



# OCTOBER 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	68	40	54	5	44	50	11	0	FG+ MIFG BR	0		0.0	0.00	28.41	29.92	10.3	32	10.7	31	29	25	30	01						
02	47	31	39	-10	33	38	26	0		0		0.0	0.00	28.67	30.22	6.1	36	7.3	21	32	16	32	02						
03	48	31	40	-9	39	41	25	0	RA DZ BCFG BR	0		0.0	0.08	28.49	30.04	6.4	13	7.4	20	11	17	12	03						
04	48	37	43	-6	43	44	22	0	RA FG BR	0		0.0	1.21	28.08	29.60	8.3	33	11.4	32	32	24	33	04						
05	51	34	43	-5	34	39	22	0		0		0.0	0.00	28.49	30.03	7.1	24	8.5	20	20	16	25	05						
06	42	29	36	-12	34	37	29	0	RA BR	0		0.0	0.36	28.40	29.94	7.1	34	10.0	29	01	23	01	06						
07	41	26	34	-13	29	33	31	0	RA	0		0.0	T	28.55	30.11	4.4	19	8.5	18	13	15	13	07						
08	49	36	43	-4	38	40	22	0	RA DZ BR	0		0.0	T	28.45	29.99	3.0	28	7.4	23	32	20	30	08						
09	45	32	39	-8	35	38	26	0		0		0.0	0.00	28.61	30.16	1.4	24	6.0	17	34	14	31	09						
10	50	40	45	-1	44	44	20	0	RA DZ FG+ BCFG BR	0		0.0	T	28.55	30.09	6.6	13	7.2	14	11	13	11	10						
11	69*	48	59*	13	49	53	6	0	RA FG+ BCFG BR	0		0.0	0.07	28.36	29.87	13.8	17	16.2	40*	17	30	18	11						
12	54	29	42	-3	35	39	23	0	RA SN BR	0		T	0.65	28.55	30.08	12.8	30	13.3	30	32	22	30	12						
13	39	25	32	-13	19	27	33	0		0		0.0	0.00	28.70	30.28	9.1	28	11.5	38	26	29	28	13						
14	56	28	42	-3	30	37	23	0	RA	0		0.0	0.02	28.39	29.94	4.7	20	14.6	39	21	31*	22	14						
15	40	24	32	-12	19	28	33	0	RA	0		0.0	T	28.51	30.06	11.1	31	11.3	31	28	24	30	15						
16	39	17	28	-16	18	26	37	0	SN BR	0		0.1	0.01	28.52	30.09	6.8	27	7.0	25	28	17	27	16						
17	38	28	33	-10	26	30	32	0	SN BR	T		0.1	T	28.36	29.92	3.7	22	6.1	13	14	12	14	17						
18	36	32	34	-9	32	33	31	0	RA SN FG+ BR UP	0		1.6	0.24	28.19	29.73	2.7	05	8.5	21	32	16	32	18						
19	36	29	33	-9	26	30	32	0	SN	0		T	T	28.44	29.99	10.1	30	10.9	22	31	16	28	19						
20	37	22	30	-12	22	27	35	0	SN BR	T		0.8	0.05	28.58	30.15	2.7	04	8.7	18	31	15	29	20						
21	32	27	30	-11	25	28	35	0	SN FZFG BR	3		3.7	0.25	28.66	30.24	8.2	04	9.2	20	01	17	02	21						
22	29	25	27	-14	16	24	38	0	SN	2		T	T	28.91	30.51	8.1	36	8.5	20	36	15	35	22						
23	29	24	27	-14	18	24	38	0	SN	2		T	T	28.99	30.59	3.8	31	4.5	10	36	9	34	23						
24	34	15*	25	-15	18	24	40	0		1		0.0	0.00	28.81	30.40	2.8	23	3.9	16	23	13	22	24						
25	34	31	33	-7	32	32	32	0	SN FG+ BR	T		T	0.06	28.52	30.09	1.8	17	4.7	14	29	12	29	25						
26	35	27	31	-8	28	31	34	0	BR	0		0.0	0.00	28.51	30.08	8.5	29	8.7	18	28	15	29	26						
27	40	28	34	-5	24	30	31	0		0		0.0	0.00	28.68	30.25	3.2	29	7.2	17	29	15	29	27						
28	39	31	35	-3	28	33	30	0	SN BR HZ	0		T	T	28.61	30.18	5.2	13	5.8	14	14	12	14	28						
29	39	34	37	0	33	35	28	0	RA DZ SN BR	0		T	0.03	28.63	30.19	2.2	03	4.6	15	36	12	36	29						
30	34	22	28	-9	23	27	37	0	SN BR	0		T	0.02	28.71	30.29	9.3	32	9.7	21	31	17	30	30						
31	31	18	25*	-11	16	21	40	0		0		0.0	0.00	28.65	30.23	12.2	29	12.0	23	28	20	27	31						
42.2 29.0 35.6 ■■										< MONTHLY AVERAGES		TOTALS->		6.3 3.05		28.55 30.10		2.9 30	8.8	<- MONTHLY AVERAGES									
-10.3 -5.5 -7.9 ■■										<-----DEPARTURE FROM NORMAL----->										0.59		SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3							
DEGREE DAYS									GREATEST 24-HR PRECIPITATION: 1.21 DATE :04				GREATEST 24-HR SNOWFALL: 3.7 DATE :21				GREATEST SNOW DEPTH: 3 DATE :21				SEA LEVEL PRESSURE DATE TIME								
MONTHLY TOTAL DEPARTURE									1239 51				SEASON TO DATE TOTAL DEPARTURE				MAXIMUM : 30.64 23 0855				MINIMUM : 29.36 04 0755								
HEATING: 902 220									1239 51				NUMBER OF DAYS WITH →				MAXIMUM TEMP ≥ 90: 0				MINIMUM TEMP ≤ 32: 24				PRECIPITATION ≥ 0.01 INCH : 13				
COOLING: 0 0									311 122								MAXIMUM TEMP ≤ 32: 4				MINIMUM TEMP ≤ 0: 0				PRECIPITATION ≥ 0.10 INCH : 5				
																	THUNDERSTORMS : 0				HEAVY FOG : 5				SNOWFALL ≥ 1.0 INCH : 2				

# HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

DULUTH, MN

OCTOBER 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												01			0.00
02													02												02			0.00
03													03												03	0.06		0.08
04	0.09	0.03	0.01	0.13	0.19	0.20	0.15	0.02	0.01	0.05	0.01	0.03	04	0.07	0.11	0.02			T	0.02	T		T	0.02	0.04	0.03	1.14	1.21
05													05												05			0.00
06	0.01	0.01	T	0.01	T		T	0.04	0.06	0.08	0.05	0.02	06	0.02	0.02	0.01	T								06	0.33		0.36
07													07									T			07			T
08													08		0.01	T	T						T		08	0.01		T
09													09												09			0.00
10	T	0.02						T	T	T	T	T	10												10	0.02		T
11													11												11			0.07
12	0.22	0.11	0.11	0.11	0.09	0.01	T					T	12									T			12	0.03		0.65
13													13												13			0.00
14													14												14	0.01		0.02
15				T									15					T		T	0.01				15			T
16													16												16			0.01
17	T						T						17										T		17	T		T
18					T	T	T	0.02	0.02	0.04	0.06	0.03	18	0.01	0.02	0.04	0.02	T							18	0.26		0.24
19													19												19	0.00		T
20	T	T	T								0.01		20												20	0.01		0.05
21	T	T	T	T	T	T	T	T	T	T	T	0.03	21	0.04	0.03	0.01	0.01	T	T	T	T	T	T	T	21	0.12		0.25
22													22												22			T
23													23			T	T	T							23			T
24													24												24			0.00
25					T	T	T	0.01	0.02	0.01	0.01		25	0.01											25			0.06
26													26												26			0.00
27													27												27			0.00
28		T	T	T	T	T	T		T	T	T	T	28												28			T
29	0.01	T	0.01	T		T	T	T	0.01	0.01	T	T	29	T	0.01	T	0.01	T	T	T	0.01	T		T	29	0.05		0.03
30													30												30			0.02
31													31												31			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)												
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.

\* = 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  
OCTOBER 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).

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							.25	10.00	
02							10.00	10.00	
03							1.75	10.00	
04							.50	10.00	
05							8.00	10.00	
06							4.00	10.00	
07							10.00	10.00	
08							5.00	10.00	
09							10.00	10.00	
10							.25	10.00	
11							.25	10.00	
12							2.50	10.00	
13							10.00	10.00	
14							10.00	10.00	
15							10.00	10.00	
16							1.00	10.00	
17							2.50	10.00	
18							.25	10.00	
19							7.00	10.00	
20							.75	10.00	
21							.50	10.00	
22							9.00	10.00	
23							9.00	10.00	
24							10.00	10.00	
25							.25	10.00	
26							2.00	10.00	
27							10.00	10.00	
28							2.50	10.00	
29							5.00	10.00	
30							3.00	10.00	
31							10.00	10.00	
<b>MONTHLY AVGS</b>							5.31	10.00	
<p align="center"><b>SUNSHINE (MINUTES)</b></p> <p>Total:                  Possible:</p> <p>                              Percent Possible:</p>									
<p align="center"><b>NUMBER OF DAYS WITH:</b></p> <p align="center"><b>SKY CONDITION</b></p> <p align="center">CLR   PTLY CLDY   CLOUDY   MISSING</p> <p align="center">31</p> <p align="center"><b>MINIMUM VISIBILITY (MILES)</b></p> <p align="center">&lt;=0.25      &lt;=3.0      &gt;=7.0</p> <p align="center">4                      13                      13</p>									

