



# SEPTEMBER 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	73	60	67	7	63	64	0	2	TS TSRA RA BR HZ	0		0.0	0.14	28.42	29.91	7.6	22	9.2	24	17	20	14	01								
02	70	56	63	3	58	60	2	0	TS TSRA RA FG BR	0		0.0	0.53	28.20	29.69	6.2	26	10.7	35	31	28	31	02								
03	74	52	63	4	48	55	2	0		0		0.0	0.00	28.43	29.93	14.6	30	15.1	38*	31	30*	30	03								
04	74	47	61	2	51	55	4	0		0		0.0	0.00	28.65	30.17	7.3	13	8.5	26	11	23	11	04								
05	76	55	66	8	59	62	0	1	TS TSRA GR RA FG+ BR	0		T	0.40	28.55	30.06	11.1	15	13.8	21	11	17	17	05								
06	73	62	68	10	62	64	0	3		0		0.0	0.00	28.48	29.98	9.4	17	10.0	13	15	13	15	06								
07	88*	61	75	17	67	69	0	10	FG+ BCFG BR	0		0.0	0.00	28.46	29.95	9.3	20	11.1	16	21	16	21	07								
08	87	68	78*	21	65	69	0	13		0		0.0	0.00	28.52	30.00	11.3	22	12.4	25	19	18	22	08								
09	80	63	72	15	65	67	0	7	TS RA	0		0.0	T	28.50	29.99	4.2	30	9.5	20	34	15	35	09								
10	71	53	62	5	51	55	3	0	RA BR	0		0.0	1.21	28.57	30.08	9.3	35	9.7	36	36	24	01	10								
11	74	46	60	4	51	56	5	0	MIFG	0		0.0	0.00	28.59	30.11	6.5	27	7.1	21	26	16	28	11								
12	80	55	68	12	53	59	0	3		0		0.0	0.00	28.44	29.95	11.7	27	12.3	32	26	26	26	12								
13	65	51	58	3	51	54	7	0		0		0.0	0.00	28.43	29.94	4.0	13	7.1	14	23	12	23	13								
14	64	43	54	-1	48	53	11	0	RA	0		0.0	T	28.42	29.93	7.1	33	10.3	25	34	20	35	14								
15	64	38	51	-4	42	48	14	0		0		0.0	0.00	28.63	30.17	5.5	24	6.4	24	25	16	23	15								
16	77	50	64	10	52	56	1	0		0		0.0	0.00	28.43	29.94	9.0	25	9.2	24	25	21	26	16								
17	75	53	64	10	55	58	1	0	MIFG BCFG	0		0.0	0.00	28.38	29.88	6.0	16	6.8	18	19	15	20	17								
18	73	55	64	10	58	60	1	0	BR	0		0.0	0.00	28.18	29.67	8.7	12	9.1	21	13	17	15	18								
19	68	52	60	7	58	59	5	0	TSRA RA BR	0		0.0	0.41	28.06	29.55	2.9	32	7.1	21	32	16	25	19								
20	67	52	60	7	50	54	5	0		0		0.0	0.00	28.06	29.56	3.9	28	7.4	31	29	24	29	20								
21	60	42	51	-2	39	45	14	0	RA	0		0.0	0.01	28.32	29.84	12.9	27	13.2	35	25	28	25	21								
22	53	35	44	-8	36	40	21	0	RA	0		0.0	T	28.48	30.02	11.8	27	12.0	30	27	25	28	22								
23	46	34	40*	-12	37	39	25	0	RA BR	0		0.0	0.66	28.56	30.11	3.6	33	6.7	18	22	14	01	23								
24	55	32*	44	-8	36	41	21	0		0		0.0	0.00	28.67	30.22	7.1	20	8.4	21	19	18	21	24								
25	49	34	42	-9	40	41	23	0	RA BR	0		0.0	0.36	28.60	30.14	4.8	28	7.3	21	21	16	21	25								
26	57	35	46	-5	36	41	19	0		0		0.0	0.00	28.50	30.05	5.0	23	5.8	17	21	15	20	26								
27	57	37	47	-4	37	43	18	0		0		0.0	0.00	28.46	30.00	1.3	08	5.3	13	01	10	36	27								
28	50	44	47	-3	42	44	18	0	RA FG+ BCFG BR	0		0.0	0.15	28.59	30.13	5.2	09	5.6	14	11	12	11	28								
29	50	44	47	-3	47	47	18	0	DZ FG+ BR	0		0.0	0.02	28.46	29.99	10.6	09	10.7	22	11	16	09	29								
30	71	50	61	11	59	60	4	0	RA DZ FG+ MIFG BR	0		0.0	0.04	28.15	29.64	6.4	17	8.8	24	19	21	18	30								
67.4 48.6 58.0 ■■										50.5 53.9 8.1 1.3		< MONTHLY AVERAGES TOTALS-->			T	3.93	28.44	29.95	3.0	24	9.2	<-- MONTHLY AVERAGES									
2.9 3.8 3.3 ■■										<-----DEPARTURE FROM NORMAL----->										-.20		SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3									
DEGREE DAYS									GREATEST 24-HR PRECIPITATION: 1.21 DATE :10				SEA LEVEL PRESSURE DATE TIME																		
MONTHLY TOTAL DEPARTURE									GREATEST 24-HR SNOWFALL: T DATE :05				MAXIMUM : 30.28 24 0755																		
SEASON TO DATE TOTAL DEPARTURE									GREATEST SNOW DEPTH: 0 DATE :				MINIMUM : 29.47 20 1655																		
HEATING: 242 -89 337 -169									NUMBER OF DAYS WITH ➔				MAXIMUM TEMP ≥ 90: 0				MINIMUM TEMP ≤ 32 : 1				PRECIPITATION ≥ 0.01 INCH : 11										
COOLING: 39 27 311 122													MAXIMUM TEMP ≤ 32 : 0				MINIMUM TEMP ≤ 0 : 0				PRECIPITATION ≥ 0.10 INCH : 8										
													THUNDERSTORMS : 5				HEAVY FOG : 5				SNOWFALL ≥ 1.0 INCH : 0										

