



JULY 2003

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

DULUTH, MN

DULUTH INTERNATIONAL ARPT (DLH)
 Lat: 46° 50' N Long: 92° 11' W Elev (Ground): 1426 Feet
 Time Zone: CENTRAL WBAN: 14913 ISSN #:0198-2702

JULY 2003
DULUTH, MN

DATE	TEMPERATURE °F						DEG DAYS BASE 65°		WEATHER	SNOW/ICE ON GND(IN)		PRECIPITATION (INCHES)		PRESSURE (INCHES OF HG)		WIND SPEED = MPH DIR = TENS OF DEGREES						DATE	
	MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	HEATING	COOLING		0600 LST	1200 LST	2400 LST	2400 LST	AVERAGE STATION	AVERAGE SEA LEVEL	RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM				
																			5-SEC	2-MIN	SPEED		DIR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01	83	59	71	7	55	62	0	6		0		0.0	0.00	28.49	29.99	9.5	22	9.9	22	20	18	22	01
02	86	63	75	11	62	66	0	10	TS TSRA RA BR	0		0.0	0.60	28.30	29.78	8.2	19	13.6	38	31	31*	30	02
03	86	61	74	10	63	67	0	9	TSRA RA FG+ BR	0		0.0	0.11	28.24	29.71	6.1	28	7.5	26	13	24	12	03
04	82	59	71	7	54	61	0	6	TS RA	0		0.0	0.01	28.30	29.78	9.3	29	10.0	28	31	22	30	04
05	84	55	70	6	54	61	0	5	TS RA	0		0.0	0.04	28.37	29.85	8.3	23	9.1	25	21	22	21	05
06	73	53	63	-1	55	59	2	0	TS TSRA FG+ BR	0		0.0	0.13	28.32	29.81	5.9	12	6.4	21	18	20	20	06
07	75	55	65	0	54	59	0	0	TS TSRA RA BR	0		0.0	0.94	28.36	29.86	10.9	29	12.7	33	26	26	27	07
08	72	50	61	-4	50	55	4	0		0		0.0	0.00	28.52	30.03	4.4	34	8.1	22	28	18	29	08
09	60	50	55*	-10	51	52	10	0	RA BR	0		0.0	0.62	28.48	30.00	12.5	09	12.7	26	08	22	09	09
10	62	53	58	-7	55	55	7	0	RA FG BR	0		0.0	0.36	28.32	29.83	3.2	02	6.6	17	35	15	08	10
11	73	52	63	-2	53	57	2	0	RA	0		0.0	0.01	28.36	29.86	7.4	34	7.8	23	36	17	36	11
12	79	54	67	1	55	60	0	2	RA	0		0.0	0.06	28.50	30.01	4.4	30	5.3	20	31	15	31	12
13	80	55	68	2	58	62	0	3		0		0.0	0.00	28.48	29.97	7.3	22	8.4	23	22	18	23	13
14	78	60	69	3	63	65	0	4	TS TSRA RA BR	0		0.0	0.31	28.33	29.82	12.0	22	13.2	37	21	29	23	14
15	76	57	67	1	54	59	0	2	RA	0		0.0	T	28.43	29.93	8.7	32	9.6	23	01	17	34	15
16	77	55	66	0	59	62	0	1	TS RA	0		0.0	T	28.54	30.04	2.1	20	6.0	28	01	20	02	16
17	67	49	58	-8	45	52	7	0		0		0.0	0.00	28.69	30.20	10.3	08	10.8	37	08	29	07	17
18	76	44*	60	-6	49	56	5	0		0		0.0	0.00	28.67	30.18	2.3	23	3.3	14	21	12	25	18
19	80	58	69	3	59	63	0	4	TS TSRA BR	0		0.0	0.48	28.49	29.98	9.8	24	10.8	38*	36	29	35	19
20	82	59	71	5	61	64	0	6	TS RA BR	0		0.0	0.04	28.31	29.79	9.6	30	10.7	32	25	29	25	20
21	67	54	61	-5	55	58	4	0	RA	0		0.0	0.02	28.41	29.91	5.3	07	8.2	18	11	15	11	21
22	68	51	60	-6	53	56	5	0	RA	0		0.0	T	28.61	30.12	3.3	07	5.2	16	11	15	12	22
23	75	48	62	-4	52	57	3	0		0		0.0	0.00	28.63	30.15	1.1	25	5.3	14	19	12	18	23
24	77	55	66	0	54	60	0	1		0		0.0	0.00	28.49	29.99	9.3	20	10.1	23	18	18	18	24
25	79	65	72	6	63	66	0	7	RA	0		0.0	0.01	28.36	29.84	8.6	21	10.1	24	23	20	22	25
26	91*	67	79*	13	68	71	0	14	BR	0		0.0	0.00	28.35	29.83	5.3	27	8.8	25	30	23	27	26
27	75	59	67	1	57	61	0	2		0		0.0	0.00	28.58	30.08	3.1	07	6.9	18	12	16	12	27
28	78	56	67	1	58	62	0	2	RA	0		0.0	0.02	28.54	30.04	5.4	23	6.2	24	27	21	27	28
29	83	59	71	5	61	64	0	6	TSRA RA BR	0		0.0	0.06	28.43	29.92	2.1	19	7.4	20	18	17	19	29
30	79	59	69	3	60	63	0	4	TS TSRA RA BR	0		0.0	0.18	28.36	29.85	7.0	26	8.4	28	30	21	29	30
31	73	56	65	-1	59	61	0	0	TS TSRA RA BR HZ	0		0.0	0.79	28.37	29.87	1.9	24	3.8	16	29	13	18	31
MONTHLY AVERAGES										TOTALS->						MONTHLY AVERAGES							
DEPARTURE FROM NORMAL														0.59		SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3							
DEGREE DAYS										GREATEST 24-HR PRECIPITATION: 1.07 DATE: 06-07				SEA LEVEL PRESSURE		DATE TIME							
MONTHLY TOTAL DEPARTURE										GREATEST 24-HR SNOWFALL: 0.0 DATE:				MAXIMUM		: 30.25 17 1155							
SEASON TO DATE TOTAL DEPARTURE										GREATEST SNOW DEPTH: 0 DATE:				MINIMUM		: 29.63 03 0355							
HEATING: 49 -20										NUMBER OF DAYS WITH				MAXIMUM TEMP ≥ 90: 1		MINIMUM TEMP ≤ 32: 0		PRECIPITATION ≥ 0.01 INCH: 19					
COOLING: 94 12														MAXIMUM TEMP ≤ 32: 0		MINIMUM TEMP ≤ 0: 0		PRECIPITATION ≥ 0.10 INCH: 10					
														THUNDERSTORMS: 13		HEAVY FOG: 2		SNOWFALL ≥ 1.0 INCH: 0					

