

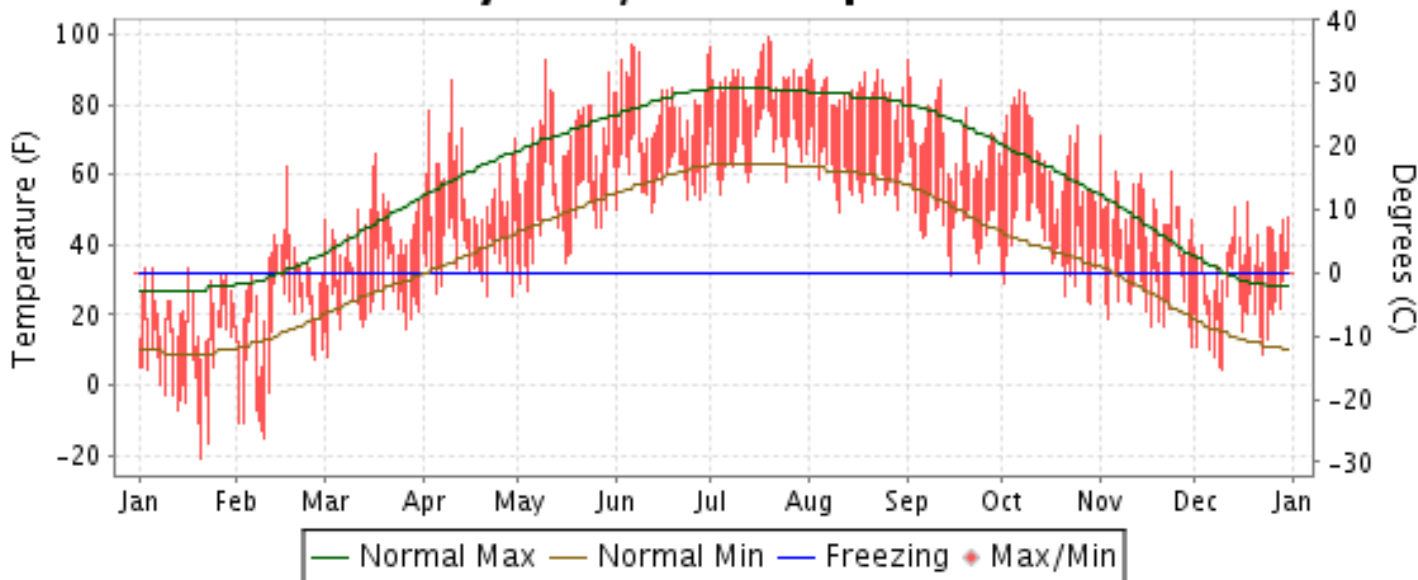


# 2011 LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA

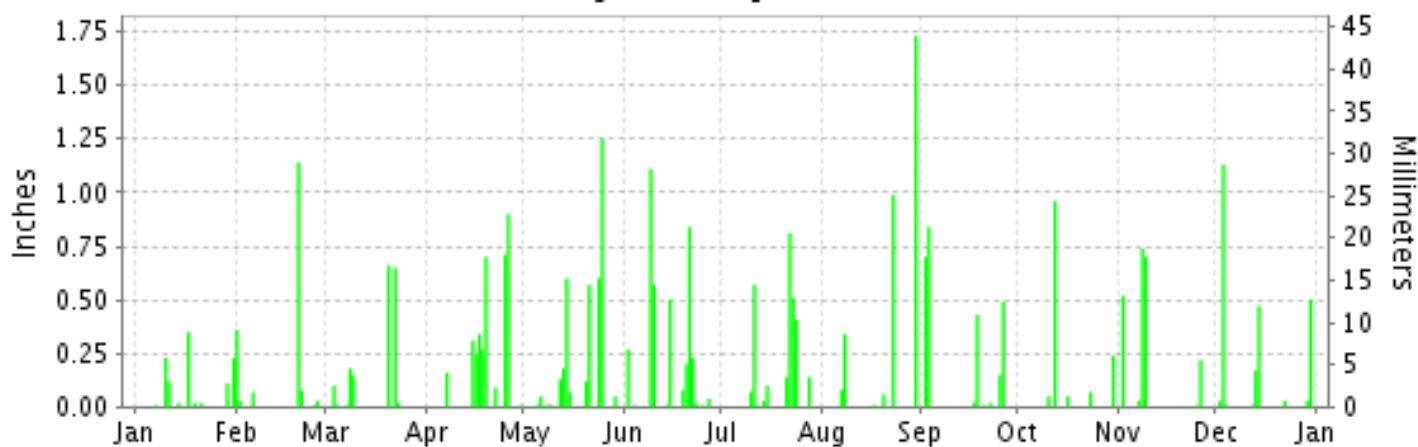
ISSN 0198-2117

## WATERLOO, IOWA (KALO)

### Daily Max/Min Temperature



### Daily Precipitation



### Daily Station Pressure



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NATIONAL  
CLIMATIC DATA CENTER  
ASHEVILLE, NORTH CAROLINA

*Thomas R. Karl*  
DIRECTOR  
NATIONAL CLIMATIC DATA CENTER

# METEOROLOGICAL DATA FOR 2011

## WATERLOO (KALO)

LATITUDE: 42° 33'N      LONGITUDE: -92° 24'W      ELEVATION (FT): GRND: 868 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	21.7	30.0	43.6	57.7	70.8	80.1	87.8	83.5	70.4	65.9	49.4	38.0	58.2	
	HIGHEST DAILY MAXIMUM	33	62	66	87	93	97	99	93	93	84	71	52	99	
	DATE OF OCCURRENCE	17+	17	17	10	10	06	19	02	01	07	01	18	JUL 19	
	MEAN DAILY MINIMUM	5.7	13.3	24.3	36.6	47.9	59.9	67.3	59.4	47.7	39.7	27.9	21.2	37.6	
	LOWEST DAILY MINIMUM	-21	-15	8	25	27	49	54	49	31	23	11	4	-21	
	DATE OF OCCURRENCE	21	10	02	29+	04	12	04	11	15	29	30	10	JAN 21	
	AVERAGE DRY BULB	13.7	21.7	34.0	47.2	59.4	70.0	77.6	71.5	59.1	52.8	38.7	29.6	47.9	
	MEAN WET BULB	13.6	21.0	31.3	42.5	53.1	63.8	72.0	65.8	54.4	46.2	35.7	28.2	44.0	
	MEAN DEW POINT	10.1	17.4	26.4	37.1	47.3	60.0	69.4	62.3	50.4	39.8	30.4	24.5	39.6	
	NUMBER OF DAYS WITH:														
	MAXIMUM >= 90°	0	0	0	0	1	5	10	3	1	0	0	0	0	20
	MAXIMUM <= 32°	28	15	3	0	0	0	0	0	0	0	0	6	52	
MINIMUM <= 32°	31	27	27	9	2	0	0	0	1	8	21	26	152		
MINIMUM <= 0°	11	7	0	0	0	0	0	0	0	0	0	0	18		
H/C	HEATING DEGREE DAYS	1583	1209	953	533	233	22	0	0	217	386	786	1089	7011	
	COOLING DEGREE DAYS	0	0	0	3	65	179	398	209	46	14	0	0	914	
RH	MEAN (PERCENT)	82	80	76	71	68	73	78	75	76	66	73	80	75	
	HOUR 00 LST	84	82	82	79	79	84	90	90	88	73	79	85	83	
	HOUR 06 LST	84	86	88	85	83	86	90	91	91	87	83	87	87	
	HOUR 12 LST	76	76	65	59	55	60	63	56	59	51	63	71	63	
	HOUR 18 LST	82	78	67	59	54	61	66	60	63	53	69	79	66	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	1	2	3	3	0	1	3	3	3	2	1	2	24	
