

1999

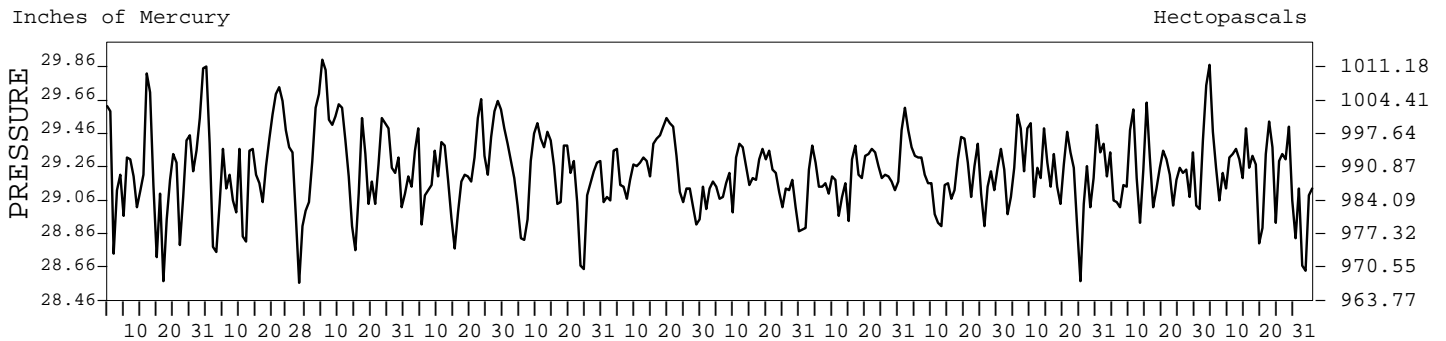
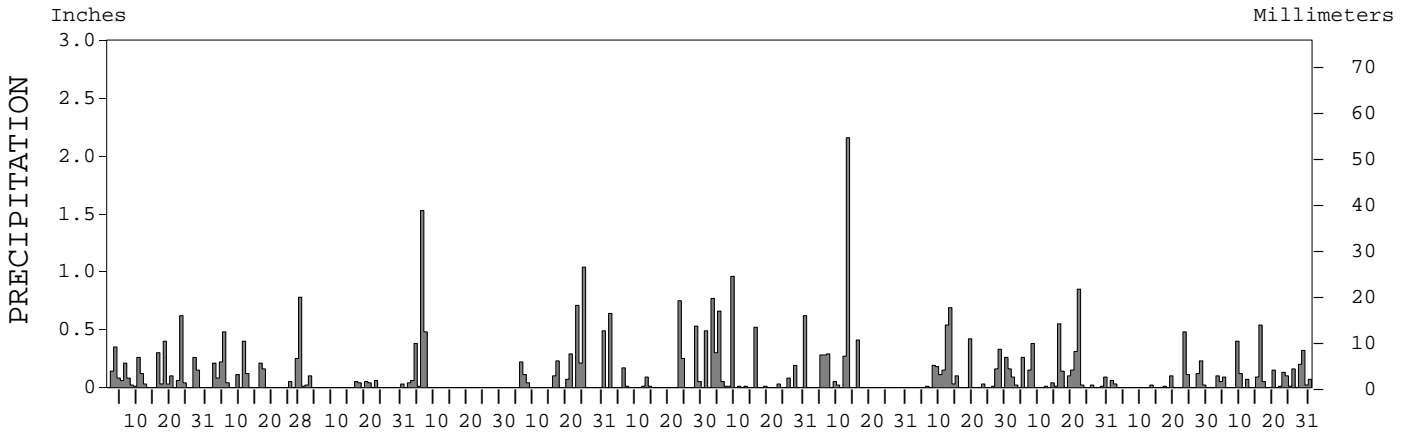
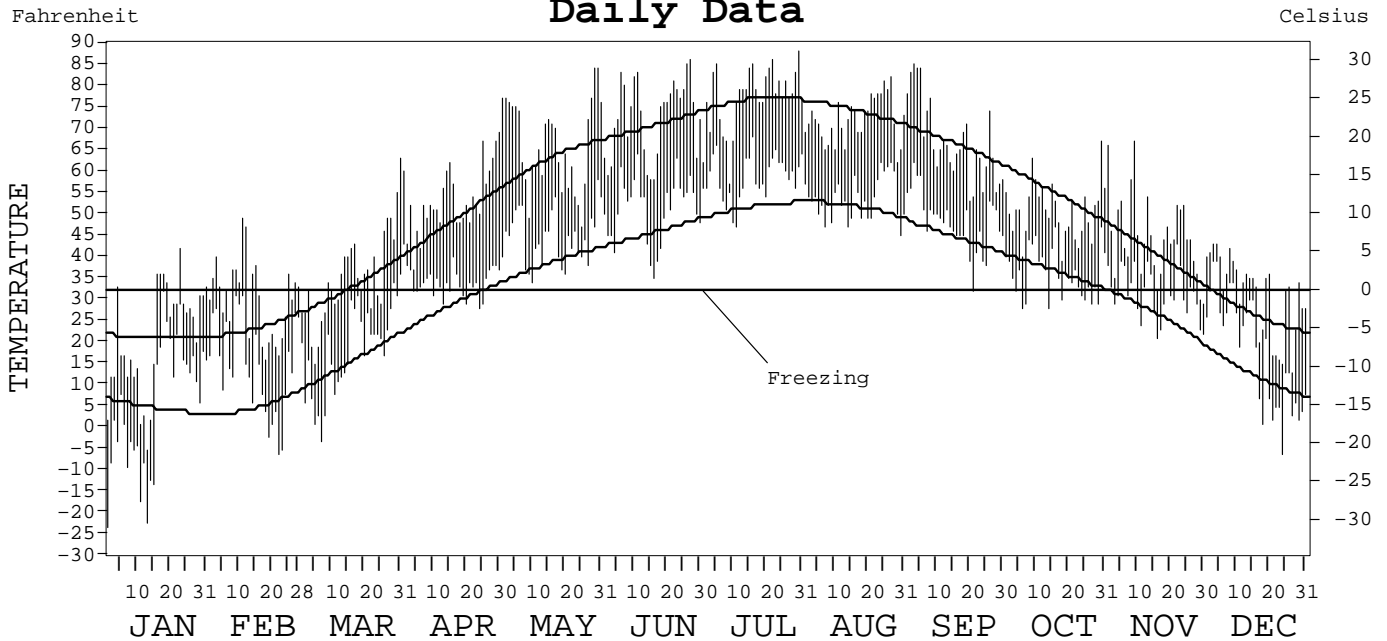
LOCAL CLIMATOLOGICAL DATA ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-2672