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

OCTOBER 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: 0607 OCT 01						SUNSET: 1749						SUNRISE: 0615 OCT 07						SUNSET: 1737											
03	VV	001			0.25	FG	59	59	59	100	9	31	28.22	29.71	03	CLR	NC			10.00	29	26	28	89	8	28	28.57	30.14	
06	CLR	NC			5.00	BR	55	53	54	93	9	32	28.30	29.80	06	CLR	NC			10.00	28	25	27	88	3	30	28.57	30.14	
09	CLR	NC			10.00		58	47	52	67	10	34	28.37	29.88	09	FEW	NC			10.00	38	30	35	73	6	27	28.59	30.15	
12	SCT	NC			10.00		65	37	51	36	10	31	28.42	29.92	12	OVC	070			10.00	41	29	36	62	10	21	28.58	30.14	
15	FEW	NC			10.00		65	39	52	39	14	32	28.45	29.95	15	OVC	050			10.00	39	29	35	67	12	19	28.55	30.11	
18	SCT	NC			10.00		55	36	46	49	13	29	28.49	30.01	18	OVC	070			10.00	38	31	35	76	8	14	28.52	30.08	
21	SCT	NC			10.00		48	38	43	68	10	33	28.54	30.08	21	OVC	039			10.00	37	32	35	82	10	13	28.51	30.06	
24	BKN	027			10.00		43	36	40	76	9	31	28.61	30.14	24	OVC	013			10.00	37	34	36	89	9	11	28.47	30.01	
SUNRISE: 0609 OCT 02						SUNSET: 1747						SUNRISE: 0617 OCT 08						SUNSET: 1735											
03	OVC	023			10.00		41	35	38	79	9	33	28.63	30.16	03	OVC	003			9.00	38	37	38	97	7	11	28.42	29.96	
06	OVC	025			10.00		39	35	37	86	12	32	28.67	30.22	06	OVC	003			7.00	39	38	39	96	5	10	28.42	29.96	
09	FEW	NC			10.00		39	32	36	76	13	02	28.70	30.25	09	OVC	005		BR	6.00	41	39	40	93	3	VR	28.42	29.96	
12	SCT	NC			10.00		46	32	40	58	6	34	28.70	30.24	12	OVC	009			9.00	45	41	43	86	3	19	28.41	29.96	
15	SCT	NC			10.00		47	33	41	59	10	01	28.68	30.23	15	OVC	018			9.00	46	43	45	89	14	26	28.42	29.96	
18	FEW	NC			10.00		41	35	38	79	6	11	28.67	30.22	18	BKN	044			10.00	44	38	41	79	10	28	28.48	30.02	
21	CLR	NC			10.00		34	33	34	97	0	00	28.67	30.24	21	SCT	NC			10.00	37	32	35	82	7	30	28.51	30.07	
24	SCT	NC			10.00		36	34	35	93	3	12	28.67	30.22	24	OVC	011			10.00	38	35	37	89	8	29	28.55	30.10	
SUNRISE: 0610 OCT 03						SUNSET: 1745						SUNRISE: 0618 OCT 09						SUNSET: 1733											
03	SCT	NC			10.00		34	33	34	97	0	00	28.64	30.19	03	OVC	011			10.00	39	35	37	86	13	33	28.58	30.13	
06	FEW	NC			10.00		32	31	32	96	7	11	28.61	30.17	06	OVC	026			10.00	34	33	34	97	6	27	28.62	30.17	
09	BKN	100			10.00		42	36	39	79	10	13	28.59	30.14	09	OVC	019			10.00	40	34	37	79	5	VR	28.66	30.21	
12	OVC	018			10.00		47	40	44	77	10	16	28.53	30.08	12	OVC	021			10.00	41	33	38	74	7	20	28.65	30.21	
15	OVC	070			10.00		47	41	44	80	7	12	28.45	30.00	15	SCT	NC			10.00	45	34	40	66	9	24	28.60	30.15	
18	OVC	020			10.00		45	41	43	86	12	10	28.37	29.91	18	FEW	NC			10.00	40	33	37	77	0	00	28.59	30.15	
21	OVC	008			8.00		46	44	45	93	7	14	28.31	29.84	21	OVC	100			10.00	40	37	39	89	9	11	28.58	30.13	
