

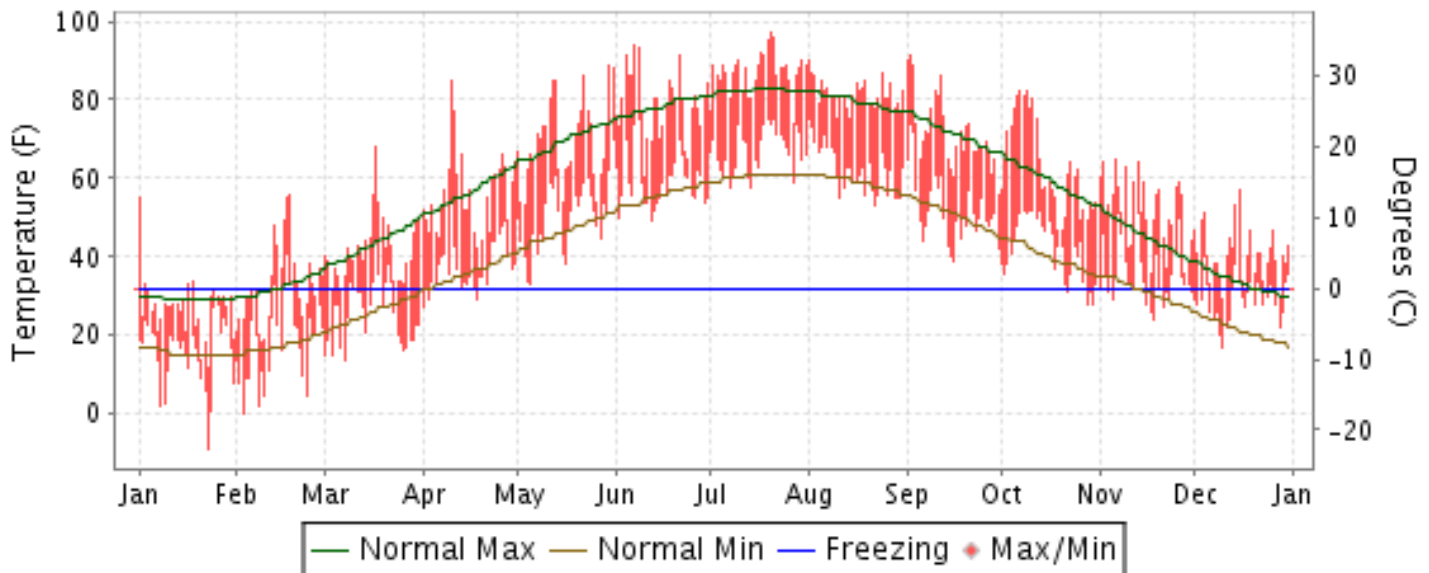


# 2011 LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA

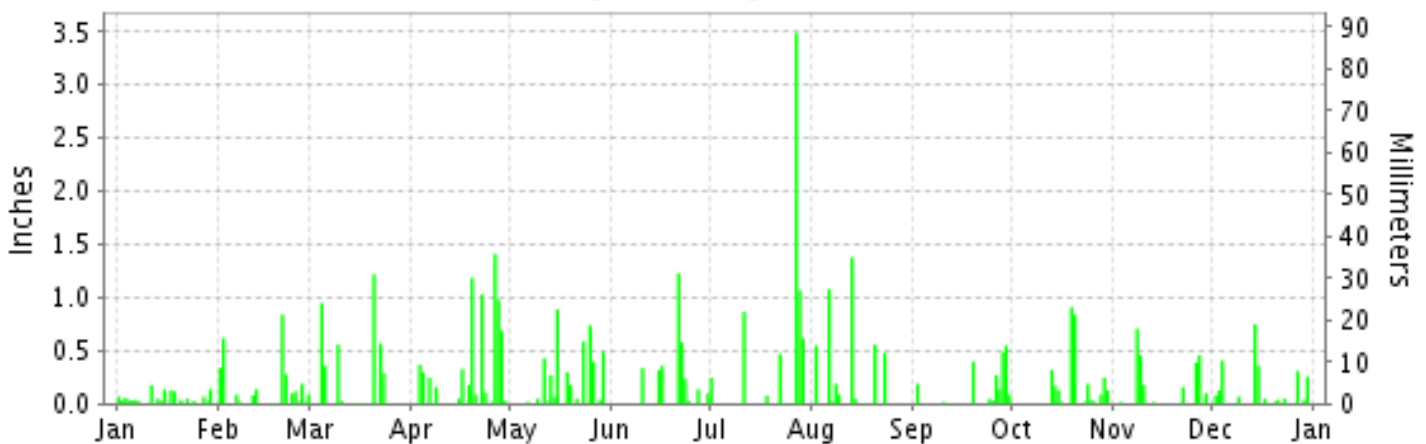
ISSN 0198-2575

## GRAND RAPIDS, MICHIGAN (KGRR)

### Daily Max/Min Temperature



### Daily Precipitation



### Daily Station Pressure



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CLIMATIC DATA CENTER  
ASHEVILLE, NORTH CAROLINA

*Thomas R. Karl*  
DIRECTOR  
NATIONAL CLIMATIC DATA CENTER

# METEOROLOGICAL DATA FOR 2011

## GRAND RAPIDS (KGRR)

LATITUDE: 42° 52'N      LONGITUDE: -85° 31'W      ELEVATION (FT): GRND: 803 BARO: 788      TIME ZONE: EASTERN (UTC -5)      WBAN: 94860