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

DULUTH, MN

JULY 2003

DLH

WBAN # 14913

DATE	FOR HOUR (LST) ENDING AT												DATE	FOR HOUR (LST) ENDING AT												DATE	Sum if Different (See Note)	2400 LST	
	1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20	21	22	23	24			Water	Equiv.
01													01											01			0.00		
02													02											02			0.60		
03	0.10	0.01	T										03										03			0.11			
04		0.01											04										04			0.01			
05													05										05		T	0.04	0.04		
06													06										06			0.13	0.13		
07		0.31	0.29	0.19	0.12	0.02	0.01						07			T							07			0.94	0.94		
08													08										08			0.00	0.00		
09													09	T	0.08	0.01	0.01	0.14	0.04	0.01	0.03	0.06	0.01	0.12	0.11	0.62	0.62		
10	0.03	0.02	0.12	0.01	0.01	T	0.01	0.02	T	0.01	0.04	0.03	10	0.03	0.02		T						10			0.36	0.36		
11						0.01							11										11			0.01	0.01		
12													12										12			0.06	0.06		
13													13										13			0.00	0.00		
14					T	T					0.05	0.24	T	14	0.01	T						T	T	0.01		0.31	0.31		
15											T		15										15			T	T	0.00	
16											T		16	T									16			T	T	0.00	
17													17										17			0.00	0.00		
18													18										18			0.00	0.00		
19													19										19			0.48	0.48		
20													20							0.43	0.05	T				0.04	0.04		
21													21			0.02							21			0.02	0.02		
22													22		T								22			T	T	0.00	
23													23										23			0.00	0.00		
24													24										24			0.00	0.00		
25													25					T	0.01	T			25			0.01	0.01		
26													26										26			0.00	0.00		
27													27										27			0.00	0.00		
28					0.02	T							28										28			0.02	0.02		
29													29										29			0.06	0.06		
30			T	T									30										30			0.18	0.18		
31													31	0.33	0.03	0.07	T			0.01	0.26		31			0.79	0.79		

