

# 1999

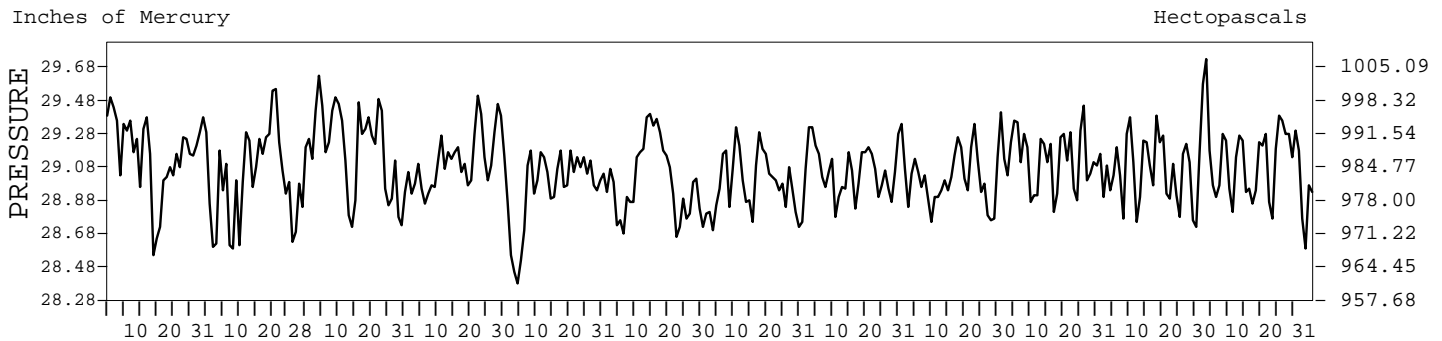
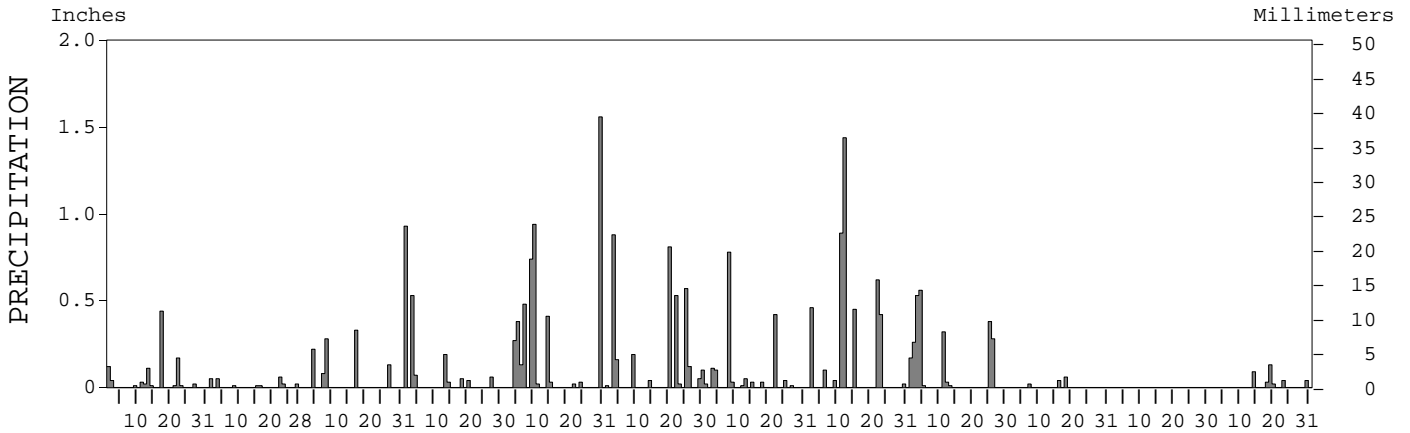
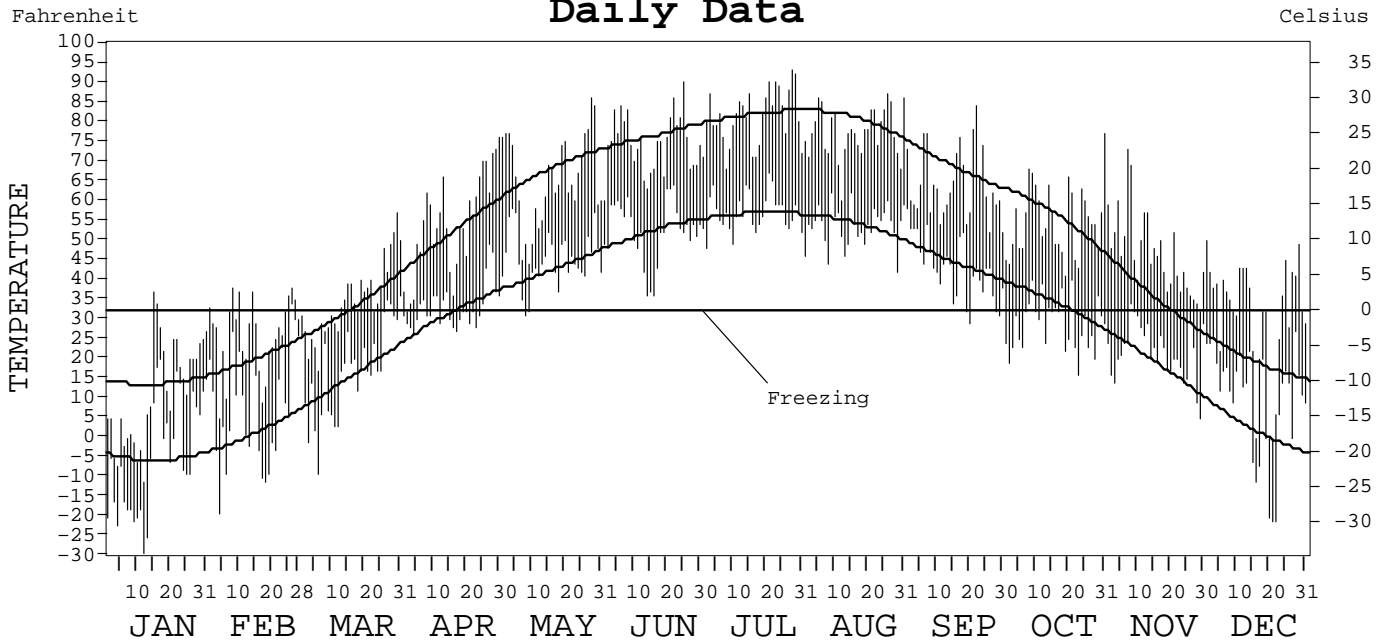
## LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 1524-5837