24	OVC	003			2.50	BR	47	47	47	100	3	21	28.26	29.79	24	BKN	070			10.00	40	38	39	93	7	12	28.56	30.11	
SUNRISE: 0611 OCT 04						SUNSET: 1743						SUNRISE: 0620 OCT 10						SUNSET: 1731											
03	OVC	001			1.25	-RA BR	47	47	47	100	6	10	28.13	29.65	03	OVC	055			10.00	42	39	41	89	5	14	28.56	30.10	
06	OVC	042			4.00	RA BR	46	45	46	96	6	35	28.03	29.54	06	OVC	025		BR	6.00	41	40	41	96	6	09	28.57	30.12	
09	OVC	010			10.00	-RA	47	46	46	97	10	36	27.92	29.42	09	OVC	004		-DZ	1.00	44	43	44	96	6	16	28.57	30.12	
12	OVC	010			2.50	-RA BR	46	44	45	93	15	34	27.87	29.38	12	OVC	002		BR	1.25	47	46	46	97	8	17	28.56	30.11	
15	BKN	031			10.00		45	42	44	90	14	32	27.99	29.50	15	OVC	008			8.00	50	47	48	89	6	13	28.54	30.08	
18	BKN	028			10.00	-RA	44	41	43	89	12	30	28.15	29.67	18	OVC	014			10.00	45	43	44	93	8	11	28.53	30.08	
21	CLR	NC			10.00		40	37	39	89	15	30	28.26	29.79	21	OVC	004			7.00	47	45	46	93	8	12	28.53	30.07	
24	CLR	NC			10.00		37	35	36	93	9	28	28.34	29.88	24	VV	001		FG	0.25	48	48	48	100	12	11	28.50	30.03	
SUNRISE: 0613 OCT 05						SUNSET: 1741						SUNRISE: 0621 OCT 11						SUNSET: 1729											
03	CLR	NC			10.00		35	34	35	96	10	27	28.41	29.95	03	SCT	NC		BR	2.50	50	50	50	100	13	15	28.47	30.00	
06	BKN	110			10.00		35	33	34	93	10	27	28.47	30.01	06	FEW	NC			8.00	51	48	49	89	9	15	28.45	29.98	
09	SCT	NC			10.00		41	32	37	70	12	26	28.54	30.09	09	CLR	NC			10.00	55	49	52	80	17	15	28.40	29.92	
12	BKN	045			10.00		49	30	41	48	10	25	28.53	30.08	12	CLR	NC			10.00	67	48	56	51	22	18	28.33	29.84	
15	BKN	070			10.00		49	32	41	52	10	22	28.51	30.05	15	CLR	NC			10.00	69	46	56	44	28	18	28.27	29.77	
18	SCT	NC			10.00		45	34	40	66	5	19	28.50	30.06	18	CLR	NC			10.00	64	47	55	54	15	19	28.30	29.81	
21	BKN	037			10.00		45	36	41	71	7	20	28.51	30.06	21	SCT	NC			10.00	62	48	54	60	18	18	28.26	29.77	
24	OVC	036			8.00		42	39	41	89	3	15	28.47	30.00	24	OVC	028		-RA BR	5.00	55	52	53	90	17	31	28.30	29.81	
SUNRISE: 0614 OCT 06						SUNSET: 1739						SUNRISE: 0622 OCT 12						SUNSET: 1727											
03	OVC	043			5.00	-RA BR	41	40	41	96	5	06	28.38	29.91	03	OVC	010		-RA	7.00	48	46	47	93	9	30	28.39	29.90	
06	OVC	070			10.00		40	39	40	97	9	06	28.30	29.84	06	OVC	060			10.00	45	43	44	93	10	30	28.45	29.97	
09	OVC	019			4.00	-RA BR	41	38	40	89	10	01	28.28	29.82	09	BKN	017			10.00	44	39	42	83	13	33	28.51	30.04	
12	OVC	014			8.00	-RA	41	39	40	93	9	34	28.30	29.83	12	OVC	022		-RA	10.00	43	37	40	80	14	33	28.55	30.09	
15	OVC	014			10.00		39	35	37	86	17	34	28.39	29.94	15	OVC	049			10.00	42	28	36	58	17	30	28.58	30.13	
18	BKN	048			10.00		37	28	33	70	12	31	28.49	30.03	18	OVC	060			10.00	37	26	33	65	14	30	28.63	30.18	

