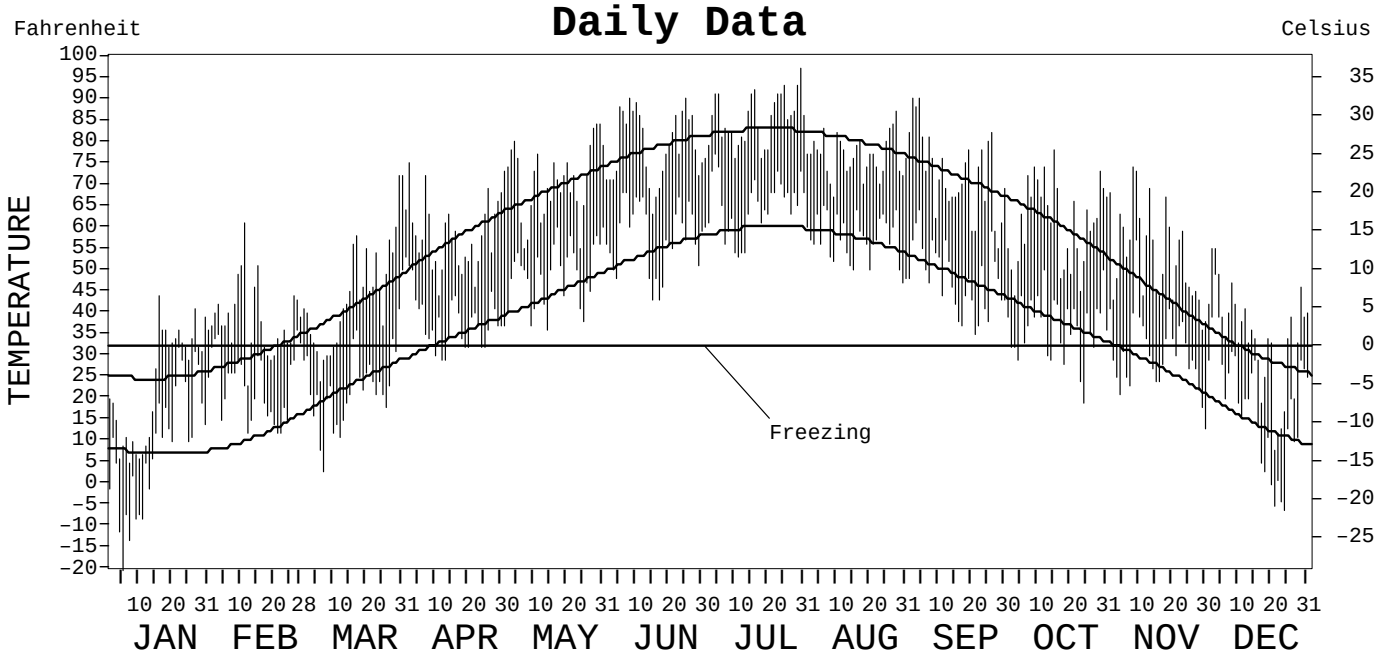
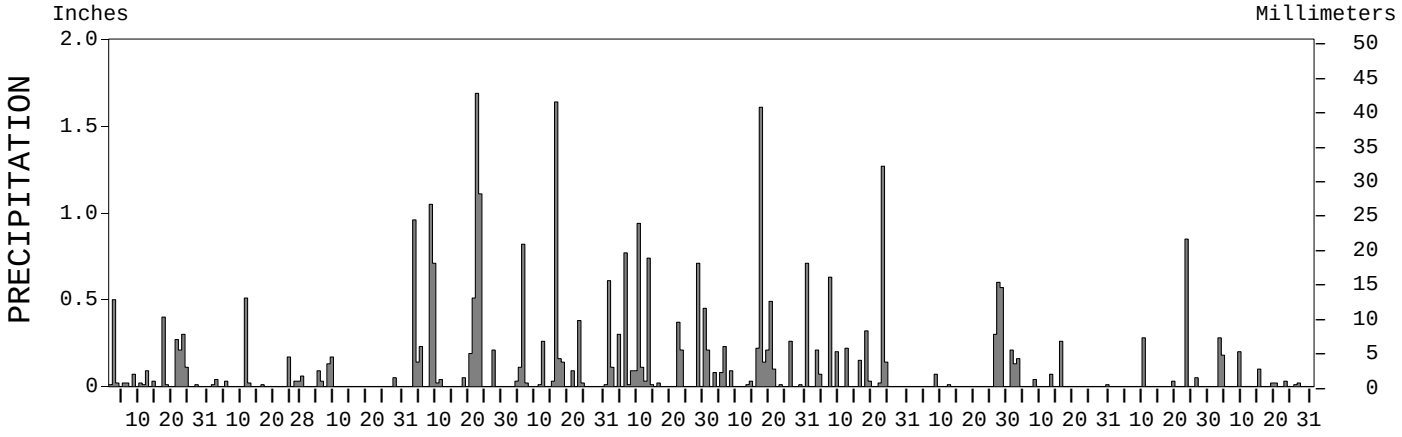
1999 LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA

