

1998

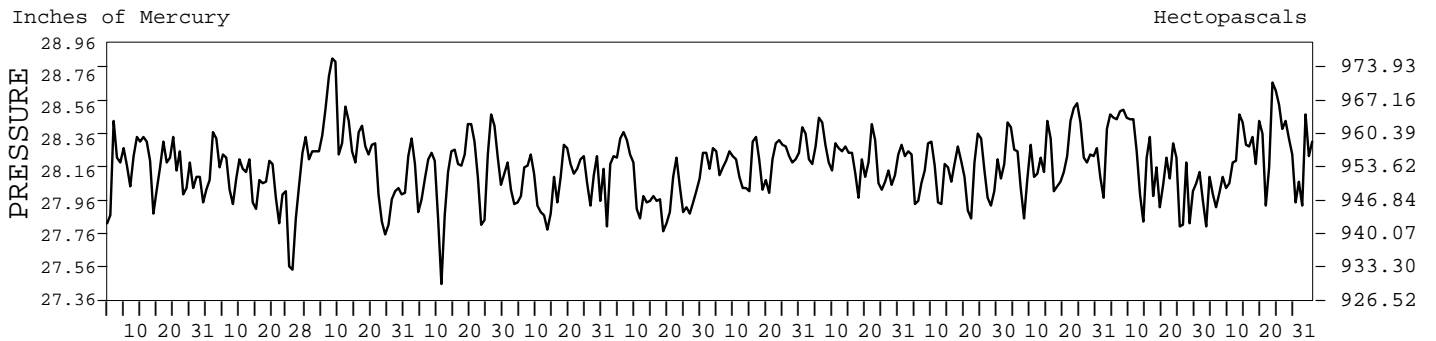
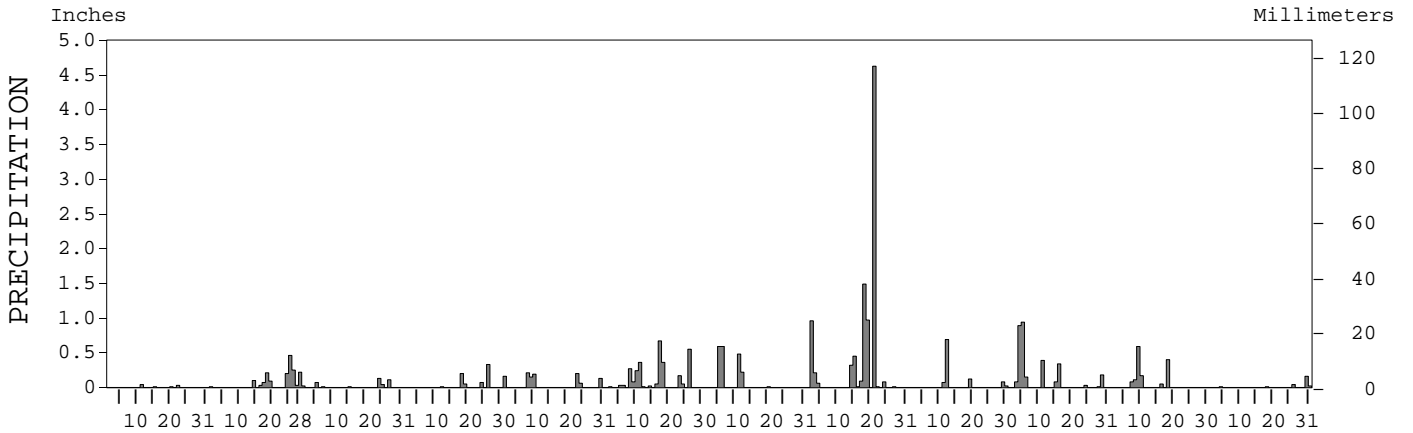
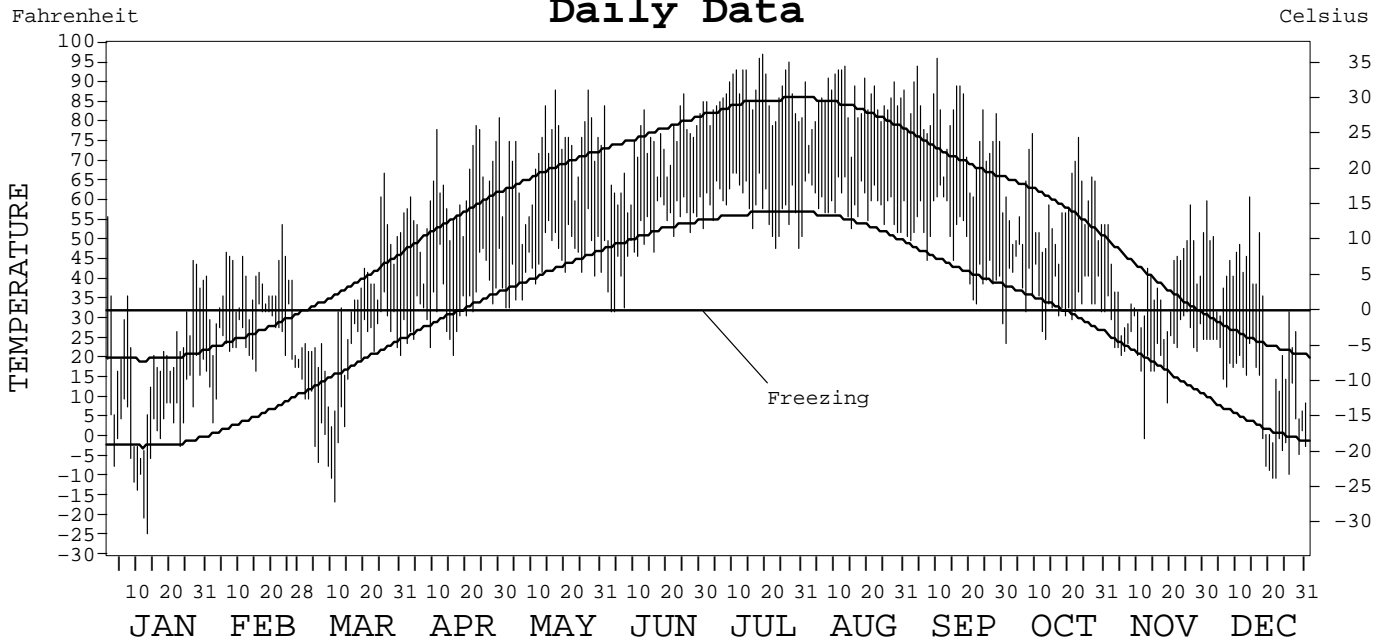
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-3822

