



# Comparing Climate and Weather



NOAA Climate Program Office



1971 — Annual 4<sup>th</sup> of July Picnic — Minneapolis, Minnesota





1972 — 4<sup>th</sup> of July Picnic — Minneapolis, Minnesota





1980 — 4<sup>th</sup> of July Picnic — Minneapolis, Minnesota



1990 — Annual 4<sup>th</sup> of July Picnic — Minneapolis, Minnesota



2000 — Annual 4<sup>th</sup> of July Picnic — Minneapolis, Minnesota

# July 4 Temperatures (°F)

## Minneapolis, Minnesota

Year	Min	Max	Year	Min	Max
1971	66	84	1986	68	89
1972	43	71	1987	62	83
1973	59	83	1988	67	95
1974	62	83	1989	67	95
1975	70	86	1990	67	84
1976	60	88	1991	62	78
1977	75	92	1992	53	71
1978	64	79	1993	68	86
1979	61	80	1994	67	86
1980	62	90	1995	68	76
1981	64	85	1996	61	87
1982	64	99	1997	52	73
1983	59	75	1998	60	77
1984	64	84	1999	80	93
1985	63	82	2000	69	80

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Year	Min	Max	Year	Min	Max
1971	66	84	1986	68	89
1972	43	71	1987	62	83
1973	59	83	1988	67	95
1974	62	83	1989	67	95
1975	70	86	1990	67	84
1976	60	88	1991	62	78
1977	75	92	1992	53	71
1978	64	79	1993	68	86
1979	61	80	1994	67	86
1980	62	90	1995	68	76
1981	64	85	1996	61	87
1982	64	99	1997	52	73
1983	59	75	1998	60	77
1984	64	84	1999	80	93
1985	63	82	2000	69	80

