

2002

LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA



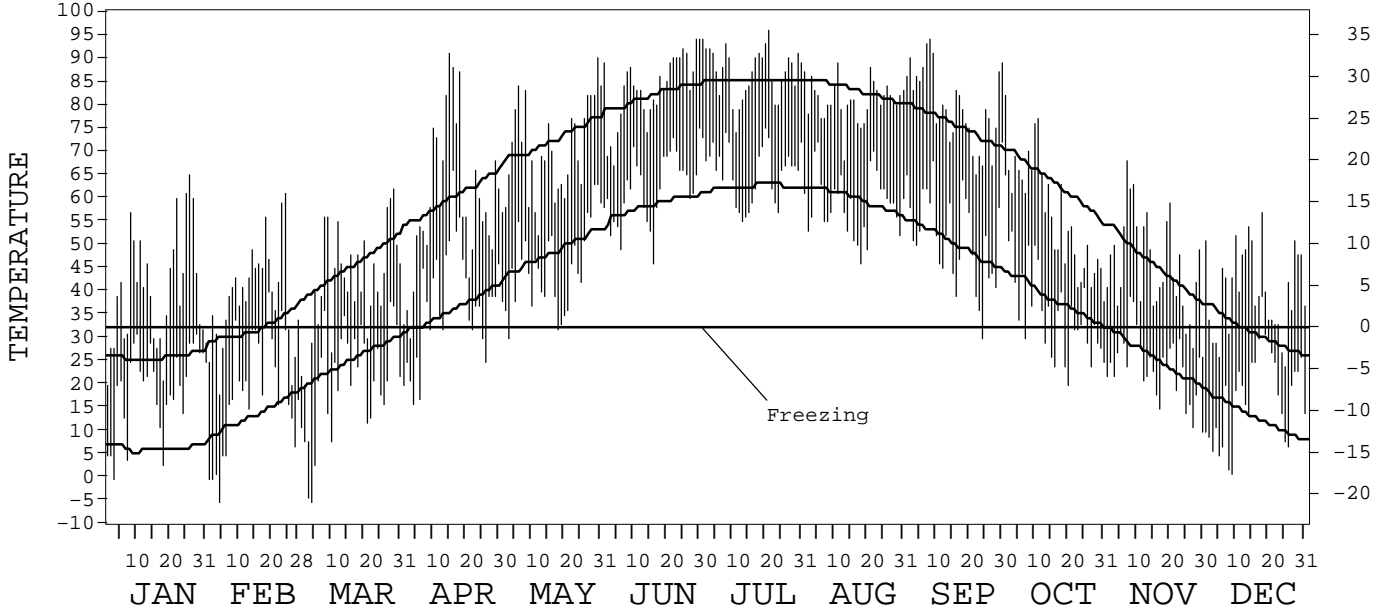
ISSN 0198-2117

WATERLOO,
IOWA (ALO)

