



# JANUARY 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

JANUARY 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	25	5	15	6	13	16	50	0	SN BR	1		T	T	28.69	30.31	9.5	08	11.0	24	11	20	07	01	
02	29	11	20	11	18	22	45	0		1		0.0	0.00	28.67	30.26	8.9	09	9.3	22	10	17	08	02	
03	27	7	17	8	11	18	48	0		1		0.0	0.00	28.47	30.06	5.5	15	6.2	14	15	13	18	03	
04	27	20	24	15	19	23	41	0	SN BR	1		0.2	0.01	28.32	29.89	2.9	12	5.5	12	15	9	14	04	
05	30	19	25	17	22	25	40	0	SN BR	1		0.1	T	28.55	30.13	9.7	35	9.9	28	36	21	36	05	
06	24	11	18	10	15	17	47	0		1		0.0	0.00	28.75	30.35	10.5	27	12.7	31	26	24	25	06	
07	46	24	35	27	28	33	30	0	BR	1		0.0	0.00	28.20	29.75	14.8	29	15.6	32	29	23	31	07	
08	48*	29	39*	31	26	33	26	0		1		0.0	0.00	27.89	29.41	15.2	29	15.8	39*	31	31*	31	08	
09	36	8	22	14	12	19	43	0	SN FZFG BR	1		1.1	0.06	28.15	29.70	15.4	32	16.1	36	30	29	30	09	
10	10	-3	4	-4	-4	3	61	0	SN BR HZ	1		0.4	0.01	28.40	30.01	17.3	30	17.4	35	31	26	31	10	
11	9	-3	3	-5	-5	1	62	0	SN BR BLSN	1		T	T	28.63	30.27	12.2	30	12.5	29	30	23	30	11	
12	17	-5	6	-1	-4	2	59	0		1		0.0	0.00	28.49	30.12	9.0	28	12.5	29	32	21	31	12	
13	5	-9	-2	-9	-11	-4	67	0	HZ	1		0.0	0.00	28.67	30.31	11.7	31	12.0	26	32	21	32	13	
14	7	-7	0	-7	-10	-2	65	0		1		0.0	0.00	28.67	30.31	14.3	30	14.6	32	29	25	29	14	
15	16	-6	5	-3	-8	2	60	0		1		0.0	0.00	28.74	30.38	11.8	31	12.0	24	31	18	31	15	
16	13	-1	6	-2	-9	4	59	0		1		0.0	0.00	28.69	30.32	14.2	32	14.5	28	29	21	31	16	
17	20	-9	6	-2	-4	5	59	0	SN BR	1		0.8	0.02	28.52	30.14	11.2	26	13.0	31	24	28	24	17	
18	17	-3	7	-1	-4	3	58	0	SN BR BLSN	1		0.6	0.04	28.29	29.89	14.5	31	14.9	32	31	24	31	18	
19	11	-5	3	-5	-6	2	62	0	SN BR BLSN	1		T	T	28.14	29.75	13.6	29	15.1	35	30	29	30	19	
20	5	-10	-2	-10	-13	-5	67	0		1		0.0	0.00	28.48	30.12	12.0	30	12.1	28	29	22	30	20	
21	2	-13	-5	-13	-13	-7	70	0		1		0.0	0.00	28.68	30.33	8.1	30	8.5	20	28	16	28	21	
22	-4	-14	-9	-17	-19	-11	74	0	SN	1		T	T	28.90	30.57	12.7	33	13.0	28	33	20	32	22	
23	3	-18*	-7	-15	-17	-9	72	0		0		0.0	0.00	28.96	30.64	11.6	32	11.8	29	32	22	33	23	
24	9	-6	2	-6	-6	1	63	0	SN UP	1		T	T	28.67	30.31	7.4	24	8.4	20	27	16	24	24	
25	9	-9	0	-9	-7	0	65	0	SN BCFG UP HZ BLSN	1		1.0	0.04	28.59	30.21	13.6	31	13.8	25	30	21	30	25	
26	-1	-17	-9*	-18	-18	-10	74	0	UP	2		T	T	28.83	30.50	8.1	31	9.1	23	32	18	30	26	
27	19	-14	3	-6	1	6	62	0	SN BR BLSN	3		1.5	0.05	28.40	30.02	7.9	19	11.3	22	16	18	17	27	
28	19	0	10	1	1	8	55	0	SN	3		T	T	28.54	30.15	10.6	33	10.8	23	31	18	32	28	
29	13	-9	2	-8	-8	2	63	0	SN	3		T	T	28.72	30.36	6.9	26	10.4	28	24	21	23	29	
30	28	9	19	9	17	19	46	0	SN FG+ FZFG BR	3		0.1	T	28.34	29.92	9.0	23	9.3	26	24	23	24	30	
31	30	26	28	18	25	26	37	0	SN FG+ FZFG BR	3		0.1	T	28.38	29.95	1.1	24	2.8	10	21	9	22	31	
										TOTALS->				-<- MONTHLY AVERAGES										
										-<- DEPARTURE FROM NORMAL ->				SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3										
										GREATEST 24-HR PRECIPITATION: 0.06 DATE :09				SEA LEVEL PRESSURE DATE TIME										
										GREATEST 24-HR SNOWFALL: 1.5 DATE :27				: 30.71 23 1055										
										GREATEST SNOW DEPTH: 3 DATE :31+				MINIMUM : 29.28 08 1355										
										NUMBER OF DAYS WITH >				PRECIPITATION ≥ 0.01 INCH : 7										
										MAXIMUM TEMP ≥ 90: 0				PRECIPITATION ≥ 0.10 INCH : 0										
										MAXIMUM TEMP ≤ 32 :28				MINIMUM TEMP ≤ 0 : 20										
										THUNDERSTORMS : 0				HEAVY FOG : 2										
										SNOWFALL ≥ 1.0 INCH : 3														