# July 4 Temperatures (°F)

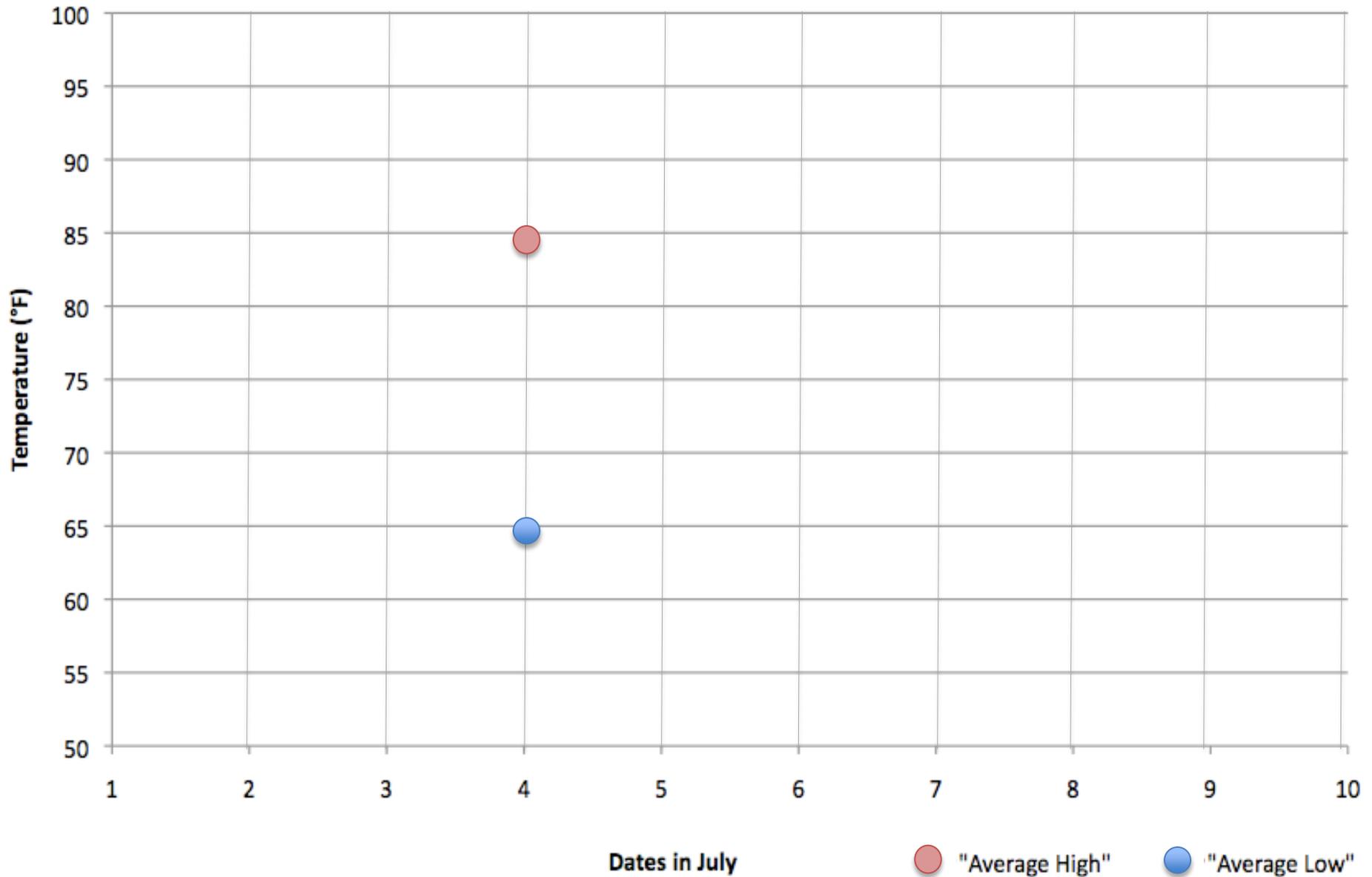
## Minneapolis, Minnesota

Year	Min	Max	Year	Min	Max
1971	66	84	1986	68	89
1972	43	71	1987	62	83
1973	59	83	1988	67	95
1974	62	83	1989	67	95
1975	70	86	1990	67	84
1976	60	88	1991	62	78
1977	75	92	1992	53	71
1978	64	79	1993	68	86
1979	61	80	1994	67	86
1980	62	90	1995	68	76
1981	64	85	1996	61	87
1982	64	99	1997	52	73
1983	59	75	1998	60	77
1984	64	84	1999	80	93
1985	63	82	2000	69	80

