

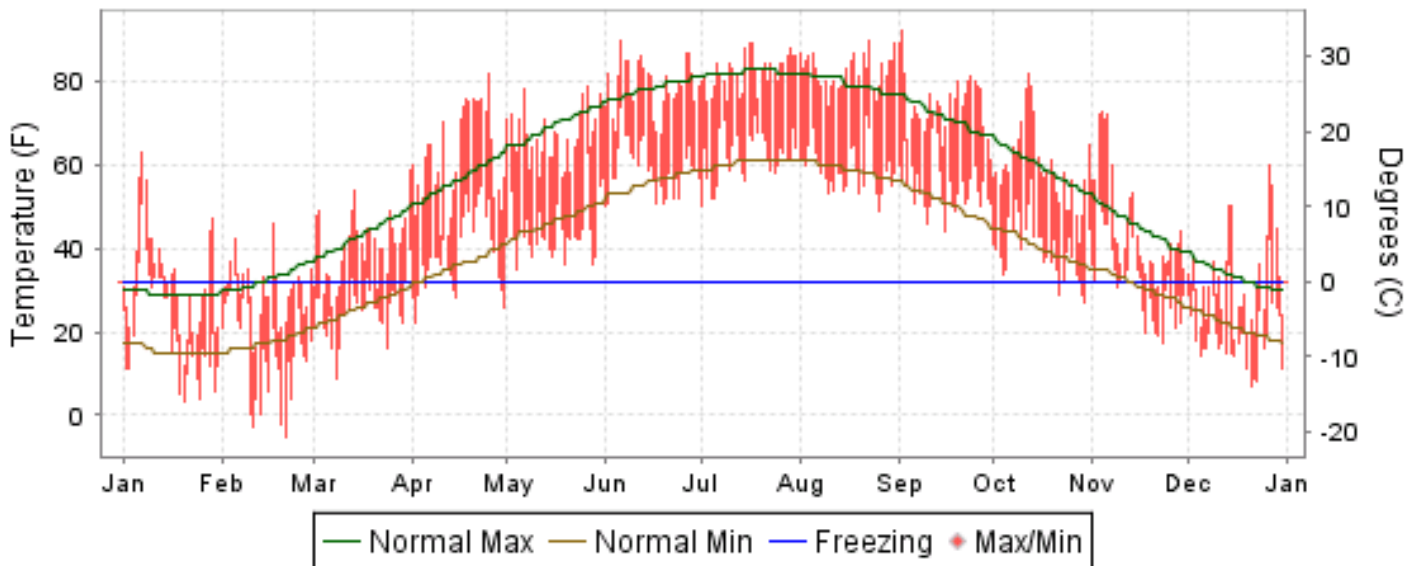


2008 LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA

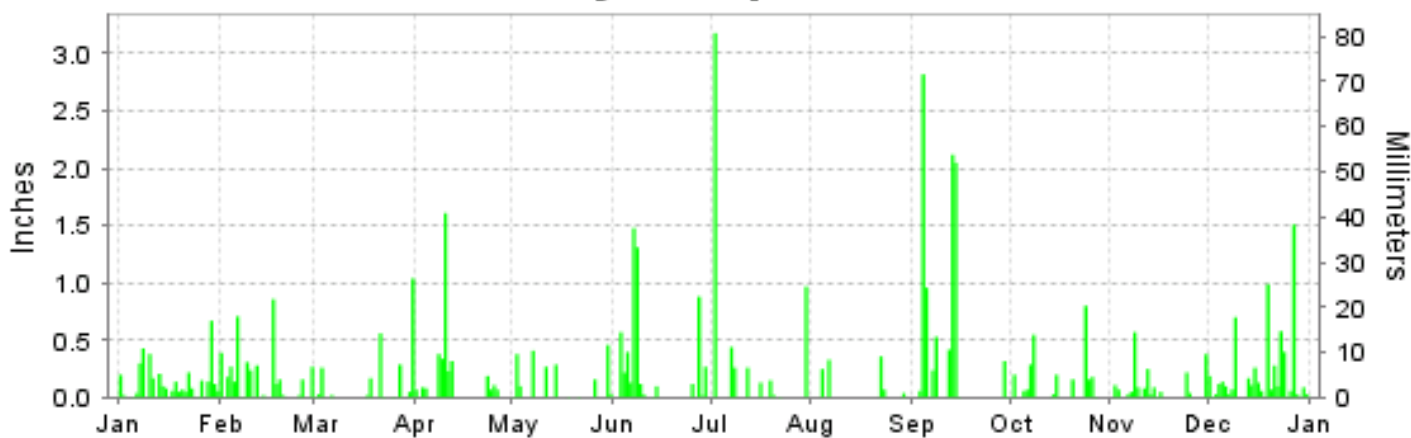
ISSN 0198-2575

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 2008

GRAND RAPIDS (KGRR)