SEPTEMBER 2002  
DULUTH, MN

# HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

DULUTH, MN

SEPTEMBER 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					T	0.01	0.01	T				T	01	0.03	T				0.01	T	0.01	0.03	T			01	0.10	0.14	
02													02	0.47	0.05											02	0.52	0.53	
03													03													03		0.00	
04													04													04		0.00	
05					0.42	T							05													05	0.42	0.40	
06													06													06		0.00	
07													07													07		0.00	
08													08													08		0.00	
09													09			T								T	T	09		T	
10	0.54	0.27	0.26	0.04	0.01								10													10	1.12	1.21	
11													11													11		0.00	
12													12													12		0.00	
13													13													13		0.00	
14										T			14													14		T	
15											T		15													15		0.00	
16													16													16		0.00	
17													17													17		0.00	
18													18													18		0.00	
19													19													19		0.00	
20													20													20	0.57	0.41	
21													21						0.01							21		0.01	
22													22	T	T											22	0.01	T	
23													23	T	T			T								23	0.64	0.66	
24													24													24	T	0.00	
25													25	0.04	T	T	T									25	0.35	0.36	
26													26													26		0.00	
27													27													27		0.00	
28													28													28		0.00	
29													29	0.05	T	T										29	0.14	0.15	
30	T	T	0.01	T	T	T	T						30	0.03	0.02		T		0.01		0.01	T	T	T	0.01	30	0.03	0.02	
																												0.06	0.04

## 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  
SEPTEMBER 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							1.00	10.00	
02							.50	10.00	
03							10.00	10.00	
04							9.00	10.00	
05							.25	10.00	
06							8.00	10.00	
07							.25	10.00	
08							7.00	10.00	
09							8.00	10.00	
10							2.50	10.00	
11							10.00	10.00	
12							10.00	10.00	
13							7.00	10.00	
14							7.00	10.00	
15							10.00	10.00	
16							10.00	10.00	
17							.75	10.00	
18							4.00	10.00	
19							1.00	10.00	
20							10.00	10.00	
21							10.00	10.00	
22							9.00	10.00	
23							1.50	10.00	
24							10.00	10.00	
25							1.75	10.00	
26							10.00	10.00	
27							10.00	10.00	
28							<.25	10.00	
29							.25	7.00	
30							<.25	9.00	
<b>MONTHLY AVGS</b>							5.80	9.87	
<p align="center"><b>SUNSHINE (MINUTES)</b></p> <p>Total:                  Possible:</p> <p align="center">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">30</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                12             17</p>									