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	27.1	33.0	41.9	55.6	69.6	78.7	87.0	81.3	71.7	63.1	51.9	40.6	58.5	
	HIGHEST DAILY MAXIMUM	55	56	68	85	89	94	97	90	91	82	65	57	97	
	DATE OF OCCURRENCE	01	18	17	10	30	07	20	01	02	09+	06	15	JUL 20	
	MEAN DAILY MINIMUM	15.6	18.3	25.6	37.6	50.5	59.4	67.1	62.3	52.1	41.9	35.5	29.3	41.3	
	LOWEST DAILY MINIMUM	-9	0	14	27	33	49	58	53	39	28	24	17	-9	
	DATE OF OCCURRENCE	23	03	07	01	05	12	14+	22	16	30+	18	10	JAN 23	
	AVERAGE DRY BULB	21.4	25.7	33.8	46.6	60.1	69.1	77.1	71.8	61.9	52.5	43.7	35.0	49.9	
	MEAN WET BULB	19.7	23.8	30.2	41.5	53.7	61.6	68.7	65.1	56.6	47.0	39.5	32.2	45.0	
	MEAN DEW POINT	14.8	17.4	23.0	35.6	48.0	56.6	64.0	61.0	52.6	41.9	34.3	27.1	39.7	
	NUMBER OF DAYS WITH:														
	MAXIMUM >= 90°	0	0	0	0	0	4	7	1	2	0	0	0	0	14
MAXIMUM <= 32°	27	15	2	0	0	0	0	0	0	0	0	3	47		
MINIMUM <= 32°	31	24	24	6	0	0	0	0	0	4	12	22	123		
MINIMUM <= 0°	1	1	0	0	0	0	0	0	0	0	0	0	2		
H/C	HEATING DEGREE DAYS	1344	1095	962	551	204	25	0	0	157	385	631	922	6276	
	COOLING DEGREE DAYS	0	0	0	5	59	151	381	218	73	7	0	0	894	
RH	MEAN (PERCENT)	75	70	67	70	68	67	66	72	74	72	72	73	71	
	HOUR 01 LST	79	77	74	76	77	78	80	86	86	83	77	75	79	
	HOUR 07 LST	78	75	75	78	74	73	74	81	85	84	78	78	78	
	HOUR 13 LST	69	61	57	61	54	56	52	55	57	50	61	67	58	
	HOUR 19 LST	73	68	64	64	63	63	58	66	73	72	73	73	68	
S	PERCENT POSSIBLE SUNSHINE										57	36	25		
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	1	6	3	0	2	1	2	1	5	1	1	1	24	
	THUNDERSTORMS	0	0	3	4	8	3	6	5	2	2	0	0	33	
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.)	29.13	29.13	29.25	28.98	29.06	29.07	29.11	29.06	29.14	29.13	29.12	29.22	29.12	
	MEAN SEA-LEVEL PRESS. (IN.)	30.04	30.03	30.13	29.85	29.92	29.92	29.95	29.91	30.00	29.99	30.01	30.11	29.99	
WINDS	RESULTANT SPEED (MPH)	2.7	2.8	2.2	0.6	1.6	1.7	3.0	2.2	0.4	2.1	3.2	3.9	1.4	
	RES. DIR. (TENS OF DEGS.)	25	25	03	15	09	22	26	26	36	28	21	24	25	
	MEAN SPEED (MPH)	8.3	11.2	9.3	11.7	9.7	8.5	6.8	6.4	7.8	7.9	10.3	9.0	8.9	
	PREVAIL.DIR.(TENS OF DEGS.)	30	21	09	07	04	27	24	28	05	15	19	21	19	
	MAXIMUM 2-MINUTE WIND														
	SPEED (MPH)	32	38	37	37	38	39	43	33	40	36	33	35	43	
	DIR. (TENS OF DEGS.)	25	28	25	26	25	30	25	25	26	27	20	27	25	
	DATE OF OCCURRENCE	01	18	17	11	23	21	11	13	29	15	09	15	JUL 11	
	MAXIMUM 3-SECOND WIND:														
	SPEED (MPH)	43	51	45	46	48	48	55	47	52	47	45	45	55	
DIR. (TENS OF DEGS.)	24	29	14	26	24	28	26	24	26	26	20	27	26		
DATE OF OCCURRENCE	01	18	20	11	23	08	11	13	29	15	09	15	JUL 11		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	1.31	2.96	4.01	7.19	4.54	3.34	6.87	4.42	2.23	3.13	2.50	2.59	45.09	
	GREATEST 24-HOUR (IN.)	0.25	1.12	1.23	1.66	1.10	1.81	4.16	1.38	0.63	1.58	1.05	0.90	4.16	
	DATE OF OCCURRENCE	17-18	20-21	20-21	27-28	25-26	21-22	27-28	13	27-28	19-20	08-09	14-15	JUL 27-28	
	NUMBER OF DAYS WITH:														
	PRECIPITATION 0.01	20	15	10	16	15	9	9	11	10	13	9	15	152	
PRECIPITATION 0.10	5	8	6	12	9	8	6	6	6	8	7	6	87		
PRECIPITATION 1.00	0	0	1	3	0	1	2	2	0	0	0	0	9		
SNOWFALL	SNOW,ICE PELLETS,HAIL														
	TOTAL (IN.)	21.2	38.2	1.2	1.9	0.0	0.0	0.0	0.0	0.0	T	0.7	4.5	67.7	
	GREATEST 24-HOUR (IN.)	2.4	11.1	1.1	1.8	0.0	0.0	0.0	0.0	0.0	T	0.7	1.3	11.1	
	DATE OF OCCURRENCE	15	02	05	18						28	10	27	FEB 02	
	MAXIMUM SNOW DEPTH (IN.)	8	19	6	1	0	0	0	0	0	0	0	1	19	
	DATE OF OCCURRENCE	29	03	01	18								28+	FEB 03	
NUMBER OF DAYS WITH:															
SNOWFALL >= 1.0	11	9	1	1	0	0	0	0	0	0	0	2	24		