LATITUDE: 42 ° 52'N LONGITUDE: -85 ° 31'W ELEVATION (FT): GRND: 790 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	32.6	29.6	40.5	62.2	67.0	78.8	82.1	82.3	74.5	59.7	45.6	32.7	57.3	
	HIGHEST DAILY MAXIMUM	63	46	59	82	79	90	89	90	92	82	73	60	92	
	DATE OF OCCURRENCE	07	17	31	25	26	06	17+	23	02	12	04	27	SEP 02	
	MEAN DAILY MINIMUM	20.6	15.0	25.0	38.8	44.0	59.0	62.2	59.0	54.9	40.0	32.3	19.7	39.2	
	LOWEST DAILY MINIMUM	3	-5	9	22	35	50	50	49	44	27	17	7	-5	
	DATE OF OCCURRENCE	20	21	08	02	04	01	01	26	16	30	23	21	FEB 21	
	AVERAGE DRY BULB	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	
	MEAN WET BULB	25.4	21.2	29.2	43.3	48.9	61.8	64.6	62.5		44.9	35.5	24.0		
	MEAN DEW POINT	21.2	16.8	22.3	34.8	41.2	56.9	59.6	57.2		39.4	30.2	19.9		
	NUMBER OF DAYS WITH:														
	MAXIMUM >= 90°	0	0	0	0	0	1	0	1	1	0	0	0	0	3
	MAXIMUM <= 32°	17	19	6	0	0	0	0	0	0	0	2	15	59	
MINIMUM <= 32°	24	28	28	8	0	0	0	0	0	0	5	16	29	138	
MINIMUM <= 0°	0	5	0	0	0	0	0	0	0	0	0	0	0	5	
H/C	HEATING DEGREE DAYS	1185	1231	990	431	298	20	1	3	62	468	776	1194	6659	
	COOLING DEGREE DAYS	0	0	0	3	8	143	229	186	61	5	0	0	635	
RH	MEAN (PERCENT)	78	78	67	59	60	68	67	65	73	70	72	78	70	
	HOUR 01 LST	80	80	72	71	70	80	79	80	82	79	75	81	77	
	HOUR 07 LST	82	83	75	71	67	73	74	77	84	81	78	80	77	
	HOUR 13 LST	72	72	57	45	47	53	50	45	58	54	62	75	58	
	HOUR 19 LST	79	75	67	49	53	63	61	59	74	71	73	79	67	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	3	9	2	0	0	2	0	2	1	0	2	5	26	
	THUNDERSTORMS	1	0	2	5	3	7	6	2	2	1	2	1	32	
CLOUDNESS	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.)	29.16	29.09	29.19	29.13	29.00	29.03	29.09	29.14	29.24	29.29	29.13	29.14	29.14	
	MEAN SEA-LEVEL PRESS. (IN.)	30.07	29.99	30.08	30.00	29.86	29.88	29.93	30.00	30.08	30.16	30.01	30.04	30.01	
WINDS	RESULTANT SPEED (MPH)	6.2	2.2	0.6	2.8	2.3	4.7	4.8	1.6	0.1	1.5	3.0	5.0	2.6	
	RES. DIR. (TENS OF DEGS.)	23	24	33	19	27	24	25	30	19	22	25	23	24	
	MEAN SPEED (MPH)	11.3	9.4	9.3	10.1	9.3	8.9	7.9	7.1	6.5	8.0	9.2	12.1	9.1	
	PREVAIL.DIR.(TENS OF DEGS.)	18	21	26	19	25	25	24	07	07	10	18	18	18	
	MAXIMUM 2-MINUTE WIND														
	SPEED (MPH)	39	33	30	40	30	41	37	28	21	33	26	48	48	
	DIR. (TENS OF DEGS.)	26	06	28	25	28	27	25	29	30	25	29	25	25	
	DATE OF OCCURRENCE	30	06	13	01	31	08	30	06	30	26	27	28	DEC 28	
	MAXIMUM 3-SECOND WIND:														
	SPEED (MPH)	52	41	39	51	43	55	49	40	25	41	36	61	61	
DIR. (TENS OF DEGS.)	26	06	27	24	28	28	24	30	31	26	29	23	23		
DATE OF OCCURRENCE	29	06	13	01	17	08	30	06	30	26	27	28	DEC 28		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	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	
	GREATEST 24-HOUR (IN.)	0.79	0.86	1.04	1.81	0.46	2.73	3.18	0.36	3.76	0.92	0.57	1.51	3.76	
	DATE OF OCCURRENCE	29-30	17	31	10-11	30	07-08	02	22	04-05	24-25	08	27	SEP 04-05	
	NUMBER OF DAYS WITH:														
	PRECIPITATION 0.01	24	17	12	12	11	14	9	5	11	12	15	26	168	
PRECIPITATION 0.10	13	13	5	7	7	11	7	3	8	8	5	9	96		
PRECIPITATION 1.00	0	0	1	1	0	2	1	0	3	0	0	1	9		
SNOWFALL	SNOW,ICE PELLETS,HAIL														
	TOTAL (IN.)	28.3	41.6	9.2	T	0.0	0.0	0.0	0.0	0.0	T	10.0	54.6	143.7	
	GREATEST 24-HOUR (IN.)	4.2	8.1	6.6	T	0.0	0.0	0.0	0.0	0.0	T	5.3	10.2	10.2	
	DATE OF OCCURRENCE	22	06	21	13+						26	30	19	DEC 19	
	MAXIMUM SNOW DEPTH (IN.)	7	15	12	0	0	0	0	0	0	0	T	17	17	
	DATE OF OCCURRENCE	27+	13	02+								26+	24	DEC 24	
NUMBER OF DAYS WITH:															
SNOWFALL >= 1.0	14	11	2	0	0	0	0	0	0	0	2	15	44		

