



# MARCH 2003

## 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

MARCH 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				
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	37	1	19	-1	14	19	46	0	SN FZFG BR HZ BLSN	T		0.4	0.02	28.33	29.91	6.9	29	11.6	31	33	23	33	01		
02	3	-13	-5*	-25	-18	-6	70	0		T		0.0	0.00	28.58	30.21	5.3	34	7.1	24	34	18	34	02		
03	11	-5	3	-17	-1	4	62	0	SN FZFG BR BLSN	1		3.0	0.08	28.22	29.83	5.0	14	7.1	20	31	15	31	03		
04	9	-7	1	-20	-9	0	64	0	SN BR UP HZ	3		0.2	T	28.36	29.97	9.8	30	9.9	23	30	18	29	04		
05	11	-18*	-3	-24	-13	-2	68	0		3		0.0	0.00	28.43	30.06	4.1	26	6.4	16	27	14	26	05		
06	24	-4	10	-12	4	12	55	0	SN BR	3		1.0	0.05	28.27	29.87	10.4	18	11.1	28	19	24	19	06		
07	20	1	11	-11	1	9	54	0	SN BR	4		1.3	0.05	28.41	30.01	9.3	32	9.8	22	33	17	34	07		
08	6	-8	-1	-23	-15	-2	66	0	SN HZ	4		0.3	0.01	28.55	30.17	11.2	31	12.0	32	30	22	30	08		
09	5	-13	-4	-27	-16	-5	69	0	BLSN	4		0.0	0.00	28.53	30.18	17.2	28	17.4	35	27	28	30	09		
10	17	-10	4	-19	-6	3	61	0	SN	4		T	T	28.53	30.16	12.9	26	13.8	25	25	22	25	10		
11	24	8	16	-7	10	14	49	0	SN BR	3		0.3	0.01	28.21	29.79	9.0	27	10.4	28	28	24	27	11		
12	24	2	13	-11	1	12	52	0	SN	3		T	T	28.51	30.10	3.7	34	5.0	17	30	13	34	12		
13	32	0	16	-8	9	16	49	0	BR	2		0.0	0.00	28.65	30.25	4.8	14	7.6	18	19	16	19	13		
14	52	26	39	15	31	34	26	0	BR HZ	2		0.0	0.00	28.35	29.90	7.2	18	9.5	24	21	20	20	14		
15	40	29	35	10	30	31	30	0	FG+ FZFG BR	T		0.0	0.00	28.22	29.76	10.4	11	10.5	20	11	17	11	15		
16	60*	31	46	21	40	43	19	0	FG+ BR HZ	T		0.0	0.00	28.12	29.64	0.1	02	2.4	10	14	9	13	16		
17	41	29	35	10	31	33	30	0	FG BR UP	T		0.0	T	28.35	29.89	17.5	08	17.6	36	07	28	08	17		
18	30	27	29	3	24	27	36	0	BR	0		0.0	0.00	28.55	30.12	16.6	08	16.6	35	07	25	08	18		
19	43	27	35	9	16	27	30	0		0		0.0	0.00	28.48	30.05	12.4	07	12.6	28	06	22	06	19		
20	34	30	32	5	24	30	33	0	RA SN FG BR	0		0.1	0.10	28.20	29.74	2.0	34	4.1	18	09	15	08	20		
21	35	31	33	6	32	33	32	0	RA DZ SN BR	T		0.3	0.06	28.15	29.69	8.3	34	8.4	21	34	16	35	21		
22	46	32	39	11	34	36	26	0	RA BR	0		0.0	T	28.33	29.87	0.8	04	5.2	14	01	12	07	22		
23	56	31	44	16	33	38	21	0	BR	0		0.0	0.00	28.15	29.68	6.8	16	8.6	17	17	14	13	23		
24	56	36	46*	18	29	39	19	0	RA	0		0.0	0.01	28.12	29.64	19.8	27	20.6	48*	26	40*	27	24		
25	44	30	37	8	23	32	28	0		0		0.0	0.00	28.37	29.92	11.6	30	12.1	28	33	22	27	25		
26	46	22	34	5	23	30	31	0		0		0.0	0.00	28.40	29.96	3.0	08	6.2	23	08	20	08	26		
27	32	28	30	0	23	28	35	0	SN FG+ FZFG BR BLSN	0		3.5	0.30	28.35	29.91	19.2	07	19.5	36	06	29	06	27		
28	32	26	29	-1	25	27	36	0	SN FZFG BCFG BR HZ BLSN	7		6.6	0.32	28.32	29.88	14.0	36	14.3	29	01	22	05	28		
29	37	22	30	-1	14	24	35	0	SN	8		T	T	28.62	30.20	9.4	34	10.2	22	31	18	34	29		
30	36	19	28	-3	20	25	37	0	SN BR UP	6		T	T	28.63	30.21	1.2	30	7.1	17	10	15	11	30		
31	41	24	33	1	27	29	32	0	RA SN FG+ FZFG BR	5		0.1	0.02	28.24	29.79	9.2	13	10.5	24	19	18	19	31		
< MONTHLY AVERAGES										TOTALS->				<- MONTHLY AVERAGES											
-2.5										-2.5				-2.5											
DEGREE DAYS										GREATEST 24-HR PRECIPITATION: 0.32 DATE :28				GREATEST 24-HR SNOWFALL: 6.6 DATE :28				GREATEST SNOW DEPTH: 8 DATE :29				SEA LEVEL PRESSURE DATE TIME			
MONTHLY TOTAL DEPARTURE					SEASON TO DATE TOTAL DEPARTURE					NUMBER OF DAYS WITH				MAXIMUM TEMP ≥ 90: 0				MINIMUM TEMP ≤ 32: 30				PRECIPITATION ≥ 0.01 INCH : 12			
HEATING: 1301					8383					MAXIMUM TEMP ≤ 32 :15				MINIMUM TEMP ≤ 0 : 9				PRECIPITATION ≥ 0.10 INCH : 3							
COOLING: 0					0					THUNDERSTORMS : 0				HEAVY FOG : 4				SNOWFALL ≥ 1.0 INCH : 5							

SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3

# HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

## DULUTH, MN

MARCH 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			T	T	T	T	T	T				01	T	0.02		
02													02												02		0.00		
03													03	T	T	T	T	T	T	T	T	T	T		03	T	0.08		
04	T	T											04												04		T		
05					T	T							05												05		0.00		
06													06						T	T	T	T	T		06	T	0.05		
07	T	T	T	T	T	T	T						07												07	T	0.05		
08	T	T	T	T		T							08												08	T	0.01		
09												T	09												09		0.00		
10													10										T	T	10		T		
11	T	T	T	T	T	T							11	T	T	T	T	T							11	T	0.01		
12													12								T	T			12		T		
13													13												13		0.00		
14													14												14		0.00		
15													15												15		0.00		
16													16												16		0.00		
17													17												17	0.00	T		
18													18												18		0.00		
19													19												19		0.00		
20									T	T	T	0.01	0.03	20	0.02	0.02	0.04	0.01					T	T	20	0.13	0.10		
21	0.01	0.01	T	T	T	T	T	0.01	0.01	T	T	0.01	0.01	21	0.01	T	T	0.01	T		T	T			21	0.07	0.06		
22														22											22		T		
23														23											23		0.00		
24				T	T									24											24	T	0.01		
25														25											25		0.00		
26														26											26		0.00		
27														27	T	T	T	T	T	T	T	T	T		27	T	0.30		
28	T	T	T	T	T	T	T	T		T	0.01	0.04	0.02	28	T	T	T	T	T	T	T	T	T		28	0.07	0.32		
29														29											29	0.00	T		
30														30											30		T		
31														31	T	T	0.01	T	T	0.01					31		0.02		

### MAXIMUM SHORT DURATION PRECIPITATION (See Note)

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (Inches)												
Ending Date												
Ending Time (Hour/Min)												

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 MARCH 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							.50	10.00	
02							10.00	10.00	
03							.50	10.00	
04							2.00	10.00	
05							10.00	10.00	
06							.75	10.00	
07							1.25	10.00	
08							1.75	10.00	
09							8.00	10.00	
10							5.00	10.00	
11							1.00	10.00	
12							8.00	10.00	
13							4.00	10.00	
14							2.00	6.00	
15							.25	6.00	
16							<.25	6.00	
17							.50	9.00	
18							4.00	10.00	
19							10.00	10.00	
20							.50	10.00	
21							1.75	10.00	
22							1.75	10.00	
23							1.25	10.00	
24							9.00	10.00	
25							10.00	10.00	
26							10.00	10.00	
27							.25	10.00	
28							.50	10.00	
29							10.00	10.00	
30							.75	10.00	
31							.25	10.00	
<b>MONTHLY AVGS</b>							4.01	9.58	
<b>SUNSHINE (MINUTES)</b>									
Total:      Possible: Percent Possible:									
<b>NUMBER OF DAYS WITH:</b>									
<b>SKY CONDITION</b>									
CLR   PTLY CLDY   CLOUDY   MISSING 31									
<b>MINIMUM VISIBILITY (MILES)</b>									
<=0.25    <=3.0    >=7.0 3            18            9									

# OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN  
MARCH 2003

DLH

WBAN # 14913

HOUR (LST)	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)					
	SKY COVER	CEILING 100'S OF FT			OBSERVATION TIME (LST)	EFF CLD AMT Oktas	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG		STATION	SEA LEVEL			SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)	EFF CLD AMT Oktas	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
SUNRISE: 0649					MAR 01					SUNSET: 1754					SUNRISE: 0638					MAR 07					SUNSET: 1801				
03	CLR	NC	10.00		16	14	15	92	3	19	28.36	29.93	03	OVC	034	2.00	-SN BR	20	17	19	89	10	30	28.25	29.82				
06	OVC	065	9.00		20	15	18	81	10	24	28.32	29.90	06	OVC	015	5.00	-SN BR	12	8	11	84	13	32	28.32	29.90				
09	OVC	075	7.00		25	19	23	78	9	25	28.29	29.86	09	CLR	NC	10.00		3	-4	2	72	13	33	28.42	30.01				
12	OVC	080	7.00		34	22	30	61	10	22	28.25	29.81	12	CLR	NC	10.00		10	-3	7	55	10	34	28.45	30.05				
15	VV	011	0.75	-SN BR	30	27	29	88	12	31	28.24	29.80	15	CLR	NC	10.00		15	-4	11	42	12	31	28.45	30.03				
18	OVC	022	4.00	-SN	21	16	19	81	14	34	28.30	29.88	18	SCT	NC	10.00		9	-8	6	46	10	33	28.47	30.07				
21	CLR	NC	10.00		9	0	7	67	18	34	28.42	30.01	21	OVC	055	10.00		6	-5	4	60	7	33	28.50	30.12				
24	CLR	NC	10.00		1	-10	-1	59	9	34	28.51	30.11	24	OVC	032	3.00	-SN	4	-2	3	76	5	32	28.52	30.14				
SUNRISE: 0647					MAR 02					SUNSET: 1755					SUNRISE: 0636					MAR 08					SUNSET: 1803				
03	CLR	NC	10.00		-6	-15	-7	64	10	34	28.57	30.19	03	OVC	029	3.00	-SN	2	-4	1	76	9	32	28.55	30.16				
06	CLR	NC	10.00		-11	-19	-12	67	10	34	28.62	30.24	06	OVC	095	7.00		0	-7	-1	72	10	35	28.54	30.17				
09	CLR	NC	10.00		-11	-20	-12	63	13	34	28.66	30.30	09	CLR	NC	10.00		-4	-16	-5	55	9	34	28.58	30.22				
12	CLR	NC	10.00		-4	-20	-5	45	3	34	28.64	30.28	12	CLR	NC	10.00		1	-20	-1	36	13	32	28.56	30.19				
15	CLR	NC	10.00		2	-17	0	40	6	25	28.58	30.22	15	CLR	NC	10.00		5	-21	2	28	15	32	28.51	30.13				
18	CLR	NC	10.00		-1	-18	-3	43	5	28	28.53	30.17	18	CLR	NC	10.00		3	-21	0	31	15	30	28.52	30.15				
21	CLR	NC	10.00		-7	-18	-8	58	0	00	28.50	30.16	21	CLR	NC	10.00		-3	-21	-4	41	17	29	28.54	30.19				
24	CLR	NC	10.00		-4	-15	-5	59	7	15	28.47	30.10	24	CLR	NC	10.00		-8	-17	-9	64	15	29	28.53	30.17				
SUNRISE: 0645					MAR 03					SUNSET: 1757					SUNRISE: 0634					MAR 09					SUNSET: 1804				
03	FEW	NC	10.00		-3	-15	-4	56	7	14	28.40	30.03	03	CLR	NC	10.00		-10	-20	-11	60	16	28	28.53	30.17				
06	OVC	032	4.00	-SN	-2	-11	-3	65	8	14	28.33	29.96	06	CLR	NC	10.00		-13	-21	-14	67	15	28	28.51	30.16				
09	VV	015	0.75	-SN	2	-3	1	80	13	13	28.25	29.87	09	CLR	NC	8.00	BLSN	-8	-19	-9	58	20	29	28.51	30.16				
12	OVC	020	1.50	-SN	7	2	6	80	12	14	28.17	29.78	12	FEW	NC	8.00	BLSN	0	-14	-2	51	20	28	28.52	30.16				
15	OVC	027	1.25	-SN BR	10	6	9	84	6	11	28.10	29.70	15	BKN	037	10.00	BLSN	4	-11	2	49	28	27	28.50	30.13				
18	OVC	055	1.50	-SN BR	10	7	9	87	3	12	28.09	29.69	18	FEW	NC	10.00		1	-14	-1	48	20	29	28.52	30.16				
