.3	.7	.0	.0	.0	.0	.3	.0	.4	.3
10	5.4	2.9	7.6	10.3	5.7	5.6	1.4	1.9	3.0	2.0	2.4	3.0	4.4
20	13.1	12.3	19.9	25.1	17.1	11.0	4.6	6.1	9.7	8.9	11.1	11.4	12.7
30	16.4	23.2	26.2	34.0	26.1	19.1	13.7	13.0	14.6	16.6	17.2	17.1	19.9
40	22.1	33.0	35.0	41.9	37.1	28.0	21.0	26.6	22.4	21.1	22.9	24.0	28.2
60	36.3	46.2	49.0	58.1	58.2	43.4	36.0	47.7	36.7	33.2	37.4	36.1	42.9
80	52.7	64.1	58.9	65.3	68.9	58.0	51.0	64.9	47.3	41.4	47.5	46.8	54.9
100	66.1	75.7	74.0	80.0	78.9	70.0	71.9	84.7	62.0	55.6	60.9	58.6	70.7
120	83.2	87.0	88.4	90.4	94.3	83.4	91.1	97.3	86.9	70.1	76.1	70.4	86.3
140	94.0	96.0	99.7	97.6	99.7	98.3	99.0	100.0	97.5	89.1	93.3	91.3	96.2
160	96.7	99.3	100.0	93.7	99.7	99.7	100.0	.0	100.0	99.0	96.3	97.3	99.3
180	100.0	100.0	.0	100.0	100.0	100.0	.0	.0	.0	100.0	100.0	99.6	100.0
200	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	99.6	100.0
220	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100.0	100.0
240	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
260	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
280	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
300	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
350	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
400	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
450	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
500	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
550	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
600	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
650	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
700	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
750	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
LOWEST	-1.7	2.0	-3.0	-.5	-4.0	1.1	1.7	5.6	2.0	-10.1	1.9	-40.0	-40.0
HIGHEST	177.3	163.6	150.2	166.9	161.7	167.6	143.6	139.2	158.9	174.4	172.3	230.0	200.0
AVERAGE	76.1	66.5	64.4	58.1	62.6	58.1	74.0	64.7	77.4	86.3	81.2	81.9	71.0
STD DEV	42.1	40.6	40.6	41.4	38.0	36.0	34.4	33.6	38.1	44.5	43.6	45.5	40.9
NO. OF OBS	298	276	302	291	299	288	292	262	237	344	297	263	3409

STABILITY UNITS ARE SECONDS(EXP-2) TIMES 10(EXP-5).