SAULT STE. MARIE,
MICHIGAN (ANJ)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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 ASHEVILLE, NORTH CAROLINA

METEOROLOGICAL DATA FOR 1999

SAULT STE. MARIE, MI (ANJ)

LATITUDE: 46° 28' 00" N LONGITUDE: 84° 22' 00" W ELEVATION (FT): GRND: 721 BARO: 721 TIME ZONE: EASTERN (UTC + 5) WBAN: 14847

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	21.2	30.2	35.2	53.4	66.3	72.6	77.1	72.0	66.9	50.7	44.7	31.1	51.8	
	HIGHEST DAILY MAXIMUM	42	49	63	69	84	86	88	82	85	67	67	43	88	
	DATE OF OCCURRENCE	23	11	31	30	30+	27	30	27	03	30	09	04+	JUL 30	
	MEAN DAILY MINIMUM	5.5	14.5	18.2	34.2	44.5	51.1	58.5	53.4	48.3	36.1	31.6	17.7	34.5	
	LOWEST DAILY MINIMUM	-23	-6	-3	28	34	35	47	45	32	28	21	-6	-23	
	DATE OF OCCURRENCE	01	22	07	24	10	16	11	30	21	14+	16	24	JAN 01	
	AVERAGE DRY BULB	13.4	22.4	26.7	43.8	55.4	61.9	67.8	62.7	57.6	43.4	38.2	24.4	43.1	
	MEAN WET BULB	12.7	20.6	23.9	37.6	49.4			58.9	53.9	40.9	34.7	23.3		
	MEAN DEW POINT	8.2	15.7	16.7	29.0	43.1			55.7	51.1	37.3	29.5	19.8		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAXIMUM ≤ 32°	24	15	15	0	0	0	0	0	0	0	3	13	70	
	MINIMUM ≤ 32°	31	28	29	9	0	0	0	0	1	9	17	27	151	
	MINIMUM ≤ 0°	12	3	1	0	0	0	0	0	0	0	0	1	17	
H/C	HEATING DEGREE DAYS	1591	1188	1181	629	298	139	36	96	244	661	796	1251	8110	
	COOLING DEGREE DAYS	0	0	0	0	7	53	133	32	30	0	0	0	255	
RH	MEAN (PERCENT)	79	77	67	61	67	77	79	79	82	79	74	82	75	
	HOUR 01 LST	81	82	75	69	75	88	89	91	93	84	76	83	82	
	HOUR 07 LST	81	83	77	74	74	88	89	91	94	87	81	84	84	
	HOUR 13 LST	73	70	52	49	56	63	68	64	64	68	68	77	64	
	HOUR 19 LST	80	77	64	55	62	67	69	71	78	80	73	82	72	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	7	3	0	2	1	2	3	6	7	4	2	7	44	
	THUNDERSTORMS	0	1	0	2	2	5	8	3	7	3	0	2	33	
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.)	29.23	29.19	29.31	29.24	29.17	29.22	29.14	29.21	29.17	29.23	29.23	29.17	29.21	
	MEAN SEA-LEVEL PRESS. (IN.)	30.04		30.11	30.02	29.95			29.98	29.94	30.01	30.01	29.96		
WINDS	RESULTANT SPEED (MPH)	0.6	0.9	2.7	1.8	1.0		2.3	2.0	1.2	1.9	3.0	1.4		
	RES. DIR. (TENS OF DEGS.)	07	09	33	01	13		28	30	26	28	30	25		
	MEAN SPEED (MPH)	7.7	8.8	7.9	8.1	8.6	7.4	7.3	6.3	6.7	8.7	9.8	8.2	8.0	
	PREVAIL. DIR. (TENS OF DEGS.)	09	12	32	31	11	31	29	30	31	30	30	08	31	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	28	35	28	29	26	26	33	30	29	29	36	40	40	
	DIR. (TENS OF DEGS.)	29	22	33	30	14	27	31	32	28	27	31	31	31	
	DATE OF OCCURRENCE	24+	12	18	06	07+	07	04	28	30	02	14	26	DEC 26	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	37	46	36	40	38	36	48	38	38	38	47	49	49	
DIR. (TENS OF DEGS.)	28	23	32	31	13	26	31	31	27	36	30	31	31		
DATE OF OCCURRENCE	24	12	18	06	06	07	04	28	30	23+	14	26	DEC 26		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	3.35	3.11	0.40	2.50	3.51	2.51	4.72	3.76	3.21	3.36	1.18	2.68	34.29	
	GREATEST 24-HOUR (IN.)	0.63	0.78	0.10	1.53	1.04	1.00	0.97	2.43	1.21	1.08	0.54	0.54	2.43	
	DATE OF OCCURRENCE	23-24	28	03	06	25	23-24	08-09	12-13	12-13	21-22	23-24	16	AUG 12-13	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	21	13	9	6	11	10	16	8	15	19	10	19	157	
PRECIPITATION ≥ 0.10	11	10	1	3	9	5	8	6	11	10	5	10	89		
PRECIPITATION ≥ 1.00	0	0	0	1	1	0	0	1	0	0	0	0	3		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)											2.3	25.9		
	GREATEST 24-HOUR (IN.)											2.0	7.2		
	DATE OF OCCURRENCE											28	16		
	MAXIMUM SNOW DEPTH (IN.)											1	14		
	DATE OF OCCURRENCE											30+	30		
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0											1	9			