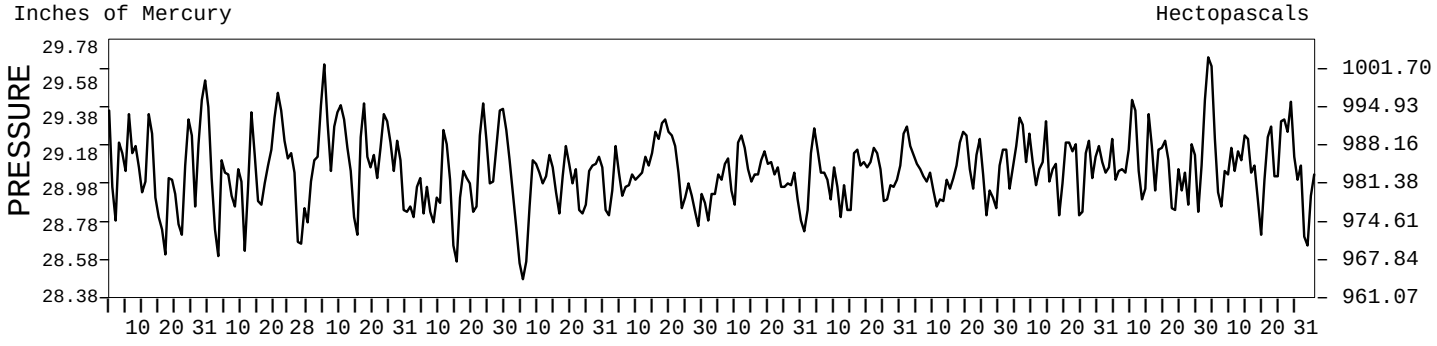
ISSN 0198-5728

MADISON,
WISCONSIN (MSN)

Daily Data







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Thomas R. Karl

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NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA
DIRECTOR NATIONAL CLIMATIC DATA CENTER

METEOROLOGICAL DATA FOR 1999

MADISON, WI (MSN)

LATITUDE: 43° 08′ 26″ N | LONGITUDE: 89° 20′ 43″ W | ELEVATION (FT): GRND: 857 BARO: 857 | TIME ZONE: CENTRAL (UTC + 6) | WBAN: 14837

	ELEMENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	MEAN DAILY MAXIMUM	23.8	38.4	44.3	58.0	70.8	79.0	85.0	76.6	72.4	61.1	53.4	34.2	58.1
	HIGHEST DAILY MAXIMUM	44	61	72	75	84	90	97	87	90	78	74	55	97
	DATE OF OCCURRENCE	16	11	31+	02	30+	25+	30	28	04+	15	08	03+	JUL 30
	MEAN DAILY MINIMUM	9.1	23.2	23.3	38.2	48.9	57.7	64.8	57.2	48.1	36.7	30.6	18.5	38.0
	LOWEST DAILY MINIMUM	-20	12	3	29	36	43	53	47	35	19	13	-6	-20
	DATE OF OCCURRENCE	05	22+	07	13+	14	17+	11	30	21	24	30	24	JAN 05
	AVERAGE DRY BULB	16.5	30.8	33.8	48.1	59.9	68.4	74.9	66.9	60.3	48.9	42.0	26.4	48.1
	MEAN WET BULB	16.0	28.2	29.3	43.8	54.2	62.4	69.6	62.9	54.2	43.8	37.6	24.9	43.9
	MEAN DEW POINT	11.6	22.6	20.5	38.1	48.6	58.2	66.1	59.9	49.3	37.1	30.9	20.3	38.6
	NUMBER OF DAYS WITH:													
	MAXIMUM ≥ 90°	0	0	0	0	0	2	9	0	2	0	0	0	13
	MAXIMUM ≤ 32°	20	6	6	0	0	0	0	0	0	0	0	8	40
	MINIMUM ≤ 32°	31	24	26	7	0	0	0	0	0	9	18	28	143
	MINIMUM ≤ 0°	9	0	0	0	0	0	0	0	0	0	0	4	13
H/C	HEATING DEGREE DAYS	1497	952	962	496	178	53	0	26	177	491	681	1190	6703
	COOLING DEGREE DAYS	0	0	0	0	24	161	315	95	42	0	0	0	637
RH	MEAN (PERCENT)	78	72	61	70	67	71	74	78	71	65	67	77	71
	HOUR 00 LST	82	78	71	81	76	82	85	90	84	73	74	82	80
	HOUR 06 LST	82	81	75	86	81	84	86	90	85	78	79	81	82
	HOUR 12 LST	74	63	49	59	56	57	60	64	53	52	55	72	60
	HOUR 18 LST	76	66	49	59	57	61	61	69	67	60	64	78	64
S	PERCENT POSSIBLE SUNSHINE													
W/O	NUMBER OF DAYS WITH:													
	HEAVY FOG(VISBY ≤ 1/4 MI)	2	3	0	0	1	1	1	1	0	3	0	4	16
	THUNDERSTORMS	0	1	0	7	2	9	15	3	2	1	2	0	42
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.)	29.12	29.05	29.19	29.03	29.00	29.08	29.04	29.09	29.07	29.15	29.17	29.11	29.09
	MEAN SEA-LEVEL PRESS. (IN.)	30.09	30.01	30.15	29.96	29.92	29.99	29.95	30.01	30.00	30.08	30.10		
WINDS	RESULTANT SPEED (MPH)	1.2	2.2	0.9	5.1	0.7	2.5	1.9	0.2	1.9	2.5	2.9	2.5	0.9
	RES. DIR. (TENS OF DEGS.)	36	21	34	07	22	18	21	08	24	23	23	24	21
	MEAN SPEED (MPH)	8.4	8.5	9.0	9.6	8.4	6.5	6.7	6.0	5.8	7.4	7.3	7.0	7.6
	PREVAIL.DIR.(TENS OF DEGS.)	28	18	33	06	16	18	22	34	18	18	19	18	18
	MAXIMUM 2-MINUTE WIND:													
	SPEED (MPH)	34	26	30	33	30	28	28	28	25	28	26	26	34
	DIR. (TENS OF DEGS.)	06	27	11	05	12	28	01	19	18	31	02	31	06
	DATE OF OCCURRENCE	02	11	08	09	04	06	23+	09	26	21	10	26	JAN 02
	MAXIMUM 5-SECOND WIND:													
	SPEED (MPH)	45	37	40	41	37	45	33	36	33	38	33	37	45
	DIR. (TENS OF DEGS.)	07	24	28	07	16	17	01	19	19	32	26	31	17
	DATE OF OCCURRENCE	02	11	17	09	05	10	23	09	26	21	23	26	JUN 10
PRECIPITATION	WATER EQUIVALENT:													
	TOTAL (IN.)	2.10	0.91	0.47	6.91	3.72	5.57	4.49	3.26	1.55	0.88	1.21	0.86	31.93
	GREATEST 24-HOUR (IN.)	0.50	0.51	0.17	2.26	1.80	0.94	1.83	1.41	0.76	0.34	0.85	0.28	2.26
	DATE OF OCCURRENCE	02	11	09	22-23	16-17	10	16-17	23-24	26-27	01-02	23	03	APR 22-23
	NUMBER OF DAYS WITH:													
	PRECIPITATION ≥ 0.01	17	10	5	13	14	17	17	11	5	7	4	9	129
	PRECIPITATION ≥ 0.10	6	2	2	10	7	11	10	8	3	4	2	4	69
	PRECIPITATION ≥ 1.00	0	0	0	3	1	0	1	1	0	0	0	0	6
SNOWFALL	SNOW,ICE PELLETS,HAIL:													
	TOTAL (IN.)	23.9	3.8	7.8	T	0.0	0.0	0.0	T	0.0	0.0	T	3.2	38.7
	GREATEST 24-HOUR (IN.)	10.2	2.8	2.9	T	0.0	0.0	0.0	T	0.0	0.0	T	0.9	10.2
	DATE OF OCCURRENCE	02	24	09+	18+				23			26	23+	JAN 02
	MAXIMUM SNOW DEPTH (IN.)	14	2	5	0	0	0	0	0	0	0	0	2	14
	DATE OF OCCURRENCE	16+	25	09									28+	JAN 16+
	NUMBER OF DAYS WITH:													
	SNOWFALL ≥ 1.0	6	1	3	0	0	0	0	0	0	0	0	0	10

