

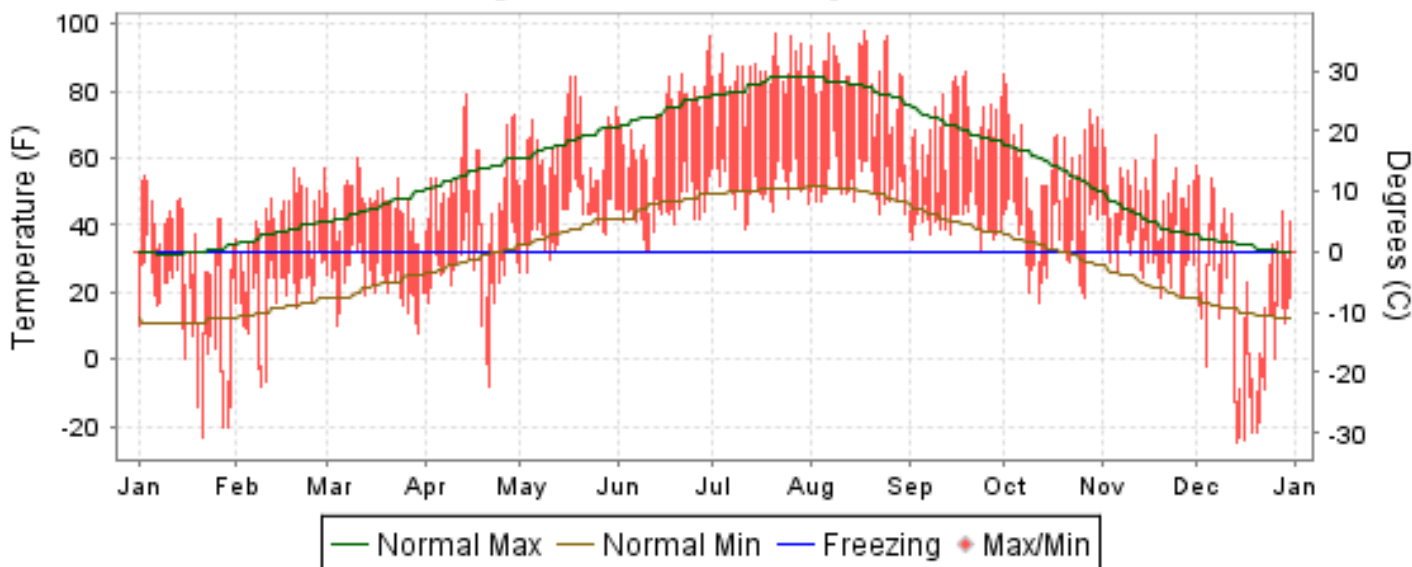


# 2008 LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA

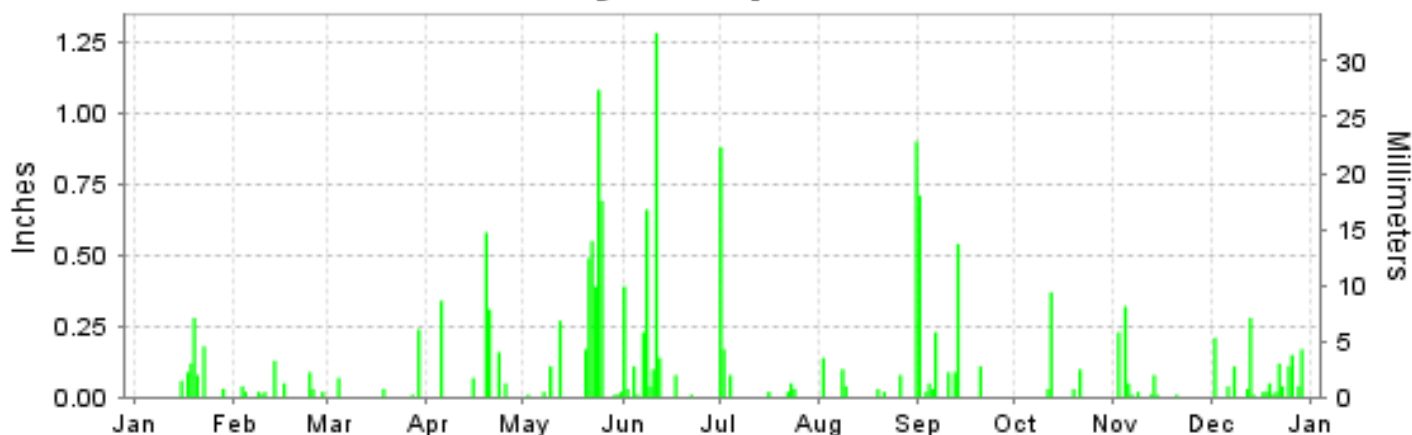
ISSN 0198-2982

## GREAT FALLS, MONTANA (KGTF)

### Daily Max/Min Temperature



### Daily Precipitation



### Daily Station Pressure



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ASHEVILLE, NORTH CAROLINA

*Thomas R. Karl*  
DIRECTOR  
NATIONAL CLIMATIC DATA CENTER

# METEOROLOGICAL DATA FOR 2008

## GREAT FALLS (KGTF)

LATITUDE: 47° 28'N      LONGITUDE: -111° 22'W      ELEVATION (FT): GRND: 3664    BARO: 3673      TIME ZONE: MOUNTAIN (UTC -7)      WBAN: 24143