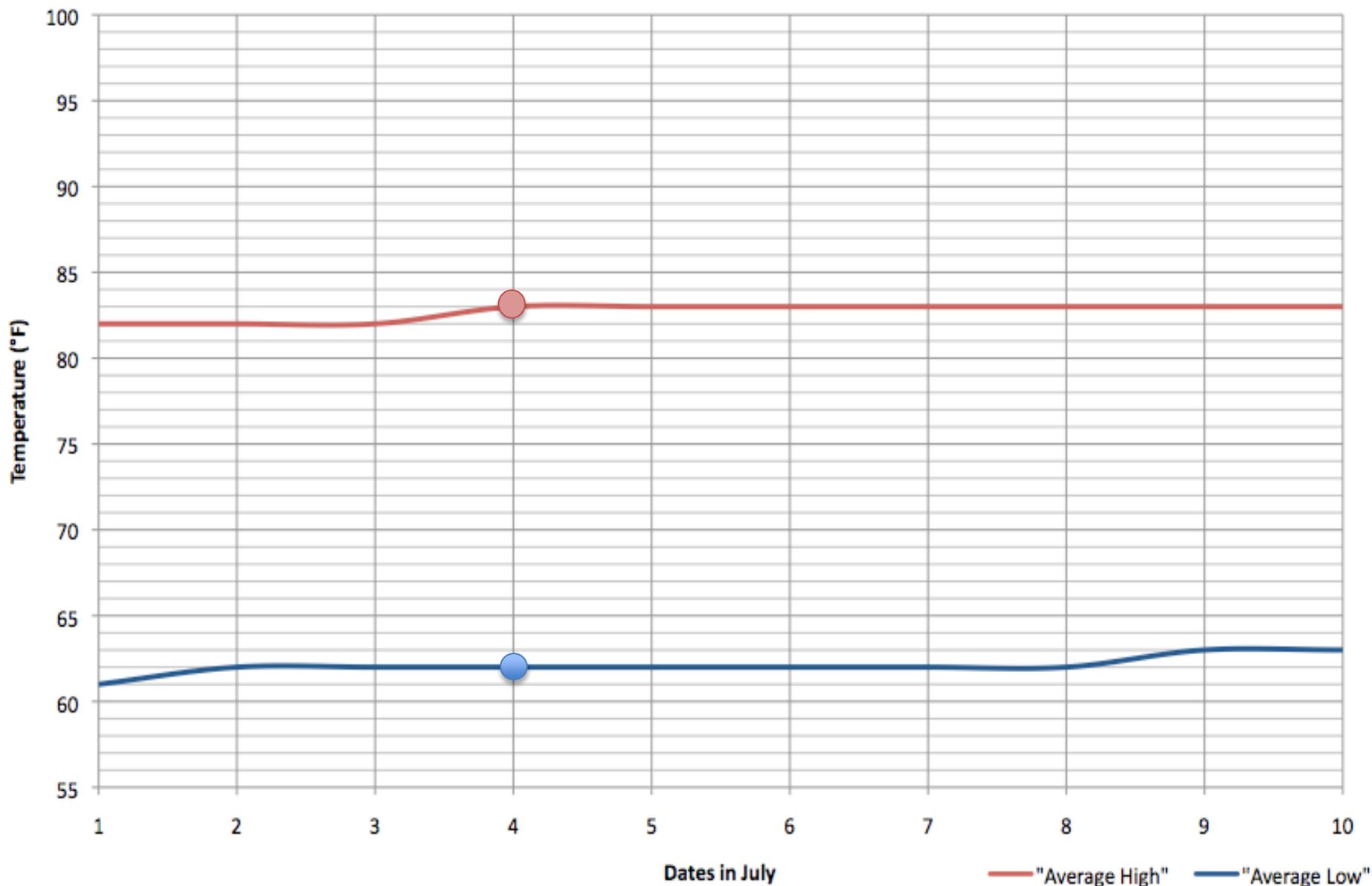
Average Minimum Temp = 64

Average Maximum Temp = 84

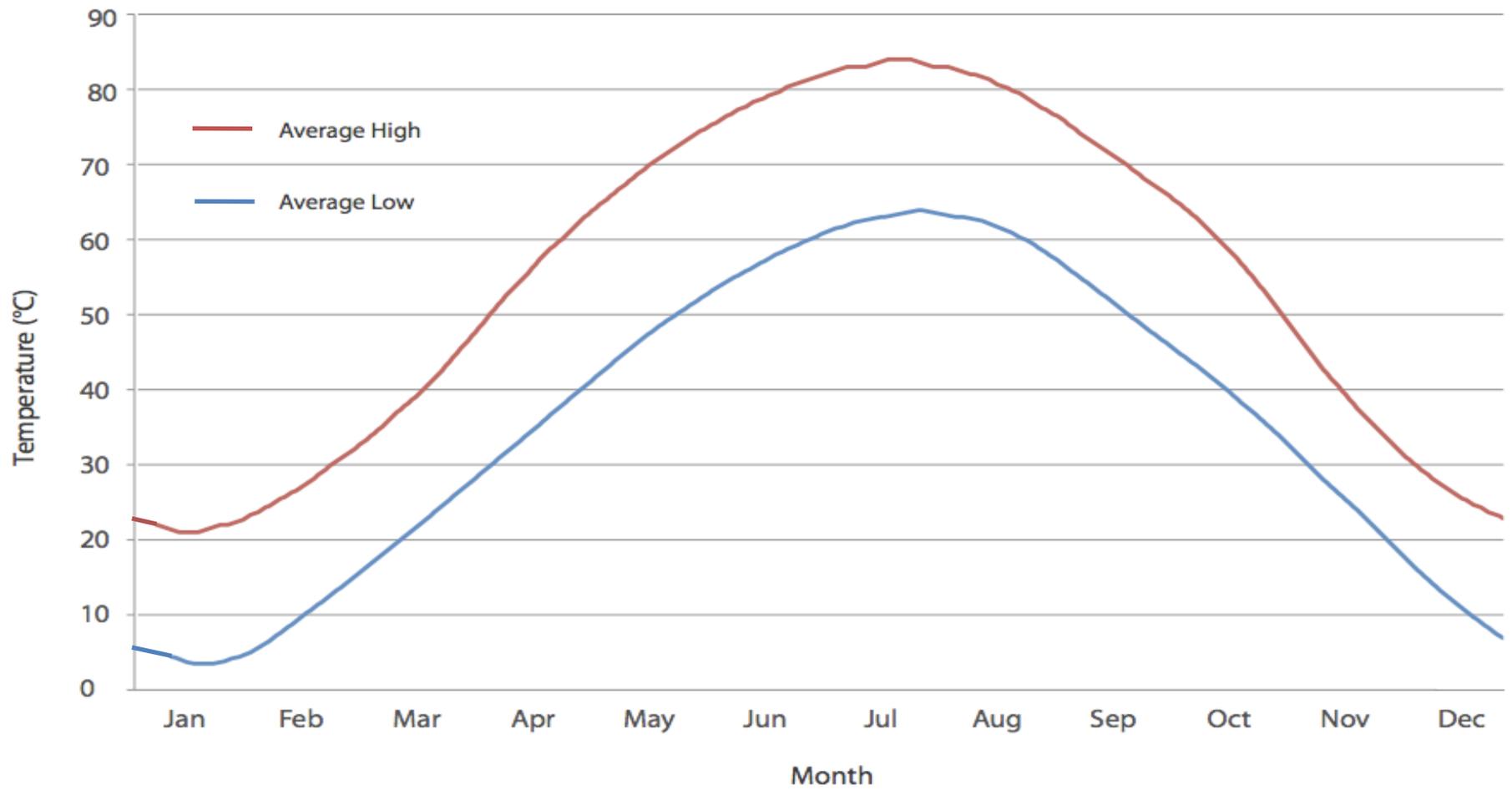
# Minneapolis, Minnesota — July 4 Climate Normals (1971-2000)



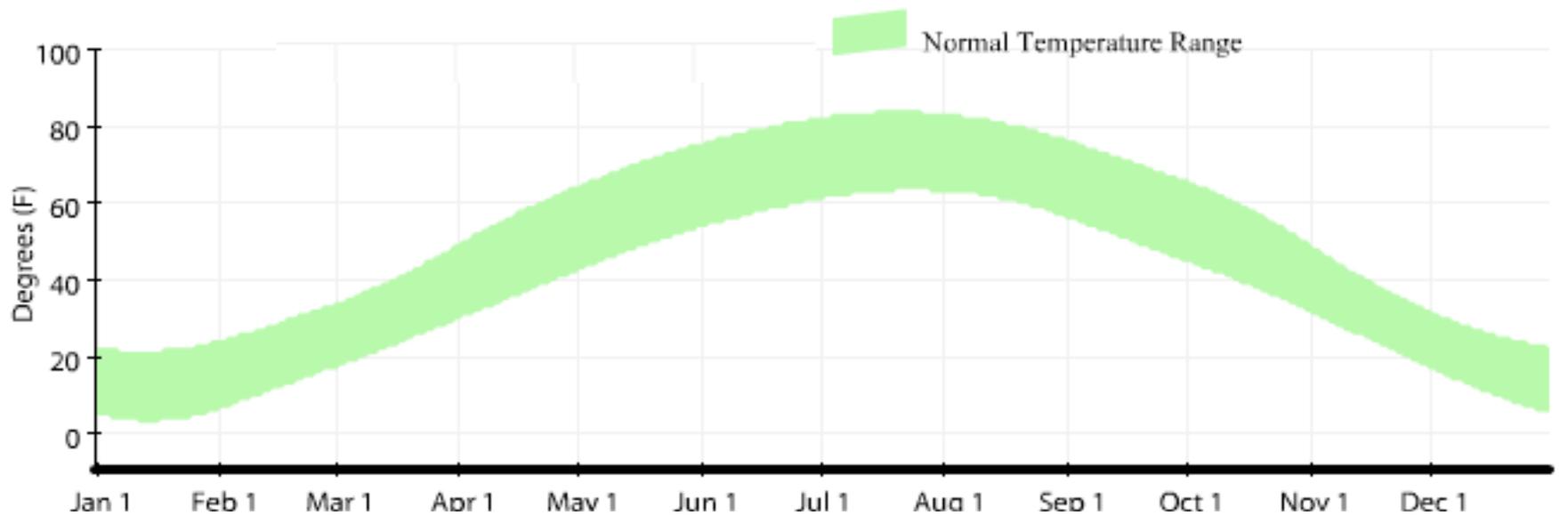
# Minneapolis, Minnesota — July 1-10 Climate Normals (1971-2000)