BISMARCK,
NORTH DAKOTA (BIS)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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METEOROLOGICAL DATA FOR 1998

BISMARCK, ND (BIS)

LATITUDE: 46° 46' 27" N LONGITUDE: 100° 44' 51" W ELEVATION (FT): GRND: 1647 BARO: 1655 TIME ZONE: CENTRAL (UTC+ 6) WBAN: 24011

	ELEMENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	22.7	36.9	32.7	61.9	71.2	72.1	87.1	85.4	78.2	57.8	38.8	31.2	56.3	
	HIGHEST DAILY MAXIMUM	56	54	67	81	88	87	97	94	96	77	59	61	97	
	DATE OF OCCURRENCE	01	23	26	30	27+	25	19	13	10	09	26	14	JUL 19	
	MEAN DAILY MINIMUM	3.6	23.8	15.3	34.1	44.8	50.7	58.6	59.5	48.7	35.8	23.2	10.1	34.0	
	LOWEST DAILY MINIMUM	-24	4	-16	21	33	32	48	52	29	24	0	-10	-24	
	DATE OF OCCURRENCE	13	02	11	16	03+	04+	30+	30+	30	01	12	22+	JAN 13	
	AVERAGE DRY BULB	13.2	30.4	24.0	48.0	58.0	61.4	72.9	72.5	63.5	46.8	31.0	20.7	45.2	
	MEAN WET BULB	12.5	28.6	22.6	41.8	51.2	55.8	64.8	64.6	56.1	43.0	29.3	17.9	40.7	
	MEAN DEW POINT	8.6	26.3	18.9	33.8	44.7	51.4	59.3	60.0	50.8	39.6	26.4	13.0	36.1	
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	0	10	8	3	0	0	0	21	
	MAXIMUM ≤ 32°	23	7	15	0	0	0	0	0	0	0	9	15	69	
	MINIMUM ≤ 32°	31	26	30	14	0	2	0	0	1	10	29	31	174	
	MINIMUM ≤ 0°	11	0	6	0	0	0	0	0	0	0	1	11	29	
H/C	HEATING DEGREE DAYS	1601	962	1264	502	230	143	2	3	121	556	1013	1368	7765	
	COOLING DEGREE DAYS	0	0	0	0	17	42	253	242	79	0	0	0	633	
RH	MEAN (PERCENT)	80	87	81	63	65	73	64	69	67	80	83	75	74	
	HOUR 06 LST	83	91	90	86	84	89	88	89	87	90	87	81	87	
	HOUR 12 LST	76	83	74	46	51	60	47	56	53	69	78	69	64	
	HOUR 18 LST	77	82	72	44	47	58	45	50	50	71	81	72	62	
	HOUR 24 LST	85	91	85	76	78	86	78	79	79	88	87	80	83	
S	PERCENT POSSIBLE SUNSHINE	46	22	41	60	57	38	76	68	81	47	28	56	52	
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	2	2	4	0	2	0	0	1	0	5	2	3	21	
	THUNDERSTORMS	0	0	0	1	2	5	5	11	3	1	0	0	28	
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.)	28.18	28.08	28.29	28.16	28.10	28.07	28.23	28.25	28.16	28.26	28.18	28.28	28.19	
	MEAN SEA-LEVEL PRESS. (IN.)	30.04	29.89	30.13	29.94	29.85	29.81	29.97	29.98	29.90	30.05	29.99	30.12	29.97	
WINDS	RESULTANT SPEED (MPH)	0.6	0.8	2.2	1.8	1.4	2.1	1.1	1.5	1.6	1.6	1.3	3.3	1.0	
	RES. DIR. (TENS OF DEGS.)	33	08	03	03	35	31	09	09	09	03	05	31	02	
	MEAN SPEED (MPH)	8.5	9.4	8.1	9.0	9.5	9.8	8.0	7.6	7.9	8.9	8.1	8.4	8.6	
	PREVAIL. DIR. (TENS OF DEGS.)	14	33	04	01	32	29	16	14	06	06	09	28	06	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	28	32	30	39	34	39	29	32	29	34	33	32	39	
	DIR. (TENS OF DEGS.)	31	33	33	12	31	32	24	15	15	29	33	31	32	
	DATE OF OCCURRENCE	08	28	13	24	04	01	12	21	08	11	10	17	JUN 01	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	36	40	40	45	41	48	35	44	36	44	44	40	48	
DIR. (TENS OF DEGS.)	25	32	32	12	31	30	24	15	36	31	32	32	30		
DATE OF OCCURRENCE	10	28	13	24	04	01	11	21	19	11	10	17	JUN 01		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.09	1.67	0.39	0.66	1.10	2.90	1.89	9.29	0.98	3.09	1.40	0.24	23.70	
	GREATEST 24-HOUR (IN.)	0.04	0.64	0.17	0.33	0.24	0.73	0.70	4.64	0.69	1.73	0.66	0.16	4.64	
	DATE OF OCCURRENCE	11	24-25	24-25	26	23-24	17-18	11-12	21-22	12	04-05	09-10	30	AUG 21-22	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	4	11	7	5	7	15	5	13	5	10	6	5	93	
PRECIPITATION ≥ 0.10	0	6	2	2	6	7	4	7	2	6	4	1	47		
PRECIPITATION ≥ 1.00	0	0	0	0	0	0	0	2	0	0	0	0	2		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	3.3	12.1	2.8	T	T	T	0.0	T	0.0	T	17.1	6.0	41.3	
	GREATEST 24-HOUR (IN.)	1.0	4.9	1.4	T	T	T	0.0	T	0.0	T	7.1	3.2	7.1	
	DATE OF OCCURRENCE	22	28	05	07	01	11	0	18	0	12	09	30	NOV 09	
	MAXIMUM SNOW DEPTH (IN.)	3	4	5	0	0	0	0	0	0	0	8	4	8	
	DATE OF OCCURRENCE	23	28	02+								10	31	NOV 10	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	1	3	1	0	0	0	0	0	0	0	5	1	11		