NORMALS, MEANS, AND EXTREMES GRAND RAPIDS (KGRR)

LATITUDE: 42 ° 52'N LONGITUDE: -85 ° 31'W ELEVATION (FT): GRND: 790 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	71	30.1	31.7	42.4	56.9	69.3	78.3	82.9	80.7	72.5	60.9	45.9	34.2	57.2
	HIGHEST DAILY MAXIMUM	45	63	69	78	88	79	90	100	100	93	88	77	69	100
	YEAR OF OCCURRENCE		2008	1999	2000	1970	2008	2008	1988	1964	1973	2007	1975	2001	JUL 1988
	MEAN OF EXTREME MAXS.	72	48.4	49.7	67.2	78.9	85.1	91.2	92.4	91.6	87.5	79.1	66.3	53.0	74.2
	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	71	16.4	16.6	24.9	36.1	46.4	55.8	60.8	59.0	50.9	41.0	31.1	21.6	38.4
	LOWEST DAILY MINIMUM	45	-22	-19	-8	3	-22	41	39	27	18	5	-18	-22	-22
	YEAR OF OCCURRENCE		1994	1973	1978	1982	1994	1994	1983	1976	1991	1988	1977	1983	JUN 1994
	MEAN OF EXTREME MINS.	72	-5.1	-3.0	5.7	20.9	31.2	41.5	48.0	46.5	35.4	26.3	16.0	1.6	22.1
	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	71	23.3	24.2	33.7	46.5	57.9	67.2	71.8	69.9	61.7	51.0	38.5	27.9	47.8
	MEAN WET BULB	25	22.5	23.6	30.5	40.8	51.0	60.3	64.3	63.6	56.5	45.6	35.5	26.5	43.4
	MEAN DEW POINT	25	19.6	20.1	26.3	35.7	46.6	56.7	61.3	61.1	53.4	42.4	32.4	23.8	40.0
	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(VISBY <= 1/4 MI)	45	2.3	2.3	2.5	1.5	1.4	1.2	1.3	1.9	1.9	1.9	2.0	3.3	23.5
	THUNDERSTORMS	61	0.3	0.3	1.7	3.4	4.0	5.7	6.2	5.1	3.8	1.7	1.2	0.3	33.7
CLOUDNESS	MEAN: SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH: CLEAR														
	PARTLY CLOUDY CLOUDY														
PR	MEAN STATION PRESSURE(IN)	25	29.16	29.18	29.16	29.11	29.07	29.11	29.13	29.18	29.19	29.18	29.16	29.17	29.15
	MEAN SEA-LEVEL PRES. (IN)	25	30.06	30.07	30.04	29.99	29.97	29.96	29.98	30.03	30.04	30.05	30.04	30.06	30.02
WINDS	MEAN SPEED (MPH)	25	11.1	10.7	10.8	10.8	9.7	8.6	8.2	7.5	8.0	9.2	10.4	10.5	9.6
	PREVAIL.DIR.(TENS OF DEGS)	34	26	25	26	07	26	25	25	25	19	19	19	21	25
	MAXIMUM 2-MINUTE: SPEED (MPH)	13	45	55	47	52	45	45	51	41	44	47	49	48	55
	DIR. (TENS OF DEGS)		24	24	25	19	24	24	26	22	23	24	23	25	24
	YEAR OF OCCURRENCE		1996	1999	2002	1999	1996	1996	1999	2007	2007	1996	1998	2008	FEB 1999