### GRAND FORKS, NORTH DAKOTA (GFK)

### Daily Data



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# METEOROLOGICAL DATA FOR 1999

## GRAND FORKS, ND (GFK)

LATITUDE: 47° 56' 57" N      LONGITUDE: 97° 10' 33" W      ELEVATION (FT): GRND: 844      BARO: 844      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	11.8	26.3	34.9	54.3	65.3	74.6	81.2	77.3	64.2	55.0	46.7	31.4	51.9	
	HIGHEST DAILY MAXIMUM	37	38	57	76	86	90	93	87	84	77	73	50	93	
	DATE OF OCCURRENCE	15	26+	30	30	28	25	28	26	22	31	07	01	JUL 28	
	MEAN DAILY MINIMUM	-4.4	7.8	17.2	33.1	45.1	52.3	57.0	53.5	42.8	28.8	21.7	9.5	30.4	
	LOWEST DAILY MINIMUM	-29	-19	-9	26	31	36	48	42	29	16	5	-21	-29	
	DATE OF OCCURRENCE	12	04	06	04	08	16+	02	29	20	23	29	22+	JAN 12	
	AVERAGE DRY BULB	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	
	MEAN WET BULB		17.3	25.9	39.9	50.5	58.5	63.8	60.8	49.0	37.3	29.9	19.0		
	MEAN DEW POINT		14.1	23.1	34.9	46.0	54.3	60.0	57.3	45.0	30.2	23.5	14.7		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	1	4	0	0	0	0	0	0	5
	MAXIMUM ≤ 32°	29	21	14	1	0	0	0	0	0	0	1	15	81	
	MINIMUM ≤ 32°	31	27	28	18	2	0	0	0	4	23	29	31	193	
MINIMUM ≤ 0°	20	10	2	0	0	0	0	0	0	0	0	8	40		
H/C	HEATING DEGREE DAYS	1895	1334	1199	631	306	104	18	52	337	708	915	1375	8874	
	COOLING DEGREE DAYS	0	0	0	0	11	61	152	73	2	0	0	0	299	
RH	MEAN (PERCENT)	80	83	85	74	74	73	76	76	76	65	69	78	76	
	HOUR 00 LST	81	84	85	84	83	86	87	87	84	74	76	83	83	
	HOUR 06 LST	80	84	90	88	85	89	91	94	90	79	78	82	86	
	HOUR 12 LST	79	80	80	61	62	60	59	60	61	50	58	72	65	
	HOUR 18 LST	81	83	80	60	62	59	57	59	65	56	62	78	67	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	3	0	7	0	0	0	0	5	1	0	0	1	17	
	THUNDERSTORMS	0	0	0	0	4	10	10	5	3	0	0	0	32	
CLOUDINESS	SUNRISE-SUNSET: (OKTAS)														
	CEILOMETER (≤ 12,000 FT.)														
	SATELLITE (> 12,000 FT.)														
	MIDNIGHT-MIDNIGHT: (OKTAS)														
	CEILOMETER (≤ 12,000 FT.)														
	SATELLITE (> 12,000 FT.)														
NUMBER OF DAYS WITH:															
CLEAR															
PARTLY CLOUDY															
CLOUDY															
PR	MEAN STATION PRESS. (IN.)	29.17	29.01	29.18	29.12	28.96	28.99	28.98	29.06	29.02	29.12	29.10	29.07	29.07	
	MEAN SEA-LEVEL PRESS. (IN.)	30.15	29.96	30.13	30.04	29.87	29.89	29.87	29.96	29.94	30.04	30.04	30.02	29.99	
WINDS	RESULTANT SPEED (MPH)	2.0	1.9	1.3	1.7	2.2	2.4	2.1	1.0	3.7	2.9	2.8	2.8	1.1	
	RES. DIR. (TENS OF DEGS.)	29	23	15	06	08	19	26	12	29	27	26	27	26	
	MEAN SPEED (MPH)	11.8	13.0	10.4	10.3	12.3	9.9	9.0	8.7	9.8	10.4	9.7	10.8	10.5	
	PREVAIL. DIR. (TENS OF DEGS.)	18	16	17	14	34	14	29	17	31	18	17	17	17	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	34	36	43	32	40	38	30	32	30	37	46	34	46	
	DIR. (TENS OF DEGS.)	17	17	35	02	15	14	28	02	29	31	31	32	31	
	DATE OF OCCURRENCE	14	23+	17	01	04	04	05	12	30	21	01	25	NOV 01	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	39	40	48	37	53	47	38	41	36	46	54	43	54	
DIR. (TENS OF DEGS.)	17	33	35	36	15	31	28	26	30	31	31	32	31		
DATE OF OCCURRENCE	14	27+	17	15+	04	25	05	22	30	21	01	25	NOV 01		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	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	
	GREATEST 24-HOUR (IN.)	0.44	0.06	0.33	0.93	1.56	1.04	0.79	1.45	0.66	0.06	T	0.04	1.56	
	DATE OF OCCURRENCE	17	22	17+	01	30	03-04	08	11-12	25-26	18	25+	30	MAY 30	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	12	8	5	8	12	12	12	9	10	3	0	6	97	
PRECIPITATION ≥ 0.10	4	0	4	3	8	8	4	7	7	0	0	1	46		
PRECIPITATION ≥ 1.00	0	0	0	0	1	0	0	1	0	0	0	0	2		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	27.3	3.7	13.5	0.3	T	0.0	0.0	0.0	0.0	T	T	5.8	50.6	
	GREATEST 24-HOUR (IN.)	6.5	1.2	4.5	0.2	T	0.0	0.0	0.0	0.0	T	T	2.9	6.5	
	DATE OF OCCURRENCE	13	22	08	01	09					19+	25+	19	JAN 13	
	MAXIMUM SNOW DEPTH (IN.)	16	13	10	0	0	0	0	0	0	0	0	3	16	
	DATE OF OCCURRENCE	25+	02+	09									20	JAN 25+	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	7	2	4	0	0	0	0	0	0	0	0	2	15		

