

2002

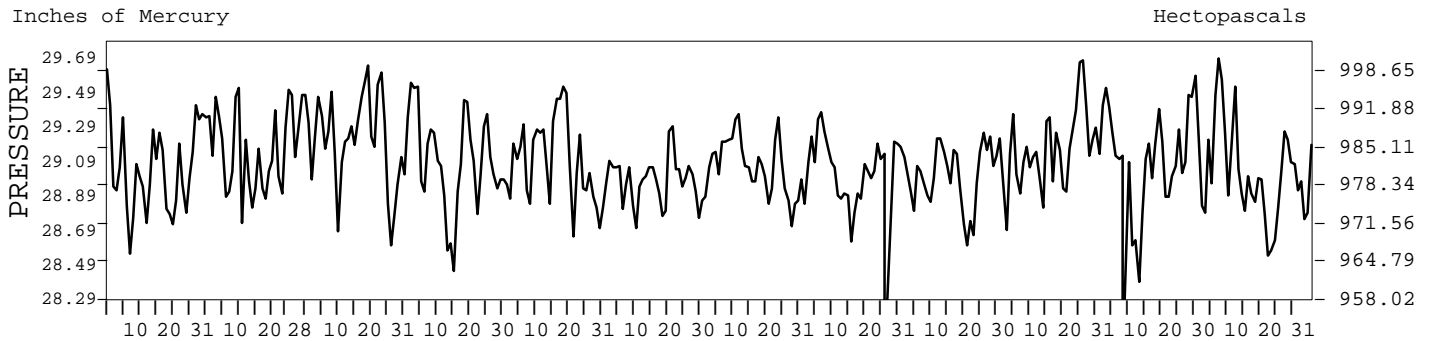
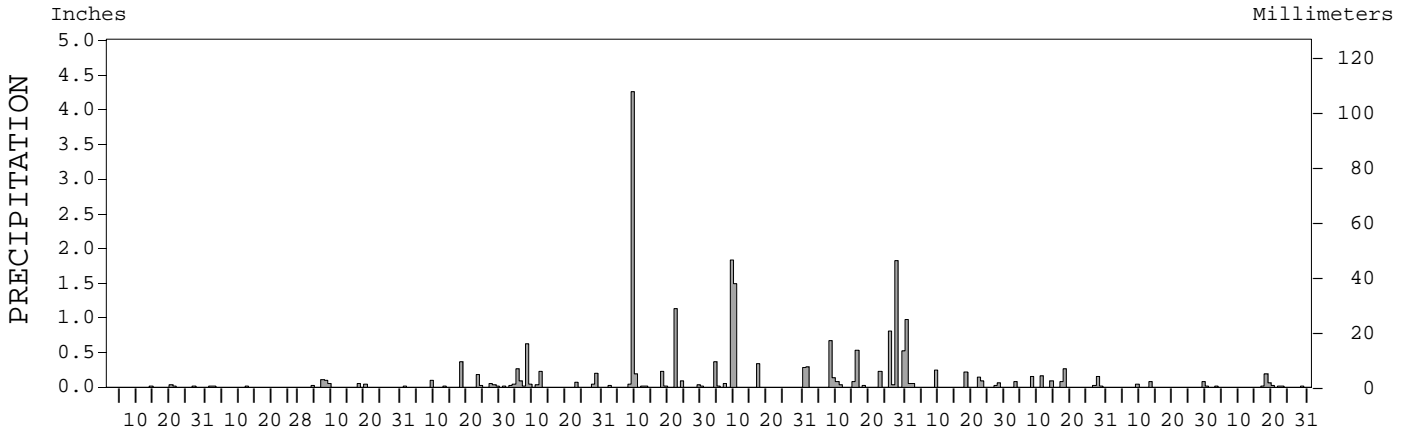