NORMALS, MEANS, AND EXTREMES

MADISON, WI (MSN)

LATITUDE: 43° 08′ 26″ N | LONGITUDE: 89° 20′ 43″ W | ELEVATION (FT): GRND: 857 BARO: 857 | TIME ZONE: CENTRAL (UTC + 6) | WBAN: 14837

	ELEMENT	POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	24.8	30.1	41.5	56.7	68.9	78.2	82.4	79.6	71.5	59.9	44.0	29.8	55.6
	MEAN DAILY MAXIMUM	52	25.8	30.9	41.9	57.4	69.9	79.2	83.1	80.8	72.4	60.9	44.0	31.1	56.5
	HIGHEST DAILY MAXIMUM	60	56	61	82	94	93	101	104	102	99	90	76	62	104
	YEAR OF OCCURRENCE		1989	1999	1986	1980	1975	1988	1976	1988	1953	1976	1964	1998	JUL 1976
	MEAN OF EXTREME MAXS.	52	44.2	48.2	66.5	79.0	86.2	91.7	93.9	92.2	87.5	79.2	64.5	50.5	73.6
	NORMAL DAILY MINIMUM	30	7.2	11.1	23.0	34.1	44.2	54.2	59.5	56.9	48.2	37.7	26.7	13.5	34.7
	MEAN DAILY MINIMUM	52	8.1	12.6	22.8	34.8	45.0	54.7	59.6	57.5	48.7	38.3	26.6	14.9	35.3
	LOWEST DAILY MINIMUM	60	-37	-29	-29	0	19	31	36	35	25	13	-11	-25	-37
	YEAR OF OCCURRENCE		1951	1996	1962	1982	1978	1972	1965	1968	1974	1988	1947	1983	JAN 1951
	MEAN OF EXTREME MINS.	52	-15.3	-10.7	2.2	19.3	29.6	39.6	46.3	43.6	32.2	22.9	8.7	-7.5	17.6
	NORMAL DRY BULB	30	16.0	20.6	32.3	45.4	56.5	66.2	71.0	68.3	59.8	48.9	35.4	21.7	45.2
	MEAN DRY BULB	52	16.9	21.8	32.2	45.9	57.4	67.0	71.4	69.1	60.5	49.5	35.4	23.0	45.8
	MEAN WET BULB	16	17.9	22.2	30.8	41.3	52.0	61.3	61.7	64.1	56.3	44.7	32.4	22.7	42.3
	MEAN DEW POINT	16	13.1	16.7	24.4	34.0	45.7	56.4	58.1	60.7	52.3	39.4	27.4	18.1	37.2
	NORMAL NO. DAYS WITH:														
	MAXIMUM ≥ 90°	30	0.0	0.0	0.0	*	0.3	3.1	5.4	2.8	0.5	0.1	0.0	0.0	12.2
	MAXIMUM ≤ 32°	30	21.2	15.1	5.7	0.4	0.0	0.0	0.0	0.0	0.0	*	3.8	17.2	63.4
	MINIMUM ≤ 32°	30	30.2	26.9	25.8	14.1	3.3	*	0.0	0.0	1.2	10.2	21.8	29.2	162.7
	MINIMUM ≤ 0°	30	11.3	6.9	0.9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.2	5.7	25.0
H/C	NORMAL HEATING DEG. DAYS	30	1519	1243	1014	588	294	68	12	38	168	499	888	1342	7673
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	30	104	198	141	12	0	0	0	485
RH	NORMAL (PERCENT)	30	74	73	71	66	66	68	71	74	77	73	77	78	72
	HOUR 00 LST	30	78	78	78	75	76	80	84	87	88	82	82	82	81
	HOUR 06 LST	30	79	80	81	81	80	82	86	91	92	86	85	83	84
	HOUR 12 LST	30	69	66	62	54	53	55	56	59	61	59	67	73	61
	HOUR 18 LST	30	73	70	65	56	54	56	58	62	68	68	75	77	65
S	PERCENT POSSIBLE SUNSHINE	50	47	51	52	52	58	64	67	64	60	54	39	40	54
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG(VISBY≤1/4 MI)	53	2.3	1.9	2.6	1.4	1.4	1.1	1.4	2.1	1.9	1.7	1.9	2.9	22.6
	THUNDERSTORMS	51	0.2	0.2	1.9	3.6	5.1	7.1	7.5	6.3	4.5	2.0	0.8	0.3	39.5
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	1						6.4							