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

SEPTEMBER 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>Oktas</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>Oktas</small>	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
					SUNRISE: 0528	SEP 01			SUNSET: 1850										SUNRISE: 0536	SEP 07									
03	FEW	NC			7.00					12	21	28.52	30.02	03	CLR	NC			2.00	BCFG	62	61	61	96	10	15	28.42	29.92	
06	BKN	018			5.00	-TSRA	BR			9	27	28.52	30.03	06	FEW	NC			1.00	BCFG	62	61	61	96	5	13	28.45	29.95	
09	CLR	NC			5.00	HZ				15	19	28.42	29.91	09	CLR	NC			8.00		75	67	70	76	14	20	28.46	29.95	
12	BKN	019			4.00	HZ				10	25	28.42	29.91	12	CLR	NC			10.00		85	69	74	59	12	20	28.46	29.95	
15	BKN	110			2.50	BR				5	32	28.36	29.85	15	CLR	NC			10.00		88	68	74	52	12	20	28.45	29.94	
18	OVC	100			1.00	-TSRA	BR			9	20	28.34	29.83	18	CLR	NC			8.00		82	70	74	67	12	19	28.46	29.95	
21	OVC	049			8.00	-RA				9	22	28.34	29.84	21	CLR	NC			9.00		78	71	73	79	13	24	28.49	29.97	
24	BKN	060			10.00					7	22	28.30	29.79	24	CLR	NC			10.00		75	65	68	71	13	24	28.51	30.00	
					SUNRISE: 0530	SEP 02			SUNSET: 1848										SUNRISE: 0537	SEP 08									
03	BKN	050			4.00	BR				3	18	28.26	29.75	03	CLR	NC			10.00		71	63	66	76	13	24	28.52	30.01	
06	OVC	025			10.00					6	17	28.22	29.71	06	CLR	NC			10.00		69	59	63	70	15	23	28.53	30.02	
09	OVC	012			10.00					7	24	28.21	29.70	09	CLR	NC			10.00		74	61	66	64	17	19	28.52	30.01	
12	OVC	008			8.00					14	16	28.11	29.60	12	CLR	NC			10.00		83	66	72	57	14	22	28.51	30.00	
15	BKN	019			10.00					15	30	28.10	29.59	15	CLR	NC			10.00		87	65	72	48	16	22	28.50	29.98	
18	CLR	NC			10.00					17	30	28.17	29.66	18	CLR	NC			8.00		81	68	72	65	10	20	28.51	30.00	
21	CLR	NC			10.00					12	28	28.25	29.74	21	CLR	NC			7.00		75	69	71	82	8	20	28.51	30.01	
24	CLR	NC			10.00					14	29	28.27	29.77	24	CLR	NC			8.00		74	67	69	79	13	23	28.51	30.00	
					SUNRISE: 0531	SEP 03			SUNSET: 1846										SUNRISE: 0539	SEP 09									
03	CLR	NC			10.00					12	28	28.30	29.80	03	CLR	NC			9.00		72	65	67	79	13	22	28.49	29.97	
06	CLR	NC			10.00					15	28	28.34	29.85	06	SCT	NC			10.00		70	64	66	82	10	25	28.49	29.98	
09	CLR	NC			10.00					17	30	28.39	29.89	09	FEW	NC			10.00		75	67	70	76	12	29	28.50	29.99	
12	FEW	NC			10.00					26	31	28.42	29.92	12	BKN	027			10.00		79	69	72	72	10	31	28.50	29.99	
15	CLR	NC			10.00					23	31	28.45	29.95	15	OVC	010			10.00		72	67	69	84	12	34	28.51	30.00	
18	CLR	NC			10.00					13	31	28.49	29.99	18	OVC	027			10.00		70	64	66	82	6	35	28.53	30.03	
21	CLR	NC			10.00					7	33	28.53	30.04	21	OVC	037			10.00		66	60	62	81	9	04	28.52	30.02	
24	CLR	NC			10.00					7	32	28.58	30.09	24	OVC	018			10.00		63	59	61	87	8	07	28.44	29.93	
					SUNRISE: 0532	SEP 04			SUNSET: 1844										SUNRISE: 0540	SEP 10									
03	CLR	NC			10.00					3	27	28.62	30.14	03	OVC	009			2.50	RA BR	55	53	54	93	18	02	28.48	29.98	
06	CLR	NC			10.00					0	00	28.66	30.19	06	FEW	NC			10.00		54	52	53	93	7	35	28.54	30.06	
09	CLR	NC			10.00					9	15	28.70	30.22	09	FEW	NC			10.00		60	52	56	75	13	36	28.58	30.10	
12	CLR	NC			9.00					9	16	28.69	30.20	12	SCT	NC			10.00		67	51	58	57	12	35	28.58	30.09	
15	CLR	NC			10.00					10	13	28.65	30.16	15	FEW	NC			10.00		70	43	55	38	15	35	28.57	30.09	
18	CLR	NC			10.00					12	12	28.62	30.14	18	FEW	NC			10.00		66	49	57	54	5	33	28.59	30.11	
21	FEW	NC			10.00					13	12	28.63	30.14	21	CLR	NC			10.00		55	51	53	87	0	00	28.63	30.15	
24	CLR	NC			10.00					13	10	28.63	30.14	24	CLR	NC			10.00		54	50	52	87	0	00	28.63	30.14	
					SUNRISE: 0533	SEP 05			SUNSET: 1842										SUNRISE: 0541	SEP 11									
03	CLR	NC			10.00					14	12	28.58	30.09	03	CLR	NC			10.00		50	49	49	96	0	00	28.63	30.15	
06	BKN	070			7.00					12	12	28.58	30.09	06	CLR	NC			10.00	MIFG	47	45	46	93	0	00	28.64	30.17	
09	OVC	015			10.00					12	13	28.57	30.09	09	FEW	NC			10.00		67	52	58	59	6	29	28.64	30.16	
12	FEW	NC			10.00					12	16	28.54	30.05	12	BKN	075			10.00		72	52	60	50	14	27	28.61	30.13	
15	SCT	NC			10.00					14	17	28.52	30.03	15	BKN	075			10.00		70	52	60	53	13	27	28.57	30.09	
18	BKN	120			10.00					12	18	28.52	30.03	18	FEW	NC			10.00		68	53	59	59	8	24	28.54	30.06	
21	SCT	NC			10.00					17	17	28.53	30.04	21	CLR	NC			10.00		61	53	57	75	8	25	28.54	30.05	
24	SCT	NC			10.00					12	17	28.52	30.03	24	CLR	NC			10.00		58	52	55	81	9	26	28.52	30.03	
					SUNRISE: 0535	SEP 06			SUNSET: 1840										SUNRISE: 0542	SEP 12									
03	SCT	NC			10.00					6	19	28.50	30.00	03	CLR	NC			10.00		57	49	53	75	10	26	28.50	30.01	
06	OVC	007			8.00					12	18	28.51	30.02	06	CLR	NC			10.00		56	49	52	77	12	25	28.48	29.98	
09	CLR	NC			10.00					12	18	28.50	30.01	09	CLR	NC			10.00		66	54	59	65	12	28	28.46	29.96	
12	SCT	NC			10.00					12	18	28.50	29.99	12	CLR	NC			10.00		77	54	63	45	21	28	28.42	29.91	
15	CLR	NC			10.00					12	18	28.46	29.95	15	CLR	NC			10.00		79	55	64	44	20	27	28.39	29.88	
18	CLR	NC			10.00					12	15	28.43	29.93	18	FEW	NC			10.00		71	57	63	61	10	27	28.39	29.89	
21	CLR	NC			10.00					7	13	28.45	29.95	21	CLR	NC			10.00		64	55	59	73	8	31	28.44	29.93	
24	FEW	NC			9.00					13	15	28.43	29.93	24	CLR	NC			10.00		59	53	56	81	3	33	28.47	29.97	