21	OVC	038	4.00	-SN BR	8	6	8	92	3	20	28.11	29.70	21	CLR	NC	10.00		-3	-13	-4	61	15	29	28.58	30.23				
24	OVC	033	6.00	BLSN	9	3	8	77	10	31	28.17	29.76	24	CLR	NC	10.00		-6	-13	-7	71	12	29	28.62	30.27				
SUNRISE: 0643					MAR 04					SUNSET: 1758					SUNRISE: 0632					MAR 10					SUNSET: 1805				
03	CLR	NC	10.00		1	-4	0	79	12	30	28.25	29.85	03	CLR	NC	10.00		-10	-14	-10	82	10	27	28.65	30.29				
06	CLR	NC	10.00		-4	-8	-5	83	13	30	28.31	29.93	06	CLR	NC	10.00		-9	-15	-10	75	10	28	28.64	30.29				
09	CLR	NC	10.00		-3	-9	-4	75	10	30	28.38	30.00	09	CLR	NC	10.00		-2	-11	-3	65	12	29	28.62	30.27				
12	FEW	NC	10.00		5	-6	3	60	9	31	28.39	30.00	12	CLR	NC	10.00		9	-7	6	48	15	26	28.57	30.21				
15	FEW	NC	10.00		9	-9	6	43	12	30	28.36	29.97	15	CLR	NC	10.00		17	-2	13	43	20	24	28.49	30.10				
18	CLR	NC	10.00		5	-13	2	43	7	32	28.37	29.99	18	FEW	NC	10.00		14	-2	11	49	16	25	28.43	30.05				
21	CLR	NC	10.00		-3	-15	-4	56	7	29	28.44	30.07	21	OVC	090	10.00		12	0	9	58	15	24	28.39	30.01				
24	CLR	NC	10.00		-6	-16	-7	61	7	33	28.43	30.06	24	OVC	060	10.00	-SN	11	5	10	77	13	25	28.34	29.94				
SUNRISE: 0641					MAR 05					SUNSET: 1760					SUNRISE: 0630					MAR 11					SUNSET: 1807				
03	CLR	NC	10.00		-9	-16	-10	71	6	32	28.43	30.06	03	OVC	035	4.00	-SN BR	9	6	8	88	6	22	28.27	29.86				
06	CLR	NC	10.00		-12	-17	-12	78	6	31	28.44	30.08	06	OVC	004	2.50	BR	10	8	10	92	5	22	28.21	29.80				
09	CLR	NC	10.00		-5	-11	-6	75	3	VR	28.47	30.11	09	OVC	006	1.75	BR	13	11	12	92	8	22	28.14	29.72				
12	CLR	NC	10.00		4	-11	2	49	10	25	28.47	30.10	12	OVC	008	3.00	BR	18	16	17	92	13	27	28.11	29.68				
15	CLR	NC	10.00		10	-10	7	39	9	26	28.41	30.03	15	OVC	024	3.00	-SN BR	24	16	22	71	18	28	28.12	29.69				
18	CLR	NC	10.00		8	-10	5	43	7	19	28.39	30.02	18	FEW	NC	10.00		22	10	19	60	17	29	28.19	29.77				
21	CLR	NC	10.00		4	-10	2	52	9	21	28.40	30.02	21	CLR	NC	10.00		14	5	12	67	9	31	28.30	29.89				
24	CLR	NC	10.00		1	-10	-1	59	6	19	28.39	30.01	24	CLR	NC	10.00		9	2	7	73	3	34	28.35	29.95				
SUNRISE: 0640					MAR 06					SUNSET: 1801					SUNRISE: 0628					MAR 12					SUNSET: 1808				
03	CLR	NC	10.00		-1	-11	-2	62	3	14	28.36	29.97	03	BKN	120	10.00		9	2	7	73	10	34	28.39	29.97				
06	OVC	039	10.00		2	-8	0	63	6	14	28.34	29.96	06	SCT	NC	10.00		7	0	6	73	3	27	28.45	30.04				
09	FEW	NC	10.00		9	-4	6	55	14	16	28.30	29.91	09	CLR	NC	10.00		11	0	9	61	3	02	28.50	30.10				
12	CLR	NC	10.00		21	8	17	57	14	18	28.26	29.86	12	CLR	NC	10.00		18	-1	14	43	5	VR	28.50	30.10				
15	OVC	032	10.00		23	12	20	63	17	19	28.22	29.81	15	CLR	NC	10.00		23	-1	17	35	0	00	28.50	30.10				
18	OVC	029	8.00	-SN	23	14	20	68	22	19	28.20	29.78	18	OVC	050	10.00		22	1	17	40	5	36	28.54	30.14				
21	OVC	015	1.25	-SN BR	20	18	19	92	7	20	28.23	29.81	21	OVC	034	8.00	-SN	20	4	16	50	6	34	28.59	30.19				
24	OVC	020	1.50	-SN BR	20	18	19	92	6	24	28.23	29.80	24	CLR	NC	10.00		13	4	11	67	7	33	28.63	30.23				

