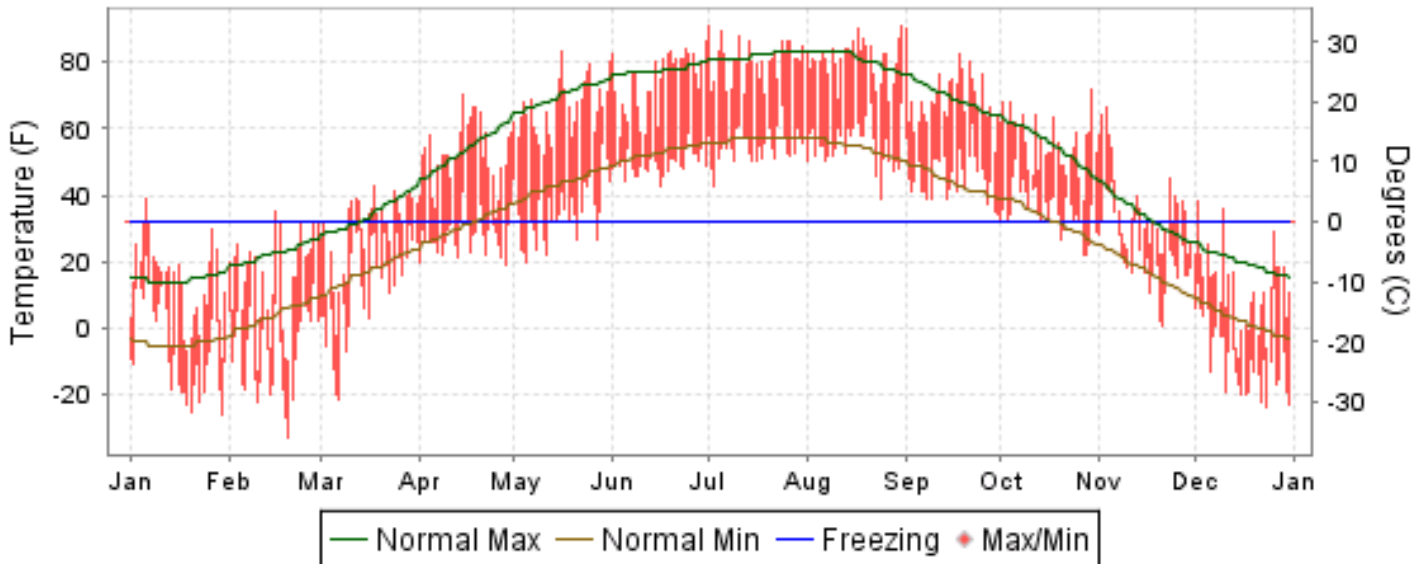




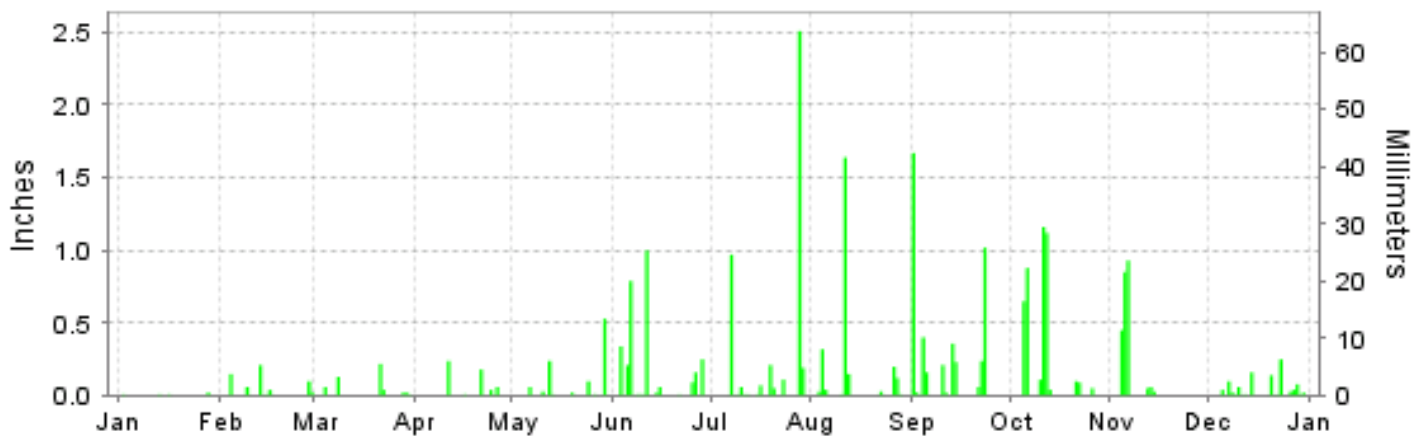
2008 LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA

ISSN 1524-5837

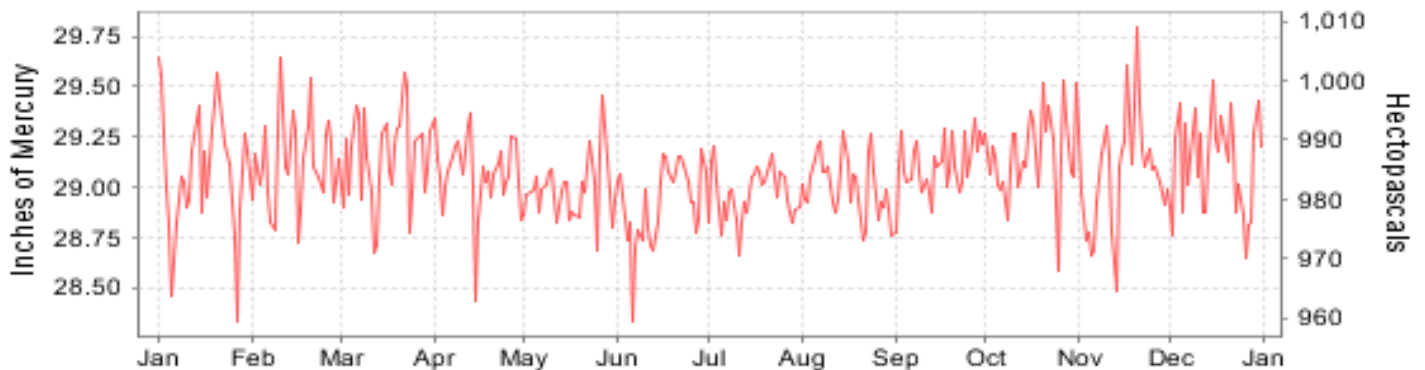
GRAND FORKS, NORTH DAKOTA (KGFK) Daily Max/Min Temperature



Daily Precipitation



Daily Station Pressure



I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC DATA CENTER.

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NATIONAL
CLIMATIC DATA CENTER
ASHEVILLE, NORTH CAROLINA

Thomas R. Karl
DIRECTOR
NATIONAL CLIMATIC DATA CENTER

METEOROLOGICAL DATA FOR 2008

GRAND FORKS (KGFK)