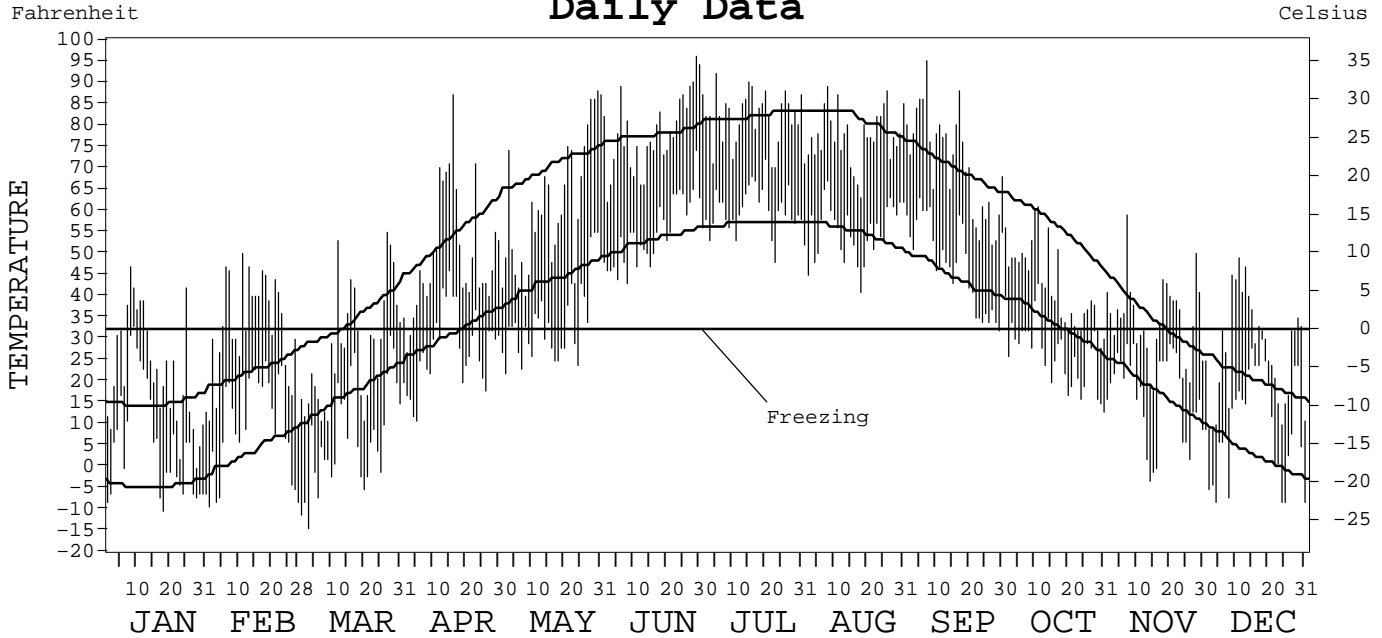
LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA



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GRAND FORKS,
NORTH DAKOTA (GFK)

Daily Data



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METEOROLOGICAL DATA FOR 2002

GRAND FORKS, ND (GFK)

LATITUDE: 47° 56' 57" N LONGITUDE: 97° 10' 33" W ELEVATION (FT): GRND: 839 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	22.0	33.0	28.2	49.6	61.5	78.2	82.0	77.3	71.2	42.4	34.3	27.2	50.6	
	HIGHEST DAILY MAXIMUM	47	50	55	87	88	96	92	89	95	61	59	49	96	
	DATE OF OCCURRENCE	08	11	27	16	30	29	05	08	07	11	07	11	JUN 29	
	MEAN DAILY MINIMUM	5.7	10.7	7.3	27.7	34.2	54.8	60.1	55.2	47.7	26.7	16.8	10.1	29.8	
	LOWEST DAILY MINIMUM	-10	-9	-14	11	22	43	48	41	32	13	-3	-8	-14	
	DATE OF OCCURRENCE	18	01	03	05	02	08	23	18	29	31	14	31+	MAR 03	
	AVERAGE DRY BULB	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	
	MEAN WET BULB	13.0	19.7	15.5	34.5	41.8	59.8	65.5		54.4			17.4		
	MEAN DEW POINT	9.1	14.8	8.5	28.8	33.4	54.2	61.9		50.2			13.2		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	3	2	0	1	0	0	0	0	6
	MAXIMUM ≤ 32°	24	14	21	2	0	0	0	0	0	6	12	21	100	
	MINIMUM ≤ 32°	30	28	31	23	14	0	0	0	1	26	30	31	214	
MINIMUM ≤ 0°	15	6	10	0	0	0	0	0	0	0	3	7	41		
H/C	HEATING DEGREE DAYS	1575	1202	1455	782	544	65	10	49	215	935	1176	1430	9438	
	COOLING DEGREE DAYS	0	0	0	0	21	121	203	94	57	0	0	0	496	
RH	MEAN (PERCENT)	80	75	68	72	62	67	74	77	74	78	79	79	74	
	HOUR 00 LST	82	83	73	80	72	76	87	89	85	85	83	83	82	
	HOUR 06 LST	82	82	81	88	81	84	89	91	92	84	84	83	85	
	HOUR 12 LST	76	65	60	61	50	56	63	64	59	66	74	73	64	
	HOUR 18 LST	81	72	59	57	45	53	60	66	61	72	77	79	65	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	1	3	2	2	2	0	1	2	3	1	0	2	19	
	THUNDERSTORMS	0	3	0	4	5	8	5	10	3	0	0	0	38	
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.)	29.05	29.14	29.23	29.09	29.08	28.97	29.05		28.99	29.20		29.02		
	MEAN SEA-LEVEL PRESS. (IN.)	30.00	30.08	30.17	30.01	29.99	29.86	29.93		29.89					
WINDS	RESULTANT SPEED (MPH)	3.3	4.7	4.6	1.5	2.3	1.9	1.8		2.7			2.4		
	RES. DIR. (TENS OF DEGS.)	31	32	31	33	32	23	17		23			27		
	MEAN SPEED (MPH)	10.1	12.2	12.2	11.5	12.5	10.0	8.7	9.7	9.3	8.9	10.0	10.5	10.5	
	PREVAIL. DIR. (TENS OF DEGS.)	36	36	36	36	17	16	18	16	18	36	34	18	18	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	26	47	36	40	44	39	36	44	31	25	41	33	47	
	DIR. (TENS OF DEGS.)	32	27	31	15	31	08	33	24	30	30	31	29	27	
	DATE OF OCCURRENCE	19	11	12	06	09	09	31	08	21	11+	23	30	FEB 11	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	31	58	41	48	53	46	44	59	38	32	52	43	59	
DIR. (TENS OF DEGS.)	34	28	27	18	31	09	32	24	18	30	32	28	24		
DATE OF OCCURRENCE	19	11	21+	06	09	09	31	08	17	11+	23	30	AUG 08		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	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	
	GREATEST 24-HOUR (IN.)	0.03	0.01	0.11	0.36	0.63	4.30	3.32	1.82	0.34	0.26	0.08	0.19	4.30	
	DATE OF OCCURRENCE	20	12+	07	18	07-08	08-09	09-10	28	31-01	18	29+	18	JUN 08-09	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	4	3	6	9	13	12	7	14	8	9	4	8	97	
PRECIPITATION ≥ 0.10	0	0	2	3	4	4	5	9	3	4	0	1	35		
PRECIPITATION ≥ 1.00	0	0	0	0	0	2	2	1	0	0	0	0	5		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	2.3	0.6	10.7	1.3	0.8	0.0	0.0	0.0	0.0	1.8	3.0	5.5	26.0	
	GREATEST 24-HOUR (IN.)	1.0	0.2	3.1	0.8	0.5	0.0	0.0	0.0	0.0	1.0	1.3	2.2	3.1	
	DATE OF OCCURRENCE	20	02+	08	18	06					18	13	18	MAR 08	
	MAXIMUM SNOW DEPTH (IN.)	3	T	5	1	0	0	0	0	0	1	1	5	5	
	DATE OF OCCURRENCE	07+	27+	11+	19						18+	30+	26+	DEC 26+	
	NUMBER OF DAYS WITH:														
SNOWFALL ≥ 1.0	1	0	5	0	0	0	0	0	0	1	2	2	11		