# OBSERVATIONS AT 3-HOURLY INTERVALS

## DULUTH, MN MARCH 2003

DLH

WBAN # 14913

HOUR (LST)	SATellite		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SATellite		VISIBILITY (MILES)	WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)	
	SKY COVER	CEILING 100'S OF FT			OBSERVATION TIME (LST)	EFF CLD AMT Oktas	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG		STATION	SEA LEVEL			SKY COVER	CEILING 100'S OF FT	OBSERVATION TIME (LST)	EFF CLD AMT Oktas	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)
<b>SUNRISE: 0626 MAR 13</b>					<b>SUNSET: 1810</b>					<b>SUNRISE: 0614 MAR 19</b>					<b>SUNSET: 1818</b>										
03	CLR	NC	10.00		3	-1	2	83	7	35	28.66	30.27	03	OVC	025	10.00		28	14	24	56	10	08	28.56	30.13
06	CLR	NC	10.00		1	-6	0	72	3	35	28.72	30.33	06	BKN	025	10.00		28	15	24	58	12	06	28.54	30.12
09	CLR	NC	10.00		20	11	17	68	12	13	28.74	30.34	09	OVC	013	10.00		32	19	28	59	10	07	28.55	30.12
12	CLR	NC	10.00		25	10	21	53	8	14	28.73	30.34	12	OVC	025	10.00		36	22	31	57	12	09	28.50	30.07
15	BKN	110	10.00		32	16	27	52	12	16	28.65	30.25	15	SCT	NC	10.00		39	12	30	33	20	08	28.46	30.02
18	CLR	NC	10.00		24	16	22	71	9	12	28.59	30.20	18	CLR	NC	10.00		34	12	27	40	12	07	28.44	30.00
21	OVC	018	10.00		24	17	22	75	8	13	28.54	30.12	21	BKN	110	10.00		33	14	27	45	13	08	28.39	29.94
24	CLR	NC	4.00	BR	26	23	25	88	10	19	28.47	30.04	24	CLR	NC	10.00		30	17	26	59	9	08	28.34	29.90
<b>SUNRISE: 0624 MAR 14</b>					<b>SUNSET: 1811</b>					<b>SUNRISE: 0612 MAR 20</b>					<b>SUNSET: 1820</b>										
03	CLR	NC	5.00	BR	31	27	29	85	16	21	28.42	29.98	03	BKN	110	10.00		32	13	26	45	7	05	28.28	29.83
06	OVC	011	4.00	BR	31	29	30	92	12	18	28.38	29.95	06	OVC	110	10.00		31	17	26	56	3	01	28.26	29.80
09	OVC	009	2.50	BR	34	31	33	89	10	21	28.36	29.93	09	OVC	049	10.00	-RA	33	18	28	54	6	34	28.23	29.77
12	CLR	NC	4.00	HZ	45	35	41	68	10	20	28.32	29.87	12	OVC	040	5.00	-RA	33	28	31	82	0	00	28.21	29.75
15	CLR	NC	5.00	HZ	52	36	44	55	5	VR	28.29	29.83	15	OVC	005	0.75	-SN BR	32	31	32	96	0	00	28.17	29.71
18	CLR	NC	6.00	HZ	37	30	34	76	7	13	28.31	29.86	18	OVC	050	10.00		34	31	33	89	6	26	28.15	29.69
21	CLR	NC	3.00	BR	32	30	31	92	8	12	28.31	29.87	21	OVC	070	10.00		34	31	33	89	7	30	28.12	29.66
24	CLR	NC	3.00	BR	30	29	30	96	12	11	28.32	29.86	24	OVC	011	2.00	-SN BR	33	31	32	92	6	30	28.10	29.64
<b>SUNRISE: 0622 MAR 15</b>					<b>SUNSET: 1813</b>					<b>SUNRISE: 0610 MAR 21</b>					<b>SUNSET: 1821</b>										
03	OVC	002	2.00	BR	30	29	30	96	13	10	28.30	29.83	03	OVC	007	3.00	-SN BR	32	31	32	96	7	33	28.07	29.61
06	VV	001	0.25	FZFG	29	29	29	100	15	10	28.29	29.84	06	OVC	037	5.00	-SN BR	31	30	31	96	6	34	28.08	29.62
09	OVC	001	0.75	BR	30	30	30	100	15	11	28.26	29.82	09	OVC	010	7.00		32	30	31	92	10	36	28.09	29.63
12	OVC	003	1.50	BR	33	31	32	92	14	11	28.23	29.77	12	OVC	007	2.00	-SN BR	34	32	33	92	7	34	28.13	29.67
15	FEW	NC	5.00	BR	40	37	39	89	14	10	28.16	29.70	15	OVC	007	1.75	BR	34	33	34	97	8	35	28.16	29.70
