

1999

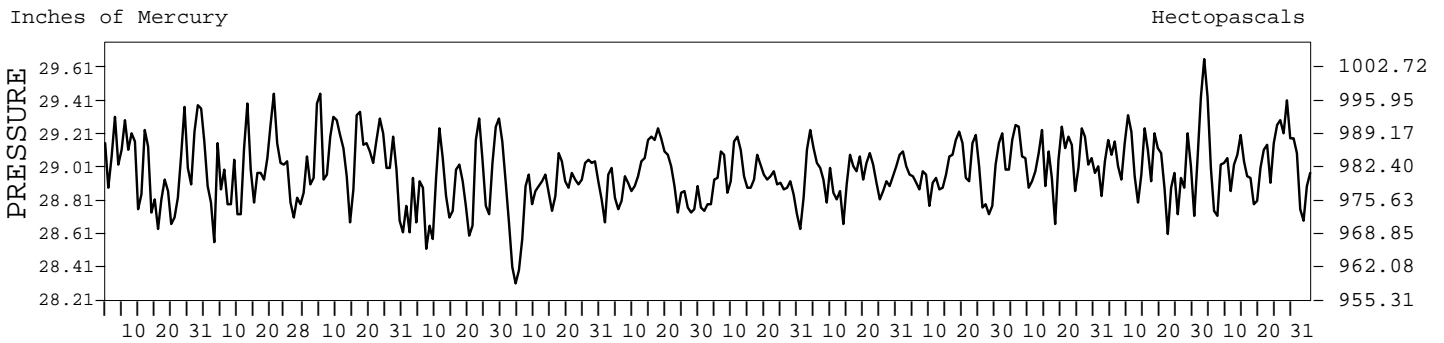
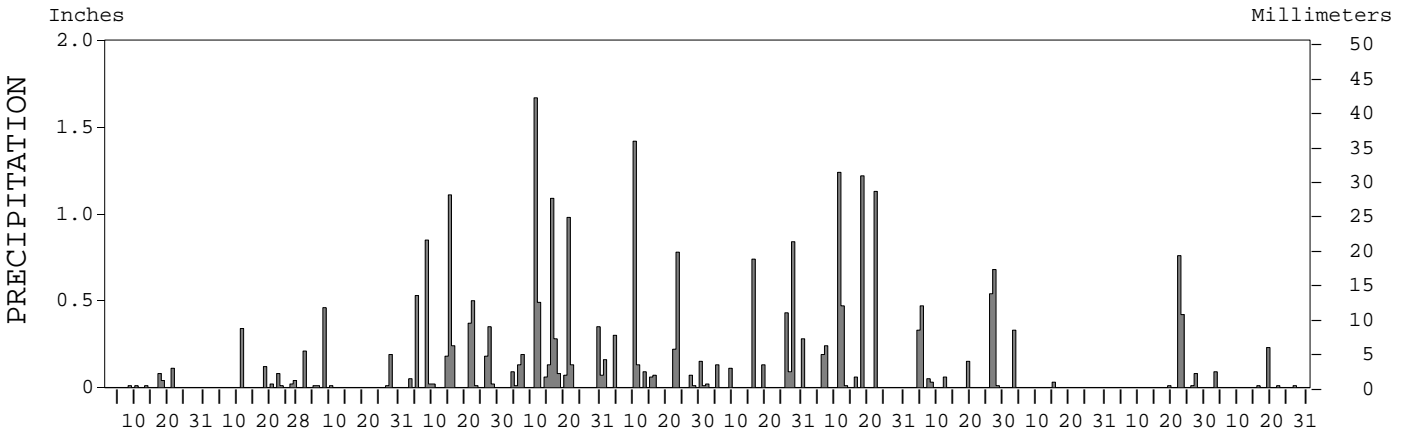
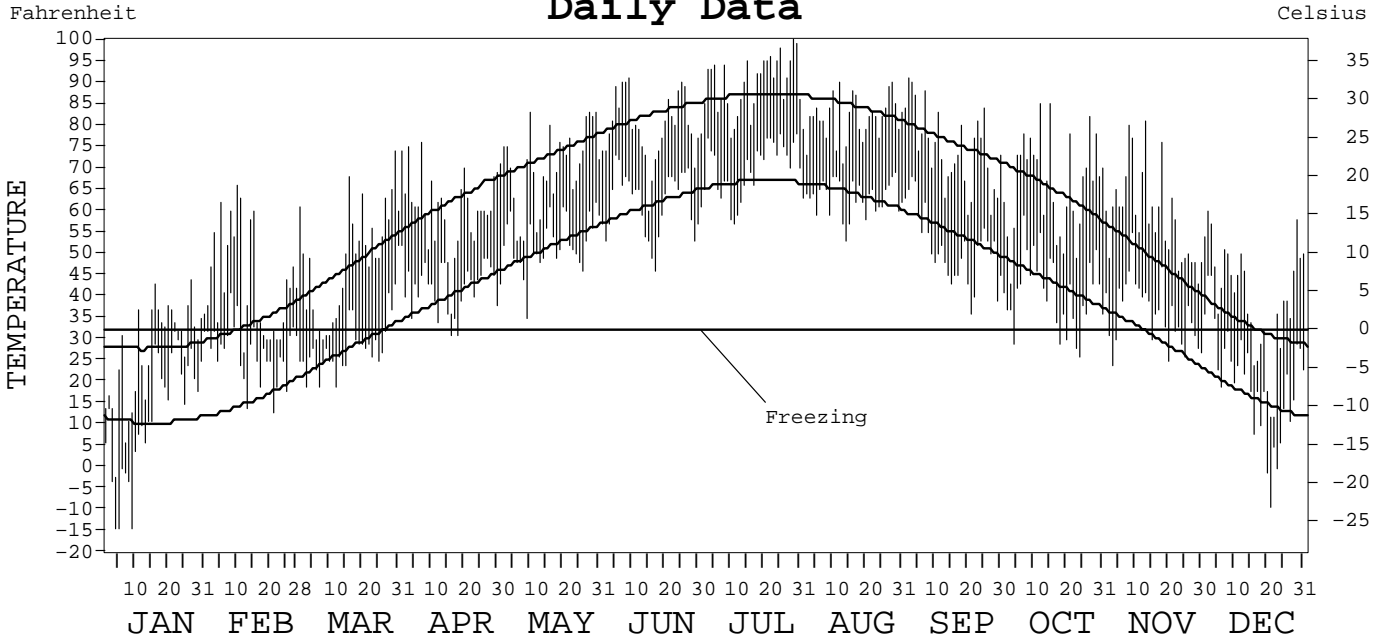
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-2052

