

1998

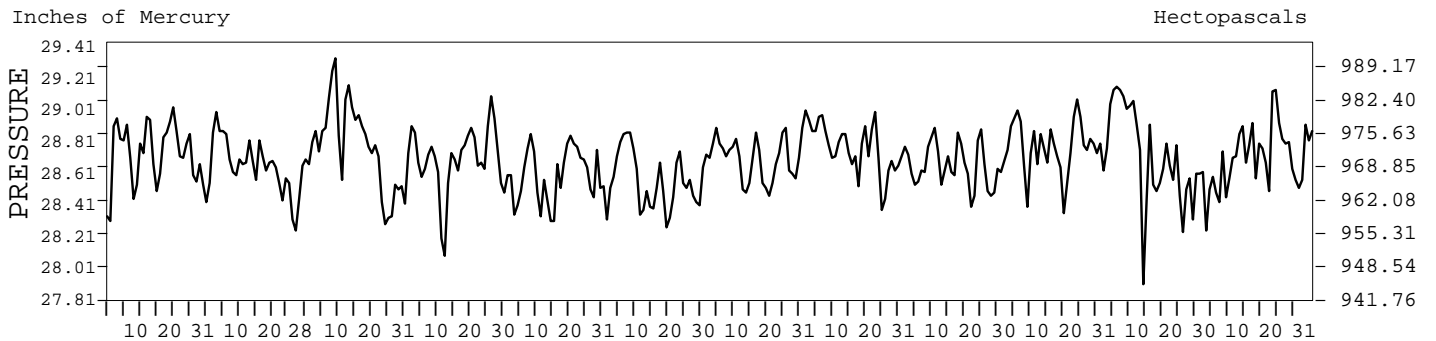
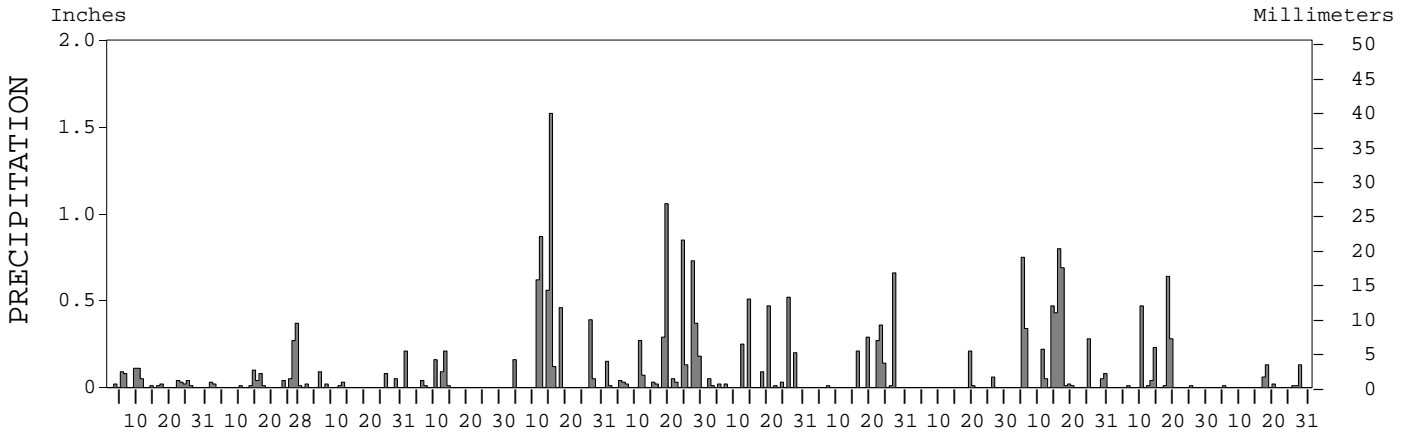
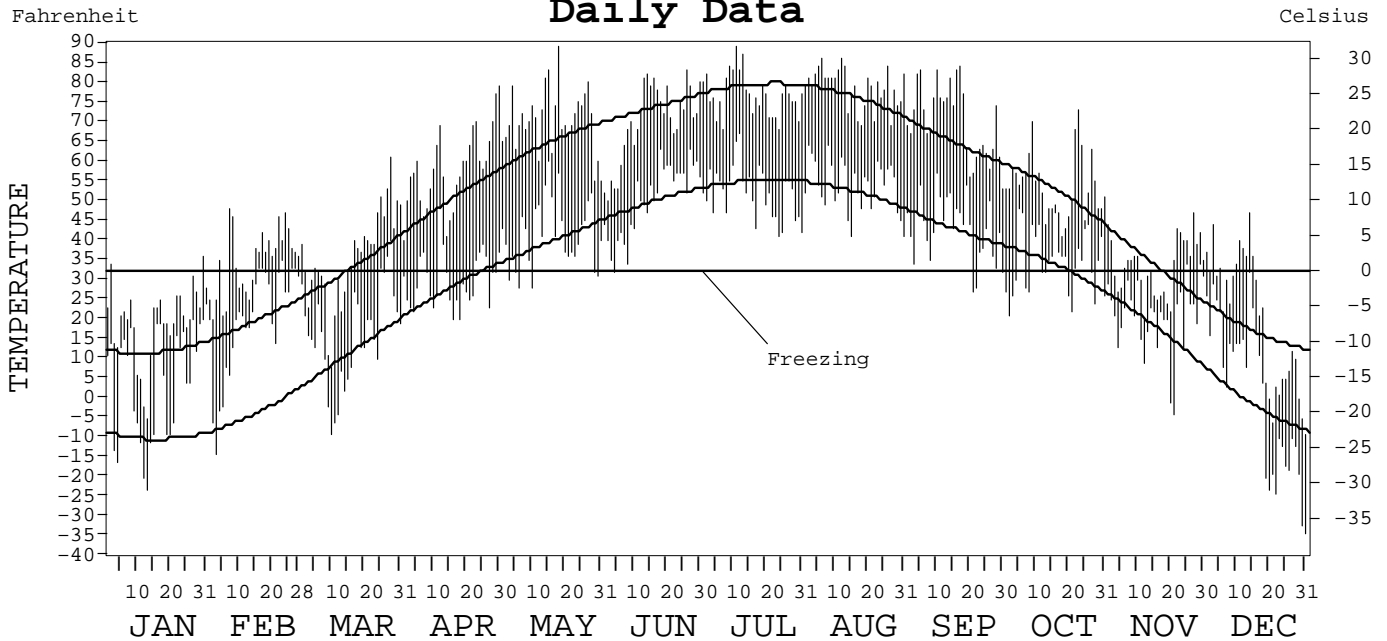
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-2729

