

1999

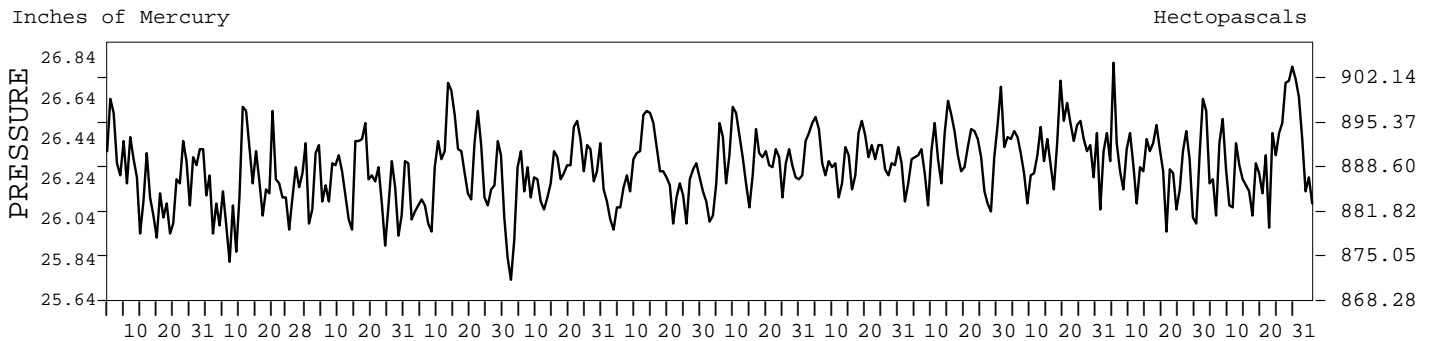
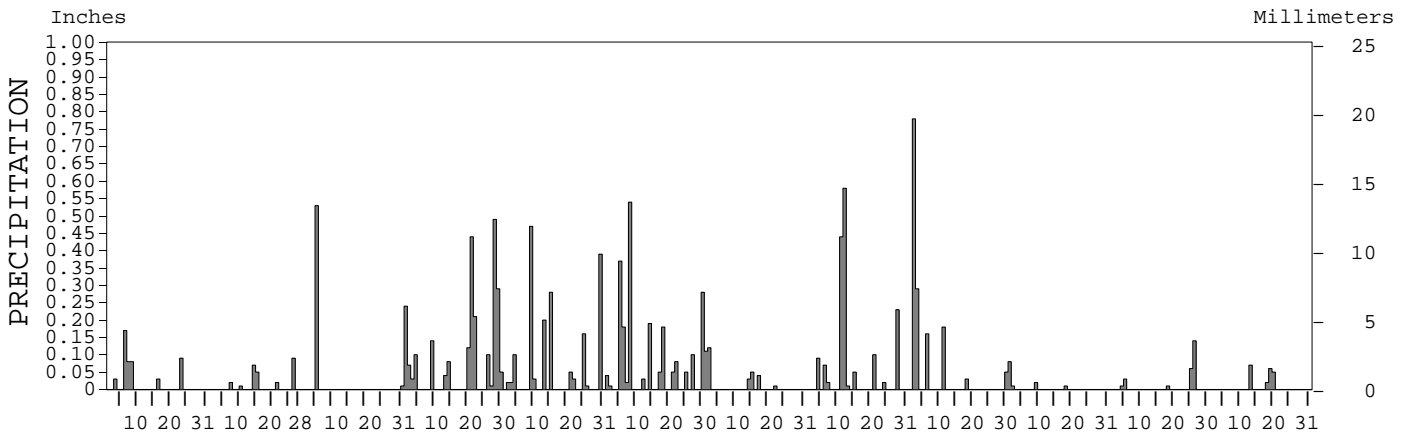
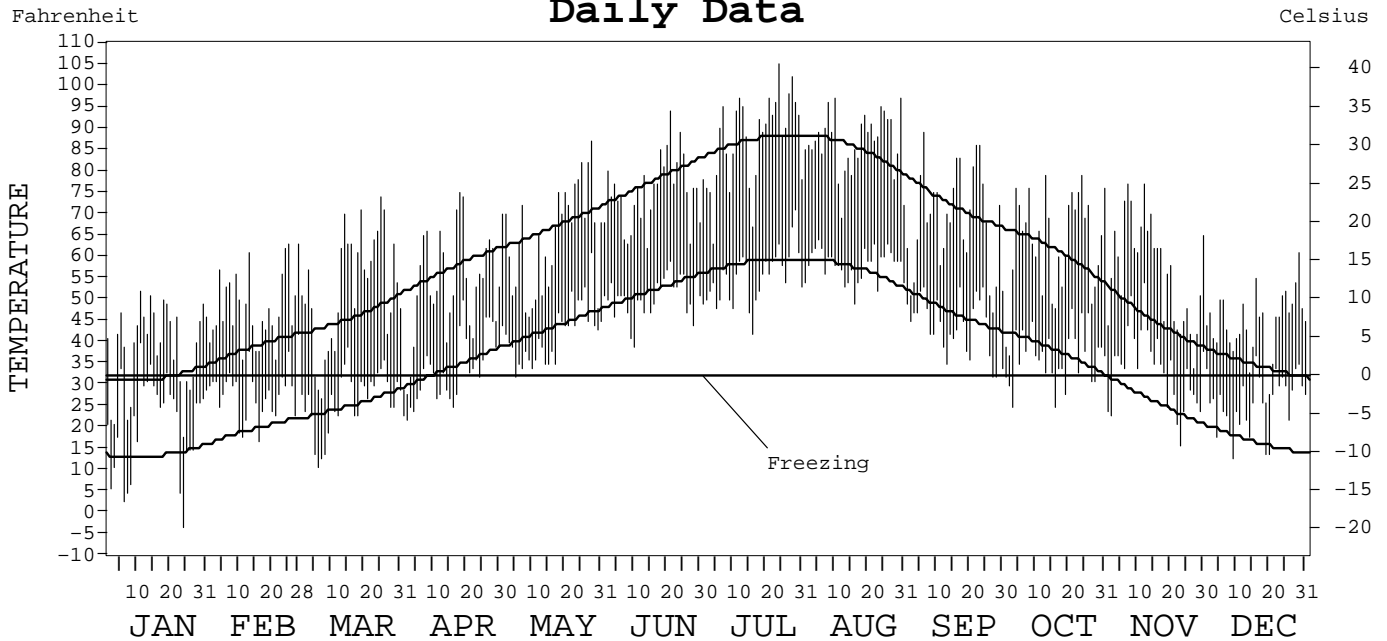
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-294X