# NORMALS, MEANS, AND EXTREMES GRAND RAPIDS (KGRR)

LATITUDE: 42° 52'N      LONGITUDE: -85° 31'W      ELEVATION (FT): GRND: 803 BARO: 788      TIME ZONE: EASTERN (UTC -5)      WBAN: 94860

	ELEMENT	POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	29.3	32.6	43.3	56.6	69.6	78.4	82.3	79.7	71.7	59.6	45.5	33.7	56.9
	MEAN DAILY MAXIMUM	74	30.0	31.7	42.6	57.0	69.3	78.3	82.9	80.7	72.5	60.9	46.1	34.2	57.2
	HIGHEST DAILY MAXIMUM	48	63	69	78	88	90	96	100	100	93	88	77	69	100
	YEAR OF OCCURRENCE		2008	1999	2010	1970	2010	2009	1988	1964	1973	2007	1975	2001	JUL 1988
	MEAN OF EXTREME MAXS.	75	48.3	49.8	67.4	79.1	85.3	91.3	92.4	91.5	87.5	79.0	66.4	53.1	74.3
	NORMAL DAILY MINIMUM	30	15.6	17.4	25.9	36.1	46.6	55.8	60.5	59.0	51.0	40.2	31.2	21.4	38.4
	MEAN DAILY MINIMUM	74	16.3	16.7	25.0	36.2	46.6	55.9	60.9	59.2	51.0	41.0	31.3	21.8	38.5
	LOWEST DAILY MINIMUM	48	-22	-19	-8	3	-22	41	39	27	18	5	-18	5	-22
	YEAR OF OCCURRENCE		1994	1973	1978	1982	1994	1994	1983	1976	1991	1988	1977	1983	JUN 1994
	MEAN OF EXTREME MINS.	75	-5.0	-2.7	6.0	21.2	31.3	41.8	48.2	46.7	35.7	26.4	16.3	2.0	22.3
	NORMAL DRY BULB	30	22.4	25.0	34.6	46.3	58.1	67.1	71.4	69.4	61.3	49.9	38.4	27.6	47.6
	MEAN DRY BULB	74	23.2	24.3	33.9	46.6	58.0	67.2	71.9	70.0	61.8	51.0	38.7	28.0	47.9
	MEAN WET BULB	28	21.7	23.2	29.8	40.2	50.5	59.9	64.0	63.3	56.1	45.1	35.3	26.1	42.9
	MEAN DEW POINT	28	19.6	20.4	26.9	36.5	47.3	57.2	61.8	61.5	53.8	42.8	33.1	24.2	40.4
	NORMAL NO. DAYS WITH: MAXIMUM >= 90	30	0.0	0.0	0.0	0.0	0.5	2.2	4.3	2.1	0.4	0.0	0.0	0.0	9.5
	MAXIMUM <= 32	30	19.1	14.6	5.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	2.6	13.1	55.1
	MINIMUM <= 32	30	29.0	25.6	23.2	11.4	1.7	0.0	0.0	0.0	0.4	5.7	17.6	27.8	142.4
MINIMUM <= 0	30	3.5	2.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.9	
H/C	NORMAL HEATING DEG. DAYS	30	1317	1135	956	571	255	58	10	24	159	471	793	1147	6896
	NORMAL COOLING DEG. DAYS	30	0	0	2	6	38	124	217	165	56	5	0	0	613
RH	NORMAL (PERCENT)	30	79	76	71	66	66	69	71	75	76	75	77	80	73
	HOURLY 01 LST	30	81	80	77	74	77	81	84	87	87	82	80	82	81
	HOURLY 07 LST	30	82	82	81	79	79	82	85	90	90	86	83	83	84
	HOURLY 13 LST	30	73	69	63	56	53	55	56	60	60	62	69	74	63
	HOURLY 19 LST	30	78	73	66	58	55	57	59	64	69	72	75	79	67
S	PERCENT POSSIBLE SUNSHINE	36	28	39	46	51	28	28	64	61	54	44	27	23	41
W/O	MEAN NO. DAYS WITH: HEAVY FOG (VISIB <= 1/4 MI)	48	2.3	2.4	2.5	1.5	1.4	1.2	1.3	1.9	2.0	1.8	2.0	3.3	23.6
	THUNDERSTORMS	64	0.3	0.3	1.7	3.4	4.1	5.7	6.2	5.0	3.8	1.7	1.2	0.3	33.7
CLOUDINESS	MEAN: SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH: CLEAR														
	PARTLY CLOUDY CLOUDY														
PR	MEAN STATION PRESSURE (IN)	28	29.16	29.17	29.17	29.10	29.08	29.10	29.13	29.17	29.18	29.18	29.16	29.17	29.15
	MEAN SEA-LEVEL PRES. (IN)	28	30.06	30.07	30.05	29.98	29.97	29.96	29.98	30.02	30.04	30.04	30.04	30.06	30.02
WINDS	MEAN SPEED (MPH)	28	10.9	10.6	10.6	10.8	9.7	8.5	8.0	7.5	7.9	9.1	10.3	10.5	9.5
	PREVAIL. DIR. (TENS OF DEGS)	37	26	25	26	08	26	25	25	25	19	19	19	21	25
	MAXIMUM 2-MINUTE: SPEED (MPH)	16	45	55	47	52	45	45	51	41	51	47	49	48	55
	DIR. (TENS OF DEGS)		24	24	25	19	24	24	26	22	25	24	23	25	24
	YEAR OF OCCURRENCE		1996	1999	2002	1999	1996	1996	1999	2007	2010	1996	1998	2008	FEB 1999
	MAXIMUM 3-SECOND SPEED (MPH)	16	55	64	58	61	55	55	58	55	72	60	66	64	72
	DIR. (TENS OF DEGS)		24	25	25	25	24	28	29	23	27	25	23	20	27
YEAR OF OCCURRENCE		1996	1999	2002	1997	1996	2008	1999	2007	2010	1996	1998	2007	SEP 2010	
PRECIPITATION	NORMAL (IN)	30	2.03	1.54	2.59	3.48	3.35	3.67	3.56	3.78	4.28	2.80	3.35	2.70	37.13
	MAXIMUM MONTHLY (IN)	48	4.67	4.80	5.12	7.19	4.67	8.04	8.83	8.46	11.85	7.64	7.90	6.63	11.85
	YEAR OF OCCURRENCE		2005	1997	1974	2011	2005	2010	1992	1987	1986	2009	2003	1971	SEP 1986
	MINIMUM MONTHLY (IN)	48	0.47	0.33	0.54	.77	0.47	0.47	0.81	0.14	T	0.60	0.95	T	0.14
	YEAR OF OCCURRENCE		1981	1969	2001	2005	1981	1981	1976	1969	1979	1964	1986	1952	AUG 1969
	MAXIMUM IN 24 HOURS (IN)	48	2.16	3.05	1.78	2.66	2.16	3.27	4.16	3.68	4.55	3.19	3.00	2.79	4.55
	YEAR OF OCCURRENCE		1993	1997	1985	1999	1993	2010	2011	1987	1986	1993	1990	1982	SEP 1986
	NORMAL NO. DAYS WITH: PRECIPITATION >= 0.01	30	16.7	11.9	12.2	13.2	10.7	9.9	9.4	9.7	10.5	11.3	13.3	15.5	144.3
PRECIPITATION >= 1.00	30	0.2	0.1	0.2	0.7	0.7	1.0	0.8	1.0	1.1	0.5	0.6	0.6	7.5	
SNOWFALL	NORMAL (IN)	30	21.1	12.2	9.0	2.8	0.*	0.0	0.0	0.0	0.0	0.6	7.7	18.8	72.2
	MAXIMUM MONTHLY (IN)	48	46.8	41.6	36.0	12.4	46.8	46.8	T	T	T	8.4	25.3	59.2	59.2
	YEAR OF OCCURRENCE		1999	2008	1965	1982	1999	1999	1990	1993	1967	1967	1991	2000	DEC 2000
	MAXIMUM IN 24 HOURS (IN)	48	16.1	11.1	13.6	9.8	16.1	16.1	T	T	T	8.4	10.4	15.1	16.1
	YEAR OF OCCURRENCE		1978	2011	2002	1975	1978	1978	1990	1993	1967	1967	1991	1970	JUN 1978
	MAXIMUM SNOW DEPTH (IN)	63	27	21	15	10	0	0	0	0	0	5	11	22	27
	YEAR OF OCCURRENCE		1978	1985	2007	1975						1967	1951	1951	JAN 1978
NORMAL NO. DAYS WITH: SNOWFALL >= 1.0	30	5.9	3.5	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.2	2.3	5.5	20.3	