	MAXIMUM 3-SECOND SPEED (MPH)	13	55	64	58	61	55	55	58	55	58	60	66	64	66
	DIR. (TENS OF DEGS)		24	25	25	25	24	28	29	23	24	25	23	20	23
	YEAR OF OCCURRENCE		1996	1999	2002	1997	1996	2008	1999	2007	2007	1996	1998	2007	NOV 1998
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)	45	4.67	4.80	5.12	6.69	4.67	5.66	8.83	8.46	11.85	7.38	7.90	6.63	11.85
	YEAR OF OCCURRENCE		2005	1997	1974	1999	2005	2008	1992	1987	1986	2001	2003	1971	SEP 1986
	MINIMUM MONTHLY (IN)	45	0.47	0.33	0.54	.77	0.47	0.47	0.81	0.14	T	0.60	0.95	T	T
	YEAR OF OCCURRENCE		1981	1969	2001	2005	1981	1981	1976	1969	1979	1964	1986	1952	SEP 1979
	MAXIMUM IN 24 HOURS (IN)	45	2.16	3.05	1.78	2.66	2.16	2.73	3.68	3.68	4.55	3.19	3.00	2.79	4.55
	YEAR OF OCCURRENCE		1993	1997	1985	1999	1993	2008	1994	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)	45	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)	45	16.1	9.1	13.6	9.8	16.1	16.1	T	T	T	8.4	10.4	15.1	16.1
	YEAR OF OCCURRENCE		1978	1985	2002	1975	1978	1978	1990	1993	1967	1967	1991	1970	JUN 1978
	MAXIMUM SNOW DEPTH (IN)	60	27	21	15	10	27	27	0	0	0	5	11	22	27
	YEAR OF OCCURRENCE		1978	1985	2007	1975	1978	1978				1967	1951	1951	JUN 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) 2008 GRAND RAPIDS (KGRR)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1979	2.09	0.61	3.72	3.56	1.37	4.16	2.27	4.33	T	2.10	5.46	2.97	32.64
1980	1.76	1.76	1.74	3.64	3.19	4.00	5.90	3.18	4.57	1.99	1.57	3.60	36.90
1981	0.47	2.03	1.29	6.11	8.29	4.22	3.74	2.95	9.52	2.54	2.58	1.10	44.84
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
POR= 72 YRS	2.17	1.73	2.56	3.27	3.34	3.67	3.41	3.12	3.68	2.75	3.12	2.64	35.46

WBAN : 94860

AVERAGE TEMPERATURE (°F) 2008 GRAND RAPIDS (KGRR)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1979	17.1	15.0	36.9	44.5	57.7	67.6	71.1	68.5	63.4	51.5	40.5	33.0	47.2
1980	25.1	22.7	32.5	47.0	59.9	64.4	72.7	72.6	62.7	45.8	37.5	25.1	47.3
1981	20.8	30.2	35.1	47.3	55.5	68.6	72.1	70.7	60.9	48.2	39.8	28.7	48.2
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
POR= 71 YRS	23.3	24.2	33.7	46.5	57.9	67.2	71.8	69.9	61.7	51.0	38.5	27.9	47.8