NORMALS, MEANS, AND EXTREMES

GRAND FORKS, ND (GFK)

LATITUDE: 47° 56' 57" N LONGITUDE: 97° 10' 33" W ELEVATION (FT): GRND: 839 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	5	17.7	27.5	34.2	53.9	67.1	74.4	81.2	80.1	70.1	52.2	38.5	22.6	51.6
	HIGHEST DAILY MAXIMUM	5	47	67	64	87	88	96	93	95	96	77	73	50	96
	YEAR OF OCCURRENCE		2002	2000	2000	2002	2002	2002	1999	2001	2001	1999	1999	1999	JUN 2002
	MEAN OF EXTREME MAXS.	5	37.8	46.2	55.6	80.0	85.0	91.6	91.0	91.6	91.6	72.4	61.4	42.4	70.6
	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	5	1.3	9.0	16.4	30.9	41.4	51.9	57.9	55.3	44.6	31.1	20.2	4.5	30.4
	LOWEST DAILY MINIMUM	5	-29	-22	-14	6	22	33	37	40	28	12	-9	-24	-29
	YEAR OF OCCURRENCE		1999	2001	2002	2000	2002	1998	2001	2001	2000	2001	1998	2000	JAN 1999
	MEAN OF EXTREME MINS.	5	-20.2	-15.4	-4.4	17.6	28.8	38.0	45.0	42.6	29.6	15.8	1.8	-15.6	13.6
	NORMAL DRY BULB	30	4.3	10.4	24.0	41.5	55.1	64.2	69.1	67.0	56.2	44.5	26.5	10.3	39.4
	MEAN DRY BULB	5	9.5	18.3	25.3	42.5	54.2	63.2	69.6	67.7	57.3	41.7	29.3	13.6	41.0
	MEAN WET BULB	4	10.4	17.1	23.7	37.9	48.7	57.8	64.2	62.1	51.9	39.7	28.2	12.9	37.9
	MEAN DEW POINT	4	6.7	13.1	19.2	32.0	42.4	53.2	60.5	58.1	47.5	34.6	24.4	8.9	33.4
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°															
MAXIMUM ≤ 32°															
MINIMUM ≤ 32°															
MINIMUM ≤ 0°															
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)														
	HOUR 00 LST														
	HOUR 06 LST														
	HOUR 12 LST														
	HOUR 18 LST														
S	PERCENT POSSIBLE SUNSHINE														
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG(VISBY≤1/4 MI)	5	2.0	2.4	3.0	0.8	1.2	0.6	1.8	2.4	1.4	1.4	2.0	2.4	21.4
	THUNDERSTORMS	5	0.0	1.0	0.2	1.2	4.2	7.4	7.2	7.2	3.0	0.8	2.6	0.8	35.6
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
	CLEAR														
	PARTLY CLOUDY														
	CLOUDY														
PR	MEAN STATION PRESSURE(IN)	5	29.13	29.11	29.17	29.09	28.98	28.96	29.03	29.07	29.03	29.12	29.07	29.12	29.07