NORMALS, MEANS, AND EXTREMES

SAULT STE. MARIE, MI (ANJ)

LATITUDE: 46° 28' 00" N LONGITUDE: 84° 22' 00" W ELEVATION (FT): GRND: 721 BARO: 721 TIME ZONE: EASTERN (UTC + 5) WBAN: 14847

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	21.1	23.2	32.8	48.0	62.6	70.5	76.3	73.8	65.9	54.3	40.0	26.2	49.6
	MEAN DAILY MAXIMUM	53	21.9	24.1	32.8	47.4	61.6	70.4	75.4	73.9	64.7	53.7	39.0	27.2	49.3
	HIGHEST DAILY MAXIMUM	59	45	49	75	85	89	93	97	98	95	80	67	60	98
	YEAR OF OCCURRENCE		1973	1999	1946	1990	1991	1983	1988	1947	1976	1968	1999	1982	AUG 1947
	MEAN OF EXTREME MAXS.	53	37.5	39.6	49.4	67.6	80.6	84.8	87.2	86.1	81.3	71.3	55.8	43.1	65.4
	NORMAL DAILY MINIMUM	30	4.6	4.8	15.3	28.4	38.4	45.5	51.3	51.3	44.3	36.2	25.9	11.8	29.8
	MEAN DAILY MINIMUM	53	5.3	6.4	15.5	29.0	38.5	46.6	52.0	52.5	45.4	36.8	26.2	13.4	30.6
	LOWEST DAILY MINIMUM	59	-36	-35	-24	-2	18	26	36	29	25	16	-10	-31	-36
	YEAR OF OCCURRENCE		1982	1979	1943	1982	1966	1982	1992	1982	1993	1981	1976	1993	JAN 1982
	MEAN OF EXTREME MINS.	53	-18.4	-16.5	-6.4	13.8	26.6	34.1	41.0	40.4	31.1	23.8	8.2	-10.0	14.0
	NORMAL DRY BULB	30	12.9	14.0	24.0	38.2	50.5	58.0	63.8	62.6	55.1	45.3	33.0	19.0	39.7
	MEAN DRY BULB	53	13.6	15.2	24.1	38.2	50.0	58.5	63.8	63.2	55.0	45.3	32.6	20.3	40.0
	MEAN WET BULB	16	13.7	15.4	22.7	34.8	45.7	54.3	59.1	59.3	52.1	41.6	30.5	20.7	37.5
	MEAN DEW POINT	16	9.0	9.8	16.6	27.7	39.4	49.9	55.8	56.3	49.3	38.0	26.7	17.1	33.0
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.2	*	0.0	0.0	0.0	1.2	
MAXIMUM ≤ 32°	30	25.9	22.1	13.7	1.8	0.0	0.0	0.0	0.0	0.0	0.2	6.6	21.8	92.1	
MINIMUM ≤ 32°	30	30.8	27.7	29.0	20.8	7.6	0.9	0.0	*	2.1	11.1	22.7	29.7	182.4	
MINIMUM ≤ 0°	30	12.4	10.7	3.9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.2	6.2	33.4	
H/C	NORMAL HEATING DEG. DAYS	30	1615	1428	1271	804	457	224	92	128	300	611	960	1426	9316
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	8	14	55	54	0	0	0	0	131
RH	NORMAL (PERCENT)	30	77	75	75	70	68	75	76	80	82	80	82	81	77
	HOUR 01 LST	30	79	78	79	78	80	87	89	91	91	87	85	83	84
	HOUR 07 LST	30	79	78	81	80	79	85	88	92	92	89	86	83	84
	HOUR 13 LST	30	73	69	67	59	54	61	61	64	67	68	74	77	66
	HOUR 19 LST	30	78	75	72	64	59	65	66	72	79	79	81	81	73
S	PERCENT POSSIBLE SUNSHINE	55	36	47	55	54	57	58	62	57	45	38	24	27	47
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	58	1.8	1.8	3.1	2.7	2.9	3.4	4.4	5.6	5.7	4.6	2.8	3.0	41.8
	THUNDERSTORMS	58	0.1	0.1	0.7	1.5	3.1	5.7	5.8	5.2	4.2	1.8	0.4	0.1	28.7
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	55	6.3	5.8	5.5	5.4	5.2	5.0	4.7	4.9	5.7	5.9	6.7	6.6	5.6
	MIDNIGHT-MIDNIGHT (OKTAS)	32	6.2	5.7	5.2	5.1	4.8	4.8	4.6	4.5	5.3	5.9	6.4	6.5	5.4