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

OCTOBER 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 Oktas		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 Oktas	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
					SUNRISE: 0624	OCT 13			SUNSET: 1726										SUNRISE: 0632	OCT 19									
03	CLR	NC			10.00		26	24	25	92	10	26	28.68	30.24	03	BKN	020			10.00		33	30	32	89	12	32	28.35	29.91
06	FEW	NC			10.00		27	21	25	78	13	24	28.65	30.22	06	BKN	017			7.00		32	30	31	92	12	31	28.42	29.97
09	CLR	NC			10.00		34	22	30	61	18	28	28.66	30.23	09	OVC	020			10.00		32	26	30	79	9	33	28.47	30.03
12	BKN	048			10.00		38	18	31	44	20	31	28.71	30.28	12	OVC	020			10.00		35	25	31	67	10	29	28.47	30.02
15	CLR	NC			10.00		38	15	30	39	14	28	28.73	30.30	15	OVC	037			10.00		34	23	30	64	8	30	28.46	30.02
18	CLR	NC			10.00		33	13	27	43	6	32	28.75	30.34	18	OVC	041			10.00		32	21	28	64	10	28	28.47	30.03
21	CLR	NC			10.00		27	20	25	75	0	00	28.74	30.32	21	OVC	041			10.00		30	22	27	72	8	26	28.47	30.03
24	CLR	NC			10.00		28	19	25	69	7	13	28.73	30.30	24	OVC	060			10.00		30	24	28	79	8	25	28.45	30.01
					SUNRISE: 0625	OCT 14			SUNSET: 1724										SUNRISE: 0634	OCT 20									
03	BKN	120			10.00		31	18	27	59	7	13	28.66	30.23	03	OVC	048			10.00		28	22	26	78	8	31	28.49	30.06
06	SCT	NC			10.00		30	22	27	72	12	11	28.54	30.11	06	CLR	NC			10.00		22	20	21	92	7	29	28.54	30.12
09	CLR	NC			10.00		39	28	35	65	13	13	28.41	29.96	09	FEW	NC			10.00		28	21	26	75	10	34	28.59	30.16
12	FEW	NC			10.00		47	33	41	59	8	15	28.30	29.84	12	FEW	NC			10.00		34	19	29	54	6	36	28.59	30.16
15	SCT	NC			10.00		56	33	45	42	26	23	28.22	29.75	15	FEW	NC			10.00		34	23	30	64	9	12	28.58	30.15
18	OVC	060			10.00		53	36	45	52	10	25	28.24	29.76	18	BKN	110			10.00		30	22	27	72	7	08	28.60	30.19
21	BKN	023			10.00		43	36	40	76	14	31	28.30	29.84	21	OVC	090			10.00		31	23	28	72	7	09	28.63	30.20
24	OVC	026			10.00		40	32	37	73	10	33	28.36	29.89	24	OVC	005			1.00 -SN BR		29	28	29	96	12	12	28.63	30.20
					SUNRISE: 0627	OCT 15			SUNSET: 1722										SUNRISE: 0635	OCT 21									
03	OVC	048			10.00		38	32	35	79	12	30	28.39	29.92	03	OVC	006			1.00 -SN BR		29	28	29	96	9	11	28.63	30.20
06	BKN	034			10.00		34	24	30	67	8	32	28.46	30.00	06	OVC	006			0.75 -SN BR		28	27	28	96	7	05	28.63	30.20
09	BKN	036			10.00		35	20	30	54	18	31	28.50	30.05	09	OVC	010			1.50 -SN BR		29	27	28	92	10	04	28.64	30.21
12	FEW	NC			10.00		37	15	30	41	17	33	28.53	30.08	12	OVC	037			10.00		32	22	28	66	12	03	28.64	30.21
