

1998

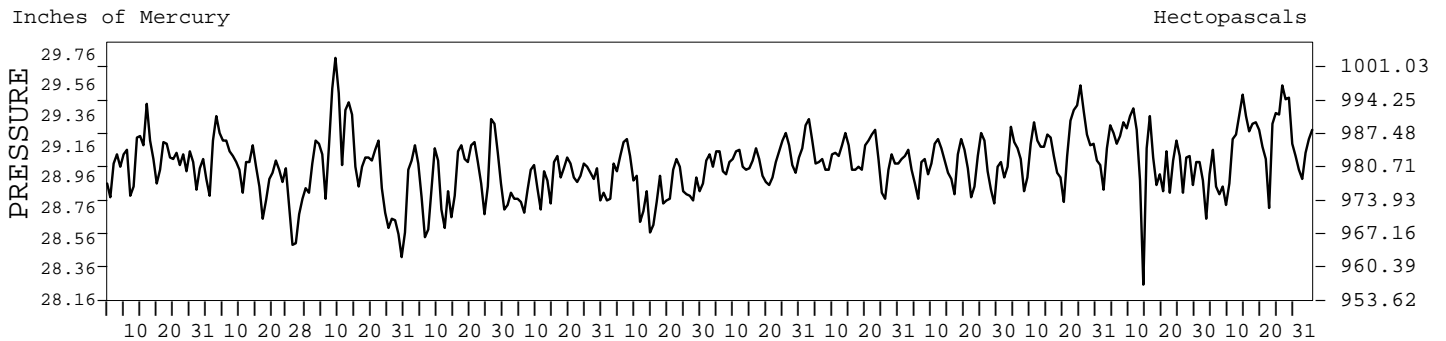
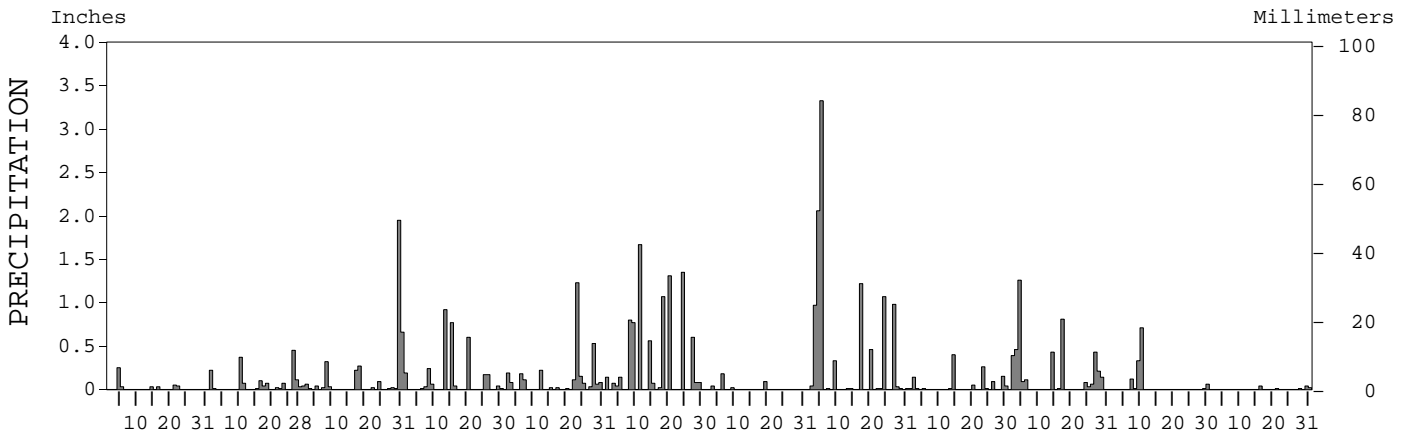