	MEAN NO. DAYS WITH:														
	CLEAR	55	3.7	4.7	6.6	6.4	7.1	6.9	8.2	7.5	4.6	4.7	1.9	3.2	65.5
PARTLY CLOUDY	55	5.8	6.1	7.0	7.4	8.7	9.6	10.6	10.5	8.6	6.6	4.3	4.3	89.5	
CLOUDY	55	21.5	17.4	17.4	16.2	15.2	13.5	11.7	12.5	16.3	19.2	23.3	22.9	207.1	
PR	MEAN STATION PRESSURE (IN)	27	29.18	29.23	29.21	29.18	29.18	29.17	29.19	29.23	29.24	29.22	29.19	29.20	29.20
	MEAN SEA-LEVEL PRES. (IN)	16	30.01	30.06	30.06	29.97	29.98	29.95	29.97	30.02	30.01	30.02	30.00	30.02	30.01
WINDS	MEAN SPEED (MPH)	40	9.2	9.0	9.8	10.0	9.4	8.4	7.7	7.4	8.3	8.9	9.6	9.1	8.9
	PREVAIL. DIR (TENS OF DEGS)	25	11	11	31	31	30	30	30	30	31	12	12	11	30
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	3	31	35	30	34	30	28	33	33	34	31	36	40	40
	DIR. (TENS OF DEGS)		28	22	32	24	23	33	31	29	32	31	31	31	31
	YEAR OF OCCURRENCE		1997	1999	1998	1997	1998	1997	1999	1998	1998	1997	1999	1999	DEC 1999
	MAXIMUM 5-SECOND:														
SPEED (MPH)	3	39	46	38	51	38	37	48	47	48	40	48	49	51	
DIR. (TENS OF DEGS)		28	23	29	23	13	32	31	26	30	29	31	31	23	
YEAR OF OCCURRENCE		1997	1999	1997	1997	1999	1997	1999	1998	1998	1998	1998	1999	APR 1997	
PRECIPITATION	NORMAL (IN)	30	2.42	1.74	2.30	2.35	2.71	3.14	2.71	3.61	3.69	3.23	3.45	2.88	34.23
	MAXIMUM MONTHLY (IN)	58	4.52	3.74	4.97	5.16	7.41	7.35	7.23	9.48	7.78	6.55	7.72	6.24	9.48
	YEAR OF OCCURRENCE		1982	1971	1976	1954	1970	1969	1996	1974	1970	1995	1988	1995	AUG 1974
	MINIMUM MONTHLY (IN)	58	0.51	0.21	0.35	0.60	0.62	0.52	0.57	0.50	0.86	0.16	0.87	0.58	0.16
	YEAR OF OCCURRENCE		1961	1993	1993	1949	1996	1988	1989	1947	1943	1963	1962	1994	OCT 1963
	MAXIMUM IN 24 HOURS (IN)	58	1.37	1.11	1.81	2.67	5.10	5.06	2.79	5.92	2.71	2.06	2.42	1.67	5.92
	YEAR OF OCCURRENCE		1950	1977	1976	1954	1970	1970	1965	1974	1986	1979	1988	1995	AUG 1974
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	19.8	14.6	13.4	11.2	11.1	11.5	9.7	11.7	13.0	14.7	17.3	20.1	168.1	
PRECIPITATION ≥ 1.00	30	0.1	*	0.1	0.3	0.2	0.6	0.5	0.7	0.6	0.4	0.4	*	3.9	
SNOWFALL	NORMAL (IN)	30	33.4	21.7	15.0	5.9	0.6	0.0	0.0	0.0	0.1	2.3	16.0	33.0	128.0
	MAXIMUM MONTHLY (IN)	55	71.0	41.3	34.7	25.8	4.6	T	T	T	2.7	12.5	46.8	98.7	98.7
	YEAR OF OCCURRENCE		1982	1972	1964	1982	1947	1951	1995	1986	1956	1943	1989	1995	DEC 1995
	MAXIMUM IN 24 HOURS (IN)	55	15.3	12.6	11.9	11.5	4.6	T	T	T	2.7	10.1	14.3	27.8	27.8
	YEAR OF OCCURRENCE		1988	1968	1964	1979	1947	1951	1995	1986	1956	1943	1943	1995	DEC 1995
	MAXIMUM SNOW DEPTH (IN)	48	38	40	50	26	2	0	0	0	1	6	14	49	50
	YEAR OF OCCURRENCE		1982	1972	1972	1972	1984				1965	1972	1989	1995	MAR 1972
NORMAL NO. DAYS WITH:															
SNOWFALL ≥ 1.0	30	10.6	6.7	4.5	1.8	0.2	0.0	0.0	0.0	0.*	0.8	5.5	10.2	40.3	