	THUNDERSTORMS	0	1	3	1	6	6	8	4	2	1	0	0	32	
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.)	29.11	29.08	29.15	28.87	28.94	28.92	29.00	28.98	29.09	29.05	29.03	29.14	29.03	
	MEAN SEA-LEVEL PRESS. (IN.)	30.10	30.05	30.12	29.81	29.87	29.85	29.92	29.91	30.02	30.02	30.00	30.12	29.98	
WINDS	RESULTANT SPEED (MPH)	3.5	2.6	2.6	2.0	2.0	3.1	2.8	0.7	2.3	1.8	1.7	2.9	0.5	
	RES. DIR. (TENS OF DEGS.)	30	29	06	03	11	15	16	20	32	27	25	27	28	
	MEAN SPEED (MPH)	9.0	10.6	9.8	12.1	11.6	9.8	6.5	6.0	7.2	8.3	10.0	8.6	9.1	
	PREVAIL.DIR.(TENS OF DEGS.)	31	31	08	30	12	12	17	15	31	29	17	17	31	
	MAXIMUM 2-MINUTE WIND														
	SPEED (MPH)	32	36	40	37	36	33	31	32	46	31	30	32	46	
	DIR. (TENS OF DEGS.)	33	35	10	08	18	11	29	27	24	33	34	33	24	
	DATE OF OCCURRENCE	07	01	22	15	30	13	22	07	02	20	26	31	SEP 02	
	MAXIMUM 3-SECOND WIND:														
	SPEED (MPH)	40	45	54	47	48	41	45	44	60	39	39	41	60	
DIR. (TENS OF DEGS.)	33	35	10	09	23	12	29	27	24	32	33	32	24		
DATE OF OCCURRENCE	07	02	22	15	31	13	22	07	02	20	26	31	SEP 02		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	1.11	1.72	1.78	3.74	3.65	3.89	2.79	3.21	2.66	1.37	2.22	2.38	30.52	
	GREATEST 24-HOUR (IN.)	0.35	1.14	0.67	1.61	1.85	1.66	1.30	1.73	1.52	0.96	1.21	1.16	1.85	
	DATE OF OCCURRENCE	17	20	22-23	25-26	24-25	09-10	22-23	30	02-03	12	08-09	02-03	MAY 24-25	
	NUMBER OF DAYS WITH:														
	PRECIPITATION 0.01	9	7	8	10	13	13	10	6	8	5	6	9	104	
PRECIPITATION 0.10	5	2	5	8	7	7	7	3	5	2	4	4	59		
PRECIPITATION 1.00	0	1	0	0	1	1	0	1	0	0	0	1	5		
SNOWFALL	SNOW,ICE PELLETS,HAIL														
	TOTAL (IN.)	13.3	9.3	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.1	27.6	
	GREATEST 24-HOUR (IN.)	4.1	5.1	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.9	5.1	
	DATE OF OCCURRENCE	17	01	09	19							09	22	FEB 01	
	MAXIMUM SNOW DEPTH (IN.)	9	12	1	T	0	0	0	0	0	0	1	1	12	
	DATE OF OCCURRENCE	18+	02	09	16							09	22	FEB 02	
NUMBER OF DAYS WITH:															
SNOWFALL >= 1.0	5	4	1	0	0	0	0	0	0	0	1	0	11		