DES MOINES,
IOWA (DSM)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	NATIONAL ENVIRONMENTAL AND INFORMATION SERVICE	NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE	NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA	DIRECTOR NATIONAL CLIMATIC DATA CENTER
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METEOROLOGICAL DATA FOR 1999

DES MOINES, IA (DSM)

LATITUDE: 41° 32' 16" N LONGITUDE: 93° 39' 58" W ELEVATION (FT): GRND: 910 BARO: 910 TIME ZONE: CENTRAL (UTC + 6) WBAN: 14933

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	27.3	43.4	48.6	60.5	70.3	79.6	89.5	81.6	74.4	66.3	58.7	39.5	61.6	
	HIGHEST DAILY MAXIMUM	44	66	74	76	83	91	100	90	91	85	81	60	100	
	DATE OF OCCURRENCE	27	10	30	07	30+	09	29	28+	02	15+	13	02	JUL 29	
	MEAN DAILY MINIMUM	13.1	27.0	28.8	42.2	52.2	61.8	69.8	63.1	51.4	41.0	36.0	20.2	42.2	
	LOWEST DAILY MINIMUM	-14	13	19	31	35	46	57	53	36	26	24	-9	-14	
	DATE OF OCCURRENCE	09+	21	12+	18+	09	17	11	14	21	24	03	21	JAN 09+	
	AVERAGE DRY BULB	20.2	35.2	38.7	51.4	61.3	70.7	79.7	72.4	62.9	53.7	47.4	29.9	52.0	
	MEAN WET BULB	18.9	31.8	33.4	46.4	55.9	64.4	72.0	66.2	55.5	45.9	40.6	27.6	46.5	
	MEAN DEW POINT	15.5	26.7	24.7	41.5	51.0	60.4	68.1	62.5	49.5	37.5	32.1	22.7	41.0	
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	4	18	2	2	0	0	0	0	26
	MAXIMUM ≤ 32°	17	7	5	0	0	0	0	0	0	0	0	8	37	
	MINIMUM ≤ 32°	31	23	25	2	0	0	0	0	0	5	11	27	124	
	MINIMUM ≤ 0°	7	0	0	0	0	0	0	0	0	0	0	3	10	
H/C	HEATING DEGREE DAYS	1384	824	808	402	147	27	0	2	130	355	522	1080	5681	
	COOLING DEGREE DAYS	0	0	0	0	40	204	463	236	72	11	1	0	1027	
RH	MEAN (PERCENT)	82	74	60	73	71	72	69	74	64	58	60	75	69	
	HOUR 00 LST	84	76	65	77	78	78	77	82	74	66	67	79	75	
	HOUR 06 LST	86	81	78	85	83	85	84	89	81	76	76	82	82	
	HOUR 12 LST	79	67	50	68	62	64	57	62	51	46	48	68	60	
	HOUR 18 LST	81	70	48	62	61	61	57	62	51	45	50	70	60	
S	PERCENT POSSIBLE SUNSHINE		52	87	59	69	58	72	60	71	73	68	44		
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	7	4	1	2	2	0	1	0	1	1	0	2	21	
	THUNDERSTORMS	0	1	0	4	7	6	9	6	4	2	1	0	40	
CLOUDINESS	SUNRISE-SUNSET: (OKTAS)														
	CEILOMETER (≤ 12,000 FT.)														
	SATELLITE (> 12,000 FT.)														
	MIDNIGHT-MIDNIGHT: (OKTAS)														
	CEILOMETER (≤ 12,000 FT.)														
	SATELLITE (> 12,000 FT.)														
	NUMBER OF DAYS WITH:														
	CLEAR														
	PARTLY CLOUDY														
	CLOUDY														
PR	MEAN STATION PRESS. (IN.)	29.03	28.97	29.09	28.88	28.87	28.94	28.93	28.98	28.99	29.06	29.06	29.02	28.98	
	MEAN SEA-LEVEL PRESS. (IN.)	30.11	30.02	30.14	29.91	29.89	29.95	29.93	29.99	30.01	30.10	30.11	30.09	30.02	
WINDS	RESULTANT SPEED (MPH)	2.7	2.3	0.7	3.0	3.1	3.7	3.7	1.1	1.9	1.2	1.9	1.9	1.0	
	RES. DIR. (TENS OF DEGS.)	35	26	07	05	21	18	21	15	25	25	22	27	23	
	MEAN SPEED (MPH)	10.8	11.6	10.7	11.8	10.8	9.0	9.3	8.1	8.2	9.4	9.6	9.2	9.9	
	PREVAIL. DIR. (TENS OF DEGS.)	30	31	32	11	14	18	20	15	19	19	19	17	19	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	37	41	39	34	37	32	32	36	29	33	32	30	41	
	DIR. (TENS OF DEGS.)	29	30	30	26	15	20	04	03	25	32	19	01	30	
	DATE OF OCCURRENCE	18	12	17	06	10	10	28	12	04	22	18+	27	FEB 12	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	48	48	47	44	43	38	41	45	32	40	41	38	48	
DIR. (TENS OF DEGS.)	29	30	29	29	15	18	18	02	25	30	31	01	30		
	DATE OF OCCURRENCE	18	12	17	11	10	10	03	12	04	22	01	27	FEB 12	
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.26	0.63	0.90	4.43	5.82	3.46	2.78	4.56	2.32	0.36	1.28	0.35	27.15	
	GREATEST 24-HOUR (IN.)	0.12	0.34	0.46	1.13	1.96	1.42	0.93	1.71	1.22	0.33	1.18	0.23	1.96	
	DATE OF OCCURRENCE	17-18	11	08	14-15	11-12	10	27-28	11-12	26-27	03	22-23	19	MAY 11-12	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	6	7	7	14	16	12	10	8	9	2	5	5	101	
PRECIPITATION ≥ 0.10	1	2	3	9	10	7	7	6	5	1	2	1	54		
	PRECIPITATION ≥ 1.00	0	0	0	1	2	1	0	3	0	0	0	0	7	
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)														
	GREATEST 24-HOUR (IN.)														
	DATE OF OCCURRENCE														
	MAXIMUM SNOW DEPTH (IN.)	11	6	11	T	0	0	0	0	0	0	0	5	11	
	DATE OF OCCURRENCE	3	23	09	16							24+	MAR 09		
	NUMBER OF DAYS WITH:														
	SNOWFALL ≥ 1.0														