Figure 5. Sample Format 4 -- Stability Summary for Selected Layers

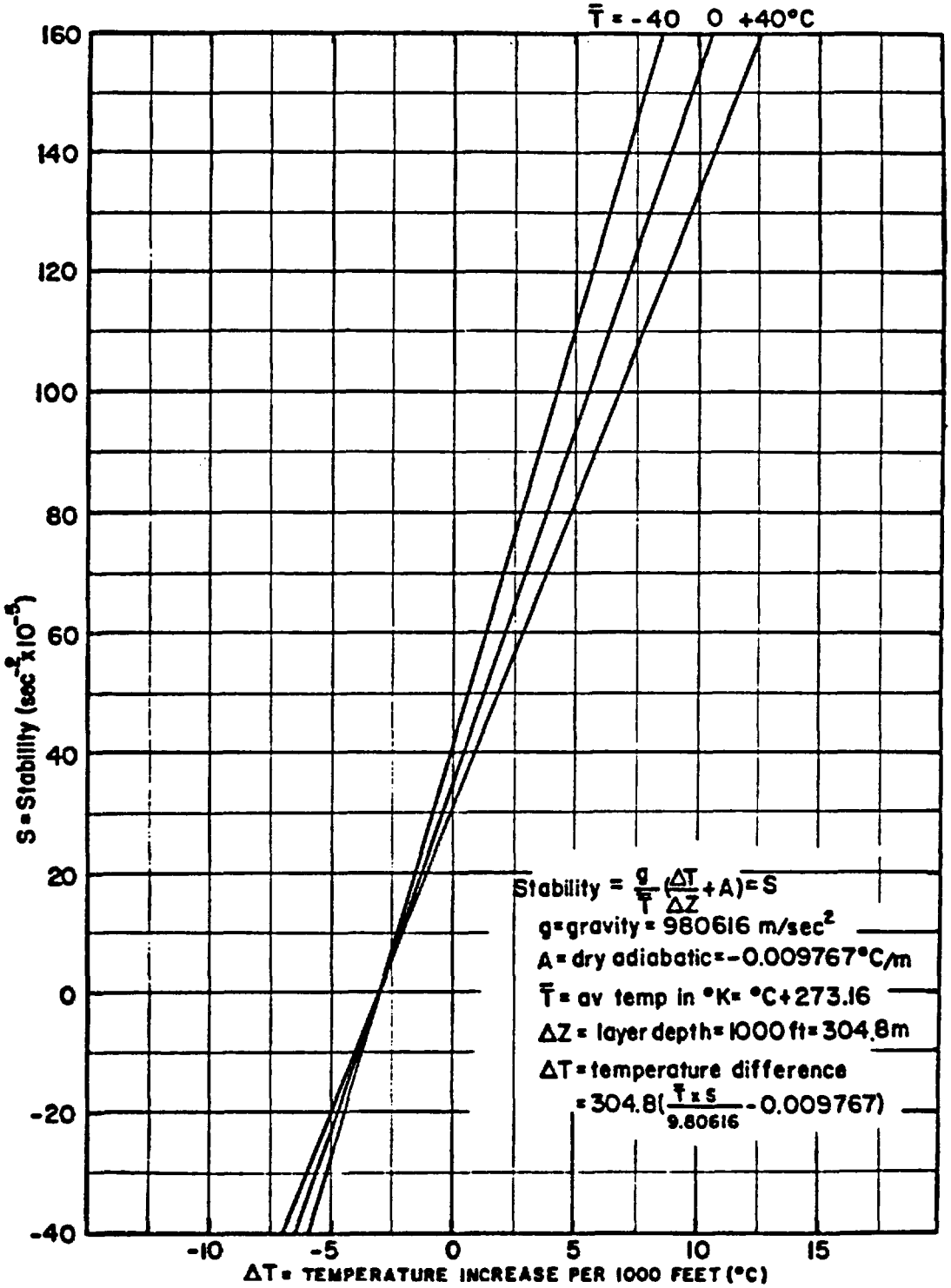


Figure 6. Lapse Rate as a Function of Stability and Average Temperature

Table 1

YUCCA FLAT INVERSION SUMMARY

Hour: 00Z

\# Height of inversion base is given in feet above ground surface.

Note: Monthly values are based on all observation--seasonal values on only those observations with wind.

	Dec	Jan	Feb	Winter	Mar	Apr	May	Spring	Jun	Jul	Aug	Summer	Sep	Oct	Nov	Fall
SURFACE BASED INVERSIONS																
Inversion Frequency (%)	2.2	5.2	0.7	2.6	0.7	0	0	0.2	0.7	0	1.9	0.9	2.0	0.7	0	0.7
Median Height of Base #(feet)	0	0	0	0	0			0	0		0	0	0	0		0
Median Depth (feet)	450	550	400	475	500			500	920		475	550	550	600		625
Median Intensity ($sec^{-2} \times 10^{-5}$)	39	40	55	42	34			34	33		110	80	75	192		75
Median Shear ($sec^{-1} \times 10^{-4}$)	188	138	258	156	230			230	145		63	75	175	142		163
Median Direction Change (deg)	30	3	3	3	4			4	69		0	5	55	16		20
INVERSION TYPE E1																
Inversion Frequency (%)	70.5	66.5	58.9	64.9	44.1	39.7	33.8	38.6	26.2	16.9	19.5	20.8	39.2	51.6	58.0	49.7
Median Height of Base #(feet)	4250	4287	5844	4665	7420	8750	10500	8774	10894	11500	12000	11208	8833	7250	5537	7183
Median Depth (feet)	922	872	886	894	668	811	717	720	783	600	675	690	814	846	795	825
Median Intensity ($sec^{-2} \times 10^{-5}$)	49	51	46	49	49	52	48	50	46	40	49	46	49	49	40	48
Median Shear ($sec^{-1} \times 10^{-4}$)	100	97	93	97	86	102	78	90	64	52	50	55	61	73	78	71
Median Direction Change (deg)	5	6	4	5	2	1	0	1	3	2	4	3	1	2	2	2
INVERSION TYPE E1*																
Inversion Frequency (%)	1.4	3.2	0	1.6	0	0	0	0	0	0	0.6	0.2	1.4	0	0	0.2
Median Height of Base #(feet)	5250	4375		4417							14370	14370	7750			2700
Median Depth (feet)	900	950		950							950	950	1050			0
Median Intensity ($sec^{-2} \times 10^{-5}$)	60	44		47							49	49	180			375
Median Shear ($sec^{-1} \times 10^{-4}$)	88	109		103							70	70	113			103
Median Direction Change (deg)	10	8		7							23	23	0			0
INVERSION TYPE E2																
Inversion Frequency (%)	22.3	21.9	9.2	18.0	2.0	4.1	0	2.0	2.0	0	0	0.7	7.4	8.5	13.3	10.0
Median Height of Base #(feet)	9351	6099	12750	8079	8750	12250		10250	13125			13125	9876	10250	9000	9625
Median Depth (feet)	888	784	850	839	675	800		750	825			825	817	1075	600	839
Median Intensity ($sec^{-2} \times 10^{-5}$)	45	44	50	45	39	47		46	39			39	40	42	46	43
Median Shear ($sec^{-1} \times 10^{-4}$)	106	103	69	99	88	113		96	106			106	113	100	75	94
Median Direction Change (deg)	2	2	1	2	-2	-2		-2	0			0	0	2	2	2
Number of Observations	139	155	141	427	152	146	154	440	149	154	154	447	148	153	150	431