BILLINGS,
MONTANA (BIL)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL ENVIRONMENTAL AND INFORMATION SERVICE
 NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
 NATIONAL CLIMATIC DATA CENTER
 ASHEVILLE, NORTH CAROLINA
 DIRECTOR
 NATIONAL CLIMATIC DATA CENTER

METEOROLOGICAL DATA FOR 1999

BILLINGS, MT (BIL)

LATITUDE: 45° 48' 29" N LONGITUDE: 108° 32' 35" W ELEVATION (FT): GRND: 3580 BARO: 3580 TIME ZONE: MOUNTAIN (UTC + 7) WBAN: 24033

	ELEMENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	38.9	48.3	52.6	53.2	64.6	75.2	87.2	86.7	68.5	63.3	56.8	44.4	61.6	
	HIGHEST DAILY MAXIMUM	52	63	74	75	87	94	105	97	89	79	77	61	105	
	DATE OF OCCURRENCE	11	28+	25	18	28	21	24	30+	06	24+	12+	29	JUL 24	
	MEAN DAILY MINIMUM	21.2	28.3	26.6	33.6	41.9	50.6	55.4	58.1	44.0	36.9	33.7	26.1	38.0	
	LOWEST DAILY MINIMUM	-3	17	11	22	32	39	42	49	32	25	16	13	-3	
	DATE OF OCCURRENCE	24	16	06	02	05	10	16	16	28+	16+	23	09	JAN 24	
	AVERAGE DRY BULB	30.1	38.3	39.6	43.4	53.3	62.9	71.3	72.4	56.3	50.1	45.3	35.3	49.9	
	MEAN WET BULB	25.4	31.5	32.7	37.1	45.1	52.4	55.5	58.5	46.1	39.9	35.4	28.9	40.7	
	MEAN DEW POINT	19.7	21.3	22.8	28.6	36.4	43.5	42.9	48.2	35.5	27.2	20.5	18.0	30.4	
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	1	16	11	0	0	0	0	0	28
	MAXIMUM ≤ 32°	9	0	3	3	0	0	0	0	0	0	0	2	17	
	MINIMUM ≤ 32°	27	24	26	13	1	0	0	0	2	7	11	26	137	
MINIMUM ≤ 0°	1	0	0	0	0	0	0	0	0	0	0	0	1		
H/C	HEATING DEGREE DAYS	1077	741	780	642	369	100	26	4	271	454	585	916	5965	
	COOLING DEGREE DAYS	0	0	0	0	10	44	228	241	17	0	1	0	541	
RH	MEAN (PERCENT)	71	55	57	62	57	54	42	48	51	47	44	52	53	
	HOUR 05 LST	75	67	70	76	74	74	63	67	65	60	51	58	67	
	HOUR 11 LST	70	48	50	54	46	48	32	43	44	43	40	49	47	
	HOUR 17 LST	66	44	40	48	42	37	29	31	38	35	37	45	41	
	HOUR 23 LST	73	61	63	68	63	61	47	49	56	49	47	60	58	
S	PERCENT POSSIBLE SUNSHINE		74												
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	2	2	1	1	0	0	0	1	2	1	5	1	16	
	THUNDERSTORMS	0	0	0	1	4	9	8	12	2	0	0	0	36	
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.)	26.25	26.19	26.23	26.29	26.24	26.25	26.32	26.35	26.38	26.40	26.33	26.35	26.30	
	MEAN SEA-LEVEL PRESS. (IN.)	30.02	29.90	29.93	29.99	29.89	29.86	29.90	29.93	30.03	30.08	30.03	30.10	29.97	
WINDS	RESULTANT SPEED (MPH)	7.3	10.1	2.9	2.8	2.5	1.6	2.1	1.4	2.1	4.3	7.1	11.3	4.0	
	RES. DIR. (TENS OF DEGS.)	24	25	27	33	31	31	33	32	28	25	23	24	26	
	MEAN SPEED (MPH)	11.7	13.7	9.7	10.2	9.6	9.2	9.8	8.4	9.9	10.9	10.4	14.5	10.7	
	PREVAIL. DIR. (TENS OF DEGS.)	22	23	20	01	22	03	02	20	22	22	23	22	22	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	41	48	53	36	38	44	40	38	41	56	33	43	56	
	DIR. (TENS OF DEGS.)	29	26	30	33	31	31	29	31	29	31	32	26	31	
	DATE OF OCCURRENCE	15	02	16	19	25	18	20+	20	25	31	04	16	OCT 31	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	49	61	63	45	45	52	51	52	48	70	40	52	70	
DIR. (TENS OF DEGS.)	29	26	31	32	31	30	28	31	30	32	33	27	32		
DATE OF OCCURRENCE	15	02	16	19	05	18	08	20	25	31	04	16	OCT 31		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.48	0.26	0.54	2.41	1.76	2.17	0.36	1.61	1.49	0.12	0.25	0.20	11.65	
	GREATEST 24-HOUR (IN.)	0.17	0.12	0.53	0.74	0.47	0.54	0.12	1.02	0.93	0.08	0.20	0.07	1.02	
	DATE OF OCCURRENCE	06	14-15	05	28-29	09	08	02	11-12	02-03	01	25-26	13	AUG 11-12	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	6	6	2	15	12	15	6	10	6	4	5	4	91	
PRECIPITATION ≥ 0.10	1	0	1	9	6	7	2	4	4	0	1	0	35		
PRECIPITATION ≥ 1.00	0	0	0	0	0	0	0	0	0	0	0	0	0		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	18.2	2.4	8.5	8.7	T	0.0	0.0	0.0	T	0.9	0.0	3.7	42.4	
	GREATEST 24-HOUR (IN.)	7.6	0.9	8.0	4.5	T	0.0	0.0	0.0	T	0.8	0.0	1.3	8.0	
	DATE OF OCCURRENCE	06	26	05	01	21+				30	01		19	MAR 05	
	MAXIMUM SNOW DEPTH (IN.)	10	1	6	6	0	0	0	0	0	0	0	2	10	
	DATE OF OCCURRENCE	09	15	06	02								20	JAN 09	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	4	0	1	3	0	0	0	0	0	0	0	2	10		