18	FEW	NC	4.00	BR	33	30	32	89	7	09	28.17	29.72	18	OVC	005	4.00	BR	35	34	35	96	10	34	28.21	29.75
21	FEW	NC	2.50	BR	31	30	31	96	6	11	28.14	29.69	21	OVC	005	8.00		34	33	34	97	12	34	28.25	29.79
24	CLR	NC	4.00	BR	31	29	30	92	0	00	28.12	29.66	24	OVC	003	6.00	BR	34	33	34	97	8	35	28.27	29.82
<b>SUNRISE: 0620 MAR 16</b>					<b>SUNSET: 1814</b>					<b>SUNRISE: 0608 MAR 22</b>					<b>SUNSET: 1822</b>										
03	CLR	NC	2.50	BR	36	33	35	89	3	28	28.11	29.64	03	OVC	007	10.00		34	31	33	89	6	34	28.30	29.85
06	OVC	002	0.50	FG	34	34	34	100	3	32	28.11	29.65	06	OVC	016	10.00		33	32	33	96	7	31	28.32	29.88
09	SCT	NC	1.50	BR	44	42	43	93	0	00	28.11	29.65	09	OVC	018	10.00		35	33	34	93	3	32	28.35	29.91
12	CLR	NC	3.00	HZ	55	46	50	72	0	00	28.09	29.62	12	OVC	010	10.00		40	36	38	86	0	00	28.35	29.90
15	CLR	NC	5.00	HZ	59	45	52	60	7	36	28.07	29.59	15	OVC	033	10.00		44	36	40	73	3	27	28.34	29.88
18	SCT	NC	5.00	HZ	54	43	48	67	0	00	28.11	29.63	18	CLR	NC	10.00		40	35	38	83	8	12	28.32	29.87
21	CLR	NC	4.00	BR	42	39	41	89	0	00	28.16	29.69	21	CLR	NC	7.00		35	34	35	96	6	12	28.33	29.88
24	FEW	NC	3.00	BR	42	40	41	92	5	01	28.17	29.69	24	CLR	NC	4.00	BR	33	33	33	100	5	16	28.29	29.84
<b>SUNRISE: 0618 MAR 17</b>					<b>SUNSET: 1815</b>					<b>SUNRISE: 0606 MAR 23</b>					<b>SUNSET: 1824</b>										
03	OVC	003	0.50	FG	39	38	39	96	10	07	28.22	29.73	03	SCT	NC	10.00		38	31	35	76	10	22	28.26	29.80
06	OVC	015	5.00	BR	36	33	35	89	16	09	28.27	29.80	06	CLR	NC	10.00		36	30	34	79	6	17	28.23	29.76
09	OVC	013	7.00		35	30	33	82	20	08	28.33	29.87	09	CLR	NC	10.00		45	32	39	61	8	18	28.22	29.75
12	OVC	011	7.00		35	31	33	85	23	06	28.37	29.91	12	CLR	NC	10.00		53	36	45	52	13	18	28.16	29.69
15	OVC	005	5.00	BR	33	31	32	92	20	08	28.38	29.93	15	FEW	NC	10.00		53	36	45	52	8	12	28.11	29.63
18	OVC	001	0.75	BR	30	29	30	96	17	08	28.40	29.96	18	CLR	NC	8.00		40	33	37	77	9	12	28.09	29.62
21	OVC	003	2.00	BR	29	28	29	96	21	08	28.43	29.99	21	FEW	NC	9.00		37	32	35	82	8	11	28.04	29.57
24	OVC	005	8.00		29	26	28	89	22	08	28.47	30.03	24	CLR	NC	9.00		38	32	35	79	6	13	28.00	29.50
<b>SUNRISE: 0616 MAR 18</b>					<b>SUNSET: 1817</b>					<b>SUNRISE: 0604 MAR 24</b>					<b>SUNSET: 1825</b>										
03	OVC	006	9.00		28	26	27	92	17	09	28.50	30.07	03	OVC	055	10.00		45	36	41	71	10	29	28.05	29.56
06	OVC	006	9.00		27	26	27	96	17	08	28.51	30.09	06	BKN	120	10.00		40	35	38	83	12	25	28.09	29.62
09	OVC	006	9.00		27	25	26	92	15	08	28.55	30.13	09	CLR	NC	10.00		48	31	41	52	20	26	28.12	29.64
12	OVC	010	10.00		28	24	27	85	18	08	28.55	30.12	12	CLR	NC	10.00		54	21	40	28	30	26	28.08	29.60
15	OVC	015	10.00		29	24	27	82	16	07	28.54	30.11	15	FEW	NC	10.00		55	23	42	29	38	26	28.08	29.59
18	OVC	019	10.00		28	22	26	78	18	08	28.56	30.14	18	BKN	070	10.00		48	27	39	44	14	29	28.14	29.66
21	OVC	019	10.00		28	21	26	75	14	07	28.58	30.16	21	OVC	041	10.00		42	28	36	58	23	28	28.22	29.74
24	OVC	021	10.00		28	19	25	69	13	08	28.57	30.15	24	BKN	032	10.00		38	29	34	70	18	30	28.25	29.77