Table 2

TUCCA FLAT INVERSION SUMMARY

Season: December - February

Hour: 00Z No. of Observations: 427

ø Above ground level

INVERSION TYPE

Surface to 500mb MLW Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)ø	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)ø	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)ø	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)ø	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		2.2-14.1	0						66.7	4416	966	44	69	10	0						11.9	13750	1350	43	69	10
to		14.2-31.5	3.6	0	425	45	63	10	61.9	4124	825	51	96	11	3.6	4250	1350	50	106	20	23.8	6000	750	43	92	8
090		32.2-62.1	7.1	0	650	39	188	2	50.0	4416	925	52	138	8	4.8	5500	900	40	113	5	19.0	9500	667	40	125	1
	39.3	All Speeds	3.6	0	467	40	150	5	60.1	4280	888	50	96	10	3.0	4417	950	45	109	13	19.6	6550	737	43	94	5
091		3.3-14.5	0						57.1	4332	1000	45	75	3	0						12.2	6500	850	50	50	2
to		14.7-24.5	3.1	0	1250	45	63	-10	69.1	4466	975	49	89	4	1.0	12600	2380	52	43	-15	18.6	9250	750	50	100	1
180		24.8-57.3	2.0	0	450	38	188	40	79.6	6051	950	50	138	0	0						24.5	11500	1400	40	150	0
	45.7	All Speeds	2.1	0	850	40	113	15	68.7	4845	978	49	103	2	0.5	12600	2380	52	43	-15	18.5	9333	929	48	105	1
181		2.1-11.6	0						61.5	3500	900	39	63	25	0						7.7	8250	1080	35	70	-15
to		12.2-27.4	0						76.0	5876	775	50	71	2	0						24.0	9750	800	47	125	-2
270		28.7-46.3	7.7	0	400	43	2374	-161	61.5	6750	800	52	113	3	7.7	6340	490	55	92	3	7.7	5060	1680	37	626	175
	11.9	All Speeds	2.0	0	400	43	2374	-161	68.6	5623	839	48	74	4	2.0	6340	490	55	92	3	15.7	7750	900	40	125	-2
271		6.3-11.4	0						33.3	3090	790	50	150	38	0						0					
to		12.2-24.5	0						71.4	5750	575	53	69	8	0						0					
360		24.6-28.2	0						33.3	14800	10	166	34	0	0						0					
	3.0	All Speeds	0						53.8	5750	575	54	69	7	0						0					
		2.1-14.0	0						59.8	4349	917	44	71	9	0						9.3	8000	1000	44	63	3
		14.0-28.2	2.3	0	483	43	56	0	68.5	4500	892	50	87	5	1.4	4125	2150	55	88	20	21.1	6450	790	46	93	3
ALL		28.2-62.1	5.6	0	467	40	188	5	62.6	5047	870	51	144	3	3.7	5500	850	40	108	5	20.6	9500	900	40	130	1
	100.0	All Speeds	2.6	0	475	42	156	3	64.9	4665	894	49	97	5	1.6	4417	950	47	103	7	18.0	8079	839	45	99	2

Table 3

YUCCA FLAT INVERSION SUMMARY

Season: March - May

Hour: 00Z No. of Observations: 440

Above ground level

INVERSION TYPE

Surface to 500mb MLW Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)#	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)#	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)#	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)#	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		1.8-11.3	0						22.6	10000	650	56	65	12	0						0					
to		11.3-23.8	0						37.1	8127	650	41	84	7	0						1.9	12500	750	70	100	5
090		24.7-56.6	1.9	0	500	34	230	4	35.8	9376	816	48	121	1	0						1.9	9200	690	36	89	3
	48.0	All Speeds	0.5	0	500	34	230	4	33.2	8799	689	47	85	5	0						1.4	10250	650	50	88	2
091		4.0-11.0	0						40.0	9750	575	49	56	1	0						0					
to		11.1-21.6	0						51.9	9250	750	49	88	1	0						3.7	12250	750	39	94	-10
180		21.8-42.9	0						55.0	9000	1050	54	163	-2	0						5.0	10750	900	50	338	-25
	36.6	All Speeds	0						49.7	9338	838	51	100	0	0						3.1	12125	850	43	156	-10
181		1.4-6.0	0						8.3	8350	790	56	56	9	0						0					
to		6.4-20.4	0						44.0	7250	675	53	63	-3	0						0					
270		21.3-37.7	0						41.7	6750	650	53	163	-2	0						8.3	8860	620	41	49	1
	11.1	All Speeds	0						34.7	7124	684	52	72	-2	0						2.0	8860	620	41	49	1
271		2.1-5.9	0						20.0	6050	620	48	41	-12	0						0					
to		7.0-15.8	0						0												0					
360		19.0-38.0	0						40.0	4750	650	38	138	-5	0						0					
	4.3	All Speeds	0						15.8	5750	650	39	88	-8	0						0					
		1.4-10.6	0						29.1	9250	640	51	58	1	0						0					
ALL		10.6-22.3	0						40.0	8644	682	46	87	2	0						2.7	11250	700	46	88	-2
		22.4-56.6	0.9	0	500	34	230	4	45.5	8500	833	52	138	0	0						2.7	9375	850	45	163	-2
	100.0	All Speeds	0.2	0	500	34	230	4	38.6	8774	720	50	90	1	0						2.0	10250	750	46	96	-2