NORMALS, MEANS, AND EXTREMES

BILLINGS, MT (BIL)

LATITUDE: 45° 48' 29" N LONGITUDE: 108° 32' 35" W ELEVATION (FT): GRND: 3580 BARO: 3580 TIME ZONE: MOUNTAIN (UTC + 7) WBAN: 24033

	ELEMENT	POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	31.8	38.6	45.8	57.1	66.7	77.6	86.7	84.7	71.6	60.6	44.5	34.4	58.3
	MEAN DAILY MAXIMUM	52	32.0	38.8	45.3	56.6	67.1	76.8	86.0	84.8	72.4	60.7	44.7	35.8	58.4
	HIGHEST DAILY MAXIMUM	65	68	72	79	92	96	105	106	105	103	90	77	69	106
	YEAR OF OCCURRENCE		1953	1961	1986	1939	1936	1984	1937	1961	1983	1992	1999	1980	JUL 1937
	MEAN OF EXTREME MAXS.	52	54.8	60.1	67.9	78.0	86.2	93.9	98.9	98.0	91.6	81.5	66.0	56.9	77.8
	NORMAL DAILY MINIMUM	30	13.7	19.4	25.2	34.0	43.3	52.0	58.3	56.7	46.5	37.5	25.6	16.5	35.7
	MEAN DAILY MINIMUM	52	13.5	19.3	24.6	33.9	43.5	51.7	57.9	56.5	46.8	37.3	26.0	18.1	35.8
	LOWEST DAILY MINIMUM	66	-30	-38	-19	-5	14	32	41	35	22	-7	-22	-32	-38
	YEAR OF OCCURRENCE		1997	1936	1989	1936	1954	1969	1972	1992	1984	1991	1959	1983	FEB 1936
	MEAN OF EXTREME MINS.	52	-11.8	-4.7	2.1	19.8	31.0	41.3	48.5	46.6	33.0	21.2	4.6	-7.5	18.7
	NORMAL DRY BULB	30	22.8	29.0	35.5	45.6	55.0	64.8	72.5	70.7	59.1	49.1	35.1	25.5	47.1
	MEAN DRY BULB	52	22.7	29.1	35.1	45.3	55.2	64.3	72.0	70.8	59.6	48.9	35.4	26.9	47.1
	MEAN WET BULB	15	22.3	24.6	31.1	38.4	47.0	54.2	57.8	56.6	48.5	39.5	27.8	22.7	39.2
	MEAN DEW POINT	15	13.8	15.2	22.2	28.8	37.9	45.2	47.8	45.9	38.3	29.4	19.1	13.8	29.8
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	*	0.4	4.3	12.2	10.6	1.9	*	0.0	0.0	29.4	
MAXIMUM ≤ 32°	30	13.7	7.9	5.0	0.8	0.0	0.0	0.0	0.0	*	0.6	5.3	11.8	45.1	
MINIMUM ≤ 32°	30	27.5	23.5	23.6	12.8	1.7	0.1	0.0	0.0	1.5	8.2	21.6	27.6	148.1	
MINIMUM ≤ 0°	30	8.3	3.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	4.9	19.0	
H/C	NORMAL HEATING DEG. DAYS	30	1308	1008	915	582	316	119	12	42	242	498	897	1225	7164
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	6	113	244	219	65	5	0	0	652
RH	NORMAL (PERCENT)	30	60	59	58	54	55	53	46	44	52	53	59	61	54
	HOUR 05 LST	30	64	66	68	67	69	70	63	61	66	64	66	65	66
	HOUR 11 LST	30	60	58	54	48	48	45	39	39	48	49	57	60	50
	HOUR 17 LST	30	56	52	46	40	42	39	31	30	37	41	53	57	44
	HOUR 23 LST	30	62	62	62	58	60	58	49	47	54	56	62	62	58
S	PERCENT POSSIBLE SUNSHINE	56	47	53	61	60	61	64	76	75	68	61	46	45	60
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	52	1.5	2.2	2.4	2.6	1.4	0.7	0.4	0.3	1.0	1.9	2.2	1.6	18.2
	THUNDERSTORMS	60	0.0	0.0	0.1	1.2	4.5	7.5	7.6	5.7	2.0	0.2	0.0	0.0	28.8
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	1			9.6		8.8	3.2							