LATITUDE: 47° 56'N LONGITUDE: -97° 10'W ELEVATION (FT): GRND: 840 BARO: 842 TIME ZONE: CENTRAL (UTC -6) WBAN: 14916

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	13.2	14.9	29.7	52.3	66.1	74.2	80.3	80.7	69.0	56.0	36.6	12.1	48.8	
	HIGHEST DAILY MAXIMUM	39	35	43	70	83	86	91	91	90	72	66	38	91	
	DATE OF OCCURRENCE	06	16	18	15	16	30	01	31	01	30	03	02	AUG 31	
	MEAN DAILY MINIMUM	-6.2	-7.0	12.8	27.6	35.1	49.5	54.8	55.2	45.7	35.4	22.4	-8.8	26.4	
	LOWEST DAILY MINIMUM	-26	-33	-21	19	20	43	43	39	34	22	1	-24	-33	
	DATE OF OCCURRENCE	30	20	07	28	05	16	03	24	30	28+	21	24	FEB 20	
	AVERAGE DRY BULB	3.5	4.0	21.3	40.0	50.6	61.9	67.6	68.0	57.4	45.7	29.5	1.7	37.6	
	MEAN WET BULB	4.2	4.2	19.9	34.1	42.9	55.0	61.6	61.3	53.2	41.3	27.8	1.9	34.0	
	MEAN DEW POINT	-0.5	-0.6	15.3	24.6	32.7	49.2	57.5	56.9	49.5	36.6	24.4	-2.4	28.6	
	NUMBER OF DAYS WITH:														
	MAXIMUM >= 90°	0	0	0	0	0	0	1	2	1	0	0	0	4	
MAXIMUM <= 32°	30	28	15	0	0	0	0	0	8	0	13	4	98		
MINIMUM <= 32°	31	29	31	27	11	0	0	0	0	11	24	31	195		
MINIMUM <= 0°	19	19	5	0	0	0	0	0	0	0	0	24	67		
H/C	HEATING DEGREE DAYS	1900	1762	1348	744	441	111	18	27	240	591	1057	1957	10196	
	COOLING DEGREE DAYS	0	0	0	0	0	22	106	129	17	0	0	0	274	
RH	MEAN (PERCENT)	77	76	76	58	54	65	71	70	77	75	81	78	72	
	HOUR 00 LST	79	78	79	68	67	77	85	84	88	82	85	80	79	
	HOUR 06 LST	77	79	82	77	75	84	88	89	91	87	86	80	83	
	HOUR 12 LST	74	73	70	45	39	52	56	55	62	61	75	73	61	
	HOUR 18 LST	78	75	71	40	38	50	53	53	65	69	79	79	63	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	4	2	1	1	1	0	1	1	2	0	0	0	13	
	THUNDERSTORMS	0	0	0	2	2	6	5	4	3	1	2	0	25	
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.)	28.95	29.13	29.14	29.07	29.00	28.93	28.97	29.03	29.11	29.17	29.09	29.11	29.06	
	MEAN SEA-LEVEL PRESS. (IN.)	29.97	30.10	30.08	29.99	29.90	29.82	29.86	29.90	30.01	30.08	30.02	30.08	29.98	
WINDS	RESULTANT SPEED (MPH)	3.1	2.5	1.1	2.6	5.0	2.2	2.3	4.6	1.4	2.8	3.2	3.3	1.2	
	RES. DIR. (TENS OF DEGS.)	25	31	26	02	03	31	27	18	22	23	34	32	30	
	MEAN SPEED (MPH)	10.1	11.7	11.5	12.3	11.6	9.8	8.8	9.2	9.0	9.5	10.9	11.2	10.5	
	PREVAIL.DIR.(TENS OF DEGS.)	17	35	17	35	02	29	30	16	17	18	35	35	16	
	MAXIMUM 2-MINUTE WIND														
	SPEED (MPH)	39	43	41	35	38	37	44	36	41	37	35	41	44	
	DIR. (TENS OF DEGS.)	31	34	18	34	32	36	15	16	18	32	35	36	15	
	DATE OF OCCURRENCE	29	09	29	26	17	28	28	26	01	26	06	14	JUL 28	
	MAXIMUM 3-SECOND WIND:														
	SPEED (MPH)	51	52	54	45	48	49	49	45	51	51	46	48	54	
DIR. (TENS OF DEGS.)	31	33	18	33	36	36	14	15	18	30	36	36	18		
DATE OF OCCURRENCE	28	09	29	26	17	28	28	26	01	26	06	14	MAR 29		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.05	0.59	0.50	0.53	1.00	2.96	4.21	2.55	4.39	4.20	2.37	0.98	24.33	
	GREATEST 24-HOUR (IN.)	0.02	0.21	0.23	0.24	0.53	1.00	2.70	1.79	1.69	2.07	1.56	0.26	2.70	
	DATE OF OCCURRENCE	28	13	21-22	11	29	11	28-29	11-12	01-02	11-12	05-06	22-23	JUL 28-29	
	NUMBER OF DAYS WITH:														
PRECIPITATION 0.01	4	7	7	5	8	13	12	10	11	9	6	15	107		
PRECIPITATION 0.10	0	3	2	2	3	6	5	5	7	6	3	5	47		
PRECIPITATION 1.00	0	0	0	0	0	1	1	1	2	2	0	0	7		
SNOWFALL	SNOW,ICE PELLETS,HAIL														
	TOTAL (IN.)	1.5	9.8	7.7	5.1	0.2	0.0	0.0	0.0	0.0	0.1	1.0	26.7	52.1	
	GREATEST 24-HOUR (IN.)	0.4	3.0	2.8	4.2	0.2	0.0	0.0	0.0	0.0	0.1	0.7	5.4	5.4	
	DATE OF OCCURRENCE	12	13	08	11	10					26	14	20	DEC 20	
	MAXIMUM SNOW DEPTH (IN.)	10	12	12	4	0	0	0	0	0	0	T	10	12	
	DATE OF OCCURRENCE	01	17	11+	11							14+	31+	MAR 11+	
NUMBER OF DAYS WITH:															
SNOWFALL >= 1.0	0	3	3	1	0	0	0	0	0	0	0	7	14		