Table 4

YUCCA FLAT INVERSION SUMMARY

Season: June - August

Hour: 00Z No. of Observations: 447

Above ground level

INVERSION TYPE

Surface to 500mb MLV Bearing	% of Obs. this bearing	Speed Range (knots)	STC Inversion Frequency %	STC Median Height of Base (feet)#	STC Median Depth (feet)	STC Median Intensity ($sec^{-2} \times 10^{-5}$)	STC Median Shear ($sec^{-1} \times 10^{-4}$)	STC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)#	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)#	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)#	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		0.4-7.9	1.2	0	670	49	86	-13	20.9	12000	666	48	60	1	0						0					
to		7.9-16.0	0.6	0	430	156	67	7	18.8	10876	683	47	48	4	0.6	14370	950	49	70	23	0					
090		16.0-55.0	0						31.4	10127	687	45	55	3	0						1.2	13290	690	36	58	0
	76.5	All Speeds	0.6	0	550	100	75	0	22.5	10971	681	47	53	3	0.3	14370	950	49	70	23	0.3	13290	690	36	58	0
091		1.6-4.3	9.1	0	450	107	37	4	0						0						0					
to		4.7-11.8	0						18.2	12750	700	50	63	0	0						0					
180		13.0-39.3	0						45.5	9750	850	43	163	-1	0						18.2	12750	850	40	113	0
	9.8	All Speeds	2.3	0	450	107	37	4	20.5	12626	850	46	138	-1	0						4.5	12750	850	40	113	0
181		1.8-3.1	20.0	0	920	33	145	69	0						0						0					
to		4.0-10.0	0						10.0	13690	1020	37	155	146	0						0					
270		10.4-11.9	0						40.0	9250	950	40	263	-50	0						0					
	4.5	All Speeds	5.0	0	920	33	145	69	15.0	10750	1025	39	163	0	0						0					
271		2.3-5.3	0						20.0	12500	1100	40	63	25	0						0					
to		5.4-10.2	0						4.8	12900	100	47	29	0	0						0					
360		11.9-35.5	0						10.0	12710	260	36	100	5	0						0					
	9.2	All Speeds	0						9.8	12750	450	40	75	15	0						0					
		0.4-7.0	2.7	0	650	50	88	0	15.2	12250	688	42	63	4	0						0					
ALL		7.0-15.0	0.4	0	430	156	67	7	17.9	11375	700	47	53	3	0.4	14370	950	49	70	23	0					
		15.0-55.0	0						32.1	9416	683	45	57	3	0						2.7	13125	825	39	106	0
	100.0	All Speeds	0.9	0	550	80	75	5	20.8	11208	690	46	55	3	0.2	14370	950	49	70	23	0.7	13125	825	39	106	0

Table 5

YUCCA FLAT INVERSION SUMMARY

Season: September - November

\# Above ground level

Hour: 00Z No. of Observations: 431

I N V E R S I O N T Y P E

Surface to 500mb MLW Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)#	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)#	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)#	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)#	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		2.0-10.6	0						42.2	10082	888	39	42	0	0						2.2	13100	780	44	54	14
to		10.6-22.4	0						45.6	6750	822	48	65	6	0						6.7	7250	750	40	108	5
090		23.2-44.6	0						53.3	6250	720	49	75	4	0						17.8	9250	800	45	125	3
	41.8	All Speeds	0						46.7	7250	808	45	64	4	0						8.3	8876	775	44	109	4
091		0.7-9.5	0						40.5	5876	784	40	79	0	0						10.8	10250	600	50	38	0
to		9.9-22.3	0						60.0	7062	1025	45	68	1	0						12.0	9750	850	39	113	0
180		22.9-52.9	0						67.6	7688	1075	51	123	-2	0						16.2	11000	1050	39	225	2
	34.6	All Speeds	0						57.0	7177	990	46	88	0	0						12.8	10250	830	40	113	0
181		1.3-7.9	0						42.1	6000	550	48	38	3	0						10.5	9250	450	40	38	-10
to		8.3-19.4	2.6	0	310	71	169	-18	48.7	7687	525	46	63	0	0						10.3	8250	1000	40	50	0
270		19.7-35.8	0						68.4	5813	950	47	88	1	0						15.8	9250	1250	50	94	20
	17.9	All Speeds	1.3	0	310	71	169	-18	51.9	6500	633	47	50	1	0						11.9	9250	1025	45	56	1
271		0.1-3.2	16.7	0	660	74	192	151	0						16.7	2700	0	375	103	0	0					
to		4.7-11.7	7.7	0	600	192	142	16	23.1	7750	550	45	88	20	0						0					
360		13.3-24.9	0						33.3	7500	900	38	50	0	0						0					
	5.8	All Speeds	8.0	0	550	130	163	70	20.0	7625	750	39	69	10	4.0	2700	0	375	103	0	0					
		0.1-9.3	0.9	0	660	74	192	151	38.9	7667	820	44	48	1	0.9	2700	0	375	103	0	5.6	9250	600	47	38	-1
ALL		9.4-20.7	0.9	0	500	130	150	0	49.8	7455	827	43	65	2	0						8.8	9418	863	40	88	2
		21.0-52.9	0						60.2	6689	825	51	99	1	0						16.7	9832	866	45	142	3
	100.0	All Speeds	0.7	0	625	75	163	20	49.7	7183	825	48	71	2	0.2	2700	0	375	103	0	10.0	9625	839	43	94	2