	MIDNIGHT-MIDNIGHT (OKTAS)	1					8.8	4.0							
	MEAN NO. DAYS WITH:														
	CLEAR														
	PARTLY CLOUDY														
	CLOUDY														
PR	MEAN STATION PRESSURE (IN)	27	26.30	26.29	26.20	26.30	26.30	26.30	26.30	26.30	26.40	26.30	26.31	26.30	26.30
	MEAN SEA-LEVEL PRES. (IN)	16	30.07	30.06	30.00	29.95	29.90	29.89	29.93	29.93	29.99	30.02	30.03	30.09	29.99
WINDS	MEAN SPEED (MPH)	35	13.0	12.0	11.1	11.4	10.6	10.0	9.4	9.3	10.0	10.8	12.0	13.0	11.1
	PREVAIL. DIR (TENS OF DEGS)	20	23	23	23	23	22	22	22	22	23	23	23	23	23
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	4	41	48	53	46	43	47	51	39	51	56	43	49	56
	DIR. (TENS OF DEGS)		29	26	30	31	23	28	31	31	27	31	29	27	31
	YEAR OF OCCURRENCE		1999	1999	1999	1996	1998	1998	1998	1996	1997	1999	1996	1998	OCT 1999
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	4	49	61	63	52	55	57	60	52	62	70	51	61	70
DIR. (TENS OF DEGS)		29	26	31	31	22	29	31	31	27	32	29	26	32	
YEAR OF OCCURRENCE		1999	1999	1999	1996	1998	1998	1998	1999	1997	1999	1996	1998	OCT 1999	
PRECIPITATION	NORMAL (IN)	30	0.90	0.64	1.16	1.74	2.57	1.99	0.94	1.01	1.36	1.14	0.84	0.79	15.08
	MAXIMUM MONTHLY (IN)	65	2.35	1.77	2.70	4.42	7.71	7.64	5.08	3.50	4.99	3.80	2.34	2.00	7.71
	YEAR OF OCCURRENCE		1972	1978	1954	1955	1981	1944	1993	1965	1941	1971	1978	1973	MAY 1981
	MINIMUM MONTHLY (IN)	65	0.04	0.02	0.13	0.06	0.40	0.24	0.04	0.05	0.06	0.01	T	0.05	T
	YEAR OF OCCURRENCE		1941	1997	1936	1962	1993	1961	1988	1955	1964	1987	1954	1957	NOV 1954
	MAXIMUM IN 24 HOURS (IN)	65	1.41	0.65	1.01	3.19	2.83	2.78	2.32	2.47	2.19	1.98	1.37	0.96	3.19
	YEAR OF OCCURRENCE		1972	1986	1973	1978	1952	1997	1993	1965	1966	1974	1959	1978	APR 1978
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	8.4	7.4	9.2	10.0	11.6	10.8	7.3	6.6	7.6	6.3	6.2	7.9	99.3	
PRECIPITATION ≥ 1.00	30	0.1	0.0	0.0	0.1	0.3	0.3	*	0.1	0.2	0.1	*	0.0	1.2	
SNOWFALL	NORMAL (IN)	30	10.7	6.6	10.7	7.9	1.9	T	0.0	0.0	1.7	3.6	7.5	9.4	60.0
	MAXIMUM MONTHLY (IN)	65	27.7	22.4	27.6	42.3	15.6	2.0	0.4	T	9.3	23.1	25.2	28.8	42.3
	YEAR OF OCCURRENCE		1963	1978	1935	1955	1981	1950	1993	1992	1984	1949	1978	1955	APR 1955
	MAXIMUM IN 24 HOURS (IN)	61	16.6	9.0	10.5	23.7	15.3	2.0	0.4	T	7.5	11.2	15.3	13.7	23.7
	YEAR OF OCCURRENCE		1972	1944	1964	1955	1981	1950	1993	1992	1983	1980	1959	1978	APR 1955
	MAXIMUM SNOW DEPTH (IN)	51	18	22	22	33	10	0	0	0	7	14	17	24	33
	YEAR OF OCCURRENCE		1972	1978	1978	1955	1983				1984	1949	1978	1978	APR 1955
	NORMAL NO. DAYS WITH:														
SNOWFALL ≥ 1.0	30	3.3	2.2	3.4	2.4	0.4	0.0	0.0	0.0	0.6	1.1	2.4	2.9	18.7	