MAXIMUM SHORT DURATION PRECIPITATION (See Note)

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (Inches)	.22	.31	.39	.43	.48	.52	.52	.55	.65	.70	.82	.89
Ending Date	31	19	19	19	19	31	31	07	07	07	07	07
Ending Time (Hour/Min)	1800	1951	1955	2000	2003	1304	1304	0253	0307	0329	0402	0423

Date and time are not entered for TRACE amounts.

Note : The sum of the hourly totals is given when it differs from the daily total. NWS does not edit ASOS hourly values but may edit daily and monthly totals. Hourly, daily, and monthly totals are printed as reported by the ASOS site.

REFERENCE NOTES & SUPPLEMENTAL SUMMARIES

* = Extreme for the month (last occurrence if more than one)
 T = Trace precipitation amount
 + = also occurs on earlier date
 FG+ = Heavy fog, visibility .25 miles or less
 BLANK entries denote missing or unreported data

Resultant wind is the vector sum of the wind speeds and directions divided by the number of observations.

Wind direction is recorded in tens of degrees (2 digits) clockwise from true north. '00' = calm, 'VR' = variable.

Precipitation is for the 24-hour period ending at the time indicated in the column heading.

Water Equivalent of snow on the ground is reported only when the depth is 2 or more inches.

NORMALS ARE FOR THE YEARS 1971–2000

WEATHER NOTATIONS

QUALIFIER	WEATHER PHENOMENA		
	PRECIPITATION	OBSCURATION	OTHER
BC Patches	DZ Drizzle	BR Mist	DS Duststorm
BL Blowing	GR Hail	DU Widespread Dust	FC Funnel Cloud
DR Low Drifting	GS Small Hail and/or Snow Pellets	FG Fog	+FC Tornado Waterspout
FZ Freezing	IC Ice Crystals	FU Smoke	PO Well-Developed Dust/Sand Whirls
MI Shallow	PL Ice Pellets	HZ Haze	SQ Squalls
PR Partial	RA Rain	PY Spray	SS Sandstorm
SH Shower(s)	SG Snow Grains	SA Sand	GL Glaze
TS Thunderstorm	SN Snow	VA Volcanic Ash	
VC In the Vicinity	UP Unknown Precipitation		

Intensity (as indicated on pages 4 to 6):
 '+ ' = Heavy ' ' = Moderate '- ' = Light

DULUTH, MN JULY 2003

Ceilorometer (30-second) data are used to derive cloudiness at or below 12,000 feet. This cloudiness is the mean cloud cover detected during sunrise to sunset (SR-SS), or midnight to midnight (MN-MN).

Satellite data are used to derive cloudiness above 12,000 feet. Effective Cloud Amount is based on the cloud cover and the transparency of the clouds within the satellite field of view (approx. 31x31 miles).

Sky Condition is based on the sum (not to exceed 8) of the sunrise to sunset cloud cover below and above 12,000 feet. Both ceilometer and satellite data must be present to compute Sky Condition. Clear = 0-2 oktas, Partly Cloudy = 3-6 oktas, Cloudy = 7-8 oktas.

A Heating (Cooling) Degree Day is the difference between the average daily temperature and 65 degrees F. The HDD season begins July 1, the CDD season begins January 1.

Dew Point is the temperature to which the air must be cooled to achieve 100% relative humidity. Wet Bulb is the temperature the air would have if cooled to saturation at constant pressure by evaporation of water into it.

Snow Depth, Snowfall, and Sunshine data may come from nearby sites that the National Weather Service deems Climatologically representative of this site.