NORMALS, MEANS, AND EXTREMES

BISMARCK, ND (BIS)

LATITUDE: 46° 46' 27" N LONGITUDE: 100° 44' 51" W ELEVATION (FT): GRND: 1647 BARO: 1655 TIME ZONE: CENTRAL (UTC+ 6) WBAN: 24011

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	20.2	26.4	38.5	54.9	67.8	77.1	84.4	82.7	70.8	58.7	39.3	24.5	53.8
	MEAN DAILY MAXIMUM	51	19.2	26.1	37.1	55.0	68.2	77.0	84.2	83.3	71.6	58.8	38.7	25.4	53.7
	HIGHEST DAILY MAXIMUM	59	62	69	81	93	98	107	109	109	105	95	75	65	109
	YEAR OF OCCURRENCE		1981	1992	1946	1992	1941	1988	1973	1941	1959	1963	1978	1979	JUL 1973
	MEAN OF EXTREME MAXS.	51	43.3	49.1	61.9	80.0	87.4	92.6	98.4	98.4	92.2	82.3	62.7	49.1	74.8
	NORMAL DAILY MINIMUM	30	-1.7	5.1	17.8	31.0	42.2	51.6	56.4	53.9	43.1	32.5	17.8	3.3	29.4
	MEAN DAILY MINIMUM	51	-2.5	5.0	16.5	30.6	42.4	51.8	56.6	54.6	43.6	32.4	17.9	4.8	29.5
	LOWEST DAILY MINIMUM	59	-44	-43	-31	-12	15	30	35	33	11	-10	-30	-43	-44
	YEAR OF OCCURRENCE		1950	1994	1948	1975	1967	1969	1971	1988	1974	1991	1985	1967	JAN 1950
	MEAN OF EXTREME MINS.	51	-28.2	-21.4	-9.2	14.0	26.6	38.6	44.7	40.4	27.7	16.1	-3.6	-19.7	10.5
	NORMAL DRY BULB	30	9.2	15.7	28.2	43.0	55.0	64.4	70.4	68.3	57.0	45.7	28.6	14.0	41.6
	MEAN DRY BULB	51	8.4	15.6	26.8	42.8	55.3	64.3	70.4	69.0	57.6	45.6	28.4	15.1	41.6
	MEAN WET BULB	15	11.5	17.2	26.2	37.4	49.3	58.1	61.7	60.3	50.6	38.9	23.5	14.4	37.4
	MEAN DEW POINT	15	6.9	12.6	20.9	29.1	41.9	52.5	55.9	54.2	44.0	31.9	19.1	10.2	31.6
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	0.1	0.6	3.1	8.0	8.2	1.7	*	0.0	0.0	21.7	
MAXIMUM ≤ 32°	30	22.5	17.0	9.9	0.7	0.1	0.0	0.0	0.0	0.0	0.4	8.6	20.9	80.1	
MINIMUM ≤ 32°	30	30.9	27.8	28.6	17.5	4.0	0.1	0.0	0.0	2.7	15.2	28.1	31.0	185.9	
MINIMUM ≤ 0°	30	17.1	11.0	3.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.3	12.9	47.1	
H/C	NORMAL HEATING DEG. DAYS	30	1730	1380	1141	660	324	116	15	69	262	598	1092	1581	8968
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	14	98	183	171	22	0	0	0	488
RH	NORMAL (PERCENT)	30	71	72	70	62	60	65	62	61	64	64	72	74	66
	HOUR 06 LST	30	74	76	77	70	70	77	75	72	74	72	77	78	74
	HOUR 12 LST	30	74	77	80	79	78	84	84	83	79	80	78	80	80
	HOUR 18 LST	30	68	67	62	51	48	52	47	46	50	51	64	70	56
	HOUR 24 LST	30	70	68	59	46	44	47	42	40	46	51	66	73	54
S	PERCENT POSSIBLE SUNSHINE	59	53	53	58	58	61	64	74	71	65	58	44	47	59
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	60	1.1	1.5	1.5	0.8	0.4	0.6	0.7	0.7	0.7	1.1	1.3	1.4	11.8
	THUNDERSTORMS	60	0.0	0.0	0.1	1.0	3.9	8.5	9.2	7.7	2.9	0.6	0.0	0.0	33.9
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	1						4.0							