NORMALS, MEANS, AND EXTREMES GRAND FORKS (KGFK)

LATITUDE: 47 ° 56'N LONGITUDE: -97 ° 10'W ELEVATION (FT): GRND: 840 BARO: 842 TIME ZONE: CENTRAL (UTC -6) WBAN: 14916

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	14.9	22.4	34.3	53.6	70.0	77.6	81.9	81.0	69.7	55.6	34.1	20.1	51.3	
	MEAN DAILY MAXIMUM	19	15.9	19.5	32.8	52.4	67.1	74.1	81.7	79.7	68.7	55.7	35.5	21.5	50.4	
	HIGHEST DAILY MAXIMUM	11	47	67	64	88	95	96	98	95	96	85	73	50	98	
	YEAR OF OCCURRENCE		2002	2000	2000	2005	2006	2002	2006	2003	2001	2003	1999	1999	1999	JUL 2006
	MEAN OF EXTREME MAXS.	19	38.1	40.6	54.6	79.8	85.5	89.3	91.7	90.3	91.3	76.6	60.5	41.1	70.0	
	NORMAL DAILY MINIMUM	30	-4.3	3.7	17.1	31.0	43.5	52.8	56.8	54.5	44.3	33.0	17.4	2.5	29.4	
	MEAN DAILY MINIMUM	19	-2.2	0.0	13.9	30.1	41.2	51.0	56.9	54.2	44.2	33.3	18.5	3.9	28.8	
	LOWEST DAILY MINIMUM	11	-43	-33	-25	6	20	33	37	32	25	12	-13	-26	-43	
	YEAR OF OCCURRENCE		2004	2008	2003	2000	2008	1998	2001	2004	2003	2001	2007	2007	2007	JAN 2004
	MEAN OF EXTREME MINS.	19	-23.2	-21.8	-9.9	17.0	27.0	39.4	45.7	40.8	30.5	18.3	-1.4	-17.0	12.1	
	NORMAL DRY BULB	30	5.3	13.1	25.7	42.3	56.8	65.2	69.4	67.8	57.0	44.3	25.8	11.3	40.3	
	MEAN DRY BULB	19	6.8	9.8	23.4	41.3	54.2	62.9	69.3	67.0	56.4	44.5	27.0	12.8	39.6	
	MEAN WET BULB	11	7.5	10.3	21.9	35.7	45.9	56.4	62.2	59.5	51.1	38.0	25.0	11.7	35.4	
	MEAN DEW POINT	11	6.0	8.8	19.9	33.2	43.2	54.5	60.8	57.9	48.9	36.0	23.8	10.4	33.6	
	NORMAL NO. DAYS WITH: MAXIMUM >= 90	30	0.0	0.0	0.0	0.2	1.1	2.1	3.6	3.9	1.2	*	0.0	0.0	12.1	
	MAXIMUM <= 32	30	27.2	21.1	12.4	1.7	0.0	0.0	0.0	0.0	0.0	0.8	14.2	25.1	102.5	
	MINIMUM <= 32	30	31.0	27.8	27.5	17.3	3.4	0.0	*	0.1	2.2	14.6	28.1	30.9	182.9	
MINIMUM <= 0	30	19.4	12.9	5.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.0	14.6	55.3		
H/C	NORMAL HEATING DEG. DAYS	30	1860	1468	1233	689	294	88	27	53	276	655	1186	1660	9489	
	NORMAL COOLING DEG. DAYS	30	0	0	0	2	30	85	148	127	27	1	0	0	420	
RH	NORMAL (PERCENT)	30														
	hour 00 LST	30														
	hour 06 LST	30														
	hour 12 LST	30														
	hour 18 LST	30														
S	PERCENT POSSIBLE SUNSHINE															
W/O	MEAN NO. DAYS WITH: HEAVY FOG(VISBY <= 1/4 MI)	11	2.2	2.1	3.4	1.0	0.9	0.6	1.4	2.0	1.6	1.5	1.5	2.5	20.7	
	THUNDERSTORMS	11	0.0	0.5	0.4	1.1	4.1	6.5	6.3	5.8	2.9	0.7	1.4	0.4	30.1	
CLOUDNESS	MEAN: SUNRISE-SUNSET (OKTAS)															
	MIDNIGHT-MIDNIGHT (OKTAS)															