INTERNATIONAL FALLS,
MINNESOTA (INL)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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 ASHEVILLE, NORTH CAROLINA

METEOROLOGICAL DATA FOR 1998

INTERNATIONAL FALLS, MN (INL)

LATITUDE: 48° 33' 59" N LONGITUDE: 93° 24' 11" W ELEVATION (FT): GRND: 1179 BARO: 1185 TIME ZONE: CENTRAL (UTC+ 6) WBAN: 14918

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	19.5	34.6	35.7	58.1	70.4	69.8	76.7	78.5	70.1	53.8	33.6	19.9	51.7	
	HIGHEST DAILY MAXIMUM	36	48	61	79	89	83	89	86	84	73	47	47	89	
	DATE OF OCCURRENCE	30	07	28	30	18	26	11	12+	17	23	27	14	JUL 11	
	MEAN DAILY MINIMUM	4.5	19.6	16.0	29.9	41.5	50.2	51.9	53.8	42.9	34.6	20.7	1.4	30.6	
	LOWEST DAILY MINIMUM	-23	-14	-9	20	28	32	41	41	27	21	-4	-34	-34	
	DATE OF OCCURRENCE	13	03	10	18+	10+	04	24	31+	21	02	21	31	DEC 31	
	AVERAGE DRY BULB	12.0	27.1	25.9	44.0	56.0	60.0	64.3	66.2	56.5	44.2	27.2	10.7	41.2	
	MEAN WET BULB	12.0	25.7	23.2	37.6	50.1	55.7	60.0	61.2	52.5	41.8	26.7			
	MEAN DEW POINT	8.8	22.2	15.6	27.0	43.4	52.1	56.4	57.7	48.1	38.6	23.9			
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAXIMUM ≤ 32°	29	10	13	0	0	0	0	0	0	0	13	22	87	
	MINIMUM ≤ 32°	31	23	28	21	6	1	0	0	3	13	28	31	185	
MINIMUM ≤ 0°	12	4	4	0	0	0	0	0	0	0	2	13	35		
H/C	HEATING DEGREE DAYS	1637	1053	1205	621	291	169	68	40	259	637	1129	1676	8785	
	COOLING DEGREE DAYS	0	0	0	0	18	25	53	84	13	0	0	0	193	
RH	MEAN (PERCENT)	83	82	67	55	65	76	75	76	74	82	84	78	75	
	HOUR 06 LST	85	88	81	76	83	87	91	93	93	92	90	83	87	
	HOUR 12 LST	82	79	58	41	49	65	59	56	54	71	80	74	64	
	HOUR 18 LST	82	76	52	41	50	65	58	62	62	76	82	76	65	
	HOUR 24 LST	86	85	73	64	79	88	90	89	86	89	86	82	83	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	2	3	2	2	1	2	2	1	3	0	4	1	23	
	THUNDERSTORMS	0	0	1	1	7	10	6	7	3	1	1	0	37	
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.)	28.73	28.66	28.79	28.70	28.59	28.56	28.71	28.76	28.66	28.79	28.68	28.74	28.70	
	MEAN SEA-LEVEL PRESS. (IN.)	29.94	29.86	29.97	29.87	29.79	29.75	29.91	29.91	29.82	29.96	29.90	29.96	29.89	
WINDS	RESULTANT SPEED (MPH)	0.2	2.6	2.3	1.9	0.3	1.4	2.8	1.5	1.6	1.1	1.2	3.5	0.4	
	RES. DIR. (TENS OF DEGS.)	16	13	36	08	08	18	27	23	28	13	32	27	26	
	MEAN SPEED (MPH)	6.9	7.1	8.2	7.9	8.2	7.1	6.3	6.3	6.8	8.7	7.7	7.7	7.4	
	PREVAIL. DIR. (TENS OF DEGS.)	29	19	07	06	07	15	29	18	32	12	26	26	27	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	22	29	24	32	31	28	37	24	26	28	33	25	37	
	DIR. (TENS OF DEGS.)	27	14	35	20	27	13	33	02	34	12	36	36	33	
	DATE OF OCCURRENCE	09	25	13+	12	16	18	20	26	30	05	10	18	JUL 20	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	26	36	30	44	40	34	43	30	31	38	39	32	44	
DIR. (TENS OF DEGS.)	28	11	07	20	25	11	33	02	33	12	36	27	20		
DATE OF OCCURRENCE	09	26+	31+	12	16	18	20	26	30+	05	10	14	APR 12		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	0.64	1.04	0.30	0.73	4.81	4.33	2.18	1.95	0.28	4.20	1.70	0.37	22.53	
	GREATEST 24-HOUR (IN.)	0.22	0.56	0.09	0.21	1.58	1.11	0.52	0.66	0.21	0.80	0.64	0.13	1.58	
	DATE OF OCCURRENCE	09-10	26-27	06	13	15	18-19	26	27	19	16	18	18	MAY 15	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	14	13	7	7	9	18	12	8	3	14	9	7	121	
PRECIPITATION ≥ 0.10	2	3	0	3	8	9	5	6	1	8	4	2	51		
PRECIPITATION ≥ 1.00	0	0	0	0	1	1	0	0	0	0	0	0	2		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	17.1	5.6	4.2	5.7	T	0.0	0.0	0.0	0.0	T	22.4	12.9	67.9	
	GREATEST 24-HOUR (IN.)	3.2	2.0	1.2	5.3	T	0.0	0.0	0.0	0.0	T	8.6	5.2	8.6	
	DATE OF OCCURRENCE	09	27	06	01	18+					19+	18	18	NOV 18	
	MAXIMUM SNOW DEPTH (IN.)	14	9	1	3	0	0	0	0	0	0	15	5	15	
	DATE OF OCCURRENCE	27+	04+	15+	02+							20	31+	NOV 20	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	6	2	2	1	0	0	0	0	0	0	4	4	19		