# NORMALS, MEANS, AND EXTREMES

## GRAND FORKS, ND (GFK)

LATITUDE: 47° 56' 57" N      LONGITUDE: 97° 10' 33" W      ELEVATION (FT): GRND: 844      BARO: 844      TIME ZONE: CENTRAL (UTC + 6)      WBAN: 14916

		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	13.8	19.8	32.7	51.6	67.8	76.3	81.6	80.2	68.3	55.4	34.8	19.0	50.1	
	MEAN DAILY MAXIMUM	2	13.3	28.8	33.3	57.5	68.7	73.1	81.1	80.4	70.0	55.0	39.8	25.8	52.2	
	HIGHEST DAILY MAXIMUM	2	37	47	57	82	86	90	93	92	94	77	73	50	94	
	YEAR OF OCCURRENCE		1999	1998	1999	1998	1999	1999	1999	1998	1998	1999	1999	1999	1999	SEP 1998
	MEAN OF EXTREME MAXS.	2	32.5	42.5	56.5	79.0	85.5	87.5	91.0	89.5	89.0	76.0	60.5	45.5	69.6	
	NORMAL DAILY MINIMUM	30	-5.3	1.0	15.3	31.3	42.4	52.0	56.5	53.7	44.1	33.5	18.2	1.5	28.7	
	MEAN DAILY MINIMUM	2	-9	14.0	17.2	33.8	45.0	51.7	56.8	55.1	43.8	32.2	19.9	6.9	31.3	
	LOWEST DAILY MINIMUM	2	-29	-19	-10	26	31	33	46	42	29	16	-9	-21	-29	
	YEAR OF OCCURRENCE		1999	1999	1998	1999	1999	1998	1998	1999	1999	1999	1998	1999	1999	JAN 1999
	MEAN OF EXTREME MINS.	2	-26.5	-16.5	-9.5	26.0	31.5	34.5	47.0	44.5	29.0	18.0	-2.0	-19.5	13.0	
	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	2	6.2	21.4	25.2	45.7	56.8	62.5	68.9	67.8	57.0	43.7	29.9	16.4	41.8	
	MEAN WET BULB	1	8.6	21.2	24.3	40.8	51.2	57.7	63.5	62.0	49.0	40.2	27.8	15.5	38.5	
	MEAN DEW POINT	1	5.4	18.7	21.3	34.7	45.8	53.4	59.7	58.0	45.0	35.2	23.2	11.5	34.3	
	NORMAL NO. DAYS WITH: MAXIMUM ≥ 90° MAXIMUM ≤ 32° MINIMUM ≤ 32° MINIMUM ≤ 0°															
H/C	NORMAL HEATING DEG. DAYS	30	1882	1529	1271	705	344	123	38	76	278	636	1155	1696	9733	
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	37	99	165	138	14	0	0	0	453	
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)	2	2.0	3.5	5.0	0.0	0.5	0.0	1.0	3.0	1.5	1.5	2.5	2.5	23.0	
	THUNDERSTORMS	2	0.0	0.5	0.0	0.5	4.5	9.0	7.5	6.0	3.0	1.0	0.0	0.0	32.0	
CLOUDINESS	MEAN: SUNRISE-SUNSET (OKTAS)															
	MIDNIGHT-MIDNIGHT (OKTAS)															
	MEAN NO. DAYS WITH: CLEAR															
	PARTLY CLOUDY CLOUDY															