### DEGREE DAYS

MONTHLY TOTAL DEPARTURE	SEASON TO DATE TOTAL DEPARTURE	HEATING: 1730	COOLING: 0
0	0	-41	0
5528	-142		
0	0		

GREATEST 24-HR PRECIPITATION: 0.06 DATE :09	SEA LEVEL PRESSURE DATE TIME
GREATEST 24-HR SNOWFALL: 1.5 DATE :27	: 30.71 23 1055
GREATEST SNOW DEPTH: 3 DATE :31+	MINIMUM : 29.28 08 1355
NUMBER OF DAYS WITH >	PRECIPITATION ≥ 0.01 INCH : 7
MAXIMUM TEMP ≥ 90: 0	PRECIPITATION ≥ 0.10 INCH : 0
MAXIMUM TEMP ≤ 32 :28	MINIMUM TEMP ≤ 0 : 20
THUNDERSTORMS : 0	HEAVY FOG : 2
SNOWFALL ≥ 1.0 INCH : 3	

# HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

## DULUTH, MN

JANUARY 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	T		
02													02												02		0.00		
03													03												03		0.00		
04													04				T	T	T	T	T	T		T	04	T	0.01		
05	T	T	T	T									05				T	T	T	T	T	T			05		T		
06													06												06		0.00		
07													07												07		0.00		
08													08												08		0.00		
09													09												09	T	0.06		
10	T	T	T	T	T	T	T	T	T	T	T		10											T	10	T	0.01		
11													11	T	T										11		T		
12													12												12		0.00		
13													13												13		0.00		
14													14												14		0.00		
15													15												15		0.00		
16													16												16		0.00		
17													17								T	T	T	T	17	T	0.02		
18	T	T	T	T	T	T	T	T	T	T			18												18	T	0.04		
19													19												19		T		
20													20												20		0.00		
21													21												21		0.00		
22													22												22	0.00	T		
23													23												23		0.00		
24													24	T	T	T	T	T	T	T	T	T	T	T	24		T		
25	T	T	T	T	T	T	T	T	T	T	T		25												25	T	0.04		
26													26												26		T		
27													27	T	T	T	T	T	T	T					27	T	0.05		
28													28												28		T		
29													29												29	T	T		
30													30												30		T		
31	T	T	T	T	T	T	T	T	T	T	T		31												31		T		

### 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 JANUARY 2003

Ceilometer (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							4.00	10.00	
02							10.00	10.00	
03							10.00	10.00	
04							.75	10.00	
05							2.50	10.00	
06							10.00	10.00	
07							5.00	10.00	
08							10.00	10.00	
09							.50	10.00	
10							.75	10.00	
11							1.75	10.00	
12							10.00	10.00	
13							5.00	10.00	
14							10.00	10.00	
15							10.00	10.00	
16							10.00	10.00	
17							1.00	10.00	
18							.50	10.00	
19							2.00	10.00	
20							10.00	10.00	
21							9.00	10.00	
22							10.00	10.00	
23							10.00	10.00	
24							4.00	10.00	
25							.75	10.00	
26							8.00	10.00	
27							.25	10.00	
28							8.00	10.00	
29							9.00	10.00	
30							.25	10.00	
31							.25	4.00	
<b>MONTHLY AVGS</b>							5.85	9.81	
<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 2              12              15									