**PRECIPITATION (inches) 2011 GRAND RAPIDS (KGRR)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1982	2.98	0.36	3.36	2.11	3.63	2.45	3.81	3.07	1.92	1.42	5.36	6.49	36.96
1983	1.33	1.12	3.30	5.06	4.64	2.09	4.76	1.49	4.87	2.66	3.00	2.79	37.11
1984	0.94	1.15	2.77	2.10	4.77	0.62	2.12	1.49	2.16	3.34	2.85	4.37	28.68
1985	1.94	3.26	4.20	2.54	1.36	1.68	3.09	6.48	4.26	4.64	5.45	2.00	40.90
1986	1.07	3.34	2.35	2.58	3.88	7.14	5.27	5.30	11.85	2.76	0.95	1.04	47.53
1987	0.67	0.37	1.15	2.40	0.94	3.56	2.93	8.46	4.47	2.33	2.49	3.29	33.06
1988	2.39	1.14	2.12	3.11	1.07	0.25	3.69	3.04	7.49	5.37	4.82	1.88	36.37
1989	0.95	1.01	2.47	1.79	4.33	5.02	1.29	4.78	4.90	1.53	4.86	0.97	33.90
1990	2.39	2.08	1.96	2.23	4.39	3.00	3.73	3.40	4.22	5.05	7.14	2.97	42.56
1991	1.32	0.64	3.58	5.58	4.44	1.76	6.24	3.79	2.93	5.61	6.41	2.63	44.93
1992	1.52	1.06	3.51	3.98	1.45	1.61	8.83	3.55	5.60	2.34	5.64	3.27	42.36
1993	4.21	1.13	2.31	4.93	2.17	6.05	1.83	7.73	8.20	4.32	2.12	1.47	46.47
1994	2.68	1.70	1.46	3.25	2.64	7.17	8.07	7.39	2.38	3.29	5.44	1.11	46.58
1995	2.73	0.94	1.49	3.85	2.85	3.97	6.11	3.10	1.54	2.78	4.37	1.52	35.25
1996	1.18	0.90	0.96	2.41	4.83	6.33	1.28	.33	2.72	2.76	1.40	2.45	27.55
1997	2.63	4.80	1.40	1.70	3.05	2.76	1.95	1.99	4.85	2.02	1.49	0.98	29.62
1998	4.09	1.50	4.93	2.75	1.86	2.11	2.49	1.70	2.49	2.98	2.27	1.20	30.37
1999	3.54	1.49	0.96	6.69	2.46	3.81	2.88	3.22	3.21	1.00	0.95	2.31	32.52
2000	1.02	1.09	1.33	3.98	8.65	4.67	4.06	2.31	6.31	1.85	2.82	2.07	40.16
2001	0.71	2.58	0.54	2.05	10.01	3.35	2.00	3.48	3.76	7.38	2.26	2.37	40.49
2002	1.12	1.48	2.65	3.72	4.32	2.06	2.09	4.67	0.97	2.04	2.40	1.97	29.49
2003	0.91	0.61	1.58	2.96	5.68	1.72	3.56	3.75	2.45	1.76	7.90	1.23	34.11
2004	2.01	1.03	4.79	2.04	9.29	3.09	2.56	3.41	0.67	3.98	4.03	2.38	39.28
2005	4.67	2.54	1.41	0.77	2.04	7.35	4.08	1.42	3.82	0.71	5.29	2.43	36.53
2006	4.30	2.39	3.31	2.22	4.92	1.77	6.90	1.62	5.38	5.02	2.80	3.76	44.39
2007	2.19	1.98	3.50	4.27	1.68	3.39	1.24	6.10	1.21	3.13	1.06	3.03	32.78
2008	3.76	4.16	2.47	3.56	2.13	5.66	5.42	1.05	9.54	2.71	2.07	6.27	48.80
2009	1.74	3.31	2.66	5.56	2.65	6.17	2.35	4.74	1.56	7.64	1.48	2.99	42.85
2010	0.85	1.80	1.17	3.81	3.80	8.04	4.66	1.74	2.80	2.61	2.81	1.78	35.87
2011	1.31	2.96	4.01	7.19	4.54	3.34	6.87	4.42	2.23	3.13	2.50	2.59	45.09
POR= 75 YRS	2.13	1.76	2.57	3.36	3.36	3.76	3.46	3.14	3.62	2.81	3.09	2.63	35.69

