



JUNE 2002

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

DULUTH, MN

INTERNATIONAL AIRPORT (DLH)

Lat: 46°50' N Long: 92°11' W Elev (Ground): 1426 Feet

Time Zone: CENTRAL WBAN: 14913 ISSN #:0198-2702

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	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	78	56	67	10	42	54	0	2		0		0.0	0.00	28.27	29.76	7.3	35	8.7	24	32	18	32	01		
02	56	39	48	-9	35	42	17	0	RA	0		0.0	T	28.50	30.02	9.8	10	10.5	22	09	18	10	02		
03	49	39*	44*	-13	32	39	21	0	RA	0		0.0	T	28.46	30.00	11.4	09	11.4	25	09	21	09	03		
04	52	40	46	-11	42	44	19	0	DZ FG+ BR VCFG	0		0.0	T	28.43	29.97	4.6	11	6.2	17	13	15	13	04		
05	74	40	57	0	44	51	8	0		0		0.0	0.00	28.48	29.99	2.8	08	7.1	17	09	15	11	05		
06	78	43	61	3	48	54	4	0	TS RA	0		0.0	T	28.41	29.92	10.3	19	11.7	28	22	23	19	06		
07	71	56	64	6	54	58	1	0	TSRA RA BR	0		0.0	0.43	28.38	29.87	10.6	25	12.5	36	23	30	23	07		
08	75	51	63	5	44	54	2	0		0		0.0	0.00	28.51	30.02	2.3	14	5.4	14	17	12	36	08		
09	58	45	52	-6	46	48	13	0		0		0.0	0.00	28.48	30.00	15.6	11	16.0	32	10	25	10	09		
10	72	45	59	0	52	55	6	0	TS TSRA RA BR	0		0.0	T	28.26	29.77	12.8	12	12.3	28	11	25	11	10		
11	58	46	52	-7	51	51	13	0	DZ FG+ BR	0		0.0	T	28.33	29.85	6.5	11	7.5	22	12	18	13	11		
12	64	48	56	-3	50	51	9	0	TSRA RA DZ BR	0		0.0	0.11	28.46	29.98	6.8	13	7.5	17	12	16	12	12		
13	60	47	54	-5	51	52	11	0	RA FG+ BR	0		0.0	0.02	28.35	29.87	5.9	12	7.6	20	14	17	14	13		
14	75	48	62	2	49	54	3	0	FG+ BR	0		0.0	0.00	28.34	29.85	8.4	36	8.9	22	35	16	03	14		
15	71	51	61	1	45	52	4	0		0		0.0	0.00	28.35	29.85	10.8	01	11.2	32	03	24	03	15		
16	75	48	62	2	44	53	3	0	RA	0		0.0	0.02	28.36	29.87	6.5	34	9.0	35	30	25	30	16		
17	71	41	56	-4	41	50	9	0		0		0.0	0.00	28.43	29.94	7.8	11	8.4	21	12	17	12	17		
18	72	47	60	0	51	55	5	0	RA	0		0.0	0.04	28.40	29.90	10.3	14	10.4	18	14	16	14	18		
19	71	58	65	4	63	64	0	0	TS TSRA RA FG+ BR	0		0.0	0.86	28.32	29.81	8.7	17	11.4	30	27	24	28	19		
20	76	58	67	6	54	60	0	2	TSRA RA BR	0		0.0	T	28.64	30.15	10.5	30	11.0	32	31	24	30	20		
21	65	54	60	-1	54	57	5	0	RA	0		0.0	0.09	28.78	30.31	6.7	12	7.3	16	12	14	12	21		
22	71	53	62	1	57	58	3	0	TS TSRA RA FG+ BR SQ	0		0.0	3.33	28.58	30.10	7.2	12	10.4	49*	33	32*	31	22		
23	69	59	64	2	62	63	1	0	TSRA RA DZ FG+ MIFG BR	0		0.0	0.26	28.54	30.05	8.5	11	11.2	24	10	21	09	23		
24	80	51	66	4	62	64	0	1	TS TSRA RA FG+ BR	0		0.0	0.59	28.45	29.96	7.9	20	11.1	25	30	22	29	24		
25	86	64	75	13	62	66	0	10	RA	0		0.0	T	28.40	29.89	9.7	28	11.1	29	02	22	26	25		
26	80	60	70	7	56	61	0	5		0		0.0	0.00	28.37	29.86	9.3	34	9.7	26	33	20	36	26		
27	85	58	72	9	58	64	0	7	HZ	0		0.0	0.00	28.40	29.88	5.6	35	6.9	20	02	15	01	27		
28	86	65	76	13	64	68	0	11	BR HZ	0		0.0	0.00	28.45	29.93	5.4	25	7.4	20	19	17	21	28		
29	89	66	78	15	69	72	0	13	BR HZ	0		0.0	0.00	28.41	29.90	12.7	21	13.0	26	22	22	20	29		
30	91*	73	82*	19	71	74	0	17	BR	0		0.0	0.00	28.36	29.83	13.1	24	15.1	33	24	29	24	30		
71.9 51.6 61.8 ■■											< MONTHLY AVERAGES		TOTALS-->		0.0	5.75	28.43	29.94	1.7	16	9.9	<- MONTHLY AVERAGES			
0.7 3.1 1.9 ■■											<-----DEPARTURE FROM NORMAL----->		1.50		SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3										
DEGREE DAYS									GREATEST 24-HR PRECIPITATION: 3.42 DATE: 22-23				SEA LEVEL PRESSURE DATE TIME												
MONTHLY TOTAL DEPARTURE									GREATEST 24-HR SNOWFALL: 0.0 DATE: 22-23				MAXIMUM : 30.34 21 0655												
SEASON TO DATE TOTAL DEPARTURE									GREATEST SNOW DEPTH: 0 DATE: 22-23				MINIMUM : 29.64 01 0355												
HEATING: 157 -13 8820 -998									NUMBER OF DAYS WITH ➔		MAXIMUM TEMP ≥ 90: 1				MINIMUM TEMP ≤ 32: 0				PRECIPITATION ≥ 0.01 INCH : 10						
COOLING: 68 40 78 43											MAXIMUM TEMP ≤ 32: 0				MINIMUM TEMP ≤ 0: 0				PRECIPITATION ≥ 0.10 INCH : 6						
											THUNDERSTORMS : 9				HEAVY FOG : 8				SNOWFALL ≥ 1.0 INCH : 0						