PRECIPITATION (inches) 1999 SAULT STE. MARIE, MI (ANJ)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	2.38	0.84	1.58	1.81	7.41	1.68	4.06	2.07	7.78	4.29	3.10	2.16	39.16
1971	3.50	3.74	2.84	1.13	2.99	2.86	3.42	4.03	4.03	2.85	3.41	4.43	39.23
1972	4.08	2.98	2.41	2.83	2.15	1.29	3.51	4.52	3.25	1.79	3.01	3.63	35.45
1973	1.74	1.59	1.79	2.80	5.21	2.62	4.21	4.51	2.75	2.81	3.92	2.50	36.45
1974	2.67	1.13	1.69	3.63	2.30	4.02	2.32	9.48	3.71	3.51	3.13	1.85	39.44
1975	3.27	2.34	2.24	2.38	3.96	3.69	3.57	1.27	5.12	1.16	3.25	1.63	33.88
1976	2.24	2.35	4.97	1.89	2.21	1.87	1.24	1.39	1.71	1.43	2.47	1.93	25.70
1977	2.72	2.89	4.76	1.66	1.78	2.37	4.87	3.54	4.31	1.86	4.71	3.42	38.89
1978	2.51	0.54	1.10	1.74	3.74	3.82	5.19	3.65	6.71	3.35	2.61	3.25	38.21
1979	1.86	1.94	4.60	3.79	2.15	5.58	4.42	5.22	1.63	6.36	3.70	2.10	43.35
1980	3.42	0.82	1.14	3.45	0.80	3.94	1.77	2.64	3.32	2.43	2.11	4.14	29.98
1981	0.68	2.55	1.17	3.28	1.15	5.59	0.80	2.45	2.18	4.50	1.89	2.42	28.66
1982	4.52	0.62	3.20	3.75	1.37	1.72	1.72	3.34	6.12	2.88	3.89	4.40	37.53
1983	2.13	1.21	2.57	2.60	4.70	1.65	3.27	2.73	3.35	3.66	3.17	3.04	34.08
1984	1.52	1.90	2.06	1.67	1.16	3.91	2.24	2.99	5.08	3.50	3.78	5.10	34.91
1985	2.61	2.78	2.77	4.36	4.37	1.63	3.29	4.24	3.37	2.81	3.69	3.45	39.37
1986	1.70	0.95	4.14	1.22	1.80	5.12	4.76	4.57	5.23	3.14	2.57	2.21	37.41
1987	1.74	0.80	1.14	1.32	1.96	2.86	3.14	4.50	1.85	5.06	3.42	3.07	30.86
1988	3.12	0.92	2.91	2.17	1.49	0.52	2.14	4.77	3.01	4.54	7.72	3.63	36.94
1989	2.30	1.78	2.37	1.98	2.12	2.61	0.57	2.64	1.05	2.43	4.31	1.73	25.89
1990	2.48	2.04	2.39	1.79	3.29	4.99	1.67	2.33	3.95	3.75	3.90	2.48	35.06
1991	1.51	0.63	3.70	3.39	1.62	1.09	3.86	1.55	5.85	3.97	3.52	2.51	33.20
1992	2.86	1.07	1.52	2.50	1.46	1.55	4.09	3.27	5.72	3.29	5.03	3.45	35.81
1993	2.23	0.21	0.35	3.82	4.51	3.79	3.23	1.86	3.66	5.22	2.49	2.56	33.93
1994	2.18	0.98	1.54	2.34	2.99	2.79	3.91	4.05	1.50	2.17	2.96	0.58	27.99
1995	2.42	1.20	1.63	4.17	2.65	2.17	3.54	6.52	4.95	6.55	3.80	6.24	45.84
1996	4.02	2.24	1.57	4.21	0.62	3.32	7.23	1.32	6.47	4.95	2.95	4.07	42.97
1997	3.99	0.86	2.59	1.55	3.38	3.41	1.17	2.14	3.12	2.06	2.21	1.38	27.86
1998	2.36	0.62	3.59	2.31	2.16	3.10	3.14	3.01	2.91	2.78	4.47	2.75	33.20
1999	3.35	3.11	0.40	2.50	3.51	2.51	4.72	3.76	3.21	3.36	1.18	2.68	34.29
POR= 111 YRS	2.15	1.48	1.92	2.27	2.72	2.98	2.75	2.98	3.62	3.11	3.08	2.41	31.47