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
	CLEAR	1	6.0	7.0	8.0										
	PARTLY CLOUDY	1	4.0	6.0	4.0										
	CLOUDY	1	21.0	16.0	19.0										
PR	MEAN STATION PRESSURE(IN)	27	29.11	29.13	29.06	29.03	29.03	29.03	29.06	29.10	29.11	29.10	29.08	29.11	29.08
	MEAN SEA-LEVEL PRES. (IN)	16	30.07	30.09	30.04	29.94	29.95	29.94	29.97	30.02	30.03	30.03	30.04	30.09	30.02
WINDS	MEAN SPEED (MPH)	44	10.3	10.2	11.2	11.3	9.9	8.9	8.0	7.7	8.3	9.4	10.5	9.9	9.6
	PREVAIL.DIR(TENS OF DEGS)	28	30	30	30	18	18	18	18	18	18	18	18	30	18
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	3	34	29	34	36	31	41	40	28	25	31	38	28	41
	DIR. (TENS OF DEGS)		06	11	01	03	08	36	33	19	30	17	18	34	36
	YEAR OF OCCURRENCE		1999	1998	1998	1997	1998	1998	1997	1999	1997	1997	1998	1998	JUN 1998
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	3	45	37	41	53	43	49	53	36	43	40	52	37	53
	DIR. (TENS OF DEGS)		07	24	18	26	28	01	22	19	30	17	21	31	22
	YEAR OF OCCURRENCE		1999	1999	1998	1997	1997	1998	1997	1999	1997	1997	1998	1999	JUL 1997
PRECIPITATION	NORMAL (IN)	30	1.07	1.08	2.17	2.86	3.14	3.66	3.39	4.04	3.37	2.17	2.09	1.84	30.88
	MAXIMUM MONTHLY (IN)	60	2.53	2.77	5.46	7.11	6.26	9.95	10.93	9.49	9.51	5.63	5.13	4.09	10.93
	YEAR OF OCCURRENCE		1996	1953	1998	1973	1960	1978	1950	1980	1941	1984	1985	1987	JUL 1950
	MINIMUM MONTHLY (IN)	60	0.14	0.06	0.28	0.96	0.64	0.81	1.38	0.70	0.11	0.06	0.11	0.25	0.06
	YEAR OF OCCURRENCE		1981	1995	1978	1946	1981	1973	1946	1948	1979	1952	1976	1960	FEB 1995
	MAXIMUM IN 24 HOURS (IN)	51	1.27	1.58	3.01	2.83	3.64	4.51	5.25	2.98	3.57	2.78	2.36	2.19	5.25
	YEAR OF OCCURRENCE		1960	1981	1998	1975	1966	1996	1950	1995	1961	1984	1985	1990	JUL 1950
	NORMAL NO. DAYS WITH:														
	PRECIPITATION ≥ 0.01	30	10.5	7.8	10.6	11.6	11.5	10.1	9.6	9.5	9.5	9.3	10.0	10.2	120.2
	PRECIPITATION ≥ 1.00	30	0.1	0.1	0.1	0.5	0.7	0.9	0.8	1.0	0.9	0.3	0.4	0.3	6.1
SNOWFALL	NORMAL (IN)	30	9.9	7.1	7.9	2.6	0.1	0.0	0.0	0.0	T	0.2	3.4	12.2	43.4
	MAXIMUM MONTHLY (IN)	51	27.5	37.0	25.4	17.4	3.0	T	T	T	T	3.9	18.3	32.8	37.0
	YEAR OF OCCURRENCE		1995	1994	1959	1973	1990	1992	1994	1994	1994	1997	1985	1987	FEB 1994
	MAXIMUM IN 24 HOURS (IN)	51	13.0	14.2	13.6	12.9	3.0	T	T	T	T	3.8	9.0	17.3	17.3
	YEAR OF OCCURRENCE		1996	1994	1971	1973	1990	1992	1994	1994	1994	1997	1985	1990	DEC 1990
	MAXIMUM SNOW DEPTH (IN)	51	32	28	16	14	4	0	0	0	0	4	9	17	32
	YEAR OF OCCURRENCE		1979	1979	1986	1973	1994					1997	1985	1990	JAN 1979
	NORMAL NO. DAYS WITH:														
	SNOWFALL ≥ 1.0	30	2.8	2.5	2.2	0.7	0.*	0.0	0.0	0.0	0.0	0.*	1.2	3.5	12.9