Table 6

YUCCA FLAT INVERSION SUMMARY

Hour: 12Z

* Height of inversion base is given in feet above ground surface.

Note: Monthly values are based on all observation--seasonal values on only those observations with wind.

	Dec	Jan	Feb	Winter	Mar	Apr	May	Spring	Jun	Jul	Aug	Summer	Sep	Oct	Nov	Fall
SURFACE BASED INVERSIONS																
Inversion Frequency (%)	89.0	90.3	87.3	89.0	84.8	80.4	86.0	84.2	89.6	95.5	94.3	93.1	90.7	94.4	88.9	91.2
Median Height of Base *(feet)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Median Depth (feet)	1048	918	806	928	869	588	682	674	700	862	821	809	860	907	941	904
Median Intensity ($sec^{-2} \times 10^{-5}$)	117	121	124	121	130	143	143	139	142	141	115	135	142	149	136	142
Median Shear ($sec^{-1} \times 10^{-4}$)	83	99	101	93	98	111	96	101	103	91	79	91	97	97	85	94
Median Direction Change (deg)	6	3	1	3	2	6	6	4	0	-1	1	0	-1	1	3	1
INVERSION TYPE E1																
Inversion Frequency (%)	6.8	7.0	6.9	6.7	6.3	7.9	6.0	6.8	4.9	0.7	3.1	2.9	5.9	3.0	5.7	5.0
Median Height of Base *(feet)	5500	4084	4624	4670	4750	6374	4250	5500	4500	2500	2750	3750	3500	8250	6418	6300
Median Depth (feet)	850	1050	825	850	1050	850	800	900	800	850	1067	900	750	825	850	800
Median Intensity ($sec^{-2} \times 10^{-5}$)	49	45	41	46	48	53	51	50	44	38	38	39	56	43	51	51
Median Shear ($sec^{-1} \times 10^{-4}$)	92	113	113	103	125	108	90	100	71	225	63	72	113	88	104	100
Median Direction Change (deg)	5	2	3	3	5	-3	2	1	2	5	10	4	1	1	3	2
INVERSION TYPE E1*																
Inversion Frequency (%)	62.4	59.4	50.0	57.7	38.7	36.1	28.4	35.1	26.7	20.2	21.0	23.0	40.9	45.7	53.5	46.7
Median Height of Base *(feet)	3941	3895	4720	4169	5476	7066	9542	6681	9250	10750	12250	10475	9035	5690	4869	6490
Median Depth (feet)	879	904	864	884	850	806	769	812	754	737	779	757	859	812	859	846
Median Intensity ($sec^{-2} \times 10^{-5}$)	49	49	49	49	48	47	41	46	43	40	42	41	46	42	48	45
Median Shear ($sec^{-1} \times 10^{-4}$)	93	90	100	94	85	88	78	83	84	73	72	75	68	65	83	73
Median Direction Change (deg)	9	6	3	6	4	4	2	3	4	6	9	6	3	3	3	3
INVERSION TYPE E2																
Inversion Frequency (%)	21.7	22.1	10.9	17.7	8.6	5.5	5.0	6.5	4.9	1.0	1.1	2.3	9.3	10.9	12.1	10.8
Median Height of Base *(feet)	8186	7376	8250	7750	8835	7250	11938	9750	9750	12750	13750	9876	9000	9625	8250	8948
Median Depth (feet)	813	820	750	794	875	766	875	831	650	625	1025	716	700	930	867	835
Median Intensity ($sec^{-2} \times 10^{-5}$)	48	48	48	48	46	50	40	46	40	45	39	41	57	45	49	50
Median Shear ($sec^{-1} \times 10^{-4}$)	81	81	73	79	73	109	83	85	100	125	88	91	93	66	78	77
Median Direction Change (deg)	1	1	2	1	-1	1	-1	0	0	-20	18	0	0	0	1	0
Number of Observations	263	298	276	800	302	291	299	848	288	292	262	814	237	304	297	803