15	FEW	NC			10.00		36	16	29	44	14	31	28.54	30.10	15	OVC	032			3.00 -SN		30	25	28	82	9	01	28.64	30.22
18	CLR	NC			10.00		30	15	25	54	7	30	28.56	30.13	18	OVC	036			10.00		30	22	27	72	8	02	28.69	30.27
21	CLR	NC			10.00		26	14	22	60	6	29	28.58	30.15	21	OVC	065			10.00		28	22	26	78	12	02	28.73	30.30
24	CLR	NC			10.00		24	13	21	62	7	31	28.56	30.13	24	OVC	065			10.00		28	21	26	75	9	01	28.76	30.34
					SUNRISE: 0628	OCT 16			SUNSET: 1720										SUNRISE: 0637	OCT 22									
03	CLR	NC			10.00		21	15	19	78	3	29	28.57	30.14	03	OVC	065			10.00		27	22	25	81	8	34	28.80	30.39
06	CLR	NC			10.00		19	15	18	85	7	27	28.58	30.16	06	OVC	060			9.00 -SN		26	22	25	84	7	02	28.85	30.44
09	CLR	NC			10.00		30	16	25	56	8	28	28.58	30.16	09	OVC	042			10.00		25	15	22	66	14	02	28.91	30.50
12	SCT	NC			10.00		36	16	29	44	14	28	28.54	30.11	12	BKN	038			10.00		28	13	23	53	10	36	28.93	30.52
15	SCT	NC			10.00		39	16	31	39	13	27	28.49	30.05	15	OVC	040			10.00		28	14	24	56	8	35	28.93	30.53
18	BKN	070			10.00		34	17	28	50	3	26	28.47	30.04	18	OVC	042			10.00		27	14	23	58	7	36	28.96	30.55
21	OVC	080			10.00		33	20	28	59	8	25	28.45	30.01	21	OVC	040			10.00		26	14	22	60	5	33	28.99	30.59
24	OVC	022			6.00 -SN BR		30	29	30	96	5	26	28.42	29.98	24	OVC	038			10.00		26	15	23	63	5	33	28.99	30.60
					SUNRISE: 0629	OCT 17			SUNSET: 1718										SUNRISE: 0638	OCT 23									
03	OVC	019			10.00		29	28	29	96	8	25	28.39	29.95	03	OVC	040			10.00		25	17	22	72	5	29	29.01	30.61
06	OVC	038			5.00 -SN BR		29	27	28	92	7	31	28.39	29.95	06	OVC	040			10.00		24	18	22	77	5	32	29.02	30.62
09	BKN	047			10.00		32	27	30	82	3	24	28.39	29.94	09	OVC	034			9.00 -SN		26	19	24	75	6	35	29.03	30.64
12	OVC	034			10.00		35	26	32	70	9	22	28.37	29.92	12	OVC	034			10.00		28	19	25	69	5	VR	29.01	30.61
15	OVC	048			10.00		37	24	32	60	5	21	28.34	29.90	15	OVC	025			9.00 -SN		28	18	25	66	3	26	28.97	30.57
18	BKN	055			10.00		32	24	29	73	5	19	28.36	29.91	18	OVC	032			10.00		28	18	25	66	5	28	28.95	30.55
21	OVC	046			10.00		33	26	30	75	5	14	28.34	29.89	21	OVC	032			10.00		27	18	24	69	3	32	28.94	30.53
24	OVC	029			10.00		33	29	31	85	8	15	28.29	29.84	24	OVC	032			10.00		26	18	23	71	5	25	28.92	30.52
					SUNRISE: 0631	OCT 18			SUNSET: 1716										SUNRISE: 0639	OCT 24									
03	BKN	035			9.00		32	29	31	88	9	13	28.23	29.77	03	OVC	032			10.00		26	16	23	66	3	31	28.91	30.50
06	OVC	006			1.00 -SN BR		32	31	32	96	9	11	28.16	29.71	06	CLR	NC			10.00		18	15	17	88	3	29	28.89	30.49
09	OVC	001			0.75 -SN BR		33	32	33	96	8	10	28.12	29.66	09														