WBAN : 14847

AVERAGE TEMPERATURE (°F) 1999 SAULT STE. MARIE, MI (ANJ)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	9.7	10.2	20.2	39.0	47.7	58.7	64.9	63.8	55.0	47.7	32.9	17.3	38.9
1971	9.5	13.1	20.3	35.8	47.4	60.7	60.4	59.1	57.2	50.9	31.6	22.0	39.0
1972	13.8	10.7	19.0	33.9	55.1	57.3	62.6	61.6	53.2	41.4	32.5	18.7	38.3
1973	19.2	14.6	35.0	39.8	46.3	58.7	62.9	68.2	53.9	49.5	33.1	19.3	41.7
1974	14.3	9.6	21.9	37.9	46.7	59.8	65.0	64.2	50.4	41.2	32.8	24.1	39.0
1975	16.2	17.9	20.9	32.5	56.2	61.2	66.2	64.3	52.4	47.4	35.8	19.8	40.9
1976	10.4	18.8	22.9	40.0	47.7	62.4	63.3	64.8	53.6	41.3	27.3	9.9	38.5
1977	6.3	14.3	28.6	40.0	55.2	54.8	62.8	57.3	53.6	44.7	34.4	19.8	39.3
1978	10.8	11.1	20.4	35.1	55.0	56.2	62.4	63.1	55.5	43.9	31.8	17.9	38.6
1979	8.9	5.2	27.1	37.0	49.4	57.3	65.4	61.3	55.2	42.4	32.2	24.0	38.8
1980	15.0	12.4	22.5	41.1	54.1	54.8	63.1	64.9	52.2	37.7	29.2	12.8	38.3
1981	8.8	18.6	27.2	39.3	50.7	56.2	63.4	62.8	50.3	38.9	32.5	21.7	39.2
1982	4.7	11.5	21.6	31.7	56.2	51.5	62.7	57.6	54.2	46.8	32.3	24.3	37.9
1983	15.9	21.0	27.5	37.0	45.3	60.9	69.2	68.0	58.5	44.8	33.0	11.2	41.0
1984	7.3	23.7	20.9	44.5	47.5	59.7	63.4	64.9	51.9	46.7	31.7	20.6	40.2
1985	11.9	12.9	26.5	38.8	51.2	54.6	60.7	62.8	57.6	45.8	32.1	13.9	39.1
1986	12.6	15.1	25.8	43.5	54.3	55.3	65.2	60.3	53.9	44.5	30.3	25.8	40.6
1987	20.0	22.1	29.7	45.9	53.0	61.3	66.8	63.0	57.3	42.2	33.5	26.0	43.4
1988	13.5	12.2	23.0	39.2	53.6	59.1	67.5	64.8	55.3	41.1	36.6	19.2	40.4
1989	19.5	11.2	19.4	36.9	52.3	58.1	66.7	63.3	56.1	45.9	28.1	7.3	38.7
1990	23.5	17.9	26.6	41.1	48.8	57.1	62.9	62.6	55.0	43.4	35.9	22.2	41.4
1991	12.9	18.9	27.0	42.9	55.7	63.0	64.5	66.2	54.0	44.9	32.2	21.5	42.0
1992	16.6	17.7	21.8	35.6	51.9	56.4	57.4	60.4	54.0	43.4	30.9	23.7	39.2
1993	16.8	11.8	26.4	36.9	48.3	56.4	64.2	65.2	50.8	40.9	29.6	21.3	39.1
1994	0.8	8.1	25.1	36.3	49.3	60.1	63.0	60.0	56.3	47.3	35.3	29.3	39.2
1995	20.8	11.8	28.2	34.5	49.7	63.4	63.7	66.1	52.8	46.1	25.7	16.2	39.9
1996	10.5	12.5	19.6	32.3	47.3	59.5	58.9	62.7	58.0	44.8	29.9	23.5	38.3
1997	11.2	17.6	22.9	36.7	44.7	62.6	63.7	61.8	57.0	45.1	32.9	26.0	40.2
1998	18.3	29.1	28.8	44.0	57.6	60.2	66.7	68.5	60.3	48.5	37.9	25.8	45.5
1999	13.4	22.4	26.7	43.8	55.4	61.9	67.8	62.7	57.6	43.4	38.2	24.4	43.1
POR= 111 YRS	14.0	14.0	23.6	38.0	49.7	58.5	63.8	63.0	55.5	45.1	32.7	20.6	39.9

HEATING DEGREE DAYS (base 65°F) 1999 SAULT STE. MARIE, MI (ANJ)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	63	99	301	530	959	1469	1712	1452	1380	868	538	157	9528
1971-72	144	190	262	434	998	1324	1582	1566	1420	926	314	232	9392
1972-73	105	122	348	722	972	1432	1414	1406	923	748	574	192	8958
1973-74	92	22	376	473	949	1413	1566	1550	1330	805	558	164	9298
1974-75	57	72	432	730	959	1260	1507	1314	1358	968	298	151	9106
1975-76	64	70	373	537	871	1394	1686	1333	1299	746	534	100	9007
1976-77	76	90	349	728	1121	1706	1818	1420	1119	744	318	305	9794
1977-78	111	246	335	621	910	1396	1675	1503	1377	889	333	270	9666
1978-79	112	96	282	645	989	1453	1733	1673	1171	835	477	237	9703
1979-80	69	134	305	696	979	1263	1541	1520	1313	711	342	317	9190
1980-81	70	44	383	841	1066	1613	1740	1297	1164	763	438	262	9681
1981-82	89	83	435	799	968	1336	1868	1495	1337	991	273	393	10067
1982-83	97	228	339	556	976	1256	1520	1229	1153	832	604	169	8959
1983-84	34	25	236	619	951	1665	1787	1193	1362	608	535	177	9192
1984-85	82	51	391	560	990	1367	1643	1453	1184	776	424	306	9227
1985-86	135	100	242	590	978	1579	1619	1392	1207	639	325	285	9091
1986-87	60	153	325	625	1036	1209	1386	1195	1086	568	393	142	8178
1987-88	53	105	229	699	938	1202	1586	1525	1295	767	358	197	8954
1988-89	39	103	291	733	847	1413	1403	1502	1409	835	388	211	9174
1989-90	34	119	271	582	1099	1785	1281	1317	1186	719	494	240	9127
1990-91	96	99	303	662	866	1319	1609	1282	1169	657	292	92	8446
1991-92	68	56	338	615	976	1341	1495	1367	1331	875	405	256	9123
1992-93	230	165	326	661	1014	1277	1486	1482	1187	834	512	252	9426
1993-94	66	66	421	740	1054	1346	1993	1592	1229	855	481	177	10020
1994-95	101	161	258	543	885	1099	1362	1487	1131	910	470	113	8520
1995-96	81	48	363	579	1171	1510	1686	1518	1401	973	542	174	10046
1996-97	184	97	228	617	1043	1282	1658	1321	1296	840	623	96	9285
1997-98	97	121	235	613	956	1204	1443	996	1114	622	232	175	7808
1998-99	24	14	157	507	805	1210	1591	1188	1181	629	298	139	7743
1999-	36	96	244	661	796	1251							