NORMALS, MEANS, AND EXTREMES

INTERNATIONAL FALLS, MN (INL)

LATITUDE: 48° 33' 59" N LONGITUDE: 93° 24' 11" W ELEVATION (FT): GRND: 1179 BARO: 1185 TIME ZONE: CENTRAL (UTC+ 6) WBAN: 14918

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	11.9	19.3	32.8	50.1	64.6	73.4	78.8	75.6	64.3	51.8	32.8	16.6	47.7
	MEAN DAILY MAXIMUM	51	12.2	20.3	32.7	49.8	64.5	73.4	78.1	75.8	64.4	52.2	32.4	17.9	47.8
	HIGHEST DAILY MAXIMUM	59	48	55	76	93	95	99	98	95	95	88	73	57	99
	YEAR OF OCCURRENCE		1973	1991	1946	1952	1964	1995	1988	1991	1976	1963	1975	1939	JUN 1995
	MEAN OF EXTREME MAXS.	51	34.3	40.7	52.0	72.7	84.4	88.0	90.5	89.2	82.6	74.5	53.5	38.0	66.7
	NORMAL DAILY MINIMUM	30	-10.0	-4.0	11.4	27.8	39.6	49.5	54.6	51.7	42.5	32.9	17.0	-2.2	25.9
	MEAN DAILY MINIMUM	51	-9.5	-3.2	10.3	27.3	39.2	49.1	53.9	51.4	42.0	32.6	16.9	-1.8	25.8
	LOWEST DAILY MINIMUM	59	-46	-45	-38	-14	11	23	34	30	20	2	-32	-41	-46
	YEAR OF OCCURRENCE		1968	1996	1962	1954	1967	1964	1997	1982	1965	1988	1985	1955	JAN 1968
	MEAN OF EXTREME MINS.	51	-35.8	-30.7	-17.3	7.8	24.5	34.6	41.5	38.4	26.8	17.2	-6.9	-27.8	6.0
	NORMAL DRY BULB	30	1.0	7.7	22.1	39.0	52.1	61.4	66.7	63.7	53.4	42.4	24.9	7.2	36.8
	MEAN DRY BULB	51	1.4	8.5	21.5	38.5	52.0	61.3	66.0	63.7	53.3	42.4	24.7	8.5	36.8
	MEAN WET BULB	14	4.8	10.6	21.3	34.1	46.7	56.3	60.1	58.9	49.6	37.8	21.9	9.1	34.3
	MEAN DEW POINT	14	.8	4.8	14.0	25.0	38.9	51.1	56.1	55.0	45.7	32.8	17.8	5.5	29.0
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	*	0.4	0.9	2.0	1.0	0.1	0.0	0.0	0.0	4.4	
MAXIMUM ≤ 32°	30	29.0	22.7	14.0	1.9	0.1	0.0	0.0	0.0	0.0	0.9	14.9	27.7	111.2	
MINIMUM ≤ 32°	30	31.0	27.9	29.2	21.6	7.0	0.4	0.0	0.1	3.9	16.4	28.0	30.9	196.4	
MINIMUM ≤ 0°	30	22.0	16.9	7.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	3.3	17.4	67.8	
H/C	NORMAL HEATING DEG. DAYS	30	1984	1604	1330	780	418	156	55	116	348	701	1203	1792	10487
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	18	48	107	76	0	0	0	0	249
RH	NORMAL (PERCENT)	30	71	67	66	61	61	69	71	75	77	74	79	77	71
	HOUR 06 LST	30	73	71	70	68	72	80	84	87	87	80	82	79	78
	HOUR 12 LST	30	74	73	75	76	77	83	87	91	90	85	84	80	81
	HOUR 18 LST	30	68	63	59	52	49	56	56	60	64	64	73	74	62
	HOUR 24 LST	30	68	62	57	49	48	55	56	60	67	67	76	76	62
S	PERCENT POSSIBLE SUNSHINE														
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	60	0.9	1.1	1.1	0.9	0.9	0.9	1.5	2.1	1.9	1.3	1.1	1.5	15.2
	THUNDERSTORMS	60	0.0	0.0	0.2	0.9	3.5	7.0	8.4	6.8	3.6	0.9	0.1	0.0	31.4
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	47	5.4	5.0	5.3	5.2	5.3	5.4	5.0	4.9	5.5	5.8	6.3	5.6	5.4
	MIDNIGHT-MIDNIGHT (OKTAS)	32	5.1	4.8	4.9	4.9	5.0	5.0	4.7	4.4	5.0	5.6	5.9	5.3	5.0