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	33.3	40.6	45.9	51.4	63.4	72.3	84.7	84.2	68.9	59.0	50.6	26.1	56.7	
	HIGHEST DAILY MAXIMUM	55	57	60	79	84	96	97	98	86	85	68	58	98	
	DATE OF OCCURRENCE	03	29+	10	14	18+	30	21	18	19	01	01	01	AUG 18	
	MEAN DAILY MINIMUM	11.7	18.6	22.5	25.7	40.5	44.4	51.1	52.0	41.0	34.1	30.5	6.8	31.6	
	LOWEST DAILY MINIMUM	-23	-8	8	-8	26	32	39	43	33	17	18	-25	-25	
	DATE OF OCCURRENCE	21	09	30	21	03+	11	11	31+	24	12	27+	14	DEC 14	
	AVERAGE DRY BULB	22.5	29.6	34.2	38.6	52.0	58.4	67.9	68.1	55.0	46.6	40.6	16.5	44.2	
	MEAN WET BULB	18.9	25.2	28.1	44.1	49.4	54.3	52.8	45.9	38.9	34.7	14.7	14.7	14.7	
	MEAN DEW POINT	9.7	17.9	16.0	35.4	39.9	42.0	38.8	36.7	27.8	25.6	8.1	8.1	8.1	
	NUMBER OF DAYS WITH:														
	MAXIMUM >= 90°	0	0	0	0	0	2	6	10	0	0	0	0	0	18
MAXIMUM <= 32°	13	5	1	2	0	0	0	3	0	1	0	18	43		
MINIMUM <= 32°	30	28	29	25	4	1	0	0	0	16	21	28	182		
MINIMUM <= 0°	7	3	0	2	0	0	0	0	0	0	0	12	24		
H/C	HEATING DEGREE DAYS	1310	1020	947	786	403	214	19	45	295	567	725	1497	7828	
	COOLING DEGREE DAYS	0	0	0	0	6	24	118	149	1	0	0	0	298	
RH	MEAN (PERCENT)	59	65	52	52	60	54	45	40	56	51	58	67	55	
	HOUR 05 LST	63	71	65	68	75	73	66	58	76	62	64	70	68	
	HOUR 11 LST	54	56	37	34	46	40	28	27	41	37	47	63	43	
	HOUR 17 LST	58	63	41	37	48	37	28	28	42	45	59	69	46	
	HOUR 23 LST	63	71	63	62	71	65	57	49	66	59	64	69	63	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	1	1	0	0	0	0	0	0	0	0	0	0	2	
	THUNDERSTORMS	0	0	0	0	2	1	1	1	1	0	0	0	6	
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.)	26.08	26.12	26.18	26.15	26.18	26.18	26.21	26.19	26.30	26.31	26.24	26.14	26.19	
	MEAN SEA-LEVEL PRESS. (IN.)	29.99	29.99	30.04	29.98	29.94	29.90	29.89	29.87	30.05	30.11	30.05	30.08	29.99	
WINDS	RESULTANT SPEED (MPH)	11.4	9.5	9.1	7.6	2.4	4.7	3.5	4.6	4.3	7.8	9.9	9.9	6.9	
	RES. DIR. (TENS OF DEGS.)	22	23	24	24	27	25	24	24	23	22	22	23	24	
	MEAN SPEED (MPH)	14.8	12.5	12.5	11.5	10.5	9.8	8.5	10.2	8.2	12.3	12.7	14.2	11.5	
	PREVAIL.DIR.(TENS OF DEGS.)	22	22	22	22	22	22	23	23	22	22	22	22	22	
	MAXIMUM 2-MINUTE WIND														
	SPEED (MPH)	45	39	48	40	40	35	37	38	35	45	41	44	48	
	DIR. (TENS OF DEGS.)	20	25	27	28	28	33	14	29	22	25	22	25	27	
	DATE OF OCCURRENCE	04	07	24	29	20	12	01	19	21	07	12	31	MAR 24	
	MAXIMUM 3-SECOND WIND:														
	SPEED (MPH)	55	49	59	51	83	44	45	55	43	53	49	55	83	
DIR. (TENS OF DEGS.)	19	25	26	28	33	24	15	26	35	25	21	27	33		
DATE OF OCCURRENCE	04	07	24	29	28	10	01	09	12	07	12	29	MAY 28		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.84	0.43	0.35	1.51	3.82	3.08	1.25	1.31	1.87	0.53	0.74	1.43	17.16	
	GREATEST 24-HOUR (IN.)	0.36	11.87	0.24	0.89	1.33	1.28	1.05	0.90	0.71	0.38	0.37	0.29	11.87	
	DATE OF OCCURRENCE	19-20	03-04	29	19-20	24-25	11	01-02	31	01	11-12	04-05	12-13	FEB 03-04	
	NUMBER OF DAYS WITH:														
	PRECIPITATION 0.01	7	10	4	6	13	12	7	7	9	4	9	17	105	
PRECIPITATION 0.10	3	1	1	4	8	7	2	2	4	2	2	7	43		
PRECIPITATION 1.00	0	0	0	0	1	1	0	0	0	0	0	0	2		
SNOWFALL	SNOW,ICE PELLETS,HAIL														
	TOTAL (IN.)	14.1	6.9	5.9	21.7	0.2	6.8	0.0	0.0	0.0	6.7	2.7	30.5	95.5	
	GREATEST 24-HOUR (IN.)	3.5	2.2	3.8	9.6	0.2	6.8	0.0	0.0	0.0	6.5	1.6	7.8	9.6	
	DATE OF OCCURRENCE	19	13	29	19	12	11				12	13	26	APR 19	
	MAXIMUM SNOW DEPTH (IN.)	7	2	3	11	0	6	0	0	0	4	2	10	11	
	DATE OF OCCURRENCE	24+	25+	30	20		11				13	14	27+	APR 20	
NUMBER OF DAYS WITH:															
SNOWFALL >= 1.0	6	2	2	4	0	1	0	0	0	1	1	8	25		