PRECIPITATION (inches) 1999 BILLINGS, MT (BIL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0.87	1.10	0.95	3.04	3.48	1.61	0.37	0.21	1.92	0.93	0.82	0.79	16.09
1971	1.30	0.56	0.83	1.60	2.07	0.70	0.40	0.43	1.80	3.80	0.17	1.13	14.79
1972	2.35	0.81	0.80	1.63	2.51	0.91	1.91	1.61	1.31	2.24	1.01	1.08	18.17
1973	1.30	0.43	1.59	3.00	0.73	0.81	0.29	1.23	2.21	1.36	1.21	2.00	16.16
1974	0.78	0.22	1.20	1.65	2.80	1.94	0.91	2.18	1.80	2.24	0.28	0.30	16.30
1975	2.05	0.75	1.30	1.91	3.62	1.62	2.64	0.37	0.24	2.66	1.39	1.96	20.51
1976	0.58	1.12	0.95	3.53	1.85	2.70	0.07	0.60	1.21	0.91	0.68	0.31	14.51
1977	1.44	0.05	1.37	0.64	1.35	0.63	0.80	1.05	0.65	1.20	1.42	1.65	12.25
1978	2.03	1.77	0.18	4.12	6.97	1.55	1.54	0.52	3.78	0.27	2.34	1.73	26.80
1979	0.72	0.56	1.11	1.20	0.92	1.06	0.46	0.87	0.16	0.73	0.53	0.09	8.41
1980	1.11	0.78	1.53	0.46	4.47	1.64	0.39	1.17	0.77	2.45	0.42	0.33	15.52
1981	0.21	0.24	1.75	0.35	7.71	1.58	1.65	0.55	0.14	1.33	0.41	0.53	16.45
1982	0.71	0.34	1.81	1.53	2.63	5.03	1.91	0.45	1.22	1.15	0.42	1.07	18.27
1983	0.11	0.31	0.73	0.56	2.23	0.88	1.52	1.12	2.26	1.32	0.90	0.92	12.86
1984	0.65	0.93	0.84	1.38	1.12	1.65	0.29	0.58	1.32	0.37	0.95	0.84	10.92
1985	0.31	0.39	2.05	0.31	1.27	1.07	1.40	1.66	1.89	0.69	1.43	0.20	12.67
1986	0.37	1.72	1.04	2.72	1.92	2.15	1.01	0.43	1.24	0.33	1.21	0.12	14.26
1987	0.07	0.49	1.36	0.42	3.84	1.03	2.23	1.73	0.68	0.01	0.29	0.31	12.46
1988	0.45	0.71	0.66	1.82	1.84	0.43	0.04	0.12	2.12	1.01	0.60	0.56	10.36
1989	1.27	0.56	2.04	2.36	2.06	1.18	0.55	0.76	0.70	2.05	0.52	1.36	15.41
1990	0.29	0.50	1.70	2.06	2.81	0.66	0.37	0.93	0.08	1.05	0.33	0.49	11.27
1991	0.82	0.49	0.62	3.87	2.25	5.62	1.04	0.35	3.11	1.29	0.96	0.31	20.73
1992	0.09	0.12	0.65	2.35	1.70	2.69	1.67	0.34	0.62	0.42	0.30	0.51	11.46
1993	0.47	0.32	0.50	1.86	0.40	2.05	5.08	0.69	1.76	2.11	0.26	0.20	15.70
1994	0.34	0.36	0.62	1.89	1.53	1.97	2.02	0.11	1.33	2.06	1.17	0.25	13.65
1995	0.53	0.28	1.87	1.84	3.51	2.94	1.37	0.94	1.01	0.94	0.51	0.34	16.08
1996	0.82	0.62	1.02	1.06	3.85	0.85	0.57	0.07	1.80	0.58	0.86	0.23	12.33
1997	0.95	0.02	0.80	1.13	1.49	4.14	2.76	0.94	0.28	1.16	0.49	0.41	14.57
1998	1.03	0.23	1.32	1.29	1.26	3.63	2.29	1.94	1.50	1.36	0.76	0.41	17.02
1999	0.48	0.26	0.54	2.41	1.76	2.17	0.36	1.61	1.49	0.12	0.25	0.20	11.65
POR= 65 YRS	0.71	0.58	1.06	1.61	2.24	2.37	1.03	0.82	1.29	1.08	0.69	0.58	14.06