	MEAN NO. DAYS WITH:														
	CLEAR	57	7.5	7.9	7.7	6.9	6.8	4.8	6.1	7.1	5.6	5.8	3.7	6.2	76.1
PARTLY CLOUDY	57	7.3	6.4	7.6	8.3	9.0	10.8	13.2	11.3	8.8	7.1	5.2	5.8	100.8	
CLOUDY	57	16.2	14.1	15.6	14.8	15.2	14.4	11.2	12.1	15.3	18.1	21.1	18.9	187.0	
PR	MEAN STATION PRESSURE (IN)	26	28.70	28.79	28.70	28.70	28.70	28.60	28.70	28.70	28.70	28.70	28.70	28.70	28.70
	MEAN SEA-LEVEL PRES. (IN)	15	30.05	30.07	30.05	29.96	29.94	29.90	27.94	27.97	27.83	29.97	29.99	30.05	29.48
WINDS	MEAN SPEED (MPH)	32	8.6	8.7	9.3	9.6	9.2	8.2	7.4	7.4	8.4	9.0	9.4	8.6	8.7
	PREVAIL. DIR (TENS OF DEGS)	25	29	30	30	06	18	18	30	18	18	18	30	30	30
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	2	28	29	24	32	31	31	37	26	30	30	33	25	37
	DIR. (TENS OF DEGS)		34	14	27	20	34	18	33	18	28	17	36	36	33
	YEAR OF OCCURRENCE		1997	1998	1997	1998	1997	1997	1998	1997	1997	1997	1998	1998	JUL 1998
	MAXIMUM 5-SECOND:														
	SPEED (MPH)	2	34	36	31	44	40	38	43	34	40	39	39	32	44
DIR. (TENS OF DEGS)		03	11	26	20	25	18	33	18	28	26	01	27	20	
YEAR OF OCCURRENCE		1997	1998	1997	1998	1998	1997	1998	1997	1997	1997	1997	1998	APR 1998	
PRECIPITATION	NORMAL (IN)	30	0.88	0.63	1.06	1.58	2.47	3.93	3.59	3.11	3.15	1.97	1.15	0.84	24.36
	MAXIMUM MONTHLY (IN)	59	3.03	1.81	3.07	3.33	6.67	8.19	9.52	11.26	7.36	4.84	3.49	1.70	11.26
	YEAR OF OCCURRENCE		1975	1955	1966	1986	1985	1941	1966	1942	1961	1971	1977	1992	AUG 1942
	MINIMUM MONTHLY (IN)	59	0.10	0.10	0.19	0.08	0.20	0.70	1.00	0.58	0.28	0.14	0.10	0.16	0.08
	YEAR OF OCCURRENCE		1973	1993	1969	1987	1976	1961	1941	1991	1952	1992	1939	1940	APR 1987
	MAXIMUM IN 24 HOURS (IN)	59	1.50	1.14	1.80	1.59	2.76	3.80	4.87	4.82	3.37	2.62	1.56	1.25	4.87
	YEAR OF OCCURRENCE		1975	1946	1957	1979	1991	1964	1966	1942	1973	1979	1977	1960	JUL 1966
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	11.2	8.2	9.7	8.8	10.9	12.5	11.4	11.0	11.6	10.1	10.3	11.6	127.3	
PRECIPITATION ≥ 1.00	30	0.0	0.0	*	0.2	0.3	0.7	0.7	0.5	0.6	0.3	0.1	0.0	3.4	
SNOWFALL	NORMAL (IN)	30	13.4	8.9	9.3	5.7	0.5	0.*	0.0	0.0	0.1	1.9	11.2	12.8	63.8
	MAXIMUM MONTHLY (IN)	59	43.0	32.3	31.5	23.0	13.4	0.3	T	T	1.9	8.5	29.7	43.9	43.9
	YEAR OF OCCURRENCE		1975	1992	1951	1950	1954	1969	1992	1996	1942	1981	1965	1992	DEC 1992
	MAXIMUM IN 24 HOURS (IN)	59	17.7	12.1	17.0	13.9	7.7	0.3	T	T	1.5	5.9	14.7	14.4	17.7
	YEAR OF OCCURRENCE		1975	1996	1966	1950	1954	1969	1992	1995	1951	1981	1991	1990	JAN 1975
	MAXIMUM SNOW DEPTH (IN)	50	38	35	38	25	12	0	0	0	0	5	26	25	38
	YEAR OF OCCURRENCE		1982	1969	1966	1975	1954					1988	1965	1985	MAR 1966
	NORMAL NO. DAYS WITH:														
SNOWFALL ≥ 1.0	30	3.9	3.2	2.7	1.5	0.2	0.0	0.0	0.0	0.*	0.7	3.2	4.2	19.6	