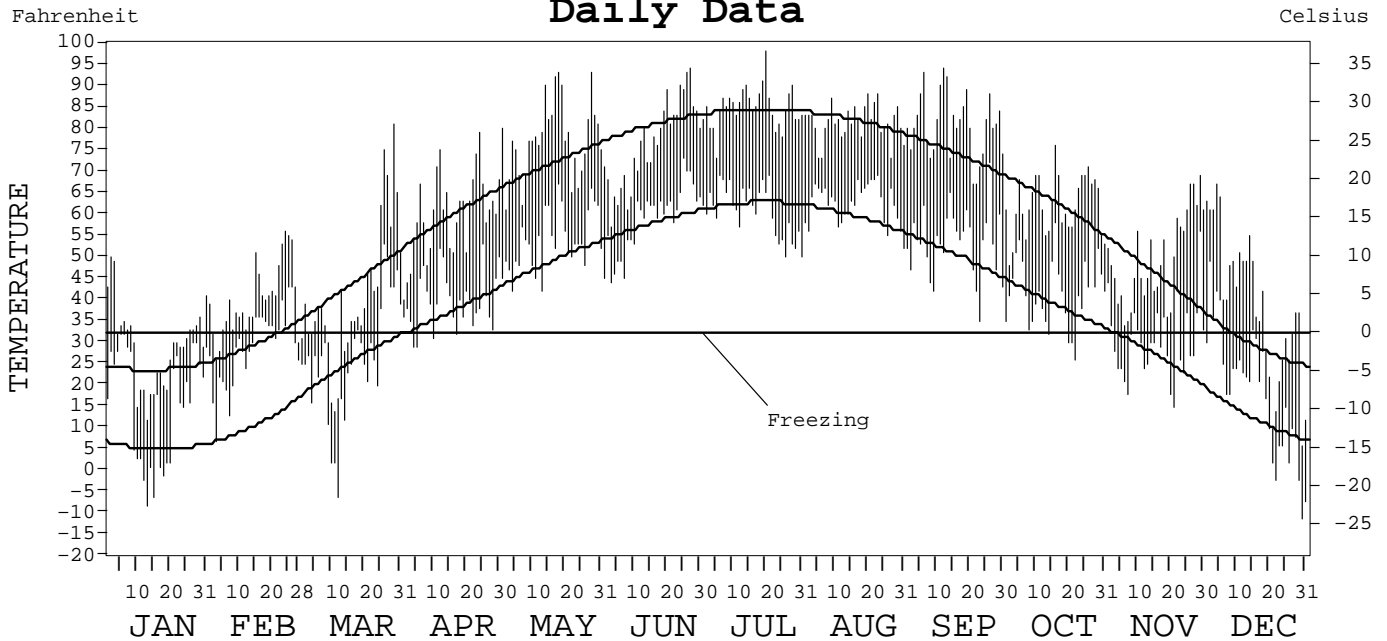
LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-2125

