HONG KONG OBSERVATORY

Technical Note No. 92

UPPER-AIR NORMALS FOR HONG KONG 1961-1990

by

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ABSTRACT

This report presents the 30-year averages of upper-air parameters measured over Hong Kong based on ascents made at King's Park Upper-air Station at 08 hours (00 UTC) during the period 1961-1990. Levels included in this report are more than those standard levels required in Part A and Part C of the TEMP bulletins specified by World Meteorological Organization so that a more detailed picture of the vertical distribution of the parameters can be visualized. A brief account of changes of instruments and data archives during the period is also included.

摘要

本篇報告刊出了１９６１至１９９０三十年間香港上空的氣象參數的平均數值。數據取自京士柏高空氣象站每日上午八時的探空資料。除了列出世界氣象組織所規定的標準層外，還有不少的附加層，使讀者對高空氣象參數分佈形勢有較清晰的了解。本文亦簡述了這段期間內的儀器沿革及資料儲存概況。

1. INTRODUCTION

This report presents the 30-year normal of upper air data measured in Hong Kong during the period from 1961 to 1990. All ascents were made at King's Park Upper Air Station which was inaugurated in June 1951. The position of the station is at 22° 19′ N, 114°10′ E and the elevation of the station floor beneath the barometer is 66 metres above mean sea-level.

Only the 00UTC* ascent data were used to compile this report because the other ascents did not cover the whole 30-year period. The following table shows the frequency of routine radiosonde ascents made during the period. A tick means ascents available.

Hour		1961-68	1969-80	1981-83	1984-90
HKT	UTC				
02	18			√	
08	00	√	√	√	√
14	06			√	
20	12		√	√	√

2. INSTRUMENTS

This 30-year period covers employment of different kinds of radiosondes and different ways of obtaining wind data.

In 1961, the radiosonde in use was of Kew MK IIB type. Every morning, a radiosonde, a radar reflector and a parachute were lifted by a hydrogen-filled balloon. The sensors (barometer, thermometer and hygrometer) in the radiosonde sequentially controlled three variable frequency audio oscillators. The signal was transmitted to the ground station at 27 MHz where actual values of pressure, temperature and humidity at different altitudes were computed.

At the same time, the radar reflector was followed by a wind-finding radar. The range, azimuth and elevation of the reflector were determined every minute. The wind at a given height or pressure level was measured over an interval of two or three minutes chosen so that the mid-point coincided as closely as possible with a standard level.

A GL III 100-mm radar was employed to track the reflector attached to the balloon since 1954. It was replaced by a Plessey WF2 30-mm wind finding radar in May 1962. Whenever the wind finding radar was unserviceable, upper air winds were determined by theodolite.

On 1 January 1969, Vaisala RS13 radiosondes were brought into use. The Vaisala sensors used a nickel alloy aneroid capsule for pressure, a bimetallic thermometer for temperature and chemically treated human hair for humidity. The sensors controlled the frequency of the transmitter directly between 23.6 and 26.2 MHz with no audio oscillators. The actual values of pressure, temperature and humidity at different altitudes were computed more directly from calibrated curves.

On 18 November 1974, Vaisala RS18 radiosondes replaced RS13. The sensors of these two types of radiosondes were basically the same. However, the RS18 employed two pressure sensors, one for sensing pressure up to 100 hectopascals(hPa) and the other above 100 hPa while the RS13 used only one sensor. The use of a second sensor ensured values above 100 hPa level to be determined more accurately.

The wind data were continued to be computed from the location of the balloon tracked by the 30-mm Plessey WF2 wind finding radar.

An automatic sounding system, the MicroCORA, was commissioned in January 1981. The system acquired pressure, temperature and humidity data and transmitted them back to the ground station at 403 MHz. Data reduction was carried out automatically in real time by a minicomputer.

For computation of wind data, the system made use of the world-wide Omega navigational network. During sounding, the radiosonde received VLF signals from Omega stations and relayed them to the ground station. The location of the radiosonde was calculated from the phase differences of the relayed signals. The upper-air winds were then computed by a cross correlation algorithm.

The MicroCORA was replaced by the DigiCORA in July 1993.

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* UTC is Co-ordinated Universal Time. The time used in this publication is Hong Kong Time (HKT) which is 8 hours ahead of UTC.

3. DATA SOURCE

3.1 Publication

Results of the radiosonde ascents were published annually in "Meteorological Results Part II - Upper-Air Observations" from 1949 until 1980. From 1981 onwards, only summaries of the data were presented and published in the series 'A Summary of Radiosonde-radiowind Ascents Made at King's Park, Hong Kong'. However, data at selected levels for individual ascents were archived on magnetic tapes.

3.2 Magnetic Tape

Between 1956 and 1980, the upper-air data at selected levels were also stored on magnetic tapes. Since then, data at the surface, and for the highest freezing level, tropopause, as well as levels of lowest temperature and maximum wind were archived on tapes. In addition, data at 50-hPa interval from 1000 hPa to 200 hPa, at 25-hPa interval from 175 hPa to 100 hPa and at every 10-hPa level upwards were also archived on tapes.

3.3 Database

A climatological database using ORACLE was established in 1993. Upper-air data archived on tapes were loaded into the database in early 1995. Quality check procedures were applied to guarantee internal consistency of data. To ensure that data loaded into the database were correct, monthly means and extremes for each year were computed and checked against those figures published in the annual publications. Some of the parameters were re-computed, this includes dew point temperatures which were stored as -50 on tape whenever it was lower than -50°C.

4. DATA

4.1 Pressure, temperature and geopotential height

In the earlier days, although pressure, temperature and geopotential height were computed to the nearest 0.1 hectopascal, 0.1 degree and metre for each ascent for the compilation of TEMP bulletins for global data exchange over the Global Telecommunication System, they were archived on tapes and in printed form to the nearest hectopascal, whole degree and decametre respectively. Since 1970, data were archived to the nearest 0.1 hectopascal, 0.1 degree and metre respectively.

4.2 Relative Humidity and Dew Point Temperature

In the earlier days, relative humidity sensor could not serve its purpose at temperatures lower than -40°C, therefore dew point temperatures were not always available for 250 hPa level and totally not available for levels higher up.

The current humidity sensors are able to indicate dew point temperatures below -50°C. Hong Kong has followed the practice of many other nations to report dew point temperatures well below -50°C since 1981.

Like temperature, dew point temperature was archived in whole degrees before 1970 but in 0.1 degree thereafter.

The following table shows the availability of relative humidity and dew point data kept in the database. A tick denotes data available and a cross means data not available.

Level (hPa)	Jan61-Dec65	Jan66-Dec69	Jan70-Dec80	Jan81-Jul81	Aug81-Dec90
surface - 400					
350				√	
300	√				
250			>-40°C √		
200-100		×			
90					
80					
70-10					
tropopause					

4.3 Wind

Wind directions were in degrees from true north. Wind speeds were archived in knots before 1981. These speeds were converted to the nearest 0.1 metre per second by multiplying the factor 0.514. From 1981 onwards, wind speeds were computed and archived in 0.1 metre per second.

Precision of data is summarized in the following table.

Element	1961-69	1970-80	1981-90
pressure	**hPa**	**0.1 hPa**	
height	**decametre**	**m e t r e**	
temperature & dew point	**°C**	**0.1 °C**	
wind speed	**knot**		**0.1 m/s**
wind direction	**degrees from north**		
relative humidity	**per cent**		

4.4 Surface Data

Surface observations were taken using the conventional meteorological instruments at the station. Station level pressure was read from a Kew pattern barometer, temperature from thermometer housed in a Stevenson Screen and relative humidity calculated from dry-bulb and wet-bulb temperatures. Winds were read from a counter anemometer in the earlier days and from the chart recorder of a Mark IV anemometer since 1971.

4.5 Standard Levels

The standard levels refer to those isobaric surfaces reported in Part A and Part C in the TEMP reports. They are 1000, 850, 700, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30, 20 and 10 hectopascals. The 925 hPa level is not included because it was only introduced in the recent years. The means for 10-hPa level is computed based on very limited number of data because ascents seldom reached that level.

4.6 Special Levels

Data for freezing level, tropopause, minimum temperature and maximum wind are also prepared.

Freezing level refers to the highest freezing level while tropopause refers to the first tropopause reached.

Minimum temperature refers to the lowest temperature recorded in the ascent. However, if the lowest temperature occurred at the end of the ascent, then the minimum temperature is considered as not reached and therefore not included for computation.

In the archive, only one record of maximum wind was stored for each ascent, to eliminate the effect of tropical cyclones or strong monsoon near the surface and to be in line with the criterion set in

the 'Manual on Codes' for reporting maximum wind, only those located above the 500-hPa isobaric surface were considered for computation. Comparing this table with those vector winds in the stratosphere, we can see that these two data sets for the summer months are not agreeable, this is because the stratospheric easterly jet occurred at a very high altitude and our ascents seldom reached that level. Maximum winds in summer were often located at the end of the ascent where the level of maximum winds were not reached.

4.7 Other Levels

Data at every 50 hectopascals from 1000 hectopascals level upwards were available since 1961.

4.8 Lapse Rate

Lapse rates between different levels were also prepared.

4.9 Temperature Inversion

Bases and tops of temperature inversions which were at least 20 hPa thick or the change in temperature was at least 2.5°C were archived on magnetic tape for the period 1966-1980. Frequency distribution of temperature inversions at different layers was analysed based on this set of data.

5. METHOD OF COMPUTATION

As recommended by WMO-TD/No. 341, monthly mean values are first computed from the individual ascents stored in the database. For those levels that are not available in the database, monthly mean values are taken from the "Meteorological Results Part II - Upper-Air Observations". The monthly standard normals for each parameter are computed from the set of 30 monthly values. Annual normals are calculated by averaging the 12 monthly normals.

The table on the following page shows the periods for which monthly mean data instead of daily values were used in the computation.

Level (hPa)	Jan61-Jun61	Jul61-Jun62	Jul62-Dec65	Jan66-Dec80	Jan81-Jul81	Aug81-Dec90
Surface						
1000-950	Monthly					
900 - 400						
350	Monthly					
300 - 100						
90	Monthly				Nil	
80						
70	Monthly					
60		Monthly				
50						
40						
30						
20-10						
freezing level	Monthly					
tropopause						

The geopotential height, temperature, relative humidity, dew point, vector wind, scalar mean speed and constancy together with the extremes and their dates of occurrence are computed for each standard and special level. The dates are represented by a six-digit number with two digits each for year, month and day. The vector mean wind is computed from the north- and east-components of the daily wind. They are shown in Tables 1-33.

The scalar wind speed is the arithmetic mean of the daily wind speeds, so as the means for other elements.

Constancy is the ratio of the vector mean speed to the scalar mean speed expressed in percentage.

The maximum and minimum values are the absolute extremes occurred during the period 1961-1990. If the same absolute value occurred more than once, only the earliest date is shown.

The number of observations shown against each element can indicate the availability of data used for computation. Generally speaking, whenever pressure, temperature and relative humidity are available, geopotential height for each isobaric level can be calculated.

Standard deviation in Table 34 is calculated with n-1 degrees of freedom.

6. DATA PRESENTATION

The monthly and annual mean values are shown in Tables 1-33. Data not covering the whole 30-year period are indicated at the bottom of each table.

For easy reference, graphical representations of vector wind, temperature and relative humidity are shown in Figures 1-3.

7. DECADAL DATA

Decadal means for the periods 1961-70, 71-80 and 81-90 for different elements at the standard levels are shown below for comparison. For levels at very high altitudes, large discrepancies is probably due to the small number of data available for computation.

Level (hPa)	1961 - 1970			1971 - 1980			1981 - 1990		
	Pressure/ Height (hPa/gpm)	Temp (°C)	Vector Wind (deg m/s)	Pressure/ Height (hPa/gpm)	Temp (°C)	Vector Wind (deg m/s)	Pressure/ Height (hPa/gpm)	Temp (°C)	Vector Wind (deg m/s)
Surface	1006.2	21.6	079 2	1005.9	21.6	090 2	1005.9	21.5	095 1
1000	118	21.1	080 3	116	21.1	075 3	117	21.1	093 2
850	1511	14.6	162 2	1509	14.9	163 2	1512	15.2	162 2
700	3136	7.8	254 4	3136	8.0	250 5	3139	8.3	247 4
500	5842	-6.4	262 9	5846	-5.8	261 9	5848	-5.8	260 9
400	7554	-16.6	263 12	7561	-16.1	262 12	7563	-16.0	261 12
300	9658	-30.9	264 18	9667	-30.6	263 15	9669	-30.5	263 14
250	10927	-40.5	264 16	10937	-40.1	263 15	10939	-40.2	264 15
200	12410	-52.0	263 16	12423	-51.5	261 15	12423	-51.8	263 15
150	14217	-65.4	263 13	14232	-64.9	262 12	14229	-65.3	263 13
100	16598	-78.2	277 5	16626	-76.9	284 4	16611	-77.7	277 4
70	18640	-74.7	064 2	18687	-72.5	078 3	18660	-73.5	077 3
50	20644	-65.2	085 6	20714	-63.0	084 7	20677	-63.5	084 6
30	23837	-55.3	090 10	23927	-54.1	090 11	23889	-54.3	089 10
20	26484	-50.2	097 10	26564	-48.1	097 11	26516	-49.2	095 11
10	30985	-44.9	083 8	31208	-37.8	088 11	31106	-41.7	092 13
Freezing level	4657			4789			4767		
Tropopause	16861	-80.2		16493	-78.0		16730	-79.4	

ACKNOWLEDGEMENT

The authors wish to thank Mr. W.K. Kwan for his valuable comments on reviewing this report, Mr. K.L. Ho for verifying the data for the period 1961-82 and also Ms M.F. Yu for extracting the monthly mean values of 1961-65 data.

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11. World Meteorological Organization	1996	Guide to Meteorological Instruments and Method of Observation (sixth ed.) (WMO-No.8)

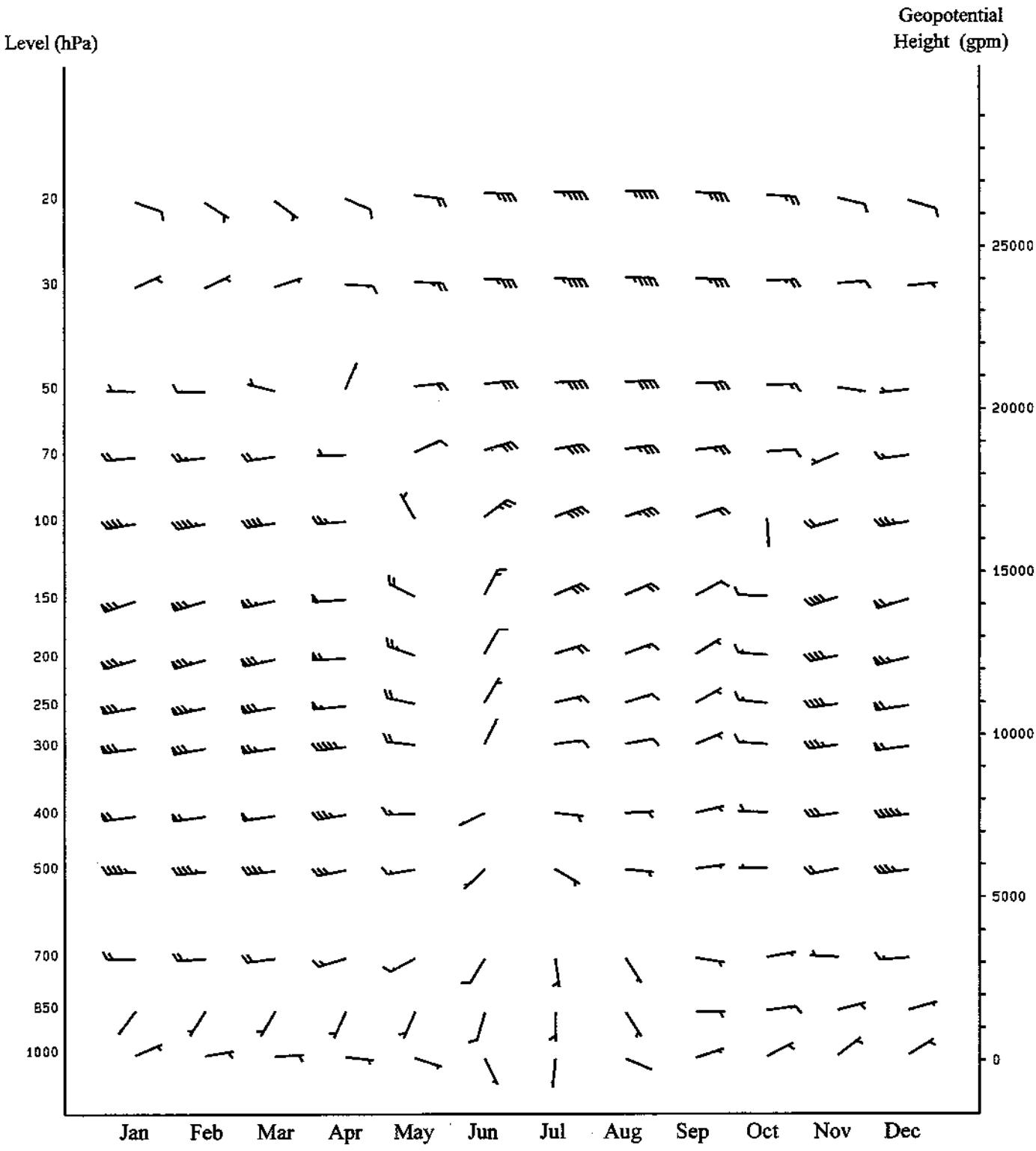

Figure 1. Monthly Normals of Vector Mean Wind at Standard Levels Based on 0800 Hours Ascents (1961-1990)