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
CLEAR	1	6.0	10.0	6.0	3.0										
PARTLY CLOUDY	1	10.0	10.0	9.0	10.0										
CLOUDY	1	15.0	9.0	16.0	17.0										
PR	MEAN STATION PRESSURE (IN)	26	28.30	28.29	28.20	28.20	28.20	28.19	28.20	28.20	28.20	28.20	27.15	28.30	28.14
	MEAN SEA-LEVEL PRES. (IN)	15	30.12	30.12	30.06	29.97	29.92	29.88	29.93	29.95	29.98	29.99	28.03	30.11	29.84
WINDS	MEAN SPEED (MPH)	46	9.9	9.7	10.6	11.6	11.3	10.2	9.1	9.3	9.7	10.1	9.9	9.6	10.1
	PREVAIL. DIR (TENS OF DEGS)	30	32	32	32	06	16	16	16	15	30	30	30	30	30
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	3	40	40	39	49	54	40	41	40	41	44	37	43	54
	DIR. (TENS OF DEGS)		32	03	32	32	02	03	08	16	25	32	15	32	02
	YEAR OF OCCURRENCE		1997	1996	1997	1997	1996	1996	1997	1996	1997	1996	1996	1996	MAY 1996
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	3	48	62	48	64	69	52	56	46	64	55	45	54	69
DIR. (TENS OF DEGS)		34	00	31	35	02	03	32	17	23	33	35	32	02	
YEAR OF OCCURRENCE		1997	1996	1997	1997	1996	1996	1996	1996	1997	1996	1997	1996	MAY 1996	
PRECIPITATION	NORMAL (IN)	30	0.45	0.43	0.77	1.67	2.18	2.72	2.14	1.72	1.49	0.90	0.49	0.51	15.47
	MAXIMUM MONTHLY (IN)	59	1.29	1.67	3.19	5.46	5.18	8.29	13.75	9.29	6.93	4.30	2.56	0.95	13.75
	YEAR OF OCCURRENCE		1969	1998	1975	1975	1965	1947	1993	1998	1977	1982	1944	1967	JUL 1993
	MINIMUM MONTHLY (IN)	59	0.02	0.03	0.09	T	0.28	0.50	0.18	0.03	0.02	0.02	T	T	T
	YEAR OF OCCURRENCE		1940	1985	1981	1952	1984	1974	1968	1971	1948	1993	1990	1944	NOV 1990
	MAXIMUM IN 24 HOURS (IN)	59	0.67	0.73	1.30	1.97	2.54	3.25	5.27	4.64	4.34	1.81	0.99	0.59	5.27
	YEAR OF OCCURRENCE		1952	1958	1950	1964	1985	1947	1993	1998	1994	1980	1944	1960	JUL 1993
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	7.6	6.8	7.8	8.7	10.0	11.0	8.7	8.0	7.1	5.5	5.8	8.2	95.2	
PRECIPITATION ≥ 1.00	30	0.0	0.0	*	0.2	0.4	0.5	0.4	0.3	0.2	0.2	0.0	0.0	2.2	
SNOWFALL	NORMAL (IN)	30	7.3	7.1	8.2	4.4	0.7	0.0	0.0	0.0	0.3	1.2	5.8	8.1	43.1
	MAXIMUM MONTHLY (IN)	59	25.0	25.6	31.1	18.7	10.3	T	T	T	5.0	23.7	29.9	17.2	31.1
	YEAR OF OCCURRENCE		1982	1979	1975	1984	1950	1993	1993	1991	1984	1991	1993	1977	MAR 1975
	MAXIMUM IN 24 HOURS (IN)	59	13.2	11.0	15.5	15.2	11.0	T	T	T	4.8	14.3	11.4	10.0	15.5
	YEAR OF OCCURRENCE		1996	1996	1966	1997	1967	1993	1993	1991	1984	1991	1986	1988	MAR 1966
	MAXIMUM SNOW DEPTH (IN)	50	19	28	27	22	11	0	0	0	2	10	19	13	28
	YEAR OF OCCURRENCE		1982	1979	1979	1975	1967				1984	1991	1993	1977	FEB 1979
	NORMAL NO. DAYS WITH:														
SNOWFALL ≥ 1.0	30	2.5	2.4	2.2	1.3	0.2	0.0	0.0	0.0	0.1	0.3	1.8	2.5	13.3	