	MEAN SEA-LEVEL PRES. (IN)	5	30.09	30.06	30.11	30.00	29.88	29.86	29.92	29.96	29.96	30.01	30.02	30.11	30.00
WINDS	MEAN SPEED (MPH)	5	10.8	11.5	11.0	11.0	11.4	10.0	8.3	8.9	9.2	10.3	10.3	10.7	10.3
	PREVAIL.DIR (TENS OF DEGS)														
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	5	35	47	43	41	44	40	39	62	34	37	46	36	62
	DIR. (TENS OF DEGS)		31	27	35	31	31	14	25	30	15	34	31	33	30
	YEAR OF OCCURRENCE		2001	2002	1999	2000	2002	1998	2001	2001	2000	2001	1999	2000	AUG 2001
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	5	41	58	48	49	53	51	46	70	43	46	54	45	70
DIR. (TENS OF DEGS)		31	28	35	31	31	31	29	31	29	31	31	34	31	
YEAR OF OCCURRENCE		2001	2002	1999	2000	2002	2000	2001	2001	2000	1999	1999	1998	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)	5	0.99	1.65	1.04	1.90	5.01	7.20	7.17	6.21	2.55	5.79	3.94	0.53	7.20
	YEAR OF OCCURRENCE		1999	2000	1999	1999	1999	2000	2001	2002	1999	1998	2000	2000	JUN 2000
	MINIMUM MONTHLY (IN)	5	0.06	0.03	0.08	0.77	0.84	1.74	1.63	1.68	0.26	0.12	0.21	0.24	0.03
	YEAR OF OCCURRENCE		2002	2002	1998	2002	2000	2001	1999	1998	1998	1999	2002	1998	FEB 2002
	MAXIMUM IN 24 HOURS (IN)	5	0.44	1.54	0.33	0.93	1.80	4.30	3.32	1.82	0.91	1.86	1.18	0.21	4.30
	YEAR OF OCCURRENCE		1999	2000	1999	1999	2001	2002	2002	2002	2000	1998	2000	2000	JUN 2002
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01															
PRECIPITATION ≥ 1.00															
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)	5	27.3	9.7	13.5	4.4	0.8	T	0.0	0.0	0.0	10.9	22.4	18.7	27.3
	YEAR OF OCCURRENCE		1999	2001	1999	2000	2002	2000				2001	1998	2000	JAN 1999
	MAXIMUM IN 24 HOURS (IN)	5	6.5	4.0	4.5	3.5	0.5	T	0.0	0.0	0.0	10.8	12.4	6.9	12.4
	YEAR OF OCCURRENCE		1999	2001	1999	2000	2002	2000				2001	1998	2000	NOV 1998
	MAXIMUM SNOW DEPTH (IN)	5	16	13	10	3		0	0	0	0	11	16	10	16
	YEAR OF OCCURRENCE		1999	1999	1999	2000						2001	1998	2000	NOV 1998
	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) 2002 GRAND FORKS, ND (GFK)