# NORMALS, MEANS, AND EXTREMES GREAT FALLS (KGTF)

**LATITUDE:** 47 ° 28'N      **LONGITUDE:** -111 ° 22'W      **ELEVATION (FT):** GRND: 3664 BARO: 3673      **TIME ZONE:** MOUNTAIN (UTC -7)      **WBAN: 24143**

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
<b>TEMPERATURE °F</b>	NORMAL DAILY MAXIMUM	30	32.1	37.7	45.3	55.6	64.7	73.9	82.0	81.2	69.6	58.0	42.1	34.2	56.4
	MEAN DAILY MAXIMUM	61	31.4	37.4	43.3	54.8	65.0	73.4	83.5	81.8	70.1	58.5	43.6	35.2	56.5
	HIGHEST DAILY MAXIMUM	71	67	70	78	89	93	101	105	106	98	91	76	69	106
	YEAR OF OCCURRENCE		1992	1992	2004	1980	1980	1990	1973	1969	1980	1992	1999	1939	AUG 1969
	MEAN OF EXTREME MAXS.	61	55.0	58.0	65.3	75.4	83.9	90.9	97.2	96.5	89.3	79.2	64.4	55.2	75.9
	NORMAL DAILY MINIMUM	30	11.3	15.1	21.5	29.7	38.3	46.0	50.4	49.9	41.2	33.0	22.5	14.4	31.1
	MEAN DAILY MINIMUM	61	12.5	17.4	22.1	31.6	40.6	48.3	53.7	52.4	43.8	35.3	25.0	17.0	33.3
	LOWEST DAILY MINIMUM	71	-37	-35	-29	-8	15	31	36	30	16	-11	-25	-43	-43
	YEAR OF OCCURRENCE		1969	1996	1951	2008	1954	1999	1999	1992	2000	1991	1985	1968	DEC 1968
	MEAN OF EXTREME MINS.	61	-15.9	-8.4	-3.1	15.9	28.3	37.8	44.0	41.8	30.6	16.9	-0.5	-11.9	14.6
	NORMAL DRY BULB	30	21.7	26.4	33.4	42.6	51.5	60.0	66.2	65.6	55.4	45.5	32.3	24.3	43.7
	MEAN DRY BULB	61	22.0	27.4	32.8	43.2	52.8	61.0	68.6	67.2	56.9	46.9	34.3	26.1	44.9
	MEAN WET BULB	25	20.8	22.3	28.0	36.3	43.4	50.3	53.7	52.0	45.4	37.0	27.5	21.5	36.5
	MEAN DEW POINT	25	15.5	15.8	21.8	28.3	36.5	44.2	46.0	44.2	38.4	29.9	21.4	15.2	29.8
	NORMAL NO. DAYS WITH: MAXIMUM >= 90	30	0.0	0.0	0.0	0.0	0.1	2.2	7.1	7.3	1.1	*	0.0	0.0	17.8
	MAXIMUM <= 32	30	12.3	8.4	5.0	1.3	0.0	0.0	0.0	0.0	*	1.1	6.0	10.6	44.7
MINIMUM <= 32	30	27.0	24.0	25.4	16.3	4.1	0.1	0.0	0.1	2.8	12.7	22.6	26.6	161.7	
MINIMUM <= 0	30	8.6	5.3	1.8	0.1	0.0	0.0	0.0	0.0	0.0	0.2	2.2	6.1	24.3	
<b>H/C</b>	NORMAL HEATING DEG. DAYS	30	1327	1065	964	657	410	183	52	73	291	592	967	1247	7828
	NORMAL COOLING DEG. DAYS	30	0	0	0	1	7	47	105	107	19	2	0	0	288
<b>RH</b>	NORMAL (PERCENT)	30	65	63	62	55	56	56	49	48	54	56	62	62	57
	HOURLY 05 LST	30	68	68	70	69	72	73	69	68	69	67	67	66	69
	HOURLY 11 LST	30	62	58	55	47	47	45	39	40	45	48	56	59	50
	HOURLY 17 LST	30	61	54	49	41	41	41	32	31	37	45	57	60	46
	HOURLY 23 LST	30	66	67	67	61	63	63	54	54	59	62	65	65	62
<b>S</b>	PERCENT POSSIBLE SUNSHINE	46	49	56	66	62	62	65	79	76	67	61	46	44	61
<b>W/O</b>	MEAN NO. DAYS WITH: HEAVY FOG(VISBY <= 1/4 MI)	45	1.4	1.6	2.4	1.8	0.6	0.5	0.1	0.3	0.6	1.4	2.0	1.1	13.8
	THUNDERSTORMS	61	0.0	0.1	0.1	0.6	3.0	6.4	6.3	5.5	1.4	0.2	0.0	0.1	23.7
<b>CLOUDNESS</b>	MEAN: SUNRISE-SUNSET (OKTAS)				9.6		8.0	4.0							