PR	MEAN STATION PRESSURE (IN)	2	29.14	29.00	29.19	29.08	28.95	28.94	29.02	29.08	29.01	29.12	29.08	29.11	29.06	
	MEAN SEA-LEVEL PRES. (IN)	2	30.11	29.95	30.13	30.00	29.85	29.84	29.92	29.97	29.94	30.04	30.03	30.07	29.99	
WINDS	MEAN SPEED (MPH)	2	11.2	11.5	10.5	10.3	11.2	9.8	8.5	8.3	9.5	10.6	10.1	10.5	10.2	
	PREVAIL. DIR (TENS OF DEGS)															
	MAXIMUM 2-MINUTE: SPEED (MPH)	2	34	36	43	36	40	40	30	32	31	37	46	36	46	
	DIR. (TENS OF DEGS)		17	17	35	15	15	14	28	02	10	31	31	35	31	
	YEAR OF OCCURRENCE		1999	1999	1999	1998	1999	1998	1999	1999	1998	1999	1999	1998	NOV 1999	
	MAXIMUM 5-SECOND: SPEED (MPH)	2	39	40	48	40	53	49	38	41	37	46	54	45	54	
DIR. (TENS OF DEGS)		17	33	35	15	15	14	28	26	18	31	31	34	31		
YEAR OF OCCURRENCE		1999	1999	1999	1998	1999	1998	1999	1999	1998	1999	1999	1998	NOV 1999		
PRECIPITATION	NORMAL (IN)	30	0.72	0.49	0.94	1.35	2.05	2.84	2.72	2.41	2.24	1.29	0.65	0.64	18.34	
	MAXIMUM MONTHLY (IN)	2	0.99	1.49	1.04	1.90	5.01	5.31	2.30	4.44	2.55	5.79	1.73	0.35	5.79	
	YEAR OF OCCURRENCE		1999	1998	1999	1999	1999	1998	1998	1999	1999	1998	1998	1999	OCT 1998	
	MINIMUM MONTHLY (IN)	2	0.45	0.23	0.08	1.04	2.37	3.48	1.63	1.68	0.26	0.12	1.73	0.24	0.08	
	YEAR OF OCCURRENCE		1998	1999	1998	1998	1998	1999	1999	1998	1998	1999	1999	1998	MAR 1998	
	MAXIMUM IN 24 HOURS (IN)	2	0.44	0.53	0.33	0.93	1.56	2.96	1.00	1.45	0.66	1.86	0.75	0.12	2.96	
	YEAR OF OCCURRENCE		1999	1998	1999	1999	1999	1998	1998	1999	1999	1998	1998	1998	JUN 1998	
NORMAL NO. DAYS WITH: PRECIPITATION ≥ 0.01 PRECIPITATION ≥ 1.00																
SNOWFALL	NORMAL (IN)															
	MAXIMUM MONTHLY (IN)	2	27.3	7.0	13.5	0.3	T	0.0	0.0	0.0	0.0	T	22.4	5.8	27.3	
	YEAR OF OCCURRENCE		1999	1998	1999	1999	1999	1999	1999	1999	1999	1999	1998	1999	JAN 1999	
	MAXIMUM IN 24 HOURS (IN)	2	6.5	3.3	4.5	0.2	T	0.0	0.0	0.0	0.0	T	12.4	2.9	12.4	
	YEAR OF OCCURRENCE		1999	1998	1999	1999	1999	1999	1999	1999	1999	1999	1998	1998	NOV 1998	
	MAXIMUM SNOW DEPTH (IN)	2	16	13	10			0	0	0	0		16	7	16	
YEAR OF OCCURRENCE		1999	1999	1999								1998	1998	NOV 1998		
NORMAL NO. DAYS WITH: SNOWFALL ≥ 1.0																