	MEAN NO. DAYS WITH: CLEAR															
	PARTLY CLOUDY CLOUDY															
PR	MEAN STATION PRESSURE(IN)	11	29.14	29.14	29.14	29.08	29.00	28.97	29.03	29.06	29.03	29.09	29.08	29.11	29.07	
	MEAN SEA-LEVEL PRES. (IN)	11	30.10	30.10	30.09	30.00	29.90	29.87	29.92	29.95	29.94	30.01	30.02	30.06	30.00	
WINDS	MEAN SPEED (MPH)	11	10.6	11.0	11.0	11.2	11.5	9.7	8.4	8.8	9.6	10.4	10.5	10.6	10.3	
	PREVAIL.DIR(TENS OF DEGS)	3	18	35	35	35	34	35	18	16	16	32	35	18	18	
	MAXIMUM 2-MINUTE: SPEED (MPH)	11	43	47	45	41	49	46	45	62	41	39	46	41	62	
	DIR. (TENS OF DEGS)		31	27	31	31	19	26	35	30	18	35	31	36	30	
	YEAR OF OCCURRENCE		2006	2002	2004	2000	2004	2003	2006	2001	2008	2004	1999	2008	AUG 2001	
	MAXIMUM 3-SECOND SPEED (MPH)	11	53	58	54	51	66	58	53	70	51	51	54	49	70	
	DIR. (TENS OF DEGS)		31	28	18	15	19	25	34	31	18	30	31	35	31	
YEAR OF OCCURRENCE		2006	2002	2008	2007	2004	2003	2006	2001	2008	2008	1999	2004	AUG 2001		
PRECIPITATION	NORMAL (IN)	30	0.68	0.58	0.89	1.23	2.21	3.03	3.06	2.72	1.96	1.70	0.99	0.55	19.60	
	MAXIMUM MONTHLY (IN)	11	0.99	1.65	2.30	1.90	5.74	7.50	7.17	6.21	4.39	5.79	3.94	0.98	7.50	
	YEAR OF OCCURRENCE		1999	2000	2007	1999	2004	2005	2001	2002	2008	1998	2000	2008	JUN 2005	
	MINIMUM MONTHLY (IN)	11	0.05	0.03	0.08	0.41	0.84	0.68	0.76	1.00	0.26	0.12	0.11	0.24	0.03	
	YEAR OF OCCURRENCE		2008	2002	1998	2004	2000	2004	2006	2003	1998	1999	2004	1998	FEB 2002	
	MAXIMUM IN 24 HOURS (IN)	11	0.44	1.54	0.79	0.93	1.80	4.30	3.32	3.18	2.00	2.07	1.56	0.50	4.30	
	YEAR OF OCCURRENCE		1999	2000	2006	1999	2001	2002	2002	2005	2004	2008	2008	2006	JUN 2002	
	NORMAL NO. DAYS WITH: PRECIPITATION >= 0.01	30	9.4	7.2	7.8	7.5	9.8	10.5	10.5	9.3	7.9	7.6	7.0	8.2	102.7	
PRECIPITATION >= 1.00	30	0.0	0.0	0.0	0.1	0.3	0.6	0.7	0.3	0.4	0.3	0.1	0.0	2.8		
SNOWFALL	NORMAL (IN)	30	10.8	6.2	6.8	2.6	0.*	0.0	0.0	0.0	0.*	1.1	8.5	8.3	44.3	
	MAXIMUM MONTHLY (IN)	11	27.3	12.3	16.1	9.0	0.8	T	0.0	0.0	0.0	10.9	22.4	26.7	27.3	
	YEAR OF OCCURRENCE		1999	2006	2007	2003	2002	2000				2001	1998	2008	JAN 1999	
	MAXIMUM IN 24 HOURS (IN)	11	12.9	4.0	4.5	3.5	0.5	T	0.0	0.0	0.0	10.8	12.4	6.9	12.9	
	YEAR OF OCCURRENCE		2004	2001	1999	2000	2002	2000				2001	1998	2000	JAN 2004	
	MAXIMUM SNOW DEPTH (IN)	11	18	13	16	4	0	0	0	0	0	11	16	14	18	
	YEAR OF OCCURRENCE		2004	2006	2007	2008						2001	1998	2007	JAN 2004	
NORMAL NO. DAYS WITH: SNOWFALL >= 1.0	30	2.7	1.9	2.1	0.6	0.0	0.0	0.0	0.0	0.0	0.3	2.5	2.6	12.7		