WBAN : 14847

COOLING DEGREE DAYS (base 65°F) 1999 SAULT STE. MARIE, MI (ANJ)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	0	0	21	69	67	7	0	0	0	164
1971	0	0	0	0	0	34	7	14	34	4	0	0	93
1972	0	0	0	0	12	7	36	24	0	0	0	0	79
1973	0	0	0	0	0	9	33	129	49	0	0	0	220
1974	0	0	0	0	0	14	61	51	0	0	0	0	126
1975	0	0	0	0	32	42	113	54	2	0	0	0	243
1976	0	0	0	3	2	29	33	88	12	0	0	0	167
1977	0	0	0	0	19	5	49	13	0	0	0	0	86
1978	0	0	0	0	27	9	40	44	5	0	0	0	125
1979	0	0	0	0	0	13	87	30	15	0	0	0	145
1980	0	0	0	0	10	16	19	48	6	0	0	0	99
1981	0	0	0	0	1	5	46	22	0	0	0	0	74
1982	0	0	0	0	6	0	30	5	21	0	0	0	62
1983	0	0	0	0	0	52	171	124	49	0	0	0	396
1984	0	0	0	0	0	24	41	56	3	0	0	0	124
1985	0	0	0	0	4	1	8	38	28	0	0	0	79
1986	0	0	0	1	2	1	75	12	0	0	0	0	91
1987	0	0	0	1	27	35	114	52	2	0	0	0	231
1988	0	0	0	0	12	25	126	104	8	0	0	0	275
1989	0	0	0	0	0	9	97	74	11	0	0	0	191
1990	0	0	0	10	0	7	36	30	9	0	0	0	92
1991	0	0	0	0	12	39	57	98	14	0	0	0	220
1992	0	0	0	0	8	2	0	27	2	0	0	0	39
1993	0	0	0	0	2	3	48	79	3	0	0	0	135
1994	0	0	0	0	2	34	47	13	3	0	0	0	99
1995	0	0	0	0	0	72	50	91	5	0	0	0	218
1996	0	0	0	0	0	13	4	33	23	0	0	0	73
1997	0	0	0	0	0	31	62	29	3	0	0	0	125
1998	0	0	0	0	9	40	81	132	23	0	0	0	285
1999	0	0	0	0	7	53	133	32	30	0	0	0	255

SNOWFALL (inches) 1999 SAULT STE. MARIE, MI (ANJ)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0.0	0.0	0.0	0.3	12.2	24.2	50.4	32.6	17.5	6.8	0.5	0.0	144.5
1971-72	0.0	0.0	0.0	0.0	13.7	26.7	53.2	41.3	22.8	14.7	0.0	0.0	172.4
1972-73	0.0	0.0	0.0	10.1	10.1	38.3	13.9	17.1	0.2	2.0	0.5	0.0	92.2
1973-74	0.0	0.0	0.0	0.2	24.4	19.2	27.1	17.6	18.1	2.9	0.3	0.0	109.8
1974-75	0.0	0.0	T	0.8	7.0	21.8	41.8	32.8	21.3	0.6	0.0	0.0	126.1
1975-76	0.0	0.0	T	T	7.7	11.7	40.8	31.7	32.1	5.0	1.8	0.0	130.8
1976-77	0.0	0.0	T	7.5	34.2	34.9	45.9	26.3	18.5	11.3	0.0	0.0	178.6
1977-78	0.0	0.0	0.0	T	16.2	41.9	35.5	12.1	14.7	5.3	0.0	0.0	125.7
1978-79	0.0	0.0	0.0	T	14.0	51.3	39.6	21.7	13.6	19.2	0.7	0.0	160.1
1979-80	0.0	0.0	0.0	3.5	12.4	28.0	30.7	14.3	17.5	1.7	0.0	0.0	108.1
1980-81	0.0	0.0	0.0	5.2	14.6	69.3	13.6	29.9	8.7	0.4	0.0	0.0	141.7
1981-82	0.0	0.0	0.0	6.3	11.7	25.9	71.0	10.8	17.1	25.8	0.0	0.0	168.6
1982-83	0.0	0.0	0.0	T	12.2	22.7	22.6	15.7	9.4	4.4	T	0.0	87.0
1983-84	0.0	0.0	T	T	5.6	57.5	23.3	10.8	7.8	2.5	0.9	0.0	108.4
1984-85	0.0	0.0	0.1	T	8.2	44.8	43.8	31.5	16.8	9.7	0.0	0.0	154.9
1985-86	0.0	0.0	0.0	0.4	15.7	56.4	28.7	17.0	29.9	0.4	0.1	0.0	148.6
1986-87	0.0	T	0.0	T	25.4	29.0	29.2	10.2	7.2	2.0	0.0	0.0	103.0
1987-88	0.0	0.0	0.0	4.6	16.7	27.7	43.0	14.5	23.4	5.2	0.0	0.0	135.1
1988-89	0.0	0.0	0.0	6.6	7.4	50.2	25.6	23.7	24.7	4.1	T	0.0	142.3
1989-90	0.0	0.0	0.1	0.4	46.8	28.8	31.5	27.3	7.4	16.2	0.9	0.0	159.4
1990-91	0.0	0.0	T	0.4	16.7	29.2	25.9	11.3	15.2	8.5	T	0.0	107.2
1991-92	0.0	0.0	0.4	2.2	19.1	25.1	37.6	12.8	10.5	5.0	0.4	0.0	113.1
1992-93	0.0	0.0	T	10.8	13.6	35.0	28.9	2.8	1.9	8.7	0.0	0.0	101.7
1993-94	0.0	0.0	0.0	5.0	12.6	28.4	33.4	8.4	15.4	3.6	T	0.0	106.8
1994-95	0.0	0.0	0.0	T	15.9	5.1	26.8	15.6	15.3	15.0	0.0	0.0	93.7
1995-96	T	0.0	0.0	1.0	36.4	98.7	44.2	18.7	9.2	13.6	0.2	0.0	222.0
1996-97	0.0	0.0	0.0	0.7	21.6	45.4							
1997-98													
1998-99													
1999-					2.3	25.9							
POR= 54 YRS	T	T	0.1	2.4	15.5	30.7	28.5	18.1	14.4	5.8	0.9	T	116.4