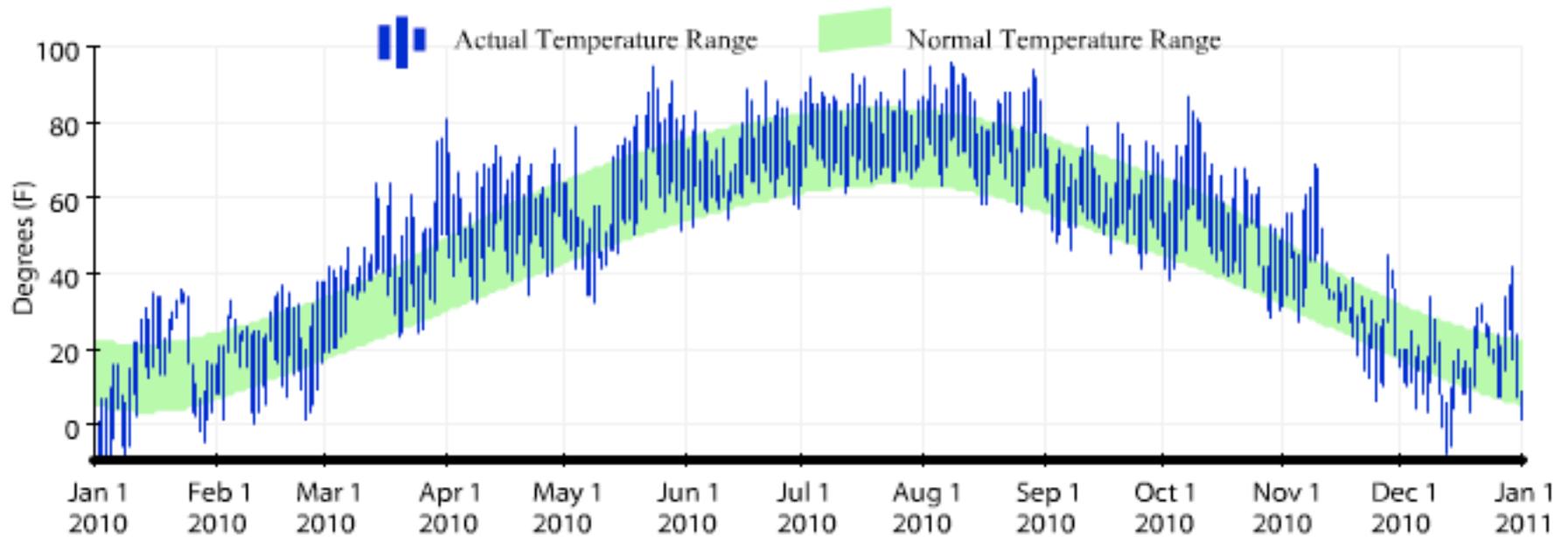
## Minneapolis, Minnesota — Climate Normals (1971-2000)



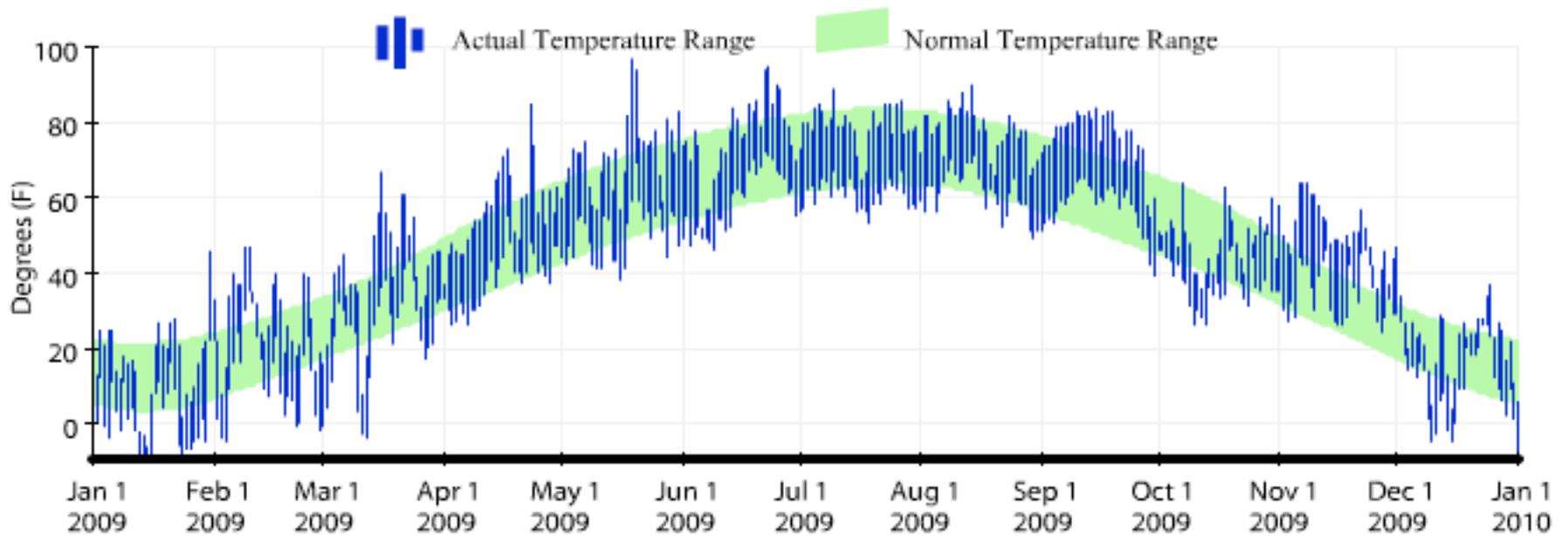
# Climate normals for Minneapolis, 1971 - 2000