# OBSERVATIONS AT 3-HOURLY INTERVALS

## DULUTH, MN

JANUARY 2003

DLH

WBAN # 14913

HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)							
	SKY COVER	CEILING 100'S OF FT		OBSERVATION 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	SKY COVER	CEILING 100'S OF FT	OBSERVATION 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: 0754				JAN 01				SUNSET: 1631				SUNRISE: 0753				JAN 07				SUNSET: 1637									
03	CLR	NC			10.00	7	0	6	73	8	36	28.67	30.28	03	OVC	003			5.00	BR	27	26	27	96	16	27	28.38	29.95	
06	OVC	110			10.00	7	2	6	80	5	02	28.66	30.28	06	SCT	NC			7.00		27	25	26	92	8	26	28.29	29.86	
09	OVC	006		BR	4.00	17	15	16	92	8	08	28.71	30.32	09	SCT	NC			9.00		28	25	27	88	9	27	28.23	29.79	
12	OVC	008			10.00	19	17	18	92	12	09	28.70	30.31	12	CLR	NC			10.00		41	28	36	60	16	28	28.18	29.72	
15	OVC	008			10.00	22	20	21	92	12	08	28.71	30.32	15	CLR	NC			10.00		45	31	39	58	17	29	28.13	29.66	
18	OVC	010			10.00	24	21	23	88	13	10	28.73	30.33	18	CLR	NC			10.00		44	31	38	60	22	30	28.11	29.64	
21	OVC	013			10.00	24	21	23	88	13	10	28.72	30.32	21	CLR	NC			10.00		43	30	38	60	18	31	28.11	29.64	
24	OVC	017			10.00	24	19	22	81	13	10	28.71	30.30	24	CLR	NC			10.00		40	30	36	68	15	31	28.10	29.63	
SUNRISE: 0754				JAN 02				SUNSET: 1632				SUNRISE: 0753				JAN 08				SUNSET: 1638									
03	OVC	017			10.00	24	19	22	81	14	09	28.72	30.31	03	CLR	NC			10.00		35	30	33	82	9	26	28.05	29.58	
06	BKN	017			10.00	24	18	22	77	12	10	28.70	30.28	06	CLR	NC			10.00		32	27	30	82	7	25	27.98	29.50	
09	SCT	NC			10.00	22	18	21	85	10	10	28.72	30.31	09	CLR	NC			10.00		31	27	29	85	13	27	27.85	29.37	
12	SCT	NC			10.00	27	19	24	72	9	09	28.70	30.28	12	CLR	NC			10.00		42	26	36	53	21	30	27.79	29.31	
15	CLR	NC			10.00	28	18	25	66	12	07	28.65	30.23	15	CLR	NC			10.00		47	23	37	39	21	30	27.79	29.29	
18	FEW	NC			10.00	21	18	20	88	7	04	28.64	30.23	18	CLR	NC			10.00		40	25	34	55	21	30	27.83	29.35	
21	FEW	NC			10.00	16	13	15	88	0	00	28.62	30.22	21	OVC	055			10.00		37	26	33	65	17	30	27.86	29.39	
24	CLR	NC			10.00	17	15	16	92	9	12	28.59	30.18	24	OVC	030			10.00		36	27	32	70	22	29	27.89	29.41	
SUNRISE: 0754				JAN 03				SUNSET: 1633				SUNRISE: 0752				JAN 09				SUNSET: 1639									
03	CLR	NC			10.00	16	14	15	92	0	00	28.58	30.16	03	OVC	026			10.00		35	28	32	76	22	30	27.90	29.41	
06	CLR	NC			10.00	11	8	10	88	3	14	28.53	30.14	06	OVC	023			2.00	-SN BR	31	28	30	89	16	30	27.94	29.46	
09	CLR	NC			10.00	17	12	16	80	3	14	28.51	30.11	09	OVC	015			7.00		24	19	22	81	21	34	28.08	29.62	
12	CLR	NC			10.00	26	11	22	53	8	17	28.47	30.04	12	SCT	NC			10.00		20	11	17	68	16	33	28.22	29.78	
15	OVC	085			10.00	26	12	22	55	8	17	28.43	30.01	15	FEW	NC			10.00		20	5	16	52	16	33	28.26	29.81	
18	CLR	NC			10.00	21	16	19	81	9	12	28.41	29.99	18	OVC	100			10.00		16	1	13	51	16	31	28.29	29.86	