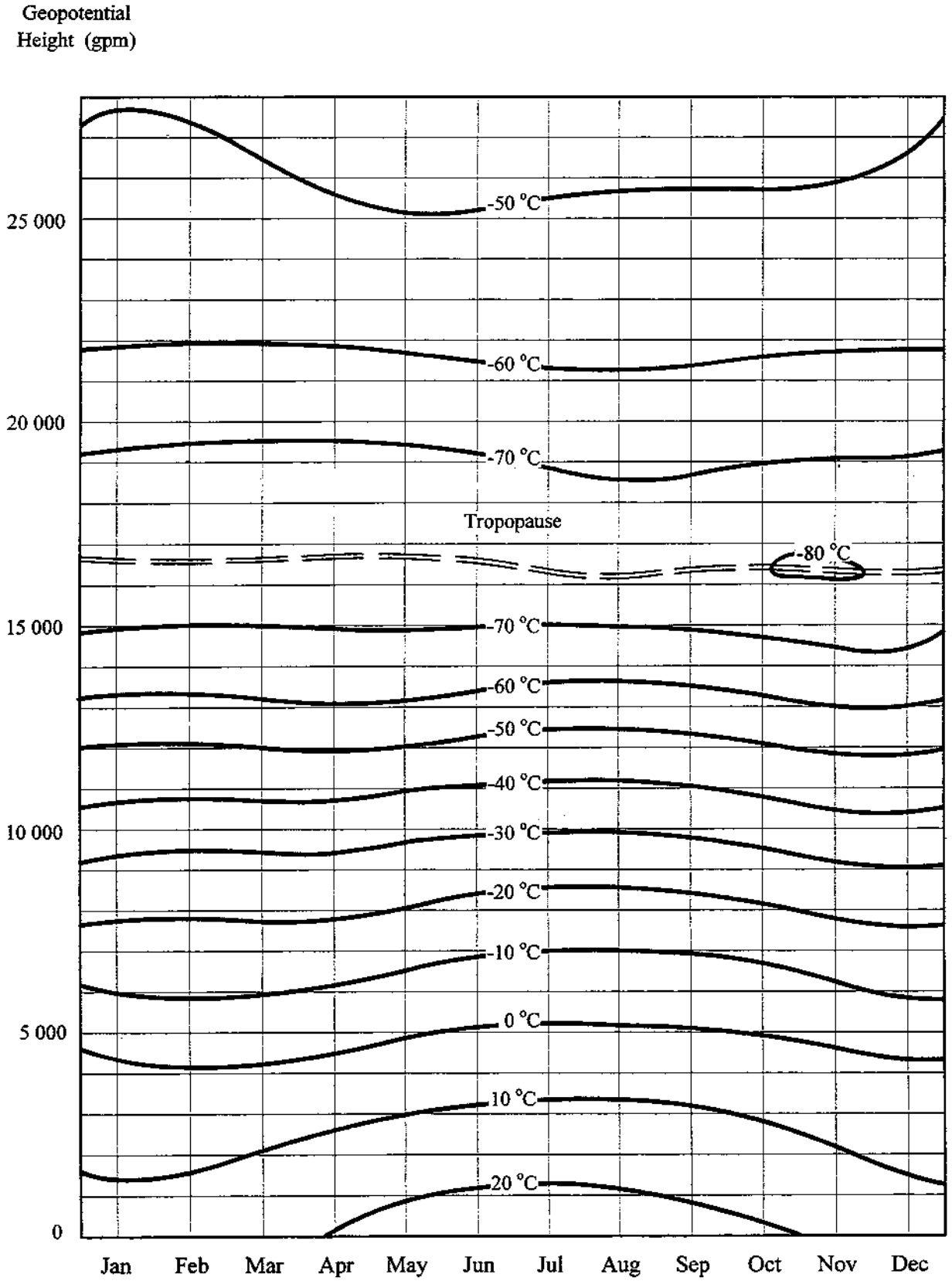

Figure 2. Monthly Normals of Temperature at Different Geopotential Heights Based on 0800 Hours Ascents (1961-1990)

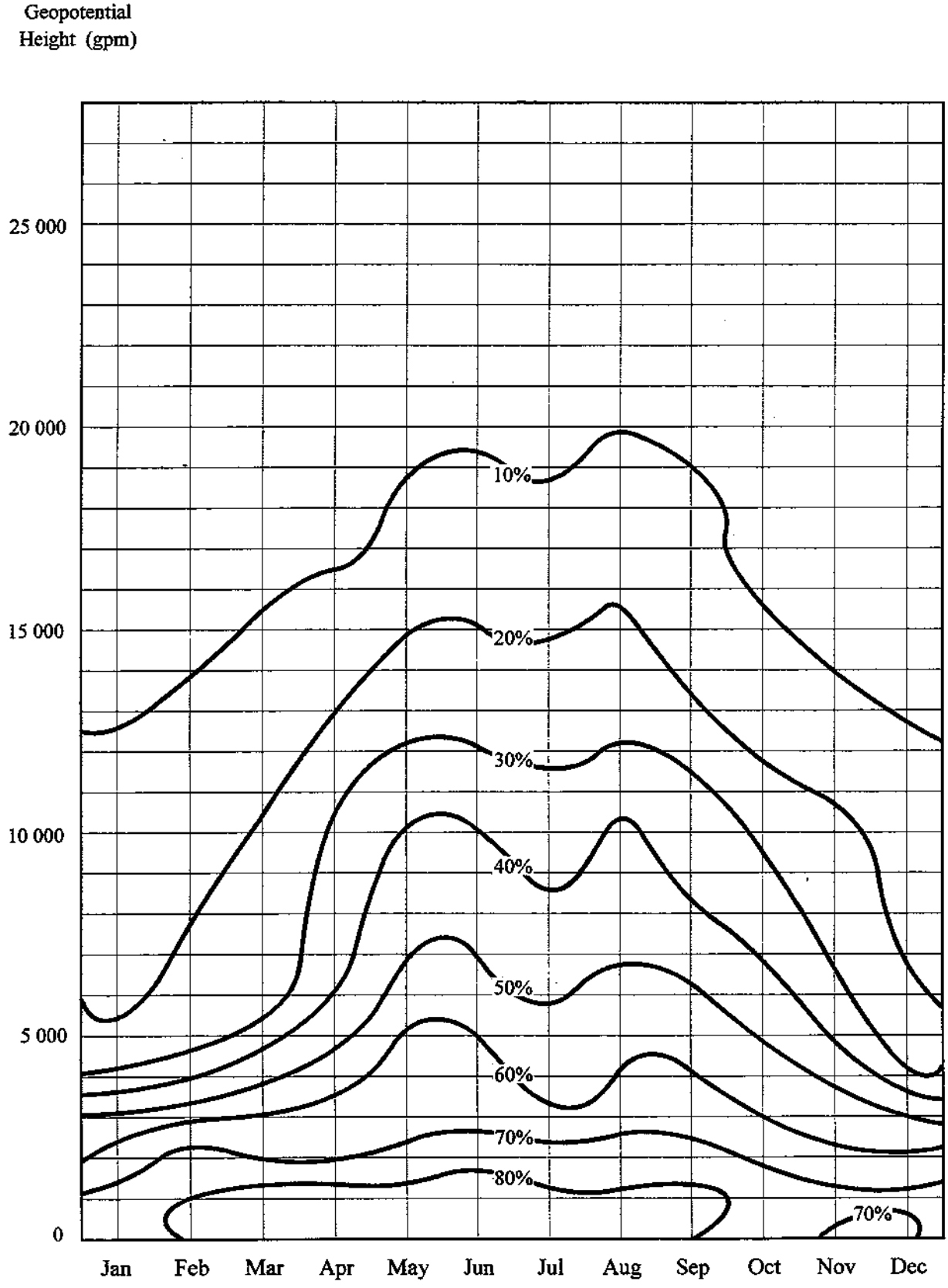

Figure 3. Monthly Normals of Relative Humidity at Different Geopotential Heights Based on 0800 Hours Ascents (1961-1990)

Table 1. Means and Extremes of Upper Air Data at 1000 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	067 3	081 4	087 4	096 3	108 2	153 2	185 1	112 1	072 2	063 4	053 4	058 3	081 2
Scalar mean	4	4	5	4	4	4	3	3	4	5	5	4	4
CONSTANCY (%)	81	81	82	75	56	45	43	40	65	82	84	83	61
No. of obs.	920	839	904	846	737	392	369	288	675	900	891	922	8683
Max. speed	15	17	19	17	14	19	15	14	17	21	19	17	21
Date	740131	710210	690322	650405	650512	760603	640703	750828	730914	741031	711123	801212	741031
Min. speed	0	0	0	0	0	0	0	0	0	0	0	0	0
Date	680119	810224	630301	750426	640521	630623	630705	630827	630901	811005	811116	811226	630301
HEIGHT (gpm)													
Mean	176	164	145	120	86	58	52	50	84	129	161	178	117
No. of obs.	930	846	928	900	929	898	915	917	898	929	900	930	10920
Maximum	250	250	256	230	159	119	111	130	150	200	259	260	260
Date	650115	690207	770304	690405	830503	780610	790712	690813	630924	631020	891130	671211	671211
Minimum	49	56	58	40	-169	-127	-140	-80	-50	-30	40	83	-169
Date	800129	850208	800308	750428	610519	850624	710722	680821	610929	741019	741108	741202	610519
TEMPERATURE (degree C)													
Mean	13.3	13.8	16.6	20.6	24.4	26.6	27.5	27.0	26.0	23.3	19.1	15.1	21.1
No. of obs.	929	843	924	882	755	396	369	288	685	903	898	930	8802
Maximum	21.0	23.7	25.0	27.0	30.0	29.3	29.6	29.1	29	28.9	26.2	23.0	30.0
Date	660113	730227	670331	660425	770520	700608	720701	900811	640901	841003	871127	681205	770520
Minimum	3.0	3.0	4.0	8.0	17.0	21	23.8	22.9	19.2	13.0	6.0	2.9	2.9
Date	670116	690205	860301	690405	660503	640605	830728	760825	700930	781029	871130	751214	751214
DEW POINT (degree C)													
Mean	8.2	10.3	13.6	16.1	21.7	24.1	24.8	24.4	22.5	18.3	13.2	9.0	17.3
No. of obs.	929	843	922	882	755	396	369	288	685	903	898	930	8800
Maximum	20.0	22.2	22.9	25.0	26.4	27.0	28.1	26.4	26.3	25.3	23.2	21.8	28.1
Date	690120	790223	830323	660426	730518	690625	770716	800831	800906	811008	721115	741202	770716
Minimum	-14.0	-11.3	-9.4	-2.4	5.3	11.8	21.4	19.0	7.0	-4.2	-5.0	-12.9	-14.0
Date	670116	740226	860303	880409	790520	820604	750723	660829	660925	781029	881128	731231	670116
RELATIVE HUMIDITY (%)													
Mean	73	81	84	86	85	86	85	86	81	75	70	69	80
No. of obs.	929	843	922	882	755	396	369	288	685	903	898	930	8800
Maximum	100	100	100	100	100	99	98	99	100	98	98	99	100
Date	640122	610221	610323	620406	700501	790610	670714	820819	800901	741031	621101	711218	610221
Minimum	17	23	26	23	31	46	65	73	33	29	23	17	17
Date	630125	750221	770305	880415	790520	820604	750723	870803	660917	681025	831117	731231	630125

Table 2. Means and Extremes of Upper Air Data at 950 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	081 4	103 4	119 4	130 3	156 2	180 3	187 2	145 1	077 4	073 6	068 6	070 5	100 3
Scalar mean	5	5	6	6	6	6	6	5	6	7	7	6	6
CONSTANCY (%)	75	72	68	62	45	46	43	24	62	87	89	85	51
No. of obs.	921	840	904	859	897	861	911	917	883	925	892	920	10730
Max. speed	18	15	16	20	22	23	25	22	24	25	23	20	25
Date	710108	750213	620324	880415	890520	760603	630722	900828	760919	861018	901117	851209	630722
Min. speed	0	0	0	0	0	0	0	0	0	1	1	1	0
Date	860103	810224	820330	820423	850519	840618	890709	850826	810908	661012	761115	701222	810224
HEIGHT (gpm)													
Mean	607	597	582	564	536	510	506	503	535	576	601	611	561
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	672	680	681	680	601	573	570	590	600	640	685	684	685
Date	780105	620201	770304	690405	830503	780610	690713	690813	630924	631020	891130	891201	891130
Minimum	489	494	486	479	283	328	300	370	390	412	480	526	283
Date	800129	790221	800308	730411	610519	850624	690729	680821	610929	741019	741109	701217	610519
TEMPERATURE (degree C)													
Mean	11.4	12.1	15.1	18.5	21.7	23.5	24.4	24.1	22.9	20.0	16.3	12.9	18.6
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	19.3	21.3	24.0	24.8	27.1	27.9	29.0	28.7	27.2	25.3	23.2	20.5	29.0
Date	790127	810223	660323	890428	760526	850623	680726	900823	900901	841003	871127	901210	680726
Minimum	1.0	.6	2.4	6.0	14	18.1	20.4	20.7	16.1	11.2	3.6	2.2	.6
Date	670116	740208	860302	690405	640512	870608	890729	760824	700930	781029	871129	731225	740208
DEW POINT (degree C)													
Mean	6.6	9.0	12.2	16.2	19.4	21.4	21.9	21.6	19.8	16.0	11.3	7.0	15.2
No. of obs.	930	846	926	900	929	897	917	915	898	929	900	930	10917
Maximum	19.0	19.5	21.6	24.1	25.0	24.9	25.8	26.0	25.1	23.0	21.2	19.4	26.0
Date	690119	790223	780329	750427	690523	800630	770716	740821	800904	741001	901109	741201	740821
Minimum	-18	-12.6	-13.1	-8.7	4.1	.3	9.4	12.0	5.0	-6.6	-10.4	-18.3	-18.3
Date	630125	740226	860303	880415	790520	880605	890715	770831	660924	781029	831117	851216	851216
RELATIVE HUMIDITY (%)													
Mean	75	82	85	87	88	88	87	86	83	79	74	70	82
No. of obs.	930	846	926	900	929	897	917	915	898	929	900	930	10917
Maximum	100	100	100	100	100	100	100	100	100	100	99	100	100
Date	640122	610221	610323	620405	690503	650613	650728	630809	700911	781003	621101	811229	610221
Minimum	12	23	23	17	32	20	34	39	33	28	14	14	12
Date	630125	610202	770305	880415	790520	880605	890715	890816	890914	781029	831117	691210	630125

Table 3. Means and Extremes of Upper Air Data at 900 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	097 3	143 3	159 4	166 4	183 3	188 4	183 4	147 2	085 5	079 7	075 6	077 4	123 3
Scalar mean	5	5	6	6	6	7	7	6	7	8	7	5	6
CONSTANCY (%)	51	54	57	60	53	56	50	33	64	86	85	72	42
No. of obs.	917	840	903	855	897	861	910	916	882	923	892	919	10715
Max. speed	21	16	17	21	32	23	33	26	32	28	24	21	33
Date	710108	740204	770304	740428	690529	760603	800722	900828	760919	741019	871128	741202	800722
Min. speed	0	0	0	0	0	0	0	0	0	1	1	1	0
Date	830112	820217	820330	850403	820522	840618	810717	880807	810908	621014	681104	621221	810908
HEIGHT (gpm)													
Mean	1059	1050	1041	1027	1005	983	980	976	1006	1041	1060	1065	1025
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	1130	1130	1126	1110	1067	1044	1042	1070	1070	1100	1132	1132	1132
Date	650115	620201	770304	690405	830503	780610	790712	690813	630924	691013	891130	891201	891130
Minimum	955	958	952	947	757	807	720	850	870	880	948	984	720
Date	800129	790221	800308	730411	610519	850624	690729	680821	610929	741019	741109	701217	690729
TEMPERATURE (degree C)													
Mean	10.6	11.7	14.2	17.1	19.5	20.8	21.4	21.5	20.3	17.7	14.7	11.8	16.8
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	18.0	19.2	22.2	24.0	26.0	26.4	26.6	26.9	25.5	22.9	21.3	19.2	26.9
Date	690119	820220	880315	870423	760526	900622	710726	760810	900901	751012	741107	741201	760810
Minimum	1.2	.0	-.7	6.0	12.3	15.0	18.0	17.1	13.6	9.2	4.0	.6	-.7
Date	800131	690205	860302	690405	840506	640605	720727	710817	710920	781030	751123	731225	860302
DEW POINT (degree C)													
Mean	5.3	8.1	10.9	13.9	16.5	18.2	18.3	18.2	16.8	13.4	9.2	5.1	12.8
No. of obs.	930	846	926	897	929	897	917	913	898	928	900	930	10911
Maximum	16.7	17.0	19.2	22.5	22.4	25.8	23.0	23.3	23.8	20.9	18.1	17.2	25.8
Date	900130	620212	900324	750427	880522	890606	620724	790803	800904	831003	871121	811229	890606
Minimum	-31.3	-27.7	-18.5	-29.8	-6.3	-2.4	3.9	5.0	2.0	-9.6	-31.0	-43.0	-43.0
Date	860108	860211	860303	880415	820503	880604	700729	680830	660917	781029	811111	621224	621224
RELATIVE HUMIDITY (%)													
Mean	73	81	82	83	84	85	83	82	81	78	72	68	79
No. of obs.	930	846	926	897	929	897	917	913	898	928	900	930	10911
Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100
Date	690102	640203	610323	620404	620527	650603	650710	630809	730905	761002	651112	811229	610323
Minimum	3	4	14	3	17	18	28	31	32	14	3	1	1
Date	860108	860211	650316	880415	820503	880604	700729	900823	660917	871004	811111	621224	621224