Daily Data

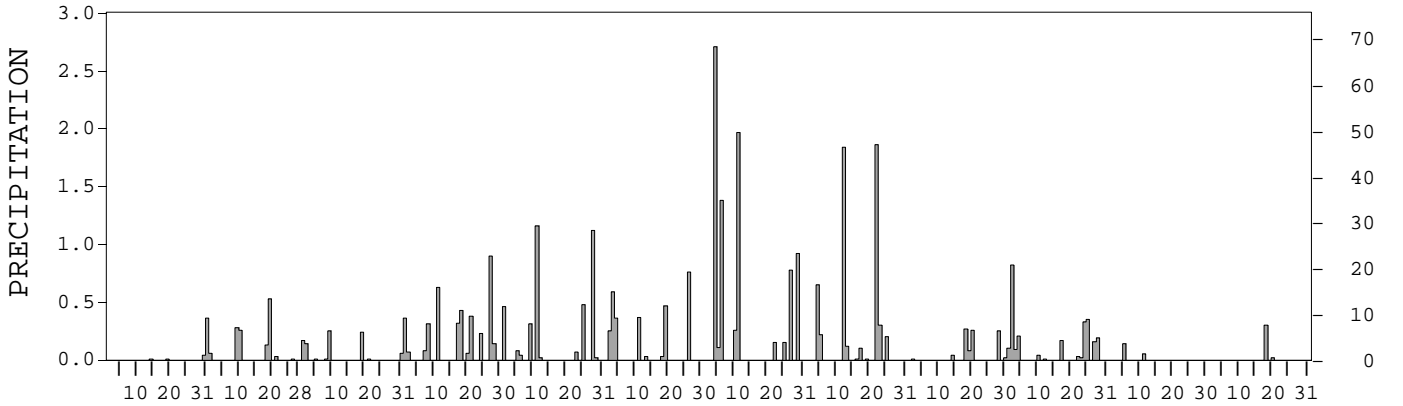
Fahrenheit

Celsius



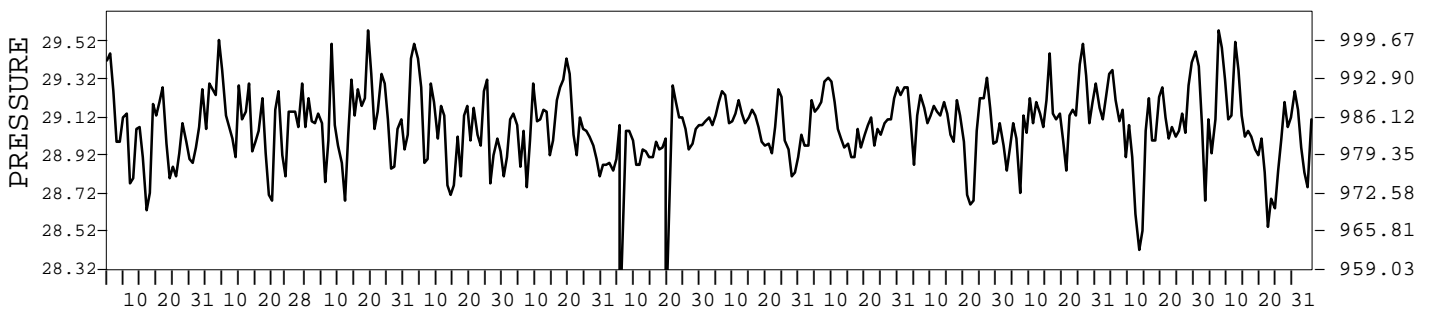
Inches

Millimeters



Inches of Mercury

Hectopascals



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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL ENVIRONMENTAL AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA

DIRECTOR NATIONAL CLIMATIC DATA CENTER

METEOROLOGICAL DATA FOR 2002

WATERLOO, IA (ALO)

LATITUDE: 42° 33' 16" N LONGITUDE: 92° 24' 04" W ELEVATION (FT.): GRND: 860 BARO: 863 TIME ZONE: CENTRAL (UTC + 6) WBAN: 94910

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	40.3	39.0	41.7	59.2	70.3	83.5	87.0	80.9	79.8	56.6	45.5	40.2	60.3	
	HIGHEST DAILY MAXIMUM	65	61	62	91	90	94	96	89	94	82	68	57	96	
	DATE OF OCCURRENCE	26	24	29	15	30	30+	21	11	08	01	07	18	JUL 21	
	MEAN DAILY MINIMUM	19.4	18.7	21.0	37.3	45.2	61.9	65.6	58.8	51.9	36.1	23.9	17.7	38.1	
	LOWEST DAILY MINIMUM	0	-5	-5	16	30	46	55	46	30	20	10	1	-5	
	DATE OF OCCURRENCE	03	04	04	04	03	16	13	18	24	20	30	09	MAR 04	
	AVERAGE DRY BULB	29.9	28.9	31.4	48.3	57.8	72.7	76.3	69.9	65.9	46.4	34.7	29.0	49.3	
	MEAN WET BULB	26.9	27.4	27.5	44.0		66.9		67.3		43.4	32.1	26.7		
	MEAN DEW POINT	21.2	23.0	20.8	38.3		63.5		65.6		39.6	26.9	21.5		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	1	1	7	13	0	4	0	0	0	0	26
	MAXIMUM ≤ 32°	11	7	6	1	0	0	0	0	0	0	3	6	6	34
	MINIMUM ≤ 32°	31	24	25	11	2	0	0	0	1	13	27	30	30	164
MINIMUM ≤ 0°	1	3	2	0	0	0	0	0	0	0	0	0	0	6	
H/C	HEATING DEGREE DAYS	1082	1003	1037	519	259	10	0	9	84	579	901	1110	6593	
	COOLING DEGREE DAYS	0	0	0	25	43	248	360	166	117	9	0	0	968	
RH	MEAN (PERCENT)	73	77	69	70	68	74	82	85	75	79	73	74	75	
	HOUR 00 LST	77	81	75	77	78	83	94	95	87	87	80	79	83	
	HOUR 06 LST	82	84	79	84	84	92	96	98	95	90	85	82	88	
	HOUR 12 LST	64	69	57	61	55	62	69	71	55	66	60	64	63	
	HOUR 18 LST	66	74	62	59	53	61	70	75	63	73	67	70	66	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	0	3	3	4	0	0	3	5	1	0	2	4	25	