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

SEPTEMBER 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: 0544				SEP 13				SUNSET: 1827				SUNRISE: 0552				SEP 19				SUNSET: 1815											
03	CLR	NC			10.00	54	51	52	90	6	01	28.48	29.97	03	OVC	006			1.50	-RA	BR	61	60	60	97	15	13	28.00	29.48		
06	CLR	NC			10.00	54	47	50	77	5	09	28.50	30.01	06	OVC	011			10.00			61	59	60	93	5	08	28.01	29.49		
09	CLR	NC			10.00	60	48	54	65	9	11	28.50	30.01	09	OVC	007			10.00			64	61	62	90	0	00	28.03	29.50		
12	CLR	NC			10.00	64	49	56	58	8	11	28.47	29.97	12	OVC	005			3.00	BR		65	62	63	90	12	31	28.03	29.51		
15	CLR	NC			10.00	61	50	55	67	7	13	28.42	29.93	15	BKN	025			10.00			65	59	61	81	8	32	28.05	29.54		
18	OVC	110			10.00	56	49	52	77	3	11	28.37	29.89	18	OVC	014			10.00			59	54	56	83	10	32	28.11	29.60		
21	OVC	075			10.00	56	52	54	87	6	20	28.34	29.85	21	OVC	027			10.00			56	52	54	87	5	32	28.15	29.65		
24	OVC	055			7.00	59	58	58	96	9	23	28.33	29.83	24	BKN	017			10.00			55	51	53	87	5	36	28.14	29.64		
SUNRISE: 0545				SEP 14				SUNSET: 1825				SUNRISE: 0553				SEP 20				SUNSET: 1813											
03	OVC	042			10.00	61	57	59	87	9	25	28.29	29.79	03	OVC	019			10.00			55	51	53	87	0	00	28.12	29.61		
06	OVC	021			10.00	59	57	58	93	10	26	28.28	29.78	06	OVC	021			10.00			54	51	52	90	3	04	28.09	29.58		
09	OVC	017			10.00	62	58	60	86	12	30	28.30	29.81	09	OVC	009			10.00			55	52	53	90	6	09	28.09	29.59		
12	BKN	033			10.00	61	46	53	58	12	35	28.39	29.89	12	OVC	017			10.00			59	53	56	81	0	00	28.03	29.52		
15	FEW	NC			10.00	62	41	51	46	15	02	28.45	29.95	15	CLR	NC			10.00			65	50	57	59	10	27	27.99	29.47		
18	FEW	NC			10.00	58	40	49	51	9	35	28.52	30.04	18	CLR	NC			10.00			58	45	51	62	7	26	28.00	29.49		
21	CLR	NC			10.00	51	41	46	69	5	34	28.61	30.13	21	BKN	060			10.00			60	51	55	72	15	29	28.04	29.54		
24	CLR	NC			10.00	45	41	43	86	5	34	28.64	30.17	24	CLR	NC			10.00			52	41	47	66	12	29	28.13	29.63		
SUNRISE: 0546				SEP 15				SUNSET: 1823				SUNRISE: 0554				SEP 21				SUNSET: 1811											
03	CLR	NC			10.00	41	38	40	89	0	00	28.67	30.21	03	BKN	120			10.00			48	40	44	74	14	28	28.19	29.69		
06	CLR	NC			10.00	40	38	39	93	0	00	28.72	30.26	06	SCT	NC			10.00			43	38	41	82	9	27	28.25	29.76		
09	CLR	NC			10.00	58	43	50	58	7	25	28.72	30.25	09	FEW	NC			10.00			53	39	46	59	14	26	28.31	29.82		
12	SCT	NC			10.00	61	41	51	48	8	25	28.69	30.22	12	SCT	NC			10.00			57	39	48	51	18	26	28.32	29.84		
15	FEW	NC			10.00	63	42	52	47	8	25	28.61	30.14	15	BKN	075			10.00			59	38	49	46	21	26	28.34	29.85		
18	CLR	NC			10.00	59	44	51	58	8	23	28.57	30.11	18	SCT	NC			10.00			49	42	46	77	8	27	28.39	29.92		