NORMALS, MEANS, AND EXTREMES

DES MOINES, IA (DSM)

LATITUDE: 41° 32' 16" N LONGITUDE: 93° 39' 58" W ELEVATION (FT): GRND: 910 BARO: 910 TIME ZONE: CENTRAL (UTC + 6) WBAN: 14933

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	28.1	33.7	46.9	61.8	73.0	82.2	86.7	84.2	75.6	64.3	48.0	32.6	59.8
	MEAN DAILY MAXIMUM	54	28.8	34.5	46.0	61.1	72.3	81.7	86.1	83.9	74.3	64.6	47.2	33.8	59.5
	HIGHEST DAILY MAXIMUM	60	65	73	91	93	98	103	105	108	101	95	81	69	108
	YEAR OF OCCURRENCE		1989	1972	1986	1980	1967	1988	1955	1983	1939	1963	1999	1984	AUG 1983
	MEAN OF EXTREME MAXS.	54	51.4	56.8	73.1	83.2	87.6	93.5	97.1	95.7	89.2	83.6	68.1	56.9	78.0
	NORMAL DAILY MINIMUM	30	10.7	15.6	27.6	40.0	51.5	61.2	66.5	63.6	54.5	42.7	29.9	16.1	40.0
	MEAN DAILY MINIMUM	54	11.2	16.8	27.1	39.7	51.2	61.1	65.8	63.7	53.3	43.0	29.2	17.5	40.0
	LOWEST DAILY MINIMUM	60	-24	-26	-22	9	30	38	47	40	0	14	-4	-22	-26
	YEAR OF OCCURRENCE		1970	1996	1962	1975	1967	1945	1971	1950	1996	1972	1991	1989	FEB 1996
	MEAN OF EXTREME MINS.	54	-11.9	-5.5	6.8	23.4	36.2	48.1	54.9	51.8	37.0	26.2	10.9	-4.4	22.8
	NORMAL DRY BULB	30	19.4	24.7	37.3	50.9	62.3	71.8	76.6	73.9	65.1	53.5	39.0	24.4	49.9
	MEAN DRY BULB	54	20.0	25.6	36.4	50.3	61.7	71.3	75.9	73.9	63.9	53.8	38.2	25.7	49.7
	MEAN WET BULB	15	20.7	25.1	34.1	44.2	55.2	64.3	68.4	62.4	54.2	46.8	33.9	24.2	44.5
	MEAN DEW POINT	15	15.7	19.5	27.3	36.8	49.0	55.6	64.5	59.0	50.0	41.0	28.4	19.9	38.9
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	*	0.2	0.5	4.5	10.0	7.1	1.8	0.1	0.0	0.0	24.2	
MAXIMUM ≤ 32°	30	17.4	13.0	4.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.1	14.4	52.7	
MINIMUM ≤ 32°	30	30.0	25.6	20.7	6.6	0.2	0.0	0.0	0.0	0.2	4.7	18.6	28.9	135.5	
MINIMUM ≤ 0°	30	8.3	4.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.1	16.8	
H/C	NORMAL HEATING DEG. DAYS	30	1414	1128	859	428	165	10	0	11	71	372	780	1259	6497
	NORMAL COOLING DEG. DAYS	30	0	0	0	5	81	214	360	287	74	15	0	0	1036
RH	NORMAL (PERCENT)	30	71	71	68	63	63	65	68	70	71	66	71	75	68
	HOUR 00 LST	30	74	76	73	69	70	72	76	79	79	73	75	78	74
	HOUR 06 LST	30	75	78	78	77	77	79	82	85	85	79	79	79	79
	HOUR 12 LST	30	66	65	61	55	54	55	57	58	59	56	63	69	60
	HOUR 18 LST	30	68	66	60	52	52	53	56	58	60	58	66	72	60
S	PERCENT POSSIBLE SUNSHINE	46	51	54	57	56	61	68	72	70	66	62	49	46	59
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	50	2.5	2.3	2.0	1.0	0.9	0.7	0.6	1.2	1.2	1.2	1.7	2.9	18.2
	THUNDERSTORMS	60	0.3	0.4	2.1	4.3	7.0	9.0	8.3	7.1	4.9	2.6	1.1	0.3	47.4
CLOUDINESS	MEAN:	0						4.8							
	SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
CLEAR	1	1.0	1.0	6.0		3.0	10.0								
PARTLY CLOUDY	1	2.0		3.0		2.0	1.0								
CLOUDY	1	3.0	3.0	7.0		12.0	10.0								
PR	MEAN STATION PRESSURE (IN)	26	29.10	29.09	29.00	28.90	28.90	28.90	29.00	29.00	29.00	29.00	29.00	29.09	29.00
	MEAN SEA-LEVEL PRES. (IN)	15	30.11	30.11	30.05	29.94	29.95	30.01	29.97	30.01	30.03	30.04	30.06	30.12	30.03
WINDS	MEAN SPEED (MPH)	47	11.4	11.3	12.6	12.8	11.0	10.2	8.9	8.7	9.5	10.4	11.7	11.2	10.8
	PREVAIL. DIR (TENS OF DEGS)	28	32	32	32	32	18	18	18	18	18	18	32	32	18
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	4	41	41	45	51	43	47	44	53	37	46	52	33	53
	DIR. (TENS OF DEGS)		30	30	31	29	07	31	31	28	08	29	25	32	28
	YEAR OF OCCURRENCE		1996	1999	1996	1996	1996	1997	1998	1998	1996	1996	1998	1998	AUG 1998
	MAXIMUM 5-SECOND:														
SPEED (MPH)	4	52	51	53	64	54	63	49	70	45	57	62	41	70	
DIR. (TENS OF DEGS)		33	29	29	28	08	31	31	29	27	28	26	32	29	
YEAR OF OCCURRENCE		1996	1996	1996	1996	1996	1997	1998	1998	1997	1996	1998	1998	AUG 1998	
PRECIPITATION	NORMAL (IN)	30	0.96	1.11	2.33	3.36	3.66	4.46	3.78	4.20	3.53	2.62	1.79	1.32	33.12
	MAXIMUM MONTHLY (IN)	60	4.38	2.99	5.82	7.76	12.13	14.19	10.51	13.68	10.19	7.29	6.52	3.43	14.19
	YEAR OF OCCURRENCE		1960	1951	1990	1976	1996	1947	1958	1977	1961	1941	1983	1982	JUN 1947
	MINIMUM MONTHLY (IN)	60	0.04	0.13	0.17	0.23	1.23	1.02	0.04	0.25	0.41	0.03	0.03	0.03	0.03
	YEAR OF OCCURRENCE		1997	1968	1994	1985	1949	1992	1975	1984	1950	1952	1969	1998	DEC 1998
	MAXIMUM IN 24 HOURS (IN)	60	2.97	1.77	2.42	3.80	3.23	5.50	5.14	6.18	4.47	2.81	3.35	1.69	6.18
	YEAR OF OCCURRENCE		1960	1961	1945	1974	1996	1947	1958	1975	1961	1947	1952	1982	AUG 1975
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	7.7	7.2	10.1	10.7	11.5	10.2	9.6	9.1	9.2	8.0	7.6	8.8	109.7	
PRECIPITATION ≥ 1.00	30	0.1	0.1	0.3	0.7	0.8	1.2	1.0	1.3	0.8	0.7	0.3	0.1	7.4	
SNOWFALL	NORMAL (IN)	30	7.6	7.9	5.6	2.4	T	0.0	0.0	0.0	T	0.4	3.2	7.7	34.8
	MAXIMUM MONTHLY (IN)	57	22.3	21.3	18.8	15.6	0.2	T	T	0.0	T	7.4	14.7	23.9	23.9
	YEAR OF OCCURRENCE		1996	1962	1948	1982	1944	1993	1992	1992	1992	1980	1991	1961	DEC 1961
	MAXIMUM IN 24 HOURS (IN)	57	19.8	12.1	8.5	10.4	0.2	T	T	0.0	T	7.4	11.8	11.0	19.8
	YEAR OF OCCURRENCE		1942	1950	1957	1973	1944	1993	1992	1992	1992	1980	1968	1961	JAN 1942
	MAXIMUM SNOW DEPTH (IN)	49	14	17	18	12	0	0	0	0	0	5	10	30	30
	YEAR OF OCCURRENCE		1979	1979	1960	1973						1980	1968	1962	DEC 1962
	NORMAL NO. DAYS WITH:														
SNOWFALL ≥ 1.0	30	2.4	2.4	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.9	2.4	10.4	