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

DULUTH, MN

JUNE 2002

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				T	T							01			0.00	
02													02				T	T							02			T	
03													03				T	T							03			T	
04				T	T	T							04												04			T	
05													05												05			0.00	
06													06												06			T	
07		T			T	T		T	0.34	0.05	0.01		07	T	0.01		T	T	T	T					07	0.41		0.43	
08													08												08			0.00	
09													09												09			0.00	
10													10										T	T	10			T	
11													11							T	T	T	T	T	11			T	
12	T			T	T	T							12				T	T		0.02	0.04	T	0.01	0.04	12			0.11	
13	T												13							T					13	T		0.02	
14													14												14			0.00	
15													15												15			0.00	
16													16		T										16	T		0.02	
17													17												17			0.00	
18													18									T			18	0.03		0.04	
19													19							T					19	0.72		0.86	
20	0.05	0.01	0.05	0.06	0.11	0.17	0.03				T	0.04	T			T	0.08	0.02	0.01	T			0.01	0.02	20	0.05		T	
21													21												21	0.12		0.09	
22			T	0.05	0.06	0.01	T						22												22	3.18		3.33	
23	0.07	0.02	T	T		0.07	0.09	0.01	0.01			0.01	23					1.18	0.13	0.56				0.13	23	0.27		0.26	
24				0.01	0.01	0.42	0.15	0.01					24												24	0.60		0.59	
25													25				T	T							25			T	
26													26												26			0.00	
27													27												27			0.00	
28													28												28			0.00	
29													29												29			0.00	
30													30												30			0.00	

MAXIMUM SHORT DURATION PRECIPITATION (See Note)

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (Inches)	.32	.50	.72	.97	1.12	1.18	1.22	1.29	1.31	1.37	1.87	1.87
Ending Date	22	22	22	22	22	22	22	22	22	22	22	22
Ending Time (Hour/Min)	1735	1736	1735	1736	1738	1753	1807	1833	1837	1913	1937	1937

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.

* = 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

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

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

WEATHER NOTATIONS

**DULUTH, MN
JUNE 2002**

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.

DATE	SUNSHINE		CLOUDINESS (OKTAS)				VISIBILITY (MILES)		RESERVED
	TOTAL MINUTES	PERCENT POSSIBLE	SR-SS		MN-MN		MINIMUM	MAXIMUM	
			CEILOMETER	SATELLITE	CEILOMETER	SATELLITE			
01							9.00	10.00	
02							10.00	10.00	
03							10.00	10.00	
04							.25	10.00	
05							10.00	10.00	
06							10.00	10.00	
07							1.25	10.00	
08							10.00	10.00	
09							9.00	10.00	
10							.00	10.00	
11							<.25	10.00	
12							.75	10.00	
13							<.25	10.00	
14							.25	10.00	
15							10.00	10.00	
16							10.00	10.00	
17							10.00	10.00	
18							10.00	10.00	
19							<.25	10.00	
20							10.00	10.00	
21							9.00	10.00	
22							.25	10.00	
23							<.25	10.00	
24							<.25	10.00	
25							9.00	10.00	
26							10.00	10.00	
27							5.00	10.00	
28							5.00	10.00	
29							4.00	10.00	
30							6.00	10.00	
MONTHLY AVGS							5.81	10.00	
<p align="center">SUNSHINE (MINUTES)</p> <p>Total: Possible:</p> <p> Percent Possible:</p>									
<p align="center">NUMBER OF DAYS WITH:</p> <p align="center">SKY CONDITION</p> <p align="center">CLR PTLY CLDY CLOUDY MISSING</p> <p align="center"> 30</p> <p align="center">MINIMUM VISIBILITY (MILES)</p> <p align="center"><=0.25 <=3.0 >=7.0</p> <p align="center"> 5 11 15</p>									

OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

JUNE 2002

DLH

WBAN # 14913

HOUR (LST)			SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)		HOUR (LST)			SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)			
	SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)	EFF CLD AMT <i>Okta</i>		VISIBILITY (MILES)	DRY BULB	DEW POINT		WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION		SEA LEVEL	SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)		EFF CLD AMT <i>Okta</i>	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
					SUNRISE: 0419	JUN 01			SUNSET: 1954										SUNRISE: 0416	JUN 07						SUNSET: 1959			
03	FEW	NC			10.00		60	43	51	53	0	00	28.18	29.66	03	FEW	NC			10.00		63	54	58	73	21	23	28.32	29.81
06	CLR	NC			10.00		62	46	53	56	5	34	28.19	29.67	06	BKN	100			10.00		64	56	59	75	21	24	28.35	29.85
09	CLR	NC			10.00		72	45	57	38	14	02	28.25	29.73	09	OVC	033		-TSRA	2.50		59	56	57	90	12	24	28.36	29.86
12	CLR	NC			10.00		76	39	56	27	16	03	28.28	29.76	12	OVC	090			9.00		64	60	62	87	9	24	28.39	29.88
15	BKN	100			10.00		74	39	55	28	13	32	28.29	29.78	15	BKN	095			10.00		70	58	63	66	10	26	28.38	29.87
18	SCT	NC			10.00		74	41	56	31	12	34	28.29	29.78	18	OVC	090		-RA	10.00		62	47	54	58	6	29	28.42	29.93
21	FEW	NC			10.00		64	44	53	48	5	35	28.35	29.85	21	OVC	085			10.00		59	48	53	67	3	33	28.41	29.92
24	FEW	NC			10.00		56	39	48	53	6	33	28.40	29.90	24	CLR	NC			10.00		56	47	51	72	6	36	28.43	29.93
					SUNRISE: 0418	JUN 02			SUNSET: 1955										SUNRISE: 0415	JUN 08						SUNSET: 2000			
03	FEW	NC			10.00		49	41	45	74	8	06	28.43	29.93	03	CLR	NC			10.00		53	44	49	72	5	33	28.46	29.97
06	CLR	NC			10.00		47	36	42	66	12	11	28.50	30.02	06	CLR	NC			10.00		54	45	49	72	6	36	28.48	29.99
09	CLR	NC			10.00		50	35	43	57	14	10	28.52	30.04	09	CLR	NC			10.00		69	45	56	42	3	22	28.52	30.03
12	SCT	NC			10.00		49	34	42	57	10	08	28.52	30.05	12	CLR	NC			10.00		73	39	55	29	6	14	28.51	30.02
15	OVC	090			10.00		50	34	43	54	8	10	28.52	30.06	15	CLR	NC			10.00		74	39	56	28	10	16	28.51	30.02
18	BKN	090			10.00		45	34	40	66	12	10	28.50	30.04	18	CLR	NC			10.00		73	43	57	34	9	14	28.53	30.03
21	SCT	NC			10.00		41	32	37	70	9	09	28.50	30.05	21	FEW	NC			10.00		64	47	55	54	7	17	28.55	30.06
24	CLR	NC			10.00		39	30	35	70	13	09	28.45	29.99	24	CLR	NC			10.00		55	48	51	77	6	13	28.54	30.05
					SUNRISE: 0417	JUN 03			SUNSET: 1956										SUNRISE: 0415	JUN 09						SUNSET: 2001			
03	FEW	NC			10.00		40	30	36	68	10	08	28.48	30.01	03	BKN	050			10.00		55	45	50	69	13	10	28.54	30.04
06	BKN	100			10.00		40	31	36	70	13	09	28.46	30.00	06	OVC	018			10.00		50	46	48	86	24	10	28.55	30.06
09	OVC	070			10.00		47	33	41	59	12	10	28.48	30.01	09	OVC	010			10.00		51	47	49	86	14	11	28.58	30.11