PRECIPITATION (inches) 1998 INTERNATIONAL FALLS, MN (INL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	2.79	0.27	0.19	1.15	2.11	3.21	4.80	2.17	1.77	2.87	1.02	1.08	23.43
1970	0.93	0.43	1.11	1.83	3.24	1.97	1.67	2.28	2.80	4.32	0.99	1.07	22.64
1971	0.52	1.22	0.52	1.06	2.30	2.67	3.40	1.39	5.22	4.84	1.21	0.48	24.83
1972	0.76	0.71	0.57	0.89	2.57	1.52	4.52	2.65	1.70	1.60	0.93	0.97	19.39
1973	0.10	0.27	0.93	1.30	1.69	4.18	5.10	4.20	6.81	1.92	1.11	0.61	28.22
1974	0.87	0.65	0.99	2.11	3.17	4.64	1.06	6.38	0.86	1.61	1.12	0.79	24.25
1975	3.03	0.51	1.55	1.82	1.37	6.22	2.02	3.34	1.66	2.46	0.87	0.86	25.71
1976	0.99	0.46	1.84	0.94	0.20	7.01	5.70	1.89	1.19	0.81	0.21	0.60	21.84
1977	0.66	1.01	1.91	1.01	5.81	4.20	2.16	3.01	6.81	0.80	3.49	0.96	31.83
1978	0.76	0.27	0.41	1.12	3.86	2.89	6.29	2.96	3.62	0.39	1.60	0.93	25.10
1979	0.54	1.03	1.66	2.70	1.75	4.26	1.08	3.18	0.69	3.88	0.76	0.41	21.94
1980	0.92	0.55	0.87	0.45	0.83	1.70	2.23	4.03	4.08	1.81	1.62	0.56	19.65
1981	0.26	0.22	1.18	1.49	2.47	3.71	2.33	2.03	4.12	2.86	0.67	0.76	22.10
1982	1.24	0.51	1.58	0.84	3.51	2.68	2.37	2.88	3.63	3.67	1.52	0.29	24.72
1983	0.36	0.98	0.72	0.62	1.21	5.02	2.98	3.66	4.23	2.58	1.95	0.66	24.97
1984	0.30	0.76	0.22	0.89	1.77	6.50	2.14	1.30	1.14	4.11	0.91	1.27	21.31
1985	0.38	0.70	0.72	3.17	6.67	6.15	1.22	4.27	2.97	1.97	1.57	0.51	30.30
1986	0.61	0.95	0.26	3.33	0.50	3.67	2.59	1.52	2.42	0.64	1.27	0.35	18.11
1987	0.37	0.48	1.05	0.08	3.13	1.11	7.86	2.50	1.38	0.66	0.72	0.20	19.54
1988	0.44	0.14	1.71	0.30	1.18	4.39	3.04	6.66	3.93	1.03	1.39	0.76	24.97
1989	1.42	0.28	0.81	0.54	1.93	6.59	1.51	4.82	1.92	1.21	0.99	0.45	22.47
1990	0.62	0.50	1.35	1.47	0.98	5.50	3.13	2.15	1.23	1.42	0.75	1.21	20.31
1991	0.79	0.91	1.10	2.52	4.09	4.58	4.10	0.58	4.94	1.47	1.83	0.94	27.85
1992	0.78	1.57	0.56	1.43	2.08	2.17	4.00	5.48	2.34	0.14	1.17	1.70	23.42
1993	0.68	0.10	0.32	1.67	2.82	2.01	6.03	3.84	2.04	0.73	0.81	0.44	21.49
1994	0.46	0.34	0.58	1.47	1.65	4.56	4.02	2.73	3.67	1.97	2.46	0.67	24.58
1995	1.03	0.65	0.70	1.21	2.36	2.66	3.29	3.13	3.56	3.12	1.32	1.26	24.29
1996	1.78	1.47	0.43	1.54	2.10	4.41	3.05	3.52	2.64	3.17	3.00	1.48	28.59
1997	0.72	0.19	1.18	1.31	1.44	2.57	2.65	1.41	3.90	2.37	0.99	0.23	18.96
1998	0.64	1.04	0.30	0.73	4.81	4.33	2.18	1.95	0.28	4.20	1.70	0.37	22.53
POR= 59 YRS	0.82	0.68	1.01	1.54	2.56	3.91	3.55	3.16	3.05	1.78	1.33	0.79	24.18