Table 4. Means and Extremes of Upper Air Data at 850 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	217 1	213 3	211 4	205 4	204 4	196 5	179 4	147 3	090 4	082 6	076 4	074 1	162 2
Scalar mean	5	6	7	6	7	8	8	7	7	7	6	5	6
CONSTANCY (%)	14	57	65	67	65	62	53	38	60	78	66	31	32
No. of obs.	917	837	900	854	892	860	909	917	881	922	892	919	10700
Max. speed	22	21	19	19	33	25	34	29	29	32	26	23	34
Date	710108	790221	780309	740428	890520	740612	800722	640809	760919	741019	671107	741202	800722
Min. speed	0	1	0	0	0	0	1	0	0	0	0	0	0
Date	820119	680219	820328	870427	820518	870616	750720	870831	830904	811009	861102	821201	811009
HEIGHT (gpm)													
Mean	1534	1528	1523	1514	1496	1477	1474	1471	1498	1529	1543	1542	1511
No. of obs.	930	846	928	900	929	899	917	917	899	929	900	930	10924
Maximum	1600	1590	1595	1565	1555	1541	1539	1550	1560	1584	1601	1607	1607
Date	650115	620201	770304	800402	850517	800623	750719	690813	630924	791021	891130	891201	891201
Minimum	1442	1446	1440	1439	1255	1301	1277	1340	1350	1371	1438	1464	1255
Date	800129	790221	800308	730411	610519	850624	730717	680821	610929	741019	741109	701217	610519
TEMPERATURE (degree C)													
Mean	9.4	10.5	12.9	15.3	17.3	18.4	19.0	19.0	17.9	15.7	13.2	10.4	14.9
No. of obs.	930	846	928	900	929	899	917	917	899	929	900	930	10924
Maximum	19.0	21.3	21.4	21.5	22.4	23.9	24.8	23.9	25.0	22.0	20.5	18.0	25.0
Date	690128	730228	830324	870423	760526	890627	890719	900819	690927	621003	841106	651222	690927
Minimum	-1.5	-3.0	.2	6.0	9.9	13.0	15.4	13.5	10.6	8.6	4.0	1.5	-3.0
Date	700116	690206	860303	690406	840506	640605	730709	710817	710920	711014	621129	731225	690206
DEW POINT (degree C)													
Mean	2.8	6.1	8.4	10.8	13.4	15.1	15.0	15.1	13.9	10.7	6.1	2.3	10.0
No. of obs.	930	845	926	897	929	897	917	914	899	928	900	930	10912
Maximum	14.4	15.0	18.0	19.8	19.5	23.9	22.6	20.0	20.8	18.7	17.8	15.7	23.9
Date	750126	620212	850328	720418	830515	890627	890719	680825	800904	831003	741129	741203	890627
Minimum	-45.5	-43.5	-26.8	-39.0	-15.5	-2.0	-4.1	.9	-1.3	-15.1	-42.5	-44.4	-45.5
Date	860109	860211	860303	890424	900507	880604	700729	900827	750907	731028	881129	851225	860109
RELATIVE HUMIDITY (%)													
Mean	69	77	78	77	79	82	79	79	79	74	67	65	75
No. of obs.	930	845	926	897	929	897	917	914	899	928	900	930	10912
Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100
Date	670109	670223	650305	620404	620527	630603	640702	630809	620927	651010	631115	841203	620404
Minimum	1	1	12	1	9	24	19	29	26	12	2	1	1
Date	830126	860211	650316	890424	900507	880604	700729	870806	750907	731028	841105	851225	830126

Table 5. Means and Extremes of Upper Air Data at 800 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	264 3	248 6	242 6	230 6	221 5	202 5	176 4	148 3	094 4	083 4	064 2	281 1	211 2
Scalar mean	6	7	8	7	7	8	8	7	7	6	5	5	7
CONSTANCY (%)	55	76	80	77	71	65	54	40	54	64	32	26	33
No. of obs.	915	833	903	851	890	853	909	915	877	921	889	920	10676
Max. speed	21	20	20	21	35	24	37	36	31	32	25	22	37
Date	640123	790221	610325	830406	890520	760603	800722	640809	760919	671019	671107	741202	800722
Min. speed	0	1	0	1	0	0	1	0	0	0	0	0	0
Date	820103	620204	890331	620422	840522	820605	640723	820811	830904	851005	811124	841217	811124
HEIGHT (gpm)													
Mean	2036	2032	2033	2028	2013	1996	1994	1991	2017	2043	2052	2046	2023
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	2096	2093	2110	2100	2080	2070	2062	2090	2080	2098	2100	2106	2110
Date	780104	780225	690317	690404	690506	690624	750719	690813	630924	781024	651117	891201	690317
Minimum	1953	1956	1957	1960	1779	1821	1797	1850	1870	1886	1954	1971	1779
Date	800129	850208	800308	730411	610519	850624	730717	680821	610929	741019	741109	701217	610519
TEMPERATURE (degree C)													
Mean	7.4	8.8	11.5	13.5	15.1	16.0	16.6	16.4	15.3	13.0	11.4	8.5	12.9
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
Maximum	17.0	19.3	19.7	19.0	20.0	20.9	20.8	22.0	21.0	21.0	18.3	18.4	22.0
Date	660111	730228	800331	630428	630517	890627	790721	770813	690927	621003	871126	811227	770813
Minimum	-1.0	.0	-.5	5.3	7.2	10.5	12.3	11.4	8.0	8.0	2.9	.0	-1.0
Date	610116	690206	720301	720409	840507	790614	730709	710817	660926	651016	751124	841224	610116
DEW POINT (degree C)													
Mean	.2	3.5	5.2	7.4	10.0	11.9	11.3	11.8	10.8	6.9	2.9	-.2	6.8
No. of obs.	930	845	926	897	929	896	916	913	898	928	900	930	10908
Maximum	12.4	13.1	15.4	15.5	17.6	20.9	18.1	18.1	17.8	16.1	14.2	13.0	20.9
Date	750126	790222	840319	800422	610519	890627	800711	840821	800904	891012	901109	861202	890627
Minimum	-48.0	-46.0	-43.9	-40.1	-40.0	-9.0	-7.7	-1.0	-9.0	-31.2	-45.6	-45.8	-48.0
Date	620127	860211	890329	890424	900507	640606	700703	680831	870909	841022	881130	861228	620127
RELATIVE HUMIDITY (%)													
Mean	66	73	70	71	75	78	73	76	76	68	63	62	71
No. of obs.	930	845	926	897	929	896	916	913	898	928	900	930	10908
Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100
Date	670109	680203	650305	620404	800508	630603	730716	660818	620927	681007	631115	801222	620404
Minimum	1	1	1	1	1	15	14	29	15	3	1	1	1
Date	620127	860211	890329	890424	900507	830624	700703	690821	870909	841022	821111	621202	620127

Table 6. Means and Extremes of Upper Air Data at 700 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	270 9	267 11	263 10	254 8	243 6	212 5	172 4	147 2	099 3	080 2	273 3	265 7	250 4
Scalar mean	11	12	11	9	8	8	8	7	6	6	6	9	8
CONSTANCY (%)	86	91	91	89	80	63	52	36	40	27	44	79	53
No. of obs.	911	830	902	850	879	841	906	914	873	918	883	915	10622
Max. speed	26	23	24	25	30	27	31	37	35	34	22	22	37
Date	880122	680214	880317	830406	890520	740613	800722	640809	640905	741019	671107	831230	640809
Min. speed	1	1	2	1	0	1	0	0	0	0	0	1	0
Date	620105	860211	640312	670415	850519	630620	820728	820811	670916	831031	891109	721202	670916
HEIGHT (gpm)													
Mean	3128	3128	3139	3143	3136	3123	3123	3119	3140	3161	3160	3143	3137
No. of obs.	930	846	928	900	929	899	917	917	899	929	900	930	10924
Maximum	3195	3192	3218	3200	3197	3200	3195	3200	3214	3213	3210	3209	3218
Date	780110	780225	770314	630430	850517	800623	750719	690813	800904	821002	651116	781204	770314
Minimum	3041	3048	3051	3082	2917	2954	2930	2980	3000	3007	3079	3066	2917
Date	740102	740206	720301	900411	610519	850624	730717	680821	610929	741019	741109	821227	610519
TEMPERATURE (degree C)													
Mean	3.6	4.1	6.0	8.1	9.8	11.0	11.4	11.0	10.3	9.1	6.9	4.8	8.0
No. of obs.	930	846	928	900	929	899	917	917	899	929	900	930	10924
Maximum	14.0	13.5	13.9	13.7	14.1	15.0	15.4	16.3	14.8	13.9	13.3	13.5	16.3
Date	840111	840205	880313	750428	890518	780612	720714	750814	800904	781012	741128	861220	750814
Minimum	-5.0	-4.0	-1.7	2.2	5.1	7.0	6.9	5.0	6.0	3.0	-.2	-5.1	-5.1
Date	680121	680210	720302	720410	890506	630627	730720	660823	650919	611031	841124	731218	731218
DEW POINT (degree C)													
Mean	-9.7	-5.5	-2.5	.0	2.9	4.5	3.5	4.2	3.0	.1	-3.5	-8.8	-1.0
No. of obs.	930	844	926	896	928	896	916	913	899	927	899	929	10903
Maximum	5.6	11.9	10.2	9.1	11.7	12.5	12.8	12.3	11.6	10.3	9.5	8.0	12.8
Date	840117	840205	860327	780428	780518	750605	790706	750808	860901	751008	741109	701224	790706
Minimum	-48.0	-48.1	-45.3	-43.5	-44.2	-43.3	-15.7	-18.5	-45.6	-42.9	-46.8	-48.0	-48.1
Date	620127	860211	900320	840428	900507	880603	820728	900831	850930	881020	831128	891204	860211
RELATIVE HUMIDITY (%)													
Mean	50	59	60	61	66	68	61	65	64	58	55	48	60
No. of obs.	930	844	926	896	928	896	916	913	899	927	899	929	10903
Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100
Date	700113	640203	690301	790406	650509	650613	730716	750808	700909	721011	631115	841203	631115
Minimum	1	1	1	1	1	1	12	9	1	1	1	1	1
Date	620127	820202	650316	840428	830517	880603	820728	900831	850930	881020	831102	851225	620127

Table 7. Means and Extremes of Upper Air Data at 600 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	266 16	265 16	265 14	260 11	255 7	219 4	154 3	124 2	090 2	Calm	260 6	262 13	258 7
Scalar mean	17	17	15	12	8	7	7	6	6	6	9	14	10
CONSTANCY (%)	94	95	94	92	82	54	44	31	35	7	76	93	66
No. of obs.	894	820	900	847	864	836	901	909	869	917	882	914	10553
Max. speed	34	35	34	31	26	26	37	28	35	32	25	34	37
Date	650103	750214	660323	740401	890502	740613	650715	640809	640905	741019	651128	831231	650715
Min. speed	2	3	2	0	0	0	0	0	0	0	0	1	0
Date	880103	670205	860329	810416	850520	860602	830728	840802	830905	851025	881107	631208	810416
HEIGHT (gpm)													
Mean	4369	4370	4386	4399	4402	4395	4396	4391	4409	4424	4414	4390	4395
No. of obs.	930	846	928	900	929	899	916	916	898	929	900	930	10921
Maximum	4455	4453	4475	4465	4469	4481	4475	4460	4501	4476	4491	4474	4501
Date	750126	730201	770314	790424	780508	800623	790712	650812	800904	821002	741121	781204	800904
Minimum	4270	4267	4281	4330	4209	4235	4217	4240	4270	4275	4336	4285	4209
Date	630114	710202	720302	670401	610519	850624	730717	840815	610929	741019	771116	821227	610519
TEMPERATURE (degree C)													
Mean	-.7	-1.0	-.8	.5	2.8	4.3	4.4	4.3	3.6	2.4	1.2	.5	1.8
No. of obs.	930	846	928	900	929	899	916	916	898	929	900	930	10921
Maximum	8.1	8.5	8.6	5.4	7.6	10.0	9.7	12.3	8.2	7.3	7.8	8.5	12.3
Date	760118	810223	770302	730401	800524	620627	800710	750814	800913	731013	841125	851214	750814
Minimum	-12.8	-9.0	-7.8	-6.0	-3.0	-1.0	.0	-1.4	-.5	-4.0	-7.5	-10.0	-12.8
Date	830123	630206	860302	720409	650501	630627	640721	810827	860930	631024	771124	671215	830123
DEW POINT (degree C)													
Mean	-22.8	-18.6	-14.7	-9.1	-4.5	-3.1	-4.7	-3.7	-4.9	-7.2	-13.5	-21.0	-10.6
No. of obs.	928	844	926	895	928	896	915	912	898	927	899	929	10897
Maximum	1.1	-.6	.9	2.4	5.0	6.7	7.1	5.2	5.4	4.1	2.1	3.2	7.1
Date	750112	850223	750326	740408	610519	840625	770720	800807	700909	891012	701121	841228	770720
Minimum	-53.0	-52.2	-50.6	-50.0	-49.2	-46.7	-30.1	-28.7	-49.8	-47.5	-49.1	-51.6	-53.0
Date	620127	860222	880305	630403	890506	880603	880718	890819	850930	861007	831128	821228	620127
RELATIVE HUMIDITY (%)													
Mean	27	35	44	55	64	63	55	60	59	55	44	28	49
No. of obs.	928	844	926	895	928	896	915	912	898	927	899	929	10897
Maximum	100	100	100	100	100	100	100	100	100	100	100	100	100
Date	820117	840210	830316	670402	840517	650613	730717	710817	700909	721011	651111	841203	650613
Minimum	1	1	1	1	1	1	5	6	1	1	1	1	1
Date	610111	820204	820318	630403	890506	880603	880718	890819	850930	611012	821120	661227	610111

Table 8. Means and Extremes of Upper Air Data at 500 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	266 23	264 22	264 19	259 14	261 7	227 2	120 3	096 3	082 2	271 2	259 10	262 18	261 9
Scalar mean	24	23	20	14	9	6	7	7	6	7	12	19	13
CONSTANCY (%)	96	96	96	94	83	38	44	39	38	30	86	95	72
No. of obs.	893	821	901	845	857	831	898	905	870	912	879	911	10523
Max. speed	49	41	37	31	28	24	37	34	30	31	32	42	49
Date	640129	710201	660323	790402	890502	740613	650715	640809	850906	741019	631125	821227	640129
Min. speed	2	5	1	1	0	0	0	0	0	0	0	3	0
Date	650118	710218	720314	620427	850511	860624	870714	860805	820912	841015	861116	881227	820912
HEIGHT (gpm)													
Mean	5805	5806	5822	5842	5857	5859	5860	5855	5869	5877	5861	5831	5845
No. of obs.	930	846	928	899	929	899	917	916	899	929	900	930	10922
Maximum	5911	5911	5921	5927	5941	5955	5941	5920	5981	5936	5958	5930	5981
Date	750126	730201	770322	790424	780508	800623	790713	690813	800904	791021	741121	781204	800904
Minimum	5660	5670	5724	5751	5694	5711	5698	5723	5740	5738	5745	5701	5660
Date	630114	680214	720302	720409	610519	850624	730717	710817	610929	741019	711116	821227	630114
TEMPERATURE (degree C)													
Mean	-8.1	-8.3	-8.2	-7.2	-5.1	-3.7	-3.7	-3.7	-4.4	-5.5	-6.5	-7.6	-6.0
No. of obs.	930	846	928	899	927	898	917	916	899	929	900	930	10919
Maximum	-.6	.4	.9	-1.1	1.9	1.0	1.9	1.3	.6	-.4	-.3	-1.0	1.9
Date	760112	720227	720302	790407	700513	620608	790706	750814	790929	791018	741107	621203	700513
Minimum	-17.1	-16.6	-15.0	-13.0	-10.0	-8.0	-8.4	-8.6	-9.0	-11.3	-15.4	-16.0	-17.1
Date	830123	860221	630330	670414	650503	770613	740728	710819	660928	761016	711116	631230	830123
DEW POINT (degree C)													
Mean	-33.0	-29.9	-28.1	-21.0	-13.7	-12.2	-14.0	-12.9	-14.1	-17.1	-23.8	-30.1	-20.8
No. of obs.	928	843	925	892	925	895	916	912	899	927	898	928	10888
Maximum	-8.5	-9.6	-7.7	-2.8	-1.0	-.3	-.1	-1.1	-.2	-2.9	-4.4	-6.6	-.1
Date	750112	710226	890318	740408	610519	830617	780729	700803	700909	741018	871128	741202	780729
Minimum	-61.5	-61.2	-58.1	-56.7	-55.1	-53.3	-51.3	-41.7	-44.7	-52.7	-54.5	-58.0	-61.5
Date	830123	860221	900319	900408	820503	880603	820726	890808	870912	871017	861121	891210	830123
RELATIVE HUMIDITY (%)													
Mean	18	23	26	41	57	58	50	54	53	47	34	22	40
No. of obs.	928	843	925	892	925	895	916	912	899	927	898	928	10888
Maximum	100	96	100	100	100	100	100	100	100	100	100	100	100
Date	820117	840210	880325	690416	820531	830602	690729	730827	810922	861019	651111	861202	651111
Minimum	1	1	1	1	1	1	1	3	2	1	1	1	1
Date	620120	630206	820317	630403	820503	880603	820726	890808	870912	871017	821122	621223	620120