21	CLR	NC			10.00	53	45	49	74	9	23	28.53	30.05	21	SCT	NC			10.00			44	39	42	83	8	28	28.43	29.96		
24	CLR	NC			10.00	51	45	48	80	10	24	28.50	30.02	24	CLR	NC			10.00			43	38	41	82	10	27	28.44	29.96		
SUNRISE: 0548				SEP 16				SUNSET: 1821				SUNRISE: 0555				SEP 22				SUNSET: 1809											
03	CLR	NC			10.00	51	45	48	80	13	25	28.46	29.98	03	CLR	NC			10.00			39	37	38	93	9	26	28.44	29.96		
06	CLR	NC			10.00	50	45	47	83	13	25	28.44	29.96	06	SCT	NC			10.00			40	37	39	89	12	27	28.45	29.98		
09	CLR	NC			10.00	59	48	53	67	12	25	28.43	29.95	09	BKN	021			10.00			46	39	43	77	17	28	28.48	30.01		
12	CLR	NC			10.00	70	54	61	57	10	26	28.42	29.93	12	SCT	NC			10.00			50	41	46	71	16	29	28.49	30.02		
15	CLR	NC			10.00	76	58	65	54	10	26	28.41	29.91	15	OVC	075			10.00			51	33	43	50	13	29	28.49	30.02		
18	CLR	NC			10.00	70	59	63	68	7	22	28.42	29.92	18	BKN	075			10.00			46	36	41	68	8	26	28.50	30.05		
21	CLR	NC			10.00	61	57	59	87	0	00	28.44	29.94	21	FEW	NC			10.00			38	34	36	86	7	26	28.52	30.07		
24	CLR	NC			10.00	60	56	58	86	0	00	28.43	29.93	24	CLR	NC			10.00			36	33	35	89	7	26	28.52	30.07		
SUNRISE: 0549				SEP 17				SUNSET: 1819				SUNRISE: 0557				SEP 23				SUNSET: 1807											
03	CLR	NC			8.00	56	53	54	90	0	00	28.44	29.94	03	OVC	060			10.00			38	34	36	86	0	00	28.52	30.06		
06	CLR	NC			9.00	54	52	53	93	3	16	28.43	29.93	06	OVC	035			10.00			41	38	40	89	10	23	28.51	30.06		
09	CLR	NC			10.00	64	57	60	78	7	18	28.44	29.95	09	OVC	020			3.00	RA	BR	40	37	39	89	7	05	28.50	30.06		
12	CLR	NC			10.00	73	56	63	55	12	21	28.40	29.90	12	OVC	018			5.00	-RA	BR	40	38	39	93	14	04	28.51	30.06		
15	CLR	NC			10.00	72	56	62	57	12	17	28.34	29.84	15	OVC	070			10.00			44	39	42	83	6	32	28.56	30.11		
18	CLR	NC			10.00	60	55	57	84	8	12	28.32	29.83	18	SCT	NC			10.00			44	40	42	85	5	31	28.61	30.16		
21	CLR	NC			9.00	55	54	54	96	7	13	28.32	29.83	21	CLR	NC			10.00			38	36	37	93	7	31	28.65	30.20		
24	CLR	NC			7.00	55	53	54	93	6	14	28.30	29.80	24	CLR	NC			10.00			34	32	33	92	6	29	28.68	30.24		
SUNRISE: 0550				SEP 18				SUNSET: 1817				SUNRISE: 0558				SEP 24				SUNSET: 1805											
03	BKN	044			8.00	58	55	56	90	7	14	28.26	29.75	03	BKN	048			10.00			33	31	32	92	0	00	28.70	30.25		
06	BKN	019			6.00	57	56	56	96	5	13	28.25	29.74	06	FEW	NC			10.00			32	30	31	92	0	00	28.71	30.27		
09	BKN	014			7.00	62	58	60	86	12	14	28.22	29.72	09	CLR	NC			10.00			45	38	42	77	8	23	28.73	30.28		
12	FEW	NC			10.00	71	61	65	71	9	14	28.17	29.66	12	SCT	NC			10.00			50	37	44	61	12	21	28.70	30.25		
15	SCT	NC			7.00	70	61	64	73	9	11	28.14	29.63	15	BKN	090															