ADDITIONAL NOTES:

DATE	SUNSHINE		CLOUDINESS (OKTAS)				VISIBILITY (MILES)		RESERVED
	TOTAL MINUTES	PERCENT POSSIBLE	SR-SS		MN-MN		MINIMUM	MAXIMUM	
			CEILOMETER	SATELLITE	CEILOMETER	SATELLITE			
01							10.00	10.00	
02							1.25	10.00	
03							.25	10.00	
04							10.00	10.00	
05							10.00	10.00	
06							10.00	10.00	
07							1.75	10.00	
08							10.00	10.00	
09							1.25	10.00	
10							.50	10.00	
11							10.00	10.00	
12							5.00	10.00	
13							10.00	10.00	
14							1.75	10.00	
15							10.00	10.00	
16							10.00	10.00	
17							10.00	10.00	
18							10.00	10.00	
19							1.25	10.00	
20							1.25	10.00	
21							10.00	10.00	
22							10.00	10.00	
23							10.00	10.00	
24							10.00	10.00	
25							8.00	10.00	
26							5.00	10.00	
27							10.00	10.00	
28							5.00	10.00	
29							5.00	10.00	
30							2.50	10.00	
31							.50	10.00	
MONTHLY AVGS							6.78	10.00	
SUNSHINE (MINUTES)									
Total: Possible: Percent Possible:									
NUMBER OF DAYS WITH:									
SKY CONDITION									
CLR PTLY CLDY CLOUDY MISSING 31									
MINIMUM VISIBILITY (MILES)									
<=0.25 <=3.0 >=7.0 0 9 17									

OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

JULY 2003

DLH

WBAN # 14913

HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)	
	OBSCURATION TIME (LST)	EFF CLD AMT OKtas		VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL	OBSCURATION TIME (LST)		EFF CLD AMT OKtas	VISIBILITY (MILES)		DRY BULB	DEW POINT		WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL		
SUNRISE: 0427 JUL 13							SUNSET: 2002							SUNRISE: 0433 JUL 19							SUNSET: 1957								
03	CLR	NC			10.00		59	55	57	87	0	00	28.51	30.01	03	CLR	NC			10.00		60	53	56	78	5	25	28.57	30.08
06	CLR	NC			10.00		60	57	58	90	0	00	28.52	30.03	06	FEW	NC			10.00		62	52	56	70	9	24	28.56	30.07
09	FEW	NC			10.00		74	57	64	56	10	21	28.53	30.03	09	SCT	NC			10.00		73	58	64	59	13	23	28.53	30.03
12	SCT	NC			10.00		77	57	65	50	15	22	28.50	30.00	12	SCT	NC			10.00		77	61	67	58	15	22	28.49	29.98
15	SCT	NC			10.00		80	56	65	44	12	22	28.47	29.96	15	SCT	NC			10.00		77	64	69	64	15	24	28.43	29.92
18	FEW	NC			10.00		76	59	65	56	9	20	28.45	29.94	18	BKN	100			10.00		75	66	69	74	13	23	28.40	29.90
21	SCT	NC			10.00		70	61	64	73	8	17	28.41	29.90	21	BKN	100			10.00	TS	64	62	63	93	12	27	28.41	29.90
24	BKN	090			10.00		68	61	64	78	9	21	28.43	29.91	24	FEW	NC			10.00		64	62	63	93	8	26	28.37	29.85
SUNRISE: 0428 JUL 14							SUNSET: 2001							SUNRISE: 0434 JUL 20							SUNSET: 1956								
03	FEW	NC			10.00		67	60	63	79	10	22	28.39	29.87	03	BKN	085			10.00		64	62	63	93	5	33	28.33	29.82
06	BKN	095			10.00		67	61	63	81	13	18	28.33	29.82	06	CLR	NC			10.00		66	64	65	93	6	31	28.35	29.84
09	CLR	NC			10.00		72	63	66	73	17	20	28.36	29.85	09	BKN	120			10.00		74	64	68	71	9	28	28.34	29.83
12	BKN	080			8.00	-RA	67	65	66	93	14	20	28.39	29.88	12	FEW	NC			10.00		80	62	68	54	20	28	28.30	29.78
15	SCT	NC			10.00		75	68	70	79	17	20	28.29	29.77	15	FEW	NC			10.00		79	64	69	60	12	29	28.26	29.75
18	SCT	NC			10.00		73	66	68	79	18	23	28.27	29.75	18	CLR	NC			10.00		78	57	65	48	16	29	28.26	29.73
21	BKN	043			10.00	-RA	69	59	63	70	8	36	28.28	29.77	21	BKN	110			10.00		65	57	60	76	7	34	28.28	29.77
24	FEW	NC			10.00		60	58	59	93	8	26	28.29	29.79	24	CLR	NC			10.00		59	56	57	90	7	32	28.28	29.77
SUNRISE: 0429 JUL 15							SUNSET: 2000							SUNRISE: 0436 JUL 21							SUNSET: 1955								
03	OVC	008			10.00		61	59	60	93	10	31	28.30	29.79	03	BKN	007			10.00		58	57	57	97	9	35	28.28	29.77
06	BKN	014			10.00		62	58	60	86	10	33	28.35	29.84	06	SCT	NC			10.00		60	57	58	90	8	01	28.33	29.82
09	BKN	016			10.00		66	58	61	75	13	34	28.43	29.92	09	OVC	016			10.00		61	56	58	84	13	10	28.39	29.89
12	SCT	NC			10.00		71	52	60	51	14	36	28.48	29.98	12	OVC	043			10.00		66	57	61	73	10	11	28.42	29.92
15	SCT	NC			10.00		75	52	61	45	10	30	28.48	29.98	15	BKN	100			10.00		65	55	59	70	13	09	28.45	29.95
18	FEW	NC			10.00		75	51	61	43	10	29	28.47	29.97	18	SCT	NC			10.00		64	53	58	68	12	10	28.47	29.97