Table 9. Means and Extremes of Upper Air Data at 400 hPa Based on 0000 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	263 30	262 29	262 26	261 18	268 8	245 1	096 4	087 4	077 3	273 4	262 15	263 24	262 12
Scalar mean	31	30	27	19	10	6	7	7	7	9	16	25	16
CONSTANCY (%)	97	97	96	95	83	11	61	51	41	44	90	96	74
No. of obs.	893	821	902	846	851	821	891	899	863	908	877	909	10481
Max. speed	58	51	49	41	32	25	29	25	34	32	42	55	58
Date	630114	790201	650309	830401	890502	740613	890718	680821	850906	791031	711116	821227	630114
Min. speed	9	9	8	3	0	0	1	1	0	0	1	7	0
Date	640110	660208	710305	750430	820515	820618	680714	640803	850901	831023	641103	741219	820515
HEIGHT (gpm)													
Mean	7506	7504	7520	7547	7579	7590	7589	7585	7594	7594	7571	7533	7559
No. of obs.	930	845	928	899	927	896	914	915	897	928	900	930	10909
Maximum	7630	7636	7650	7658	7689	7699	7679	7666	7730	7674	7667	7655	7730
Date	670109	810223	770302	790424	800521	800623	790713	760825	800904	791021	741121	791205	800904
Minimum	7352	7310	7404	7420	7460	7469	7462	7442	7480	7478	7422	7360	7310
Date	830123	680214	740317	680421	610519	810614	710722	710817	610910	741030	711116	641231	680214
TEMPERATURE (degree C)													
Mean	-17.9	-18.5	-18.6	-17.8	-15.1	-13.6	-14.0	-13.9	-14.7	-15.8	-16.9	-18.0	-16.2
No. of obs.	930	845	928	899	926	895	914	915	897	928	900	930	10907
Maximum	-11.0	-11.0	-8.3	-8.8	-6.4	-7.5	-6.3	-7.1	-9.1	-8.8	-10.6	-12.0	-6.3
Date	820120	770212	800308	740428	800521	830617	800712	700803	700909	741019	731124	621202	800712
Minimum	-28.0	-29.0	-26.6	-25.0	-22.0	-18.8	-19.7	-21.0	-19.4	-21.7	-25.0	-29.0	-29.0
Date	620105	680228	720313	680422	680502	790614	740728	710819	780904	781019	691109	641223	641223
DEW POINT (degree C)													
Mean	-41.9	-39.8	-38.0	-32.0	-25.3	-23.8	-25.4	-24.1	-26.1	-29.7	-34.7	-39.7	-31.7
No. of obs.	918	831	923	891	924	890	913	911	897	925	896	923	10842
Maximum	-19.2	-21.1	-18.8	-11.2	-12.2	-7.5	-7.7	-10.4	-10.2	-10.9	-14.1	-15.2	-7.5
Date	750106	780222	770330	740428	610519	830617	800712	700803	700909	741019	871128	741202	830617
Minimum	-67.4	-63.6	-64.8	-62.3	-63.3	-60.8	-59.2	-57.3	-60.3	-60.4	-62.7	-68.5	-68.5
Date	830123	860221	830311	870406	890506	880604	820708	900817	890923	811026	821117	871210	871210
RELATIVE HUMIDITY (%)													
Mean	15	20	24	35	48	49	43	48	43	37	29	19	34
No. of obs.	918	831	923	891	924	890	913	911	897	925	896	923	10842
Maximum	96	91	98	100	100	100	100	100	100	95	98	97	100
Date	780107	820228	810302	810415	810531	830617	810727	810801	840918	831013	651111	791203	810415
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	620108	640202	630311	630402	820503	880604	820708	900817	810911	621005	621118	631217	620108

Table 10. Means and Extremes of Upper Air Data at 350 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	263 32	261 32	261 30	262 21	271 9	Calm	089 5	084 4	073 3	273 5	262 17	262 27	263 13
Scalar mean	33	33	31	22	11	6	7	7	7	10	18	28	18
CONSTANCY (%)	97	97	97	95	82	6	69	55	40	49	92	96	75
No. of obs.	893	822	901	845	846	819	886	899	858	906	874	906	10455
Max. speed	64	56	52	49	39	25	32	27	28	38	49	57	64
Date	630114	760204	780311	830401	820502	800604	710722	790802	850906	791030	711116	821227	630114
Min. speed	11	11	8	4	0	0	0	1	0	1	1	10	0
Date	670108	840223	710304	670409	850511	830610	860717	760817	850927	861020	711106	741203	830610
HEIGHT (gpm)													
Mean	8488	8485	8501	8528	8572	8589	8588	8583	8588	8583	8556	8515	8548
No. of obs.	930	844	928	897	926	893	912	913	896	927	900	930	10896
Maximum	8617	8630	8652	8656	8715	8708	8690	8689	8740	8679	8673	8648	8740
Date	750126	810223	770302	790424	800521	800623	790713	760825	800904	791021	741121	791205	800904
Minimum	8303	8260	8360	8380	8440	8471	8484	8439	8481	8470	8413	8330	8260
Date	830123	680214	680327	680421	680502	810613	710722	710817	710919	631023	711116	671215	680214
TEMPERATURE (degree C)													
Mean	-24.3	-24.7	-24.9	-24.6	-21.7	-20.0	-20.4	-20.4	-21.2	-22.6	-23.5	-24.5	-22.7
No. of obs.	930	843	928	897	926	891	912	913	895	926	900	930	10891
Maximum	-18.7	-17.8	-16.6	-16.9	-12.4	-12.3	-10.6	-12.1	-15.5	-12.7	-17.8	-18.7	-10.6
Date	730103	860221	800308	740428	830515	830617	800712	700803	770925	741019	791104	751201	800712
Minimum	-34.3	-37.0	-32.2	-34.0	-29.0	-27.0	-26.4	-27.0	-27	-29	-30	-34	-37.0
Date	830124	680228	720313	680422	680502	690627	870705	720831	620914	621001	611114	641223	680228
DEW POINT (degree C)													
Mean	-47.9	-46.0	-44.0	-38.2	-32.5	-31.2	-32.7	-30.9	-33.5	-37.5	-41.4	-45.4	-38.4
No. of obs.	650	590	647	623	648	624	635	633	628	649	629	649	7605*
Maximum	-26.4	-25.0	-25.1	-19.8	-16.0	-12.5	-12.9	-16.5	-17.1	-15.1	-21.0	-22.1	-12.5
Date	750106	840210	770330	740428	830515	830617	800712	700803	700909	741019	871128	741202	830617
Minimum	-71.5	-69.5	-68.9	-67.6	-68.3	-63.1	-64.1	-63.1	-65.4	-66.9	-68.0	-70.4	-71.5
Date	830123	880221	830303	830402	890506	860628	860727	890809	820926	821011	821122	871210	830123
RELATIVE HUMIDITY (%)													
Mean	14	18	23	34	44	44	39	45	39	32	26	17	31
No. of obs.	650	590	647	623	648	624	635	633	628	649	629	649	7605*
Maximum	90	88	94	94	100	100	100	100	92	91	93	86	100
Date	780107	810213	740320	810415	810531	840625	810722	810801	900911	701009	761129	711221	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	810103	730202	820308	830402	820503	830611	860727	890809	820926	811021	811121	821202	730202

* Period : 1970-1990

Table 11. Means and Extremes of Upper Air Data at 300 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	262 35	260 35	261 33	263 24	277 10	027 1	083 6	080 5	068 3	274 6	262 18	262 29	263 15
Scalar mean	36	36	34	25	12	7	9	8	8	11	20	30	20
CONSTANCY (%)	97	97	97	96	81	19	74	58	36	53	93	97	74
No. of obs.	892	822	901	845	848	820	883	899	858	903	873	904	10448
Max. speed	67	63	61	55	38	29	31	30	31	41	49	59	67
Date	830122	790213	830309	830402	820503	800604	710722	790802	830909	631024	771122	891222	830122
Min. speed	12	12	9	3	0	0	1	0	1	0	1	8	0
Date	670102	840224	710306	680422	820520	820613	730709	840812	610915	821014	741106	811212	820520
HEIGHT (gpm)													
Mean	9597	9592	9607	9636	9694	9718	9715	9711	9712	9701	9670	9624	9665
No. of obs.	930	844	928	897	926	891	912	914	896	925	900	930	10893
Maximum	9740	9746	9769	9768	9856	9852	9870	9835	9875	9804	9791	9765	9875
Date	670109	810223	770302	790424	800521	830617	650716	760825	800904	791021	741121	791202	800904
Minimum	9372	9340	9457	9470	9500	9587	9628	9561	9598	9560	9520	9400	9340
Date	830123	680214	830328	680421	630530	790614	720727	710817	710919	791026	631116	641231	680214
TEMPERATURE (degree C)													
Mean	-32.1	-32.4	-32.5	-32.5	-29.7	-28.0	-28.3	-28.3	-29.4	-30.8	-31.5	-32.4	-30.6
No. of obs.	930	844	928	897	926	891	911	914	896	925	900	930	10892
Maximum	-26.7	-25.0	-26.5	-26.9	-17.5	-20.1	-20.2	-18.7	-22.8	-21.9	-26.5	-26.9	-17.5
Date	800109	800226	800308	740428	830515	830617	800712	700803	700909	741019	741109	741202	830515
Minimum	-41.8	-44.0	-41.0	-41.0	-38.0	-35.6	-34.1	-34.0	-34.7	-37.2	-38.0	-43.0	-44.0
Date	880103	680228	670326	680422	680502	790614	710729	620815	760902	791025	611114	641223	680228
DEW POINT (degree C)													
Mean	-54.1	-52.7	-50.7	-45.4	-40.4	-39.1	-40.4	-38.8	-41.4	-45.2	-48.6	-52.0	-45.7
No. of obs.	766	704	792	773	801	771	787	786	775	798	769	789	9311*
Maximum	-33.9	-35.6	-32.4	-30.3	-21.8	-20.9	-23.3	-23.3	-24.9	-24.6	-29.8	-30.0	-20.9
Date	750106	840210	770330	740428	830515	830617	800712	700803	700909	741019	871128	741202	830617
Minimum	-77.1	-73.7	-73.6	-73.0	-71.0	-71.6	-68.9	-69.5	-71.4	-72.5	-73.5	-74.6	-77.1
Date	830124	870214	870307	630402	650501	880604	890715	890816	820919	821011	821122	871211	830124
RELATIVE HUMIDITY (%)													
Mean	13	16	21	33	41	41	37	42	36	30	23	17	29
No. of obs.	766	704	792	773	801	771	787	786	775	798	769	789	9311*
Maximum	66	81	100	93	100	94	100	100	84	86	85	83	100
Date	700113	780221	810330	810401	810531	710607	810727	810801	840914	701009	741108	711221	810330
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	620115	630215	640312	630402	650501	820603	830702	820825	820918	811021	621108	621230	620115

* Period : 1961-1965, 1970-1990

Table 12. Means and Extremes of Upper Air Data at 250 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	260 36	258 37	260 35	265 27	282 11	032 3	077 8	073 6	061 3	276 7	262 20	261 31	264 15
Scalar mean	37	38	36	28	14	8	10	9	9	12	21	32	21
CONSTANCY (%)	97	97	97	95	79	34	79	62	31	56	93	96	72
No. of obs.	886	824	900	842	842	819	885	900	851	900	871	900	10420
Max. speed	64	69	67	57	41	32	26	34	26	47	48	62	69
Date	830124	680214	830301	830402	820503	800618	820714	810805	860930	791031	711117	671215	680214
Min. speed	11	14	9	4	0	1	0	0	1	1	1	7	0
Date	670101	840220	710307	850426	850507	850620	890721	860824	620921	631012	611108	741202	850507
HEIGHT (gpm)													
Mean	10859	10854	10867	10897	10968	11001	10996	10992	10988	10969	10935	10884	10934
No. of obs.	928	843	927	897	924	889	910	911	892	924	899	930	10874
Maximum	11020	11023	11039	11034	11172	11174	11160	11146	11170	11088	11060	11040	11174
Date	670109	810223	770302	790424	830515	830617	650716	760825	800904	791021	741121	651203	830617
Minimum	10604	10590	10684	10680	10770	10836	10881	10842	10877	10802	10750	10640	10590
Date	830123	680214	830328	680422	680502	790614	740728	710817	710919	791026	631116	641231	680214
TEMPERATURE (degree C)													
Mean	-41.5	-41.6	-41.7	-41.8	-39.5	-37.9	-38.1	-38.1	-39.3	-40.5	-41.1	-41.9	-40.2
No. of obs.	928	843	927	897	922	888	910	911	892	923	899	929	10869
Maximum	-37.0	-34.3	-36.7	-36.3	-30.7	-31.2	-29.6	-31.9	-31.0	-33.0	-36.1	-37.5	-29.6
Date	640130	700216	700302	790421	610519	830617	710722	780827	700909	741019	741109	781218	710722
Minimum	-49.4	-51.4	-50.6	-51.0	-46.0	-44.0	-52.0	-44.6	-44.2	-47.0	-47.0	-49.0	-52.0
Date	880103	900210	810321	680423	630523	680604	680720	760828	860930	671031	631115	631230	680720
DEW POINT (degree C)													
Mean	-61.8	-60.1	-59.1	-54.3	-49.2	-48.7	-49.7	-48.4	-50.8	-54.6	-57.1	-59.5	-54.5
No. of obs.	391	342	385	364	526	581	580	588	502	450	405	357	5471*
Maximum	-47.9	-45.9	-42.5	-38.5	-36.1	-33.0	-32.2	-35.7	-33.6	-35.9	-39.4	-41.1	-32.2
Date	790128	810227	770330	740408	810531	830617	710722	780827	700909	741019	741108	741202	710722
Minimum	-80.3	-78.5	-78.6	-78.4	-75.4	-74.6	-75.3	-75.7	-78.1	-79.4	-80.7	-80.0	-80.7
Date	830129	860213	890324	830402	860504	820603	820722	890807	820926	821011	821122	871211	821122
RELATIVE HUMIDITY (%)													
Mean	11	15	19	27	38	37	35	38	33	25	20	15	26
No. of obs.	391	342	385	364	526	581	580	588	502	450	405	357	5471*
Maximum	53	74	90	90	100	91	100	100	79	80	81	71	100
Date	830120	810227	810330	810414	810531	710607	810727	810802	730902	701009	741108	741202	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820111	820204	820307	830402	860503	820603	820722	820825	820903	811021	811121	821210	811021

* Period : 1970-1990

Table 13. Means and Extremes of Upper Air Data at 200 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	254 37	255 37	258 36	267 29	289 12	031 5	073 11	070 7	058 3	274 7	259 21	256 32	262 15
Scalar mean	38	38	37	30	15	11	13	11	10	12	23	34	23
CONSTANCY (%)	97	97	97	95	77	46	82	65	30	58	92	96	68
No. of obs.	874	821	896	834	843	815	882	898	847	897	868	897	10372
Max. speed	73	81	72	58	40	35	34	40	32	51	48	70	81
Date	620105	680214	830326	870405	890502	800618	650709	810805	690903	651021	791101	641220	680214
Min. speed	13	15	7	3	0	0	0	1	1	1	2	8	0
Date	890121	840226	710304	690425	860524	870616	890721	630810	610917	641027	611102	741201	860524
HEIGHT (gpm)													
Mean	12336	12330	12344	12373	12457	12499	12494	12490	12478	12452	12414	12359	12419
No. of obs.	927	842	927	896	921	887	910	911	891	923	899	929	10863
Maximum	12500	12507	12525	12523	12662	12720	12664	12679	12677	12589	12542	12535	12720
Date	670109	810223	770302	750424	800521	830617	800712	760825	800904	791021	741121	791202	830617
Minimum	12085	12060	12147	12120	12240	12314	12346	12338	12344	12259	12210	12110	12060
Date	830123	680214	810320	680422	680502	790614	740728	710817	760914	791026	631116	641231	680214
TEMPERATURE (degree C)													
Mean	-52.8	-52.8	-52.8	-52.8	-51.2	-50.2	-50.0	-50.0	-51.0	-51.9	-52.6	-53.2	-51.8
No. of obs.	926	841	926	894	920	887	909	911	890	922	899	929	10854
Maximum	-47.0	-44.8	-45.3	-46.4	-43.2	-42.5	-42.3	-44.0	-42.8	-46.0	-46.9	-48.3	-42.3
Date	690131	700216	830316	790421	610519	790630	710722	690811	700909	751014	791104	871210	710722
Minimum	-58.8	-58.0	-58.7	-60.0	-57.0	-57.0	-55.0	-57.1	-57.0	-59.0	-58.9	-59.0	-60.0
Date	710130	640217	810317	680429	620502	630604	640722	830802	640902	671031	821122	631221	680429
DEW POINT (degree C)													
Mean	-74.1	-73.1	-72.0	-68.0	-63.9	-62.2	-63.5	-62.4	-65.0	-69.5	-70.9	-73.0	-68.2
No. of obs.	307	279	307	293	304	295	294	292	298	304	298	307	3578*
Maximum	-57.7	-58.3	-56.7	-54.9	-49.1	-46.9	-49.7	-50.0	-52.9	-54.4	-56.1	-56.5	-46.9
Date	810126	810226	810331	810420	810531	830617	810718	820816	840901	831003	871128	811209	830617
Minimum	-86.9	-87.0	-86.6	-86.9	-85.0	-83.3	-84.4	-85.3	-87.3	-87.8	-90.1	-87.1	-90.1
Date	830120	820220	890301	830402	820502	820603	890715	890813	820918	821030	821122	821224	821122
RELATIVE HUMIDITY (%)													
Mean	10	12	16	21	29	28	27	29	24	16	13	10	20
No. of obs.	307	279	307	293	304	295	294	292	298	304	298	307	3578*
Maximum	54	59	81	89	100	88	100	100	70	68	55	64	100
Date	810126	810227	810330	810401	810531	810630	810718	810802	840914	831003	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820111	820204	820301	820407	820502	820603	870705	820825	820902	811021	811104	811201	811021

* Period : 1981-1990

Table 14. Means and Extremes of Upper Air Data at 175 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	252 36	253 36	257 35	267 28	292 12	028 6	070 13	068 8	058 4	274 7	256 21	253 32	262 15
Scalar mean	37	38	36	29	15	12	15	12	10	12	22	34	23
CONSTANCY (%)	97	97	97	96	75	52	85	70	37	56	92	96	64
No. of obs.	854	807	891	822	838	808	879	890	839	890	857	889	10264
Max. speed	67	79	67	59	43	39	42	40	34	50	48	63	79
Date	620105	680214	690314	900408	900507	800618	750710	810805	690903	651021	821128	641221	680214
Min. speed	13	13	8	1	1	1	0	0	1	0	1	11	0
Date	890121	760220	710304	710426	730508	850608	900726	830814	660907	841011	711104	661219	830814
HEIGHT (gpm)													
Mean	13183	13179	13193	13221	13310	13356	13353	13348	13332	13303	13262	13206	13270
No. of obs.	921	839	925	892	919	885	909	907	886	920	894	925	10822
Maximum	13341	13370	13382	13400	13532	13603	13544	13555	13545	13449	13407	13388	13603
Date	800104	610214	770306	660429	800521	830617	800712	760825	800904	791021	741128	791202	830617
Minimum	12955	12890	12994	12950	13090	13170	13188	13195	13180	13105	13040	12950	12890
Date	830123	680214	810320	680423	640525	680604	740728	710817	650923	791026	631116	641231	680214
TEMPERATURE (degree C)													
Mean	-59.2	-59.1	-59.0	-58.7	-57.8	-57.1	-56.7	-56.9	-57.7	-58.5	-59.1	-59.6	-58.3
No. of obs.	916	834	923	886	916	879	908	903	882	914	889	923	10773
Maximum	-50.8	-50.9	-51.5	-50	-51.0	-49.1	-49.5	-50.0	-47.8	-52	-52.1	-54.1	-47.8
Date	830128	700216	830316	610415	610519	830617	710722	690811	700909	621012	791104	871210	700909
Minimum	-65.0	-67.0	-69.0	-66.0	-64.0	-65.0	-61.3	-63.7	-63.1	-67.8	-66,2	-66.0	-69.0
Date	660111	670217	680324	670425	670502	680601	750722	830802	760914	841007	821122	671217	680324
DEW POINT (degree C)													
Mean	-79.6	-79.0	-77.7	-74.4	-70.7	-69.0	-70.3	-69.1	-72.2	-75.7	-77.3	-78.9	-74.5
No. of obs.	306	277	307	291	304	295	292	290	297	303	296	307	3565*
Maximum	-63.6	-65.0	-62.6	-61.1	-56.7	-52.1	-56.7	-57.8	-60.8	-62.4	-65.4	-62.6	-52.1
Date	810104	810218	810315	810423	810531	830617	810718	810827	810903	831003	871128	811209	830617
Minimum	-90.9	-91.3	-91.5	-91.7	-90.8	-88.6	-88.8	-90.0	-92.0	-92.0	-95.3	-92.6	-95.3
Date	860109	830228	820321	830402	820502	820604	890715	890813	820918	821030	821122	831227	821122
RELATIVE HUMIDITY (%)													
Mean	9	11	14	18	26	26	24	27	20	14	11	9	17
No. of obs.	306	277	307	291	304	295	292	290	297	303	296	307	3565*
Maximum	49	60	68	79	100	92	100	100	72	63	46	69	100
Date	810105	810227	810308	810401	810531	810605	810718	810801	810903	831003	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820102	820201	820301	820406	820502	820603	870705	820822	820902	811021	811119	811201	811021