WATERLOO,
IOWA (ALO)

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

METEOROLOGICAL DATA FOR 1998

WATERLOO, IA (ALO)

LATITUDE: 42° 33' 16" N LONGITUDE: 92° 24' 04" W ELEVATION (FT): GRND: 868 BARO: 872 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	29.3	40.1	41.0	60.0	77.3	76.5	84.7	81.3	80.7	62.0	49.5	38.8	60.1	
	HIGHEST DAILY MAXIMUM	50	56	81	79	93	94	98	88	94	76	69	67	98	
	DATE OF OCCURRENCE	02	24	29	24	28+	27	20	23+	12	16	29	04	JUL 20	
	MEAN DAILY MINIMUM	15.9	28.8	26.3	39.7	53.6	58.7	60.7	62.4	53.3	41.9	30.1	18.2	40.8	
	LOWEST DAILY MINIMUM	-8	7	-6	29	42	44	50	52	35	26	15	-11	-11	
	DATE OF OCCURRENCE	13	03	12	05+	13+	03	31+	31	23	22	21	30	DEC 30	
	AVERAGE DRY BULB	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	
	MEAN WET BULB	22.4	32.7	32.4	44.8	59.0	64.0		67.6	60.6	48.6	36.6	26.0		
	MEAN DEW POINT	19.6	30.4	29.1	39.3	54.0	61.5		65.2	56.0	44.9	32.1	20.4		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	5	3	4	0	4	0	0	0	16	
	MAXIMUM ≤ 32°	19	4	9	0	0	0	0	0	0	0	0	11	43	
	MINIMUM ≤ 32°	31	17	23	4	0	0	0	0	0	4	19	26	124	
MINIMUM ≤ 0°	4	0	1	0	0	0	0	0	0	0	0	4	9		
H/C	HEATING DEGREE DAYS	1309	849	966	446	72	73	0	1	55	398	746	1123	6038	
	COOLING DEGREE DAYS	0	0	0	0	96	159	247	221	123	2	0	0	848	
RH	MEAN (PERCENT)	85	86	83	70	70	82	77	82	71	78	76	72	78	
	HOUR 06 LST	88	90	87	85	86	92	93	93	92	92	83	79	88	
	HOUR 12 LST	82	83	76	58	58	71	62	68	51	64	66	64	67	
	HOUR 18 LST	84	83	80	59	55	73	63	73	57	72	73	69	70	
	HOUR 24 LST	86	88	86	77	80	91	90	92	85	88	80	77	85	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	6	2	3	0	1	2	2	6	5	2	1	4	34	
	THUNDERSTORMS	0	0	2	4	9	10	2	8	6	4	1	0	46	
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.)	29.07	28.98	29.04	28.96	28.93	28.90	29.08	29.09	29.03	29.16	29.06	29.19	29.04	
	MEAN SEA-LEVEL PRESS. (IN.)	30.05	29.94	30.01	29.91	29.85	29.83		30.02	29.96	30.11	30.02	30.16		
WINDS	RESULTANT SPEED (MPH)	0.9	1.0	2.6	3.9	1.9	2.2	0.2	2.2	1.4	2.7	2.2	4.4	0.6	
	RES. DIR. (TENS OF DEGS.)	34	07	36	08	12	18	22	13	18	16	23	26	16	
	MEAN SPEED (MPH)	8.6	8.7	12.1	11.2	9.8	8.5	5.9	6.5	6.9	9.1	10.6	9.5	8.9	
	PREVAIL. DIR. (TENS OF DEGS.)	30	31	30	07	17	12	17	17	17	12	16	32	17	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	26	32	39	39	40	37	34	46	26	31	53	34	53	
	DIR. (TENS OF DEGS.)	10	12	35	17	32	27	25	31	22	18	22	33	22	
	DATE OF OCCURRENCE	20	25	09+	12	28+	27	19	24	26	17	10	29	NOV 10	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	32	39	46	48	48	46	43	56	31	40	68	41	68	
DIR. (TENS OF DEGS.)	10	10	35	17	32	27	25	32	35	18	22	32	22		
DATE OF OCCURRENCE	20	25	09	12	28	27	19	24	30+	17	10	29	NOV 10		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	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	
	GREATEST 24-HOUR (IN.)	0.25	0.56	1.98	0.92	1.29	1.67	0.18	3.33	0.41	1.35	0.95	0.06	3.33	
	DATE OF OCCURRENCE	04	26-27	30-31	13	23-24	11	06	05	13-14	04-05	09-10	30-31	AUG 05	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	6	14	16	13	16	16	4	17	12	14	6	5	139	
PRECIPITATION ≥ 0.10	1	5	5	7	8	10	1	8	4	9	3	0	61		
PRECIPITATION ≥ 1.00	0	0	1	0	1	4	0	4	0	1	0	0	11		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)														
	GREATEST 24-HOUR (IN.)														
	DATE OF OCCURRENCE														
	MAXIMUM SNOW DEPTH (IN.)														
	DATE OF OCCURRENCE														
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0															

NORMALS, MEANS, AND EXTREMES

WATERLOO, IA (ALO)