PRECIPITATION (inches) 1999 MADISON, WI (MSN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0.44	0.16	1.17	2.53	6.09	2.26	2.42	0.97	8.82	2.65	1.06	2.12	30.69
1971	1.48	2.59	1.52	2.42	0.98	2.27	1.65	3.96	1.87	1.30	3.48	3.64	27.16
1972	0.40	0.42	2.23	2.02	2.83	1.65	3.49	7.47	5.26	2.42	0.86	1.91	30.96
1973	1.54	1.20	5.04	7.11	5.27	0.81	2.68	2.53	3.59	2.30	1.48	1.98	35.53
1974	2.45	1.17	3.43	4.24	5.77	3.86	2.69	4.60	1.08	3.18	1.79	1.80	36.06
1975	0.98	1.54	3.09	4.19	4.57	4.30	6.05	5.25	0.84	0.64	2.79	0.29	34.53
1976	0.56	1.72	4.75	4.80	1.95	1.38	1.46	1.99	0.50	1.49	0.11	0.37	21.08
1977	0.53	1.44	3.03	2.59	2.52	2.63	6.63	5.19	2.84	1.41	2.12	1.60	32.53
1978	1.03	0.24	0.28	3.50	3.96	9.95	4.54	1.63	5.44	1.11	3.05	1.71	36.44
1979	1.69	0.90	2.67	2.46	2.70	2.53	2.80	4.96	0.11	3.10	2.27	1.93	28.12
1980	1.11	0.64	0.68	2.36	2.08	3.43	2.67	9.49	7.84	1.13	1.33	1.62	34.38
1981	0.14	2.47	0.33	3.42	0.64	4.99	4.81	7.06	3.10	2.68	1.71	0.75	32.10
1982	1.42	0.17	2.11	3.26	4.34	3.40	3.47	2.67	1.42	1.46	4.21	3.65	31.58
1983	0.53	2.26	2.70	2.23	4.21	1.85	1.92	5.05	2.85	2.59	3.18	2.30	31.67
1984	0.36	1.26	1.15	3.86	3.32	7.01	1.96	1.89	2.79	5.63	1.83	2.66	33.72
1985	1.43	1.89	3.13	1.52	3.35	3.06	4.48	2.98	5.00	4.58	5.13	2.39	38.94
1986	1.02	2.72	1.55	2.27	1.97	3.24	4.31	4.38	6.82	1.85	1.03	0.69	31.85
1987	0.68	0.62	1.99	2.46	3.90	1.17	3.26	7.16	3.61	1.24	3.24	4.09	33.42
1988	1.82	0.46	1.20	2.65	0.92	2.06	2.44	2.95	3.33	1.60	3.58	1.56	24.57
1989	0.61	0.57	1.69	1.69	1.72	1.67	4.97	6.46	0.89	1.88	0.98	0.26	23.39
1990	1.60	0.99	4.18	1.90	5.35	4.88	2.61	6.03	1.64	2.25	1.65	3.46	36.54
1991	1.17	0.44	4.24	4.89	2.20	3.75	5.18	2.34	3.96	5.35	3.86	1.71	39.09
1992	0.78	1.34	1.90	3.17	1.12	1.53	5.54	2.48	5.99	1.06	4.83	2.39	32.13
1993	1.60	1.18	3.29	5.33	3.81	6.67	9.34	5.57	3.74	0.91	1.55	0.35	43.34
1994	1.46	2.76	0.46	2.57	1.33	5.66	4.10	4.56	6.14	0.65	2.77	1.08	33.54
1995	2.12	0.06	2.17	4.14	3.92	1.22	4.36	5.58	1.78	4.29	3.17	0.77	33.58
1996	2.53	0.53	0.80	2.76	2.95	9.69	4.08	1.84	1.07	3.14	1.01	1.27	31.67
1997	1.36	2.52	1.54	2.50	1.94	5.23	6.23	2.33	1.38	1.23	1.25	1.25	28.76
1998	2.24	1.44	5.46	4.10	4.58	7.46	2.50	4.24	2.48	3.20	1.95	0.29	39.94
1999	2.10	0.91	0.47	6.91	3.72	5.57	4.49	3.26	1.55	0.88	1.21	0.86	31.93
POR= 60 YRS	1.25	1.11	2.10	2.99	3.21	4.13	3.83	3.65	3.09	2.20	2.06	1.55	31.17