PRECIPITATION (inches) 1999 DES MOINES, IA (DSM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0.26	0.24	3.28	2.28	4.21	2.45	1.96	4.95	6.51	5.20	1.46	0.83	33.63
1971	1.75	2.34	0.41	1.54	3.87	4.31	2.16	1.83	2.19	3.51	3.29	1.12	28.32
1972	0.44	0.63	1.05	3.56	3.05	2.58	5.86	6.65	5.45	2.36	2.43	1.96	36.02
1973	2.09	2.21	4.15	4.67	5.01	2.04	9.17	1.37	7.07	3.26	1.49	2.65	45.18
1974	1.51	0.84	1.99	6.31	7.19	4.62	1.33	2.81	2.08	3.96	1.20	1.83	35.67
1975	1.41	1.48	1.90	2.65	3.41	5.98	0.04	9.73	1.70	0.63	2.20	0.48	31.61
1976	0.23	2.43	3.04	7.76	2.84	7.25	1.87	2.26	1.00	1.11	0.10	0.12	30.01
1977	0.50	0.36	3.57	2.45	2.29	1.25	2.63	13.68	2.82	5.10	0.69	1.81	37.15
1978	0.28	1.27	0.90	4.57	3.49	2.74	2.95	3.10	6.39	1.14	3.16	1.37	31.36
1979	1.72	0.52	4.23	3.23	2.50	5.78	2.96	5.07	0.97	3.23	1.43	0.20	31.84
1980	1.80	0.64	1.15	0.86	1.94	5.56	1.52	7.24	1.03	1.90	0.45	1.00	25.09
1981	0.25	0.97	0.39	2.00	2.46	5.02	5.76	6.32	2.30	2.06	2.63	1.14	31.30
1982	2.63	0.78	3.30	5.03	5.79	2.59	7.00	5.25	2.94	3.44	2.62	3.43	44.80
1983	1.17	1.95	3.72	3.80	3.93	3.65	2.44	3.01	3.87	5.54	6.52	1.57	41.17
1984	0.99	0.82	1.65	5.85	5.58	7.81	6.22	0.25	2.76	6.28	1.16	2.41	41.78
1985	0.64	1.98	3.37	0.23	1.56	3.72	2.04	2.83	5.42	3.75	1.65	1.31	28.50
1986	0.12	1.76	2.92	5.66	4.35	7.08	3.90	4.52	6.41	3.89	0.99	0.98	42.58
1987	0.42	1.38	2.99	2.92	3.75	2.10	5.08	10.04	1.40	1.03	3.27	2.59	36.97
1988	0.37	0.59	0.66	0.75	1.46	2.75	4.78	3.05	2.89	0.59	3.38	0.84	22.11
1989	1.30	1.05	0.37	1.95	3.62	2.22	3.65	6.53	5.41	2.28	0.19	0.57	29.14
1990	1.43	0.89	5.82	3.43	4.36	9.52	8.75	1.83	1.40	1.80	2.52	2.18	43.93
1991	0.95	0.17	3.90	7.54	7.88	2.87	1.14	3.65	0.90	4.96	3.61	2.20	39.77
1992	0.97	2.12	2.13	3.99	1.45	1.02	7.76	1.39	4.99	0.51	5.20	1.98	33.51
1993	1.59	1.52	3.22	2.96	7.51	7.68	9.75	12.24	5.79	1.70	1.06	0.86	55.88
1994	1.22	1.71	0.17	2.71	1.76	5.29	4.30	2.81	3.11	1.02	1.68	2.42	28.20
1995	0.98	0.68	2.75	6.04	6.29	2.88	4.36	1.04	3.12	1.24	1.57	0.08	31.03
1996	2.99	0.57	1.38	2.12	12.13	2.95	4.02	2.54	4.05	2.87	2.40	0.52	38.54
1997	0.04	0.77	0.85	4.11	3.95	4.90	2.89	2.36	2.14	4.62	1.13	0.77	28.53
1998	0.60	1.23	3.03	1.79	4.97	9.95	4.28	5.65	0.69	3.39	2.09	0.03	37.70
1999	0.26	0.63	0.90	4.43	5.82	3.46	2.78	4.56	2.32	0.36	1.28	0.35	27.15
POR= 122 YRS	1.11	1.13	2.00	3.00	4.27	4.64	3.49	3.71	3.23	2.41	1.61	1.17	31.77