LATITUDE: 42° 33' 16" N LONGITUDE: 92° 24' 04" W ELEVATION (FT): GRND: 868 BARO: 872 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	23.7	29.4	43.3	59.3	71.6	80.5	83.9	81.5	73.7	61.8	45.2	28.9	56.9
	MEAN DAILY MAXIMUM	38	24.1	30.0	42.8	58.6	71.1	80.6	84.0	81.5	73.5	61.6	44.2	29.7	56.8
	HIGHEST DAILY MAXIMUM	50	58	66	87	100	94	103	105	105	98	95	79	67	105
	YEAR OF OCCURRENCE		1981	1981	1986	1980	1967	1988	1988	1988	1955	1997	1950	1998	AUG 1988
	MEAN OF EXTREME MAXS.	38	44.4	49.2	69.6	81.1	87.6	92.9	94.9	92.9	89.0	81.8	64.4	50.2	74.8
	NORMAL DAILY MINIMUM	30	5.4	10.6	25.0	37.1	48.7	57.6	62.2	59.0	50.0	38.4	26.2	11.7	36.0
	MEAN DAILY MINIMUM	38	5.9	11.8	24.1	36.2	48.0	57.9	62.3	59.3	50.1	38.6	25.9	12.7	36.1
	LOWEST DAILY MINIMUM	50	-33	-31	-34	-4	25	38	42	38	22	11	-17	-27	-34
	YEAR OF OCCURRENCE		1994	1996	1962	1982	1971	1964	1984	1967	1967	1988	1977	1963	MAR 1962
	MEAN OF EXTREME MINS.	38	-17.5	-14.0	2.1	19.6	32.5	44.1	50.3	45.9	33.0	21.5	6.7	-11.7	17.7
	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	38	15.0	21.0	33.3	47.4	59.6	69.2	73.1	70.4	61.7	50.1	35.1	21.2	46.4
	MEAN WET BULB	15	17.2	21.7	31.9	42.7	53.7	63.2	67.7	65.5	57.1	45.1	29.6	21.4	43.1
	MEAN DEW POINT	15	13.3	17.4	26.7	35.8	47.2	58.3	64.2	62.1	52.7	39.7	25.5	17.7	38.4
	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	1562	1257	955	501	203	27	10	29	127	470	879	1386	7406
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	55	150	261	194	34	8	0	0	702
RH	NORMAL (PERCENT)	30	73	74	73	66	66	68	72	74	74	70	75	77	72
	HOUR 06 LST	30	75	78	79	75	76	78	84	86	84	78	80	80	79
	HOUR 12 LST	30	76	79	81	81	81	83	87	90	89	83	83	81	83
	HOUR 18 LST	30	68	68	64	55	54	55	58	59	59	57	66	72	61
	HOUR 24 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)	43	2.5	2.2	2.8	1.4	1.3	0.7	0.9	1.9	1.8	0.9	1.9	3.2	21.5
	THUNDERSTORMS	44	0.1	0.3	1.5	4.0	6.3	7.6	7.2	6.6	4.7	2.3	0.5	0.2	41.3
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)	26	29.14	29.13	29.05	29.01	29.01	29.01	29.08	29.09	29.10	29.10	29.09	29.14	29.08
	MEAN SEA-LEVEL PRES. (IN)	15	30.12	30.13	30.04	29.95	29.96	29.93	29.97	30.02	30.03	30.04	30.05	30.12	30.03
WINDS	MEAN SPEED (MPH)	26	11.4	11.0	12.3	12.3	10.8	9.4	8.1	8.0	8.7	10.0	11.0	10.9	10.3
	PREVAIL. DIR (TENS OF DEGS)	23	31	31	31	31	18	18	18	18	18	16	30	31	31
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	2	37	32	39	51	44	60	34	46	33	34	53	34	60
	DIR. (TENS OF DEGS)		31	12	35	28	32	33	01	31	28	16	22	33	33
	YEAR OF OCCURRENCE		1997	1998	1998	1997	1997	1997	1997	1998	1997	1997	1998	1998	JUN 1997
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	2	45	39	46	61	52	72	43	56	44	44	68	41	72
DIR. (TENS OF DEGS)		31	10	35	27	31	33	25	32	29	17	22	32	33	
YEAR OF OCCURRENCE		1997	1998	1998	1997	1997	1997	1998	1998	1997	1997	1998	1998	JUN 1997	
PRECIPITATION	NORMAL (IN)	30	0.80	1.08	2.30	3.30	4.08	4.47	4.83	3.64	3.51	2.57	1.82	1.30	33.70
	MAXIMUM MONTHLY (IN)	50	2.78	3.54	5.43	8.53	7.72	10.11	12.60	10.56	11.38	5.45	5.61	3.77	12.60
	YEAR OF OCCURRENCE		1949	1971	1961	1991	1991	1993	1968	1998	1965	1984	1992	1982	JUL 1968
	MINIMUM MONTHLY (IN)	50	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)	50	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	6.3	6.9	5.7	1.7	0.*	0.0	0.0	0.0	0.1	3.2	7.8	31.7	
	MAXIMUM MONTHLY (IN)	46	24.2	24.3	20.1	10.3	1.0	T	0.0	0.0	0.0	1.2	15.9	20.1	24.3
	YEAR OF OCCURRENCE		1996	1962	1959	1973	1991	1994			1991	1991	1961	1961	FEB 1962
	MAXIMUM IN 24 HOURS (IN)	41	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	1991	1985	JAN 1971
	MAXIMUM SNOW DEPTH (IN)	35	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	1.9	2.2	2.1	0.5	0.0	0.0	0.0	0.0	0.0	0.*	0.9	2.5	10.1	