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AVERAGE TEMPERATURE (°F) 1998 INTERNATIONAL FALLS, MN (INL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	0.9	10.4	18.7	43.2	49.5	53.3	65.1	67.6	54.9	37.6	24.8	14.4	36.7
1970	-3.0	4.5	17.5	37.2	46.5	65.0	70.1	65.2	55.6	43.7	24.0	3.5	35.8
1971	-7.1	9.7	21.2	39.4	50.2	64.4	62.1	63.3	55.6	45.1	24.7	8.5	36.4
1972	-5.7	1.3	19.3	36.9	59.5	62.8	63.9	65.6	51.1	39.9	25.5	3.8	35.3
1973	9.5	9.2	32.7	38.1	52.1	64.7	68.4	68.2	53.0	47.7	25.2	8.5	39.8
1974	-4	6.3	16.6	37.9	47.4	61.4	70.0	61.7	48.6	43.2	27.9	16.8	36.5
1975	6.3	6.8	15.1	33.0	55.1	61.2	70.2	62.2	50.6	44.8	28.7	6.9	36.7
1976	-4	14.5	17.3	42.8	51.2	64.6	66.0	64.9	53.6	36.3	19.5	-3.0	35.6
1977	-5.8	12.6	29.6	42.9	61.0	61.8	66.6	57.0	52.5	43.3	22.6	3.6	37.3
1978	-3.5	2.6	18.5	37.0	55.5	59.6	63.5	63.0	56.0	43.4	20.5	0.7	34.7
1979	-8.7	-6	19.7	34.0	46.0	59.5	66.4	60.2	52.9	36.9	22.2	15.1	33.6
1980	2.1	8.1	16.8	44.3	58.8	62.3	68.8	64.9	52.8	38.9	26.1	4.6	37.4
1981	6.2	14.5	28.6	40.9	53.3	61.5	68.6	67.8	54.0	40.1	34.9	10.5	40.1
1982	-10.5	6.5	18.7	35.4	55.8	56.2	67.3	61.1	53.7	45.0	21.6	16.4	35.6
1983	11.2	16.6	27.8	38.2	49.0	61.9	69.6	68.6	55.1	41.7	27.7	-4.3	38.6
1984	0.7	20.7	17.5	44.0	48.9	61.5	65.1	67.7	49.0	44.6	25.6	3.4	37.4
1985	-1	4.7	26.7	41.7	54.4	54.5	63.6	60.1	51.2	42.1	14.3	0.2	34.5
1986	7.7	9.4	27.6	43.2	56.0	60.4	66.7	61.2	52.4	41.4	19.9	15.9	38.5
1987	11.0	23.5	29.8	47.9	55.8	64.1	67.9	62.5	56.2	38.6	31.0	18.6	42.2
1988	0.2	1.9	21.7	39.5	58.5	67.6	68.4	65.2	53.8	37.8	26.1	8.8	37.5
1989	8.0	-1.7	16.8	36.0	53.4	60.2	69.7	65.2	55.0	43.4	21.0	-1.5	35.5
1990	13.4	9.6	27.0	38.7	49.7	63.2	65.8	66.0	55.6	40.6	28.1	5.9	38.6
1991	-1	15.4	25.3	44.8	58.1	66.1	66.4	67.9	51.8	38.1	20.2	13.0	38.9
1992	12.3	16.5	23.9	35.6	55.0	57.7	59.4	60.3	53.0	40.4	25.4	8.6	37.3
1993	4.7	9.1	25.5	38.6	50.7	58.6	64.4	65.0	48.5	37.4	22.9	13.1	36.5
1994	-7.8	5.5	29.2	38.7	54.2	64.1	64.8	61.8	57.8	47.5	30.9	19.1	38.8
1995	9.6	6.4	27.0	33.9	52.5	68.1	65.9	67.1	53.2	41.6	15.4	6.5	37.3
1996	-5.4	7.3	15.2	32.0	49.9	63.8	65.0	66.1	55.5	42.5	17.5	6.1	34.6
1997	2.1	10.2	18.4	35.9	46.0	62.7	64.2	60.6	56.4	43.1	23.0	20.4	36.9
1998	12.0	27.1	25.9	44.0	56.0	60.0	64.3	66.2	56.5	44.2	27.2	10.7	41.2
POR= 59 YRS	2.4	8.5	21.7	38.8	51.7	61.0	66.3	63.6	53.3	42.8	24.7	8.8	37.0

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HEATING DEGREE DAYS (base 65°F) 1998 INTERNATIONAL FALLS, MN (INL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	76	33	308	843	1200	1561	2106	1694	1467	829	565	83	10765
1970-71	19	68	314	650	1226	1908	2239	1550	1352	761	451	69	10607
1971-72	111	106	318	609	1201	1745	2195	1848	1413	833	236	109	10724
1972-73	72	74	412	769	1180	1893	1720	1561	993	800	393	60	9927
1973-74	26	20	364	530	1186	1751	2027	1641	1493	806	539	145	10528
1974-75	12	133	485	669	1106	1491	1815	1629	1542	950	322	163	10317
1975-76	41	118	426	622	1085	1801	2025	1463	1475	659	420	83	10218
1976-77	40	94	362	883	1359	2112	2195	1461	1089	658	183	114	10550
1977-78	34	246	367	666	1266	1908	2126	1745	1436	832	312	195	11133
1978-79	95	119	299	661	1329	1992	2287	1837	1402	923	580	177	11701
1979-80	36	161	364	862	1277	1539	1951	1646	1488	618	257	124	10323
1980-81	19	56	365	805	1161	1873	1818	1411	1119	716	359	108	9810
1981-82	32	17	324	764	894	1685	2343	1638	1431	882	280	256	10546
1982-83	21	161	354	612	1298	1500	1664	1352	1145	797	490	153	9547
1983-84	27	23	320	715	1116	2149	1995	1276	1470	621	494	112	10318
1984-85	50	50	474	626	1176	1908	2015	1687	1182	688	324	307	10487
1985-86	74	163	411	704	1520	2011	1773	1555	1152	646	313	161	10483
1986-87	34	145	367	723	1346	1517	1671	1158	1084	513	299	103	8960
1987-88	31	127	257	809	1018	1433	2011	1828	1337	756	237	53	9897
1988-89	29	85	331	834	1162	1743	1765	1868	1490	863	363	170	10703
1989-90	11	73	308	670	1312	2062	1596	1548	1171	796	464	88	10099
1990-91	39	59	284	748	1101	1833	2017	1383	1219	601	261	35	9580
1991-92	44	43	393	826	1338	1610	1631	1404	1267	875	335	233	9999
1992-93	173	155	354	756	1178	1746	1868	1560	1221	787	434	211	10443
1993-94	58	73	492	845	1257	1606	2263	1666	1102	784	339	80	10565
1994-95	58	135	221	535	1019	1416	1714	1640	1174	924	390	80	9306
1995-96	50	36	358	719	1484	1809	2183	1672	1540	984	462	111	11408
1996-97	50	37	309	691	1419	1819	1943	1531	1436	865	579	88	10767
1997-98	105	164	262	677	1253	1377	1637	1053	1205	621	291	169	8814
1998-	68	40	259	637	1129	1676							