WBAN : 94860

**AVERAGE TEMPERATURE (°F) 2011 GRAND RAPIDS (KGRR)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1982	17.2	22.1	32.5	41.8	65.0	62.8	73.1	68.6	61.9	53.6	40.8	36.2	48.0
1983	27.6	30.9	36.9	42.6	52.8	67.7	74.7	72.2	62.4	50.7	40.7	19.2	48.2
1984	17.1	34.0	28.9	47.3	53.5	70.1	70.1	73.0	60.5	54.2	40.3	32.2	48.4
1985	18.6	21.3	36.2	51.7	60.4	63.8	70.7	67.4	63.6	50.6	38.4	22.3	47.1
1986	22.7	22.5	36.7	49.7	58.8	64.4	72.5	66.0	62.8	50.2	35.0	29.8	47.6
1987	25.4	29.9	37.3	50.1	62.6	71.2	74.1	69.3	62.2	45.0	41.1	31.5	50.0
1988	20.8	20.7	34.1	47.1	60.9	68.5	74.7	73.4	61.3	44.2	40.7	27.3	47.8
1989	30.5	19.7	31.8	43.9	55.8	65.9	71.9	68.4	59.4	51.1	35.7	17.2	45.9
1990	32.1	28.1	37.1	47.7	55.0	67.1	70.3	69.0	62.8	49.9	43.3	30.0	49.4
1991	22.2	29.2	37.9	50.8	64.6	71.2	72.4	70.5	60.1	52.0	35.7	29.4	49.7
1992	27.5	30.3	33.7	44.0	57.4	64.3	67.2	65.0	59.7	48.2	38.2	30.5	47.2
1993	25.9	21.9	32.4	44.0	58.2	65.2	72.7	71.4	56.5	48.0	37.9	27.8	46.8
1994	14.5	19.2	34.1	47.9	56.1	68.6	71.1	66.6	63.8	51.7	42.3	33.2	47.4
1995	26.5	23.2	37.0	42.8	56.4	69.8	72.5	74.8	59.1	51.4	32.0	24.2	47.5
1996	21.7	24.4	28.4	43.0	55.6	67.7	68.2	72.2	62.3	50.2	33.2	28.7	46.3
1997	21.6	27.3	34.6	44.1	50.3	68.3	70.8	66.1	61.1	49.9	35.6	31.1	46.7
1998	29.6	34.1	36.1	48.6	64.3	67.4	72.2	72.2	66.0	52.7	42.1	33.3	51.6
1999	21.2	31.4	32.9	48.8	61.0	69.4	74.7	67.8	62.7	49.5	43.6	30.4	49.5
2000	23.4	31.4	42.2	45.9	59.6	66.1	68.6	69.1	60.4	53.6	37.6	19.0	48.1
2001	25.5	25.9	32.5	50.0	59.6	66.3	71.3	71.6	59.3	50.4	46.8	33.9	49.4
2002	30.2	30.7	31.0	47.0	52.7	69.4	74.9	70.4	65.6	47.0	36.2	28.2	48.6
2003	19.1	20.0	33.3	45.7	54.9	64.7	70.1	71.2	61.3	48.9	41.1	31.6	46.8
2004	19.5	25.7	39.3	49.9	59.7	66.3	70.5	66.1	65.5	50.5	40.4	27.9	48.4
2005	21.7	28.2	29.9	50.6	54.7	72.9	72.8	72.2	66.7	52.7	40.5	25.8	49.1
2006	33.2	26.4	36.5	50.6	58.2	67.7	74.7	71.2	60.1	47.2	41.3	35.2	50.2
2007	27.3	18.7	39.6	45.1	62.7	70.6	72.3	73.3	66.1	58.1	39.0	29.2	50.2
2008	26.6	22.3	32.8	50.5	55.5	68.9	72.2	70.7	64.7	49.9	39.0	26.2	48.3
2009	17.5	27.8	37.4	47.5	58.3	67.6	67.1	69.0	63.6	48.3	44.1	27.9	48.0
2010	25.1	27.2	41.2	53.7	61.6	69.2	75.5	74.9	62.7	53.6	41.8	27.4	51.2
2011	21.4	25.7	33.8	46.6	60.1	69.1	77.1	71.8	61.9	52.5	43.7	35.0	49.9
POR= 74 YRS	23.2	24.3	33.9	46.6	58.0	67.2	71.9	70.0	61.8	51.0	38.7	28.0	47.9