PRECIPITATION (inches) 1998 BISMARCK, ND (BIS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	1.29	1.17	0.15	0.77	1.57	2.01	5.24	0.92	0.49	0.30	0.06	0.79	14.76
1970	0.46	0.34	0.55	4.05	2.32	3.78	1.63	0.13	1.47	0.69	1.33	0.16	16.91
1971	0.78	0.41	0.30	1.06	1.34	3.86	1.04	0.03	1.63	3.74	0.59	0.47	15.25
1972	0.68	0.41	1.32	1.81	3.16	1.81	1.60	1.70	0.29	1.60	0.11	0.67	15.16
1973	0.07	0.08	0.55	0.87	1.77	1.15	1.24	0.30	2.32	1.40	0.46	0.83	11.04
1974	0.11	0.29	0.40	2.23	2.68	0.50	1.10	1.52	0.23	0.74	0.36	0.50	10.66
1975	0.53	0.47	3.19	5.46	1.81	4.60	2.63	0.64	0.57	0.71	0.19	0.70	21.50
1976	0.52	0.27	0.52	2.84	1.08	2.66	0.46	0.32	1.59	0.21	0.15	0.55	11.17
1977	0.55	0.33	0.71	0.13	1.09	2.35	1.39	1.92	6.93	1.00	1.36	0.78	18.54
1978	0.14	0.41	0.30	2.00	4.65	1.79	2.58	1.21	1.80	0.45	1.13	0.49	16.95
1979	0.54	1.21	1.15	0.94	1.07	0.76	3.22	1.73	0.82	0.10	0.05	0.22	11.81
1980	0.70	0.28	0.32	0.43	1.08	1.67	3.16	5.03	1.11	2.31	0.09	0.21	16.39
1981	0.12	0.42	0.09	0.58	0.90	1.67	3.69	3.32	1.88	0.52	0.79	0.48	14.46
1982	0.75	0.40	1.08	0.76	3.71	2.04	2.17	1.52	0.45	4.30	0.41	0.48	18.07
1983	0.23	0.44	1.65	0.51	1.46	2.95	2.04	0.87	1.03	0.75	0.73	0.48	13.14
1984	0.38	0.31	1.65	3.65	0.28	3.58	0.81	0.87	0.94	0.99	0.73	0.58	14.77
1985	0.27	0.03	0.80	1.77	4.13	1.80	0.55	4.61	1.29	1.33	0.91	0.35	17.84
1986	0.36	0.25	0.25	3.60	3.11	3.95	4.24	1.61	4.41	0.35	2.09	0.02	24.24
1987	0.14	1.65	1.34	0.13	4.19	1.52	4.59	3.03	0.29	0.10	0.02	0.13	17.13
1988	0.68	0.40	0.92	0.12	1.16	2.18	0.55	2.19	0.63	0.15	0.48	0.71	10.17
1989	0.59	0.21	0.29	1.86	1.92	0.70	1.76	1.62	1.23	0.21	0.64	0.30	11.33
1990	0.26	0.23	0.55	0.31	1.65	4.73	1.53	1.37	1.25	0.29	T	0.50	12.67
1991	0.16	0.24	0.62	1.62	3.34	2.64	0.65	1.77	2.49	2.33	0.74	0.16	16.76
1992	0.31	0.40	0.61	0.22	1.12	3.64	2.46	0.98	1.28	0.39	0.81	0.48	12.70
1993	0.29	0.33	0.38	1.26	2.36	4.57	13.75	1.89	0.26	0.02	1.04	0.84	26.99
1994	0.58	0.45	0.66	1.06	0.54	3.35	1.76	0.33	5.01	3.41	1.50	0.29	18.94
1995	0.41	0.33	1.67	1.00	4.15	1.39	4.99	1.99	0.80	1.11	0.51	0.55	18.90
1996	0.94	0.66	1.18	0.51	1.62	2.93							
1997	0.84	0.59	0.97	3.26	0.32	1.23	2.21	1.07	1.73	2.29	0.31	0.08	14.90
1998	0.09	1.67	0.39	0.66	1.10	2.90	1.89	9.29	0.98	3.09	1.40	0.24	23.70
POR= 124 YRS	0.46	0.46	0.86	1.48	2.20	3.18	2.30	1.76	1.31	0.94	0.52	0.50	15.97