12	OVC	037			10.00		49	31	41	50	15	10	28.46	30.00	12	OVC	008			10.00		50	46	48	86	15	09	28.51	30.04
15	OVC	026			10.00		46	32	40	58	10	10	28.47	30.00	15	FEW	NC			10.00		54	48	51	80	13	10	28.44	29.96
18	OVC	020			10.00		45	33	40	63	10	08	28.47	30.01	18	FEW	NC			10.00		51	47	49	86	14	12	28.41	29.93
21	OVC	018			10.00		45	33	40	63	8	09	28.45	29.98	21	CLR	NC			10.00		47	45	46	93	17	11	28.39	29.91
24	OVC	006			10.00		42	32	38	68	6	06	28.44	29.97	24	CLR	NC			10.00		45	42	44	90	12	13	28.35	29.88
					SUNRISE: 0417	JUN 04			SUNSET: 1957										SUNRISE: 0415	JUN 10						SUNSET: 2001			
03	OVC	004			5.00	BR	43	42	43	97	6	08	28.41	29.95	03	CLR	NC			10.00		46	44	45	93	9	12	28.31	29.83
06	OVC	002			0.75	BR	43	43	43	100	3	09	28.45	29.98	06	CLR	NC			8.00		50	49	49	96	10	12	28.31	29.83
09	OVC	009			0.50	FG	43	43	43	100	8	15	28.44	29.97	09	CLR	NC			8.00		60	54	57	80	16	12	28.32	29.84
12	OVC	003			1.50	BR	45	44	45	97	9	12	28.44	29.97	12	OVC	028			8.00		69	59	63	70	9	11	28.26	29.76
15	OVC	010			10.00		49	45	47	86	6	12	28.44	29.98	15	CLR	NC			7.00		67	58	62	73	14	13	28.24	29.74
18	BKN	120			10.00		51	43	47	74	7	11	28.41	29.94	18	FEW	NC			7.00		65	56	60	73	13	15	28.22	29.72
21	FEW	NC			9.00		44	41	43	89	3	28	28.44	29.97	21	BKN	029			7.00		53	50	51	89	16	12	28.21	29.71
24	FEW	NC			10.00		43	41	42	93	0	00	28.44	29.97	24	OVC	003			2.50	BR	50	50	50	100	7	11	28.19	29.69
					SUNRISE: 0416	JUN 05			SUNSET: 1958										SUNRISE: 0414	JUN 11						SUNSET: 2002			
03	BKN	110			10.00		45	45	45	100	6	33	28.43	29.96	03	VV	001			0.13	FG	48	48	48	100	9	12	28.22	29.72
06	FEW	NC			10.00		49	46	47	90	7	34	28.47	29.99	06	OVC	007			1.00	BR	53	53	53	100	5	36	28.26	29.76
09	FEW	NC			10.00		69	46	56	44	8	31	28.49	30.00	09	OVC	001			<.25	FG	49	49	49	100	8	14	28.29	29.82
12	BKN	085			10.00		73	41	56	32	0	00	28.48	29.99	12	OVC	003			2.50	BR	54	52	53	93	7	10	28.34	29.86
15	BKN	095			10.00		68	43	55	41	10	12	28.48	29.99	15	OVC	007			7.00		55	52	53	90	8	09	28.37	29.89
18	BKN	100			10.00		64	45	54	50	9	12	28.49	30.00	18	OVC	007			6.00	BR	52	50	51	93	12	09	28.39	29.91
21	BKN	070			10.00		54	44	49	69	10	12	28.50	30.01	21	OVC	003			1.50	-DZ BR	49	49	49	100	9	12	28.45	29.97
24	CLR	NC			10.00		47	43	45	86	6	12	28.50	30.01	24	OVC	003			1.50	-DZ BR	49	49	49	100	6	10	28.45	29.97
					SUNRISE: 0416	JUN 06			SUNSET: 1959										SUNRISE: 0414	JUN 12						SUNSET: 2003			
03	CLR	NC			10.00		44	39	42	83	6	14	28.48	29.99	03	OVC	003			1.50	BR	48	48	48	100	5	12	28.45	29.97
06	FEW	NC			10.00		48	42	45	80	6	14	28.49	30.01	06	BKN	001			0.75	BR	49	49	49	100	6	12	28.46	29.98
09	FEW	NC			10.00		65	49	56	56	14	23	28.47	29.98															

OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

JUNE 2002

DLH

WBAN # 14913

HOUR (LST)			SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)		HOUR (LST)			SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)									
	SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)	EFF CLD AMT <small>Okta</small>		VISIBILITY (MILES)	DRY BULB	DEW POINT		WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION		SEA LEVEL	SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)		EFF CLD AMT <small>Okta</small>	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL						
SUNRISE: 0414						JUN 13						SUNSET: 2003						SUNRISE: 0414						JUN 19						SUNSET: 2006					
03	SCT	NC			0.25 BR	47	47	47	100	3	15	28.39	29.90	03	OVC	075			9.00 TSRA	61	59	60	93	9	12	28.29	29.79								
06	OVC	001			0.50 FG	53	53	53	100	3	23	28.37	29.88	06	OVC	029			1.00 RA BR	58	58	58	100	13	13	28.29	29.80								
09	VV	001			0.25 FG	50	50	50	100	7	13	28.35	29.87	09	OVC	008			2.00 BR	63	63	63	100	9	19	28.32	29.82								
12	VV	001			<.25 BR	53	53	53	100	14	12	28.35	29.86	12	OVC	002			2.00 BR	67	65	66	93	18	21	28.29	29.78								
15	OVC	005			7.00	55	52	53	90	12	12	28.31	29.83	15	OVC	019			3.00 -RA	70	66	67	87	10	18	28.31	29.80								
18	OVC	060			10.00	56	53	54	90	6	05	28.33	29.84	18	OVC	021			2.50 BR	66	66	66	100	8	13	28.35	29.85								
21	OVC	001			1.00 BR	50	50	50	100	6	11	28.35	29.87	21	BKN	100			1.00	67	64	65	91	13	19	28.32	29.81								
24	OVC	005			10.00	52	50	51	93	3	05	28.36	29.88	24	OVC	027			3.00 TSRA BR	69	68	68	96	14	26	28.37	29.86								
SUNRISE: 0414						JUN 14						SUNSET: 2004						SUNRISE: 0414						JUN 20						SUNSET: 2006					
03	SCT	NC			9.00	48	48	48	100	5	35	28.34	29.86	03	CLR	NC			10.00	62	58	60	86	16	30	28.40	29.90								
06	BKN	001			0.50 FG	49	49	49	100	7	35	28.35	29.87	06	CLR	NC			10.00	60	54	57	80	14	29	28.53	30.04								
09	SCT	NC			10.00	61	53	57	75	6	01	28.37	29.88	09	FEW	NC			10.00	67	53	59	61	16	29	28.63	30.13								
12	BKN	047			10.00	69	50	58	51	13	36	28.35	29.85	12	SCT	NC			10.00	72	52	60	50	14	30	28.69	30.19								
15	SCT	NC			10.00	73	49	59	43	10	01	28.31	29.82	15	FEW	NC			10.00	75	53	62	46	9	33	28.70	30.20								
18	SCT	NC			10.00	72	43	56	35	10	01	28.30	29.80	18	FEW	NC			10.00	71	52	60	51	10	27	28.72	30.23								
21	SCT	NC			10.00	61	48	54	63	6	03	28.32	29.83	21	FEW	NC			10.00	65	53	58	66	5	35	28.74	30.26								
24	BKN	080			10.00	58	50	54	75	13	01	28.33	29.83	24	SCT	NC			10.00	62	53	57	73	3	34	28.79	30.30								
SUNRISE: 0414						JUN 15						SUNSET: 2004						SUNRISE: 0415						JUN 21						SUNSET: 2006					
03	FEW	NC			10.00	53	49	51	86	7	35	28.31	29.81	03	OVC	100			10.00	60	57	58	90	0	00	28.78	30.30								
06	SCT	NC			10.00	53	50	51	89	12	35	28.33	29.83	06	BKN	120			10.00	59	56	57	90	5	13	28.81	30.33								
09	BKN	020			10.00	59	49	54	69	14	35	28.36	29.87	09	OVC	085			10.00	64	56	59	75	5	12	28.81	30.33								
12	FEW	NC			10.00	67	39	53	36	21	01	28.34	29.85	12	OVC	085			10.00	61	56	58	84	9	14	28.80	30.33								
15	FEW	NC			10.00	69	42	55	38	15	03	28.35	29.85	15	OVC	070			10.00	63	54	58	73	10	14	28.78	30.31								