	MIDNIGHT-MIDNIGHT (OKTAS)						8.0	4.0							
	MEAN NO. DAYS WITH: CLEAR			1.0	2.0		1.0	8.0		8.0	6.0	2.0		5.0	
	PARTLY CLOUDY	1	1.0	2.0	1.0		6.0	6.0			3.0	8.0		1.0	
	CLOUDY	1	2.5	5.0	12.0		20.0	5.0		1.0	4.0	7.0		2.0	
<b>PR</b>	MEAN STATION PRESSURE(IN)	25	26.19	26.20	26.18	26.18	26.18	26.20	26.25	26.26	26.25	26.24	26.19	26.20	26.21
	MEAN SEA-LEVEL PRES. (IN)	25	30.09	30.09	30.03	29.98	29.93	29.91	29.93	29.95	29.99	30.03	30.04	30.09	30.01
<b>WINDS</b>	MEAN SPEED (MPH)	25	14.1	12.4	11.8	11.5	10.8	10.1	9.2	9.3	10.1	12.0	13.7	14.3	11.6
	PREVAIL.DIR(TENS OF DEGS)	32	23	23	24	24	24	24	24	24	24	23	23	23	23
	MAXIMUM 2-MINUTE: SPEED (MPH)	14	51	54	49	52	48	52	45	51	49	54	58	55	58
	DIR. (TENS OF DEGS)		23	24	23	26	24	25	24	32	24	25	23	25	23
	YEAR OF OCCURRENCE		2002	2002	2004	2002	1998	2006	1995	2002	1998	1999	2003	1999	NOV 2003
	MAXIMUM 3-SECOND SPEED (MPH)	14	64	66	63	58	83	64	59	83	57	62	72	67	83
	DIR. (TENS OF DEGS)		29	24	26	27	33	25	26	17	23	27	23	25	33
	YEAR OF OCCURRENCE		2000	2002	2004	2002	2008	2006	2002	2003	1998	1999	2003	1999	MAY 2008
<b>PRECIPITATION</b>	NORMAL (IN)	30	0.68	0.51	1.01	1.40	2.53	2.24	1.45	1.65	1.23	0.93	0.59	0.67	14.89
	MAXIMUM MONTHLY (IN)	71	2.05	2.16	2.18	4.63	8.13	6.85	4.68	4.90	3.56	3.43	2.27	1.92	8.13
	YEAR OF OCCURRENCE		1969	1958	1967	1975	1953	2005	1993	1985	1941	1975	1955	1977	MAY 1953
	MINIMUM MONTHLY (IN)	71	T	0.01	0.10	0.05	0.51	0.52	0.04	0.03	0.09	T	0.02	T	T
	YEAR OF OCCURRENCE		1944	1950	1986	1981	2001	1960	1959	1969	1990	1965	1954	1954	OCT 1965
	MAXIMUM IN 24 HOURS (IN)	71	0.74	11.87	1.14	2.43	3.42	2.90	2.40	2.74	1.82	1.15	0.97	0.82	11.87
	YEAR OF OCCURRENCE		1966	2008	1977	1951	1980	2002	1983	1989	1982	1954	1946	1972	FEB 2008
	NORMAL NO. DAYS WITH: PRECIPITATION >= 0.01	30	8.7	7.2	9.7	9.3	11.9	10.8	7.7	8.8	7.1	6.4	7.0	8.1	102.7
	PRECIPITATION >= 1.00	30	0.0	0.0	*	0.1	0.3	0.2	0.2	0.3	0.1	*	0.0	0.0	1.2
<b>SNOWFALL</b>	NORMAL (IN)	30	9.6	7.6	11.5	8.0	2.3	0.*	0.0	0.3	1.4	4.4	7.4	8.4	60.9
	MAXIMUM MONTHLY (IN)	70	22.6	26.1	27.8	35.4	11.6	11.1	T	8.3	10.4	16.6	24.9	30.5	35.4
	YEAR OF OCCURRENCE		1969	1958	1989	1967	1989	1950	1993	1992	1984	1975	1955	2008	APR 1967
	MAXIMUM IN 24 HOURS (IN)	70	10.2	11.0	11.5	16.8	11.6	11.0	T	8.3	8.4	8.3	10.8	9.8	16.8
	YEAR OF OCCURRENCE'		1984	1951	1987	1973	1989	1950	1993	1992	1988	1957	1946	1945	APR 1973
	MAXIMUM SNOW DEPTH (IN)	56	17	21	15	24	8	6	0	0	5	6	12	14	24
	YEAR OF OCCURRENCE		1978	1978	1977	1975	1983	2008			1988	1985	2005	1958	APR 1975
NORMAL NO. DAYS WITH: SNOWFALL >= 1.0	30	3.2	2.6	3.3	2.2	0.7	0.0	0.0	0.1	0.3	1.5	2.4	2.9	19.2	