# OBSERVATIONS AT 3-HOURLY INTERVALS

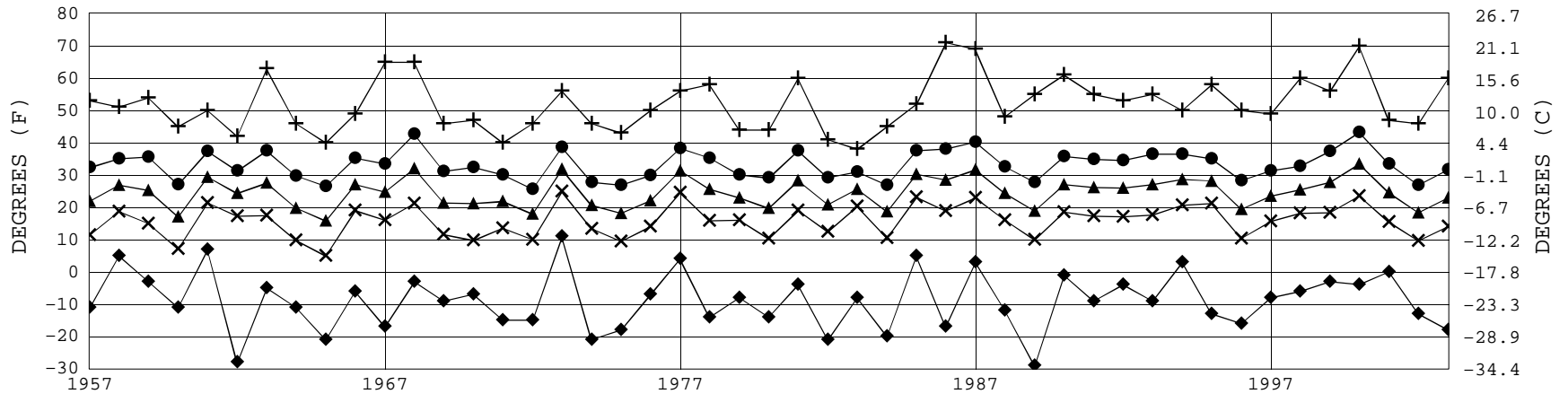
**DULUTH, MN**  
MARCH 2003

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)	
	SKY COVER	CEILING		OBSERVATION TIME (LST)	EFF CLD AMT Okltas			DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL		SKY COVER	CEILING		OBSERVATION TIME (LST)	EFF CLD AMT Okltas			DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
SUNRISE: 0602								MAR 25				SUNSET: 1827				SUNRISE: 0551								MAR 31				SUNSET: 1835			
03	BKN	049			10.00			36	28	33	73	12	28	28.27	29.80	03	OVC	004			10.00			25	23	24	92	12	10	28.51	30.09
06	OVC	030			10.00			34	23	30	64	14	31	28.32	29.86	06	VV	001			0.25	FZFG	24	23	24	96	15	10	28.45	30.01	
09	OVC	032			10.00			35	21	30	57	15	31	28.38	29.92	09	SCT	NC			10.00			26	24	25	92	14	12	28.36	29.92
12	SCT	NC			10.00			40	22	33	49	21	28	28.40	29.94	12	BKN	046			10.00			30	24	28	79	8	12	28.25	29.81
15	SCT	NC			10.00			43	23	35	45	17	27	28.39	29.93	15	OVC	004			3.00	BR	32	30	31	92	15	12	28.11	29.66	
18	FEW	NC			10.00			39	20	32	46	13	32	28.41	29.96	18	SCT	NC			10.00			41	32	37	70	12	17	28.04	29.58
21	FEW	NC			10.00			33	21	29	61	3	33	28.43	29.98	21	CLR	NC			10.00			36	31	34	82	8	16	28.01	29.55
24	OVC	060			10.00			31	23	28	72	0	00	28.44	29.99	24	CLR	NC			10.00			35	31	33	85	7	22	28.00	29.53
SUNRISE: 0600								MAR 26				SUNSET: 1828				<h3>3-HOURLY OBSERVATION NOTES</h3> <p>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. Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet. NC= No ceiling detected. &amp; = Original observation contained additional weather elements. See page 3 for additional notes.</p>															
03	CLR	NC			10.00			27	21	25	78	3	02	28.43	29.98																
06	BKN	060			10.00			25	21	24	85	0	00	28.45	30.01																
09	SCT	NC			10.00			38	27	34	65	9	33	28.45	30.00																
12	BKN	055			10.00			44	23	36	43	6	VR	28.42	29.96																
15	BKN	055			10.00			44	22	35	41	0	00	28.37	29.92																
18	OVC	065			10.00			38	24	33	57	7	09	28.37	29.93																
21	OVC	060			10.00			33	23	29	67	14	08	28.37	29.92																
24	OVC	090			10.00			30	20	27	66	16	09	28.35	29.90																
SUNRISE: 0559								MAR 27				SUNSET: 1829																			
03	OVC	075			10.00			32	16	27	52	16	08	28.34	29.88																
06	OVC	065			10.00			32	18	27	56	17	08	28.35	29.91																
09	OVC	018			2.00	-SN		30	24	28	79	22	07	28.36	29.91																
12	OVC	022			2.00	-SN		30	25	28	82	22	08	28.35	29.91																
15	OVC	020			2.50	-SN BR		29	26	28	89	21	07	28.34	29.90																
18	OVC	011			0.50	-SN FZFG		29	27	28	92	20	05	28.36	29.92																
21	OVC	012			0.75	-SN BLSN		28	27	28	96	18	06	28.38	29.94																
24	OVC	015			1.00	-SN BLSN		28	25	27	88	15	05	28.32	29.88																
SUNRISE: 0557								MAR 28				SUNSET: 1831																			
03	OVC	016			0.50	-SN BR		28	25	27	88	9	01	28.29	29.85																
06	OVC	017			1.00	-SN BR		28	26	27	92	13	01	28.28	29.84																
09	OVC	011			1.00	-SN BR		29	26	28	89	17	01	28.26	29.82																
12	OVC	016			1.50	-SN		31	26	29	82	13	36	28.26	29.81																
15	OVC	012			0.75	-SN BR		31	28	30	89	14	36	28.27	29.83																
18	OVC	015			1.00	-SN BR		29	25	28	85	14	35	28.35	29.91																
21	OVC	029			2.50	-SN		27	21	25	78	15	36	28.40	29.97																
24	OVC	046			10.00			26	17	23	69	12	36	28.44	30.00																
SUNRISE: 0555								MAR 29				SUNSET: 1832																			
03	OVC	046			10.00			25	15	22	66	13	35	28.48	30.05																
06	CLR	NC			10.00			22	11	19	63	10	34	28.54	30.12																
09	CLR	NC			10.00			26	11	22	53	16	34	28.61	30.19																
12	CLR	NC			10.00			33	9	26	36	10	36	28.66	30.23																
15	BKN	060			10.00			37	13	29	37	12	35	28.67	30.24																
18	OVC	060			10.00			35	16	29	46	10	31	28.69	30.27																
21	OVC	055			10.00			31	20	27	64	6	30	28.71	30.28																
24	CLR	NC			10.00			25	17	22	72	8	29	28.71	30.28																
SUNRISE: 0553								MAR 30				SUNSET: 1833																			
03	CLR	NC			10.00			23	15	21	72	8	31	28.68	30.26																
06	FEW	NC			10.00			19	15	18	85	6	30	28.67	30.25																
09	OVC	025			2.00	-SN		26	20	24	78	6	31	28.67	30.25																
12	OVC	032			10.00			32	20	28	61	6	VR	28.64	30.22																
15	BKN	027			5.00	-SN		33	21	29	61	6	23	28.60	30.17																
18	OVC	045			10.00			32	25	29	75	9	12	28.58	30.16																
21	OVC	002			1.00	BR		26	25	26	96	7	11	28.59	30.17																
24	OVC	004			3.00			25	24	25	96	13	09	28.55	30.13																