21	CLR	NC			10.00		62	50	55	65	5	28	28.50	30.00	21	OVC	055			10.00		59	52	55	78	3	06	28.50	30.01
24	CLR	NC			10.00		58	50	54	75	0	00	28.51	30.02	24	FEW	NC			10.00		55	52	53	90	3	05	28.52	30.04
SUNRISE: 0430 JUL 16							SUNSET: 1959							SUNRISE: 0437 JUL 22							SUNSET: 1954								
03	FEW	NC			10.00		55	51	53	87	7	28	28.52	30.03	03	OVC	060			10.00		55	53	54	93	5	33	28.54	30.06
06	FEW	NC			10.00		59	56	57	90	0	00	28.54	30.05	06	OVC	060			10.00		58	54	56	87	3	02	28.58	30.10
09	FEW	NC			10.00		70	60	64	71	7	22	28.59	30.09	09	BKN	070			10.00		64	53	58	68	6	36	28.60	30.12
12	BKN	085			10.00		69	62	65	78	10	14	28.50	30.01	12	BKN	045			10.00		64	55	59	73	8	12	28.61	30.13
15	BKN	090			10.00		76	59	65	56	8	08	28.52	30.02	15	BKN	080			10.00		67	54	59	63	14	12	28.62	30.14
18	SCT	NC			10.00		75	61	66	62	8	15	28.50	30.00	18	FEW	NC			10.00		64	52	57	65	7	11	28.62	30.14
21	SCT	NC			10.00		72	63	66	73	7	27	28.52	30.02	21	BKN	095			10.00		59	52	55	78	3	10	28.65	30.16
24	BKN	110			10.00		67	63	64	87	3	02	28.56	30.06	24	CLR	NC			10.00		52	50	51	93	0	00	28.65	30.17
SUNRISE: 0431 JUL 17							SUNSET: 1959							SUNRISE: 0438 JUL 23							SUNSET: 1953								
03	CLR	NC			10.00		59	49	54	69	22	08	28.63	30.13	03	SCT	NC			10.00		52	51	52	97	7	34	28.66	30.18
06	FEW	NC			10.00		56	45	50	67	14	08	28.67	30.18	06	CLR	NC			10.00		56	53	54	90	7	34	28.69	30.21
09	FEW	NC			10.00		61	40	50	46	16	08	28.72	30.23	09	CLR	NC			10.00		69	54	60	59	5	34	28.68	30.19
12	CLR	NC			10.00		64	40	52	41	15	08	28.73	30.25	12	SCT	NC			10.00		70	50	59	49	7	VR	28.65	30.17
15	FEW	NC			10.00		64	36	50	35	10	08	28.71	30.23	15	BKN	060			10.00		72	52	60	50	7	15	28.62	30.14
18	FEW	NC			10.00		66	43	54	43	6	08	28.71	30.23	18	FEW	NC			10.00		73	53	61	50	10	18	28.57	30.08
21	FEW	NC			10.00		57	45	51	64	6	06	28.68	30.20	21	FEW	NC			10.00		63	53	57	70	3	11	28.58	30.09
24	CLR	NC			10.00		50	46	48	86	3	05	28.68	30.21	24	CLR	NC			10.00		59	52	55	78	5	22	28.56	30.06
SUNRISE: 0432 JUL 18							SUNSET: 1958							SUNRISE: 0439 JUL 24							SUNSET: 1952								
03	OVC	090			10.00		46	45	46	96	0	00	28.70	30.22	03	OVC	100			10.00		58	51	54	78	0	00	28.54	30.05
06	CLR	NC			10.00		54	50	52	87	0	00	28.72	30.24	06	CLR	NC			10.00		59	52	55	78	8	23	28.54	30.05
09	CLR	NC			10.00		68	49	57	51	3	VR	28.70	30.21	09	CLR	NC			10.00		69	53	60	57	12	23	28.55	30.06
12	SCT	NC			10.00		73	47	58	40	6	21	28.70	30.22	12	SCT	NC			10.00		73	53	61	50	8	22	28.51	30.02
15	BKN	070			10.00		74	50	60	43	10	25	28.66	30.18	15	FEW	NC			10.00		76	55	63	48	13	17	28.47	29.97
18	CLR	NC			10.00		74	51	61	45	6	27	28.63	30.14	18	CLR	NC			10.00		74	57	64	56	13	19	28.44	29.93
21	CLR	NC			10.00		64	54	58	70	5	23	28.60	30.11	21	FEW	NC			10.00		68	57	61	68	10	18	28.44	29.93
24	CLR	NC			10.00		61	54	57	78	6	25	28.60	30.11	24	CLR	NC			10.00		66	58	61	75	13	20	28.40	29.89

OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

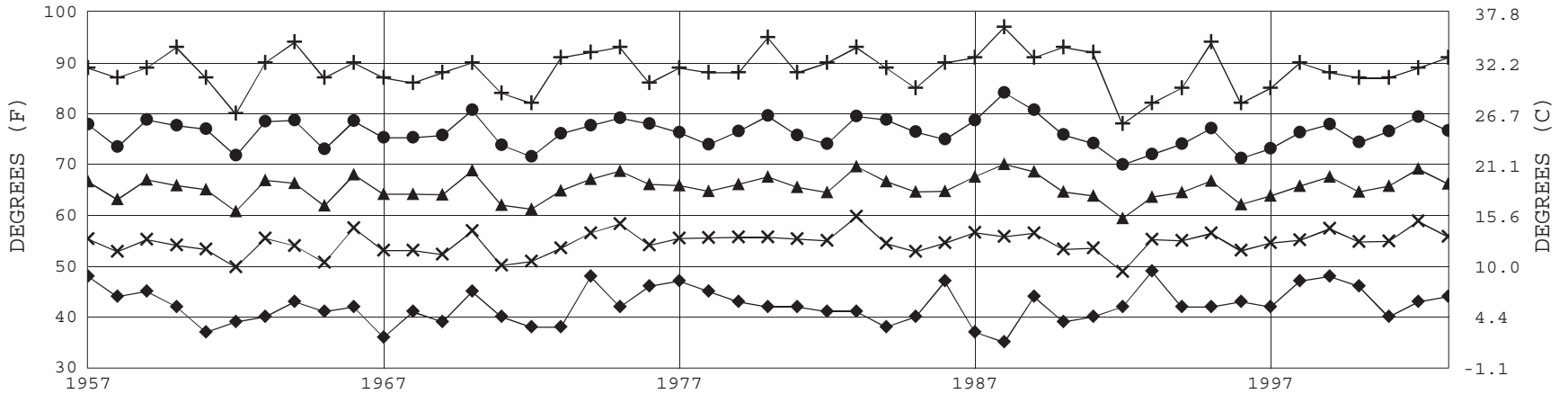
JULY 2003

DLH

WBAN # 14913

HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)																	
	DRY BULB	DEW POINT		WET BULB	RELATIVE HUMIDITY (PCT)			SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)		SPEED (MPH)	DIRECTION TENS OF DEG		STATION	SEA LEVEL																										
SUNRISE: 0440								JUL 25								SUNSET: 1951								SUNRISE: 0447								JUL 31								SUNSET: 1944							
03	CLR	NC				10.00		65	58	61	78	13	21	28.36	29.85	03	OVC	075				9.00	-RA	59	58	58	96	0	00	28.36	29.86																
06	FEW	NC				10.00		66	57	61	73	15	21	28.35	29.84	06	SCT	NC				10.00		59	58	58	96	3	31	28.36	29.86																
09	FEW	NC				10.00		72	60	65	66	16	21	28.34	29.83	09	FEW	NC				10.00		66	59	62	78	3	14	28.38	29.88																
12	CLR	NC				10.00		75	63	67	66	14	22	28.34	29.83	12	BKN	060				10.00	TS	69	61	64	76	10	15	28.36	29.86																
15	FEW	NC				10.00		79	66	70	65	16	22	28.33	29.81	15	FEW	NC				10.00		69	59	63	70	9	23	28.35	29.85																
18	SCT	NC				8.00	-RA	71	68	69	90	6	24	28.35	29.84	18	BKN	090				6.00	-TSRA	66	58	61	75	6	VR	28.37	29.88																
21	SCT	NC				9.00		69	67	68	93	0	00	28.40	29.89	21	SCT	NC				10.00		59	57	58	93	0	00	28.39	29.89																
24	CLR	NC				9.00		70	67	68	90	6	14	28.35	29.83	24	CLR	NC				10.00		56	54	55	93	6	28	28.38	29.88																
SUNRISE: 0441								JUL 26								SUNSET: 1950								3-HOURLY OBSERVATION NOTES																							
03	BKN	040				8.00		70	67	68	90	3	10	28.32	29.80	Sky Cover is the amount of the sky obscured. CLR or SKC = 0, FEW = 1/8-2/8, SCT = 3/8-4/8, BKN = 5/8-7/8, OVC = 8/8, VV = Vertical Visibility = 8/8.																															
06	FEW	NC				5.00	BR	69	67	68	93	3	13	28.32	29.80	Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.																															
09	CLR	NC				9.00		79	70	73	74	9	27	28.33	29.81	NC = No ceiling detected.																															
12	SCT	NC				10.00		86	73	77	65	9	23	28.31	29.79	& = Original observation contained additional weather elements.																															
15	SCT	NC				10.00		89	71	76	55	15	28	28.31	29.79	See page 3 for additional notes.																															
18	FEW	NC				10.00		82	68	73	63	14	29	28.33	29.82																																
21	FEW	NC				10.00		75	66	69	74	7	32	28.42	29.90																																
24	FEW	NC				10.00		69	59	63	70	7	32	28.47	29.95																																
SUNRISE: 0442								JUL 27								SUNSET: 1949																															
03	FEW	NC				10.00		62	57	59	84	5	32	28.52	30.01																																
06	CLR	NC				10.00		62	57	59	84	9	34	28.55	30.05																																
09	SCT	NC				10.00		71	57	63	61	9	01	28.59	30.09																																
12	BKN	065				10.00		68	58	62	70	13	10	28.62	30.13																																
15	SCT	NC				10.00		70	58	63	66	9	10	28.59	30.10																																
18	SCT	NC				10.00		69	54	60	59	9	10	28.59	30.09																																
21	OVC	090				10.00		63	56	59	78	3	13	28.60	30.10																																
24	BKN	095				10.00		62	54	57	75	0	00	28.59	30.10																																
SUNRISE: 0443								JUL 28								SUNSET: 1947																															
03	FEW	NC				10.00		58	54	56	87	0	00	28.57	30.08																																
06	BKN	065				10.00		63	58	60	84	3	19	28.57	30.08																																
09	BKN	095				10.00		67	56	60	68	10	23	28.58	30.09																																
12	FEW	NC				10.00		74	59	65	60	9	22	28.56	30.06																																
15	OVC	060				10.00		72	62	66	71	14	26	28.51	30.02																																
18	SCT	NC				10.00		74	58	64	57	6	26	28.49	29.98																																
21	FEW	NC				10.00		67	61	63	81	7	26	28.49	29.99																																
24	BKN	090				10.00		62	60	61	93	5	26	28.49	29.98																																
SUNRISE: 0445								JUL 29								SUNSET: 1946																															
03	CLR	NC				10.00		61	59	60	93	0	00	28.48	29.97																																
06	FEW	NC				10.00		64	61	62	90	3	31	28.49	29.98																																
09	CLR	NC				10.00		77	63	68	62	6	29	28.49	29.97																																
12	SCT	NC				10.00		81	61	68	51	5	VR	28.46	29.94																																
15	SCT	NC				10.00		82	60	68	47	13	22	28.42	29.91																																
18	SCT	NC				10.00		72	61	65	69	8	12	28.38	29.87																																
21	BKN	100				10.00		64	59	61	84	12	13	28.38	29.87																																
24	BKN	120				5.00	BR	61	60	60	97	6	12	28.35	29.84																																
SUNRISE: 0446								JUL 30								SUNSET: 1945																															
03	BKN	120				3.00	BR	62	61	61	96	5	20	28.32	29.81																																
06	OVC	020				4.00	BR	64	63	63	96	7	23	28.35	29.84																																
09	FEW	NC				10.00		71	62	65	73	13	28	28.37	29.86																																
12	FEW	NC				10.00		76	59	65	56	9	28	28.37	29.86																																
15	BKN	065				10.00	-TSRA	64	61	62	90	6	27	28.37	29.87																																
18	FEW	NC				10.00		73	56	63	55	10	26	28.35	29.84																																
21	OVC	070				10.00	-RA	61	59	60	93	3	33	28.37	29.87																																
24	SCT	NC				10.00		59	58	58	96	0	00	28.38	29.87																																