	THUNDERSTORMS	0	0	0	3	3	6	7	8	3	3	0	1	34	
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.)	29.02	29.10	29.12	29.07	29.06		29.08	29.11	29.06	29.15	29.06	29.05		
	MEAN SEA-LEVEL PRESS. (IN.)	29.99	30.07	30.10	30.02	30.00			30.04		30.10	30.03	30.02		
WINDS	RESULTANT SPEED (MPH)	4.3	5.2	3.3	1.7	1.2	1.2	1.3	1.3	0.4	1.0	5.1	2.5	1.6	
	RES. DIR. (TENS OF DEGS.)	27	27	34	20	23	12	19	16	27	29	28	25	26	
	MEAN SPEED (MPH)	10.3	12.4	12.6	12.8	11.4	10.1	8.1	7.1	7.6	9.2	9.2	9.7	10.0	
	PREVAIL. DIR. (TENS OF DEGS.)	30	31	30	17	16	17	19	10	15	31	31	29	17	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	33	35	40	40	47	43	32	33	29	33	39	30	47	
	DIR. (TENS OF DEGS.)	24	32	29	32	12	17	33	25	19	19	31	11	12	
	DATE OF OCCURRENCE	25	12	09	24	11	19	21+	17	30	04	29	17+	MAY 11	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	44	43	52	47	53	49	43	43	37	52	49	38	53	
DIR. (TENS OF DEGS.)	22	30	30	31	12	16	13	25	17	21	30	11	12		
DATE OF OCCURRENCE	25	12	09	24	11	19	10	12	30	04	29	17	MAY 11		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.42	1.30	0.89	3.91	3.76	2.86	8.43	5.31	0.93	2.52	0.19	0.32	30.84	
	GREATEST 24-HOUR (IN.)	0.36	0.64	0.25	0.90	1.16	0.76	2.71	1.86	0.27	0.82	0.14	0.30	2.71	
	DATE OF OCCURRENCE	31	18-19	09	27	11	26	04	22	18	02	05	18	JUL 04	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	4	7	8	12	10	8	9	10	7	13	2	2	92	
PRECIPITATION ≥ 0.10	1	4	4	9	5	6	9	8	3	8	1	1	59		
PRECIPITATION ≥ 1.00	0	0	0	0	2	0	3	2	0	0	0	0	7		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	5.3	2.7	7.1	3.6	0.0	0.0	0.0	0.0	0.0	1.3	2.3	0.3	22.6	
	GREATEST 24-HOUR (IN.)	4.2	1.8	3.9	2.9	0.0	0.0	0.0	0.0	0.0	0.8	1.9	0.2	4.2	
	DATE OF OCCURRENCE	31	01	01	01						27-28	05	20	JAN 31	
	MAXIMUM SNOW DEPTH (IN.)	2	6	6	3	0	0	0	0	0	0	T	0	6	
	DATE OF OCCURRENCE	31	02+	02	02							11+		MAR 02	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	1	1	2	1	0	0	0	0	0	0	1	0	6		