21	OVC	025			10.00	25	6	20	44	10	14	28.41	29.99	21	OVC	070			10.00		11	2	9	67	16	31	28.31	29.90	
24	FEW	NC			10.00	22	11	19	63	6	14	28.35	29.93	24	OVC	027			9.00	-SN	10	2	8	69	14	31	28.31	29.90	
SUNRISE: 0754				JAN 04				SUNSET: 1634				SUNRISE: 0752				JAN 10				SUNSET: 1641									
03	OVC	017			10.00	23	13	20	65	8	14	28.33	29.91	03	BKN	120			10.00	-SN	8	0	6	69	16	31	28.32	29.92	
06	OVC	013			10.00	23	14	20	68	6	16	28.30	29.87	06	OVC	014			1.00	-SN BR	7	3	6	84	13	32	28.31	29.90	
09	OVC	019			10.00	25	17	22	72	8	12	28.31	29.88	09	FEW	NC			10.00		2	-5	1	72	12	30	28.39	30.00	
12	OVC	017			10.00	26	17	23	69	7	11	28.29	29.86	12	BKN	018			10.00		5	-5	3	63	20	31	28.41	30.02	
15	OVC	020			10.00	27	18	24	69	0	00	28.30	29.87	15	CLR	NC			10.00		8	-4	6	57	18	30	28.43	30.04	
18	OVC	038			3.00	25	24	25	96	3	36	28.34	29.91	18	CLR	NC			10.00		3	-6	2	66	20	30	28.46	30.08	
21	OVC	003			3.00	26	24	25	92	3	01	28.33	29.90	21	CLR	NC			10.00		0	-8	-1	69	20	30	28.49	30.11	
24	OVC	019			4.00	26	25	26	96	6	35	28.33	29.90	24	CLR	NC			10.00		-3	-9	-4	75	18	30	28.49	30.11	
SUNRISE: 0753				JAN 05				SUNSET: 1635				SUNRISE: 0752				JAN 11				SUNSET: 1642									
03	OVC	030			4.00	27	25	26	92	9	01	28.36	29.93	03	OVC	070			10.00		-1	-8	-2	72	14	30	28.50	30.13	
06	OVC	024			8.00	26	24	25	92	3	33	28.39	29.96	06	OVC	090			3.00	-SN BR	-1	-6	-2	79	14	31	28.54	30.17	
09	OVC	034			9.00	26	24	25	92	10	34	28.47	30.04	09	OVC	027			6.00	BLSN	0	-6	-1	76	14	28	28.62	30.26	
12	OVC	032			10.00	28	24	27	85	10	35	28.50	30.08	12	OVC	031			10.00		5	-3	4	69	13	30	28.67	30.30	
15	OVC	016			9.00	29	24	27	82	13	33	28.57	30.15	15	FEW	NC			10.00		9	-2	7	61	12	30	28.69	30.32	
18	OVC	013			10.00	26	21	24	81	17	34	28.67	30.25	18	CLR	NC			10.00		7	-2	5	66	12	29	28.70	30.33	
21	OVC	017			10.00	23	18	21	81	9	34	28.77	30.37	21	CLR	NC			10.00		2	-5	1	72	8	30	28.72	30.36	
24	BKN	013			10.00	19	15	18	85	9	34	28.84	30.43	24	CLR	NC			10.00		0	-6	-1	76	8	29	28.71	30.34	
SUNRISE: 0753				JAN 06				SUNSET: 1636				SUNRISE: 0751				JAN 12				SUNSET: 1643									
03	BKN	008			10.00	15	12	14	88	13	34	28.87	30.48	03	CLR	NC			10.00		-3	-7	-4	82	7	28	28.65	30.29	
06	OVC	008			10.00	14	12	13	92	8	32	28.90	30.51	06	CLR	NC			10.00		-4	-9	-5	79	6	22	28.57	30.20	
09	FEW	NC			10.00	12	10	12	92	9	29	28.89	30.50	09	CLR	NC			10.00		-1	-7	-2	75	10	20	28.46	30.09	
12	BKN	005			10.00	16	14	15	92	8	24	28.83	30.44	12	OVC	075			10.00		9	1	7	70	12	22	28.32	29.93	
15	CLR	NC			10.00	22	16	20	78	12	23	28.72	30.32	15	BKN	031			10.00		15	3	12	59	18	30	28.32	29.93	
18	BKN	100			10.00	22	16	20	78	17	25	28.67	30.27	18	CLR	NC			10.00		8	-2	6	63	20	31	28.45	30.07	
21	OVC	075			10.00	23	18	21	81	21	25	28.52	30.12	21	CLR	NC			10.00		2	-8	0	63	20	33	28.52	30.16	
24	OVC	011			10.00	24	21	23	88	20	25	28.40	29.98	24	CLR	NC			10.00		-1	-9	-2	68	14	30	28.59	30.22	