18	FEW	NC			10.00	69	40	54	35	13	02	28.35	29.86	18	FEW	NC			10.00	63	54	58	73	9	15	28.76	30.29								
21	FEW	NC			10.00	58	42	50	56	3	30	28.38	29.89	21	FEW	NC			10.00	56	53	54	90	6	11	28.75	30.28								
24	FEW	NC			10.00	55	43	49	64	6	34	28.39	29.89	24	BKN	013			10.00	55	50	52	83	8	11	28.73	30.27								
SUNRISE: 0414						JUN 16						SUNSET: 2005						SUNRISE: 0415						JUN 22						SUNSET: 2007					
03	BKN	110			10.00	52	45	48	77	6	33	28.38	29.88	03	BKN	060			10.00	54	49	51	83	7	12	28.69	30.21								
06	CLR	NC			10.00	55	47	51	74	9	32	28.39	29.89	06	OVC	011			2.50 -TSRA BR	53	53	53	100	16	13	28.64	30.16								
09	CLR	NC			10.00	67	46	56	47	10	36	28.38	29.88	09	OVC	004			7.00	56	55	55	97	7	13	28.64	30.17								
12	SCT	NC			10.00	72	46	58	40	7	VR	28.35	29.85	12	OVC	002			2.00 BR	59	57	58	93	14	14	28.56	30.09								
15	SCT	NC			10.00	72	40	55	31	14	34	28.32	29.82	15	CLR	NC			6.00 BR	61	59	60	93	7	12	28.53	30.05								
18	SCT	NC			10.00	71	45	57	39	12	29	28.33	29.83	18	OVC	011			2.50 -TSRA	64	64	64	100	15	11	28.49	30.00								
21	FEW	NC			10.00	61	37	49	41	8	03	28.37	29.87	21	OVC	003			9.00 TS	65	64	64	97	9	08	28.49	29.99								
24	CLR	NC			10.00	52	42	47	69	3	07	28.39	29.90	24	OVC	039			5.00 -TSRA BR	63	63	63	100	5	27	28.53	30.05								
SUNRISE: 0414						JUN 17						SUNSET: 2005						SUNRISE: 0415						JUN 23						SUNSET: 2007					
03	CLR	NC			10.00	46	44	45	93	5	02	28.40	29.91	03	OVC	100			7.00 -RA	63	63	63	100	10	26	28.51	30.02								
06	CLR	NC			10.00	52	46	49	80	0	00	28.43	29.93	06	OVC	037			4.00 -RA BR	64	63	63	96	6	30	28.54	30.05								
09	CLR	NC			10.00	65	44	54	47	10	13	28.44	29.94	09	OVC	022			10.00	66	65	65	96	8	09	28.55	30.06								
12	FEW	NC			10.00	69	37	53	31	13	13	28.45	29.95	12	OVC	006			10.00	68	65	66	90	14	11	28.54	30.05								
15	FEW	NC			10.00	70	42	55	37	16	11	28.43	29.94	15	OVC	010			10.00	67	64	65	91	16	10	28.56	30.07								
18	CLR	NC			10.00	67	39	53	36	12	11	28.43	29.93	18	OVC	001			0.25 FG	60	60	60	100	16	09	28.57	30.09								
21	CLR	NC			10.00	55	37	46	51	8	11	28.46	29.96	21	VV	001			<.25 FG	59	59	59	100	13	09	28.56	30.08								
24	CLR	NC			10.00	50	39	45	66	7	12	28.45	29.96	24	OVC	001			1.00 BR	59	59	59	100	13	10	28.54	30.05								
SUNRISE: 0414						JUN 18						SUNSET: 2006						SUNRISE: 0415						JUN 24						SUNSET: 2007					
03	CLR	NC			10.00	47	40	44	77	7	12	28.44	29.96	03	VV	001			<.25 FG	55	55	55	100	14	13	28.46	29.97								
06	CLR	NC			10.00	53	44	49	72	10	13	28.45	29.96	06	OVC	032			1.50 TSRA BR	55	55	55	100	9	13	28.50	30.02								
09	CLR	NC			10.00	62	52	56	70	13	13	28.43	29.94	09	BKN	120			7.00	60	60	60	100	0	00	28.46	29.97								
12	FEW	NC			10.00	71	56	62	59	14	14	28.39	29.90	12	CLR	NC			10.00	70	64	66	82	9	19	28.46	29.96								
15	SCT	NC			10.00	70	54	61	57	13	14	28.38	29.88	15	CLR	NC			10.00	76	66	69	72	12	20	28.44	29.94								
18	SCT	NC			10.00	64	52	57	65	12	15	28.35	29.85	18	CLR	NC			8.00	73	67	69	81	12	22	28.43	29.93								
21	SCT	NC			10.00	63	54	58	73	9	14	28.35	29.85	21	CLR	NC			6.00 BR	68	67	67	96	7	25	28.42	29.92								
24	BKN	110			10.00	63	58	60	84	12	14	28.34	29.84	24	CLR	NC			10.00	66	62	64	87	12	26	28.40	29.90								

OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

JUNE 2002

DLH

WBAN # 14913

HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)	
				OBSERVATION TIME (LST)	EFF CLD AMT Okta			DRY BULB	DEW POINT	WET BULB		SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
03	CLR	NC				SUNRISE: 10.00	0416	68	64	66	87	14	27	28.41	29.90
06	FEW	NC				10.00		67	63	64	87	10	26	28.44	29.93
09	SCT	NC				10.00		74	66	69	76	6	VR	28.41	29.90
12	FEW	NC				10.00		81	66	71	61	15	26	28.43	29.92
15	SCT	NC				10.00		86	63	71	46	15	27	28.39	29.86
18	SCT	NC				10.00		80	56	65	44	17	28	28.36	29.85
21	SCT	NC				10.00		67	57	61	71	5	32	28.35	29.84
24	FEW	NC				10.00		65	57	60	76	6	30	28.36	29.84
03	CLR	NC				10.00		64	58	60	81	8	33	28.34	29.83
06	FEW	NC				10.00		63	60	61	90	13	33	28.35	29.83
09	OVC	019				10.00		64	59	61	84	12	32	28.38	29.87
12	OVC	024				10.00		68	60	63	76	14	31	28.37	29.87
15	FEW	NC				10.00		76	54	63	47	14	35	28.35	29.84
18	FEW	NC				10.00		78	50	62	37	16	36	28.35	29.84
21	CLR	NC				10.00		69	52	59	55	0	00	28.38	29.88
24	CLR	NC				10.00		63	52	57	68	5	33	28.40	29.90
03	CLR	NC				10.00		59	54	56	83	6	31	28.40	29.89
06	CLR	NC				10.00		63	57	59	81	5	33	28.41	29.90
09	FEW	NC				10.00		74	64	68	71	7	36	28.41	29.89
12	FEW	NC				5.00	HZ	80	60	67	51	9	02	28.41	29.89
15	FEW	NC				8.00		84	56	66	38	9	02	28.39	29.87
18	CLR	NC				6.00	HZ	83	57	67	41	6	34	28.39	29.87
21	CLR	NC				7.00		72	59	64	64	3	31	28.40	29.88
24	CLR	NC				7.00		68	61	64	78	7	30	28.41	29.89
03	CLR	NC				8.00		68	63	65	84	0	00	28.42	29.91
06	CLR	NC				9.00		70	65	67	84	6	32	28.46	29.94
09	CLR	NC				10.00		81	65	70	58	6	28	28.48	29.96
12	BKN	060				10.00		85	65	72	51	10	27	28.47	29.95
15	FEW	NC				9.00		85	64	71	50	12	25	28.45	29.93
18	CLR	NC				6.00	HZ	82	65	71	56	13	22	28.44	29.93
21	CLR	NC				7.00		74	64	68	71	8	19	28.45	29.93
24	CLR	NC				6.00	BR	67	63	64	87	7	20	28.45	29.93
03	CLR	NC				5.00	BR	66	64	65	93	9	20	28.44	29.93
06	CLR	NC				5.00	HZ	69	64	66	84	13	21	28.44	29.92
09	CLR	NC				8.00		78	66	70	67	18	21	28.45	29.93
12	CLR	NC				10.00		85	70	75	61	16	23	28.42	29.90
15	CLR	NC				10.00		89	70	76	53	20	24	28.39	29.87
18	CLR	NC				10.00		84	72	76	67	17	20	28.39	29.87
21	CLR	NC				9.00		79	72	74	79	12	19	28.39	29.87
24	CLR	NC				8.00		76	72	73	88	9	20	28.38	29.85
03	CLR	NC				8.00		75	72	73	90	9	21	28.37	29.85
06	CLR	NC				9.00		76	69	71	79	15	22	28.38	29.85
09	CLR	NC				10.00		83	71	75	67	17	20	28.34	29.81
12	CLR	NC				10.00		88	71	76	57	20	24	28.32	29.80
15	SCT	NC				10.00		89	72	77	57	23	24	28.32	29.80
18	CLR	NC				10.00		87	72	76	61	18	27	28.34	29.82
21	CLR	NC				10.00		80	72	74	76	10	28	28.38	29.85
24	CLR	NC				10.00		73	64	67	74	7	32	28.41	29.88
03	CLR	NC													
06	CLR	NC													
09	CLR	NC													
12	CLR	NC													
15	CLR	NC													
18	CLR	NC													
21	CLR	NC													
24	CLR	NC													