HEATING DEGREE DAYS (base 65°F) 2008 GRAND RAPIDS (KGRR)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1979-80	7	31	109	431	731	984	1230	1221	1000	541	189	106	6580
1980-81	0	4	115	588	821	1227	1363	969	919	525	298	8	6837
1981-82	7	5	173	513	749	1116	1475	1196	998	689	91	98	7110
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-	1	3	62	468	776	1194							

WBAN : 94860

COOLING DEGREE DAYS (base 65°F) 2008 GRAND RAPIDS (KGRR)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1979	0	0	0	0	46	129	204	147	69	19	0	0	614
1980	0	0	0	6	34	96	247	245	53	0	0	0	681
1981	0	0	0	0	13	124	236	190	55	0	0	0	618
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

SNOWFALL (inches) 2008 GRAND RAPIDS (KGRR)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1979-80	0.0	0.0	0.0	T	9.4	2.6	13.3	12.6	6.6	4.0	T	0.0	48.5
1980-81	0.0	0.0	0.0	0.4	5.5	17.3	8.1	18.8	1.4	T	0.0	0.0	51.5
1981-82	0.0	0.0	0.0	T	4.4	8.9	30.3	6.7	11.8	12.4	0.0	0.0	74.5
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		0.1	18.4	15.7	11.5	0.6	6.8	T	0.0	
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	94.0
2001-02	0.0	0.0	0.0	0.5	T	53.9	17.5	7.5	22.6	2.0	T	T	104.0
2002-03	0.0	0.0	0.0	T	7.6	15.6	30.2	18.9	14.4	1.3	T	T	88.0
2003-04	0.0	0.0	T	T	4.3	8.4	44.2	13.0	3.9	0.2	T	0.0	74.0
2004-05	0.0	0.0	0.0	T	10.3	13.1	27.8	15.1	14.4	1.0	T	T	81.7
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	69.2
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	83.3
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	107.0
2008-	0.0	0.0	0.0	T	10.0	54.6							
POR= 64 YRS	T	T	T	0.5	7.6	18.0	20.6	12.8	10.3	2.4	0.1	T	72.3

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.</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> <p>NOTE: 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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2008

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 Location

GRAND RAPIDS

LOCATION	Occupied From	Occupied To	Airline Distances and Directions from previous Location	Latitude		Longitude		ELEVATION ABOVE								REMARKS
				NORTH	WEST	SEA LEVEL	GROUND							AUTOMATIC OBSERVING EQUIPMENT *		
						GROUND TEMPERATURE SITE	WIND INSTRUMENT	EXTREME THERMOMETERS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING BUCKET RAIN GAUGE	WEIGHING RAIN GAUGE	8 INCH RAIN GAUGE		HYGROTHERMOMETER	
*NOTES:																
<u>AIRPORT</u>																
Kent County Airport 4 miles South of PO	9/1/34	11/21/39	NA	42° 54'	85° 40'	681	45	5	4					4	d. Not moved 11/21/39.	
Kent County Airport	11/21/39	11/24/63	50 ft. S	42° 54'	85° 40'	681	d45 e48 f63 g64	6	5				g4	4	f. Effective 7/25/47. g. Equipment from city office installed 8/3/50. h. Minor adjustment 11/30/63. i. Installed on roof 12/1/63. j. Minor adjustment 1/24/64. k. Moved to ground 4/11/67. m. Installed 9/1/72.	
Terminal Building Kent County Airport (formerly know as Cascade Airport)	11/24/63	08/01/95	6 mi. ESE	42° 53'	85° 31'	793	20 n20		4 j4	44 i44	44 k3	4 h4		5 p5 q5	n. Moved 510' SE 11/23/77. p. Type change 11/26/84. q. Moved 574' NW 6/1986.	
Gerald R. Ford Intl. Airport	08/01/95	Present	NA	42° 53'	85° 31'	r785								S	ASOS Commissioned 08/01/95 r. Ground elevation.	

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* NOTES: For earlier station history see previous editions.