# OBSERVATIONS AT 3-HOURLY INTERVALS

**DULUTH, MN**  
JANUARY 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: 0751 JAN 13					SUNSET: 1644					SUNRISE: 0747 JAN 19					SUNSET: 1652														
03	CLR	NC		10.00	-5	-12	-6	72	14	32	28.63	30.25	03	CLR	NC		10.00	-3	-7	-4	82	12	23	28.13	29.74				
06	CLR	NC		10.00	-8	-13	-9	78	20	33	28.63	30.27	06	OVC	015		5.00	-2	-2	1	83	17	26	28.03	29.62				
09	CLR	NC		10.00	-9	-15	-10	75	12	33	28.69	30.33	09	OVC	029		10.00	8	3	7	80	16	29	28.01	29.60				
12	CLR	NC		10.00	-1	-11	-2	62	10	31	28.70	30.34	12	SCT	NC		10.00	11	-2	8	56	29	30	28.03	29.62				
15	CLR	NC		10.00	3	-8	1	60	10	30	28.67	30.31	15	CLR	NC		10.00	10	-8	7	43	15	32	28.11	29.71				
18	CLR	NC		10.00	1	-8	0	65	10	30	28.70	30.35	18	CLR	NC		10.00	4	-11	2	49	9	31	28.22	29.83				
21	CLR	NC		10.00	-2	-11	-3	65	13	31	28.71	30.36	21	CLR	NC		10.00	-1	-11	-2	62	13	32	28.29	29.90				
24	CLR	NC		10.00	-5	-12	-6	72	12	30	28.72	30.36	24	CLR	NC		10.00	-4	-11	-5	71	9	31	28.35	29.97				
SUNRISE: 0750 JAN 14					SUNSET: 1646					SUNRISE: 0746 JAN 20					SUNSET: 1654														
03	CLR	NC		10.00	-7	-12	-8	79	12	30	28.72	30.36	03	CLR	NC		10.00	-7	-12	-8	79	14	30	28.40	30.02				
06	CLR	NC		10.00	-6	-10	-6	83	12	30	28.68	30.33	06	CLR	NC		10.00	-7	-12	-8	79	9	31	28.42	30.05				
09	CLR	NC		10.00	-5	-11	-6	75	14	29	28.67	30.32	09	CLR	NC		10.00	-7	-12	-8	79	8	30	28.46	30.09				
12	CLR	NC		10.00	4	-8	2	57	17	31	28.65	30.29	12	FEW	NC		10.00	1	-9	0	62	16	28	28.48	30.11				
15	CLR	NC		10.00	7	-9	4	47	20	29	28.62	30.25	15	CLR	NC		10.00	4	-13	2	45	16	31	28.47	30.10				
18	CLR	NC		10.00	4	-9	2	54	13	29	28.63	30.27	18	CLR	NC		10.00	-1	-15	-2	51	10	31	28.52	30.17				
21	CLR	NC		10.00	0	-10	-1	62	14	32	28.67	30.32	21	CLR	NC		10.00	-5	-15	-6	62	14	30	28.57	30.22				
24	CLR	NC		10.00	-3	-11	-4	68	15	32	28.70	30.33	24	CLR	NC		10.00	-8	-14	-9	74	10	30	28.62	30.27				
SUNRISE: 0750 JAN 15					SUNSET: 1647					SUNRISE: 0745 JAN 21					SUNSET: 1655														
03	CLR	NC		10.00	-5	-11	-6	75	15	31	28.73	30.37	03	CLR	NC		10.00	-11	-16	-12	78	7	30	28.65	30.30				
06	CLR	NC		10.00	-6	-12	-7	75	13	31	28.73	30.38	06	CLR	NC		10.00	-12	-16	-12	81	8	27	28.63	30.29				
09	CLR	NC		10.00	-4	-12	-5	68	13	31	28.76	30.41	09	CLR	NC		10.00	-9	-14	-10	78	8	31	28.67	30.32				
12	CLR	NC		10.00	8	-7	5	50	14	33	28.77	30.42	12	CLR	NC		10.00	-3	-13	-4	61	10	31	28.68	30.33				
15	CLR	NC		10.00	15	-4	11	42	9	30	28.74	30.38	15	FEW	NC		10.00	2	-11	0	54	14	28	28.66	30.31				
18	CLR	NC		10.00	10	-5	7	50	9	29	28.75	30.40	18	CLR	NC		10.00	-2	-12	-3	62	7	31	28.71	30.36				
21	CLR	NC		10.00	9	-6	6	50	12	31	28.74	30.38	21	CLR	NC		10.00	-7	-13	-8	75	5	32	28.72	30.38				