WBAN : 14837

AVERAGE TEMPERATURE (°F) 1999 MADISON, WI (MSN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	9.9	20.1	31.1	47.9	58.5	66.5	70.6	68.5	60.0	51.0	36.3	22.4	45.2
1971	9.6	19.9	28.6	45.4	55.1	71.7	68.5	68.3	65.1	55.9	35.2	26.8	45.8
1972	12.7	16.5	28.7	41.3	59.2	62.8	68.3	69.2	59.4	45.8	34.6	17.3	43.0
1973	23.4	24.0	41.6	44.9	54.4	67.9	71.6	70.6	60.7	54.1	36.6	21.5	47.6
1974	19.2	18.4	33.1	48.7	54.1	64.0	72.1	66.8	57.4	50.5	37.1	26.8	45.7
1975	21.9	21.3	26.1	41.0	62.5	69.2	72.4	70.6	57.5	52.2	41.9	25.5	46.8
1976	15.7	28.4	36.5	49.3	54.3	68.3	73.4	68.8	58.0	43.7	28.1	13.2	44.8
1977	3.7	22.4	39.8	51.9	65.2	64.9	73.6	64.6	59.7	47.6	34.0	19.6	45.6
1978	10.5	12.4	29.4	44.5	57.9	65.9	69.7	69.5	63.8	47.3	33.5	21.3	43.8
1979	6.9	11.7	32.1	42.4	56.7	66.0	69.8	66.6	61.1	47.5	35.1	28.8	43.7
1980	17.3	15.7	28.0	45.5	57.8	65.3	73.4	70.3	59.9	43.7	35.4	22.6	44.6
1981	20.5	25.3	36.9	48.7	55.3	67.4	70.6	68.7	59.1	46.6	36.7	22.0	46.5
1982	8.0	19.1	30.6	41.7	60.8	59.6	70.9	66.3	59.0	50.6	34.2	28.8	44.1
1983	21.4	26.3	33.1	41.6	51.9	67.5	75.0	72.2	60.1	48.2	37.3	10.8	45.5
1984	14.8	30.2	26.7	45.6	53.4	67.5	70.2	71.3	59.3	52.0	33.9	26.4	45.9
1985	12.2	19.0	37.7	52.2	60.7	63.8	70.0	66.4	61.6	49.4	31.0	11.3	44.6
1986	18.2	19.4	36.2	49.8	58.4	65.9	73.2	64.8	61.6	49.7	31.2	25.5	46.2
1987	22.6	30.5	37.2	49.9	60.8	70.4	74.5	68.7	60.6	43.4	40.0	28.4	48.9
1988	13.8	17.4	34.6	46.0	60.5	69.5	74.1	74.5	63.0	43.5	38.8	24.6	46.7
1989	27.6	14.6	30.1	44.7	56.1	65.7	72.3	68.6	58.7	50.8	33.1	14.2	44.7
1990	28.6	25.8	37.7	48.5	53.6	67.6	70.6	69.9	63.7	48.3	41.0	21.4	48.1
1991	15.1	26.5	36.8	49.4	63.6	71.1	72.3	70.2	60.0	49.4	31.4	26.3	47.7
1992	25.5	29.3	34.8	43.6	58.0	64.9	67.2	65.3	60.4	48.4	34.7	24.9	46.4
1993	21.8	21.2	31.5	43.7	59.6	65.9	72.0	72.1	56.7	47.9	35.2	26.6	46.2
1994	8.8	15.8	35.8	48.3	58.0	70.3	70.7	66.5	64.9	52.4	40.2	28.8	46.7
1995	20.4	22.9	36.9	43.8	57.6	72.0	74.8	76.9	58.7	50.2	28.7	20.6	47.0
1996	15.2	21.6	28.6	42.2	53.2	66.7	67.5	68.6	60.3	48.5	28.7	22.6	43.6
1997	15.7	24.1	34.1	43.3	51.3	67.3	69.3	65.4	60.2	50.2	33.3	27.9	45.2
1998	23.7	33.5	34.2	48.1	62.5	66.3	71.2	70.6	64.7	51.6	40.6	31.3	49.9
1999	16.5	30.8	33.8	48.1	59.9	68.4	74.9	66.9	60.3	48.9	42.0	26.4	48.1
POR= 60 YRS	17.2	21.8	32.3	46.2	57.3	66.9	71.5	69.4	60.7	49.9	35.4	23.0	46.0

HEATING DEGREE DAYS (base 65°F) 1999 MADISON, WI (MSN)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	28	18	196	431	853	1310	1718	1258	1124	582	312	22	7852
1971-72	28	21	131	293	885	1179	1616	1401	1119	705	212	117	7707
1972-73	44	42	188	587	905	1475	1279	1143	720	596	325	15	7319
1973-74	4	25	180	349	847	1342	1416	1298	979	494	347	90	7371
1974-75	1	37	253	443	829	1179	1329	1220	1198	714	150	43	7396
1975-76	18	11	236	412	687	1217	1520	1056	877	477	333	32	6876
1976-77	4	40	236	656	1102	1602	1898	1188	772	409	110	95	8112
1977-78	6	95	161	533	925	1404	1688	1466	1096	608	269	59	8310
1978-79	19	22	130	543	940	1348	1800	1489	1013	671	283	52	8310
1979-80	14	62	144	546	890	1112	1471	1424	1138	586	255	84	7726
1980-81	2	11	178	651	881	1303	1373	1107	864	482	307	30	7189
1981-82	16	27	193	566	842	1327	1765	1281	1059	688	155	172	8091
1982-83	5	66	230	444	918	1117	1346	1078	978	693	400	57	7332
1983-84	11	6	193	519	823	1678	1550	1006	1181	575	358	20	7920
1984-85	9	21	215	397	927	1191	1632	1287	839	418	155	96	7187
1985-86	12	36	198	475	1012	1661	1444	1272	888	462	220	73	7753
1986-87	7	59	145	471	1007	1218	1309	963	857	452	192	27	6707
1987-88	3	45	150	661	743	1127	1586	1377	938	565	176	53	7424
1988-89	4	18	107	661	777	1242	1153	1404	1076	602	290	68	7402
1989-90	5	22	207	437	952	1568	1122	1092	835	519	349	46	7154
1990-91	7	12	133	511	713	1349	1539	1072	868	467	173	22	6866
1991-92	8	11	222	476	1002	1195	1216	1031	929	634	244	73	7041
1992-93	26	68	176	514	903	1236	1333	1220	1032	633	196	74	7411
1993-94	0	9	260	525	887	1182	1739	1375	896	501	241	39	7654
1994-95	6	52	80	389	736	1116	1376	1173	867	629	226	20	6670
1995-96	9	0	228	452	1081	1370	1537	1256	1123	675	385	52	8168
1996-97	18	7	174	505	1083	1306	1521	1138	951	646	416	44	7809
1997-98	28	52	157	481	945	1141	1273	875	949	496	129	95	6621
1998-99	0	1	78	409	724	1040	1497	952	962	496	178	53	6390
1999-	0	26	177	491	681	1190							