* Period : 1981-1990

Table 15. Means and Extremes of Upper Air Data at 150 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	252 34	254 34	258 32	266 25	296 10	029 8	068 15	068 10	062 5	272 6	253 20	253 31	263 13
Scalar mean	35	35	33	26	14	13	17	13	10	11	21	32	22
CONSTANCY (%)	97	97	97	96	73	62	87	77	49	52	92	96	59
No. of obs.	844	796	880	823	833	804	876	889	836	887	852	887	10207
Max. speed	68	72	67	60	41	36	44	41	32	47	45	61	72
Date	620105	680214	690314	900408	900507	800618	750710	610817	840911	791031	611115	891222	680214
Min. speed	11	14	8	2	1	0	1	1	0	0	1	7	0
Date	610110	890209	710305	850426	850505	830608	900726	670801	840922	891021	711104	751203	830608
HEIGHT (gpm)													
Mean	14136	14131	14145	14176	14268	14316	14313	14308	14290	14258	14214	14155	14226
No. of obs.	915	834	923	886	912	878	907	902	883	914	890	923	10767
Maximum	14310	14317	14341	14367	14507	14599	14529	14528	14524	14409	14388	14343	14599
Date	670101	730201	770306	750424	800521	830617	800712	760825	800904	791021	791104	741201	830617
Minimum	13911	13850	13950	13920	14070	14110	14130	14151	14119	14065	13970	13900	13850
Date	830124	680214	680305	680422	680502	680601	740728	710817	760914	791026	631116	671215	680214
TEMPERATURE (degree C)													
Mean	-65.7	-65.7	-65.5	-65.0	-64.7	-64.5	-64.3	-64.3	-64.7	-65.5	-66.1	-66.3	-65.2
No. of obs.	910	833	921	883	909	877	905	901	878	912	887	922	10738
Maximum	-56.1	-56.2	-57.0	-55.0	-58.6	-55.5	-58.6	-58.0	-53.6	-59.0	-58.0	-58.2	-53.6
Date	830129	900217	690309	610415	610519	830617	710722	690811	700909	621012	791104	871211	700909
Minimum	-72.0	-73.0	-73.2	-73.0	-72.0	-71.0	-69.2	-70.9	-69.0	-71.3	-72.0	-72.4	-73.2
Date	630108	650204	740321	670425	670502	680612	750722	760831	610905	761029	621106	741214	740321
DEW POINT (degree C)													
Mean	-86.0	-85.4	-83.9	-81.0	-77.9	-77.0	-77.5	-76.5	-79.7	-82.5	-84.2	-86.1	-81.5
No. of obs.	303	277	307	290	303	295	292	290	296	303	296	307	3559*
Maximum	-70.2	-70.1	-65.2	-68.3	-64.8	-58.9	-64.0	-64.4	-68.3	-67.3	-73.8	-69.4	-58.9
Date	810122	810218	830327	810420	820531	830617	810722	810804	810903	811005	851109	811209	830617
Minimum	-96.8	-95.9	-95.9	-96.0	-96.4	-94.7	-94.8	-95.2	-95.7	-97.3	-98.6	-97.8	-98.6
Date	840122	860222	820319	830403	820502	900605	820727	890813	820919	821031	821122	831211	821122
RELATIVE HUMIDITY (%)													
Mean	8	10	11	16	23	23	22	24	16	12	9	7	15
No. of obs.	303	277	307	290	303	295	292	290	296	303	296	307	3559*
Maximum	59	64	61	73	100	91	100	100	72	58	40	70	100
Date	810106	810227	810306	810415	810531	810605	810718	810801	810903	831003	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820102	820202	820301	820406	820502	820603	820712	820822	810911	811021	811104	811201	810911

* Period : 1981-1990

Table 16. Means and Extremes of Upper Air Data at 125 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	256 29	257 29	259 27	266 20	303 8	039 10	067 17	069 13	066 7	265 4	252 17	255 26	267 10
Scalar mean	30	30	28	22	12	13	19	15	11	10	18	27	19
CONSTANCY (%)	97	97	97	95	65	74	92	88	70	37	92	97	49
No. of obs.	831	780	857	812	823	799	863	881	830	879	843	871	10069
Max. speed	77	55	53	50	39	41	44	45	31	37	44	58	77
Date	620105	700216	830307	830403	820503	750624	720708	770809	840909	631024	771122	891222	620105
Min. speed	6	7	6	1	1	1	2	1	0	0	2	9	0
Date	670121	890209	720323	850426	900519	860624	760725	720816	820919	811021	711104	751203	811021
HEIGHT (gpm)													
Mean	15227	15221	15237	15270	15362	15409	15407	15402	15384	15347	15300	15242	15317
No. of obs.	909	832	920	882	907	877	903	899	877	912	885	920	10723
Maximum	15405	15434	15434	15487	15624	15748	15653	15628	15656	15508	15519	15600	15748
Date	760120	700216	770302	750424	800521	830617	800712	760825	700909	791021	791104	651218	830617
Minimum	15015	14950	15009	15020	15181	15200	15215	15234	15200	15150	15139	15000	14950
Date	830124	680214	740321	680422	810509	680601	740728	710815	760914	671031	771123	641224	680214
TEMPERATURE (degree C)													
Mean	-72.4	-72.3	-71.9	-71.2	-71.7	-71.9	-71.9	-71.9	-71.9	-72.8	-73.3	-72.9	-72.2
No. of obs.	904	830	915	877	900	873	896	895	872	908	882	913	10665
Maximum	-61.9	-62.0	-58.7	-63	-64.0	-60.3	-65.0	-64	-61.0	-67.2	-64.6	-63.3	-58.7
Date	880103	690214	830327	610415	890505	830617	660716	610809	700909	811005	821118	721224	830327
Minimum	-81	-81.0	-79.9	-77.1	-80.0	-78.9	-78.0	-78.0	-80.0	-80.0	-80	-81.0	-81.0
Date	630108	660227	710305	870422	670502	830622	670714	680828	660922	661025	621106	661224	660227
DEW POINT (degree C)													
Mean	-92.4	-91.5	-90.2	-87.4	-85.0	-84.8	-85.2	-84.5	-86.8	-89.7	-91.8	-92.6	-88.5
No. of obs.	302	276	306	289	300	295	289	288	292	302	295	306	3540*
Maximum	-74.5	-74.1	-66.2	-74.1	-71.3	-64.0	-71.9	-70.7	-74.0	-71.8	-78.8	-76.8	-64.0
Date	810122	810223	830327	810418	810511	830617	810722	810805	810903	811005	851109	861206	830617
Minimum	-100.6	-101.4	-100.8	-100.4	-100.2	-99.9	-99.9	-99.8	-100.1	-101.4	-101.0	-100.8	-101.4
Date	900115	840216	820319	860405	820514	830601	820725	870829	820920	821015	811111	811205	821015
RELATIVE HUMIDITY (%)													
Mean	7	9	10	14	19	20	19	20	14	10	7	5	13
No. of obs.	302	276	306	289	300	295	289	288	292	302	295	306	3540*
Maximum	64	65	56	75	100	88	100	100	74	52	36	71	100
Date	810106	810227	810331	810415	810531	810605	810718	810801	810903	811005	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820202	820301	820403	820502	820603	820712	820812	820902	811019	811101	811201	811019

* Period : 1981-1990

Table 17. Means and Extremes of Upper Air Data at 100 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	261 21	260 22	262 20	266 13	330 4	054 12	070 20	072 16	071 11	Calm	254 11	260 18	279 4
Scalar mean	22	23	21	15	9	14	20	17	12	8	13	19	16
CONSTANCY (%)	97	97	96	90	46	89	97	96	90	4	88	95	28
No. of obs.	800	761	832	794	803	772	826	858	817	858	819	844	9784
Max. speed	51	60	42	39	26	34	37	38	30	26	41	47	60
Date	630106	700216	830307	700401	660507	750627	720708	810825	670901	621030	631126	621221	700216
Min. speed	2	2	2	1	1	1	4	1	1	0	1	3	0
Date	720107	770228	730331	850425	730509	880624	820731	830826	850925	811012	871121	841216	811012
HEIGHT (gpm)													
Mean	16519	16514	16533	16571	16658	16704	16704	16700	16680	16636	16587	16533	16612
No. of obs.	895	828	909	876	896	870	889	893	871	906	876	911	10620
Maximum	16724	16778	16747	16809	16955	17114	16910	16959	17025	16815	16872	16756	17114
Date	790106	700216	830316	750424	800521	830617	650716	760825	700909	751025	791104	791202	830617
Minimum	16280	16240	16267	16335	16450	16460	16509	16526	16494	16410	16290	16280	16240
Date	640118	680214	740321	740402	650501	680601	740728	710815	760914	671031	631116	641224	680214
TEMPERATURE (degree C)													
Mean	-77.8	-77.7	-77.4	-76.6	-77.6	-77.7	-76.9	-76.6	-77.3	-78.6	-78.8	-78.0	-77.6
No. of obs.	890	818	899	867	885	849	867	881	864	891	862	898	10471
Maximum	-67.3	-69.6	-65.0	-68.0	-70.8	-65.2	-69.4	-66.7	-65.1	-70.9	-67.5	-68.7	-65.0
Date	830127	750209	830327	610415	900509	830617	770717	760825	700909	771013	791104	721224	830327
Minimum	-87.0	-85.1	-84.0	-86.0	-85.0	-85.0	-85.0	-87.0	-85.0	-87.0	-87.0	-86.0	-87.0
Date	670107	710201	620326	670407	670529	640602	650715	680830	640928	621003	641109	651209	621003
DEW POINT (degree C)													
Mean	-96.9	-96.3	-95.2	-92.7	-90.7	-90.9	-90.0	-89.5	-91.7	-95.3	-97.2	-97.5	-93.7
No. of obs.	299	273	303	288	299	292	286	289	291	302	295	304	3521*
Maximum	-79.0	-79.4	-72.1	-74.3	-74.0	-69.1	-73.3	-72.3	-75.7	-80.2	-82.0	-83.3	-69.1
Date	810106	810222	830327	810415	810511	830617	810727	810802	810903	811005	851109	811209	830617
Minimum	-106.2	-104.7	-105.5	-104.7	-105.8	-104.2	-104.8	-104.4	-104.1	-106.0	-106.6	-106.6	-106.6
Date	900115	880213	860320	890413	820522	820613	820725	860801	820902	821015	861108	831222	831222
RELATIVE HUMIDITY (%)													
Mean	7	8	9	12	17	17	17	18	12	8	6	4	11
No. of obs.	299	273	303	288	299	292	286	289	291	302	295	304	3521*
Maximum	68	60	57	74	100	88	100	100	70	49	34	65	100
Date	810106	810227	810328	810415	810531	810630	810718	810801	810903	811005	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820403	820501	820603	820707	820811	810920	811013	811101	811201	810920

* Period : 1981-1990

Table 10. Means and Extremes of Upper Air Data at 90 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	262 17	261 19	263 17	267 10	009 3	060 14	072 20	075 18	075 12	094 2	254 8	261 15	296 2
Scalar mean	18	19	18	12	8	15	21	18	12	7	10	16	15
CONSTANCY (%)	96	96	95	85	41	93	98	98	95	28	81	94	15
No. of obs.	747	708	792	757	745	724	774	829	799	844	797	826	9342
Max. speed	49	60	46	33	32	31	37	35	40	28	31	42	60
Date	640103	700216	820301	700401	630506	750627	720708	770806	770924	621030	771122	621221	700216
Min. speed	3	2	2	1	0	2	6	5	1	0	1	1	0
Date	720107	860213	690329	850425	820519	670610	820704	770827	860925	811015	751114	711218	811015
HEIGHT (gpm)													
Mean	17122	17116	17138	17177	17262	17307	17313	17308	17284	17236	17186	17134	17215
No. of obs.	851	787	866	832	844	811	826	874	855	888	858	895	10187**
Maximum	17337	17396	17379	17417	17574	17755	17510	17598	17672	17419	17507	17364	17755
Date	790106	700216	830316	750424	800521	830617	650716	760825	700909	751025	791104	791202	830617
Minimum	16870	16850	16860	16950	17030	17050	17115	17120	17103	17000	16890	16910	16850
Date	640118	680214	740321	670414	680531	680601	740728	680830	760914	671031	631116	671215	680214
TEMPERATURE (degree C)													
Mean	-78.8	-78.8	-78.7	-77.9	-78.8	-78.5	-76.7	-75.9	-77.1	-78.7	-79.4	-78.7	-78.2
No. of obs.	839	779	859	828	828	797	808	853	846	880	848	882	10047**
Maximum	-66.3	-67.0	-64.8	-69.0	-70.2	-64.1	-67	-65.2	-64.3	-69.0	-67.5	-68.5	-64.1
Date	830124	750209	830327	870406	900509	830617	630725	760831	700909	771017	791104	891222	830617
Minimum	-88.0	-86.8	-86	-88	-87.0	-87.7	-86.0	-88.0	-87.6	-89.4	-87.2	-87	-89.4
Date	680102	710225	610301	650402	670524	830622	650715	680830	880923	841028	881107	651210	841028
DEW POINT (degree C)													
Mean	-99.1	-98.7	-97.9	-95.3	-92.8	-93.1	-91.1	-88.6	-91.5	-95.3	-97.5	-98.3	-94.9
No. of obs.	267	247	272	257	267	260	252	283	289	300	292	303	3289*
Maximum	-88.6	-83.1	-71.5	-81.1	-78.7	-68.1	-80.2	-70.8	-77.9	-82.2	-81.0	-80.5	-68.1
Date	820103	830225	830327	820424	830526	830617	830727	810802	810903	811005	821126	891223	830617
Minimum	-106.6	-105.6	-106.4	-105.5	-105.8	-104.5	-103.5	-102.7	-104.2	-106.4	-108.2	-106.8	-108.2
Date	890131	880213	860321	890414	820518	820603	820715	860827	820903	811020	831124	811205	831124
RELATIVE HUMIDITY (%)													
Mean	3	4	5	7	12	12	12	17	12	8	6	4	9
No. of obs.	267	247	272	257	267	260	252	283	289	300	292	303	3289*
Maximum	14	23	41	30	46	59	43	100	69	48	35	64	100
Date	840104	840210	830327	880420	840516	830617	820703	810801	810903	811005	851109	811209	810801
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820403	820501	820603	820707	820815	810920	811001	811101	811201	810920

** Period : 1961-1980, August 1981-1990
* Period : August 1981-1990

Table 19. Means and Extremes of Upper Air Data at 80 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	264 14	261 15	261 13	265 7	046 4	067 14	076 20	079 18	079 12	091 3	253 5	262 11	022 1
Scalar mean	15	16	14	10	8	15	21	19	13	6	8	12	13
CONSTANCY (%)	94	96	94	75	53	96	99	98	97	54	69	91	7
No. of obs.	754	713	798	761	746	730	780	798	779	821	774	809	9263
Max. speed	40	43	32	29	26	29	35	31	29	23	27	34	43
Date	620105	780217	830307	700402	780531	650630	810707	670831	780907	621030	651130	621215	780217
Min. speed	2	1	1	0	0	2	9	7	1	0	0	1	0
Date	720107	840226	850308	820429	810504	870601	820704	870811	660927	851028	841118	701220	810504
HEIGHT (gpm)													
Mean	17793	17787	17807	17850	17930	17980	17993	17992	17966	17911	17857	17807	17889
No. of obs.	862	801	886	856	852	819	839	854	836	873	845	877	10200
Maximum	18020	18076	18074	18095	18266	18474	18190	18319	18394	18098	18216	18051	18474
Date	790106	700216	830316	750424	800521	830617	690729	760825	700909	751025	791104	791202	830617
Minimum	17550	17520	17542	17630	17710	17720	17800	17770	17790	17650	17560	17570	17520
Date	640118	680214	740321	620403	650501	680601	680707	680830	740922	671031	631116	671215	680214
TEMPERATURE (degree C)													
Mean	-78.4	-78.4	-78.2	-77.5	-78.3	-77.4	-74.4	-73.3	-74.7	-76.5	-77.9	-77.8	-76.9
No. of obs.	854	791	872	842	829	805	826	824	821	857	825	864	10010
Maximum	-66.8	-67.4	-60.9	-66	-69.1	-65.2	-61	-61.7	-63	-65.0	-67.6	-63	-60.9
Date	780106	750209	830327	630402	900509	830617	630725	760831	610929	761020	791104	641205	830327
Minimum	-89.0	-89.0	-88.0	-87	-87.0	-87.5	-85.0	-83.0	-87	-87	-91	-87.0	-91
Date	680102	610215	610303	620405	670526	830622	680707	680822	610929	631019	621126	641206	621126
DEW POINT (degree C)													
Mean	-97.1	-96.9	-96.1	-94.0	-91.4	-91.1	-88.2	-86.9	-89.2	-92.9	-95.6	-97.4	-93.1
No. of obs.	298	272	298	284	291	286	277	280	287	296	292	303	3464*
Maximum	-79.0	-79.3	-68.6	-76.1	-75.2	-73.2	-70.5	-70.6	-77.3	-80.3	-79.0	-78.4	-68.6
Date	810115	810227	830327	810413	810510	810630	810722	810801	810904	811005	851109	891223	830327
Minimum	-105.4	-105.6	-106.9	-106.8	-104.2	-104.5	-104.5	-100.9	-101.9	-107.8	-106.0	-104.9	-107.8
Date	900114	870214	860322	890415	820518	830605	820716	890814	820903	811022	831108	871227	811022
RELATIVE HUMIDITY (%)													
Mean	7	8	9	11	16	16	16	17	12	9	6	5	11
No. of obs.	298	272	298	284	291	286	277	280	287	296	292	303	3464*
Maximum	68	57	56	67	100	84	96	100	70	46	38	59	100
Date	810106	810227	810331	810415	810531	810630	810718	810801	810903	831003	851109	811209	810531
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820403	820502	820603	820707	820822	810923	811019	811101	811201	810923