Table 7

YUCCA FLAT INVERSION SUMMARY

Season: December - February

Hour: 12Z No. of Observations: 800

* Above ground level

INVERSION TYPE

Surface to 500mb MLW Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)*	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)*	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)*	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)*	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		3.0-12.9	89.6	0	1117	140	53	13	4.5	6750	1650	39	63	30	44.8	4201	750	53	78	17	14.9	6250	750	46	63	10
to		13.0-29.5	86.5	0	917	130	74	-1	6.8	5250	950	39	113	10	63.9	4202	841	51	93	10	18.0	7250	700	53	89	3
090		29.5-59.3	50.7	0	750	115	131	-1	34.3	5250	675	45	104	3	35.8	3900	900	45	133	10	26.9	8000	700	48	125	1
	33.4		78.3	0	953	131	72	2	13.1	5377	810	43	102	5	52.1	4156	830	51	95	11	19.5	7500	700	50	89	3
091		1.9-13.2	93.8	0	1184	125	63	-17	2.1	8000	1300	50	63	10	42.7	3791	912	51	64	8	9.4	6250	750	52	59	-2
to		13.3-25.5	95.3	0	1009	117	74	1	3.7	3750	850	55	113	-3	60.7	3938	883	47	98	4	15.2	8250	750	45	77	1
180		25.6-48.6	96.9	0	457	126	132	2	2.1	9000	1050	60	175	-5	76.0	4707	1162	51	126	2	25.0	8374	1100	45	125	-1
	47.9		95.3	0	948	121	85	-1	2.9	4750	925	54	113	0	60.1	4162	927	49	104	4	16.2	8200	940	47	82	0
181		0.8-11.4	96.8	0	1220	125	120	15	0						48.4	4376	775	42	69	0	12.9	6250	900	60	38	-15
to		11.5-24.9	92.1	0	772	83	215	10	4.8	3125	1250	50	113	8	61.9	3606	830	48	69	4	20.6	7417	875	47	60	4
270		25.0-52.1	87.1	0	475	90	231	4	12.9	3500	1150	47	67	-2	80.6	4450	1063	47	104	1	32.3	7500	1050	40	63	-1
	15.6		92.0	0	788	99	199	9	5.6	3125	1250	47	71	0	63.2	4026	881	47	78	2	21.6	7312	925	46	58	0
271		5.0-7.4	100.0	0	950	160	138	75	0						66.7	6250	1300	53	17	10	0					
to		8.6-17.8	92.3	0	750	187	163	22	0						46.2	7000	800	50	75	15	0					
360		18.1-28.8	83.3	0	383	90	138	50	16.7	600	660	38	442	-126	66.7	8250	700	40	50	2	16.7	11920	850	41	35	0
	3.1		92.0	0	913	150	153	30	4.0	600	660	38	442	-126	56.0	7250	800	46	63	7	4.0	11920	850	41	35	0
		0.8-12.8	92.5	0	1134	131	70	9	2.0	6750	1300	40	63	20	47.5	4138	836	50	69	9	11.0	6250	833	48	55	0
ALL		12.8-26.4	93.0	0	941	115	89	1	4.5	3500	950	48	119	7	60.2	4056	868	48	88	6	16.7	7649	755	48	69	2
		26.4-59.3	77.5	0	497	124	140	2	16.0	4750	775	45	100	2	63.0	4388	1000	51	126	4	26.5	8208	884	47	126	0
	100.0		89.0	0	928	121	93	3	6.7	4670	850	46	103	3	57.7	4169	884	49	94	6	17.7	7750	794	48	79	1