## OBSERVATIONS AT 3-HOURLY INTERVALS

DULUTH, MN

SEPTEMBER 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		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		DRY BULB	DEW POINT	WET BULB		SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL
					SUNRISE: 0559	SEP 25		SUNSET: 1803																			
03	BKN	090					48	44	46	86	14	21	28.57	30.10													
06	BKN	025					48	46	47	93	12	24	28.58	30.11													
09	OVC	018			1.75	RA BR	47	45	46	93	7	32	28.60	30.14													
12	OVC	048			10.00	-RA	41	37	39	86	6	32	28.63	30.17													
15	BKN	055			10.00	-RA	40	38	39	93	6	31	28.62	30.16													
18	SCT	NC			10.00		40	37	39	89	3	29	28.61	30.16													
21	CLR	NC			10.00		36	35	36	97	6	32	28.62	30.17													
24	CLR	NC			10.00		37	34	36	89	3	34	28.60	30.16													
					SUNRISE: 0601	SEP 26		SUNSET: 1759																			
03	BKN	120					38	36	37	93	0	00	28.57	30.12													
06	SCT	NC					38	37	38	97	0	00	28.56	30.12													
09	CLR	NC					46	36	41	68	6	25	28.55	30.10													
12	CLR	NC					53	35	45	51	7	20	28.51	30.05													
15	CLR	NC					57	34	46	42	12	22	28.46	29.99													
18	CLR	NC					51	38	45	61	8	21	28.45	29.98													
21	CLR	NC					45	37	41	74	8	23	28.44	29.97													
24	CLR	NC					39	35	37	86	7	25	28.43	29.96													
					SUNRISE: 0602	SEP 27		SUNSET: 1757																			
03	CLR	NC					42	36	39	79	7	31	28.41	29.94													
06	CLR	NC					38	35	37	89	7	35	28.43	29.96													
09	CLR	NC					50	37	44	61	6	06	28.46	29.98													
12	CLR	NC					56	36	46	47	5	12	28.47	29.99													
15	FEW	NC					57	35	47	44	3	13	28.45	29.97													
18	SCT	NC					53	34	44	49	3	14	28.48	30.02													
21	OVC	100					47	40	44	77	5	10	28.52	30.05													
24	BKN	095					46	34	41	63	6	11	28.53	30.07													
					SUNRISE: 0603	SEP 28		SUNSET: 1755																			
03	OVC	075					45	40	43	83	3	02	28.57	30.10													
06	OVC	085					45	36	41	71	6	04	28.59	30.12													
09	SCT	NC					47	39	43	74	8	10	28.61	30.15													
12	OVC	003			2.50	-RA BR	46	45	46	96	5	11	28.62	30.17													
15	OVC	002			1.00	BR	47	47	47	100	8	12	28.57	30.11													
18	VV	001			<.25	FG	44	44	44	100	6	13	28.59	30.13													
21	VV	001			0.25	FG	44	44	44	100	7	09	28.59	30.14													
24	OVC	002			2.50	BR	44	44	44	100	7	08	28.58	30.12													
					SUNRISE: 0605	SEP 29		SUNSET: 1753																			
03	VV	001			0.25	FG	44	44	44	100	10	07	28.55	30.09													
06	OVC	001			1.25	BR	45	45	45	100	12	08	28.55	30.10													
09	OVC	003			4.00	BR	46	45	46	96	13	09	28.54	30.09													
12	OVC	003			4.00	BR	49	47	48	93	14	08	28.48	30.01													
15	OVC	001			0.25	FG	49	48	48	97	10	09	28.43	29.96													
18	VV	001			0.25	FG	49	49	49	100	10	08	28.39	29.91													
21	VV	001			0.25	-DZ FG	49	49	49	100	8	11	28.36	29.88													
24	VV	001			0.25	-DZ FG	50	49	49	96	10	09	28.27	29.79													
					SUNRISE: 0606	SEP 30		SUNSET: 1751																			
03	VV	001			0.25	-DZ FG	52	52	52	100	12	11	28.20	29.71													
06	VV	001			0.25	-DZ FG	54	54	54	100	8	16	28.18	29.68													
09	BKN	006			2.00	BR	60	60	60	100	10	20	28.16	29.66													
12	BKN	100			9.00		68	60	63	76	12	18	28.10	29.60													
15	OVC	110			8.00		68	63	65	84	8	15	28.09	29.59													
18	FEW	NC			7.00		65	61	63	87	3	14	28.10	29.59													
21	CLR	NC			6.00	BR	63	61	62	93	6	22	28.12	29.62													
24	CLR	NC			5.00	MIFG	61	60	60	97	8	29	28.16	29.65													