* Period : 1981-1990

Table 20. Means and Extremes of Upper Air Data at 70 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	264 11	263 12	262 11	269 4	066 6	074 15	080 20	083 18	083 13	086 5	247 3	262 8	074 2
Scalar mean	12	13	12	7	8	15	20	19	13	7	6	9	12
CONSTANCY (%)	92	95	91	59	75	97	99	99	98	77	48	89	20
No. of obs.	727	683	777	733	723	698	753	767	738	782	742	780	8903
Max. speed	29	36	30	27	26	29	32	29	26	21	24	30	36
Date	700115	630211	880304	700402	660514	880609	610726	810825	650903	611003	691130	621221	630211
Min. speed	1	0	0	1	1	2	11	8	2	0	0	0	0
Date	730111	900216	850304	640402	720505	870602	760703	790804	860930	811024	821101	891205	811024
HEIGHT (gpm)													
Mean	18550	18553	18574	18619	18696	18753	18776	18780	18748	18688	18627	18576	18662
No. of obs.	842	774	870	831	826	788	807	815	812	852	811	855	9883
Maximum	18795	18835	18869	18874	19062	19304	18960	19142	18983	18886	19026	18839	19304
Date	790106	700216	830327	750424	800521	830617	690729	760825	700913	751025	791104	791202	830617
Minimum	18340	18300	18337	18420	18460	18498	18540	18510	18567	18380	18330	18340	18300
Date	640118	680214	740321	670414	670502	830622	680707	680830	740922	671031	631116	671215	680214
TEMPERATURE (degree C)													
Mean	-75.6	-75.8	-75.6	-75.0	-75.4	-73.8	-70.8	-69.6	-70.7	-72.1	-73.9	-74.8	-73.6
No. of obs.	829	759	850	814	805	757	795	793	787	824	791	845	9649
Maximum	-63.1	-63.6	-58.0	-61.9	-66.2	-59.3	-60.0	-61.9	-60.0	-61.9	-64.5	-58.0	-58.0
Date	770104	750209	650306	760430	760505	830617	630725	780807	670906	771017	791104	641205	641205
Minimum	-87.0	-89	-87.0	-85.9	-85.0	-84.0	-85.0	-81.0	-83.5	-86.0	-90.0	-85.0	-90.0
Date	640119	610223	650331	880407	620514	620605	620709	680830	710919	671020	621126	621210	621126
DEW POINT (degree C)													
Mean	-94.8	-96.2	-95.9	-93.3	-90.4	-89.6	-87.4	-84.9	-86.3	-88.9	-91.9	-94.6	-91.2
No. of obs.	275	245	266	253	252	247	247	277	282	289	286	302	3221*
Maximum	-76.7	-78.3	-67.4	-78.7	-77.6	-76.9	-75.6	-66.4	-75.2	-76.0	-73.3	-75.4	-66.4
Date	810106	900226	830327	820424	840525	850624	820731	810802	810922	901004	851109	891223	810802
Minimum	-105.0	-105.6	-105.8	-102.7	-102.8	-102.5	-99.1	-99.3	-99.3	-101.0	-101.9	-103.3	-105.8
Date	880106	870216	880322	870427	890506	820604	820715	820821	820902	811030	831125	811211	880322
RELATIVE HUMIDITY (%)													
Mean	7	4	5	7	11	11	10	14	11	9	7	5	8
No. of obs.	275	245	266	253	252	247	247	277	282	289	286	302	3221*
Maximum	69	28	41	34	44	44	37	98	68	43	42	69	98
Date	810105	840210	830327	880420	840525	830618	890730	810801	810903	831003	851109	811209	810801
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820403	820502	820603	820707	820802	820902	811021	811101	811201	811021

* Period : 1981-1990

Table 21. Means and Extremes of Upper Air Data at 60 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	264 8	265 9	268 8	289 2	077 8	082 15	083 20	086 19	086 14	087 7	219 1	262 6	083 4
Scalar mean	9	10	9	6	3	15	20	19	14	7	5	7	11
CONSTANCY (%)	89	92	85	34	89	98	99	99	99	89	20	81	37
No. of obs.	660	628	715	690	687	645	695	708	680	725	698	735	8266
Max. speed	34	26	24	22	25	26	30	30	24	20	21	26	34
Date	790103	780214	700326	700401	820512	610623	890719	650819	840902	881010	691130	621221	790103
Min. speed	0	1	1	0	0	3	8	9	2	0	0	0	0
Date	890107	900220	690330	840422	830507	870602	830702	640821	870925	821019	831121	811205	811205
HEIGHT (gpm)													
Mean	19462	19456	19477	19524	19601	19665	19700	19707	19672	19606	19538	19483	19574
No. of obs.	807	740	829	790	795	748	784	778	775	816	783	836	9481
Maximum	19731	19790	19823	19800	20001	20270	19874	20106	19921	19846	19981	19768	20270
Date	780120	690203	830327	610415	800521	830617	760702	760825	770925	771009	791104	791202	830617
Minimum	19230	19230	19270	19290	19360	19375	19420	19400	19478	19240	19230	19220	19220
Date	680102	680202	670323	650402	680515	830622	680707	680830	710919	671031	631116	651210	651210
TEMPERATURE (degree C)													
Mean	-70.4	-70.6	-70.8	-70.1	-70.2	-68.5	-66.5	-66.0	-66.7	-67.4	-68.9	-69.7	-68.8
No. of obs.	762	703	786	766	761	700	741	733	730	770	747	802	9001
Maximum	-58.1	-58.3	-60.3	-56	-60.0	-56	-57.0	-57.3	-55.0	-55.6	-54.9	-59	-54.9
Date	770104	750211	770304	630402	670531	640616	810726	760825	670906	771009	821122	631229	821122
Minimum	-86	-87.0	-86.0	-86.0	-84	-84.0	-84	-75.0	-80.9	-82	-84	-82.0	-87.0
Date	620127	610223	610301	610402	620509	670620	620709	680830	700930	621012	621126	661214	610223
DEW POINT (degree C)													
Mean	-90.7	-92.2	-91.9	-89.8	-87.4	-86.2	-86.1	-84.7	-85.6	-86.9	-88.6	-90.8	-88.4
No. of obs.	268	235	260	249	248	236	244	270	269	285	280	298	3142*
Maximum	-72.5	-71.8	-69.2	-76.0	-70.8	-72.3	-70.2	-66.9	-69.7	-70.6	-71.8	-70.8	-66.9
Date	810105	900225	830327	890417	840517	830618	830727	810801	850906	861019	841103	891223	810801
Minimum	-102.7	-102.3	-102.9	-100.5	-99.9	-99.9	-98.8	-97.1	-97.0	-98.2	-99.7	-101.0	-102.9
Date	880104	880213	830317	820421	820511	880608	870717	880822	870916	831009	891125	871227	830317
RELATIVE HUMIDITY (%)													
Mean	7	5	5	7	10	10	8	11	8	7	6	5	7
No. of obs.	268	235	260	249	248	236	244	270	269	285	280	298	3142*
Maximum	59	34	43	35	48	40	40	79	59	46	43	67	79
Date	810106	840210	830327	880420	840525	820609	890730	810802	810903	861019	851109	811209	810802
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820403	820502	820601	820702	820802	820901	811021	811104	811201	811021

* Period : 1981-1990

Table 22. Means and Extremes of Upper Air Data at 50 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	272 4	270 6	284 4	024 1	084 9	084 16	087 21	087 20	088 15	088 8	098 1	263 3	084 6
Scalar mean	7	7	6	5	9	16	21	20	15	9	5	6	11
CONSTANCY (%)	67	76	67	29	94	99	99	99	99	95	28	59	58
No. of obs.	583	566	635	606	616	582	628	623	611	658	643	651	7402
Max. speed	23	28	20	16	21	27	35	33	28	20	24	19	35
Date	710115	770215	700317	750430	660513	870627	660708	660816	680902	811001	851115	871215	660708
Min. speed	0	0	0	0	1	4	8	11	6	1	0	0	0
Date	900115	880208	820315	830419	830502	640603	820702	900824	860929	711027	811109	861220	811109
HEIGHT (gpm)													
Mean	20559	20551	20573	20625	20704	20772	20812	20824	20784	20716	20640	20582	20678
No. of obs.	711	672	733	718	722	662	709	693	710	731	707	766	8534
Maximum	20867	20935	20952	20907	21135	21431	21080	21274	21063	20998	21132	20891	21431
Date	780120	750209	830327	750424	800521	830617	610721	760825	770925	771009	791104	791202	830617
Minimum	20320	20320	20350	20340	20470	20465	20520	20460	20538	20300	20310	20270	20270
Date	620127	680202	620318	650402	680510	830622	680707	680830	710919	671031	631116	651210	651210
TEMPERATURE (degree C)													
Mean	-65.3	-65.3	-65.0	-64.5	-63.8	-63.4	-62.7	-62.3	-62.8	-63.1	-64.1	-64.4	-63.9
No. of obs.	661	635	690	677	685	629	668	647	653	688	684	723	8040
Maximum	-54.0	-54.4	-54.0	-56.0	-55.0	-53.0	-53.6	-52.4	-55.0	-53.0	-55.1	-56.4	-52.4
Date	660124	750209	650304	660420	630502	640627	770706	760805	670906	691028	821122	801226	760805
Minimum	-79.0	-75.0	-82.0	-74.0	-78.5	-73.0	-75.0	-72.0	-74.0	-72.0	-75.0	-77.0	-82.0
Date	610104	620217	650328	630407	700504	610609	620709	620802	700930	631030	621116	611231	650328
DEW POINT (degree C)													
Mean	-87.9	-89.5	-88.9	-86.7	-85.0	-85.6	-85.6	-84.4	-85.7	-86.9	-88.0	-88.9	-86.9
No. of obs.	258	230	256	236	240	230	232	257	252	275	277	290	3033*
Maximum	-69.1	-68.1	-64.6	-70.2	-62.6	-67.5	-63.6	-62.9	-67.0	-66.9	-65.0	-67.3	-62.6
Date	810106	840210	830327	820424	840525	840615	890730	810827	810922	861019	851109	861202	840525
Minimum	-99.4	-98.3	-99.1	-96.5	-95.8	-98.6	-95.1	-95.9	-95.3	-96.2	-97.2	-99.2	-99.4
Date	880110	870214	830313	880425	820511	830622	900705	890813	870901	871015	871125	871224	880110
RELATIVE HUMIDITY (%)													
Mean	6	4	5	6	8	7	6	8	6	5	4	4	6
No. of obs.	258	230	256	236	240	230	232	257	252	275	277	290	3033*
Maximum	50	36	48	39	54	43	49	69	47	48	50	54	69
Date	810105	840210	830327	860416	840525	850624	890730	810801	810922	861019	851109	811209	810801
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820301	820406	820502	820601	820702	820802	810908	811003	811104	811201	810908

* Period : 1981-1990

Table 23. Means and Extremes of Upper Air Data at 40 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	Calm	315 2	321 2	070 4	085 10	089 17	090 23	089 22	088 16	087 9	082 3	273 1	086 8
Scalar mean	5	5	5	6	11	17	23	22	17	10	6	5	11
CONSTANCY (%)	9	29	30	67	94	99	99	99	99	91	55	23	76
No. of obs.	499	464	546	503	520	511	533	524	523	552	548	566	6289
Max. speed	26	22	18	23	21	28	35	32	26	22	18	20	35
Date	710115	780213	820305	810412	800531	650630	800721	660810	850902	811004	791104	741210	800721
Min. speed	0	0	0	0	0	5	10	12	8	1	0	0	0
Date	810130	820218	860301	860402	860508	830604	820701	810811	900923	851023	851114	831218	810130
HEIGHT (gpm)													
Mean	21935	21926	21949	22012	22092	22158	22199	22217	22170	22103	22025	21963	22062
No. of obs.	632	592	675	633	651	612	634	625	622	664	662	694	7696
Maximum	22268	22390	22369	22331	22552	22894	22458	22450	22494	22409	22555	22284	22894
Date	780120	690212	830327	750424	800521	830617	770706	770809	770925	771009	791104	791202	830617
Minimum	21630	21705	21717	21730	21840	21797	22000	21950	21865	21650	21780	21600	21600
Date	620127	750222	810312	640419	680510	830622	640713	680828	710919	671031	681127	651210	651210
TEMPERATURE (degree C)													
Mean	-60.4	-60.9	-60.3	-59.3	-59.0	-58.7	-58.7	-58.2	-58.7	-58.7	-59.8	-59.9	-59.4
No. of obs.	555	520	607	564	574	551	564	558	555	591	594	619	6852
Maximum	-52.8	-51.0	-50.4	-52.0	-46.7	-48.2	-50	-49.2	-51.8	-49.7	-51.3	-49.6	-46.7
Date	790103	750209	790321	640415	750528	830617	640701	760823	790906	801017	781115	781211	750528
Minimum	-75	-71.4	-71.0	-67.9	-75	-72	-71	-66.0	-69.6	-69.0	-67.0	-68.1	-75
Date	610116	730217	660302	720420	620509	610609	620709	660826	710919	671004	671110	721201	610116
DEW POINT (degree C)													
Mean	-85.7	-87.2	-86.3	-84.2	-83.6	-83.9	-84.1	-83.2	-84.2	-85.5	-86.3	-87.2	-85.1
No. of obs.	243	204	231	226	226	221	209	248	240	269	267	273	2857*
Maximum	-67.6	-64.0	-66.3	-62.7	-59.6	-62.6	-62.0	-61.6	-60.7	-64.3	-64.2	-63.4	-59.6
Date	810103	840210	900309	860416	840525	850624	890730	820816	900909	901004	821126	861202	840525
Minimum	-94.8	-96.9	-95.3	-93.3	-92.5	-95.7	-91.9	-92.6	-92.5	-93.9	-93.1	-96.1	-96.9
Date	900129	850211	880311	830420	860531	830622	870720	870816	870914	871015	871126	871216	850211
RELATIVE HUMIDITY (%)													
Mean	4	4	4	5	6	6	5	7	5	4	4	3	5
No. of obs.	243	204	231	226	226	221	209	248	240	269	267	273	2857*
Maximum	26	37	41	49	55	50	50	61	53	51	50	50	61
Date	810103	840210	890318	880420	840525	850624	890730	810801	810922	861019	851109	861202	810801
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820201	820302	820403	820502	820601	820702	820801	810906	811003	811104	811201	810906

* Period : 1981-1990

Table 24. Means and Extremes of Upper Air Data at 30 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	066 3	065 3	072 2	093 6	093 12	092 18	092 23	092 23	092 18	088 12	086 6	084 3	090 11
Scalar mean	6	6	6	7	12	18	23	23	18	12	7	6	12
CONSTANCY (%)	56	43	41	86	97	99	99	99	99	98	81	42	88
No. of obs.	410	368	438	406	413	411	438	431	423	442	440	440	5060
Max. speed	21	23	16	26	23	29	35	34	32	24	20	22	35
Date	800101	750208	820323	810418	810514	800630	700715	890814	750901	791008	811112	871224	700715
Min. speed	0	0	1	0	3	6	13	14	6	3	0	0	0
Date	830104	850217	650310	880416	670514	830604	780718	640816	870930	681015	871113	831225	830104
HEIGHT (gpm)													
Mean	23750	23735	23765	23836	23915	23998	24021	24050	24006	23936	23853	23776	23887
No. of obs.	525	492	566	521	531	516	530	524	525	554	555	578	6417
Maximum	24115	24261	24149	24204	24423	24781	24343	24302	24309	24215	24414	24145	24781
Date	780120	750209	770304	750424	800521	830617	760702	750801	800930	751025	791104	781211	830617
Minimum	23370	23455	23310	23470	23610	23584	23790	23800	23606	23611	23580	23410	23310
Date	610116	750222	650328	650402	620509	830622	620706	650828	710919	841028	681127	611231	650328
TEMPERATURE (degree C)													
Mean	-56.8	-55.9	-55.3	-54.0	-53.5	-53.2	-53.9	-53.8	-53.8	-54.1	-54.7	-55.6	-54.5
No. of obs.	453	401	491	447	452	449	472	451	449	467	488	479	5499
Maximum	-47.6	-47.0	-46.0	-47.0	-46.0	-44.0	-44.4	-45.0	-46.2	-46.7	-46.2	-48.0	-44.0
Date	790120	670226	690318	660420	640527	640615	760712	640814	760905	751015	751105	671213	640615
Minimum	-64.8	-64.8	-69.0	-62.0	-64.0	-60.0	-62.0	-62.0	-63.4	-64.0	-62.4	-65.0	-69.0
Date	850112	710214	650328	650418	620509	690616	620706	650811	710919	681023	801102	611231	650328
DEW POINT (degree C)													
Mean	-83.7	-84.4	-84.1	-82.5	-81.7	-81.3	-82.0	-81.1	-82.2	-83.7	-84.1	-85.3	-83.0
No. of obs.	216	174	206	195	200	190	178	225	216	240	243	249	2532*
Maximum	-64.9	-59.8	-60.1	-59.9	-53.9	-57.7	-57.0	-60.1	-60.9	-55.9	-59.8	-58.3	-53.9
Date	900102	880220	890318	880420	820507	900630	890726	810801	810922	861019	881113	861206	820507
Minimum	-92.4	-91.6	-93.4	-90.3	-91.7	-89.5	-89.2	-89.6	-89.8	-89.6	-91.1	-92.8	-93.4
Date	900131	900222	830305	830401	860529	850613	880718	870828	900928	881027	891129	841211	830305
RELATIVE HUMIDITY (%)													
Mean	3	4	4	4	5	5	4	5	4	3	3	3	4
No. of obs.	216	174	206	195	200	190	178	225	216	240	243	249	2532*
Maximum	32	45	47	52	58	54	51	54	52	58	54	54	58
Date	900102	880220	890318	880420	850501	850624	890726	810801	810922	861019	851109	861202	850501
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	810110	820202	820302	820401	820502	820601	820702	820801	810905	811003	811103	811201	810110