WBAN : 14933

AVERAGE TEMPERATURE (°F) 1999 DES MOINES, IA (DSM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	12.7	27.1	32.9	51.7	65.8	72.4	76.6	73.9	65.5	54.1	39.8	28.8	50.1
1971	15.7	23.1	35.2	52.1	58.7	76.8	72.1	73.2	68.1	60.5	39.6	28.2	50.3
1972	16.6	19.9	37.1	48.9	62.5	70.2	73.9	72.4	64.6	48.0	33.9	18.4	47.2
1973	22.0	27.7	45.6	49.2	59.8	73.6	76.4	76.9	65.7	59.0	40.7	22.1	51.6
1974	19.5	28.0	39.8	53.0	60.3	69.1	80.9	71.1	60.9	55.0	39.6	28.2	50.5
1975	22.7	22.4	29.7	46.9	65.9	72.3	77.9	77.1	61.8	57.2	43.5	29.9	50.6
1976	22.9	34.1	39.7	55.4	60.7	71.4	77.2	73.8	65.7	48.5	32.6	21.8	50.3
1977	10.1	29.8	44.7	58.5	69.5	74.7	81.0	72.1	66.5	52.3	39.1	23.2	51.8
1978	11.0	13.3	33.2	50.5	61.6	72.8	75.8	75.1	70.5	52.4	39.0	23.0	48.2
1979	7.5	13.8	35.2	47.0	61.1	70.9	74.5	74.3	66.8	54.3	38.0	31.6	47.9
1980	23.4	21.3	34.7	52.0	63.5	71.2	79.9	76.2	66.8	49.6	41.6	26.6	50.6
1981	25.7	29.8	42.7	57.6	60.4	72.9	76.1	72.4	66.0	51.7	42.8	25.5	52.0
1982	9.6	22.9	35.4	46.9	64.7	67.1	76.9	73.2	64.9	54.6	38.4	31.6	48.9
1983	27.3	32.3	39.4	45.4	58.4	73.2	80.9	83.3	67.7	52.6	40.7	9.8	50.9
1984	19.7	35.5	31.1	48.8	58.7	73.2	75.9	77.5	62.4	52.8	39.5	27.6	50.2
1985	15.8	22.2	42.0	55.2	65.1	68.4	76.5	71.9	64.8	52.6	30.0	13.4	48.2
1986	26.9	21.7	42.5	53.9	62.6	73.3	77.2	69.3	67.4	52.6	33.3	28.8	50.8
1987	26.6	35.7	42.7	54.6	66.8	74.7	78.5	72.1	65.2	48.2	43.1	30.0	53.2
1988	19.6	21.6	40.2	51.4	67.4	75.6	78.5	78.8	66.9	47.9	39.8	28.8	51.4
1989	32.5	15.4	37.1	52.3	61.0	68.9	77.1	73.3	62.2	54.1	36.0	16.9	48.9
1990	31.7	31.1	42.0	50.0	57.9	71.6	73.8	74.4	68.1	52.4	43.7	22.9	51.6
1991	16.8	33.5	42.5	53.6	66.7	74.8	76.1	73.7	65.0	52.5	30.9	30.6	51.4
1992	30.7	34.9	42.4	48.9	62.0	70.3	71.2	68.3	63.1	53.4	34.9	27.1	50.6
1993	21.3	21.5	34.1	47.1	61.0	69.0	73.8	73.8	59.2	50.4	36.4	28.4	48.0
1994	13.0	21.3	40.5	50.9	62.5	72.4	73.0	71.3	66.4	55.5	42.1	30.3	49.9
1995	20.8	28.8	39.8	47.4	58.9	71.0	76.4	79.1	63.2	52.9	33.3	26.0	49.8
1996	17.3	25.0	32.5	47.8	57.7	70.9	72.7	72.3	0.0	53.4	32.1	22.2	42.0
1997	17.5	27.6	40.0	45.9	55.9	72.1	75.6	72.1	66.4	53.7	34.5	28.8	49.2
1998	25.9	36.3	33.6	50.8	66.5	68.1	75.4	75.2	70.4	54.0	42.4	30.3	52.4
1999	20.2	35.2	38.7	51.4	61.3	70.7	79.7	72.4	62.9	53.7	47.4	29.9	52.0
POR= 121 YRS	20.7	25.1	36.7	50.5	61.6	71.2	76.1	73.8	64.9	53.8	38.3	26.0	49.9