Table 8

YUCCA FLAT INVERSION SUMMARY

Season: March - May

Hour: 12Z No. of Observations: 848

\# Above ground level

INVERSION TYPE

Surface to 300mb MLV Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)#	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)#	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1A Inversion Frequency %	E1A Median Height of Base (feet)#	E1A Median Depth (feet)	E1A Median Intensity ($sec^{-2} \times 10^{-5}$)	E1A Median Shear ($sec^{-1} \times 10^{-4}$)	E1A Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)#	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		1.4-10.6	96.8	0	867	158	58	3	0						23.7	6750	600	46	64	11	2.2	10500	750	40	50	15
to		10.7-26.4	84.3	0	681	153	89	10	5.9	5750	850	39	96	6	31.9	6250	694	48	82	5	6.5	8750	750	43	69	1
090		26.6-64.6	52.7	0	475	102	167	0	24.7	5584	783	52	88	2	22.6	5126	783	39	73	2	8.6	11500	850	44	113	1
	43.8		79.5	0	696	149	84	4	9.2	5624	800	48	90	2	27.5	6127	700	46	74	5	5.9	10250	833	43	80	1
091		1.1-11.9	93.8	0	861	150	77	11	0						35.0	9332	800	50	78	4	3.7	10250	1250	45	63	-10
to		11.9-21.7	88.6	0	511	124	120	5	5.1	6000	1200	45	150	-5	46.8	7500	842	44	86	5	10.8	10250	724	48	104	1
180		21.7-45.3	81.3	0	447	119	168	4	11.2	3584	1050	66	188	0	58.7	6065	938	47	139	2	13.7	8124	888	52	94	-4
	37.5		88.1	0	555	131	122	6	5.3	3750	1125	55	181	-2	46.9	7545	850	46	98	3	9.7	8750	850	49	97	-2
181		1.2-8.6	95.7	0	900	147	71	-45	0						30.4	6625	1025	43	38	-3	0					
to		8.8-21.8	89.1	0	612	110	185	6	2.2	2430	1970	43	138	24	34.8	4000	700	49	69	-5	4.3	11000	250	40	38	0
270		22.9-45.4	65.2	0	475	82	363	5	17.4	8500	3000	50	363	-50	56.5	5750	1350	54	281	0	0					
	10.8		84.8	0	634	106	181	2	5.4	4750	2750	50	213	0	39.1	5701	1050	49	70	-3	2.2	11000	250	40	38	0
271		1.9-5.5	100.0	0	863	158	68	20	0						5.9	9890	660	62	82	18	0					
to		5.6-15.2	90.9	0	880	150	75	-25	0						15.2	8750	750	43	31	3	0					
360		15.2-28.7	82.4	0	950	160	58	-15	11.8	6000	400	70	75	-5	29.4	13250	1075	39	46	1	0					
	7.9		91.0	0	886	155	70	-7	3.0	6000	400	70	75	-5	16.4	12124	850	42	43	3	0					
		1.1-10.3	95.8	0	871	152	66	3	0						25.5	8000	700	49	65	9	1.9	10500	1100	40	75	-5
		10.3-23.3	86.3	0	639	139	103	6	5.2	5665	1050	46	113	1	37.3	6719	800	46	83	3	8.0	9500	700	47	79	2
All		23.4-64.6	68.4	0	470	114	164	4	17.0	4500	833	52	94	1	40.6	5812	900	45	113	2	8.0	9624	875	47	104	-2
	100.0		84.2	0	674	139	101	4	6.8	5500	900	50	100	1	35.1	6681	812	46	83	3	6.5	9750	831	46	85	0

Table 9

YUCCA FLAT INVERSION SUMMARY

Season: June - August

Hour: 12Z No. of Observations: 814

∅ Above ground level

INVERSION TYPE

Surface to 500mb MLW Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)∅	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)∅	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)∅	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)∅	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		1.0-7.6	92.1	0	840	122	85	3	2.4	1250	1050	39	63	18	21.4	10873	617	41	91	12	3.2	13250	750	40	63	10
to		7.7-16.9	94.8	0	852	152	93	-4	1.6	4000	650	40	100	20	18.4	8500	789	41	75	8	1.6	7500	800	40	125	-5
090		16.9-42.3	84.1	0	811	148	137	-2	8.7	4750	1050	39	71	1	25.4	8500	714	40	64	1	1.6	10750	950	38	75	0
	61.7		91.4	0	841	144	97	-2	3.6	4000	950	39	70	4	20.9	9649	731	39	74	6	2.0	11250	800	39	83	1
091		0.6-4.9	100.0	0	750	120	75	0	0						18.2	13250	700	40	138	-5	0					
to		4.9-13.8	97.7	0	558	108	144	3	0						40.9	11000	800	47	83	0	2.3	9920	290	39	276	24
180		13.8-30.3	72.7	0	389	95	90	5	22.7	3750	850	45	71	10	36.4	6250	1200	40	75	-5	22.7	9250	550	50	88	-1
	10.8		92.0	0	564	109	111	3	5.7	3750	850	45	71	10	34.1	10665	850	44	81	-1	6.8	9500	500	47	113	0
181		1.1-3.6	90.9	0	1100	95	75	40	0						27.3	13750	1325	39	38	0	0					
to		3.6-9.1	100.0	0	750	127	125	35	0						40.9	10750	725	38	72	14	4.5	10150	1770	36	101	156
270		9.3-24.0	100.0	0	575	75	81	70	0						9.1	14510	920	42	55	0	0					
	5.4		97.7	0	774	106	90	48	0						29.5	12750	775	39	68	11	2.3	10150	1770	36	101	156
271		0.4-5.3	100.0	0	908	122	70	17	0						35.6	13250	700	52	92	27	0					
to		5.3-11.0	98.9	0	825	137	69	-9	0						17.8	11250	850	39	85	15	1.1	8640	560	46	16	3
360		11.0-32.0	91.1	0	784	132	103	-3	2.2	1950	960	33	289	-21	15.6	10375	775	39	41	4	2.2	8770	620	44	203	-39
	22.1		97.2	0	824	132	75	-4	0.6	1950	960	33	289	-21	21.7	11150	805	43	82	14	1.1	8750	600	50	113	-20
		0.4-6.5	95.6	0	854	115	76	7	1.0	750	1300	50	163	-50	25.5	12583	725	43	96	12	2.0	11500	800	40	63	10
		6.5-15.0	95.8	0	799	141	93	-3	1.2	2750	950	38	69	10	20.7	10333	766	40	72	7	1.7	9750	650	39	113	3
ALL		15.0-42.3	85.3	0	800	143	116	0	8.3	4582	875	40	73	3	25.0	8250	768	40	70	2	3.9	9500	750	45	88	-2
	100.0		93.1	0	809	135	91	0	2.9	3750	900	39	72	4	23.0	10475	757	41	75	6	2.3	9876	716	41	91	0