NORMALS, MEANS, AND EXTREMES

WATERLOO, IA (ALO)

LATITUDE: 42° 33' 16" N LONGITUDE: 92° 24' 04" W ELEVATION (FT): GRND: 860 BARO: 863 TIME ZONE: CENTRAL (UTC + 6) WBAN: 94910

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	25.8	31.9	45.0	59.7	72.2	81.7	85.0	82.8	75.3	62.5	45.0	30.7	58.1
	MEAN DAILY MAXIMUM	42	24.7	30.6	43.0	58.8	71.2	80.7	84.1	81.4	73.8	61.7	44.8	30.0	57.1
	HIGHEST DAILY MAXIMUM	54	65	66	87	100	94	103	105	105	98	95	80	67	105
	YEAR OF OCCURRENCE		2002	1981	1986	1980	1967	1988	1988	1988	2000	1997	1999	2001	AUG 1988
	MEAN OF EXTREME MAXS.	42	44.8	49.9	69.2	81.3	87.8	92.9	94.8	92.9	89.3	82.0	65.5	50.6	75.1
	NORMAL DAILY MINIMUM	30	6.3	13.2	24.9	35.8	48.1	58.1	62.2	59.5	49.8	37.8	25.1	12.5	36.1
	MEAN DAILY MINIMUM	42	6.4	12.4	24.1	36.4	48.2	58.1	62.5	59.3	50.0	38.5	26.1	12.8	36.2
	LOWEST DAILY MINIMUM	54	-33	-31	-34	-4	25	38	42	38	22	11	-17	-29	-34
	YEAR OF OCCURRENCE		1994	1996	1962	1982	1971	1964	1984	1967	1967	1988	1977	2000	MAR 1962
	MEAN OF EXTREME MINS.	42	-17.0	-12.7	2.6	19.9	32.8	44.0	50.4	46.2	32.9	21.4	7.2	-11.5	18.0
	NORMAL DRY BULB	30	14.6	20.1	34.2	48.3	60.2	69.1	73.1	70.3	61.9	50.1	35.7	20.3	46.5
	MEAN DRY BULB	42	15.6	21.6	33.5	47.6	59.8	69.3	73.3	70.4	61.9	50.1	35.5	21.4	46.7
	MEAN WET BULB	18	17.7	22.5	31.7	43.0	54.0	63.3	67.7	65.7	56.9	45.1	31.0	21.4	43.3
	MEAN DEW POINT	18	13.8	18.3	26.3	36.1	47.7	58.7	64.2	62.5	52.3	39.6	26.5	17.6	38.6
NORMAL NO. DAYS WITH:															
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	0.1	0.8	3.7	6.4	4.3	1.2	0.1	0.0	0.0	16.6	
MAXIMUM ≤ 32°	30	21.4	15.5	6.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	4.2	18.0	65.9	
MINIMUM ≤ 32°	30	30.6	26.9	24.4	11.3	1.6	0.0	0.0	0.0	1.0	9.9	22.2	29.7	157.6	
MINIMUM ≤ 0°	30	12.2	7.8	1.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.4	7.1	28.5	
H/C	NORMAL HEATING DEG. DAYS	30	1532	1202	946	528	205	29	7	20	155	478	903	1343	7348
	NORMAL COOLING DEG. DAYS	30	0	0	0	7	47	168	261	198	70	7	0	0	758
RH	NORMAL (PERCENT)	30	73	74	73	66	66	68	72	74	74	70	75	77	72
	HOUR 00 LST	30	75	78	79	75	76	78	84	86	84	78	80	80	79
	HOUR 06 LST	30	76	79	81	81	81	83	87	90	89	83	83	81	83
	HOUR 12 LST	30	68	68	64	55	54	55	58	59	59	57	66	72	61
	HOUR 18 LST	30	72	71	66	56	54	54	59	61	63	62	72	76	64
S	PERCENT POSSIBLE SUNSHINE														
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	47	2.6	2.4	2.8	1.5	1.3	0.8	0.9	2.2	1.9	0.9	1.9	3.2	22.4
	THUNDERSTORMS	48	0.1	0.3	1.5	4.1	6.2	7.6	7.4	6.5	4.7	2.3	0.5	0.2	41.4
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	36	5.3	5.3	5.5	5.4	5.1	4.8	4.4	4.4	4.4	4.6	5.6	5.4	5.0
	MIDNIGHT-MIDNIGHT (OKTAS)	32	4.9	4.9	5.2	4.9	4.7	4.4	4.0	4.0	4.0	4.3	5.2	5.2	4.6
	MEAN NO. DAYS WITH:														
CLEAR	36	7.5	6.9	6.5	6.1	7.2	7.1	8.5	9.5	9.7	9.7	5.4	7.0	91.1	
PARTLY CLOUDY	36	7.1	6.4	7.0	7.6	9.5	11.0	12.0	10.7	8.0	7.6	6.7	6.0	99.6	
CLOUDY	36	16.4	14.9	17.5	16.3	14.3	11.9	10.5	10.8	12.1	13.7	17.9	17.9	174.2	
PR	MEAN STATION PRESSURE (IN)	30	29.14	29.13	29.05	29.01	29.01	29.01	29.08	29.09	29.10	29.10	29.09	29.15	29.08
	MEAN SEA-LEVEL PRES. (IN)	18	30.11	30.13	30.05	29.95	29.95	29.93	29.97	30.02	30.03	30.05	30.05	30.12	30.03
WINDS	MEAN SPEED (MPH)	30	11.2	11.0	12.0	12.3	10.8	9.4	8.1	8.0	8.6	10.0	10.8	10.8	10.2
	PREVAIL. DIR (TENS OF DEGS)	27	31	31	32	31	18	18	18	18	18	16	30	30	31
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	6	37	38	41	51	48	60	49	46	38	39	53	36	60
	DIR. (TENS OF DEGS)		27	28	24	28	31	33	05	31	19	32	22	25	33
	YEAR OF OCCURRENCE		2000	2001	2000	1997	2000	1997	1999	1998	2000	1999	1998	2001	JUN 1997
MAXIMUM 5-SECOND:															
SPEED (MPH)	6	46	46	54	61	58	72	56	56	46	52	68	46	72	
DIR. (TENS OF DEGS)		28	28	30	27	31	33	04	32	20	21	22	25	33	
YEAR OF OCCURRENCE		2000	2001	2000	1997	2000	1997	1999	1998	2000	2002	1998	2001	JUN 1997	
PRECIPITATION	NORMAL (IN)	30	0.84	1.05	2.13	3.23	4.15	4.82	4.20	4.08	2.95	2.49	2.10	1.11	33.15
	MAXIMUM MONTHLY (IN)	54	2.78	3.54	5.43	8.53	9.13	10.11	12.84	10.56	11.38	5.45	5.61	3.77	12.84
	YEAR OF OCCURRENCE		1949	1971	1961	1991	2000	1993	1999	1998	1965	1984	1992	1982	JUL 1999
	MINIMUM MONTHLY (IN)	54	0.10	0.02	0.16	0.95	0.82	0.86	0.19	0.37	0.42	T	T	0.12	T
	YEAR OF OCCURRENCE		1962	1969	1994	1971	1992	1955	1996	1955	1953	1952	1954	1998	NOV 1954
	MAXIMUM IN 24 HOURS (IN)	54	1.64	1.53	1.98	2.86	3.62	4.35	9.31	5.28	3.52	2.65	2.76	1.75	9.31
	YEAR OF OCCURRENCE		1971	1976	1998	1979	1980	1980	1968	1966	1978	1961	1991	1982	JUL 1968
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	7.4	6.8	9.3	10.6	11.1	10.4	9.6	8.8	9.1	7.8	7.7	8.2	106.8	
PRECIPITATION ≥ 1.00	30	0.1	0.2	0.3	0.6	1.1	1.2	1.4	1.1	1.0	0.5	0.4	0.1	8.0	
SNOWFALL	NORMAL (IN)	30	8.2	7.3	4.8	2.2	0.*	0.0	0.0	0.0	0.0	0.1	4.8	7.5	34.9
	MAXIMUM MONTHLY (IN)	47	24.2	24.3	20.1	10.3	1.0	T	0.0	0.0	0.0	1.3	15.9	20.1	24.3
	YEAR OF OCCURRENCE		1996	1962	1959	1973	1991	1994				2002	1991	1961	FEB 1962
	MAXIMUM IN 24 HOURS (IN)	42	14.8	9.1	12.2	6.2	1.0	T	0.0	0.0	0.0	1.2	10.2	12.3	14.8
	YEAR OF OCCURRENCE		1971	1993	1959	1973	1991	1994				1991	1991	1985	JAN 1971
	MAXIMUM SNOW DEPTH (IN)	36	19	18	20	10	0	0	0	0	0	0	11	16	20
YEAR OF OCCURRENCE		1979	1962	1962	1973							1991	1985	MAR 1962	
NORMAL NO. DAYS WITH:															
SNOWFALL ≥ 1.0	30	2.5	2.2	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.2	10.4	