**PRECIPITATION (inches) 2008 GREAT FALLS (KGTF)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1979	0.71	0.57	1.00	2.05	0.69	2.61	0.27	0.29	0.33	0.84	0.29	0.26	9.91
1980	0.67	1.03	0.74	0.62	5.12	3.91	0.27	0.67	0.98	1.75	0.19	0.27	16.22
1981	0.34	0.44	2.09	0.05	5.20	1.32	1.04	1.21	0.39	1.06	0.29	0.43	13.86
1982	1.09	0.99	1.97	1.04	3.63	3.09	0.66	0.41	2.43	0.75	0.63	0.99	17.68
1983	0.10	0.33	1.61	0.26	1.34	3.03	3.78	1.10	1.89	0.77	1.28	0.70	16.19
1984	0.72	0.69	1.31	0.94	1.34	2.10	0.05	1.01	0.71	1.20	0.49	1.25	11.81
1985	0.35	0.22	1.02	0.41	3.28	0.58	0.47	4.90	3.23	1.10	1.16	0.47	17.19
1986	0.57	0.75	0.10	2.83	1.74	1.72	1.67	0.81	1.52	0.90	0.45	0.27	13.33
1987	0.05	0.24	1.81	0.64	2.63	1.33	3.05	2.43	1.30	0.02	0.30	0.24	14.04
1988	0.76	0.47	0.44	0.77	1.60	1.42	1.82	0.26	2.33	0.66	0.30	0.97	11.80
1989	0.96	1.19	1.38	2.41	2.41	1.70	3.03	4.88	1.87	0.41	0.81	1.32	22.37
1990	0.29	0.17	1.69	0.84	3.97	1.23	1.03	3.19	0.09	0.13	0.70	0.73	14.06
1991	0.63	0.21	1.21	1.54	1.54	4.15	0.75	1.35	1.00	0.81	0.77	0.08	14.04
1992	0.48	0.23	0.43	1.32	2.14	3.22	1.81	1.37	0.25	2.61	0.29	0.31	14.46
1993	1.17	0.70	0.86	3.16	2.74	2.58	4.68	3.04	1.71	1.10	0.97	0.30	23.01
1994	0.47	0.53	0.20	1.90	1.81	1.56	0.72	0.61	0.35	1.77	0.42	0.24	10.58
1995	0.05	0.15	0.82	2.17	3.11	2.92	3.36	0.54	1.20	0.78	0.35	0.14	15.59
1996	0.49	0.26	0.83	1.40	2.57	1.14	0.17	0.67	1.47	0.54	0.35	1.25	11.14
1997	0.27	0.32	0.62	1.27	2.89	3.49	1.88	1.61	0.27	0.91	0.18	0.33	14.04
1998	0.72	0.42	1.10	0.42	3.08	5.18	1.73	1.72	1.00	0.80	0.96	0.22	17.35
1999	0.33	0.36	0.53	1.43	2.29	1.67	0.81	2.18	1.72	0.67	0.45	0.03	12.47
2000	0.34	0.69	0.74	0.33	2.10	1.55	1.04	0.12	1.32	1.34	0.49	0.19	10.25
2001	0.65	0.39	0.51	1.10	0.51	1.79	2.74	0.26	1.50	0.33	0.14	0.39	10.31
2002	0.30	0.26	0.70	0.42	1.61	5.03	1.50	2.49	1.65	0.47	0.27	0.29	14.99
2003	0.12	0.61	0.49	1.78	2.11	1.85	0.18	1.31	1.13	0.27	0.18	0.11	10.14
2004	0.23	0.06	0.29	1.06	2.91	2.82	0.42	2.55	1.99	1.05	0.16	0.43	13.97
2005	0.16	0.01	0.94	1.20	1.07	6.85	0.10	0.97	1.68	0.69	1.69	0.29	15.65
2006	0.71	0.44	1.70	2.88	2.64	4.24	0.27	1.33	1.82	1.48	0.43	0.59	18.53
2007	0.28	1.53	0.25	2.35	2.81	1.00	0.13	0.24	1.71	0.68	0.76	0.12	11.86
2008	0.84	0.43	0.35	1.51	3.82	3.08	1.25	1.31	1.87	0.53	0.74	1.43	17.16
POR= 61 YRS	0.77	0.60	0.96	1.39	2.49	2.68	1.31	1.42	1.18	0.81	0.65	0.65	14.91