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COOLING DEGREE DAYS (base 65°F) 1998 INTERNATIONAL FALLS, MN (INL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	0	0	0	0	13	8	82	120	14	0	0	0	237
1970	0	0	0	0	0	89	185	82	37	0	0	0	393
1971	0	0	0	0	0	56	27	59	42	0	0	0	184
1972	0	0	0	0	70	51	41	100	0	0	0	0	262
1973	0	0	0	0	0	59	136	127	12	0	0	0	334
1974	0	0	0	0	3	43	175	38	0	0	0	0	259
1975	0	0	0	0	23	54	211	38	0	2	0	0	328
1976	0	0	0	0	0	80	76	98	27	0	0	0	281
1977	0	0	0	0	65	26	92	4	0	0	0	0	187
1978	0	0	0	0	24	41	57	63	34	0	0	0	219
1979	0	0	0	0	1	18	86	18	8	0	0	0	131
1980	0	0	0	2	69	51	142	62	5	0	0	0	331
1981	0	0	0	0	5	9	151	112	3	0	0	0	280
1982	0	0	0	2	1	0	101	46	22	0	0	0	172
1983	0	0	0	0	0	67	178	142	30	0	0	0	417
1984	0	0	0	0	4	16	61	139	0	1	0	0	221
1985	0	0	0	0	0	1	41	19	2	0	0	0	63
1986	0	0	0	0	41	32	96	34	0	0	0	0	203
1987	0	0	0	7	20	83	130	56	0	0	0	0	296
1988	0	0	0	0	40	136	141	96	3	0	0	0	416
1989	0	0	0	0	11	32	165	85	14	5	0	0	312
1990	0	0	0	11	0	40	72	96	10	0	0	0	229
1991	0	0	0	0	54	76	90	137	6	0	0	0	363
1992	0	0	0	0	33	22	5	16	1	0	0	0	77
1993	0	0	0	0	0	26	47	81	0	0	0	0	154
1994	0	0	0	0	14	60	56	42	13	0	0	0	185
1995	0	0	0	0	9	180	84	108	9	0	0	0	390
1996	0	0	0	0	0	81	60	78	32	0	0	0	251
1997	0	0	0	0	0	24	85	37	10	4	0	0	160
1998	0	0	0	0	18	25	53	84	13	0	0	0	193

SNOWFALL (inches) 1998 INTERNATIONAL FALLS, MN (INL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	0.0	0.0	T	3.0	12.8	14.0	12.7	4.5	4.8	12.5	2.0	0.0	66.3
1970-71	0.0	0.0	0.0	5.6	9.7	8.7	9.5	11.8	4.2	3.3	0.3	0.0	53.1
1971-72	0.0	0.0	0.0	1.5	10.2	7.1	13.9	14.2	8.0	12.0	T	0.0	66.9
1972-73	0.0	0.0	T	2.3	5.0	12.3	2.3	4.9	1.6	2.0	0.0	0.0	30.4
1973-74	0.0	0.0	0.0	T	6.1	9.0	15.6	8.6	13.8	5.7	1.5	0.0	60.3
1974-75	0.0	0.0	1.0	1.8	7.8	16.2	43.0	6.2	18.2	2.1	0.2	0.0	96.5
1975-76	0.0	0.0	0.0	2.1	5.5	14.8	21.4	9.7	28.1	0.2	0.4	0.0	82.2
1976-77	0.0	0.0	0.0	6.9	3.8	12.4	11.2	14.2	14.0	0.2	0.0	0.0	62.7
1977-78	0.0	0.0	0.0	T	24.4	9.7	13.4	4.6	5.4	9.2	0.0	0.0	66.7
1978-79	0.0	T	0.0	0.3	21.0	15.0	10.8	18.3	11.5	2.1	0.8	0.0	79.8
1979-80	0.0	0.0	0.0	2.1	10.3	6.2	16.3	11.0	12.5	5.8	T	0.0	64.2
1980-81	0.0	0.0	0.0	1.7	19.1	9.3	6.8	3.9	1.7	3.3	T	0.0	45.8
1981-82	0.0	0.0	1.4	8.5	5.3	16.2	28.4	4.5	14.8	10.8	0.0	0.0	89.9
1982-83	0.0	0.0	0.0	T	13.9	3.9	5.7	16.4	2.3	3.7	0.1	0.0	46.0
1983-84	0.0	0.0	T	0.9	26.5	15.4	5.7	6.1	3.9	T	0.2	0.0	58.7
1984-85	0.0	0.0	T	2.1	10.9	12.4	9.8	15.3	13.9	2.0	T	0.0	66.4
1985-86	0.0	0.0	T	4.8	27.1	15.5	16.4	15.4	5.2	0.1	0.3	0.0	84.8
1986-87	0.0	0.0	0.0	0.7	11.5	8.4	14.1	12.6	6.9	0.5	0.0	0.0	54.7
1987-88	0.0	0.0	0.0	1.4	0.1	8.1	14.7	4.9	16.1	0.2	0.0	0.0	45.5
1988-89	0.0	0.0	0.0	5.4	20.8	21.4	28.9	6.7	12.5	7.1	1.9	0.0	104.7
1989-90	0.0	0.0	T	T	8.5	10.8	9.8	11.7	3.0	17.1	T	T	60.9
1990-91	T	0.0	T	2.5	7.8	31.1	18.5	18.3	12.1	5.1	1.8	0.0	97.2
1991-92	0.0	0.0	T	3.9	23.8	22.2	16.7	32.3	2.7	9.3	0.1	T	111.0
1992-93	T	0.0	0.1	1.8	24.9	43.9	17.6	1.6	6.8	2.0	T	0.0	98.7
1993-94	0.0	0.0	1.3	4.7	18.4	5.7	15.4	8.8	10.0	10.6	T	T	74.9
1994-95	0.0	T	T	1.1	10.6	10.1	17.5	13.8	4.0	12.8	T	0.0	69.9
1995-96	0.0	T	T	4.7	16.5	21.4	30.0	18.1	7.7	17.6	T	0.0	116.0
1996-97	0.0	T	T	5.4	23.9	24.7	11.3	5.4	13.0	1.4	0.2	0.0	85.3
1997-98	0.0	0.0	0.0	3.3	10.8	4.7	17.1	5.6	4.2	5.7	T	0.0	51.4
1998-	0.0	0.0	0.0	T	22.4	12.9							
POR= 58 YRS	T	T	0.1	1.8	12.3	12.1	12.8	9.4	9.4	6.1	1.1	0.0	65.1