# NORMALS, MEANS, AND EXTREMES WATERLOO (KALO)

LATITUDE:  
42° 33'N

LONGITUDE:  
-92° 24'W

ELEVATION (FT):  
GRND: 868 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	61	25.2	30.3	42.8	58.7	71.1	80.0	83.9	81.7	73.8	62.1	44.9	30.4	57.1
	HIGHEST DAILY MAXIMUM	63	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.	61	45.0	50.0	69.7	82.1	87.8	92.8	94.5	92.7	89.3	82.4	66.5	50.2	75.3
	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	61	7.4	12.5	24.1	36.3	48.2	57.7	62.3	59.5	49.9	38.8	25.9	13.5	36.3
	LOWEST DAILY MINIMUM	63	-34	-31	-34	-4	22	38	42	38	22	11	-17	-29	-34
	YEAR OF OCCURRENCE		2009	1996	1962	1982	2005	1964	1984	1967	1967	1988	1977	2000	JAN 2009
	MEAN OF EXTREME MINS.	61	-16.2	-12.0	3.0	20.1	32.3	44.5	50.2	46.3	33.0	21.5	7.9	-10.1	18.4
	NORMAL DRY BULB	30	16.1	22.6	35.0	47.8	60.2	69.9	73.6	71.2	62.6	50.2	35.1	21.6	47.2
	MEAN DRY BULB	61	16.3	21.4	33.4	47.5	59.7	69.0	73.1	70.6	61.9	50.5	35.4	22.0	46.7
	MEAN WET BULB	28	16.5	21.4	30.9	41.7	52.3	62.4	66.6	64.9	56.1	44.1	32.0	20.6	42.5
	MEAN DEW POINT	28	14.0	18.4	27.7	37.7	48.8	59.4	64.6	63.1	53.4	40.8	29.4	18.3	39.6
	NORMAL NO. DAYS WITH: MAXIMUM >= 90	30	0.0	0.0	0.0	0.1	0.8	3.9	6.4	4.2	1.6	0.2	0.0	0.0	17.2
	MAXIMUM <= 32	30	21.5	14.3	5.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	5.1	16.7	63.5
MINIMUM <= 32	30	30.5	26.3	23.2	10.3	1.1	0.0	0.0	0.0	1.0	9.6	22.5	29.6	154.1	
MINIMUM <= 0	30	11.1	6.6	1.1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.6	6.4	25.8	
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	76	76	72	66	66	68	73	75	72	69	75	78	72
	HOURLY 00 LST	30	78	79	78	75	76	79	84	86	83	78	80	81	80
	HOURLY 06 LST	30	78	80	82	81	81	84	87	90	88	83	83	82	83
	HOURLY 12 LST	30	70	69	63	54	54	55	59	60	57	56	66	73	61
	HOURLY 18 LST	30	75	73	65	55	53	55	59	63	61	61	72	77	64
S	PERCENT POSSIBLE SUNSHINE														
W/O	MEAN NO. DAYS WITH: HEAVY FOG(VISBY <= 1/4 MI)	48	2.6	2.2	2.5	1.6	1.4	0.8	1.3	2.4	1.9	1.0	1.9	3.5	23.1
	THUNDERSTORMS	51	0.1	0.3	1.6	3.9	5.9	7.5	7.5	6.2	4.4	2.3	0.5	0.2	40.4
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)	28	29.13	29.13	29.08	29.00	29.00	29.00	29.04	29.08	29.09	29.09	29.08	29.13	29.07
	MEAN SEA-LEVEL PRES. (IN)	28	30.12	30.12	30.05	29.94	29.94	29.93	29.97	30.00	30.02	30.04	30.05	30.11	30.02
WINDS	MEAN SPEED (MPH)	28	10.7	10.7	11.4	12.0	10.6	9.0	7.7	7.3	8.4	9.7	10.6	10.3	9.9
	PREVAIL.DIR.(TENS OF DEGS)	36	31	32	32	32	17	19	19	17	19	17	31	31	31
	MAXIMUM 2-MINUTE: SPEED (MPH)	15	40	51	44	51	67	60	52	46	46	43	53	46	67