* Period : 1981-1990

Table 25. Means and Extremes of Upper Air Data at 25 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	088 4	089 4	097 3	102 6	097 11	093 18	092 23	091 23	092 18	092 12	092 6	099 4	093 11
Scalar mean	7	7	7	7	12	18	23	24	19	13	7	6	12
CONSTANCY (%)	66	56	53	88	96	98	99	99	98	97	80	57	90
No. of obs.	312	271	349	312	323	298	311	344	324	340	362	352	3898
Max. speed	21	25	21	24	25	30	32	33	31	24	21	28	33
Date	680112	750206	820323	820418	820512	840624	870724	790828	870905	881009	831109	781212	790828
Min. speed	0	0	0	0	3	2	5	12	8	2	1	0	0
Date	820107	890221	870311	830405	760504	710602	780725	870831	890923	891030	661113	831202	820107
HEIGHT (gpm)													
Mean	24929	24922	24949	25020	25123	25185	25204	25236	25193	25112	25025	24950	25071
No. of obs.	409	367	451	404	407	406	425	440	430	448	475	460	5122
Maximum	25312	25471	25271	25325	25634	25870	25535	25490	25503	25407	25607	25291	25870
Date	780120	750209	770321	790430	800521	640610	770706	640814	800930	751022	791104	791202	640610
Minimum	24690	24716	24570	24620	24839	24770	24920	24967	24736	24729	24730	24710	24570
Date	680108	710211	650331	650402	860531	830622	620706	720816	710919	841028	681127	661214	650331
TEMPERATURE (degree C)													
Mean	-53.9	-53.5	-52.7	-51.3	-50.4	-50.6	-51.1	-51.2	-51.7	-51.8	-52.4	-53.0	-52.0
No. of obs.	352	313	393	350	352	333	345	379	351	366	392	394	4320
Maximum	-42.2	-42.1	-39.0	-44.3	-43.2	-39.1	-42.0	-41	-42.1	-42.8	-41.9	-42.2	-39.0
Date	770107	770217	700312	720423	780503	750612	680717	640814	780906	781004	751105	781212	700312
Minimum	-63.0	-63.0	-65	-59	-59.1	-58.0	-57	-57.5	-57.3	-63.0	-61.0	-63.2	-65
Date	690112	660223	650331	650418	860531	680626	640723	780826	840924	681023	801102	841212	650331
DEW POINT (degree C)													
Mean	-83.6	-83.1	-82.9	-80.7	-80.4	-80.3	-81.0	-80.3	-81.4	-83.1	-83.1	-83.8	-82.0
No. of obs.	183	142	184	173	185	165	151	203	190	207	214	217	2214*
Maximum	-65.0	-59.3	-58.9	-55.8	-55.4	-55.4	-59.9	-57.2	-58.3	-61.9	-59.6	-56.5	-55.4
Date	890105	880220	890318	890417	870523	900617	820704	860821	850905	881031	901108	881231	870523
Minimum	-90.5	-90.1	-91.3	-87.7	-90.2	-87.6	-87.4	-88.3	-88.2	-89.6	-89.8	-92.9	-92.9
Date	900119	900222	900304	830402	860531	870624	830703	880811	880922	871026	891129	841210	841210
RELATIVE HUMIDITY (%)													
Mean	3	4	3	4	4	4	3	4	3	2	3	3	3
No. of obs.	183	142	184	173	185	165	151	203	190	207	214	217	2214*
Maximum	27	46	46	51	59	49	30	53	49	46	36	55	59
Date	890105	880220	890318	880420	850501	900617	830727	860821	810922	881023	901108	861202	850501
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820101	820202	820302	820401	820501	820602	820702	820801	810905	811003	811102	811204	810905

* Period : 1981-1990

Table 26. Means and Extremes of Upper Air Data at 20 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	109 5	122 4	126 3	113 5	097 9	092 19	091 23	090 24	093 19	094 13	103 5	107 5	096 11
Scalar mean	8	7	6	7	11	19	23	24	19	13	7	7	13
CONSTANCY (%)	61	52	46	73	85	99	99	99	99	97	75	62	86
No. of obs.	226	180	254	228	228	216	220	246	219	227	236	235	2715
Max. speed	25	24	20	24	26	30	33	34	32	26	20	30	34
Date	680108	750206	820323	820402	660522	810630	810725	860819	720907	861002	891122	781213	860819
Min. speed	1	0	0	0	2	8	11	14	7	1	1	0	0
Date	830104	890221	870312	850420	730502	880601	820723	870823	890923	891030	891102	831214	831214
HEIGHT (gpm)													
Mean	26369	26357	26402	26478	26575	26641	26678	26698	26655	26573	26477	26410	26526
No. of obs.	358	325	403	363	367	342	343	355	334	352	379	373	4294
Maximum	26804	26965	26780	26796	26891	27370	26978	26962	26990	26895	26745	26752	27370
Date	780120	750209	760324	790430	790517	640610	790706	770809	800930	751022	801109	781212	640610
Minimum	26100	26130	26068	26110	26227	26188	26369	26395	26313	26132	26140	26130	26068
Date	680108	660223	810312	640419	860531	830622	740710	720816	700930	841028	681127	661214	810312
TEMPERATURE (degree C)													
Mean	-51.5	-50.6	-50.1	-48.0	-47.1	-47.3	-48.3	-48.5	-48.6	-48.7	-49.4	-50.4	-49.0
No. of obs.	248	210	283	262	260	238	250	257	230	242	253	256	2989
Maximum	-39.4	-39.8	-41.9	-42.1	-40.2	-38.2	-38.0	-39.4	-43.2	-40.0	-40.9	-35.7	-35.7
Date	770107	810223	740308	700415	840510	700611	680717	710812	780917	661019	781129	781212	781212
Minimum	-64.4	-60.0	-57.1	-56.0	-56.1	-55.0	-57.0	-57.0	-57	-62.0	-59.3	-59.9	-64.4
Date	800113	660223	700302	690402	800511	680626	670705	670825	650916	681023	801102	841210	800113
DEW POINT (degree C)													
Mean	-81.1	-82.0	-81.4	-78.6	-78.1	-79.1	-80.3	-78.3	-80.7	-81.8	-82.0	-82.5	-80.5
No. of obs.	127	91	124	126	133	115	110	151	131	138	138	150	1534*
Maximum	-61.4	-56.7	-56.9	-54.6	-51.2	-53.4	-62.5	-52.2	-54.2	-56.2	-58.7	-55.7	-51.2
Date	840104	880220	890318	890404	860506	900630	840719	860821	850905	881031	901108	861202	860506
Minimum	-89.3	-89.6	-88.4	-86.4	-87.2	-85.1	-87.0	-85.9	-86.7	-86.2	-87.2	-90.8	-90.8
Date	900119	900208	830305	820401	860518	830622	880730	830801	890913	891030	891125	841210	841210
RELATIVE HUMIDITY (%)													
Mean	3	3	3	4	4	3	2	4	2	2	2	3	3
No. of obs.	127	91	124	126	133	115	110	151	131	138	138	150	1534*
Maximum	27	48	46	51	54	48	17	57	35	48	34	55	57
Date	900130	880220	890318	880420	860506	900617	850718	860821	850905	881023	901108	861202	860821
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820107	820202	820302	820401	820501	820603	820701	820804	810905	811012	811105	811223	810905

* Period : 1981-1990

Table 27. Means and Extremes of Upper Air Data at 15 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	165 4	176 3	165 2	120 4	095 10	093 19	090 25	092 25	088 19	096 10	107 4	101 5	097 10
Scalar mean	8	9	6	7	11	19	25	25	19	11	6	9	13
CONSTANCY (%)	47	35	34	60	94	99	99	99	99	96	55	58	79
No. of obs.	61	30	63	50	47	61	73	55	61	63	67	58	689
Max. speed	17	18	19	17	19	27	36	36	30	22	15	34	36
Date	800113	710217	680313	710407	670521	870628	870723	870804	880923	881001	891125	781215	870804
Min. speed	2	3	2	0	1	2	14	14	4	1	1	2	0
Date	720112	750211	650331	880410	720510	830606	870708	870805	870924	841020	901119	711229	880410
HEIGHT (gpm)													
Mean	28239	28256	28286	28410	28505	28566	28582	28591	28556	28485	28395	28298	28431
No. of obs.	199	148	214	200	193	189	185	212	185	203	216	207	2351
Maximum	28725	28953	28658	28732	28830	28902	28925	28860	28847	28841	28705	28787	28953
Date	790103	750209	780329	750423	790517	780617	760711	660820	750903	751022	751112	781212	750209
Minimum	27933	28013	27830	28126	28220	28115	28234	28266	28201	27951	28125	28000	27830
Date	700121	710217	650331	800409	670509	830622	740710	720816	700930	841028	801102	681204	650331
TEMPERATURE (degree C)													
Mean	-48.8	-47.3	-46.0	-43.9	-43.1	-44.1	-45.5	-45.8	-45.2	-45.7	-45.8	-46.3	-45.6
No. of obs.	70	42	84	60	64	75	83	67	74	74	86	71	850
Maximum	-39.7	-36.8	-33.3	-37.6	-35.0	-35	-35.0	-40.0	-37.4	-35.0	-36.2	-35.9	-33.3
Date	720122	720216	790328	790418	770516	650627	680709	780809	780917	691022	751119	841201	790328
Minimum	-58.6	-55.0	-54	-53.2	-50.6	-53.0	-57.0	-54	-52.0	-56.9	-54.7	-55.7	-58.6
Date	700121	690219	640313	720413	880519	670628	670705	640811	680918	841028	791125	841210	700121
DEW POINT (degree C)													
Mean	-81.3	-83.1	-81.3	-73.2	-76.8	-77.6	-77.5	-77.4	-79.6	-79.2	-80.5	-77.9	-78.8
No. of obs.	31	13	22	25	26	26	34	27	28	30	31	33	326*
Maximum	-69.3	-81.0	-60.4	-54.6	-54.2	-53.3	-65.8	-54.5	-71.2	-56.5	-57.5	-57.9	-53.3
Date	840121	870225	850315	860421	900504	900630	840716	810801	880930	881023	901108	881231	900630
Minimum	-87.2	-84.4	-85.9	-82.5	-84.1	-81.3	-83.2	-83.0	-84.6	-84.6	-83.7	-87.8	-87.8
Date	820109	830210	830305	880403	860529	820616	830708	900801	890915	891025	891111	841210	841210
RELATIVE HUMIDITY (%)													
Mean	2	1	2	6	3	3	2	5	1	3	2	6	3
No. of obs.	31	13	22	25	26	26	34	27	28	30	31	33	326*
Maximum	9	1	29	28	41	41	8	42	4	45	27	36	45
Date	840121	830210	850315	860421	900504	900630	840716	810801	880930	881023	901108	881231	881023
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Date	820108	830210	820326	820407	820509	820608	830701	820826	810909	861004	841104	841201	810909

* Period : 1981-1990

Table 28. Means and Extremes of Upper Air Data at 10 hPa Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	227 6	270 8	280 2	298 4	064 16	094 21	086 28	090 37	095 20	088 6	278 7	090 12	088 10
Scalar mean	8	8	6	4	17	21	29	37	20	7	7	12	15
CONSTANCY (%)	76	100	40	91	97	100	100	100	99	88	100	100	65
No. of obs.	11	1	8	3	2	5	4	1	5	2	1	1	44
Max. speed	17	8	9	5	18	29	29	37	26	10	7	12	37
Date	720117	730228	850315	690402	720524	700619	730718	720809	690910	701014	691126	701216	720809
Min. speed	2	8	4	4	15	19	28	37	13	3	7	12	2
Date	710104	730228	640306	730425	880530	890629	830701	720809	700919	711020	691126	701216	710104
HEIGHT (gpm)													
Mean	30900	30876	31021	31209	31061	31301	31311	31293	31279	31033	31139	31028	31121
No. of obs.	43	17	44	25	22	41	44	23	31	31	37	32	390
Maximum	31290	31259	31470	31486	31667	31695	31754	31618	31634	31439	31489	31351	31754
Date	780111	790221	790328	790418	770516	780617	750709	780802	780917	731017	781122	781215	750709
Minimum	30653	30674	30730	30758	30020	30950	30987	31115	30931	29750	30801	30679	29750
Date	710104	710217	690319	720413	660510	670614	740710	720809	700930	681030	791125	841210	681030
TEMPERATURE (degree C)													
Mean	-42.4	-40.9	-41.4	-38.6	-39.5	-42.4	-42.3	-41.2	-38.5	-39.0	-40.7	-41.0	-40.7
No. of obs.	17	4	14	6	6	9	8	4	7	3	4	3	85
Maximum	-34.6	-36.2	-35.9	-34.5	-33.0	-31.8	-36.3	-38.0	-35.1	-28.7	-38.1	-35.3	-28.7
Date	720122	700218	720322	720405	780531	720614	830701	730808	780909	711020	781117	701216	711020
Minimum	-48.6	-43.8	-49	-47.0	-45.2	-52.0	-53.0	-44.7	-42.0	-49.5	-47.0	-45.0	-53.0
Date	840121	700225	640304	690402	700506	680626	690716	700819	690910	701014	691112	691215	690716
DEW POINT (degree C)													
Mean	-77.2	*******	-69.9	*******	-78.0	-78.4	-74.6	*******	-77.3	*******	*******	*******	-75.9
No. of obs.	7	0	5	0	1	2	2	0	1	0	0	0	18*
Maximum	-69.9	*******	-59.9	*******	-78.0	-78.0	-74.3	*******	-77.3	*******	*******	*******	-59.9
Date	840121	*******	850315	*******	880530	890628	830701	*******	880923	*******	*******	*******	850315
Minimum	-81.7	*******	-75.1	*******	-78.0	-78.8	-74.9	*******	-77.3	*******	*******	*******	-81.7
Date	840114	*******	850313	*******	880530	890629	830715	*******	880923	*******	*******	*******	840114
RELATIVE HUMIDITY (%)													
Mean	2	******	7	******	1	1	1	******	1	******	******	******	2
No. of obs.	7	0	5	0	1	2	2	0	1	0	0	0	18*
Maximum	7	*****	25	*****	1	1	1	*****	1	*****	*****	*****	25
Date	840121	*******	850315	*******	880530	890628	830701	*******	880923	*******	*******	*******	850315
Minimum	1	*****	2	*****	1	1	1	*****	1	*****	*****	*****	1
Date	840111	*******	850313	*******	880530	890628	830701	*******	880923	*******	*******	*******	830701

* Period : 1981-1990

Table 29. Means and Extremes of Data at Surface Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	074 2	085 3	092 3	100 3	114 2	156 1	174 1	132 1	074 2	067 3	056 3	064 2	087 2
Scalar mean	3	3	4	3	3	3	3	3	3	4	3	3	3
CONSTANCY (%)	77	81	85	84	55	41	34	27	59	77	79	76	58
No. of obs.	930	846	928	900	929	900	929	929	899	929	900	930	10949
Max. speed	14	13	18	13	14	15	16	18	14	21	18	13	21
Date	610105	710224	690322	620403	640527	650616	650723	670821	630907	701017	691129	701211	701017
Min. speed	0	0	0	0	0	0	0	0	0	0	0	0	0
Date	610124	610214	610314	610402	610503	610603	610706	610817	610904	621005	611117	611211	610124
PRESSURE (hPa)													
Mean	1013.1	1011.6	1009.4	1006.2	1002.3	999.1	998.4	998.2	1001.9	1007.2	1011.0	1013.2	1006.0
No. of obs.	930	846	928	900	929	900	929	929	899	929	900	930	10949
Maximum	1022.4	1022.0	1023.0	1019.0	1010.6	1006.0	1005.0	1008.0	1010.0	1015.0	1023.0	1024.0	1024.0
Date	830122	770222	770304	690405	830503	780610	710714	690813	660929	701031	891130	671211	671211
Minimum	998.0	998.8	999.0	997.0	973.8	978.6	977.0	984.0	988.9	989.0	997.0	1002.0	973.8
Date	800129	850208	800308	750428	610519	850624	710722	680821	830909	741019	741108	741202	610519
TEMPERATURE (degree C)													
Mean	13.8	14.4	17.2	21.0	24.9	26.9	27.8	27.3	26.3	23.8	19.7	15.6	21.6
No. of obs.	930	846	928	900	929	900	929	929	899	929	900	930	10949
Maximum	21.1	24.0	25.0	27.0	30.0	30.1	31.0	31.4	30.0	29.0	26.2	23.0	31.4
Date	800129	730227	670331	630430	770520	850623	680726	900818	660904	741003	871127	681203	900818
Minimum	4.0	4.0	5.2	10.0	17.7	21.0	22.3	23.0	19.7	13.5	7.0	4.0	4.0
Date	670116	690205	860301	690405	810504	640605	890730	760825	700930	781029	871130	751214	670116
DEW POINT (degree C)													
Mean	9.2	11.2	14.4	18.6	22.4	24.3	24.9	24.7	22.8	18.9	14.1	10.1	18.0
No. of obs.	930	846	928	900	929	900	929	929	899	929	900	930	10949
Maximum	21.0	22.2	23.3	25.0	26.6	27.5	28.2	27.0	26.5	25.7	23.6	22.0	28.2
Date	640113	790223	830323	660424	780530	730617	770716	620803	800906	811008	721115	681203	770716
Minimum	-16.0	-10.5	-9.5	-1.0	5.5	12.6	20.0	18.0	7.0	-3.2	-3.7	-11.9	-16.0
Date	610116	740226	860303	690405	790520	820604	680726	660821	660925	781029	761127	731230	610116
RELATIVE HUMIDITY (%)													
Mean	75	82	85	87	86	86	85	86	81	76	71	71	81
No. of obs.	930	846	928	900	929	900	929	929	899	929	900	930	10949
Maximum	100	100	100	100	100	100	99	100	100	99	98	99	100
Date	610110	610221	610323	620406	700501	660612	730717	700803	800901	811005	621101	611218	610110
Minimum	13	23	24	33	31	49	51	52	33	26	26	18	13
Date	610116	750221	860303	630409	790520	820604	680726	620831	660917	681025	641113	641218	610116