PRECIPITATION (inches) 2002 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1973	1.16	1.49	3.22	3.45	7.23	3.07	3.29	2.72	6.88	0.94	2.75	2.26	38.46
1974	0.98	1.07	1.63	2.25	5.35	3.72	3.32	2.87	2.14	4.08	0.91	1.28	29.60
1975	0.92	1.14	2.35	3.24	1.93	4.00	1.06	4.53	0.80	0.04	3.68	0.40	24.09
1976	0.18	2.16	3.14	4.66	2.21	2.83	2.83	0.68	1.36	1.75	0.06	0.46	22.32
1977	0.37	0.68	3.04	2.26	1.47	4.11	3.93	5.45	6.09	2.94	1.89	1.73	33.96
1978	0.51	0.45	0.50	4.75	2.69	5.70	3.74	3.60	7.91	1.02	3.70	0.79	35.36
1979	1.41	0.32	3.06	4.37	3.83	6.07	6.68	5.33	0.75	4.18	1.41	0.71	38.12
1980	1.34	0.96	0.86	1.22	5.36	8.63	1.75	5.38	3.74	1.56	0.41	0.52	31.73
1981	0.23	2.44	0.25	4.20	2.05	5.23	3.52	4.13	3.13	1.76	1.86	0.83	29.63
1982	1.51	0.38	2.51	2.58	6.66	3.25	3.90	3.29	1.44	2.69	3.08	3.77	35.06
1983	0.84	1.44	3.80	2.43	5.28	5.31	3.89	1.30	3.19	4.35	3.67	1.03	36.53
1984	0.62	0.86	1.40	5.09	4.77	4.87	6.04	0.38	1.57	5.45	1.45	1.95	34.45
1985	0.61	1.23	2.86	1.45	2.32	2.72	3.38	4.22	5.27	3.09	1.78	1.25	30.18
1986	0.40	2.41	1.77	2.57	6.33	7.40	3.24	2.27	4.48	3.74	1.27	0.82	36.70
1987	0.47	0.91	2.48	1.44	2.93	2.66	5.59	8.51	1.84	0.81	2.69	1.82	32.15
1988	0.75	0.37	1.37	1.72	1.61	3.12	1.51	3.15	1.65	0.68	2.54	0.52	18.99
1989	1.09	0.28	0.93	2.41	1.54	1.40	2.67	2.33	3.07	3.13	0.55	0.22	19.62
1990	0.46	0.37	4.46	2.88	5.06	7.98	9.63	5.22	1.46	1.38	1.34	1.26	41.50
1991	0.76	0.33	4.00	8.53	7.72	2.18	1.60	4.88	2.92	4.61	4.08	1.54	43.15
1992	1.06	1.47	2.27	4.55	0.82	1.93	5.87	2.84	2.23	0.72	5.61	1.60	30.97
1993	0.58	1.30	4.00	3.67	6.11	10.11	11.26	9.65	2.86	1.80	0.97	0.76	53.07
1994	1.22	0.94	0.16	2.58	2.17	5.35	6.11	7.56	3.67	1.89	2.30	1.35	35.30
1995	0.80	0.12	2.68	4.41	3.15	4.99	1.83	4.97	2.44	2.39	1.57	0.16	29.51
1996	2.19	0.08	0.99	1.55	2.26	4.42	2.38	1.77	3.50	3.51	2.66	0.88	26.19
1997	0.80	1.12	1.56	3.62	2.68	5.92	1.99	4.63	3.15	4.12	1.03	0.52	31.14
1998	0.43	1.58	3.77	3.25	3.09	8.77	0.33	10.56	1.18	4.51	1.24	0.12	38.83
1999	0.66	0.35	0.64	4.72	6.67	4.27	12.84	4.32	0.87	0.34	1.20	0.39	37.27
2000	0.69	0.58	0.95	2.76	9.13	7.07	3.40	1.58	1.59	1.10	2.52	0.75	32.12
2001	1.01	1.00	1.25	2.15	5.44	3.91	5.96	2.44	3.75	3.45	0.78	0.88	32.02
2002	0.42	1.30	0.89	3.91	3.76	2.86	8.43	5.31	0.93	2.52	0.19	0.32	30.84
POR= 106 YRS	0.99	1.02	2.04	2.99	4.06	4.52	4.24	3.76	3.61	2.35	1.78	1.07	32.43