**HEATING DEGREE DAYS (base 65°F) 2011 GRAND RAPIDS (KGRR)**

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1982-83	6	34	140	361	717	884	1151	949	866	663	373	61	6205
1983-84	16	2	149	440	721	1413	1480	892	1107	532	353	13	7118
1984-85	16	4	189	333	735	1014	1431	1216	886	428	173	81	6506
1985-86	9	17	157	436	790	1316	1302	1186	871	466	214	75	6839
1986-87	11	56	118	452	894	1084	1220	978	849	440	178	20	6300
1987-88	18	36	118	610	712	1032	1364	1277	950	531	169	60	6877
1988-89	3	21	135	639	722	1162	1062	1263	1023	625	297	51	7003
1989-90	2	23	203	424	874	1477	1014	1026	865	549	306	45	6808
1990-91	11	15	139	475	645	1077	1323	997	830	430	157	18	6117
1991-92	5	4	211	404	871	1098	1155	1001	964	626	262	75	6676
1992-93	25	66	197	512	794	1060	1204	1203	1004	624	227	84	7000
1993-94	1	16	259	524	810	1150	1561	1274	950	520	297	42	7404
1994-95	0	46	94	405	675	980	1186	1165	860	659	265	28	6363
1995-96	14	0	212	417	982	1260	1337	1166	1130	653	320	29	7520
1996-97	10	2	147	451	944	1119	1338	1048	935	616	448	24	7082
1997-98	8	43	136	473	876	1046	1091	858	899	486	76	98	6090
1998-99	0	2	58	380	682	975	1353	940	989	481	156	49	6065
1999-00	1	17	116	474	634	1066	1282	971	706	567	213	64	6111
2000-01	15	19	199	348	815	1420	1218	1089	1001	444	189	80	6837
2001-02	20	1	194	449	538	955	1072	955	1048	561	399	43	6235
2002-03	0	4	69	559	857	1132	1416	1255	976	579	309	72	7228
2003-04	3	5	152	495	709	1025	1407	1135	789	462	194	53	6429
2004-05	7	50	61	443	733	1149	1334	1023	1082	433	321	15	6651
2005-06	4	3	56	404	727	1206	979	1073	876	426	264	20	6038
2006-07	0	0	163	547	706	919	1159	1290	787	589	137	25	6322
2007-08	2	11	83	263	770	1102	1185	1231	990	431	298	20	6386
2008-09	1	3	62	468	776	1194	1466	1035	850	524	216	47	6642
2009-10	25	28	80	513	622	1142	1229	1053	732	345	193	20	5982
2010-11	1	1	117	346	689	1160	1344	1095	962	551	204	25	6495
2011-	0	0	157	385	631	922							

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**COOLING DEGREE DAYS (base 65°F) 2011 GRAND RAPIDS (KGRR)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1982	0	0	0	0	99	40	263	153	55	12	0	0	622
1983	0	0	0	0	2	146	325	234	76	5	0	0	788
1984	0	0	0	7	5	174	179	259	60	6	0	0	690
1985	0	0	0	36	39	52	193	99	119	0	0	0	538
1986	0	0	0	14	26	64	252	94	61	0	0	0	511
1987	0	0	0	2	110	213	306	174	38	0	0	0	843
1988	0	0	0	0	50	170	310	289	29	2	0	0	850
1989	0	0	0	0	19	84	223	135	40	0	0	0	501
1990	0	0	6	37	6	115	185	144	83	13	0	0	589
1991	0	0	0	12	155	211	240	182	71	7	0	0	878
1992	0	0	0	2	36	60	99	74	44	1	0	0	316
1993	0	0	0	0	21	94	244	222	10	5	0	0	596
1994	0	0	0	13	29	159	196	102	65	1	0	0	565
1995	0	0	0	0	5	179	252	315	40	6	0	0	797
1996	0	0	0	0	33	118	116	230	74	0	0	0	571
1997	0	0	0	0	0	131	194	81	26	13	0	0	445
1998	0	0	9	0	62	177	230	233	95	4	0	0	810
1999	0	0	0	3	39	186	308	110	55	0	0	0	701
2000	0	0	2	0	48	102	132	154	66	2	0	0	506
2001	0	0	0	0	27	128	223	212	30	3	0	0	623
2002	0	0	0	29	23	180	316	179	96	10	0	0	833
2003	0	0	0	8	3	69	165	205	46	1	0	0	497
2004	0	0	0	15	38	103	186	92	83	0	0	0	517
2005	0	0	0	4	8	259	255	234	112	30	0	0	902
2006	0	0	0	2	59	108	306	200	21	0	0	0	696
2007	0	0	5	1	73	199	234	279	124	56	0	0	971
2008	0	0	0	3	8	143	229	186	61	5	0	0	635
2009	0	0	0	6	16	129	97	160	47	0	0	0	455
2010	0	0	0	12	95	153	335	313	56	0	0	0	964
2011	0	0	0	5	59	151	381	218	73	7	0	0	894