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

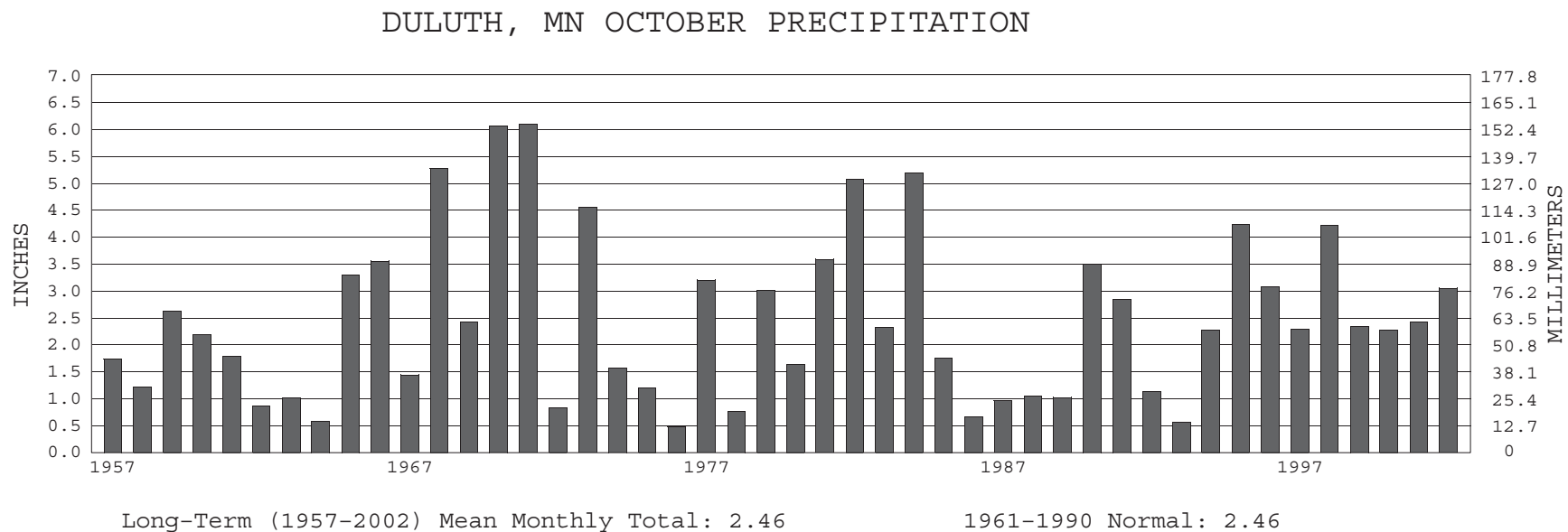
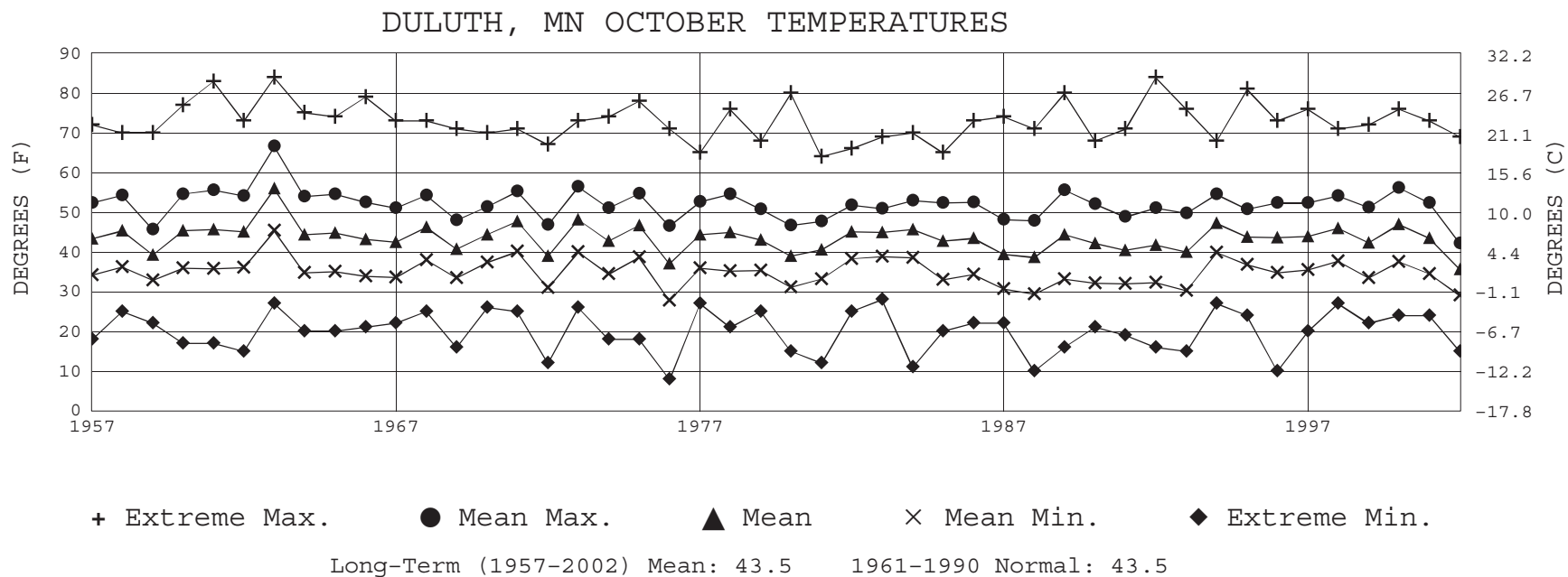
OCTOBER 2002