	DIR. (TENS OF DEGS)		31	27	20	28	32	33	27	31	24	32	22	36	32
	YEAR OF OCCURRENCE		2005	2003	2005	1997	2008	1997	2008	1998	2011	2008	1998	2010	MAY 2008
	MAXIMUM 3-SECOND SPEED (MPH)	15	47	69	54	61	93	72	70	56	60	58	68	54	93
	DIR. (TENS OF DEGS)		31	27	10	27	33	27	27	32	24	28	22	36	33
	YEAR OF OCCURRENCE		2006	2003	2011	1997	2008	2008	2008	1998	2011	2010	1998	2010	MAY 2008
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)	63	2.78	3.54	5.43	10.79	11.36	10.11	12.84	10.56	11.38	5.86	5.61	3.77	12.84
	YEAR OF OCCURRENCE		1949	1971	1961	2008	2004	1993	1999	1998	1965	2009	1992	1982	JUL 1999
	MINIMUM MONTHLY (IN)	63	0.10	0.02	0.16	0.95	0.82	0.86	0.19	0.08	0.42	T	T	0.12	0.02
	YEAR OF OCCURRENCE		1962	1969	1994	1971	1992	1955	1996	2003	1953	1952	1954	1998	FEB 1969
	MAXIMUM IN 24 HOURS (IN)	63	1.64	1.53	1.98	4.85	3.62	4.35	9.31	5.28	3.83	2.65	3.33	1.75	9.31
	YEAR OF OCCURRENCE		1971	1976	1998	2008	1980	1980	1968	1966	2006	1961	2003	1982	JUL 1968
	NORMAL NO. DAYS WITH: PRECIPITATION >= 0.01	30	7.6	7.2	9.7	10.9	11.6	11.1	9.3	9.4	8.8	8.0	8.9	8.0	110.5
PRECIPITATION >= 1.00	30	*	0.1	0.3	0.5	1.1	1.3	1.2	1.2	0.7	0.6	0.5	0.1	7.6	
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)	56	24.2	24.3	20.1	10.3	1.0	T	T	0.0	0.0	1.3	15.9	27.3	27.3
	YEAR OF OCCURRENCE		1996	1962	1959	1973	1991	1994	2007	0.0	0.0	2002	1991	2009	DEC 2009
	MAXIMUM IN 24 HOURS (IN)	51	14.8	9.1	12.2	7.2	1.0	T	T	0.0	0.0	1.2	10.2	12.3	14.8
	YEAR OF OCCURRENCE		1971	1993	1959	2003	1991	1994	2006	0.0	0.0	1991	1991	1985	JAN 1971
	MAXIMUM SNOW DEPTH (IN)	45	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) 2011 WATERLOO (KALO)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
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	.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
2003	0.32	0.54	1.44	4.04	5.41	3.27	4.32	0.08	2.32	0.95	4.99	0.53	28.21
2004	0.46	1.24	4.00	1.64	11.36	3.86	2.78	4.58	0.65	1.56	2.20	0.52	34.85
2005	1.54	1.45	1.13	2.67	3.22	8.02	3.81	2.80	3.06	0.44	1.58	1.12	30.84
2006	0.70	0.12	2.93	5.19	1.72	3.07	4.83	2.71	5.44	1.95	2.80	1.86	33.32
2007	0.73	1.31	1.61	4.47	4.65	5.11	4.64	10.31	4.18	3.76	0.16	1.92	42.85
2008	0.87	2.46	1.61	10.79	6.25	8.79	5.51	1.58	2.59	1.53	1.95	2.01	45.94
2009	0.74	0.56	3.08	4.63	4.11	3.58	5.52	5.36	2.09	5.86	0.61	3.19	39.33
2010	0.84	1.02	0.99	5.10	4.44	7.95	10.95	5.46	2.42	0.32	1.51	2.05	43.05
2011	1.11	1.72	1.78	3.74	3.65	3.89	2.79	3.21	2.66	1.37	2.22	2.38	30.52
POR= 61 YRS	0.80	0.99	2.13	3.61	4.27	4.63	4.74	3.92	3.04	2.38	1.82	1.18	33.51