WBAN : 24011

AVERAGE TEMPERATURE (°F) 1998 BISMARCK, ND (BIS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	- 8	14.7	17.5	46.1	55.9	59.5	70.4	73.8	61.9	40.6	32.5	17.6	40.8
1970	4.0	15.6	18.8	39.6	54.3	67.3	71.0	69.9	58.1	44.4	27.3	11.1	40.1
1971	1.5	12.9	28.2	43.8	52.4	65.7	66.2	71.6	56.8	45.1	30.1	10.9	40.4
1972	4.8	9.1	27.5	42.4	58.1	65.2	66.6	70.7	57.0	41.4	27.6	8.1	39.9
1973	15.5	21.9	39.4	40.9	54.1	63.3	68.4	72.0	54.6	46.8	22.6	9.8	42.4
1974	6.5	15.9	27.1	42.3	50.5	62.8	73.8	63.0	52.9	45.9	28.9	17.5	40.6
1975	12.9	12.5	22.5	35.5	53.9	63.2	72.8	66.8	55.0	47.0	31.5	19.1	41.1
1976	11.9	27.2	27.3	46.5	55.6	67.1	71.2	72.9	60.1	41.4	26.4	14.8	43.5
1977	-1.6	23.9	33.8	49.1	61.7	65.6	70.2	62.0	57.0	46.2	26.4	10.5	42.1
1978	-1.7	9.0	27.9	42.7	56.9	63.0	68.8	68.2	61.8	46.0	22.7	10.8	39.7
1979	-2.2	- 7	22.2	35.1	50.0	64.3	70.2	65.7	59.4	44.6	25.9	23.7	38.2
1980	8.7	15.4	24.8	48.7	60.1	66.2	71.9	65.7	58.1	45.6	35.9	18.5	43.3
1981	19.5	23.1	34.9	46.5	54.1	60.7	71.2	70.1	59.3	46.9	36.9	14.7	44.8
1982	-4.3	8.7	23.5	40.0	54.9	59.2	70.3	67.5	56.7	44.5	24.4	22.1	39.0
1983	23.0	27.4	30.4	39.9	50.9	62.3	72.3	74.8	56.3	44.8	30.9	-1.2	42.7
1984	15.5	28.0	25.4	41.7	51.9	63.1	70.1	71.6	52.6	45.5	30.3	8.6	42.0
1985	6.2	13.2	31.6	46.0	59.1	59.3	69.9	64.3	53.6	44.3	14.0	9.1	39.2
1986	20.1	13.8	38.8	42.3	55.9	66.5	70.1	65.5	54.3	46.1	23.5	22.3	43.3
1987	21.8	28.1	27.9	51.2	59.8	68.2	72.4	64.9	58.7	42.0	34.5	24.1	46.1
1988	8.9	14.9	30.2	45.0	61.0	75.7	73.2	69.5	56.6	43.8	29.0	18.1	43.8
1989	16.0	6.3	24.8	44.3	56.2	63.7	76.3	69.6	58.6	45.3	29.2	8.2	41.5
1990	23.6	20.0	35.2	43.5	54.8	65.7	70.2	71.8	61.7	43.8	31.2	9.4	44.2
1991	8.8	28.1	32.7	46.1	57.7	68.5	71.4	73.7	58.9	40.7	23.2	25.1	44.6
1992	23.3	27.1	35.0	42.1	58.1	62.7	64.0	64.2	56.5	43.9	28.8	11.8	43.1
1993	8.2	10.9	32.4	42.2	55.4	60.2	64.4	66.6	53.2	43.9	26.7	17.5	40.1
1994	0.6	4.8	32.7	43.0	60.0	65.5	67.3	67.5	61.6	48.0	31.0	16.2	41.5
1995	10.4	19.2	26.0	38.9	53.3	66.1	69.4	71.4	57.2	44.6	25.1	15.0	41.4
1996	2.0	19.2	19.8	39.6	52.0	65.6							
1997	3.7	18.9	26.1	38.6	54.8	69.1	71.9	69.7	62.1	47.7	27.2	28.2	43.2
1998	13.2	30.4	24.0	48.0	58.0	61.4	72.9	72.5	63.5	46.8	31.0	20.7	45.2
POR= 124 YRS	8.5	13.3	26.0	43.0	54.8	64.1	70.5	68.5	57.9	45.5	28.3	15.3	41.3

HEATING DEGREE DAYS (base 65°F) 1998 BISMARCK, ND (BIS)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	8	24	263	632	1123	1667	1967	1458	1134	631	383	41	9331
1971-72	52	20	271	608	1043	1672	1868	1618	1157	671	243	65	9288
1972-73	41	39	256	724	1116	1762	1528	1201	787	714	332	93	8593
1973-74	12	4	316	557	1263	1709	1816	1369	1167	674	440	120	9447
1974-75	6	119	357	582	1078	1466	1612	1467	1309	880	345	112	9333
1975-76	9	39	295	550	1002	1419	1642	1087	1163	550	288	65	8109
1976-77	11	6	193	726	1152	1551	2063	1147	956	473	164	45	8487
1977-78	17	111	246	574	1153	1687	2066	1564	1143	663	257	105	9586
1978-79	18	35	217	585	1263	1679	2084	1837	1320	891	463	81	10473
1979-80	11	55	191	626	1166	1273	1744	1435	1238	492	211	58	8500
1980-81	5	53	217	594	867	1438	1402	1173	925	547	335	144	7700
1981-82	11	11	191	554	836	1556	2151	1577	1279	742	310	176	9394
1982-83	5	73	291	626	1210	1321	1294	1048	1066	746	434	128	8242
1983-84	6	0	300	620	1015	2049	1532	1067	1225	690	421	94	9019
1984-85	17	27	373	602	1033	1749	1821	1450	1027	562	194	192	9047
1985-86	21	85	345	636	1526	1731	1386	1427	807	673	297	44	8978
1986-87	5	65	314	580	1237	1319	1332	1023	1144	416	189	36	7660
1987-88	10	88	199	708	909	1260	1737	1454	1071	597	184	16	8233
1988-89	1	40	251	651	1075	1448	1513	1640	1239	621	274	110	8863
1989-90	0	38	218	606	1066	1761	1278	1256	916	650	318	78	8185
1990-91	10	5	173	649	1006	1722	1740	1028	995	557	253	10	8148
1991-92	7	0	236	748	1247	1231	1286	1093	921	689	248	117	7823
1992-93	74	111	256	645	1077	1645	1757	1513	1004	678	296	177	9233
1993-94	68	52	347	645	1141	1466	1998	1684	995	651	192	51	9290
1994-95	34	64	152	520	1017	1508	1689	1276	1204	778	355	84	8681
1995-96	13	3	262	627	1189	1547	1953	1322	1396	756	399	84	9551
1996-97	10	1	249	644	1126	1793	1891	1283	1201	786	317	9	9310
1996-97	10	1	249	644	1126	1793	1891	1283	1201	786	317	9	9310
1997-98	16	34	115	538	1126	1134	1601	962	1264	502	230	143	7665
1998-	2	3	121	556	1013	1368							