WBAN : 24143

**AVERAGE TEMPERATURE (°F) 2008 GREAT FALLS (KGTF)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1979	6.5	18.8	34.7	40.7	51.5	62.9	69.0	68.5	62.9	49.4	33.4	34.6	44.4
1980	15.2	28.1	32.4	52.9	57.1	60.9	69.4	62.4	58.0	49.0	39.4	23.8	45.7
1981	33.8	30.8	37.2	46.5	52.8	58.1	66.5	69.8	59.8	45.3	40.8	24.6	47.2
1982	6.3	19.5	27.9	37.9	48.4	60.2	66.8	65.0	53.9	46.6	32.1	26.8	41.0
1983	32.2	36.7	35.8	41.7	50.7	60.1	65.8	72.4	53.6	48.9	35.1	4.0	44.8
1984	29.5	36.9	35.3	44.4	51.7	59.8	69.8	71.6	51.8	40.2	35.5	13.0	45.0
1985	19.2	21.6	33.4	48.5	57.3	62.2	73.0	61.8	48.2	44.5	12.3	24.6	42.2
1986	36.6	18.6	43.9	42.4	53.2	66.0	64.9	69.0	51.5	49.6	32.0	33.2	46.7
1987	32.4	36.0	36.2	52.8	57.8	65.4	66.8	61.6	58.9	47.5	40.4	29.6	48.8
1988	23.6	28.9	37.3	46.8	56.4	69.5	69.1	67.1	56.0	49.7	35.7	29.5	47.5
1989	28.0	10.3	29.0	43.4	50.9	60.8	70.2	64.0	56.1	46.2	36.6	27.5	43.6
1990	30.0	28.0	35.7	44.3	49.8	59.8	67.5	68.5	62.4	46.0	37.7	17.8	45.6
1991	19.0	39.2	35.0	43.1	51.2	57.9	68.0	71.7	57.7	42.4	31.7	35.0	46.0
1992	34.7	36.6	40.9	47.1	55.3	62.8	61.6	62.9	56.8	47.6	35.2	18.4	46.7
1993	14.8	19.3	37.6	43.7	55.5	56.5	58.1	60.5	52.5	46.2	28.1	33.6	42.2
1994	27.3	17.2	39.6	44.5	54.7	60.5	68.7	67.2	60.1	44.1	30.4	28.6	45.2
1995	28.2	28.0	30.2	39.8	49.3	56.9	63.9	64.0	56.0	43.2	35.1	26.6	43.4
1996	12.1	26.3	24.5	44.4	46.8	60.7	67.0	67.3	54.1	43.3	20.7	15.3	40.2
1997	17.4	31.3	33.6	36.6	51.8	59.3	65.3	65.3	60.5	45.7	34.3	30.7	44.3
1998	21.6	33.6	31.4	45.1	54.1	55.4	69.2	69.1	63.1	46.2	35.5	24.7	45.8
1999	27.4	34.5	37.8	39.9	49.7	57.8	63.6	68.0	52.5	46.7	43.3	35.2	46.4
2000	25.8	28.0	36.8	45.5	53.1	59.0	69.8	68.4	55.8	45.4	25.1	19.2	44.3
2001	30.5	17.5	36.1	42.2	55.3	60.1	68.6	70.8	60.6	46.1	41.8	25.4	46.3
2002	26.2	30.3	17.4	38.2	49.8	59.4	71.2	60.8	57.0	37.6	38.6	30.8	43.1
2003	29.3	24.4	31.2	46.0	51.1	60.8	72.4	71.0	56.4	48.9	27.2	30.4	45.8
2004	20.5	31.1	40.2	45.0	48.0	56.3	68.1	64.5	54.9	44.1	37.1	31.3	45.1
2005	20.3	31.7	34.6	43.9	50.3	58.3	69.1	65.8	56.5	48.2	36.8	25.0	45.0
2006	37.1	27.0	31.9	46.5	54.3	62.8	73.5	67.2	58.3	43.2	31.9	32.0	47.1
2007	27.5	23.6	41.9	42.0	53.8	62.4	76.8	67.6	56.4	48.5	33.5	26.7	46.7
2008	22.5	29.6	34.2	38.6	52.0	58.4	67.9	68.1	55.0	46.6	40.6	16.5	44.2
POR= 61 YRS	22.0	27.4	32.8	43.2	52.8	61.0	68.6	67.2	56.9	46.9	34.3	26.1	44.9

**HEATING DEGREE DAYS (base 65°F) 2008 GREAT FALLS (KGTF)**

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1979-80	19	15	106	482	939	934	1538	1066	1004	370	267	148	6888
1980-81	16	110	225	504	763	1275	960	953	855	548	373	218	6800
1981-82	34	14	201	603	718	1244	1819	1271	1142	806	511	161	8524
1982-83	44	66	342	565	978	1181	1007	786	899	692	437	154	7151
1983-84	59	2	356	490	891	1888	1094	810	915	620	419	183	7727
1984-85	12	18	415	760	879	1611	1415	1212	971	489	249	134	8165
1985-86	4	147	498	629	1581	1246	872	1297	648	672	390	48	8032
1986-87	50	22	400	471	987	979	1004	803	888	372	238	70	6284
1987-88	66	136	189	540	729	1090	1278	1039	852	538	281	65	6803
1988-89	24	39	294	468	876	1090	1140	1529	1109	642	430	150	7791
1989-90	3	96	269	575	845	1155	1079	1031	902	613	462	204	7234
1990-91	34	37	118	583	813	1460	1425	714	922	649	417	209	7381
1991-92	19	5	233	705	992	925	935	819	740	532	307	128	6340
1992-93	130	171	260	538	886	1441	1556	1274	841	634	291	266	8288
1993-94	221	165	372	578	1101	966	1161	1335	780	608	316	162	7765
1994-95	35	48	158	640	1031	1122	1129	1031	1072	749	478	235	7728
1995-96	70	91	285	671	889	1181	1639	1114	1252	609	557	150	8508
1996-97	41	50	323	669	1326	1535	1467	938	967	846	408	177	8747
1997-98	56	66	155	594	915	1055	1336	877	1032	589	335	282	7292
1998-99	8	14	146	573	880	1241	1157	846	839	746	473	222	7145
1999-00	115	30	372	561	642	919	1210	1069	866	579	361	191	6915
2000-01	21	34	289	600	1188	1413	1059	1328	893	680	305	185	7995
2001-02	23	4	166	575	690	1222	1198	963	1466	799	468	199	7773
2002-03	21	138	261	842	785	1053	1099	1132	1045	562	435	163	7536
2003-04	7	25	301	496	1128	1066	1375	976	759	596	521	263	7513
2004-05	41	88	306	639	834	1036	1377	924	934	625	448	216	7468
2005-06	33	77	265	513	839	1234	858	1058	1017	548	337	103	6882
2006-07	3	50	220	668	987	1015	1156	1153	709	684	346	117	7108
2007-08	2	42	280	507	935	1179	1310	1020	947	786	403	214	7625
2008-	19	45	295	567	725	1497							

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**COOLING DEGREE DAYS (base 65°F) 2008 GREAT FALLS (KGTF)**