WBAN : 94910

**AVERAGE TEMPERATURE (°F) 2011 WATERLOO (KALO)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
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
2003	19.9	19.1	34.7	50.2	58.7	69.4	74.1	73.5	61.4	51.3	35.6	27.2	47.9
2004	16.6	22.8	39.9	49.6	60.8	67.3	69.9	66.4	66.7	51.1	39.7	25.4	48.0
2005	17.6	29.1	35.4	52.6	56.6	72.5	73.7	69.9	66.3	51.2	37.5	17.1	48.3
2006	30.8	22.6	35.7	52.4	59.8	69.0	75.2	71.3	59.6	46.3	38.4	30.7	49.3
2007	20.1	13.6	40.2	45.7	64.5	69.9	73.0	73.1	64.6	54.8	35.7	18.9	47.8
2008	14.5	15.6	30.0	45.3	56.8	69.6	73.9	69.9	63.6	50.4	36.7	14.9	45.1
2009	10.9	24.9	36.7	46.8	59.7	68.9	67.7	68.4	63.0	44.4	42.5	18.8	46.1
2010	12.2	16.3	38.8	54.0	60.7	70.3	74.4	74.0	62.7	52.9	36.8	16.9	47.5
2011	13.7	21.7	34.0	47.2	59.4	70.0	77.6	71.5	59.1	52.8	38.7	29.6	47.9
POR= 61 YRS	16.3	21.4	33.4	47.5	59.7	69.0	73.1	70.6	61.9	50.5	35.4	22.0	46.7