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COOLING DEGREE DAYS (base 65°F) 1998 BISMARCK, ND (BIS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	0	0	0	0	39	11	179	282	60	0	0	0	571
1970	0	0	0	0	5	109	199	182	60	0	0	0	555
1971	0	0	0	0	0	67	94	230	32	0	0	0	423
1972	0	0	0	0	37	76	98	226	24	0	0	0	461
1973	0	0	0	0	1	47	125	227	11	0	0	0	411
1974	0	0	0	0	0	61	287	61	0	0	0	0	409
1975	0	0	0	0	6	64	257	104	2	0	0	0	433
1976	0	0	0	0	3	137	212	257	54	0	0	0	663
1977	0	0	0	3	70	72	186	25	11	0	0	0	367
1978	0	0	0	0	13	50	141	143	128	0	0	0	475
1979	0	0	0	0	6	67	178	86	28	0	0	0	365
1980	0	0	0	8	64	103	227	84	16	0	0	0	502
1981	0	0	0	0	3	24	210	177	27	0	0	0	441
1982	0	0	0	0	3	8	175	159	49	0	0	0	394
1983	0	0	0	0	3	53	243	312	47	0	0	0	658
1984	0	0	0	0	21	44	180	241	11	4	0	0	501
1985	0	0	0	0	16	26	180	67	8	0	0	0	297
1986	0	0	0	0	21	96	169	88	0	0	0	0	374
1987	0	0	0	11	33	136	245	92	15	0	0	0	532
1988	0	0	0	1	65	340	264	184	6	0	0	0	860
1989	0	0	0	4	8	78	359	190	33	0	0	0	672
1990	0	0	0	14	9	105	177	224	82	0	0	0	611
1991	0	0	0	0	36	122	212	278	61	0	0	0	709
1992	0	0	0	9	40	52	50	95	9	0	0	0	255
1993	0	0	0	0	7	42	55	110	3	0	0	0	217
1994	0	0	0	1	44	70	111	148	58	0	0	0	432
1995	0	0	0	0	1	122	154	210	35	0	0	0	522
1996	0	0	0	0	2	109	111	211	47	0	0	0	480
1997	0	0	0	0	5	138	236	187	35	8	0	0	609
1998	0	0	0	0	17	42	253	242	79	0	0	0	633

SNOWFALL (inches) 1998 BISMARCK, ND (BIS)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	0.0	0.0	0.0	0.9	0.4	13.7	7.0	4.5	7.6	18.2	0.0	0.0	52.3
1970-71	0.0	0.0	0.0	2.1	13.4	2.8	12.7	6.1	3.3	1.8	T	0.0	42.2
1971-72	0.0	0.0	0.0	3.1	6.4	8.7	13.3	5.8	8.5	0.9	T	0.0	46.7
1972-73	0.0	0.0	T	5.8	1.1	10.2	0.9	1.2	1.4	0.5	0.0	0.0	21.1
1973-74	0.0	0.0	0.0	0.6	5.5	11.5	1.4	4.5	3.4	0.6	0.0	0.0	27.5
1974-75	0.0	0.0	T	T	3.6	6.9	6.3	6.0	31.1	4.8	0.0	0.0	58.7
1975-76	0.0	0.0	0.0	T	2.2	8.6	5.3	2.7	6.5	0.8	T	0.0	26.1
1976-77	0.0	0.0	0.0	1.9	3.3	7.7	8.3	5.1	1.6	0.7	0.0	0.0	28.6
1977-78	0.0	0.0	0.0	3.5	16.2	17.2	4.1	11.1	7.6	4.0	0.0	0.0	63.7
1978-79	0.0	0.0	0.0	T	16.6	10.0	10.3	25.6	11.6	7.3	1.6	0.0	83.0
1979-80	0.0	0.0	0.0	T	1.0	1.6	12.6	5.6	5.7	0.1	0.0	0.0	26.6
1980-81	0.0	0.0	0.0	1.1	0.2	4.7	2.1	3.6	T	T	0.0	0.0	11.7
1981-82	0.0	0.0	0.0	0.7	6.3	10.4	25.0	10.3	22.5	5.1	0.0	0.0	80.3
1982-83	0.0	0.0	0.0	4.8	7.2	2.9	2.2	5.3	9.3	0.5	T	0.0	32.2
1983-84	0.0	0.0	T	0.0	6.6	10.6	4.1	5.9	20.6	18.7	T	0.0	66.5
1984-85	0.0	0.0	5.0	1.3	2.0	14.9	3.9	0.5	12.4	0.2	0.0	0.0	40.2
1985-86	0.0	0.0	T	3.2	24.2	7.1	6.1	6.5	2.4	11.7	T	0.0	61.2
1986-87	0.0	0.0	0.0	T	28.5	1.3	2.6	23.2	11.8	0.5	T	0.0	67.9
1987-88	0.0	0.0	0.0	0.3	T	1.2	12.1	8.2	9.2	0.5	0.0	0.0	31.5
1988-89	0.0	0.0	0.0	0.1	3.3	15.9	12.9	7.4	6.4	1.8	T	T	47.8
1989-90	0.0	T	T	1.7	7.6	5.1	3.7	3.6	3.5	3.1	0.8	T	29.1
1990-91	T	T	0.0	2.5	T	10.9	4.1	5.2	4.8	8.4	6.5	T	42.4
1991-92	0.0	T	T	23.7	7.5	1.5	7.0	9.5	5.3	3.0	T	T	57.5
1992-93	0.0	0.0	0.0	4.8	10.5	8.5	9.0	7.9	3.3	T	T	T	44.0
1993-94	T	0.0	0.0	0.5	29.9	14.0	14.5	12.7	11.4	8.8	0.0	0.0	91.8
1994-95	0.0	0.0	0.0	0.0	16.6	7.0	12.5	8.2	20.5	2.3	T	0.0	67.1
1995-96	0.0	0.0	T	2.5	6.1	12.1	21.3	15.2	20.0	2.9	T	0.0	80.1
1996-97	0.0	0.0	0.0	5.0	25.2	13.5	15.1	9.2	16.1	17.5	T	0.0	101.6
1997-98	0.0	T	0.0	0.4	6.3	1.7	3.3	12.1	2.8	T	T	T	26.6
1998-	0.0	T	0.0	T	17.1	6.0							
POR= 58 YRS	T	T	0.2	1.7	6.7	6.9	7.5	7.0	8.5	3.9	1.2	T	43.6