Table 10

YUCCA FLAT INVERSION SUMMARY

Season: September - November

Above ground level

Hour: 12Z No. of Observations: 803

INVERSION TYPE

Surface to 500mb MLV Bearing	% of Obs. this bearing	Speed Range (knots)	SFC Inversion Frequency %	SFC Median Height of Base (feet)#	SFC Median Depth (feet)	SFC Median Intensity ($sec^{-2} \times 10^{-5}$)	SFC Median Shear ($sec^{-1} \times 10^{-4}$)	SFC Median Direction Change (degrees)	E1 Inversion Frequency %	E1 Median Height of Base (feet)#	E1 Median Depth (feet)	E1 Median Intensity ($sec^{-2} \times 10^{-5}$)	E1 Median Shear ($sec^{-1} \times 10^{-4}$)	E1 Median Direction Change (degrees)	E1* Inversion Frequency %	E1* Median Height of Base (feet)#	E1* Median Depth (feet)	E1* Median Intensity ($sec^{-2} \times 10^{-5}$)	E1* Median Shear ($sec^{-1} \times 10^{-4}$)	E1* Median Direction Change (degrees)	E2 Inversion Frequency %	E2 Median Height of Base (feet)#	E2 Median Depth (feet)	E2 Median Intensity ($sec^{-2} \times 10^{-5}$)	E2 Median Shear ($sec^{-1} \times 10^{-4}$)	E2 Median Direction Change (degrees)
001		0.6-9.7	98.9	0	1077	154	52	8	0						44.3	8084	863	46	51	8	3.4	8250	850	50	63	0
to		9.7-24.5	93.7	0	909	158	77	-13	3.4	5750	900	40	100	5	47.7	5550	892	42	70	7	8.0	10750	667	30	88	4
090		24.6-55.9	65.9	0	560	148	192	3	20.5	7000	900	55	100	2	38.6	6000	767	48	91	3	13.6	8000	800	47	75	0
	43.6		88.0	0	920	156	79	-1	6.9	6500	900	52	100	3	44.6	5932	858	44	69	6	8.3	9250	690	49	77	1
091		0.9-10.0	100.0	0	983	159	76	0	0						62.3	5835	850	46	70	4	13.1	10000	900	48	42	8
to		10.1-21.9	94.2	0	894	126	93	-1	4.2	2875	850	55	156	-10	48.3	6802	855	44	84	-1	11.7	9750	933	47	91	1
180		22.0-49.1	90.2	0	559	119	138	-5	6.6	3500	600	50	363	40	68.9	4702	850	48	125	0	31.1	8876	875	58	73	-1
	30.1		94.6	0	892	133	97	-3	3.7	3084	750	52	156	0	57.0	5831	853	46	93	0	16.9	9689	910	51	80	0
181		1.1-7.7	97.0	0	966	140	72	32	3.0	13760	850	50	48	-14	30.3	6500	650	60	67	5	6.1	7000	700	60	50	-35
to		7.8-19.1	89.4	0	790	138	179	-10	6.1	3750	500	38	50	0	45.5	5500	800	45	45	1	13.6	7750	750	45	63	-3
270		19.6-40.9	97.0	0	471	90	325	0	3.0	10230	420	112	39	1	60.6	6500	1167	48	69	1	15.2	6750	1025	45	94	-2
	16.4		93.2	0	806	128	184	4	4.5	7500	550	40	38	-2	45.5	6000	875	48	57	2	12.1	7250	833	48	69	-5
271		1.1-5.4	100.0	0	1050	147	81	15	0						30.0	4000	700	50	50	10	5.0	4800	1180	42	130	29
to		5.5-12.7	89.7	0	912	132	79	23	2.6	12510	1350	40	46	12	25.6	8250	660	40	40	5	0					
360		12.9-37.4	85.0	0	550	123	84	10	0						25.0	10750	750	39	88	-1	0					
	9.8		91.1	0	957	135	82	17	1.3	12510	1350	40	46	12	26.6	7250	679	41	46	3	1.3	4800	1180	42	130	29
		0.6-8.5	98.5	0	1027	150	67	14	0.5	13760	850	50	48	-14	43.3	6185	770	48	54	6	7.0	9000	867	49	50	8
		8.5-22.0	92.5	0	911	143	86	-5	3.7	3124	650	42	88	-2	45.6	6341	871	42	67	3	8.7	9250	788	49	83	0
ALL		22.0-55.9	81.1	0	515	128	181	-2	11.9	6471	900	55	113	4	52.2	5351	850	48	104	3	18.9	8665	867	52	83	-1
	100.0		91.2	0	904	142	94	1	5.0	6300	800	51	100	2	46.7	6490	846	45	73	3	10.8	8948	835	50	77	0

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