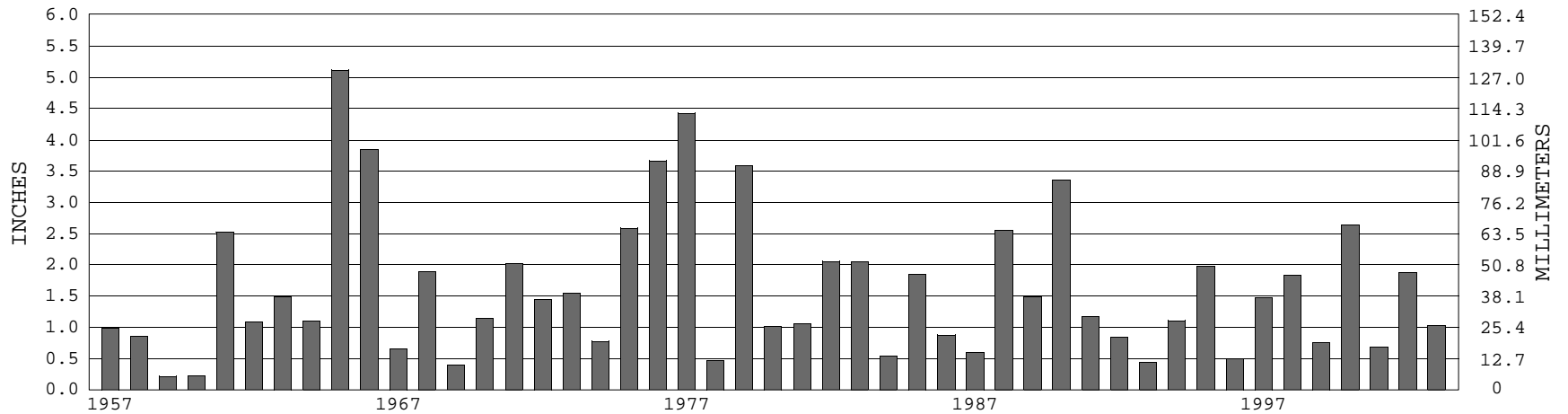
### DULUTH, MN MARCH TEMPERATURES



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

Long-Term (1957-2003) Mean: 24.5      1961-1990 Normal: 25.4

### DULUTH, MN MARCH PRECIPITATION



Long-Term (1957-2003) Mean Monthly Total: 1.61

1961-1990 Normal: 1.69



MARCH 2003

DULUTH, MN

# LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

*I certify that this is an official publication of the National Oceanic and Atmospheric Administration (NOAA). It is compiled using information from weather observing sites operated by NOAA – National Weather Service / Department Of Transportation – Federal Aviation Administration and received at the National Climatic Data Center (NCDC), Asheville, North Carolina 28801.*

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