WBAN : 24011

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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1998
BISMARCK,
NORTH DAKOTA (BIS)

Bismarck, the State Capital and County Seat of Burleigh County, is located in south-central North Dakota, near the center of North America. It is on the east bank of the Missouri River in a shallow basin 7 miles wide and 11 miles long.

The Weather Service Forecast Office is located at the Municipal Airport approximately 2 miles southeast of city center. It is almost entirely surrounded by low-lying hills. The closest hills, 3 miles to the north, and other hills 5 miles to the southeast, are about 200 to 300 feet high. West across the Missouri River the land is more hilly and 300 to 600 feet higher.

The climate is semi-arid, typically continental in character, and invigorating. Summers are warm, but there are not many hot days, and very few hot and humid days. Winters tend to be long and quite cold, but there are plenty of mild days to make winter weather pleasant much of the time. Sunshine is abundant, averaging 2,700 hours out of a possible 4,470 hours.

More than 75 percent of annual precipitation falls during the six month period from April through September, and nearly 50 percent during May, June, and July. Snow has been reported in all months except July and August. Three inches or more can be expected on about three days each year.

Most summer precipitation occurs during thunderstorms in the late afternoon and evening. Thunderstorms occur on about 34 days each year, accompanied by hail on two or three of the days. A damaging hailstorm is experienced about once every ten years. Tornadoes are rare, but damaging winds occasionally occur with the heavier thunderstorms.

The winter season usually begins in late November and continues until late March. Winter precipitation is nearly all in the form of snow and is often associated with strong winds and low temperatures. This combination produces winter storms and occasional blizzards that must never be taken lightly. A severe blizzard lasting two or three days may be expected every few years. But several times each winter storms lasting a few hours occur in which drifting snow can make travel difficult and even block roads. A stalled motorist can be in serious trouble if he is not prepared with adequate winter clothing and some kind of emergency provisions. A motorist must never leave his vehicle in a blinding snowstorm as he can easily become lost.

The temperature range from summer to winter is very large and typical of the Northern Great Plains. The average freeze-free period is 134 days, from mid-May to late September.

STATION LOCATION

BISMARCK, NORTH DAKOTA

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE											AUC	* Type M = AMOS T = AUTOB S = ASOS W = AWOS	REMARKS	
						SEA LEVEL	GROUND													
							WIND	EMER	EMER	EMER	EMER	EMER	EMER	EMER	EMER	EMER				EMER
CITY																				
Main and Third	9/10/74	7/1/77	NA	46° 48'	100°48'	1670		5	5									North window shelter.		
Main and Fifth	7/2/77	12/17/78	850 ft. E	46° 48'	100°48'	1670		5	5											
213 First Street	12/17/78	3/31/82	2100 ft. WNW	46° 48'	100°48'	1685		5	5											
Main and Third	4/1/82	3/30/87	1150 ft. ESE	46° 48'	100°48'	1670		18	18											
Main and First	10/1/87	6/30/91	850 ft. W	46° 48'	100°48'	1670	35	15	15					3				Camp Hancock site.		
Main and Fourth	7/1/91	5/31/94	1300 ft. E	46° 48'	100°48'	1670	69	59	59		52	52								
Main and First (101 Main)	6/1/94	12/31/53	1300 ft. W	46° 48'	100°48'	1670	57	8	8		3			3				WBO until 12/31/39; Cooperative 1/1/40 through 12/31/53.		
AIRPORT																				
Municipal Airport	11/1/35	7/1/36	NA	46° 46'	100°45'	1650	10		4									Cooperative nighttime airway observations by NW Airlines; daytime airway observations at WB.		
CAA Range Station	7/1/36	1/3/39	2.5 mi. E	46° 47'	100°42'	1681			5									Airways observations made by CAA personnel.		
Municipal Airport	1/3/39	3/22/73	2.5 mi. W	46° 46'	100°45'	1650 b1647	43 d20	5	5	Unk a27	3	4		3	NA c5			WBAS established. WBO and WBAS consolidated at airport 1/1/40. a - Effective 5/1/53 b - Effective 11/1/59 c - Commissioned on field site 11/1/59. Type change 8/22/63. d - Lowered 10/17/61.		
Weather Service Office Building, Municipal Airport	3/22/73	Present	3500 ft. S	46° 46'	100°45'	1647	e20	6 f6	5 f5	7 h6 16	4 g4	4 g4		4 g4	e5	NA		e - Not moved 3/22/73. f - Moved 138' WSW 6/18/74. g - Moved 118' WSW 6/18/74. h - Moved 185' SE 12/29/76. i - Minor move 11/14/94.		
																S		ASOS Commissioned 05/01/96		

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