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1979	0	0	0	0	2	55	152	132	50	5	0	0	396
1980	0	0	0	12	30	31	156	37	21	18	0	0	305
1981	0	0	0	0	3	17	85	168	49	0	0	0	322
1982	0	0	0	0	0	24	104	73	15	0	0	0	216
1983	0	0	0	0	4	14	90	241	19	0	0	0	368
1984	0	0	0	5	15	33	169	229	26	0	0	0	477
1985	0	0	0	0	20	58	260	51	0	0	0	0	389
1986	0	0	0	0	32	85	56	153	0	0	0	0	326
1987	0	0	0	13	23	90	128	36	13	4	0	0	307
1988	0	0	0	0	20	206	160	112	30	0	0	0	528
1989	0	0	0	0	0	31	170	72	8	0	0	0	281
1990	0	0	0	0	0	54	119	157	47	2	0	0	379
1991	0	0	0	0	0	1	119	217	19	13	0	0	369
1992	0	0	0	2	10	70	31	113	21	5	0	0	252
1993	0	0	0	0	4	19	13	30	3	0	0	0	69
1994	0	0	0	0	4	33	156	122	17	0	0	0	332
1995	0	0	0	0	0	1	44	68	24	0	0	0	137
1996	0	0	0	0	0	27	110	129	4	0	0	0	270
1997	0	0	0	0	5	15	71	85	26	2	0	0	204
1998	0	0	0	0	4	0	146	146	95	0	0	0	391
1999	0	0	0	0	4	9	80	131	3	0	0	0	227
2000	0	0	0	0	1	19	175	147	20	0	0	0	362
2001	0	0	0	0	12	42	144	190	43	0	0	0	431
2002	0	0	0	0	6	41	222	15	28	0	0	0	312
2003	0	0	0	0	13	46	245	216	49	5	0	0	574
2004	0	0	0	0	0	9	142	75	9	0	0	0	235
2005	0	0	0	0	0	19	167	108	15	0	0	0	309
2006	0	0	0	0	15	46	272	128	25	0	0	0	486
2007	0	0	0	0	3	47	376	131	29	0	0	0	586
2008	0	0	0	0	6	24	118	149	1	0	0	0	298

**SNOWFALL (inches) 2008 GREAT FALLS (KGTF)**

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1979-80	0.0	0.0	0.0	0.7	3.1	3.0	7.0	9.2	6.9	4.4	T	0.0	34.3
1980-81	0.0	0.0	0.0	7.7	3.3	5.4	4.1	7.1	11.5	0.1	T	0.0	39.2
1981-82	0.0	0.0	0.0	7.9	1.0	5.9	19.7	16.3	23.4	18.5	7.6	T	100.3
1982-83	0.0	0.0	0.7	1.5	8.8	13.0	0.9	4.1	6.6	1.4	8.6	0.0	45.6
1983-84	0.0	0.0	7.8	T	14.4	11.9	16.2	7.7	19.5	5.2	1.0	0.0	83.7
1984-85	0.0	0.0	10.4	10.9	5.5	16.6	5.4	3.8	11.9	2.4	0.0	0.0	66.9
1985-86	0.0	T	2.5	8.5	18.1	7.9	4.4	15.4	0.5	14.1	2.4	0.0	73.8
1986-87	0.0	0.0	0.1	1.2	7.9	4.5	1.0	1.8	16.5	0.6	5.3	0.0	38.9
1987-88	0.0	0.0	0.0	0.1	2.9	4.7	12.6	9.2	3.9	7.4	0.0	0.0	40.8
1988-89	0.0	0.0	9.1	5.3	6.0	10.9	16.0	18.7	24.2	15.7	11.6	T	117.5
1989-90	T	0.0	1.7	1.3	7.4	19.9	5.1	3.0	16.2	5.4	T	T	60.0
1990-91	T	0.0	0.0	0.4	6.7	8.5	9.2	3.1	23.9	6.0	4.0	T	61.8
1991-92	0.0	T	0.0	11.2	9.1	0.9	6.1	2.2	3.5	3.2	0.9	0.0	37.1
1992-93	0.0	8.3	0.0	8.3	3.3	6.4	14.7	10.1	7.0	4.4	T	T	62.5
1993-94	T	T	T	3.8	13.0	4.2	6.5	10.1	2.1	11.8	T	T	51.5
1994-95	0.0	0.0	T	3.8	10.2	2.7	0.2	4.1	12.9	0.0	0.0		
1995-96			T	4.5	6.3	1.9	8.8	11.5	21.7	8.6	2.8	T	
1996-97		0.0	T	8.3	8.9								
1997-98	0.0	0.0	0.0	0.4	3.3	4.0	11.0	3.4	14.7	0.9	T	0.3	38.0
1998-99	0.0	0.0	0.0	1.0	13.0	5.0	9.6	7.0	9.9	8.4	2.8	0.1	56.8
1999-00	0.0	T	T	5.4	1.7	0.2	5.7	13.2	7.2	2.6	8.3	T	44.3
2000-01	T	0.0	1.6	0.9	9.4	6.6	8.6	12.1	9.3	7.6	1.6	0.0	57.7
2001-02	T	0.0	0.0	3.7	2.6	5.6	7.3	7.6	19.3	5.2	6.7	T	58.0
2002-03	T	0.0	T	5.7	T	7.4	2.9	12.9	12.9	2.8	4.3	0.0	48.9
2003-04	0.0	0.0	0.0	5.6	8.5	7.8	8.5	2.6	5.3	5.3	5.0	0.0	48.6
2004-05	0.0	0.0	0.0	2.2	0.9	11.3	8.3	0.7	27.8	4.4	T	0.0	55.6
2005-06	0.0	0.0	0.0	0.4	24.9	5.1	3.9	5.5	14.2	3.0	1.8	0.0	58.8
2006-07	0.0	0.0	1.3	7.4	9.8	9.1	5.7	22.4	2.1	13.1	0.0	0.0	70.9
2007-08	0.0	0.0	0.0	T	12.7	1.9	14.1	6.9	5.9	21.7	0.2	6.8	70.2
2008-	0.0	0.0	0.0	6.7	2.7	30.5							
POR= 61 YRS	T	0.1	1.2	3.8	7.4	8.3	9.8	8.1	11.0	8.0	2.1	0.4	60.2