PRECIPITATION (inches) 1998 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	1.56	0.02	0.99	4.47	6.76	4.82	8.90	0.54	1.35	3.04	0.12	1.95	34.52
1970	0.18	0.42	2.48	1.21	7.24	2.16	4.13	0.99	5.20	3.50	1.41	1.13	30.05
1971	1.76	3.54	1.36	0.95	5.51	3.14	3.14	0.43	2.56	2.43	2.76	1.78	29.36
1972	0.26	1.13	1.78	3.29	3.35	4.33	5.29	3.71	4.86	3.77	1.98	1.84	35.59
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
POR= 102 YRS	0.98	1.02	2.07	2.96	3.96	4.51	4.10	3.76	3.67	2.35	1.79	1.08	32.25

WBAN : 94910

AVERAGE TEMPERATURE (°F) 1998 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	12.9	22.0	26.1	48.5	59.0	61.9	72.6	70.6	61.1	45.9	33.6	17.3	44.3
1970	5.2	17.4	29.1	47.9	61.6	69.6	72.5	70.0	61.8	49.9	34.7	19.4	44.9
1971	7.7	16.2	29.6	46.5	53.5	71.6	66.4	66.7	63.4	54.9	34.7	23.9	44.6
1972	10.2	11.9	30.8	44.3	60.8	67.2	70.2	71.1	61.2	46.4	33.2	16.1	43.6
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	9.7	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
POR= 102 YRS	17.2	21.4	33.8	48.0	59.9	69.3	73.1	71.4	62.9	51.3	35.8	22.5	47.2

HEATING DEGREE DAYS (base 65°F) 1998 WATERLOO, IA (ALO)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	9	4	150	595	935	1473	1851	1330	1104	536	182	32	8201
1970-71	15	6	175	466	900	1410	1776	1364	1095	549	354	15	8125
1971-72	37	40	146	328	903	1266	1694	1536	1053	611	196	56	7866
1972-73	23	28	158	571	945	1509	1428	1130	712	589	264	2	7359
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-	0	1	55	398	746	1123							

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COOLING DEGREE DAYS (base 65°F) 1998 WATERLOO, IA (ALO)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	0	0	0	0	41	47	250	185	40	12	0	0	575
1970	0	0	0	28	84	175	254	170	86	3	0	0	800
1971	0	0	0	2	5	217	87	100	104	21	0	0	536
1972	0	0	0	0	74	128	188	224	50	0	0	0	664
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

SNOWFALL (inches) 1998 WATERLOO, IA (ALO)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	0.0	0.0	0.0	T	0.2	19.5	2.8	4.8	8.4	0.0	0.0	0.0	35.7
1970-71	0.0	0.0	0.0	T	1.0	7.3	16.7	14.1	6.5	T	0.0	0.0	45.6
1971-72	0.0	0.0	0.0	0.0	11.7	7.0	2.9	15.4	5.8	3.4	0.0	0.0	46.2
1972-73	0.0	0.0	0.0	0.3	9.6	10.6	8.0	4.8	0.1	10.3	0.0	0.0	43.7
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	4.0								
1997-98													
1998-													
POR= 41 YRS	0.0	0.0	0.0	0.1	3.6	7.3	7.3	6.3	5.7	1.6	0.1	T	32.0

WBAN : 94910

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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1998
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											AUCOM H G Z E L E V E T I O N * *	* Type M = AMOS T = AUTOB S = ASOS W = AWOS	REMARKS
						SEA LEVEL	GROUND												
							WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND			
<u>COOPERATIVE</u>																			
617 Mulberry Street	1/21/95	4/24/11		42°31'	92°20'	856												Instrument exposures unknown for cooperative stations.	
302 High Street	4/25/11	6/01/14	1/2 mi. N	42°31'	92°20'	872													
717 Fairview Street	6/02/14	2/28/50	1 mi. NW	42°31'	92°20'	848													
<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.		
Municipal Airport	10/1/81	Present	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.		
														S			ASOS Commissioned 04/01/96		

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