WBAN : 94910

AVERAGE TEMPERATURE (°F) 2002 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1973	18.8	24.4	41.8	45.2	56.5	71.3	73.5	73.8	61.8	55.0	37.2	20.3	48.3
1974	17.2	21.2	32.9	49.4	56.0	66.5	75.5	68.3	58.0	51.3	36.7	24.4	46.5
1975	18.5	19.3	24.9	42.8	63.1	71.0	73.9	72.9	57.1	52.2	39.1	25.3	46.7
1976	16.6	30.1	35.9	50.5	56.6	68.8	73.8	69.6	60.7	43.6	26.6	12.7	45.5
1977	-1	23.3	40.1	51.7	65.5	68.9	74.3	65.9	60.7	46.0	34.0	16.8	45.6
1978	2.7	7.4	28.2	46.9	60.1	70.1	72.2	71.5	67.1	49.7	34.3	19.5	44.1
1979	3.6	9.4	31.8	44.4	58.2	69.3	72.3	71.8	66.1	51.2	35.6	28.3	45.2
1980	19.0	16.8	30.3	49.1	59.8	69.0	75.6	73.1	63.3	46.2	37.5	22.2	46.8
1981	19.3	25.4	38.5	52.8	57.8	68.5	72.5	69.1	60.7	46.3	39.2	19.6	47.5
1982	3.6	18.1	32.3	42.7	64.4	64.0	74.6	70.3	61.6	51.4	34.9	29.9	45.7
1983	24.1	27.8	36.3	43.4	55.9	69.7	77.0	77.4	63.0	49.4	37.2	6.6	47.3
1984	16.1	30.4	26.4	46.6	57.8	70.1	70.3	72.4	60.3	52.2	37.0	24.0	47.0
1985	12.6	17.7	39.2	53.8	63.3	66.3	73.3	67.6	63.2	50.3	28.1	8.9	45.4
1986	19.4	16.9	38.2	51.9	60.4	70.1	75.1	66.5	63.9	50.3	29.0	24.3	47.2
1987	21.5	32.1	39.2	51.8	64.9	73.3	77.0	69.9	62.3	45.1	40.9	27.0	50.4
1988	13.2	16.7	36.2	47.8	65.1	73.0	75.9	76.4	64.7	44.2	36.7	23.4	47.8
1989	27.2	12.8	32.2	46.8	58.3	68.7	76.0	71.6	59.7	51.8	31.7	13.1	45.8
1990	29.2	26.8	39.5	47.7	56.1	69.8	71.8	71.7	64.8	48.9	40.4	18.2	48.7
1991	11.9	25.8	38.0	50.2	63.7	74.1	73.8	71.6	60.6	49.0	28.8	26.2	47.8
1992	25.2	31.1	37.4	46.3	60.6	68.3	67.9	65.0	60.5	50.8	33.7	23.5	47.5
1993	18.3	19.8	30.5	45.9	61.0	68.5	73.2	72.4	58.2	50.1	34.1	25.3	46.4
1994	7.4	15.0	36.6	49.3	61.5	71.8	70.6	67.5	65.9	53.9	40.1	26.3	47.2
1995	17.9	23.2	37.6	44.7	58.4	71.4	74.3	77.4	60.7	49.8	29.7	23.6	47.4
1996	15.0	21.2	30.2	45.1	56.5	70.7	71.0	70.5	62.6	50.8	27.9	18.5	45.0
1997	13.7	23.3	35.6	44.4	54.7	70.7	72.4	68.6	63.1	51.6	31.2	26.7	46.3
1998	22.6	34.5	33.7	49.9	65.5	67.6	72.7	71.9	67.0	52.0	39.8	28.5	50.5
1999	15.1	32.7	35.8	50.2	61.7	70.0	76.9	69.1	61.5	50.5	42.8	25.9	49.4
2000	20.3	30.9	42.5	49.3	62.7	67.9	71.8	71.7	64.3	54.3	32.5	8.6	48.1
2001	18.5	17.0	28.6	52.6	60.9	68.4	74.1	71.7	60.4	49.4	48.0	30.3	48.3
2002	29.9	28.9	31.4	48.3	57.8	72.7	76.3	69.9	65.9	46.4	34.7	29.0	49.3
POR= 106 YRS	17.3	21.7	33.9	48.0	59.9	69.3	73.1	71.4	62.9	51.3	36.0	22.6	47.3

HEATING DEGREE DAYS (base 65°F) 2002 WATERLOO, IA (ALO)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1973-74	0	1	149	313	827	1380	1480	1218	985	469	296	52	7170
1974-75	0	27	239	420	842	1251	1435	1277	1238	662	139	28	7558
1975-76	21	1	262	411	770	1224	1495	1005	897	441	263	14	6804
1976-77	2	26	178	664	1142	1615	2017	1162	764	399	86	22	8077
1977-78	2	56	144	584	923	1490	1932	1610	1133	539	224	23	8660
1978-79	2	9	78	468	914	1404	1903	1547	1024	613	238	20	8220
1979-80	2	13	70	431	875	1131	1418	1394	1067	493	203	24	7121
1980-81	0	3	124	578	819	1323	1408	1104	814	368	234	9	6784
1981-82	10	26	152	573	767	1400	1903	1311	1006	661	97	60	7966
1982-83	0	29	166	421	895	1079	1263	1033	885	646	277	35	6729
1983-84	0	0	159	488	826	1811	1509	1000	1190	548	236	4	7771
1984-85	12	10	215	392	833	1264	1621	1320	794	372	109	53	6995
1985-86	0	19	192	448	1105	1738	1410	1344	826	406	160	11	7659
1986-87	0	43	97	448	1070	1255	1342	915	792	403	105	7	6477
1987-88	1	42	109	609	718	1173	1602	1400	887	511	85	14	7151
1988-89	2	18	81	638	843	1281	1163	1459	1009	542	236	39	7311
1989-90	0	8	189	413	994	1604	1105	1063	786	540	273	37	7012
1990-91	5	4	133	500	730	1447	1642	1094	833	449	158	4	6999
1991-92	2	6	217	488	1078	1192	1228	977	848	554	183	33	6806
1992-93	23	75	178	441	934	1278	1442	1260	1060	567	167	50	7475
1993-94	0	3	212	472	919	1223	1784	1398	874	484	159	13	7541
1994-95	2	38	87	338	742	1193	1453	1162	845	603	204	24	6691
1995-96	7	0	180	473	1051	1280	1547	1266	1075	590	290	29	7788
1996-97	2	0	141	437	1106	1433	1585	1161	906	614	317	3	7705
1997-98	17	11	95	465	1005	1182	1309	849	966	446	72	73	6490
1998-99	0	1	55	398	746	1123	1541	897	897	436	139	32	6265
1999-00	0	7	162	451	660	1207	1380	984	692	463	127	35	6168
2000-01	6	3	138	339	969	1742	1433	1335	1123	379	177	58	7702
2001-02	6	9	168	477	505	1068	1082	1003	1037	519	259	10	6143
2002-	0	9	84	579	901	1110							