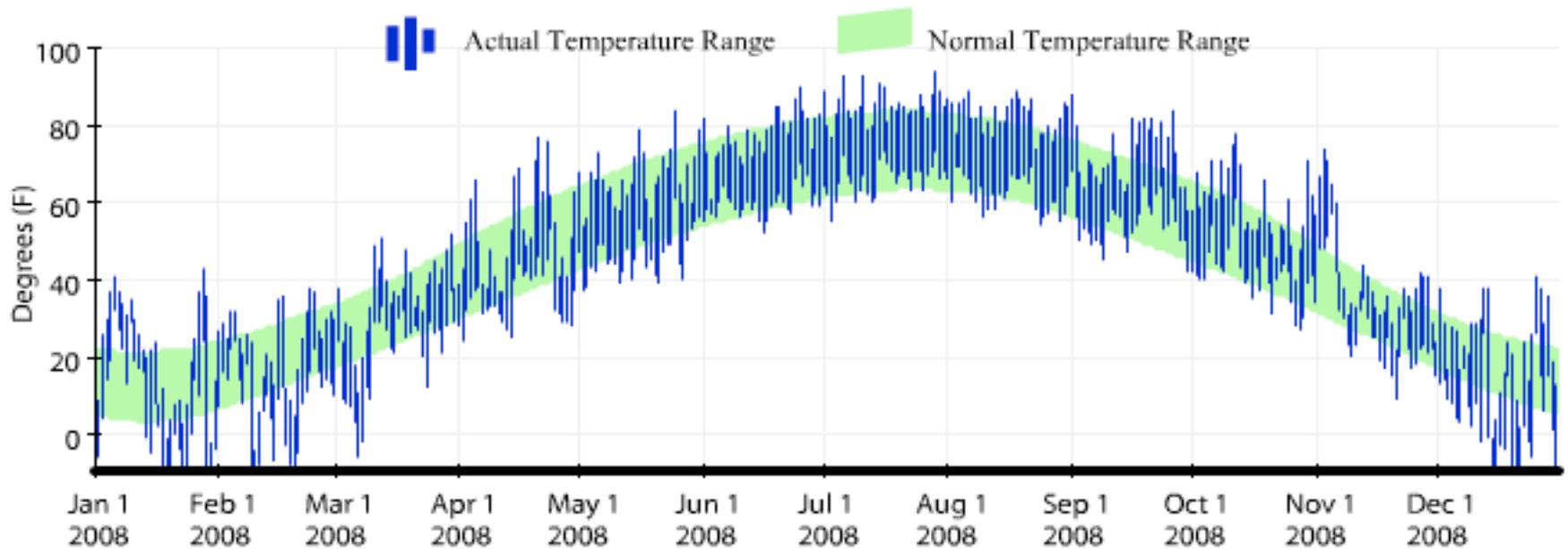
# Climate normals for Minneapolis, 1971 - 2000 Compared to 2010 weather