**SNOWFALL (inches) 2011 GRAND RAPIDS (KGRR)**

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1982-83	0.0	0.0	0.0	0.0	5.2	8.2	5.7	2.9	13.2	0.7	0.0	0.0	35.9
1983-84	0.0	0.0	0.0	T	4.7	34.8	19.6	1.6	10.6	0.1	T	0.0	71.4
1984-85	0.0	0.0	0.0	0.0	T	15.7	22.6	21.3	6.7	3.3	0.0	0.0	69.6
1985-86	0.0	0.0	0.0	0.0	3.5	30.7	18.4	20.2	6.1	0.2	0.0	0.0	79.1
1986-87	0.0	0.0	0.0	0.0	5.3	12.7	19.2	0.9	5.7	3.8	0.0	0.0	47.6
1987-88	0.0	0.0	0.0	1.6	0.7	18.2	21.9	18.1	3.4	0.3	0.0	0.0	64.2
1988-89	0.0	0.0	0.0	0.2	5.5	14.4	8.7	25.1	6.3	2.2	T	0.0	62.4
1989-90	0.0	0.0	0.0	5.8	19.4	25.2	10.6	23.8	2.7	2.1	0.2	0.0	89.8
1990-91	T	0.0	0.0	T	2.0	18.6	27.7	9.5	2.8	T	0.0	0.0	60.6
1991-92	0.0	0.0	0.0	0.3	25.3	27.9	13.4	3.5	15.1	2.3	0.0	0.0	87.8
1992-93	0.0	0.0	0.0	2.3	4.2	14.2	11.1	18.6	11.6	3.3	0.0	0.0	65.3
1993-94	0.0	T	0.0	T	1.9	17.7	25.3	29.6	1.9	T	0.1	0.0	76.5
1994-95	0.0	0.0	0.0	0.0	0.6	8.9	21.6	18.6	4.4	0.8	0.0	0.0	54.9
1995-96	0.0	0.0	0.0	T	20.8	17.4	13.5	6.9	19.3	1.8	0.0	0.0	79.7
1996-97	0.0	0.0	0.0	0.0	5.6	22.8	45.5	14.0	5.2	3.5	T	0.0	96.6
1997-98	0.0	0.0	0.0	2.4	10.1	11.5	20.3	0.5	13.8	0.0	0.0	0.0	58.6
1998-99	0.0	0.0	0.0	0.0	0.2	7.5	46.8	8.0	14.2	T	T	0.0	76.7
1999-00	0.0	0.0	0.0	0.0	0.1	18.4	15.7	11.5	0.6	6.8	T	0.0	94.0
2000-01	0.0	0.0	0.0	0.0	19.0	59.2	4.1	7.4	4.1	0.2	T	0.0	104.0
2001-02	0.0	0.0	0.0	0.5	T	53.9	17.5	7.5	22.6	2.0	T	T	88.0
2002-03	0.0	0.0	0.0	T	7.6	15.6	30.2	18.9	14.4	1.3	T	T	74.0
2003-04	0.0	0.0	T	T	4.3	8.4	44.2	13.0	3.9	0.2	T	0.0	81.7
2004-05	0.0	0.0	0.0	T	10.3	13.1	27.8	15.1	14.4	1.0	T	T	69.2
2005-06	0.0	0.0	0.0	0.0	17.3	28.9	9.6	10.1	3.3	T	0.0	0.0	83.3
2006-07	0.0	0.0	0.0	2.1	0.3	11.6	15.4	33.6	13.6	6.7	0.0	0.0	107.0
2007-08	0.0	0.0	0.0	0.0	2.9	25.0	28.3	41.6	9.2	T	0.0	0.0	104.9
2008-09	0.0	0.0	0.0	T	10.0	54.6	29.9	10.0	0.4	T	0.0	0.0	72.2
2009-10	0.0	0.0	0.0	T	0.7	35.4	9.3	24.8	2.0	T	0.0	0.0	74.0
2010-11	0.0	0.0	0.0	0.0	0.1	11.4	21.2	38.2	1.2	1.9	0.0	0.0	72.0
2011-	0.0	0.0	0.0	T	0.7	4.5							
POR= 67 YRS	T	T	T	0.4	7.3	17.9	20.6	13.3	10.0	2.4	0.1	T	72.0

WBAN : 94860

**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 GRAND RAPIDS MICHIGAN (KGRR)

Grand Rapids, Michigan, is located in the west-central part of Kent County, in the picturesque Grand River valley about 30 air miles east of Lake Michigan. The Grand River, the longest stream in Michigan, flows through the city and bisects it into east and west sections. High hills rise on either side of the valley. Elevations range from 602 feet on the valley floor to 1,020 feet in the extreme southern part of Kent County, southwest of the airport.