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COOLING DEGREE DAYS (base 65°F) 2002 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1973	0	0	0	0	8	197	268	283	60	12	0	0	828
1974	0	0	0	9	23	105	331	136	38	0	0	0	642
1975	0	0	0	0	86	215	304	253	30	21	0	0	909
1976	0	0	0	10	10	131	282	175	55	5	0	0	668
1977	0	0	0	9	107	145	297	92	23	0	0	0	673
1978	0	0	0	0	79	179	230	216	149	0	0	0	853
1979	0	0	0	0	35	153	237	230	106	9	0	0	770
1980	0	0	0	24	50	151	337	262	76	0	0	0	900
1981	0	0	0	8	19	120	252	158	27	0	0	0	584
1982	0	0	0	0	87	37	307	199	73	8	0	0	711
1983	0	0	0	4	3	182	380	390	106	11	0	0	1076
1984	0	0	0	3	20	164	183	246	80	0	0	0	696
1985	0	0	0	41	61	100	264	106	146	0	0	0	718
1986	0	0	3	18	26	171	321	97	69	0	0	0	705
1987	0	0	0	14	109	260	382	200	38	0	0	0	1003
1988	0	0	0	0	96	262	347	378	78	0	0	0	1161
1989	0	0	1	3	38	154	349	221	37	10	0	0	813
1990	0	0	0	27	6	186	223	218	132	9	0	0	801
1991	0	0	3	12	125	285	285	219	93	1	0	0	1023
1992	0	0	0	2	53	136	121	81	50	7	0	0	450
1993	0	0	0	0	48	164	262	240	16	18	0	0	748
1994	0	0	0	21	56	223	184	122	123	3	0	0	732
1995	0	0	0	0	10	219	302	389	57	9	0	0	986
1996	0	0	0	0	34	207	194	176	76	2	0	0	689
1997	0	0	0	0	6	182	253	130	45	58	0	0	674
1998	0	0	0	0	96	159	247	221	123	2	0	0	848
1999	0	0	0	0	42	187	376	139	63	8	0	0	815
2000	0	0	2	0	63	131	226	219	122	12	2	0	777
2001	0	0	0	15	58	166	292	225	37	0	0	0	793
2002	0	0	0	25	43	248	360	166	117	9	0	0	968

SNOWFALL (inches) 2002 WATERLOO, IA (ALO)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1973-74	0.0	0.0	0.0	0.0	T	8.4	4.3	8.3	3.1	0.6	0.0	0.0	24.7
1974-75	0.0	0.0	0.0	0.0	4.1	5.3	7.0	12.5	10.5	6.6	0.0	0.0	46.0
1975-76	0.0	0.0	0.0	0.0	4.9	T	1.7	7.2	1.4	T	T	0.0	15.2
1976-77	0.0	0.0	0.0	0.1	0.7	5.3	4.9	1.8	3.1	1.5	0.0	0.0	17.4
1977-78	0.0	0.0	0.0	0.0	11.2	16.9	5.9	6.4	4.6	0.4	0.0	0.0	45.4
1978-79	0.0	0.0	0.0	0.0	9.1	8.1	17.2	2.9	4.3	4.7	0.0	0.0	46.3
1979-80	0.0	0.0	0.0	T	2.5	0.2	6.2	10.5	7.9	0.9	0.0	0.0	28.2
1980-81	0.0	0.0	0.0	T	T	3.7	3.9	14.3	T	T	0.0	0.0	21.9
1981-82	0.0	0.0	0.0	T	3.3	5.2	18.1	1.9	3.9	7.5	0.0	0.0	39.9
1982-83	0.0	0.0	0.0	1.2	0.1	3.4	4.0	15.9	9.2	5.1	0.0	0.0	38.9
1983-84	0.0	0.0	0.0	T	3.2	12.5	8.8	2.1	16.1	1.8	0.0	0.0	44.5
1984-85	0.0	0.0	0.0	0.0	0.3	8.7	10.1	4.4	7.3	0.3	0.0	0.0	31.1
1985-86	0.0	0.0	0.0	0.0	6.6	14.5	5.1	11.7	T	2.2	0.0	0.0	40.1
1986-87	0.0	0.0	0.0	0.0	12.9	4.6	4.5	1.5	6.1	T	0.0	0.0	29.6
1987-88	0.0	0.0	0.0	T	0.5	12.8	6.1	4.8	0.8	T	0.0	0.0	25.0
1988-89	0.0	0.0	0.0	T	3.7	1.3	0.2	5.0	4.8	T	T	T	15.0
1989-90	0.0	0.0	0.0	0.4	1.1	5.4	4.9	5.2	T	T	0.0	T	17.0
1990-91	0.0	0.0	0.0	T	2.0	15.2	9.8	1.8	4.3	0.7	1.0	0.0	34.8
1991-92	0.0	0.0	0.0	1.2	15.9	4.5	7.1	6.6	2.8	0.3	0.0	T	38.4
1992-93	0.0	0.0	0.0	T	9.1	6.5	8.2	13.6	13.1	7.1	T	T	57.6
1993-94	0.0	0.0	0.0	T	1.5	5.5	16.7	15.8	T	1.0	0.0	T	40.5
1994-95	0.0	0.0	0.0	0.0	0.1	15.3	7.4	0.9	7.3	0.5	0.0	0.0	31.5
1995-96	0.0	0.0	0.0	T	5.0	3.7	24.2	1.2	2.1	1.6	0.0	0.0	37.8
1996-97	0.0	0.0	0.0	T	3.1	11.0	11.0	15.8	T	3.2	0.0	0.0	44.1
1997-98	0.0	0.0	0.0	5.5	7.0	6.3	7.5	3.3	12.8	T	0.0	0.0	42.4
1998-99	0.0	0.0	0.0	0.0	2.1	2.4	21.1	0.4	5.4	0.0	0.0	0.0	31.4
1999-00	0.0	0.0	0.0	T	T	8.2	10.9	12.0	5.2	1.1	0.0	0.0	37.4
2000-01	0.0	0.0	0.0	0.0	0.6	34.0	3.1	5.2	3.7	T	0.0	0.0	46.6
2001-02	0.0	0.0	0.0	0.0	T	0.8	5.3	2.7	7.1	3.6	0.0	0.0	19.5
2002-	0.0	0.0	0.0	1.3	2.3	0.3							
POR= 43 YRS	0.0	0.0	0.0	0.1	3.5	6.9	7.2	6.2	5.7	1.6	0.1	T	31.3