WBAN : 24033

AVERAGE TEMPERATURE (°F) 1999 BILLINGS, MT (BIL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	20.2	33.0	29.5	38.6	54.5	66.0	73.2	74.6	55.8	45.1	33.6	24.7	45.7
1971	18.7	26.8	33.5	44.2	54.5	64.3	69.2	76.7	55.6	43.4	35.9	19.7	45.2
1972	13.2	26.2	40.1	43.7	53.8	67.0	66.6	70.1	54.8	43.6	34.2	18.1	44.3
1973	23.1	29.2	38.6	41.4	54.3	65.0	71.7	72.3	57.7	50.4	29.5	31.4	47.1
1974	22.6	35.8	35.8	47.7	50.5	66.9	75.0	64.8	56.0	50.5	37.4	29.9	47.7
1975	23.6	18.1	30.2	37.1	51.3	60.2	74.5	67.8	59.5	47.9	32.9	29.4	44.4
1976	26.5	32.9	32.0	46.1	56.2	60.9	73.7	71.1	62.0	46.0	35.2	31.5	47.8
1977	18.0	37.6	36.0	50.3	56.6	69.2	72.6	66.1	59.0	49.7	31.8	20.3	47.3
1978	11.0	16.0	34.8	46.6	53.6	64.0	68.0	67.4	60.6	49.1	24.6	16.1	42.7
1979	7.7	18.9	36.2	43.6	53.8	66.5	73.4	71.5	66.2	52.6	33.5	36.3	46.7
1980	17.0	29.2	34.4	54.6	61.0	66.5	75.7	67.4	62.0	50.7	40.6	30.3	49.1
1981	36.0	32.5	41.7	50.5	55.6	64.6	73.8	73.2	63.3	46.0	40.5	28.5	50.5
1982	13.1	28.0	32.9	42.6	52.4	61.4	70.8	75.8	60.4	50.2	33.8	28.7	45.8
1983	35.3	38.4	38.6	42.9	53.2	63.9	72.0	77.5	59.3	53.5	37.8	8.7	48.4
1984	29.3	38.3	38.1	45.0	55.5	64.5	74.5	74.7	54.0	42.1	37.6	19.6	47.8
1985	20.3	24.1	34.1	50.5	60.3	64.0	74.8	65.6	53.0	49.6	15.2	25.9	44.8
1986	37.2	24.2	46.2	44.5	54.4	69.7	69.3	70.5	53.7	50.0	32.0	32.3	48.7
1987	30.3	35.0	37.6	54.1	60.2	67.9	70.4	66.2	61.2	49.6	40.3	29.8	50.2
1988	23.6	28.7	39.8	48.3	59.7	75.9	76.2	72.2	58.7	52.0	37.0	29.3	50.1
1989	27.2	13.4	29.9	45.0	55.0	63.6	75.3	69.3	60.5	47.2	39.7	25.0	45.9
1990	31.2	29.0	38.1	46.1	53.6	65.1	72.1	72.6	66.5	48.7	40.6	19.2	48.6
1991	20.8	41.0	38.5	43.7	54.8	64.3	72.6	75.5	60.6	45.6	32.7	34.1	48.7
1992	35.2	39.4	44.0	48.9	58.4	65.9	65.8	67.2	60.7	49.8	36.9	19.7	49.3
1993	17.9	21.7	40.6	47.0	59.8	62.2	62.7	65.6	57.0	47.5	31.4	33.7	45.6
1994	28.2	22.5	42.0	47.1	59.9	66.4	72.1	73.4	64.5	48.4	34.6	31.0	49.2
1995	31.9	34.9	34.6	42.7	51.2	61.9	69.3	70.7	58.5	47.2	38.4	28.3	47.5
1996	16.5	29.3	28.1	47.3	50.4	67.0	72.5	73.7	57.9	46.2	24.6	19.4	44.4
1997	18.8	32.3	37.6	38.8	56.0	65.5	68.8	69.4	64.1	49.3	35.4	30.0	47.2
1998	24.5	35.9	32.8	47.8	57.4	58.2	75.3	72.7	66.6	48.8	38.1	26.2	48.7
1999	30.1	38.3	39.6	43.4	53.3	62.9	71.3	72.4	56.3	50.1	45.3	35.3	49.9
POR= 65 YRS	23.0	28.2	34.9	45.6	55.5	63.9	72.4	70.7	59.9	49.4	35.4	27.4	47.2