Grand Rapids is under the natural climatic influence of Lake Michigan. In spring the cooling effect of Lake Michigan helps retard the growth of vegetation until the danger of frost has passed. The warming effect in the fall retards frost until most of the crops have matured. Fall is a colorful time of year in western Michigan, compensating for the late spring. During the winter, excessive cloudiness and numerous snow flurries occur with strong westerly winds. The tempering effect of Lake Michigan on cold waves coming in from the west and northwest is quite evident.

The tempering effect of the lake promotes the growth of a great variety of fruit trees and berries, especially apples, peaches, cherries, and blueberries. The intense cold of winter is modified, thus reducing winter kill of fruit trees. Summer days are pleasantly warm and most summer nights are quite comfortable, although there are about three weeks of hot, humid weather during most summers. Prolonged severe cold waves with below-zero temperatures are infrequent. The temperature usually rises to above zero during the daytime hours regardless of early morning readings.

July is the sunniest month and December is the month with the least sunshine. November through January is usually a period of excessive cloudiness and minimal sunshine.

Precipitation is usually ample for the growth and development of all vegetation. About one-half of the annual precipitation falls during the growing season, May through September. Droughts occur occasionally, but are seldom of protracted length. The snowfall season extends from mid-November to mid-March. Some winters have had continuous snow cover throughout this period, although there is usually a mid-winter thaw. The Grand River flows through the city and reaches critical heights a couple of times each year, generally once in January-February and again in March-April. Overflow is generally limited to the lowlands of the flood plain.

November is one of the windiest months and although violent windstorms are infrequent, gusts have on occasion exceeded 65 mph. Summer thunderstorms occasionally produce gusty winds over 60 mph.

# Station History

GRAND RAPIDS, MI

NAME	Begin Date	End Date	Latitude	Longitude	Elevation Feet	Relocation	Platform
GRAND RAPIDS KENT COUNTY AP	1963-11-01	1964-01-01	42° 52'	-85° 31'	784		COOP
GRAND RAPIDS KENT COUNTY AP	1973-01-01	1981-06-17	42° 52'	-85° 31'	784		COOP, WXSVC
GRAND RAPIDS KENT COUNTY AP	1964-01-01	1973-01-01	42° 52'	-85° 31'	784		AIRWAYS, COOP
GRAND RAPIDS KENT COUNTY INTL AP	1981-06-17	1995-08-01	42° 52'	-85° 31'	784		COOP, WXSVC
GRAND RAPIDS GERALD R FORD INTL AP	2009-06-24	Present	42° 52'	-85° 31'	803		ASOS, COOP, WXSVC
GRAND RAPIDS KENT COUNTY INTL AP	2000-01-01	2000-08-25	42° 52'	-85° 31'	803		ASOS, COOP, WXSVC
GRAND RAPIDS GERALD R FORD INTL AP	2000-08-25	2009-06-24	42° 52'	-85° 31'	803		ASOS, COOP, WXSVC
GRAND RAPIDS KENT COUNTY INTL AP	1995-08-01	1999-05-27	42° 52'	-85° 31'	793		ASOS, COOP, WXSVC
GRAND RAPIDS KENT COUNTY INTL AP	1999-05-27	2000-01-01	42° 52'	-85° 31'	803		ASOS, COOP, WXSVC

# Element History

Element	Begin Date	End Date	Frequency	Time Of Observation	Equipment *	Equipment * Modifications	Equipment Exposure
PRECIP	1995-07-01	1999-05-27	HOURLY	2400	UNIV	RCRD	
PRECIP	1999-05-27	2000-01-01	HOURLY	2400	TB	RCRD	
PRECIP	1982-01-01	1986-10-17	DAILY		UNIV	RCRD	
TEMP	1999-05-27	2000-01-01	DAILY	2400	HYGR		
TEMP	1963-11-01	1982-01-01	DAILY	2400			
PRECIP	2000-01-01	Present	HOURLY	2400	AWPAG	RCRD;HTD	
PRECIP	2000-01-01	2009-06-24	HOURLY	VAR	AWPAG	RCRD;HTD	
PRECIP	1982-01-01	1986-10-17	HOURLY	2400			
TEMP	1995-07-01	1999-05-27	DAILY	2400	MXMN		
PRECIP	1999-05-27	2000-01-01	DAILY	2400	TB	RCRD	
PRECIP	2000-01-01	Present	DAILY	2400	SRG		
PRECIP	1963-11-01	1982-01-01	DAILY		UNIV	RCRD	
TEMP	1982-01-01	1986-10-17	DAILY	2400			
TEMP	1986-10-17	1995-07-01	DAILY	2400	MXMN		
PRECIP	1986-10-17	1995-07-01	DAILY		UNIV	RCRD	
PRECIP	1986-10-17	1995-07-01	HOURLY	2400			
TEMP	2000-01-01	Present	DAILY	2400	HYGR		
PRECIP	2000-01-01	2009-06-24	DAILY	VAR	SRG		
PRECIP	1995-07-01	1999-05-27	DAILY	2400	UNIV	RCRD	

\* 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>

INQUIRES/COMMENTS CALL: (828) 271-4800, option 2

Fax Number : (828) 271-4876

TDD : (828) 271-4010

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)