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 Oktas		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 Oktas	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL																																					
SUNRISE: 0641						OCT 25						SUNSET: 1704						SUNRISE: 0650						OCT 31						SUNSET: 1655																																				
03	OVC	030		10.00		32	27	30	82	5	15	28.64	30.21	03	OVC	025		10.00		22	16	20	78	12	29	28.71	30.29																																							
06	OVC	005		2.00	-SN BR	31	30	31	96	3	10	28.60	30.17	06	CLR	NC		10.00		19	16	18	88	12	27	28.68	30.27																																							
09	OVC	001		1.00	-SN BR	32	32	32	100	5	11	28.56	30.13	09	BKN	009		10.00		21	17	20	85	15	29	28.67	30.26																																							
12	OVC	003		2.00	BR	34	33	34	97	7	12	28.50	30.07	12	CLR	NC		10.00		28	17	24	63	16	27	28.65	30.23																																							
15	OVC	003		1.75	BR	34	34	34	100	3	19	28.47	30.02	15	FEW	NC		10.00		31	15	26	51	17	29	28.59	30.17																																							
18	OVC	001		0.75	BR	34	34	34	100	0	00	28.45	30.01	18	FEW	NC		10.00		25	15	22	66	10	30	28.60	30.19																																							
21	VV	001		0.50	FG	34	33	34	97	6	28	28.44	29.99	21	FEW	NC		10.00		24	14	21	65	13	31	28.62	30.21																																							
24	OVC	015		9.00		33	32	33	96	7	29	28.44	30.00	24	BKN	049		10.00		22	15	20	75	9	29	28.62	30.20																																							
SUNRISE: 0642						OCT 26						SUNSET: 1703						3-HOURLY OBSERVATION NOTES																																																
03	OVC	013		6.00	BR	32	31	32	96	8	29	28.45	30.01	Sky Cover is the amount of the sky obscured. CLR or SKC = 0, FEW = 1/8-2/8,																																																				
06	OVC	009		4.00	BR	32	31	32	96	6	29	28.47	30.02	SCT = 3/8-4/8, BKN = 5/8-7/8, OVC = 8/8, VV = Vertical Visibilty = 8/8.																																																				
09	OVC	015		4.00	BR	33	31	32	92	8	29	28.50	30.05	Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.																																																				
12	OVC	029		10.00		33	27	31	78	13	27	28.50	30.06	NC= No ceiling detected.																																																				
15	OVC	027		10.00		33	28	31	82	9	30	28.51	30.08	& = Original observation contained additional weather elements.																																																				
18	OVC	035		10.00		33	26	30	75	12	29	28.54	30.11	See page 3 for additional notes.																																																				
21	SCT	NC		10.00		30	25	28	82	9	27	28.59	30.16																																																					
24	OVC	036		10.00		32	22	28	66	9	30	28.63	30.19																																																					
SUNRISE: 0644						OCT 27						SUNSET: 1701						SUMMARY BY HOUR																																																
03	OVC	036		10.00		32	24	29	73	8	29	28.66	30.22	HOUR (LST)	CEILOMETER	EFF CLD AMT	AVERAGES						PRESSURE (INCHES,HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	RESULTANT WIND (MPH)																																							
06	OVC	036		10.00		32	22	28	66	6	29	28.68	30.24														SPEED		DIRECTION																																					
09	OVC	033		10.00		32	25	29	75	9	29	28.70	30.28																																																					
12	SCT	NC		10.00		37	23	32	57	7	VR	28.70	30.27																																																					
15	SCT	NC		10.00		39	20	32	46	8	31	28.67	30.23																																																					
18	BKN	048		10.00		32	26	30	79	5	12	28.67	30.24																																																					
21	OVC	046		10.00		33	26	30	75	7	09	28.67	30.24																																																					
24	OVC	036		10.00		33	25	30	72	5	11	28.66	30.23																																																					
SUNRISE: 0645						OCT 28						SUNSET: 1659																																																						
03	OVC	026		9.00	-SN	33	28	31	82	6	12	28.64	30.20														01			35	31	33	85	28.55	30.10	8.40	7	3	29																											
06	OVC	080		5.00	-SN BR	32	29	31	88	5	18	28.62	30.19																																																					
09	OVC	048		3.00	-SN BR	33	30	32	89	9	16	28.63	30.20																																																					
12	OVC	032		6.00	HZ	36	29	33	76	8	15	28.61	30.17																																																					
15	OVC	037		10.00		38	28	34	68	7	09	28.58	30.14																																																					
18	OVC	041		10.00		36	29	33	76	3	08	28.58	30.15																																																					
21	OVC	050		10.00		38	27	34	65	8	15	28.61	30.17																																																					
24	OVC	050		10.00		37	27	33	67	3	10	28.61	30.17																																																					
SUNRISE: 0647						OCT 29						SUNSET: 1658																																																						
03	OVC	047		10.00	-RA	36	31	34	82	0	00	28.59	30.15																											02			35	31	33	85	28.55	30.10	8.40	7	3	29														
06	OVC	027		10.00	-RASN	35	32	34	89	3	11	28.62	30.18																																																					
09	OVC	014		5.00	-RA BR	36	33	35	89	6	16	28.64	30.20																																																					
12	OVC	008		10.00	-RA	38	34	36	86	0	00	28.62	30.18																																																					
15	OVC	010		7.00	-RA	38	36	37	93	3	34	28.61	30.17																																																					
18	OVC	015		10.00	-RA	36	35	36	97	5	36	28.64	30.20																																																					
21	OVC	032		10.00		35	33	34	93	8	36	28.67	30.23																																																					
24	OVC	016		6.00	-SN BR	34	32	33	92	7	35	28.68	30.24																																																					
SUNRISE: 0648						OCT 30						SUNSET: 1656																																																						
03	OVC	013		10.00		32	31	32	96	9	34	28.69	30.26																																								03			35	31	33	85	28.55	30.10	8.40	7	3	29	
06	OVC	011		10.00		31	29	30	92	6	34	28.71	30.28																																																					
09	OVC	027		10.00		30	25	28	82	12	34	28.73	30.31																																																					
12	OVC	025		10.00		30	23	28	75	13	33	28.73	30.30																																																					
15	OVC	028		10.00		30	19	26	64	9	33	28.71	30.28																																																					
18	OVC	023		10.00		27	18	24	69	10	34	28.71	30.29																																																					
21	OVC	019		10.00		23	16	21	74	13	30	28.73	30.31																																																					
24	OVC	023		10.00		22	14	20	71	13	31	28.72	30.30																																																					







OCTOBER 2002

DULUTH, MN

# LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

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