HEATING DEGREE DAYS (base 65°F) 1999 BILLINGS, MT (BIL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	1	0	296	614	936	1244	1429	1063	972	617	322	86	7580
1971-72	25	7	305	659	869	1397	1601	1118	764	633	353	36	7767
1972-73	85	26	311	660	914	1451	1296	994	810	699	333	99	7678
1973-74	4	3	226	446	1058	1035	1313	811	896	511	443	94	6840
1974-75	7	76	269	444	821	1078	1280	1308	1071	829	418	152	7753
1975-76	1	31	185	536	955	1095	1186	926	1015	559	265	138	6892
1976-77	0	6	131	582	884	1030	1451	759	896	437	258	28	6462
1977-78	0	59	208	463	988	1380	1668	1366	933	545	357	97	8064
1978-79	41	45	204	487	1208	1509	1771	1286	887	636	350	71	8495
1979-80	2	7	44	383	937	884	1484	1033	939	324	159	46	6242
1980-81	0	25	127	462	724	1073	891	905	717	427	292	79	5722
1981-82	12	6	124	583	729	1124	1603	1028	987	666	386	142	7390
1982-83	12	0	215	453	926	1118	911	741	810	656	381	82	6305
1983-84	29	5	234	359	811	1741	1101	769	828	592	316	97	6882
1984-85	12	3	351	701	812	1404	1381	1140	950	428	184	103	7469
1985-86	13	65	358	471	1492	1207	853	1136	579	610	347	18	7149
1986-87	8	2	331	457	982	1005	1070	829	841	337	183	44	6089
1987-88	39	56	134	473	734	1083	1276	1047	775	492	200	14	6323
1988-89	0	6	221	395	833	1099	1168	1441	1084	595	308	97	7247
1989-90	0	25	172	546	752	1235	1042	1002	829	560	346	108	6617
1990-91	9	0	73	500	725	1413	1365	665	814	630	311	50	6555
1991-92	3	0	171	612	963	951	918	737	641	481	232	73	5782
1992-93	53	95	166	475	837	1398	1456	1210	751	531	177	134	7283
1993-94	98	60	250	534	1004	963	1135	1186	707	534	161	77	6709
1994-95	13	20	67	505	908	1045	1020	838	936	661	425	141	6579
1995-96	9	12	227	551	790	1131	1500	1032	1139	525	446	44	7406
1996-97	0	3	224	578	1205	1406	1425	910	840	780	285	38	7694
1997-98	44	39	90	493	882	1077	1249	806	992	508	235	211	6626
1998-99	0	0	98	493	803	1195	1077	741	780	642	369	100	6298
1999-	26	4	271	454	585	916							

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COOLING DEGREE DAYS (base 65°F) 1999 BILLINGS, MT (BIL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	0	10	115	261	305	28	3	0	0	722
1971	0	0	0	0	4	69	162	377	29	0	0	0	641
1972	0	0	0	0	12	102	139	192	8	0	0	0	453
1973	0	0	0	0	13	107	219	235	16	0	0	0	590
1974	0	0	0	1	2	158	324	78	7	2	0	0	572
1975	0	0	0	0	2	15	299	126	26	10	0	0	478
1976	0	0	0	0	1	21	276	200	49	0	0	0	547
1977	0	0	0	0	7	160	242	102	34	0	0	0	545
1978	0	0	0	0	12	71	140	128	78	0	0	0	429
1979	0	0	0	0	12	126	270	216	86	6	0	0	716
1980	0	0	0	20	40	99	339	105	46	26	0	0	675
1981	0	0	0	0	6	74	291	268	76	3	0	0	718
1982	0	0	0	0	0	41	198	342	82	0	0	0	663
1983	0	0	0	0	24	54	256	400	69	7	2	0	812
1984	0	0	0	0	30	91	315	310	29	0	0	0	775
1985	0	0	0	0	42	83	325	92	6	0	0	0	548
1986	0	0	1	2	25	163	152	177	1	0	0	0	521
1987	0	0	0	17	41	134	215	100	30	4	0	0	541
1988	0	0	0	0	41	351	355	234	37	0	0	0	1018
1989	0	0	0	2	2	64	327	164	45	0	0	0	604
1990	0	0	0	0	0	117	239	245	123	0	0	0	724
1991	0	0	0	1	3	35	244	332	45	16	0	0	676
1992	0	0	0	4	36	106	84	166	42	10	0	0	448
1993	0	0	0	0	18	57	34	85	19	2	0	0	215
1994	0	0	0	3	9	126	241	289	58	0	0	0	726
1995	0	0	0	0	3	55	151	195	39	5	0	0	448
1996	0	0	0	0	0	108	241	280	15	1	0	0	645
1997	0	0	0	0	14	61	170	182	71	13	0	0	511
1998	0	0	0	0	6	12	326	243	152	0	0	0	739
1999	0	0	0	0	10	44	228	241	17	0	1	0	541