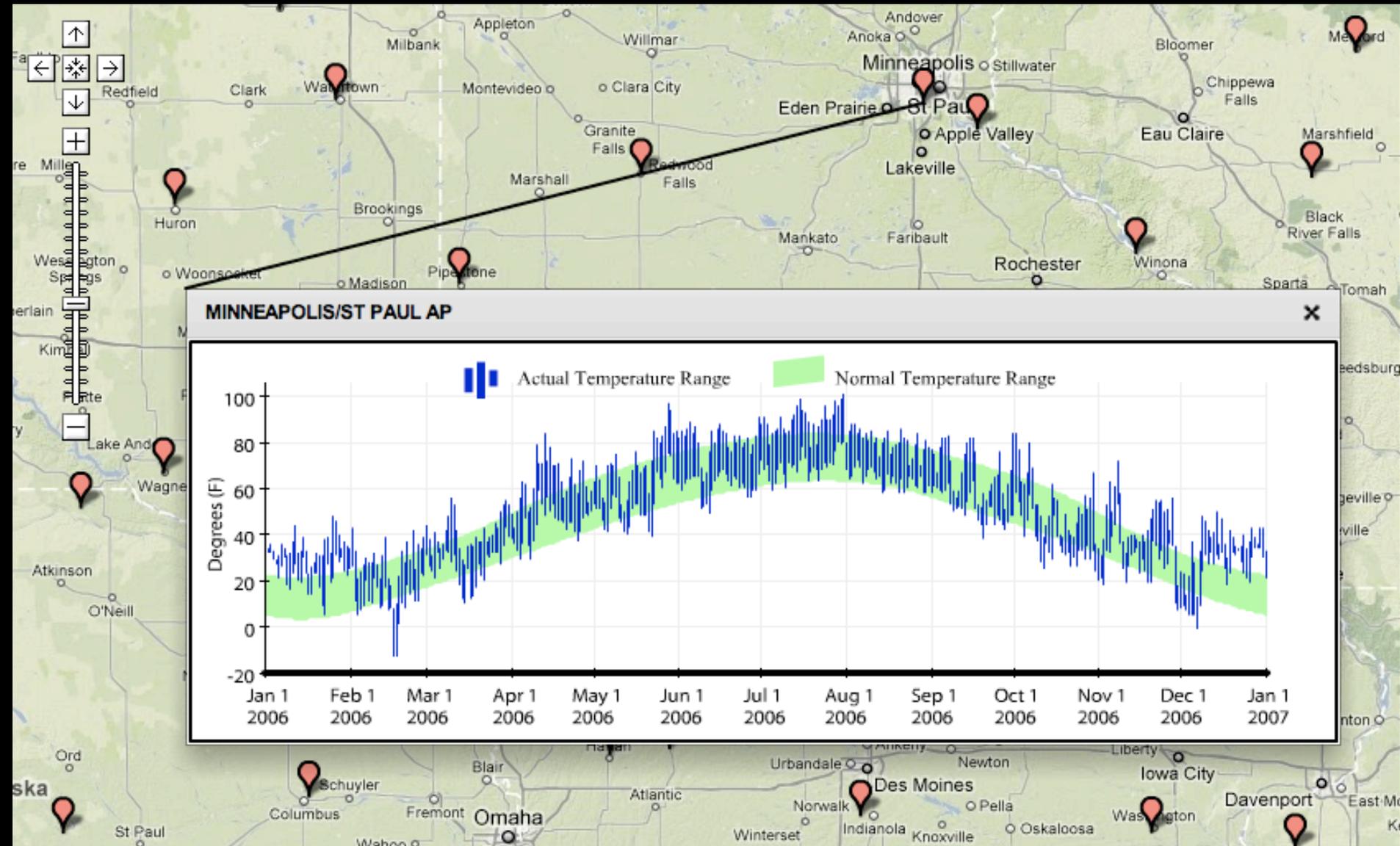
# Climate normals for Minneapolis, 1971 - 2000 Compared to 2009 weather



# Climate normals for Minneapolis, 1971 - 2000 Compared to 2008 weather



# Multigraph Climate Explorer



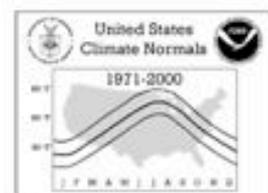
<http://climateexplorer.multigraph.org>



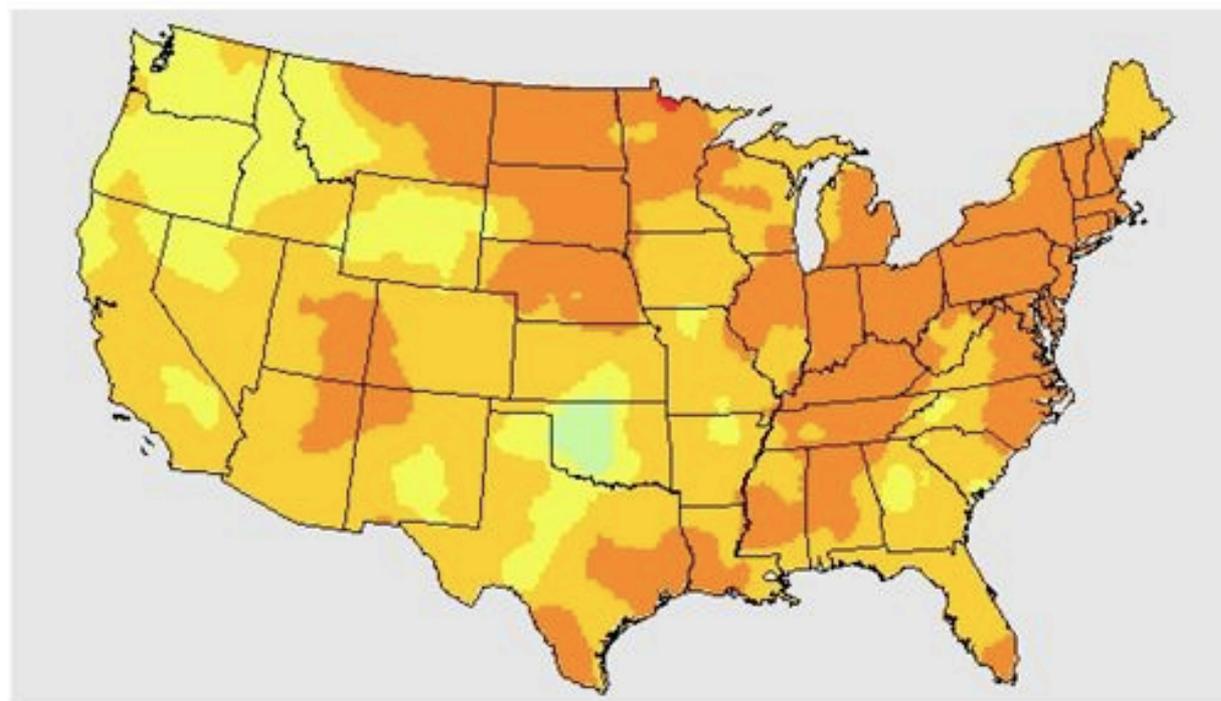
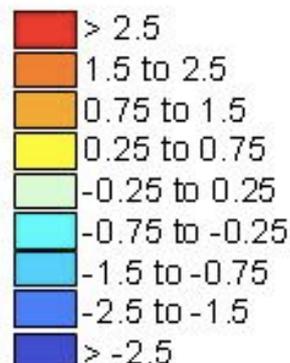
# U.S. Climate Normals, 1971-2000