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COOLING DEGREE DAYS (base 65°F) 1999 MADISON, WI (MSN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	12	47	125	210	133	53	4	0	0	584
1971	0	0	0	0	13	229	144	131	140	20	0	0	677
1972	0	0	0	0	41	61	156	180	27	0	0	0	465
1973	0	0	0	0	2	112	215	207	58	19	0	0	613
1974	0	0	0	9	17	68	228	102	31	2	0	0	457
1975	0	0	0	0	81	176	256	190	18	21	0	0	742
1976	0	0	0	14	6	136	270	165	34	2	0	0	627
1977	0	0	0	24	123	99	278	88	10	0	0	0	622
1978	0	0	0	0	56	92	171	168	102	0	0	0	589
1979	0	0	0	0	33	88	168	115	33	13	0	0	450
1980	0	0	0	8	39	100	268	183	31	0	0	0	629
1981	0	0	0	0	13	107	198	148	19	0	0	0	485
1982	0	0	0	0	29	16	194	114	53	3	0	0	409
1983	0	0	0	0	0	138	327	237	52	6	0	0	760
1984	0	0	0	1	5	102	177	224	50	0	0	0	559
1985	0	0	0	40	29	66	175	84	102	0	0	0	496
1986	0	0	0	13	24	105	269	59	49	0	0	0	519
1987	0	0	0	8	69	194	304	165	26	0	0	0	766
1988	0	0	0	0	43	194	296	315	54	0	0	0	902
1989	0	0	0	0	21	97	237	141	25	3	0	0	524
1990	0	0	0	32	2	132	191	171	100	1	0	0	629
1991	0	0	0	8	136	210	241	180	80	3	0	0	858
1992	0	0	0	0	33	76	100	86	42	5	0	0	342
1993	0	0	0	0	33	111	223	240	18	5	0	0	630
1994	0	0	0	10	32	207	192	108	85	3	0	0	637
1995	0	0	0	0	5	237	320	374	45	1	0	0	982
1996	0	0	0	0	28	110	103	125	41	0	0	0	407
1997	0	0	0	0	0	123	168	69	21	29	0	0	410
1998	0	0	0	0	57	140	199	182	76	0	0	0	654
1999	0	0	0	0	24	161	315	95	42	0	0	0	637

SNOWFALL (inches) 1999 MADISON, WI (MSN)

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	20.8	21.9	3.7	20.1	0.7	0.0	0.0	67.4
1971–72	0.0	0.0	0.0	0.0	8.8	8.9	3.6	6.3	18.8	3.9	0.0	0.0	50.3
1972–73	0.0	0.0	0.0	T	1.3	16.3	1.9	6.0	1.1	17.4	T	0.0	44.0
1973–74	0.0	0.0	0.0	0.0	0.4	10.9	10.5	14.1	6.6	0.4	T	0.0	42.9
1974–75	0.0	0.0	0.0	0.0	3.0	15.4	5.2	20.9	10.0	5.9	0.0	0.0	60.4
1975–76	0.0	0.0	0.0	0.0	5.5	2.8	10.1	10.4	2.0	T	0.0	0.0	30.8
1976–77	0.0	0.0	0.0	T	1.1	5.8	8.7	2.6	5.8	2.3	0.0	0.0	26.3
1977–78	0.0	0.0	0.0	0.0	10.4	24.6	13.5	4.7	3.0	0.5	0.0	0.0	56.7
1978–79	0.0	0.0	0.0	0.0	6.2	23.0	26.9	8.7	4.0	7.3	0.0	0.0	76.1
1979–80	0.0	0.0	0.0	0.2	4.4	1.3	4.9	7.5	5.6	7.1	0.0	0.0	31.0
1980–81	0.0	0.0	0.0	T	3.5	9.2	2.9	9.2	1.7	0.0	0.0	0.0	26.5
1981–82	0.0	0.0	0.0	0.1	2.0	7.2	19.4	2.4	8.6	10.3	0.0	0.0	50.0
1982–83	0.0	0.0	0.0	0.0	0.3	3.3	6.5	13.0	14.1	4.2	0.0	0.0	41.4
1983–84	0.0	0.0	0.0	0.0	2.1	22.6	6.0	0.8	6.8	3.9	0.0	0.0	42.2
1984–85	0.0	0.0	0.0	0.0	0.5	15.8	19.9	7.4	8.2	1.9	0.0	0.0	53.7
1985–86	0.0	0.0	0.0	0.0	18.3	24.0	13.9	13.3	2.7	0.2	0.0	0.0	72.4
1986–87	0.0	0.0	0.0	T	8.6	8.0	8.7	0.3	8.9	T	0.0	0.0	34.5
1987–88	0.0	0.0	0.0	0.4	3.9	32.8	16.3	6.4	1.1	1.3	0.0	0.0	62.2
1988–89	0.0	0.0	0.0	0.2	5.5	8.2	2.6	9.7	9.3	0.2	0.5	T	36.2
1989–90	0.0	0.0	0.0	0.7	4.4	4.3	10.1	11.7	0.1	0.5	3.0	T	34.8
1990–91	0.0	0.0	0.0	3.1	4.5	23.0	14.5	5.0	3.6	1.3	0.0	0.0	55.0
1991–92	T	0.0	0.0	0.5	8.0	10.2	4.5	12.3	6.9	0.1	0.0	T	42.5
1992–93	0.0	T	0.0	2.1	3.9	10.5	12.5	12.1	21.6	8.5	0.0	0.0	71.2
1993–94	0.0	0.0	T	0.2	1.2	2.5	22.5	37.0	0.6	9.7	0.0	0.0	73.7
1994–95	T	T	T	0.0	0.3	12.5	27.5	0.7	11.2	0.6	0.0	0.0	52.8
1995–96	0.0	0.0	0.0	0.1	12.8	10.3	26.4	1.3	4.7	4.9	0.0	0.0	60.5
1996–97	0.0	0.0	0.0	0.0	5.9	6.7	13.1	14.4	2.7	7.1	0.1	0.0	50.0
1997–98	0.0	0.0	0.0	3.9	3.0	14.3	18.9	1.8	12.0	T	0.0	0.0	53.9
1998–99	0.0	0.0	0.0	0.0	0.4	2.2	23.9	3.8	7.8	T	0.0	0.0	38.1
1999–	0.0	T	0.0	0.0	T	3.2							
POR= 50 YRS	T	T	T	0.3	3.6	10.7	11.1	7.3	8.1	2.4	0.2	T	43.7

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REFERENCE NOTES:

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).