HEATING DEGREE DAYS (base 65°F) 1999 DES MOINES, IA (DSM)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0	0	100	352	748	1114	1521	1167	915	393	211	0	6521
1971-72	8	4	96	184	756	1132	1495	1303	857	478	149	23	6485
1972-73	7	10	112	523	925	1442	1326	1039	594	470	173	0	6621
1973-74	0	0	68	209	719	1325	1406	1033	775	363	189	20	6107
1974-75	0	12	168	307	755	1131	1308	1185	1090	539	81	11	6587
1975-76	0	0	148	267	637	1085	1297	890	780	302	160	4	5570
1976-77	0	1	76	527	964	1333	1700	981	624	234	25	2	6467
1977-78	0	3	35	388	769	1289	1667	1442	988	427	181	9	7198
1978-79	0	0	48	385	776	1293	1779	1433	912	532	163	13	7334
1979-80	1	10	57	339	801	1031	1281	1263	932	408	124	9	6256
1980-81	0	0	77	473	695	1182	1214	979	684	241	177	0	5722
1981-82	6	2	57	406	660	1218	1713	1175	911	536	73	30	6787
1982-83	0	6	113	326	791	1026	1162	908	787	587	219	17	5942
1983-84	0	0	96	394	720	1709	1401	851	1043	488	217	1	6920
1984-85	0	0	172	376	759	1154	1520	1192	707	335	59	27	6301
1985-86	0	0	172	378	1046	1596	1181	1208	702	344	116	2	6745
1986-87	0	25	51	378	941	1114	1184	813	687	336	58	6	5593
1987-88	0	24	54	513	648	1083	1399	1254	764	400	33	3	6175
1988-89	0	6	35	524	749	1114	1002	1384	866	417	170	31	6298
1989-90	0	6	140	345	865	1489	1025	943	703	469	221	21	6227
1990-91	3	0	85	394	633	1301	1491	875	699	355	112	0	5948
1991-92	0	1	144	395	1019	1058	1054	868	691	486	152	9	5877
1992-93	0	26	135	363	897	1169	1344	1210	953	528	151	42	6818
1993-94	0	2	185	460	851	1129	1606	1221	751	437	132	17	6791
1994-95	0	11	74	292	681	1071	1363	1007	774	521	191	20	6005
1995-96	3	0	136	381	945	1201	1471	1155	1002	514	264	31	7103
1996-97	0	0	364	982	1322	1468	1468	1043	764	568	288	0	5995
1997-98	4	0	52	409	908	1118	1207	799	967	419	45	67	5995
1998-99	0	0	26	339	674	1067	1384	824	808	402	147	27	5698
1999-	0	2	130	355	522	1080							

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COOLING DEGREE DAYS (base 65°F) 1999 DES MOINES, IA (DSM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	31	131	238	368	280	123	20	0	0	1191
1971	0	0	0	13	26	362	234	263	194	52	0	0	1144
1972	0	0	0	3	77	184	289	247	109	0	0	0	909
1973	0	0	0	2	19	267	358	378	98	30	0	0	1152
1974	0	0	0	9	52	149	499	209	52	4	0	0	974
1975	0	0	0	3	116	237	408	383	58	32	0	0	1237
1976	0	0	0	19	36	203	385	283	104	20	0	0	1050
1977	0	0	0	48	172	298	505	232	86	1	0	0	1342
1978	0	0	6	0	83	251	341	321	221	3	0	0	1226
1979	0	0	0	0	48	194	304	305	118	15	0	0	984
1980	0	0	0	22	83	200	469	353	138	2	0	0	1267
1981	0	0	1	27	42	243	358	239	95	2	0	0	1007
1982	0	0	0	0	71	101	374	269	120	11	0	0	946
1983	0	0	0	4	20	272	502	574	183	19	0	0	1574
1984	0	0	0	8	27	254	345	397	101	2	0	0	1134
1985	0	0	0	46	69	134	361	221	174	0	0	0	1005
1986	0	0	11	17	46	258	386	162	130	0	0	0	1010
1987	0	0	0	31	121	304	426	250	65	0	0	0	1197
1988	0	0	0	1	112	329	425	444	101	3	0	0	1415
1989	0	0	6	44	53	156	379	269	61	15	0	0	983
1990	0	0	1	26	5	226	283	297	184	11	2	0	1035
1991	0	0	9	19	172	302	349	279	150	14	0	0	1294
1992	0	0	0	10	64	174	197	134	86	10	0	0	675
1993	0	0	0	0	31	167	281	280	19	15	0	0	793
1994	0	0	0	22	65	245	253	213	125	4	0	0	927
1995	0	0	0	0	9	206	361	440	90	11	0	0	1117
1996	0	0	0	4	44	212	245	231	10	10	0	0	1027
1997	0	0	0	0	14	223	338	228	101	65	0	0	969
1998	0	0	2	1	99	165	330	323	190	3	0	0	1113
1999	0	0	0	0	40	204	463	236	72	11	1	0	1027