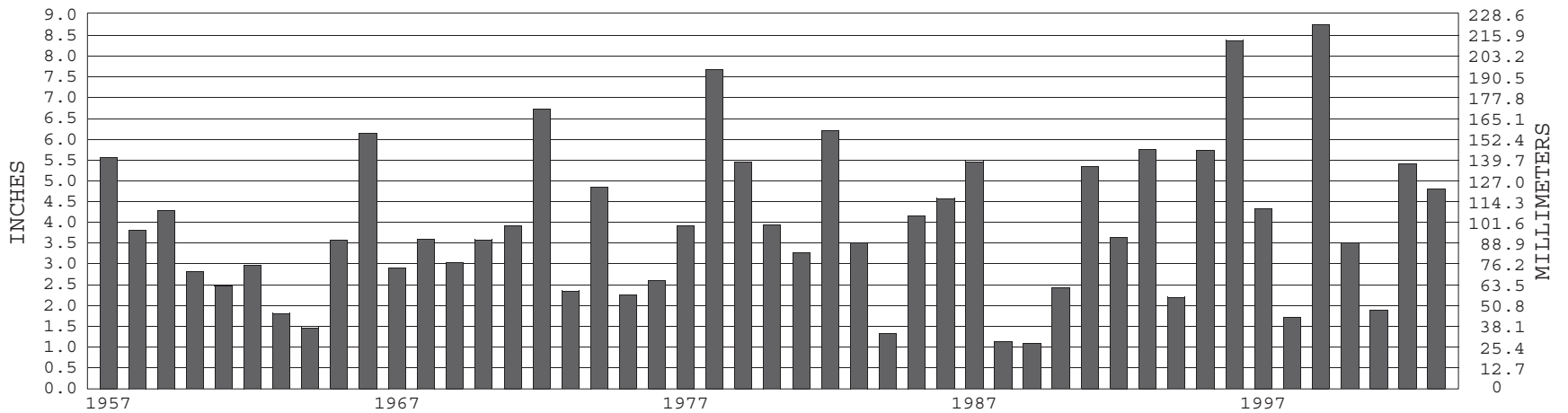
DULUTH, MN JULY TEMPERATURES



+ Extreme Max. ● Mean Max. ▲ Mean × Mean Min. ◆ Extreme Min.

Long-Term (1957-2003) Mean: 65.4 1961-1990 Normal: 65.5

DULUTH, MN JULY PRECIPITATION



Long-Term (1957-2003) Mean Monthly Total: 3.96

1961-1990 Normal: 4.20



JULY 2003

DULUTH, MN

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

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