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).

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.

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.

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 EIGHTS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.

1999
MADISON, WISCONSIN (MSN)

Madison is set on a narrow isthmus of land between Lakes Mendota and Monona. Lake Mendota (l5 square miles) lies northwest of Lake Monona (5 square miles) and the lakes are only two–thirds of a mile apart at one point. Drainage at Madison is southeast through two other lakes into the Rock River, which flows south into Illinois, and then west to the Mississippi. The westward flowing Wisconsin River is only 20 miles northwest of Madison. Madison lakes are normally frozen from mid–December to early April.

Madison has the typical continental climate of interior North America with a large annual temperature range and with frequent short period temperature changes. The range of extreme temperatures is from about 110 to –40 degrees. Winter temperatures (December–February) average near 20 degrees and the summer average (June–August) is in the upper 60s. Daily temperatures average below 32 degrees about 120 days and above 40 degrees for about 210 days of the year.

Madison lies in the path of the frequent cyclones and anticyclones which move eastward over this area during fall, winter and spring. In summer, the cyclones have diminished intensity and tend to pass farther north. The most frequent air masses are of polar origin. Occasional outbreaks of arctic air affect this area during the winter months. Although northward moving tropical air masses contribute considerable cloudiness and precipitation, the true Gulf air mass does not reach this area in winter, and only occasionally at other seasons. Summers are pleasant, with only occasional periods of extreme heat or high humidity.

There are no dry and wet seasons, but about 60 percent of the annual precipitation falls in the five months of May through September. Cold season precipitation is lighter, but lasts longer. Soil moisture is usually adequate in the first part of the growing season. During July, August, and September, the crops depend on current rainfall, which is mostly from thunderstorms and tends to be erratic and variable. Average occurrence of thunderstorms is just under 7 days per month during this period.

March and November are the windiest months. Tornadoes are infrequent. Dane County has about one tornado in every three to five years.

The ground is covered with 1 inch or more of snow about 60 percent of the time from about December l0 to near February 25 in an average winter. The soil is usually frozen from the first of December through most of March with an average frost penetration of 25 to 30 inches. The growing season averages l75 days.

Farming is diversified with the main emphasis on dairying. Field crops are mainly corn, oats, clover, and alfalfa, but barley, wheat, rye, and tobacco are also raised. Canning factories pack peas, sweet corn, and lima beans. Fruits are mainly apples, strawberries, and raspberries.

STATION LOCATION

MADISON, WISCONSIN

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE SEA LEVEL	ELEVATION ABOVE GROUND							AUTOMATIC OBSERVING EQUIPMENT *	REMARKS
						GROUND TEMPERATURE SITE	WIND INSTRUMENTS	EXTREME THERMOMETERS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING BUCKET RAIN GAGE	WEIGHING RAIN GAGE	8 INCH RAIN GAGE	HYGROTHERMOMETER	
CITY															
Bascom Hall	1/1869	10/1878	NA	43°05'	89°24'	952									
Pickney & E. Washington	10/1878	4/1883	1 mi. E	43°05'	89°23'	920									Signal Service Station established.
North Hall	5/1883	8/1883	1 mi. W	43°05'	89°24'	938									Signal Service Station closed.
Washburn Observatory	9/1883	9/1904	0.2 mi. W	43°05'	89°24'	955		8					2		
North Hall Univ. of Wisconsin	9/1904	4/30/63	0.2 mi. E	43°05'	89°24'	938	78	70	70		62	62	62		Triple register moved to WBAS, 1/1/47.
AIRPORT															
Administration Building Truax Field Minicipal Airport + + Dane County Regional AP, effective 5/12/77	9/28/39	5/17/79	NA	43°08'	89°20'	858	38 b45 d21	27 h4	27 h4	a Unk c32	NA i3	5 g4	f3	NA e5	NA a - Added 1946. Height unknown. b - Effective 8/1952. c - Effective 3/1/53. d - Effective 10/27/59. e - Maximum temperature readings influenced toward higher readings on days with full insolation and surface winds from SW to NW prior to commissioning of hygrothermometer 1/1/60. f - Added 7/9/71. g - Effective 7/19/71. h - Moved to field site 10/27/73. i - Added 10/27/73.
4309 International Lane Dane County Regional AP	5/17/79	04/01/96	0.7 mi. NW	43°08'	89°20'	858	j21 n33	5	5	j32 m7 p7	j3 k4	j4 k4	j3 k4	j5 q5	NA j - Not moved 5/17/79. k - Moved to a site 115' E of office 5/22/79. m - Moved to a site 100' E of office 5/23/79. n - Raised 8/8/81. p - Moved 130' SE 8/26/81. q - Type change 08/03/85.
Dane County Regional AP	04/01/96	Present	NA	43°08'	89°21'	857								S	ASOS Commissioned 04/01/96

* Type
M = AMOS
T = AUTOB
S = ASOS
W = AWOS

SUBSCRIPTION:
Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801.

INQUIRIES/COMMENTS CALL: (828) 271-4800

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