### 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			54	49	51	86	28.45	29.96	8.53	8	3	23
02			53	49	51	88	28.44	29.96	8.28	9	3	24
03			53	49	51	88	28.44	29.95	8.08	8	2	22
04			52	49	50	90	28.44	29.95	8.49	7	2	23
05			52	49	51	89	28.44	29.96	8.46	8	2	25
06			52	49	50	90	28.45	29.97	8.58	7	3	24
07			54	50	52	88	28.45	29.97	7.91	8	3	23
08			57	51	54	83	28.45	29.97	8.06	10	3	23
09			59	51	55	76	28.45	29.97	8.69	10	3	22
10			61	52	56	72	28.45	29.96	9.13	11	3	22
11			63	52	57	69	28.45	29.96	9.23	11	4	23
12			64	52	57	67	28.44	29.95	8.82	11	4	25
13			65	52	58	65	28.43	29.94	8.85	12	4	26
14			65	52	58	64	28.42	29.94	9.11	12	4	25
15			65	51	57	64	28.42	29.93	8.96	11	4	26
16			65	51	57	64	28.42	29.93	8.97	12	4	24
17			63	51	56	66	28.42	29.94	8.88	11	4	24
18			60	51	55	72	28.43	29.94	8.68	8	3	22
19			58	51	54	79	28.43	29.95	8.85	8	2	22
20			57	51	53	81	28.44	29.96	9.02	8	2	23
21			56	51	53	84	28.44	29.96	8.85	8	2	22
22			55	50	53	84	28.44	29.96	8.85	8	3	23
23			54	50	52	85	28.44	29.95	8.79	8	3	24
24			54	49	52	85	28.44	29.95	8.79	8	3	23

## 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 Visiblity = 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.

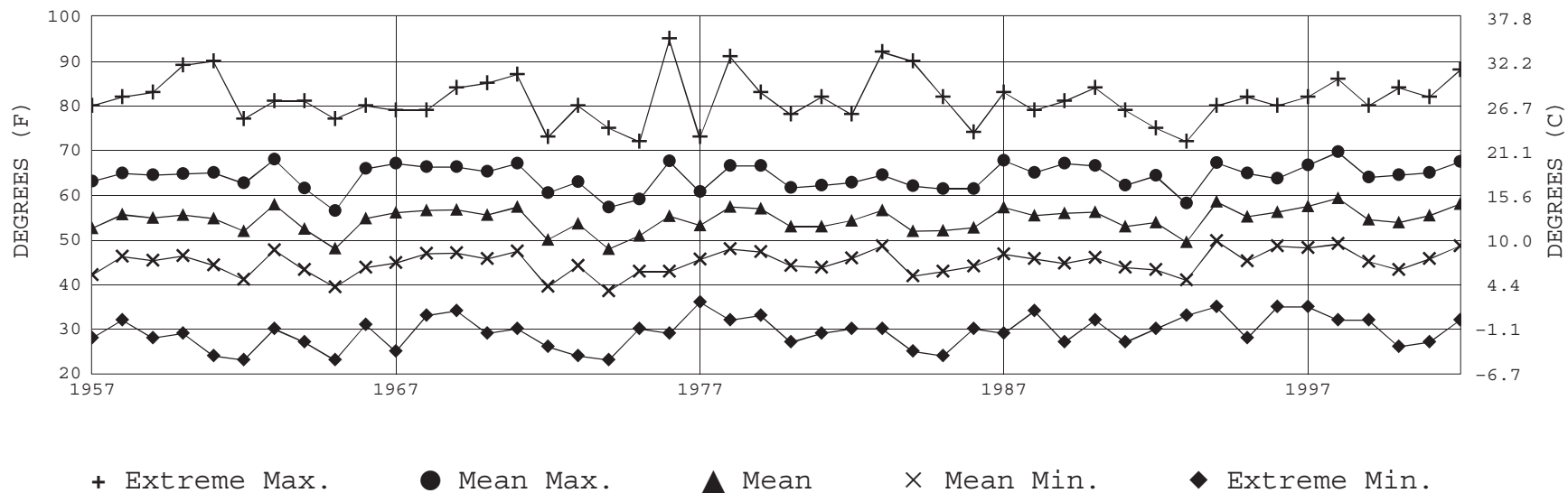
See page 3 for additional notes.