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**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><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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# 2008 GREAT FALLS MONTANA (KGTF)

The city of Great Falls is located along the main stem of the Missouri River at its confluence with the Sun River. The Weather Service Office is located at the Municipal Airport on a plateau between the Sun and Missouri Rivers. This plateau is about 200 feet higher than most of the immediate valley area, and the airport is about two miles southwest of the Sun and Missouri River Junction. Except to the north and northeast, the valley is encircled by mountain ranges, which lie about 30 miles away from east to south, 40 miles to the southwest, and 60 to 100 miles distant from west to northwest. Topography plays an important part in the climate of Great Falls. The Continental Divide to the west, and Big and Little Belt Ranges to the south, are primary factors in producing the frequent wintertime chinook winds observed in this part of Montana. The combination of valleys and plateaus in the immediate area, contributes to marked temperature differences between the airport and the city proper, either on calm, clear mornings, or when chinook winds reach the airport before they are felt at the lower elevations in town.

Summertime in the area generally is quite pleasant, with cool nights, moderately warm and sunny days, and very little hot, humid weather. Most of the summer rainfall occurs in showers or thunderstorms, and steady rains may occur during late spring or early summer. At the airport, freezing temperatures do not occur in July or August and very rarely in June. Frost occurs frequently in April and October, but more often in the valleys than on the surrounding hills or plateaus. However, frost may occur on rare occasions in nearby low lying areas at any time of the year.

Winters are not as cold as is usually expected of a continental location at this latitude, largely as a result of the chinook winds for which this area is noted. While sub-zero weather is experienced normally several times during a winter, the coldest weather seldom lasts more than a few days at a time, and is usually terminated by southwest chinook winds which can produce sharp temperature rises of 40 degrees or more in 24 hours.

As a result of recurring chinooks throughout the winter season, snow seldom lies on the ground for more than a few days. In fact, the ground usually is bare, or nearly bare, of snow most of the winter, except in the surrounding mountains and higher foothills. On the other hand, invasions of cold air from the polar regions occur a few times each winter, and sharp temperature falls from above freezing to below zero within 24 hours are observed occasionally.

Precipitation generally falls as snow during late fall, winter, and early spring, although rain can occur in any month. Late spring, summer, and early fall precipitation is almost always rain, but some hail is observed occasionally during summer thunderstorms.

Although average annual precipitation at Great Falls would normally classify the area as semi-arid, it is important to note that about 70 percent of the annual total falls normally during the April to September growing season. The combination of ideal temperatures during the peak of the growing season, long hours of summer sunshine, and adequate precipitation during the six critical months, makes the climate very favorable for dryland farming. Heavy fog occurs about one day per month, but each case lasts only a small part of the day. Although the average windspeed is relatively high, strong winds over 70 mph are seldom observed. Visibility normally is excellent.

# Station Location

GREAT FALLS

LOCATION	Occupied From	Occupied To	Airline Distances and Directions from previous Location	Latitude		Longitude		ELEVATION ABOVE								REMARKS
				NORTH	WEST	GROUND TEMPERATURE SITE	WIND INSTRUMENT	EXTREME THERMOMETERS	PSYCHROMETER	SUNSHINE SWITCH	TIPPING BUCKET RAIN GAUGE	WEIGHING RAIN GAUGE	8 INCH RAIN GAUGE	HYGROTHERMOMETER	AUTOMATIC OBSERVING EQUIPMENT *	
*NOTE:																
AIRPORT																
Administration Building Municipal Airport Gore Field+	12/20/39	08/01/94	1500 ft. NNE	47° 29'	111° 22'	3664 j3662 q3663	63 c75 f22 g22	18 a18 k5 s5	17 d17 k4 s5	b Unk e28 p37 r7	b15 n15 r5	b15 h15 m2 s5	15 a15 n15 r5	i4 t6	Weather Bureau from 1/25/40. a. Minor adjustment 2/22/40. b. Installed 11/21/41. c. Raised 11/21/41. d. Minor adjustment 1/30/57. e. Moved 80' N 8/1/59. f. Moved 1100' W 8/1/59. g. Minor adjustment 4/26/60. h. Minor adjustment 5/2/60. i. Commissioned 1100' W of thermometer site 2/4/61. j. Effective 2/4/61. k. Moved to ground 3/11/76. m. Moved to ground 5/11/76. n. Minor move 5/11/76. p. Relocated 5/12/76. q. Effective 3/11/77. r. Moved to ground 5/31/78. s. Relocated 5/31/78. Station type changed from WSMO to WSCMO 2/1980. t. Minor adjustment and type change 7/8/85.	
International Airport (Effective 3/1/58)																
International Airport	08/01/94	Present	NA	47° 28'	111° 23'	u3670								S ASOS commissioned 08/01/94. u. Ground elevation.		

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\* NOTES: For earlier station history see previous editions.