3-HOURLY OBSERVATION NOTES

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 Visibilty = 8/8.

Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.

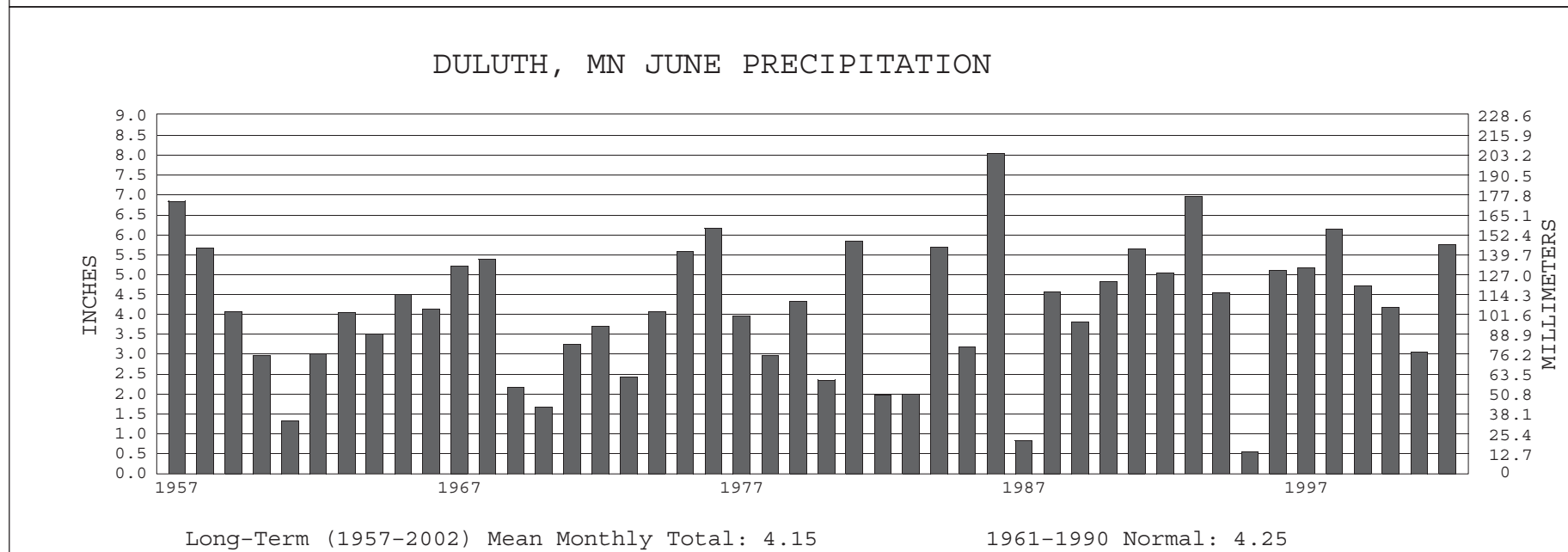
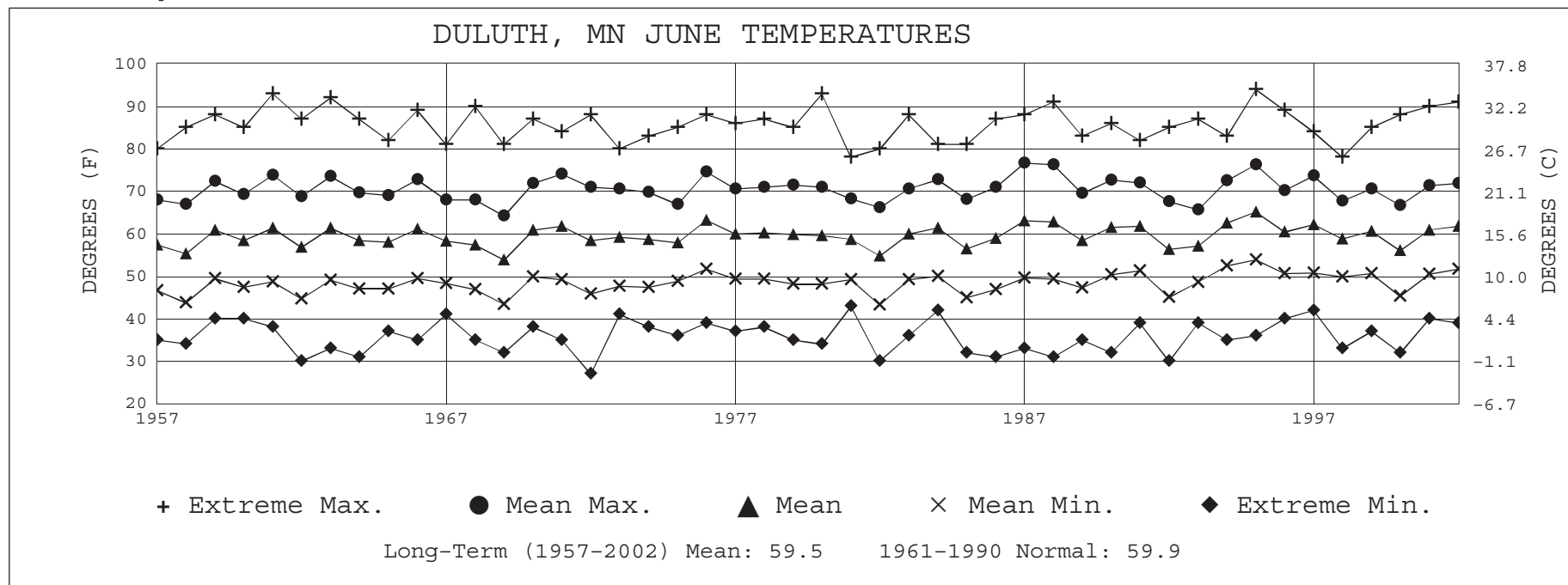
NC= No ceiling detected.

& = Original observation contained additional weather elements.

See page 3 for additional notes.

SUMMARY BY HOUR

HOUR (LST)	AVERAGES										RESULTANT	
	CEILOMETER	EFF CLD AMT	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY	PRESSURE (INCHES, HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	WIND (MPH)	
							STATION	SEA LEVEL			SPEED	DIRECTION
01			56	50	53	81	28.42	29.93	8.48	8	2	14
02			55	50	53	83	28.42	29.92	8.45	8	1	13
03			55	50	52	86	28.42	29.92	8.10	8	1	14
04			55	51	53	87	28.42	29.93	7.58	8	1	14
05			55	51	53	89	28.43	29.94	7.48	8	1	20
06			56	52	54	86	28.44	29.94	7.12	9	1	13
07			58	52	55	81	28.44	29.94	7.87	10	2	13
08			61	52	56	77	28.44	29.95	8.30	11	1	13
09			63	53	57	74	28.45	29.95	7.95	10	2	15
10			65	53	58	69	28.45	29.95	8.15	12	3	13
11			66	52	58	65	28.44	29.94	8.46	12	2	13
12			67	53	59	64	28.44	29.94	8.34	12	3	15
13			68	53	59	62	28.43	29.94	8.70	11	2	15
14			69	53	60	60	28.43	29.93	9.37	13	3	14
15			69	52	60	59	28.42	29.93	9.23	12	3	14
16			69	53	60	60	28.41	29.92	9.16	13	3	15
17			68	52	59	61	28.42	29.92	9.12	12	2	11
18			67	52	58	63	28.42	29.93	8.61	12	3	13
19			64	51	57	65	28.42	29.93	8.52	10	3	11
20			62	51	56	71	28.42	29.93	8.00	8	4	11
21			60	51	55	75	28.43	29.94	8.22	8	4	12
22			59	51	55	78	28.43	29.94	8.49	8	3	13
23			58	51	54	79	28.43	29.94	8.30	7	2	14
24			57	51	54	81	28.43	29.94	8.43	8	1	12





JUNE 2002
DULUTH, MN

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

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