SNOWFALL (inches) 1999 DES MOINES, IA (DSM)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0.0	0.0	0.0	0.0	0.2	1.4	15.9	13.7	5.3	0.4	0.0	0.0	36.9
1971-72	0.0	0.0	0.0	0.0	10.3	2.9	5.8	9.0	1.6	0.6	0.0	0.0	30.2
1972-73	0.0	0.0	0.0	T	10.2	9.5	15.3	4.6	T	15.1	0.0	0.0	54.7
1973-74	0.0	0.0	0.0	0.0	T	9.6	10.6	6.1	1.9	1.2	0.0	0.0	29.4
1974-75	0.0	0.0	0.0	0.0	9.3	9.1	13.3	17.9	5.6	4.5	0.0	0.0	59.7
1975-76	0.0	0.0	0.0	0.0	7.0	0.5	2.4	11.8	0.9	0.0	T	0.0	22.6
1976-77	0.0	0.0	0.0	T	1.1	2.8	7.6	0.9	4.8	1.9	0.0	0.0	19.1
1977-78	0.0	0.0	0.0	0.0	2.2	22.0	2.7	18.6	9.9	0.3	0.0	0.0	55.7
1978-79	0.0	0.0	0.0	0.0	5.8	11.0	16.6	8.2	4.1	8.0	0.0	0.0	53.7
1979-80	0.0	0.0	0.0	T	0.7	0.4	7.9	5.7	5.8	2.8	0.0	0.0	23.3
1980-81	0.0	0.0	0.0	7.4	T	2.7	3.7	6.6	T	0.0	0.0	0.0	20.4
1981-82	0.0	0.0	0.0	0.4	3.2	10.7	18.5	2.6	11.9	15.6	0.0	0.0	62.9
1982-83	0.0	0.0	0.0	0.8	0.3	3.6	4.2	16.8	13.2	12.6	0.0	0.0	51.5
1983-84	0.0	0.0	0.0	T	9.8	19.6	12.5	1.3	13.7	0.1	0.0	0.0	57.0
1984-85	0.0	0.0	0.0	T	2.7	7.6	7.7	6.9	6.7	T	0.0	0.0	31.6
1985-86	0.0	0.0	T	0.0	8.1	15.9	1.3	6.7	0.2	0.1	0.0	0.0	32.3
1986-87	0.0	0.0	0.0	T	3.1	2.9	5.1	2.8	5.5	0.0	0.0	0.0	19.4
1987-88	0.0	0.0	0.0	T	0.1	13.0	1.2	7.6	0.8	0.0	0.0	0.0	22.7
1988-89	0.0	0.0	0.0	0.0	1.1	1.0	0.1	16.3	1.2	0.6	T	0.0	20.3
1989-90	0.0	0.0	0.0	T	1.7	6.6	11.3	7.4	0.1	T	0.0	0.0	27.1
1990-91	0.0	0.0	0.0	T	1.3	12.1	9.9	0.4	0.2	T	T	0.0	23.9
1991-92	0.0	0.0	0.0	T	14.7	1.2	1.9	4.5	0.2	0.1	0.0	0.0	22.6
1992-93	T	0.0	T	T	10.0	3.7	11.1	10.1	5.1	1.5	T	T	41.5
1993-94	0.0	0.0	0.0	0.2	0.9	2.0	8.8	15.2	0.5	0.7	0.0	0.0	28.3
1994-95	0.0	0.0	0.0	0.0	0.2	12.4	8.7	2.0	5.3	0.4	T	0.0	29.0
1995-96	0.0	0.0	0.0	1.8	6.5		22.3		1.6				
1996-97													
1997-98													
1998-99													
1999-													
POR= 56 YRS	T	0.0	T	0.3	3.1	6.7	8.3	7.1	5.9	1.8	0.0	T	33.2

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REFERENCE NOTES:

<p>PAGE 1: THE TEMPERATURE GRAPH SHOWS NORMAL MAXIMUM AND NORMAL MINIMUM DAILY TEMPERATURES (SOLID CURVES) AND THE ACTUAL DAILY HIGH AND LOW TEMPERATURES (VERTICAL BARS).</p> <p>PAGE 2 AND 3: H/C INDICATES HEATING AND COOLING DEGREE DAYS. RH INDICATES RELATIVE HUMIDITY W/O INDICATES WEATHER AND OBSTRUCTIONS S INDICATES SUNSHINE. PR INDICATES PRESSURE. CLOUDINESS ON PAGE 3 IS THE SUM OF THE CEILOMETER AND SATELLITE DATA NOT TO EXCEED EIGHT EIGHTHS(OKTAS).</p> <p>GENERAL: T INDICATES TRACE PRECIPITATION, AN AMOUNT GREATER THAN ZERO BUT LESS THAN THE LOWEST REPORTABLE VALUE. + INDICATES THE VALUE ALSO OCCURS ON EARLIER DATES. BLANK ENTRIES DENOTE MISSING OR UNREPORTED DATA. NORMALS ARE 30-YEAR AVERAGES (1961 - 1990). ASOS INDICATES AUTOMATED SURFACE OBSERVING SYSTEM. PM INDICATES THE LAST DAY OF THE PREVIOUS MONTH. POR (PERIOD OF RECORD) BEGINS WITH THE JANUARY DATA MONTH AND IS THE NUMBER OF YEARS USED TO COMPUTE THE MEAN. INDIVIDUAL MONTHS WITHIN THE POR MAY BE MISSING. WHEN THE POR FOR A NORMAL IS LESS THAN 30 YEARS, THE NORMAL IS PROVISIONAL AND IS BASED ON THE NUMBER OF YEARS INDICATED. 0.* OR * INDICATES THE VALUE OR MEAN-DAYS-WITH IS BETWEEN 0.00 AND 0.05. CLOUDINESS FOR ASOS STATIONS DIFFERS FROM THE NON-ASOS OBSERVATION TAKEN BY A HUMAN OBSERVER. ASOS STATION CLOUDINESS IS BASED ON TIME-AVERAGED CEILOMETER DATA FOR CLOUDS AT OR BELOW 12,000 FEET AND ON SATELLITE DATA FOR CLOUDS ABOVE 12,000 FEET. THE NUMBER OF DAYS WITH CLEAR, PARTLY CLOUDY, AND CLOUDY CONDITIONS FOR ASOS STATIONS IS THE SUM OF THE CEILOMETER AND SATELLITE DATA FOR THE SUNRISE TO SUNSET PERIOD.</p>	<p>GENERAL CONTINUED: CLEAR INDICATES 0 - 2 OKTAS, PARTLY CLOUDY INDICATES 3 - 6 OKTAS, AND CLOUDY INDICATES 7 OR 8 OKTAS. WHEN AT LEAST ONE OF THE ELEMENTS (CEILOMETER OR SATELLITE) IS MISSING, THE DAILY CLOUDINESS IS NOT COMPUTED. WIND DIRECTION IS RECORDED IN TENS OF DEGREES (2 DIGITS) CLOCKWISE FROM TRUE NORTH. "00" INDICATES CALM. "36" INDICATES TRUE NORTH. RESULTANT WIND IS THE VECTOR AVERAGE OF THE SPEED AND DIRECTION. AVERAGE TEMPERATURE IS THE SUM OF THE MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURE DIVIDED BY 2. SNOWFALL DATA COMPRISE ALL FORMS OF FROZEN PRECIPITATION, INCLUDING HAIL. A HEATING (COOLING) DEGREE DAY IS THE DIFFERENCE BETWEEN THE AVERAGE DAILY TEMPERATURE AND 65° F. DRY BULB IS THE TEMPERATURE OF THE AMBIENT AIR. DEW POINT IS THE TEMPERATURE TO WHICH THE AIR MUST BE COOLED TO ACHIEVE 100 PERCENT RELATIVE HUMIDITY. WET BULB IS THE TEMPERATURE THE AIR WOULD HAVE IF THE MOISTURE CONTENT WAS INCREASED TO 100 PERCENT RELATIVE HUMIDITY.</p> <p>ON JULY 1, 1996, THE NATIONAL WEATHER SERVICE BEGAN USING THE "METAR" OBSERVATION CODE THAT WAS ALREADY EMPLOYED BY MOST OTHER NATIONS OF THE WORLD. THE MOST NOTICEABLE DIFFERENCE IN THIS ANNUAL PUBLICATION WILL BE THE CHANGE IN UNITS FROM TENTHS TO EIGHTHS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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1999
DES MOINES,
IOWA (DSM)