PRECIPITATION (inches) 2008 GRAND FORKS (KGFK)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1998	0.45	1.49	0.08	1.04	2.37	5.31	2.30	1.68	0.26	5.79	1.73	0.24	22.74
1999	0.99	0.23	1.04	1.90	5.01	3.48	1.63	4.44	2.55	0.12	T	0.35	21.74
2000	0.07	1.65	0.56	1.06	0.84	7.20	2.32	2.45	1.53	2.51	3.94	0.53	24.66
2001	0.14	0.40	0.21	1.34	3.73	1.74	7.17	3.20	1.37	1.50	0.43	0.28	21.51
2002	0.06	0.03	0.37	0.77	1.66	6.03	4.36	6.21	0.87	1.00	0.21	0.32	21.89
2003	0.22	0.19	0.47	1.00	4.27	3.25	2.87	1.00	2.38	0.73	0.71	0.67	17.76
2004	0.73	0.34	1.59	0.41	5.74	0.68	2.05	2.34	4.24	2.19	0.11	0.96	21.38
2005	0.69	0.17	0.30	0.65	3.89	7.50	0.91	5.27	1.27	2.16	1.33	0.50	24.64
2006	0.61	0.57	1.34	1.09	2.37	0.94	0.76	3.18	2.45	1.03	0.42	0.62	15.38
2007	0.22	0.60	2.30	0.47	5.12	4.19	1.50	1.79	0.80	3.09	0.26	0.75	21.09
2008	0.05	0.59	0.50	0.53	1.00	2.96	4.21	2.55	4.39	4.20	2.37	0.98	24.33
POR= 19 YRS	0.50	0.60	0.74	0.84	2.89	3.37	2.75	3.03	1.87	1.80	1.08	0.55	20.02