## SUMMARY BY HOUR

HOUR (LST)	AVERAGES										RESULTANT WIND (MPH)	
	CEILOMETER	EFF CLD AMT	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY	PRESSURE (INCHES, HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	SPEED	DIRECTION
							STATION	SEA LEVEL				
01			54	49	51	86	28.45	29.96	8.53	8	3	23
02			53	49	51	88	28.44	29.96	8.28	9	3	24
03			53	49	51	88	28.44	29.95	8.08	8	2	22
04			52	49	50	90	28.44	29.95	8.49	7	2	23
05			52	49	51	89	28.44	29.96	8.46	8	2	25
06			52	49	50	90	28.45	29.97	8.58	7	3	24
07			54	50	52	88	28.45	29.97	7.91	8	3	23
08			57	51	54	83	28.45	29.97	8.06	10	3	23
09			59	51	55	76	28.45	29.97	8.69	10	3	22
10			61	52	56	72	28.45	29.96	9.13	11	3	22
11			63	52	57	69	28.45	29.96	9.23	11	4	23
12			64	52	57	67	28.44	29.95	8.82	11	4	25
13			65	52	58	65	28.43	29.94	8.85	12	4	26
14			65	52	58	64	28.42	29.94	9.11	12	4	25
15			65	51	57	64	28.42	29.93	8.96	11	4	26
16			65	51	57	64	28.42	29.93	8.97	12	4	24
17			63	51	56	66	28.42	29.94	8.88	11	4	24
18			60	51	55	72	28.43	29.94	8.68	8	3	22
19			58	51	54	79	28.43	29.95	8.85	8	2	22
20			57	51	53	81	28.44	29.96	9.02	8	2	23
21			56	51	53	84	28.44	29.96	8.85	8	2	22
22			55	50	53	84	28.44	29.96	8.85	8	3	23
23			54	50	52	85	28.44	29.95	8.79	8	3	24
24			54	49	52	85	28.44	29.95	8.79	8	3	23

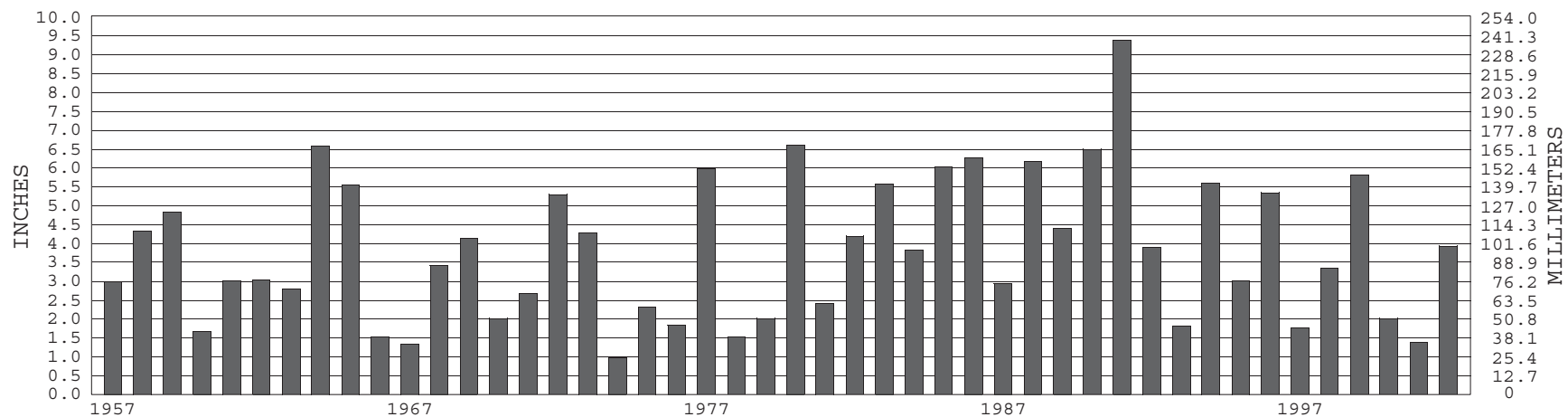


## DULUTH, MN SEPTEMBER TEMPERATURES



Long-Term (1957-2002) Mean: 54.5    1961-1990 Normal: 54.7

## DULUTH, MN SEPTEMBER PRECIPITATION



Long-Term (1957-2002) Mean Monthly Total: 3.83

1961-1990 Normal: 4.13



SEPTEMBER 2002

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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