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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 EIGHTS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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2002 WATERLOO, IOWA (ALO)

Waterloo is situated on the banks of the Cedar River in northeast Iowa, and has a continental humid climate. A wide variation is experienced in both temperature and precipitation during the four distinct seasons.

The distribution of precipitation through the year is very favorable for agriculture with an average 72 percent of the annual total falling in the April to September crop season. The annual temperature range is large. January, the coldest month, averages near 14 degrees and July, the warmest month, averages about 73 degrees. Extreme temperatures range from about -35 to 112 degrees.

It is sometimes convenient to divide the year into periods corresponding to the growing season of the area. Winter extends from November through March, based on a mean daily temperature of 40 degrees. The winter period is a season of cold, dry weather occasionally broken by storms of short duration. Precipitation during the winter is mainly snow with rain dominant at the beginning and end of the season. Annual snowfall varies considerably from year to year. Temperatures of zero degrees or below occur on average about 29 days per year. Bitterly cold days with high temperatures of zero degrees or lower average about 3 days per year. During the winter, prevailing winds are from the northwest.

The spring growing season is marked by an increase in both frequency and intensity of rainfall and by a rapid increase in the mean daily temperature. Spring extends from the first of April to mid May, when daily mean temperatures range between 40 and 59 degrees.

The summer growing season extends from mid May to mid September, based on a mean daily temperature of 60 degrees. Precipitation increases during the spring and reaches a maximum monthly amount in July. In summer, precipitation falls mainly from thunderstorms, three-fourths of which occur during the summer growing season. The prevailing summer wind is southerly, supplying moisture from the Gulf of Mexico. Daily temperatures reach their highest level in July or early August.

The fall growing season extends from mid September to the first part of November, by which time the mean daily temperature has fallen to 40 degrees. Precipitation declines and frequent periods of warm days, cool nights, and cloudless, but hazy, skies persist.

STATION LOCATION

WATERLOO, IOWA

LOCATION	Occupied From	Occupied To	Airline Distances and Directions from previous Location	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										AUTOMATED OBSERVING EQUIPMENT *	* TYPE M = AMOS T = AUTOB S = ASOS W = AWOS REMARKS
						SEA LEVEL		GROUND									
						GROUND	TEMPERATURE	WIND INSTRUMENT	EXTREME THERMOMETERS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING GAUGE	RAINING GAUGE	8 INCH RAIN GAGE	HYGROMETER		
*NOTES:																	
<u>AIRPORT</u>																	
Administration Building Waterloo Municipal AP	1/29/48	10/17/55	4 mi. NW	42°33'	92°24'	867		27	4					4	a	SAWRS.	
Administration Building Waterloo Municipal AP	10/18/55	10/1/81	NA	42°33'	92°24'	b868	20	4	4	NA	NA	5	4	a5	NA	Weather Bureau First Order Station. a. Telepsychrometer (4') 1/29/48-12/1/59. Hygro. comm. 2000' NW of tele. site 12/1/59. b. 867 feet to 12/1/59.	
Municipal Airport	10/1/81	04/01/96	220 ft. SW	42°33'	92°24'	868	c20	4	NA	NA	NA	5	5	c5 d5	NA	c. Not moved 10/1/81. d. Type change 10/2/85.	
L.B. Municipal Airport	04/01/96	Present	NA	42°33'	92°24'	e860									S	ASOS Commissioned 04/01/96 e. Ground Elevation	

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* NOTES: For earlier station history information see previous edition.