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
POR= 5 YRS	0.35	0.77	0.46	1.24	2.74	4.76	3.57	3.61	1.33	2.20	1.28	0.35	22.66

WBAN : 14916

AVERAGE TEMPERATURE (°F) 2002 GRAND FORKS, ND (GFK)

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
POR= 5 YRS	9.5	18.3	25.4	42.5	54.3	63.2	69.7	67.7	57.4	41.7	29.3	13.6	41.0

HEATING DEGREE DAYS (base 65°F) 2002 GRAND FORKS, ND (GFK)

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-	10	49	215	935	1176	1430							

WBAN : 14916

COOLING DEGREE DAYS (base 65°F) 2002 GRAND FORKS, ND (GFK)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
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

SNOWFALL (inches) 2002 GRAND FORKS, ND (GFK)

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-	0.0	0.0	0.0	1.8	3.0	5.5							
POR= 2 YRS	0.0	0.0	0.0	6.3	5.6	4.7	2.8	5.2	6.0	1.1	0.4	0.0	32.1

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 (1961 - 1990). ASOS INDICATES AUTOMATED SURFACE OBSERVING SYSTEM. PM INDICATES THE LAST DAY OF THE PREVIOUS MONTH. POR (PERIOD OF RECORD) BEGINS WITH THE JANUARY DATA MONTH AND IS THE NUMBER OF YEARS USED TO COMPUTE THE MEAN. INDIVIDUAL MONTHS WITHIN THE POR MAY BE MISSING. WHEN THE POR FOR A NORMAL IS LESS THAN 30 YEARS, THE NORMAL IS PROVISIONAL AND IS BASED ON THE NUMBER OF YEARS INDICATED. 0.* OR * INDICATES THE VALUE OR MEAN-DAYS-WITH IS BETWEEN 0.00 AND 0.05. CLOUDINESS FOR ASOS STATIONS DIFFERS FROM THE NON-ASOS OBSERVATION TAKEN BY A HUMAN OBSERVER. ASOS STATION CLOUDINESS IS BASED ON TIME-AVERAGED CEILOMETER DATA FOR CLOUDS AT OR BELOW 12,000 FEET AND ON SATELLITE DATA FOR CLOUDS ABOVE 12,000 FEET. THE NUMBER OF DAYS WITH CLEAR, PARTLY CLOUDY, AND CLOUDY CONDITIONS FOR ASOS STATIONS IS THE SUM OF THE CEILOMETER AND SATELLITE DATA FOR THE SUNRISE TO SUNSET PERIOD.</p>	<p>GENERAL CONTINUED: CLEAR INDICATES 0 - 2 OKTAS, PARTLY CLOUDY INDICATES 3 - 6 OKTAS, AND CLOUDY INDICATES 7 OR 8 OKTAS. WHEN AT LEAST ONE OF THE ELEMENTS (CEILOMETER OR SATELLITE) IS MISSING, THE DAILY CLOUDINESS IS NOT COMPUTED. WIND DIRECTION IS RECORDED IN TENS OF DEGREES (2 DIGITS) CLOCKWISE FROM TRUE NORTH. "00" INDICATES CALM. "36" INDICATES TRUE NORTH. RESULTANT WIND IS THE VECTOR AVERAGE OF THE SPEED AND DIRECTION. AVERAGE TEMPERATURE IS THE SUM OF THE MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURE DIVIDED BY 2. SNOWFALL DATA COMPRISE ALL FORMS OF FROZEN PRECIPITATION, INCLUDING HAIL. A HEATING (COOLING) DEGREE DAY IS THE DIFFERENCE BETWEEN THE AVERAGE DAILY TEMPERATURE AND 65° F. DRY BULB IS THE TEMPERATURE OF THE AMBIENT AIR. DEW POINT IS THE TEMPERATURE TO WHICH THE AIR MUST BE COOLED TO ACHIEVE 100 PERCENT RELATIVE HUMIDITY. WET BULB IS THE TEMPERATURE THE AIR WOULD HAVE IF THE MOISTURE CONTENT WAS INCREASED TO 100 PERCENT RELATIVE HUMIDITY.</p> <p>ON JULY 1, 1996, THE NATIONAL WEATHER SERVICE BEGAN USING THE "METAR" OBSERVATION CODE THAT WAS ALREADY EMPLOYED BY MOST OTHER NATIONS OF THE WORLD. THE MOST NOTICEABLE DIFFERENCE IN THIS ANNUAL PUBLICATION WILL BE THE CHANGE IN UNITS FROM TENTHS TO EIGHTS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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2002 GRAND FORKS, NORTH DAKOTA (GFK)

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, NORTH DAKOTA

LOCATION	Occupied From	Occupied To	Airline Distances and Directions from previous Location	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										AUTOMATIC OBSERVING EQUIPMENT *	* TYPE M = AMOS T = AUTOB S = ASOS W = AWOS REMARKS	
						GROUND												
						SEA LEVEL	GROUND	WIND	EX T R E M E	P S Y C H R O M E T E R	S U N - S H I N E	T I P P I N G	W E I G H I N G	8 I N C H	H Y G R O T H E R M O M E T E R			T E M P E R A T U R E
International Airport	12/18/97	Present	NA	47° 57'	97° 11'	a839											S	ASOS Commissioned 12/18/97 a. Ground elevation.

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