Conterminous United States

*Difference: 1971-2000 minus 1961-1990 period*



**Degrees  
Fahrenheit**



**Winter (Dec - Feb)**  
Average Temperature

Climate and weather are not the same thing



Weather is what's happening outside your window

Atmospheric conditions that you can see, feel, or measure are weather.



# Climate can be described by words or numbers, but you cannot touch it

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND																				
1 TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND																				
D 1 2 3 4 5 6A 6B 7 8 9 10 11 12 13 14 15 16 17 18																				
:DY MA TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND																				
1 3 DY MAX MIN AVG DEP HDD CDD WTR SNW DPTH SPD SPD DIR MIN PSSL S-S WK SPD DR																				
1	4	1	1	34	9	22	13	43	0	M	M	M	14.2	27	310	M	M	4	32	310
1	5	2	2	12	3	9	-1	57	0	M	M	M	9.6	23	310	M	M	5	24	310
1	6	2	3	25	12	19	10	46	0	M	M	M	11.3	24	120	M	M	9	29	120
1	7	1	4	14	-6	4	-5	61	0	M	M	M	M	M	M	M	M	2	M	M
1	8	1	5	28	1	15	6	50	0	M	M	M	9.0	14	190	M	M	0	M	M
1	9	1	6	28	14	21	12	44	0	M	M	M	11.4	16	300	M	M	2	22	310
1	10	1	7	12	1	7	-2	58	0	M	M	M	17.5	25	300	M	M	10	31	300
1	11	1	8	14	-4	5	-4	60	0	M	M	M	6.8	13	310	M	M	3	M	M
1	12	1	9	18	14	16	8	49	0	M	M	M	12.7	16	90	M	M	10	17	40
1	13	-10	16	1	9	1	56	0	M	M	M	7.0	12	360	M	M	2	M	M	
1	14	-11	18	5	12	4	53	0	M	M	M	9.4	16	320	M	M	7	23	320	
1	15	-12	18	-6	6	-2	59	0	M	M	M	15.1	27	340	M	M	8	36	340	
1	16	1	13	-2	-18	-10	-18	75	0	M	M	M	8.8	18	320	M	M	4	24	320
1	17	2	14	-2	-18	-10	-18	75	0	M	M	M	14.7	22	30	M	M	4	22	310
1	18	2	15	-8	-24	-16	-24	81	0	M	M	M	8.3	13	300	M	M	1	17	310
1	19	2	16	12	-24	-6	-14	71	0	M	M	M	10.7	17	180	M	M	6	23	180
1	20	1	17	25	14	20	12	45	0	M	M	M	20.0	32	320	M	M	8	41	320
1	21	2	18	28	12	20	12	45	0	M	M	M	11.0	23	10	M	M	8	29	10
1	22	2	19	21	7	14	6	51	0	M	M	M	8.5	15	330	M	M	7	20	10
1	23	1	20	19	3	11	3	54	0	M	M	M	7.6	13	230	M	M	3	M	M
1	24	2	1	28	10	19	11	46	0	M	M	M	6.6	9	280	M	M	0	M	M
1	25	2	2	28	3	16	7	49	0	M	M	M	2.8	7	310	M	M	1	M	M
1	26	2	3	19	-6	7	-2	58	0	M	M	M	21.1	29	310	M	M	7	41	310
1	27	1	24	1	-11	-5	-18	70	0	M	M	M	10.1	14	290	M	M	0	M	M
1	28	2	25	9	-4	3	-10	62	0	M	M	M	8.4	13	290	M	M	2	M	M
1	29	2	26	9	0	5	-8	60	0	M	M	M	5.7	10	290	M	M	6	M	M
1	30	2	7	12	0	6	-7	59	0	M	M	M	4.5	8	190	M	M	3	M	M
1	31	4	28	27	-2	13	-1	52	0	M	M	M	9.4	16	210	M	M	4	16	200
1	32	2	28	3	16	2	49	0	M	M	M	18.5	30	310	M	M	4	35	310	
1	AV	16																		
1	SM	491	-11			1638	0	M	M	M	300.7		M						130	
1	AV	16.9	-0.4								10.7	FASTST	M	M	4				MAX(MPH)	
1												32	M						41	M

## Temperature Statistics

**AVERAGE MONTHLY: 8.3**  
**DPTR FM NORMAL: -1.2**  
**HIGHEST: 34 ON 1**  
**LOWEST: -24 ON 16,15**

[NO. OF DAYS WITH]