Located in the heart of North America, Des Moines has a climate which is continental in character. This results in a marked seasonal contrast in both temperature and precipitation. There is a gently rolling terrain in and around the Des Moines metropolitan area. Drainage of the area is generally to the southeast to the Des Moines River and its tributaries.

Since agriculture and services for it are the mainstay of the area, it is convenient to separate the year into arbitrary seasons corresponding to the growing seasons of the principal crops of the section. The winter season, when most plant life is dormant, is from mid-November to late March. The summer season, when corn and soybeans can be grown, lasts from early May to early October. The spring growing season, including part of the growing season of oats and forage crops, and the fall harvest season, each runs about 6 weeks. There is a large variation in annual precipitation from a minimum of about 17 inches to a maximum of about 56 inches. The average annual snowfall is 32 inches. Annual variation of snowfall is also large, ranging from a minimum of about 8 inches to as much as 72 inches.

The winter is a season of cold dry air, interrupted by occasional storms of short duration. At the beginning and the end of the season, the precipitation may occur as rain, but during the major portion of the season it falls as snow. Drifting snow may be extensive and impede transportation. The average precipitation for this season is approximately 20 percent of the annual amount. Although occasional cold waves follow the storms, bitterly cold days on which the temperatures fail to rise above zero occur on an average of only 3 days in 4 years.

The average growing season with temperatures above 32 degrees normally spans 160 to 165 days between late April and mid-October. The growing season is characterized by prevailing southerly winds and precipitation falling primarily as showers and thunderstorms, occasionally with damaging wind, erosive downpours or hail. Some 60 percent of the annual precipitation falls during the crop season with the maximum rate normally in late May and June. The autumn is characteristically sunny with diminishing precipitation, a condition favorable for drying and harvesting crops.

STATION LOCATION

DES MOINES, IOWA

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE													* Type	REMARKS
						SEA LEVEL	GROUND													
							G	W	E	P	S	T	R	W	8	H	A	E		
CITY	Short periods of record during the years 1835 to 1877 were taken by U.S. Army scouting parties. Information concerning these records can be obtained from the National Climatic Data Center.																			
Address Unknown	7/1877	9/1877	NA	Unknown	Unknown	802	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	U.S. Army			
NE corner 6th & Walnut	8/10/78	12/31/86	Unknown	41°35'	93°37'	799	60	35	35						45					
SW corner 5th & Walnut	1/1/87	3/31/89	250 ft. E	41°35'	93°37'	799	78	74	74						65					
NE corner 5th & Court	4/1/89	9/30/29	400 ft. SE	41°35'	93°37'	807	88	84	84						75		a - Effective 2/27/02.			
SE corner East 1st & Walnut	10/1/29	1/2/74	2000 ft. ENE	41°35'	93°37'	807	99*	5	5			3*	4	3			b - Removed 7/1/39. * - Moved to airport 10/16/50, leaving cooperative observational program which terminated 1/2/74.			
AIRPORT																				
SW 21st & Army Post Rd. Municipal Airport	2/1/28	1/31/39	NA	41°32'	93°39'	953	29	19	19	NA	NA	NA	17	NA	NA					
Municipal Hangar SW 21st & Army Post Rd. Municipal Airport	2/1/39	10/15/50	350 ft. S	41°32'	93°39'	954	47	31	31	NA	NA	24	22	NA	NA		c - Effective 10/1945.			
Administration Building Fleur Drive & Army Post Rd., Municipal Airport+	10/16/50	12/01/95	1400 ft. N	41°32'	93°39'	948	63	21	21	Unk	17	17	16	NA	NA		d - Effective 6/17/55. e - Effective 7/21/60. f - Minor move 7/12/61. g - Minor move 7/12/61. h - Commissioned 1500' WNW of temperature site 7/18/61. i - Effective 7/18/61. j - Minor move 7/18/61. k - Moved to a location 600' E of office 12/3/69. m - Removed 6/9/80. n - Moved to roof 6/9/80. p - Type change 9/1/80. q - Installed on roof 3/12/81. r - Type change 10/01/85. s - Minor move 8/15/87.			
+ - International Airport effective 11/4/84.																				
International Airport	12/01/95	Present	NA	41°32'	93°40'	910										S	ASOS Commissioned 12/01/95			

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801. INQUIRIES/COMMENTS CALL: (828) 271-4800

National Climatic Data Center
151 Patton Avenue, Rm 120
Asheville NC 28801-5001

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