WBAN : 14916

AVERAGE TEMPERATURE (°F) 2008 GRAND FORKS (KGFK)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1998	8.7	25.7	24.4	47.6	58.5	61.4	68.8	70.1	60.4	45.4	25.5	12.2	42.4
1999	3.7	17.1	26.1	43.7	55.2	63.5	69.1	65.4	53.5	41.9	34.2	20.5	41.2
2000	7.4	22.8	34.0	39.6	53.9	61.3	69.3	67.2	55.5	45.3	24.6	-.4	40.0
2001	13.8	3.8	24.4	42.5	55.9	63.3	69.7	69.4	57.9	41.2	36.5	16.8	41.3
2002	13.9	21.9	17.8	38.7	47.9	66.5	71.1	66.3	59.5	34.6	25.6	18.7	40.2
2003	8.5	4.7	21.6	42.9	53.7	63.7	68.2	70.3	56.7	46.6	20.6	17.6	39.6
2004	-.8	11.8	25.4	40.8	49.5	60.0	65.8	59.6	59.8	44.6	31.7	15.3	38.6
2005	1.2	11.2	23.7	46.5	52.4	66.2	69.7	65.7	60.0	44.6	29.0	15.9	40.5
2006	21.3	4.9	22.9	48.2	56.2	66.3	72.4	68.2	56.8	41.0	28.7	22.5	42.5
2007	10.3	3.2	26.5	40.9	56.6	66.6	71.4	65.4	58.1	47.0	28.4	7.2	40.1
2008	3.5	4.0	21.3	40.0	50.6	61.9	67.6	68.0	57.4	45.7	29.5	1.7	37.6
POR= 19 YRS	6.8	9.8	23.4	41.3	54.2	62.9	69.3	67.0	56.4	44.5	27.0	12.8	39.6

HEATING DEGREE DAYS (base 65°F) 2008 GRAND FORKS (KGFK)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1997-98							1740	1093	1252	515	206	150	
1998-99	20	3	178	597	1179	1630	1895	1334	1199	631	306	104	9076
1999-00	18	52	337	708	915	1375	1779	1219	950	754	338	150	8595
2000-01	29	43	287	604	1209	2023	1580	1708	1249	673	283	124	9812
2001-02	23	33	240	730	849	1485	1575	1202	1455	782	544	65	8983
2002-03	10	49	215	935	1176	1430	1743	1684	1341	657	344	84	9668
2003-04	18	23	285	567	1328	1462	2032	1535	1221	719	474	163	9827
2004-05	76	168	186	623	991	1536	1971	1500	1273	554	393	42	9313
2005-06	38	52	181	626	1074	1518	1354	1678	1297	498	305	36	8657
2006-07	6	11	273	741	1083	1309	1688	1721	1184	715	263	67	9061
2007-08	10	61	250	551	1091	1787	1900	1762	1348	744	441	111	10056
2008-	18	27	240	591	1057	1957							

WBAN : 14916

COOLING DEGREE DAYS (base 65°F) 2008 GRAND FORKS (KGFK)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1998	0	0	0	0	12	49	144	168	44	0	0	0	417
1999	0	0	0	0	11	61	152	73	2	0	0	0	299
2000	0	0	0	0	1	44	169	120	7	0	0	0	341
2001	0	0	0	3	6	81	179	178	35	0	0	0	482
2002	0	0	0	0	21	121	203	94	57	0	0	0	496
2003	0	0	0	0	5	52	125	195	43	3	0	0	423
2004	0	0	0	0	0	21	105	10	38	0	0	0	174
2005	0	0	0	5	8	85	191	82	39	0	0	0	410
2006	0	0	0	0	39	79	240	120	35	5	0	0	518
2007	0	0	0	0	9	120	216	82	53	0	0	0	480
2008	0	0	0	0	0	22	106	129	17	0	0	0	274