24	CLR	NC		10.00	8	-5	6	55	12	31	28.73	30.35	24	OVC	065		10.00	-8	-14	-9	74	9	33	28.75	30.41				
SUNRISE: 0749 JAN 16					SUNSET: 1648					SUNRISE: 0744 JAN 22					SUNSET: 1657														
03	CLR	NC		10.00	6	-5	4	60	15	30	28.70	30.32	03	OVC	075		10.00	-9	-15	-10	75	9	34	28.79	30.45				
06	CLR	NC		10.00	6	-6	4	57	15	31	28.67	30.29	06	BKN	055		10.00	-12	-18	-13	74	13	33	28.83	30.50				
09	CLR	NC		10.00	7	-10	4	45	16	30	28.63	30.25	09	FEW	NC		10.00	-13	-21	-14	67	12	34	28.90	30.58				
12	CLR	NC		10.00	12	-11	8	34	16	32	28.63	30.25	12	CLR	NC		10.00	-8	-21	-9	52	13	34	28.93	30.60				
15	CLR	NC		10.00	12	-11	8	34	15	31	28.64	30.26	15	FEW	NC		10.00	-5	-19	-6	50	17	30	28.92	30.59				
18	CLR	NC		10.00	6	-11	3	45	13	34	28.72	30.34	18	CLR	NC		10.00	-9	-20	-10	58	14	32	28.96	30.64				
21	CLR	NC		10.00	2	-10	0	57	18	34	28.77	30.40	21	CLR	NC		10.00	-12	-21	-13	63	15	31	28.96	30.65				
24	CLR	NC		10.00	-1	-10	-2	65	7	32	28.81	30.44	24	CLR	NC		10.00	-14	-23	-15	63	17	33	28.95	30.63				
SUNRISE: 0748 JAN 17					SUNSET: 1650					SUNRISE: 0743 JAN 23					SUNSET: 1658														
03	CLR	NC		10.00	-4	-11	-5	71	8	31	28.81	30.45	03	CLR	NC		10.00	-16	-23	-17	70	14	31	28.97	30.65				
06	CLR	NC		10.00	-8	-13	-9	78	8	28	28.77	30.42	06	CLR	NC		10.00	-18	-24	-18	73	14	32	28.98	30.68				
09	CLR	NC		10.00	-2	-10	-3	68	12	27	28.70	30.34	09	FEW	NC		10.00	-16	-23	-17	70	16	33	28.99	30.68				
12	CLR	NC		10.00	14	-5	10	42	14	25	28.59	30.22	12	CLR	NC		10.00	-5	-15	-6	62	16	34	29.00	30.68				
15	CLR	NC		10.00	20	-9	14	27	20	25	28.44	30.05	15	FEW	NC		10.00	2	-11	0	54	8	32	28.96	30.63				
18	BKN	027		10.00	15	-5	11	40	16	22	28.27	29.89	18	CLR	NC		10.00	-1	-12	-2	59	8	33	28.94	30.61				
21	OVC	011		1.00	13	10	12	88	14	24	28.20	29.80	21	CLR	NC		10.00	-3	-14	-4	58	8	33	28.93	30.60				
24	OVC	050		5.00	17	12	16	80	13	31	28.15	29.72	24	CLR	NC		10.00	-3	-14	-4	58	5	31	28.88	30.55				
SUNRISE: 0747 JAN 18					SUNSET: 1651					SUNRISE: 0742 JAN 24					SUNSET: 1660														
03	OVC	021		2.00	13	6	11	74	21	32	28.18	29.76	03	BKN	085		10.00	-4	-13	-5	65	6	31	28.84	30.49				
06	SCT	NC		10.00	9	2	7	73	14	31	28.25	29.84	06	OVC	065		10.00	-3	-11	-4	68	0	00	28.79	30.44				
09	CLR	NC		10.00	4	-2	3	76	18	31	28.30	29.90	09	OVC	085		10.00	0	-11	-1	59	7	23	28.75	30.40				
12	CLR	NC		10.00	4	-7	2	60	15	32	28.33	29.93	12	OVC	050		10.00	5	-7	3	57	9	20	28.66	30.30				
15	CLR	NC		10.00	6	-9	4	49	15	30	28.34	29.95	15	OVC	039		10.00	6	-4	4	63	13	25	28.59	30.22				
18	CLR	NC		10.00	2	-9	0	60	13	29	28.36	29.97	18	OVC	024		9.00	6	-1	5	73	9	25	28.57	30.20				
21	CLR	NC		10.00	-1	-9	-2	68	17	30	28.32	29.94	21	OVC	037		6.00	8	2	7	76	13	26	28.53	30.16				
24	CLR	NC		10.00	-3	-8	-4	79	10	27	28.26	29.88	24	OVC	017		7.00	9	4	8	80	12	28	28.50	30.12				