SNOWFALL (inches) 1999 BILLINGS, MT (BIL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0.0	0.0	4.9	T	4.9	8.4	11.5	5.7	8.0	2.5	T	0.0	45.9
1971-72	0.0	0.0	T	13.0	1.1	12.2	27.6	7.6	8.2	7.3	T	0.0	77.0
1972-73	0.0	0.0	4.7	3.2	T	12.9	13.3	5.4	7.4	14.3	1.8	0.0	63.0
1973-74	0.0	0.0	T	8.5	11.9	14.9	8.4	2.5	10.6	2.5	0.8	0.0	60.1
1974-75	0.0	0.0	T	0.6	1.1	3.5	20.8	6.8	14.0	12.9	1.1	0.0	60.8
1975-76	0.0	0.0	0.0	3.3	13.9	20.0	5.9	11.1	9.8	6.1	0.0	0.0	70.1
1976-77	0.0	0.0	0.0	2.1	7.0	6.2	16.1	0.3	13.7	5.7	T	0.0	51.1
1977-78	0.0	0.0	0.0	3.4	14.1	18.1	25.9	22.4	1.3	T	0.0	0.0	85.2
1978-79	0.0	0.0	T	0.0	25.2	22.2	10.1	8.7	5.9	3.7	0.3	0.0	76.1
1979-80	0.0	0.0	0.0	1.4	7.7	1.7	16.9	10.0	17.3	4.2	0.0	0.0	59.2
1980-81	0.0	0.0	T	17.8	4.5	5.5	2.1	3.4	16.3	0.7	15.6	0.0	65.9
1981-82	0.0	0.0	0.0	5.7	3.2	5.4	9.8	5.3	18.2	13.5	2.0	0.0	63.1
1982-83	0.0	0.0	5.7	1.5	5.6	11.2	0.1	1.0	6.4	5.8	11.9	0.0	49.2
1983-84	0.0	0.0	7.5	T	5.5	10.9	5.3	6.8	4.5	9.0	T	0.0	49.5
1984-85	0.0	0.0	9.3	6.5	9.9	16.1	4.8	3.8	21.7	1.9	0.0	0.0	74.0
1985-86	0.0	0.0	3.6	6.0	17.1	2.0	3.3	13.8	6.4	12.9	8.3	0.0	73.4
1986-87	0.0	0.0	0.0	0.0	12.3	1.9	0.6	6.0	13.3	0.3	0.4	0.0	34.8
1987-88	0.0	0.0	0.0	0.3	2.6	3.6	7.4	8.8	1.9	10.7	2.0	0.0	37.3
1988-89	0.0	0.0	T	2.0	5.6	6.2	18.5	6.8	25.1	11.8	T	0.0	76.0
1989-90	0.0	0.0	T	7.2	5.8	17.1	3.3	8.9	13.0	11.2	T	0.0	66.5
1990-91	T	T	0.0	3.5	1.5	6.2	11.4	1.0	3.7	30.0	3.6	T	60.9
1991-92	T	0.0	0.0	15.6	7.6	3.5	0.9	1.1	3.1	3.4	0.0	0.0	35.2
1992-93	0.0	T	0.0	4.0	1.7	10.6	11.4	5.8	2.7	6.9	0.0	T	43.1
1993-94	0.4	0.0	T	7.8	5.6	3.0	8.7	6.8	7.9	10.1	T	T	50.3
1994-95	T	0.0	0.0	T	13.9	4.6	2.4	6.3	6.8	8.8	3.9	T	46.7
1995-96		0.0	1.6	4.9	3.3	3.2	13.4	10.2	18.8	7.1	0.9	T	
1996-97	T	0.0	T	9.7	15.7	20.6	18.5	0.8	10.3	23.1	T	T	98.7
1997-98	T	0.0	0.0	0.9	5.3	6.4	18.6	1.7	20.5	T	T	T	53.4
1998-99	T	0.0	0.0	0.0	5.1	6.5	18.2	2.4	8.5	8.7	T	0.0	49.4
1999-	0.0	0.0	T	0.9	0.0	3.7							
POR= 63 YRS	0.0	T	1.1	3.5	6.8	8.3	9.5	7.4	10.3	8.0	1.7	0.0	56.6

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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 (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 EIGHTHS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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1999
BILLINGS,
MONTANA (BIL)

Billings, Montana, at an elevation of 3,100 to 3,600 feet above sea level, is situated in the borderline area between the Great Plains and the Rocky Mountains, and has a climate which takes on some of the characteristics of both regions. Its climate may be classified as semi-arid, but with irrigation and the favorable distribution of the precipitation, it is possible to raise a variety of crops in the area.

About a third of the annual precipitation falls during May and June, with June being the wettest month. The period of least precipitation is from November through February. These four months normally produce less than 20 percent of the annual precipitation. The heaviest snows occur during the spring and fall months when the temperature and moisture conditions are most favorable. Heavy snows of 6 inches or more also occur during November and December. The occurrence of thawing periods normally prevents the snow from accumulating to great depths on the ground. Thunderstorms are most frequent during the summer months. These storms are frequently accompanied by strong, gusty winds and occasionally by hail. Destructive hailstorms, however, are rather infrequent.

Winter is usually cold, though not extremely so, and generally affords several mild periods of a week to several weeks in length. The winter cold periods are ushered in by moderately strong north to northeast winds and snow. The coldest temperatures occur after the snow ends and the sky clears. True blizzard conditions are not observed very often in town, but in the surrounding rural areas, blizzard conditions may develop several times during the winter. Cold weather improves with the onset of moderate to strong southwest winds. This wind is sometimes a foehn condition (chinook), but is more often a drainage wind moving down the Yellowstone Valley which transports warmer air of Pacific origin to the area. Occasionally an open winter occurs when cold Arctic outbreaks pass far to the east and temperatures stay above zero degrees.

Spring brings a period of frequent and rapid fluctuations in the weather. It is usually cloudy and cool with frequent periods of rain and/or snow. As the season progresses, snows become less frequent until late May and June when rain is the rule. The last freezing temperatures in spring usually occur before mid-May though they have occurred as late as late June.

The summer season is characterized by warm days with abundant sunshine and low humidities. The nights are cool because of the altitude and the cool air drainage into the valley from the higher terrain. Seldom is there a protracted rainy spell during this season. Frequent thunderstorms bring threatening afternoon cloudiness but usually only small amounts of rain.

The first freezing temperatures of the fall season occur in late September, but they have been noted as early as late August. Over the years, the fall months have been about evenly distributed between cold, wet ones, and mild, dry, pleasant ones. The change to severe winter weather usually arrives after the middle of November. There have been years when the more severe type of winter weather have been delayed until late in December.