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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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1998
INTERNATIONAL FALLS,
MINNESOTA (INL)

Situated on the Canadian border, International Falls is subjected to frequent outbreaks of continental polar air throughout most of the year. These are tempered to mildness during June, July, and August, when the land and lake areas to the north and northwest have been warmed by long days of sunshine. Periods of fine, mild weather occur, interspersed with showers and an occasional three or four day period of cloudy, rainy weather. The area of small lakes, covering up to 30 percent of the area to the north and northwest, supplies a good deal of the moisture for the late afternoon and evening showers and stores heat that tempers southward flow of cold air during September and October. This prolongs the fall season until early November. In November the water surfaces freeze and snow returns to International Falls. From December through February, temperatures fall below zero on most days and occasionally fail to rise above zero for a week or more.

In winter, frost penetrates into the ground to depths of 36 to 60 inches. If winter begins abruptly so that a heavy blanket of snow covers the ground before protracted freezing occurs, it may freeze to only a few inches deep. This is very important to loggers, who depend upon deep soil freezing for road foundations into otherwise inaccessible places. The wide expanse of deep snow and ice prolongs winter. The transition to summer is rapid after the spring thaw. Spring lasts only about a month.

By June 1st, the ground generally is warm enough for successful planting, but vigilance against freezing temperatures is required through most of June. Crops that do not mature by September 1st have little chance of providing a harvest. Heaviest precipitation coincides with the growing season.

Based on the 1951-1980 period, the average first occurrence of 32 degrees Fahrenheit in the fall is September 15 and the average last occurrence in the spring is May 26.

Heavy deposits of glaze occur only about once a year at International Falls. Occasional storms that intensify over the southern plateau or plains states and move rapidly northeastward, drawing up moist gulf air, bring the most violent weather changes. They often produce severe thunderstorms and windstorms in early fall and blizzards with heavy snowfall and drifting in winter. Quite often such a storm brings an abrupt end to fall weather. During winter, a variation of 100 miles in the paths of such storms as they approach the border is of tremendous importance to local transportation and road maintenance.

Surrounding terrain is generally level. Forests of varying density and swampland surround the station for many miles to the east, south, and west. Rainy Lake, approximately 300 square miles in area, lies to the north. The lake is 5 miles from the station at its closest point.

STATION LOCATION

INTERNATIONAL FALLS, MINNESOTA

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE										REMARKS	
						SEA LEVEL	GROUND										AUCOM
							WIND	EMERPH	EMERPH	EMERPH	EMERPH	EMERPH	EMERPH	EMERPH	EMERPH		
<u>COOPERATIVE</u>																	
101 Church Street Fort Frances, Ontario +	4/01/92	8/31/94		48°37'	93°24'	1120											+ - U.S. supervision effective 7/1/92. Numerous gaps in record from cooperative stations. Elevations of instruments not available.
2nd Ave. between 2nd & 3rd Sts., Koochiching, Minnesota	10/01/94	3/31/96	0.6 mi. S	48°36'	93°24'	1120											Name of town changed to International Falls in March 1904.
1st Street & 4th Avenue	4/09/96	4/30/96	0.3 mi. NW	48°36'	93°24'	1120											
2nd Avenue between 1st and 2nd Streets	1/15/97	4/30/00	2 blks. E	48°36'	93°24'	1120											
412 3rd Street on roof of one-story building	7/01/06	2/28/08	0.2 mi. SW	48°36'	93°24'	1120											
331 2nd Street	6/01/08	8/31/13	1.5 blocks NE	48°36'	93°24'	1120											
Roof M & O Paper Mill	9/01/13	9/30/16	1 block NW	48°36'	93°24'	1120											
9th Avenue between 4th & 5th Streets	11/01/16	3/31/27	0.4 mi. SW	48°36'	93°24'	1121											
<u>CITY</u>																	
Municipal Building 4th Street	10/26/39	7/20/46	0.2 mi. NE	48°36'	93°24'	1121	#48	5	5								# - 42 feet to 10/30/44.
<u>AIRPORT</u>																	
Weather Bureau Building Municipal Airport	7/20/46	10/25/50	2.3 mi. SSE	48°34'	93°23'	1179	28	5	5				3	3			
Weather Bureau Building Municipal Airport	10/25/50	9/16/53	300 ft. W	48°34'	93°23'	1177	28	5	5				3	3			
Administration Building Municipal Airport ++	9/16/53	Present	NA	48°34'	93°23'	1179	b20	d5 e5	d5 e5	NA	NA	a6 e6	5 e6	f5	NA		a - 3 feet to 10/29/62. b - 23 feet to 9/30/63; and 34 feet to 8/25/65. c - Commissioned 948 feet W of thermometer site 8/25/65. d - Standby status after 8/25/65. e - Minor move 6/26/79. f - Minor move 9/4/85. S ASOS Commissioned 11/01/96

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

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