**HEATING DEGREE DAYS (base 65°F) 2011 WATERLOO (KALO)**

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
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
2002-03	0	9	84	579	901	1110	1392	1280	933	458	204	27	6977
2003-04	0	2	176	431	873	1164	1493	1216	770	466	171	48	6810
2004-05	18	70	74	429	751	1220	1461	998	911	370	266	3	6571
2005-06	3	9	72	456	816	1480	1054	1180	902	375	230	30	6607
2006-07	0	1	183	586	791	1054	1387	1425	775	585	92	9	6888
2007-08	0	0	107	347	873	1420	1560	1427	1075	585	262	6	7662
2008-09	0	4	96	454	843	1547	1667	1116	869	544	177	30	7347
2009-10	14	33	83	634	668	1428	1628	1358	803	334	207	1	7191
2010-11	0	5	111	372	839	1484	1583	1209	953	533	233	22	7344
2011-	0	0	217	386	786	1089							

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**COOLING DEGREE DAYS (base 65°F) 2011 WATERLOO (KALO)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
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
2003	0	0	0	16	14	165	287	274	74	14	0	0	844
2004	0	0	0	11	46	126	177	119	133	5	0	0	617
2005	0	0	0	4	14	232	279	170	119	37	0	0	855
2006	0	0	0	2	76	157	323	202	29	14	0	0	803
2007	0	0	11	14	85	162	255	261	101	35	0	0	924
2008	0	0	0	0	14	149	284	164	60	9	1	0	681
2009	0	0	0	5	20	154	103	147	27	0	0	0	456
2010	0	0	0	10	80	167	299	290	50	5	0	0	901
2011	0	0	0	3	65	179	398	209	46	14	0	0	914

## SNOWFALL (inches) 2011 WATERLOO (KALO)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
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
2002-03	0.0	0.0	0.0	1.3	2.3	0.3	2.8	8.0	5.2	8.7	0.0	0.0	28.6
2003-04	0.0	0.0	0.0	0.0	T	6.0	7.0	8.6	5.1	0.0	0.0	0.0	26.7
2004-05	0.0	0.0	0.0	0.0	T	1.7	12.8	2.8	1.0	0.0	0.0	0.0	18.3
2005-06	0.0	0.0	0.0	0.0	3.7	19.7	2.0	4.6	2.0	0.0	0.0	0.0	32.0
2006-07	T	0.0	0.0	T	1.5	0.5	10.8	9.2	2.8	4.3	0.0	0.0	29.1
2007-08	T	0.0	0.0	0.0	1.1	15.2	14.4	18.1	5.1	T	0.0	0.0	53.9
2008-09	0.0	0.0	0.0	T	4.7	20.5	15.3	3.1	T	4.3	0.0	0.0	47.9
2009-10	0.0	0.0	0.0	0.0	T	27.3	7.8	16.2	1.5	0.0	0.0	0.0	52.8
2010-11	0.0	0.0	0.0	T	T	24.7	13.3	9.3	1.6	0.8	0.0	0.0	49.7
2011-	0.0	0.0	0.0	0.0	1.5	1.1							
POR= 62 YRS	T	0.0	0.0	0.2	2.8	8.2	7.6	6.5	5.1	1.5	T	T	31.9

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 (1971 - 2000). 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. 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.</p>	<p>GENERAL CONTINUED: 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. STATION HISTORY STOPPED WITH THE 2009 ANNUAL. IF YOU NEED HISTORY GO TO "MULTI-NETWORK MEDADATA SYSTEM", URL IS: <a href="https://mi3.ncdc.noaa.gov/mi3qry/login.cfm">https://mi3.ncdc.noaa.gov/mi3qry/login.cfm</a> SNOWFALL STOPPED MONTH &amp; YEAR INDICATED ABOVE. NO FURTHER YEARS INCLUDED UNLESS RESTARTED.</p> <p><b>NOTE:</b> The "Period of Record:(POR) for all "averages" is based on the "Summary of the Day First Order Station" and "Cooperative Summary of the Day" archives.</p>
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# 2011 WATERLOO IOWA (KALO)