SNOWFALL (inches) 2008 GRAND FORKS (KGFK)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2000-01	0.0	0.0	0.0	0.2	11.1	18.7	3.3	9.7	1.3	1.0	0.0	0.0	45.3
2001-02	0.0	0.0	0.0	10.9	8.2	3.8	2.3	0.6	10.7	1.3	0.8	0.0	38.6
2002-03	0.0	0.0	0.0	1.8	3.0	5.5	6.7	4.0	4.1	9.0	0.0	0.0	34.1
2003-04	0.0	0.0	0.0	1.2	10.9	7.0	23.7	6.0	10.7	T	T	0.0	59.5
2004-05	0.0	0.0	0.0	T	1.3	13.5	14.0	2.3	5.1	0.5	0.3	0.0	37.0
2005-06	0.0	0.0	0.0	0.7	3.5	6.8	9.1	12.3	7.5	T	0.0	0.0	39.9
2006-07	0.0	0.0	0.0	2.8	1.3	7.4	1.9	10.9	16.1	3.6	0.0	0.0	44.0
2007-08	0.0	0.0	0.0	0.0	1.5	18.5	1.5	9.8	7.7	5.1	0.2	0.0	44.3
2008-	0.0	0.0	0.0	0.1	1.0	26.7							
POR= 19 YRS	0.0	0.0	0.0	1.1	6.6	8.5	8.5	6.0	7.1	1.9	0.1	0.0	39.8

WBAN : 14916

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 FORKS

NORTH DAKOTA (KGFK)

Grand Forks North Dakota and it's sister city East Grand Forks straddle the Red River of the North, dividing North Dakota and Minnesota. The northward flowing Red River is one of only 2 major rivers in the continental United States that drain a large basin into Canada, ultimately draining into Hudson Bay. The Red River Valley drains approximately 100,000 square miles, is very shallow and is subject to frequent spring flooding.

The twin cities of Grand Forks/East Grand Forks contain approximately 50,000 people. Primary industries are directly related to or in support of agriculture, as the Red River Valley of the North contains some of the most fertile land in the world. A wide variety of crops are grown in the rich, clay based soil. The NWS/University of North Dakota weather station is located at the Weather Forecast Office (WFO), approximately 2 miles west of the Red River. The terrain around the WFO is extremely flat, with a grade of under 1 foot per mile north to south and near zero west to east.

Climatologically, the Red River Valley is wind swept year round, with frequent significant polar and arctic outbreaks common in the winter months. On average snow covers the ground from mid December through late March, yet tremendous variability exists; some winters experience little snow while some winters see snow covered ground from late October into early May. The magnitude of the afore mentioned flooding, particularly spring flooding, is strongly modulated by the winters snowfall. The period of November through February is typically cloudy, an average 75% of the time. In a normal winter, 55 to 60 days will experience temperatures below zero. An average of 4 blizzards per year strike the Red River Valley region, yet tremendous variability exists in this phenomena as well. Some winters experience no blizzards, with some having more than 10! Average winter snowfall is near 40 inches, much of which falls in the months of November and March.

Summer months are typically warm and relatively humid, with tremendous amounts of moisture being generated locally by transpiration from vegetation and other foliage. Thunderstorms are fairly common, with a strong bias to nighttime thunderstorms, leaving the days usually very sunny. Summer floods, though rare, can be initiated by strong and persistent thunderstorms.

Around 20 inches of precipitation falls per year in the Grand Forks area. Most of the annual precipitation is generated by the late spring through mid summer thunderstorm season, which amounts for 13 to 15 inches of rain. Historically hailstorms are fairly rare, with 1 to 2 per summer storm season.

Annual temperature variations are quite dramatic, with record lows below -40F and record highs about +110F. The climatological mean temperature varies from 5 degrees in January to 70 degrees in July.

Station Location

GRAND FORKS

LOCATION	Occupied From	Occupied To	Airline Distances and Directions from previous Location	Latitude NORTH	Longitude WEST	ELEVATION ABOVE								AUTOMATIC OBSERVING EQUIPMENT *	REMARKS	
						SEA LEVEL	GROUND									
						GROUND TEMPERATURE SITE	WIND INSTRUMENT	EXTREME THERMOMETERS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING BUCKET RAIN GAUGE	WEIGHING RAIN GAUGE	8 INCH RAIN GAUGE			HYGROTHERMOMETER
International Airport	12/18/97	Present	NA	47° 57'	97° 11'	a839									S	ASOS Commissioned 12/18/97 a. Ground elevation.

* TYPE
M = AMOS
T = AUTOB
S = ASOS
W = AWOS

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