# OBSERVATIONS AT 3-HOURLY INTERVALS

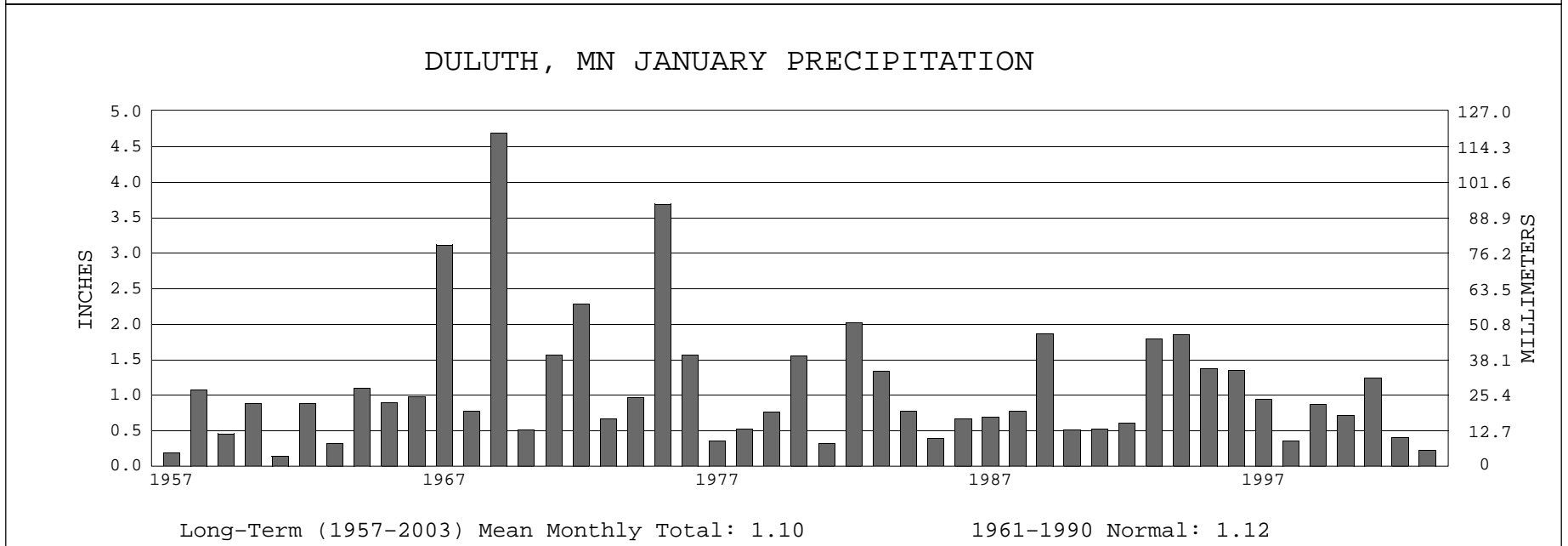
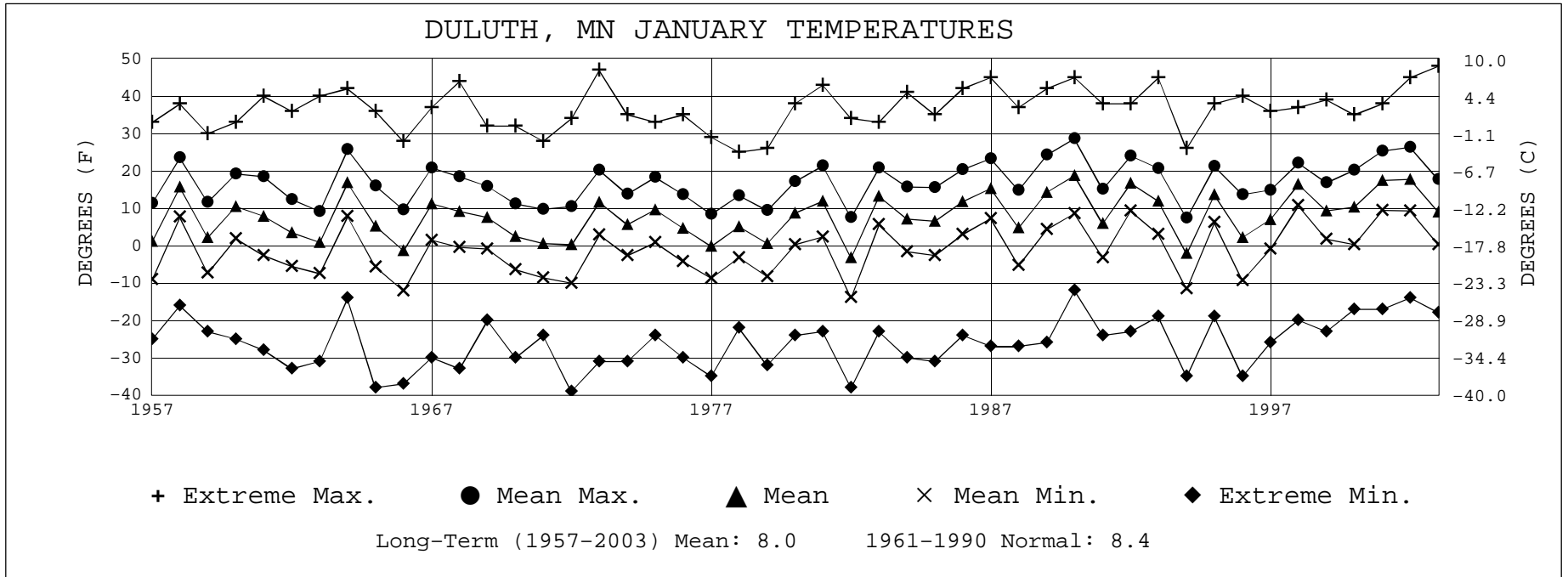
## DULUTH, MN