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 History

WATERLOO, IA

NAME	Begin Date	End Date	Latitude	Longitude	Elevation Feet	Relocation	Platform
WATERLOO MUNICIPAL AP	1948-01-29	1950-03-01	42° 33'	-92° 24'			AIRWAYS
WATERLOO MUNICIPAL AP	1956-01-01	1973-01-01	42° 33'	-92° 24'	868		AIRWAYS, COOP
WATERLOO MUNICIPAL AP	2009-02-16	Present	42° 33'	-92° 24'	868		ASOS, COOP, UNKNOWN
WATERLOO MUNICIPAL AP	1997-07-21	2002-03-08	42° 33'	-92° 24'	865		ASOS, COOP, UNKNOWN
WATERLOO MUNICIPAL AP	1973-01-01	1996-04-01	42° 33'	-92° 24'	868		COOP, WXSVC
WATERLOO MUNICIPAL AP	1950-03-01	1956-01-01	42° 33'	-92° 24'	869		AIRWAYS, COOP
WATERLOO MUNICIPAL AP	1996-04-01	1997-07-21	42° 33'	-92° 24'	865		ASOS, COOP, WXSVC
WATERLOO MUNICIPAL AP	2002-03-08	2009-02-16	42° 33'	-92° 24'	868		ASOS, COOP, UNKNOWN

# Element History

Element	Begin Date	End Date	Frequency	Time Of Observation	Equipment *	Equipment * Modifications	Equipment Exposure
PRECIP	1987-10-01	1997-07-29	HOURLY	2400			
PRECIP	2009-02-16	2010-10-25	DAILY	2400	PCPN1		
PRECIP	2009-02-16	2010-10-25	HOURLY	1400	TB	RCRD	
TEMP	1948-01-29	1982-01-01	DAILY	2400	HYGR		
TEMP	1987-10-01	1997-07-29	DAILY	2400	HYGR		
PRECIP	1999-08-31	2009-02-16	HOURLY	2400	TB	RCRD	
PRECIP	2009-02-16	2010-10-25	DAILY	1400	PCPN1		
PRECIP	2009-02-16	2010-10-25	HOURLY	2400	TB	RCRD	
PRECIP	2010-10-25	Present	DAILY	2400	PCPN1	SHLD	
TEMP	1997-07-29	1999-08-31	DAILY	2400	HYGR		
PRECIP	1948-01-29	1982-01-01	DAILY	2400			
PRECIP	1987-10-01	1997-07-29	DAILY	2400	UNIV	RCRD	
TEMP	2009-02-16	2010-10-25	DAILY	2400	HYGR		
PRECIP	1997-07-29	1999-08-31	HOURLY	2400	UNIV	RCRD	
PRECIP	1999-08-31	2009-02-16	DAILY	2400	TB	RCRD	
PRECIP	2010-10-25	Present	HOURLY	2400	TB	SHLD;RCRD	
PRECIP	1982-01-01	1987-10-01	HOURLY	2400			
TEMP	1999-08-31	2009-02-16	DAILY	2400	HYGR		
PRECIP	2010-10-25	Present	DAILY	1400	PCPN1	SHLD	
PRECIP	2010-10-25	Present	HOURLY	1400	TB	SHLD;RCRD	
TEMP	1982-01-01	1987-10-01	DAILY	2400	HYGR		
PRECIP	1982-01-01	1987-10-01	DAILY	2400			
PRECIP	1997-07-29	1999-08-31	DAILY	2400	TB	RCRD	
TEMP	2010-10-25	Present	DAILY	2400	HYGR	SHLD	

\* For explanation of codes and abbreviations see Station Metadata link below.

Other Station Information can be found at:

ASOS Implementation by NWS: <http://www.nws.noaa.gov/ops2/Surface/asosimplementation.htm>

Station Metadata website: <http://www.ncdc.noaa.gov/homr>

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Email : [ncdc.info@noaa.gov](mailto:ncdc.info@noaa.gov)

NOAA/National Climatic Data Center

Attn: User Engagement & Services Branch

151 Patton Avenue

Asheville, NC 28801-5001

Visit our Web Site for other weather data: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)