WBAN : 14847

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
SAULT STE. MARIE,
MICHIGAN (ANJ)

Sault Ste. Marie is located at the extreme eastern tip of the Upper Peninsula of Michigan at the intersection of Lake Superior, Michigan, and Huron. Consequently, the regional climate is essentially maritime during ice-free periods of the year. Lake ice development usually begins in December and progresses to maximum coverage in February. As ice cover develops, the character of the regional climate gradually changes to continental polar by the time of maximum lake ice development. Lake Superior, to the northwest, is the largest, deepest, and coldest of the Great Lakes and is the dominant climatic control for the area. Water in the northern Great Lakes remains relatively cool during the summer and seldom freezes over during the winter. Therefore, temperatures are moderated throughout most of the year, whereas cloudiness and precipitation are increased.

Terrain on the Michigan side of the international border is nearly flat and lies 700 to 800 feet above sea level. Very little climatological influence is related to Michigan terrain. However, terrain on the Canadian side of the border rises rather abruptly to about 1,500 feet above sea level and this definite topographic influence increases the rain and snow shower activity over the Canadian hills.

Heavy fog occurrences reach a maximum in August, September, and October and form in response to the passage of relatively cold air masses over the warmer waters of the northern Great Lakes. Destructive tornadoes and thunderstorms have occurred on rare occasions. Occurrences of river and flash flooding are very rare. Summer and fall pollen counts are extremely low and sources of industrial pollutants are almost non-existent.

Changing weather patterns are common because of the high frequency of migratory low pressure systems moving toward the east and the northeast through the northern Great Lakes. Summer rains are most frequent during periods of southeasterly circulation whereas winter snows most frequently accompany post-frontal northwest winds.

Most summers pass without a temperature reaching 90 degrees. Winters are cold and snowy with total seasonal snowfall ranging from about 30 inches to more than 175 inches. November 21 is the average date for the appearance of the permanent winter snow cover which normally lasts until April 7.

Annual percent of possible sunshine is low but is especially low during late fall and early winter because of cloud cover produced by lake moisture evaporated into the cold air. Sunshine amounts increase as ice development increases in the winter season. Daylight during most of June and July lasts almost 16 hours, whereas winter daylight reaches a minimum of less than 9 hours a day in late December.

Based on the 1951-1980 period, the average first occurrence of 32 degrees Fahrenheit in the fall is September 27 and the average last occurrence in the spring is May 26.

STATION LOCATION

SAULT STE. MARIE, MICHIGAN

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										AUTOMATED STATION	* Type	REMARKS	
						SEA LEVEL	GROUND												
							WIND	TEMP	PRES	REL	MO	SO	TH	RA	WE				8
CITY First Nat'l Bank Bldg. Corner Ashmun & Portage	7/01/88	4/30/96		46° 30'	84° 21'	607	65	57	56										
Evening News Building 115 Ashmun Street	5/01/96	6/30/99	200 ft. NNE	46° 30'	84° 21'	605													
Weather Bureau Building Canal Park	7/01/99	6/30/41	1/4 mi. W	46° 30'	84° 21'	607	52	11	11			3	3	3					
AIRPORT Municipal Airport	7/01/39	6/30/41	1-1/4 mi. SSW	46° 28'	84° 22'	721	43	10	10			8	8	8					
Municipal Airport	7/01/41	9/13/43		46° 28'	84° 22'	721	43	11	11			8	8	8					WBO-WBAS consolidation.
Weather Bureau - FAA Building Municipal Airport	9/14/43	11/22/48	150 ft. E	46° 28'	84° 22'	721	43	11	11			8	8	8					
Municipal Airport** **City-County Airport Effective in 1967	11/23/48	10/27/82	#	46° 28'	84° 22'	721	a20	6 h5	6 h5	%16	f4 i4	c6 j6	b5 s3	e5	NA	# - Instrument relocations only. a - 43 ft. to 6/15/49; 33 ft. to 12/10/62; 40 ft. to 10/11/66. b - Removed 6/15/61. c - 5 ft. to 6/15/62 and 4 ft. to 5/21/65. e - Commissioned 1100 ft. WSW of thermometer site 10/11/66. f - Added 10/11/74. h - Minor relocation 7/2/76. i - Minor relocation 6/23/76. s - Added as standby 6/14/68. * - Commissioned 8/5/53. j - Type change 6/17/80.			
National Weather Svce Office, 14th and Davitt	10/27/82	01/01/97	580 ft. NE	46° 28'	84° 21'	718	k20	5	5	8	4	5	5 n5	k5 m5	NA	k - Not moved 10/27/82. m - Type change 10/4/85. n - Minor adjustment 7/12/86.			
Sault Ste Marie Municipal Airport	01/01/97	Present	NA	46°28'	84°22'	721									S	ASOS Commissioned 01/01/97			

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801.
INQUIRIES/COMMENTS CALL: (828) 271-4800

National Climatic Data Center
151 Patton Avenue, Rm 120
Asheville NC 28801-5001

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