JANUARY 2003

DLH

WBAN # 14913

HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F				WIND		PRESSURE (INCHES, HG)																
	SKY COVER	CEILING 100'S OF FT		OBSERVATION 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	OBSERVATION 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: 0741 JAN 25 SUNSET: 1701												SUNRISE: 0735 JAN 31 SUNSET: 1710																										
03	SCT	NC		9.00	-SN	6	0	5	76	15	30	28.50	30.12	03	OVC	001		1.25	-SN BR	27	24	26	89	0	00	28.32	29.89											
06	OVC	032		2.50	-SN	4	-2	3	76	9	32	28.51	30.13	06	OVC	041		4.00	BR	26	23	25	88	5	03	28.35	29.92											
09	OVC	070		3.00	-SN BCFG	3	-2	2	79	12	31	28.54	30.16	09	OVC	004		4.00	BR	27	24	26	89	5	03	28.41	29.98											
12	BKN	085		10.00		1	-7	0	68	13	32	28.56	30.19	12	OVC	004		2.50	BR	29	26	28	89	0	00	28.42	29.98											
15	CLR	NC		10.00		5	-11	3	47	14	31	28.58	30.20	15	OVC	004		2.50	BR	28	26	27	92	3	28	28.42	29.99											
18	CLR	NC		10.00		0	-13	-1	54	15	30	28.65	30.28	18	OVC	006		2.50	BR	27	25	26	92	5	26	28.40	29.97											
21	CLR	NC		10.00		-4	-12	-5	68	17	31	28.69	30.33	21	OVC	006		2.50		27	25	26	92	7	21	28.38	29.95											
24	CLR	NC		10.00		-9	-17	-10	67	16	31	28.74	30.40	24	OVC	004		2.50	BR	26	25	26	92	6	23	28.36	29.92											
SUNRISE: 0740 JAN 26 SUNSET: 1703												3-HOURLY OBSERVATION NOTES																										
03	CLR	NC		8.00		-13	-18	-13	78	13	31	28.79	30.45	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	CLR	NC		10.00		-15	-21	-16	74	12	31	28.83	30.50	Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.																								
09	CLR	NC		10.00		-14	-22	-15	67	12	32	28.88	30.55	NC = No ceiling detected.																								
12	CLR	NC		10.00		-7	-18	-8	58	12	32	28.87	30.54	& = Original observation contained additional weather elements.																								
15	CLR	NC		10.00		-1	-14	-2	53	12	29	28.85	30.52	See page 3 for additional notes.																								
18	CLR	NC		10.00		-6	-16	-7	61	6	28	28.86	30.54																									
21	CLR	NC		10.00		-11	-18	-12	70	3	18	28.80	30.48																									
24	CLR	NC		10.00		-14	-20	-15	74	5	14	28.74	30.41																									
SUNRISE: 0739 JAN 27 SUNSET: 1704												SUMMARY BY HOUR																										
03	CLR	NC		10.00		-4	-13	-5	65	8	16	28.68	30.33	AVERAGES												RESULTANT WIND (MPH)												
06	OVC	049		10.00		-2	-10	-3	68	10	15	28.56	30.21																									
09	VV	016		0.75	-SN	1	-4	0	79	14	14	28.42	30.05	HOUR (LST)	CEILOMETER	EFF CLD AMT	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY	PRESSURE (INCHES, HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	SPEED	DIRECTION												
12	OVC	022		1.25	-SN BLSN	5	1	4	83	13	17	28.27	29.90								STATION	SEA LEVEL																
15	OVC	024		1.00	-SN BLSN	11	7	10	84	12	21	28.24	29.84																									
18	OVC	012		6.00	BR	13	11	12	92	9	22	28.26	29.87																									
21	OVC	010		7.00		17	13	16	84	12	24	28.27	29.87																									
24	OVC	008		7.00		19	17	18	92	12	30	28.30	29.90																									
SUNRISE: 0738 JAN 28 SUNSET: 1706												01																										
03	OVC	016		10.00		16	11	15	80	7	32	28.35	29.94								02																	
06	OVC	020		8.00	-SN	14	9	13	80	8	32	28.41	30.01								03																	
09	SCT	NC		10.00		8	-2	6	63	13	34	28.50	30.09								04																	
12	SCT	NC		10.00		8	-3	6	60	9	33	28.55	30.16								05																	
15	CLR	NC		10.00		11	-3	8	53	9	35	28.58	30.19								06																	
18	CLR	NC		10.00		7	-5	5	57	10	34	28.65	30.26	07																								
21	CLR	NC		10.00		3	-5	2	69	14	35	28.69	30.32	08																								
24	SCT	NC		10.00		0	-7	-1	72	10	34	28.75	30.40	09																								
SUNRISE: 0737 JAN 29 SUNSET: 1707												10																										
03	OVC	090		10.00		-1	-7	-2	75	6	33	28.80	30.43	11																								
06	CLR	NC		10.00		-6	-11	-7	78	6	33	28.81	30.46	12																								
09	CLR	NC		10.00		-5	-12	-6	72	10	34	28.82	30.48	13																								
12	CLR	NC		10.00		6	-11	3	45	6	25	28.80	30.45	14																								
15	CLR	NC		10.00		12	-10	8	36	10	24	28.72	30.35	15																								
18	CLR	NC		10.00		10	-9	7	41	10	22	28.64	30.27	16																								
21	OVC	034		10.00		11	-3	8	53	16	23	28.56	30.19	17																								
24	OVC	018		10.00		10	1	8	67	17	23	28.50	30.11	18																								
SUNRISE: 0736 JAN 30 SUNSET: 1709												19																										
03	OVC	011		4.00	-SN BR	9	6	8	88	13	23	28.45	30.05	20																								
06	OVC	003		1.25	-SN BR	12	10	12	92	14	23	28.39	29.99	21																								
09	OVC	003		0.75	BR	17	15	16	92	10	22	28.33	29.92	22																								
12	OVC	001		0.50	FZFG	23	20	22	88	12	23	28.28	29.87	23																								
15	OVC	001		0.50	FZFG	27	24	26	89	7	22	28.26	29.84	24																								
18	VV	001		0.25	FZFG	27	24	26	89	10	20	28.28	29.85																									
21	VV	001		0.25	FZFG	26	23	25	88	3	17	28.29	29.87																									
24	OVC	003		0.75	-SN BR	26	23	25	88	0	00	28.32	29.89																									





JANUARY 2003

DULUTH, MN

# LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

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