Table 30. Means and Extremes of Upper Air Data at Freezing Level Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
HEIGHT (gpm)													
Mean	4213	4243	4284	4526	4923	5177	5193	5175	5068	4886	4682	4484	4738
No. of obs.	930	846	927	900	929	900	917	916	898	928	900	930	10920
Maximum	5750	5881	5886	5644	6298	6050	6343	6042	6001	5813	5838	5750	6343
Date	760112	770214	720302	790407	700513	620608	790705	750814	790929	791019	741107	621205	790705
Minimum	2350	2504	3074	3439	3970	4160	4370	4189	4342	3880	3279	2360	2350
Date	630114	710204	760301	720409	650501	680601	660730	810827	860930	631025	771124	731231	630114
PRESSURE (hPa)													
Mean	615	615	609	591	563	545	544	545	554	567	581	595	577
No. of obs.	930	846	927	900	929	900	917	916	898	928	900	930	10920
Maximum	767	754	702	673	630	615	601	614	604	642	688	770	770
Date	630114	710204	760301	720409	650501	680601	660730	810827	860930	631025	771124	731231	731231
Minimum	506	497	491	514	473	485	472	487	495	503	503	506	472
Date	760112	720227	720302	790407	700513	620608	790705	750814	790929	791018	741107	621205	790705

Table 31. Means and Extremes of Upper Air Data at Tropopause Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
HEIGHT (gpm)													
Mean	16660	16679	16785	16838	16924	16851	16571	16424	16602	16695	16681	16626	16695
No. of obs.	842	778	861	830	824	791	834	835	819	847	815	865	9941
Maximum	18920	19190	19280	19098	18740	18880	18810	18390	18440	19220	18830	19150	19280
Date	640119	730208	610326	870427	620514	650601	660715	620802	650910	621013	621116	611221	610326
Minimum	12526	13380	13971	12979	14189	14415	14694	14170	14689	14690	14700	14006	12526
Date	880103	880226	880304	760428	900511	870604	800712	760831	710930	771024	821103	791217	880103
TEMPERATURE (degree C)													
Mean	-79.7	-79.7	-79.4	-78.7	-79.5	-79.3	-78.0	-77.4	-78.4	-80.4	-79.6	-79.2	-79.1
No. of obs.	842	778	861	830	824	791	834	835	819	847	815	865	9941
Maximum	-58.4	-66.1	-66.3	-63.6	-67.0	-66.2	-59.9	-68.1	-67.6	-67.7	-65.0	-67.3	-58.4
Date	880103	880226	830327	760428	690506	830617	800712	710824	750903	771025	791104	791217	880103
Minimum	-90.0	-92.0	-89.0	-88.0	-87.0	-88.1	-87.0	-89.0	-90.0	-89.4	-95.0	-88.0	-95.0
Date	640119	610225	880329	650402	610510	830622	650715	680830	630906	841028	621116	661214	621116
PRESSURE (hPa)													
Mean	98	98	97	96	96	98	103	105	102	100	99	99	99
No. of obs.	842	778	861	830	824	791	834	835	819	847	815	865	9941
Maximum	190	168	154	178	149	145	146	150	139	139	137	154	190
Date	880103	880226	880304	760428	900511	870604	800712	760831	750903	771024	821103	791217	610519
Minimum	65	64	62	65	69	69	70	75	75	64	68	63	62
Date	640119	730208	610326	870427	890506	650601	660715	620802	650910	621013	621116	611221	610326

Table 32. Means and Extremes of Upper Air Data at Level of Minimum Temperature Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE (degree C)													
Mean	-80.4	-80.4	-80.1	-79.4	-79.9	-79.4	-78.2	-77.8	-78.4	-79.9	-80.8	-80.3	-79.6
No. of obs.	890	818	902	869	878	854	878	886	862	898	867	893	10495
Maximum	-71.1	-70.3	-66.3	-68.4	-72.5	-66.2	-70.5	-59.1	-65.1	-68.7	-67.7	-71.2	-59.1
Date	830105	750209	830327	830416	900509	830617	860731	890805	700909	741004	791104	771227	890805
Minimum	-90.0	-92.0	-89.0	-88.0	-87.0	-88.1	-87.0	-89.0	-90.0	-89.4	-95.0	-88.0	-95.0
Date	640119	610225	880329	650402	610518	830622	650715	680830	630906	841028	621116	661214	621116
HEIGHT (gpm)													
Mean	17307	17323	17416	17432	17366	17218	16899	16781	16899	16941	17089	17202	17156
No. of obs.	890	818	902	869	878	854	878	886	862	898	867	893	10495
Maximum	19848	19532	19380	19546	20113	19700	18810	18515	19000	18970	18920	19377	20113
Date	700101	750228	700310	880405	700504	670620	660715	760805	670901	671020	661123	771222	700504
Minimum	15044	15069	15390	15360	15577	15300	15073	15152	15172	15383	15242	15080	15044
Date	840120	740203	660324	670417	720525	680612	700726	760804	710930	751004	761125	741207	840120
PRESSURE (hPa)													
Mean	88	88	87	87	89	93	98	99	98	96	92	90	92
No. of obs.	890	818	902	869	878	854	878	886	862	898	867	893	10495
Maximum	128.0	127.0	120.0	121.5	120.0	124.0	129.0	170.4	128.0	124.0	125.0	126.0	170.4
Date	840120	760208	660324	830416	720525	680612	700726	890805	710930	741004	761125	741207	890805
Minimum	56.0	59.0	61.0	59.3	55.0	59.0	68.0	74.0	67.0	67.0	66.0	63.0	55.0
Date	700101	750228	700310	880405	700504	670620	700710	760805	670901	701006	661123	771222	700504

Table 33. Means and Extremes of Upper Air Data at Level of Maximum Wind Based on 0800 Hours Ascents (1961-1990)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
WIND (degree, m/s)													
Vector mean	256 40	256 41	259 40	267 32	301 9	074 16	080 27	084 25	086 18	321 1	258 23	256 36	260 11
Scalar mean	43	43	41	34	21	22	28	26	21	20	27	38	30
CONSTANCY (%)	95	96	96	94	40	73	96	96	85	6	86	94	36
No. of obs.	893	818	899	845	811	796	878	888	819	812	852	907	10218
Max. speed	79	86	74	62	44	43	46	48	40	59	54	71	86
Date	640120	680214	690314	630413	900507	750624	720708	770809	690903	791031	771122	641220	680214
Min. speed	17	20	16	10	8	6	7	7	8	8	9	16	6
Date	670108	840224	710307	730430	670526	690617	700728	640829	670912	641027	811106	811212	690617
HEIGHT (gpm)													
Mean	11490	11450	11810	12231	15182	18893	19390	20388	20090	16434	12516	12341	15185
No. of obs.	893	818	899	845	811	796	877	888	819	812	852	907	10217
Maximum	15960	16840	16992	27260	31420	31735	31610	30570	31920	29420	26820	28174	31920
Date	670109	700216	820301	640420	720524	890628	640722	720809	690910	641026	671101	901219	690910
Minimum	5768	5768	6009	5789	6150	6880	7096	6170	5863	6388	5987	5801	5768
Date	890125	890212	900302	890406	680514	690617	890718	680812	880924	851015	841123	831221	890125
PRESSURE (hPa)													
Mean	236	237	223	210	164	98	81	71	83	154	210	207	164
No. of obs.	893	818	899	845	811	796	877	888	819	812	852	907	10217
Maximum	500.0	500.0	486.4	500.0	481.0	441.0	423.3	480.0	500.0	469.6	491.0	500.0	500.0
Date	890125	890212	900302	890406	690519	690617	890718	680812	880924	851015	841123	831221	831221
Minimum	35.0	99.0	91.8	18.0	10.0	9.3	9.0	11.0	9.0	13.0	19.0	15.3	9.0
Date	870108	700216	820301	640420	720524	890628	640722	640811	690910	641026	671101	901219	640722

Table 34. Lapse Rates in Degree C/km at Different Layers Based on 0800 Hours Ascents (1961-1990)

(hPa)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
1000-950	4.3	3.7	3.6	4.8	6.5	7.4	7.8	7.4	7.3	7.1	6.1	4.9	5.6
S.D.	2.91	3.28	3.66	3.20	2.38	2.03	1.70	2.05	1.59	1.80	2.13	2.72	3.03
No. of obs.	774	703	771	732	623	332	313	218	584	752	748	775	7325*
950-900	1.6	.9	1.8	2.9	4.6	5.5	6.0	5.5	5.4	4.8	3.5	2.3	3.7
S.D.	3.71	4.09	4.08	3.28	2.48	2.13	1.85	1.85	1.87	2.31	3.09	3.48	3.42
No. of obs.	775	706	774	750	776	749	762	761	749	775	750	775	9102*
900-850	2.6	2.4	2.7	3.6	4.4	4.9	4.9	5.1	5.0	4.1	3.1	3.0	3.8
S.D.	3.88	3.96	4.02	2.97	2.33	1.92	1.86	1.80	1.95	2.86	3.48	3.85	3.19
No. of obs.	930	846	928	900	929	899	918	916	899	929	900	930	10924
850-800	3.9	3.5	2.8	3.4	4.4	4.7	4.7	4.9	4.9	3.7	3.5	3.7	4.0
S.D.	3.49	3.32	3.41	3.08	2.16	1.75	1.82	1.70	1.86	2.93	3.24	3.57	2.87
No. of obs.	930	846	928	900	929	899	917	916	898	929	900	930	10922
800-700	3.5	4.3	4.9	4.8	4.7	4.5	4.6	4.8	4.5	4.2	4.1	3.4	4.3
S.D.	3.22	2.70	1.92	1.50	1.31	1.11	1.08	1.08	1.24	1.56	2.05	2.96	2.01
No. of obs.	930	846	928	900	929	899	918	917	899	929	900	930	10925
700-600	3.4	4.1	5.5	6.1	5.6	5.3	5.5	5.3	5.3	5.3	4.5	3.4	4.9
S.D.	2.75	2.58	1.84	1.27	1.01	.99	.99	1.04	.97	1.24	1.96	2.90	1.96
No. of obs.	930	846	928	900	929	899	916	916	898	929	900	930	10921
600-500	5.2	5.1	5.1	5.3	5.4	5.4	5.6	5.5	5.4	5.4	5.3	5.6	5.4
S.D.	2.05	2.17	1.67	1.12	.89	.87	.87	.88	.81	1.05	1.42	1.55	1.37
No. of obs.	930	846	928	899	927	898	918	916	899	929	900	930	10920
500-400	5.8	6.0	6.1	6.2	5.8	5.7	5.9	5.9	6.0	6.0	6.1	6.1	6.0
S.D.	1.71	1.56	1.30	.93	.76	.70	.75	.76	.75	.82	1.09	1.22	1.09
No. of obs.	930	845	928	899	926	895	915	915	897	928	900	930	10908
400-300	6.8	6.7	6.7	7.0	6.9	6.7	6.8	6.8	6.9	7.1	6.9	6.8	6.8
S.D.	1.18	1.26	1.06	.80	.59	.58	.58	.57	.61	.63	.79	.96	.85
No. of obs.	930	844	928	897	926	891	912	914	896	925	900	930	10893
300-250	7.5	7.3	7.3	7.4	7.7	7.8	7.6	7.6	7.7	7.7	7.6	7.5	7.6
S.D.	1.06	1.34	1.12	.94	.71	.67	.74	.70	.76	.77	.81	.97	.91
No. of obs.	928	843	927	897	922	888	911	911	892	923	899	929	10870
250-200	7.6	7.5	7.5	7.4	7.9	8.1	7.9	8.0	7.9	7.7	7.8	7.7	7.8
S.D.	.91	1.14	.94	.93	.75	.67	.71	.67	.72	.74	.76	.89	.86
No. of obs.	926	841	926	894	920	887	910	911	890	922	899	929	10855
200-150	7.2	7.2	7.0	6.8	7.4	7.9	7.8	7.9	7.5	7.5	7.5	7.3	7.4
S.D.	1.13	1.13	1.17	1.17	.82	.74	.71	.73	.84	.80	.82	.91	.99
No. of obs.	910	833	921	883	909	877	905	901	878	912	887	922	10738
150-100	5.1	5.0	5.0	4.8	5.4	5.5	5.3	5.1	5.3	5.5	5.4	4.9	5.2
S.D.	1.21	1.29	1.17	1.19	1.05	1.01	1.28	1.33	1.18	1.19	1.16	1.20	1.21
No. of obs.	890	818	899	867	885	849	867	881	864	891	862	898	10471
100- 50	-3.2	-3.0	-3.1	-3.0	-3.4	-3.7	-3.5	-3.5	-3.6	-3.8	-3.7	-3.3	-3.4
S.D.	1.05	1.11	1.08	.95	.98	.81	.82	.75	.74	.75	.77	.89	.94
No. of obs.	661	635	690	677	685	629	668	647	653	688	684	723	8040

* Period 1966-1990

Table 35. Percentage Frequency Distribution of Inversions With Base Between Specified Pressure Levels Based on 0800 Hours Ascents (1966-1980)

(hPa)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
SFC-951	23.4	30.4	29.1	16.8	7.4	1.2	.7	1.1	1.1	3.9	11.3	21.9	12.4
No. of occurrence	108	128	135	75	34	5	3	5	5	18	51	102	669
Ascents reached	462	421	464	446	462	433	445	460	446	465	450	465	5419
950-901	26.0	25.7	22.4	19.7	10.8	6.0	7.5	8.0	9.6	15.1	22.7	25.4	16.6
No. of occurrence	120	108	104	88	50	26	34	37	43	70	102	118	900
Ascents reached	462	421	464	446	462	434	451	463	448	465	450	465	5431
900-851	24.0	20.7	22.4	19.1	10.6	5.8	7.3	6.5	8.3	17.0	21.3	22.8	15.5
No. of occurrence	111	87	104	85	49	25	33	30	37	79	96	106	842
Ascents reached	462	421	464	446	462	434	451	463	448	465	450	465	5431
850-801	15.2	18.1	17.9	20.2	11.5	6.9	7.1	7.3	9.6	19.6	19.6	14.2	13.9
No. of occurrence	70	76	83	90	53	30	32	34	43	91	88	66	756
Ascents reached	462	421	464	446	462	434	451	463	448	465	450	465	5431
800-701	35.9	27.1	19.8	19.1	17.5	14.5	12.9	12.1	20.3	22.6	30.9	38.3	22.6
No. of occurrence	166	114	92	85	81	63	58	56	91	105	139	178	1228
Ascents reached	462	421	464	446	462	435	451	463	448	465	450	465	5432
700-601	28.8	29.5	19.6	8.3	6.3	3.7	6.4	10.4	7.4	13.1	22.7	26.0	15.2
No. of occurrence	133	124	91	37	29	16	29	48	33	61	102	121	824
Ascents reached	462	421	464	446	462	435	451	463	448	465	450	465	5432
600-501	11.3	13.5	11.6	10.3	7.8	3.9	7.1	5.2	4.9	7.3	10.4	10.1	8.6
No. of occurrence	52	57	54	46	36	17	32	24	22	34	47	47	468
Ascents reached	462	421	464	446	462	437	451	463	448	465	450	465	5434
500-401	10.8	9.7	7.3	2.9	2.0	2.1	1.1	2.2	1.8	2.4	6.9	5.4	4.5
No. of occurrence	50	41	34	13	9	9	5	10	8	11	31	25	246
Ascents reached	462	421	464	446	462	437	451	463	448	465	450	465	5434
400-301	2.2	4.5	3.2	.5	.7	.5	1.1	.2	.5	.4	1.3	1.9	1.4
No. of occurrence	10	19	15	2	3	2	5	1	2	2	6	9	76
Ascents reached	462	421	464	446	461	435	449	462	448	465	450	465	5428
300-251	.2	.2	.2	.0	.0	.0	.0	.0	.0	.0	.0	.7	.1
No. of occurrence	1	1	1	0	0	0	0	0	0	0	0	3	6
Ascents reached	462	421	464	445	460	433	448	462	448	465	450	465	5423
250-201	.2	.2	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
No. of occurrence	1	1	0	1	0	0	0	0	0	0	0	0	3
Ascents reached	462	421	464	445	460	433	447	461	447	465	450	465	5420
200-151	.7	.5	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.1
No. of occurrence	3	2	0	2	0	0	0	0	0	0	0	0	7
Ascents reached	462	421	464	444	459	433	447	462	446	465	450	465	5418
150-101	7.7	5.8	6.1	4.6	6.4	9.6	19.1	24.1	19.0	15.4	7.8	9.3	11.3
No. of occurrence	35	24	28	20	29	41	85	110	84	71	35	43	605
Ascents reached	457	417	461	438	455	428	446	457	442	460	447	461	5369
100- 51	65.4	64.9	66.6	65.9	60.0	54.5	52.2	51.4	55.3	61.5	66.4	66.1	60.8
No. of occurrence	291	270	303	286	270	231	230	233	241	281	292	298	3226
Ascents reached	445	416	455	434	450	424	441	453	436	457	440	451	5302