PRECIPITATION (inches) 1999 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
POR= 2 YRS	0.72	0.86	0.56	1.47	3.69	4.39	1.96	3.06	1.40	2.95	0.87	0.29	22.22

WBAN : 14916

AVERAGE TEMPERATURE (°F) 1999 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
POR= 2 YRS	6.2	21.4	25.3	45.7	56.9	62.5	69.0	67.8	57.0	43.7	29.9	16.4	41.8

HEATING DEGREE DAYS (base 65°F) 1999 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-	18	52	337	708	915	1375							

WBAN : 14916

COOLING DEGREE DAYS (base 65°F) 1999 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

SNOWFALL (inches) 1999 GRAND FORKS, ND (GFK)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
POR=													

WBAN : 14916

REFERENCE NOTES :

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).

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).

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.

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.

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.

1999  
GRAND FORKS,  
NORTH DAKOTA (GFK)

No narrative available

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# STATION LOCATION

GRAND FORKS, NORTH DAKOTA

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										AUCI O M P A T I O N E T I C A L S T A T E M E T E O R O L O G Y S T A T I O N I D N O .	* Type M = AMOS T = AUTOB S = ASOS W = AWOS	REMARKS
						SEA LEVEL	GROUND											
							WIND S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .	E M E T E O R O L O G Y S T A T I O N I D N O .			
International Airport	12/18/97	Present	NA	47°57'	97°11'	844											S	ASOS Commissioned 12/18/97

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801.  
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