**MAX 32 OR BELOW: 28**  
**MAX 90 OR ABOVE: 0**  
**MIN 32 OR BELOW: 29**  
**MIN 0 OR BELOW: 13**



# And though climate is often characterized by temperature alone...

TEMPERATURE IN F:		:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND									
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18			
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18			
TEMPERATURE IN F:		:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND									
DY	MA	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	
1	3	DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR	
2	1																				
3	2																				
4	1	1	34	9	22	13	43	0	M	M	M	14.2	27	310	M	M	4			32	310
5	2	2	12	3	9	-1	57	0	M	M	M	9.6	23	310	M	M	5			24	310
6	2	3	25	12	19	10	46	0	M	M	M	11.3	24	120	M	M	9			29	120
7	1	4	14	-6	4	-5	61	0	M	M	M	M	M	M	M	M	2			M	M
8	1	5	28	1	15	6	50	0	M	M	M	9.0	14	190	M	M	0			M	M
9	1	6	28	14	21	12	44	0	M	M	M	11.4	16	300	M	M	2			22	310
10	1	7	12	1	7	-2	58	0	M	M	M	17.5	25	300	M	M	10			31	300
11	1	8	14	-4	5	-4	60	0	M	M	M	6.8	13	310	M	M	3			M	M
12	1	9	18	14	16	8	49	0	M	M	M	12.7	16	90	M	M	10			17	40
13	-	10	16	1	9	1	56	0	M	M	M	7.0	12	360	M	M	2			M	M
14	-	11	18	5	12	4	53	0	M	M	M	9.4	16	320	M	M	7			23	320
15	-	12	18	-6	6	-2	59	0	M	M	M	15.1	27	340	M	M	8			36	340
16	1	13	-2	-18	-10	-18	75	0	M	M	M	8.8	18	320	M	M	4			24	320
17	2	14	-2	-18	-10	-18	75	0	M	M	M	14.7	22	30	M	M	4			22	310
18	2	15	-8	-24	-16	-24	81	0	M	M	M	8.3	13	300	M	M	1			17	310
19	2	16	12	-24	-6	-14	71	0	M	M	M	10.7	17	180	M	M	6			23	180
20	1	17	25	14	20	12	45	0	M	M	M	20.0	32	320	M	M	8			41	320
21	2	18	28	12	20	12	45	0	M	M	M	11.0	23	10	M	M	8			29	10
22	2	19	21	7	14	6	51	0	M	M	M	8.5	15	330	M	M	7			20	10
23	1	20	19	3	11	3	54	0	M	M	M	7.6	13	230	M	M	3			M	M
24	2	1	28	10	19	11	46	0	M	M	M	6.6	9	280	M	M	0			M	M
25	2	2	28	3	16	7	49	0	M	M	M	2.8	7	310	M	M	1			M	M
26	2	3	19	-6	7	-2	58	0	M	M	M	21.1	29	310	M	M	7			41	310
27	1	24	1	-11	-5	-18	70	0	M	M	M	10.1	14	290	M	M	0			M	M
28	2	25	9	-4	3	-10	62	0	M	M	M	8.4	13	290	M	M	2			M	M
29	2	26	9	0	5	-8	60	0	M	M	M	5.7	10	290	M	M	6			M	M
30	2	27	12	0	6	-7	59	0	M	M	M	4.5	8	190	M	M	3			M	M
SM	4	28	27	-2	13	-1	52	0	M	M	M	9.4	16	210	M	M	4			16	200
29	28	3	16	2	49	0	M	M	M	M	18.5	30	310	M	M	4				35	310
AV	16																				
SM	491	-11					1638	0	M	M	M	300.7			M		130				
AV	16.9	-0.4										10.7	FASTST	M	M	4	MAX(MPH)				
												32	M				41	M			

**Temperature Statistics**

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[NO. OF DAYS WITH]

MAX 32 OR BELOW: 28  
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# Climate is really a multi-faceted concept

TEMPERATURE IN F:					:PCPN:		:SNOW:		:WIND:			:SUNSHINE:			SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	34	9	22	13	43	0	M	M	M	14.2	27	310	M	M	4		32	310
2	12	3	8	-1	57	0	M	M	M	9.6	23	310	M	M	5		24	310
3	25	12	19	10	46	0	M	M	M	11.3	24	120	M	M	9		29	120
4	14	-6	4	-5	61	0	M	M	M	M	M	M	M	M	2		M	M
5	28	1	15	6	50	0	M	M	M	9.0	14	190	M	M	0		M	M
6	28	14	21	12	44	0	M	M	M	11.4	16	300	M	M	2		22	310
7	12	1	7	-2	58	0	M	M	M	17.5	25	300	M	M	10		31	300
8	14	-4	5	-4	60	0	M	M	M	6.8	13	310	M	M	3		M	M
9	18	14	16	8	49	0	M	M	M	12.7	16	90	M	M	10		17	40
10	16	1	9	1	56	0	M	M	M	7.0	12	360	M	M	2		M	M
11	18	5	12	4	53	0	M	M	M	9.4	16	320	M	M	7		23	320
12	18	-6	6	-2	59	0	M	M	M	15.1	27	340	M	M	8		36	340
13	-2	-18	-10	-18	75	0	M	M	M	8.8	18	320	M	M	4		24	320
14	-2	-18	-10	-18	75	0	M	M	M	14.7	22	30	M	M	4		22	310



Every characterization of climate implies:

- Average conditions for a specific portion of the year
- Location (from local to global)
- Base time period

# Climate? or Weather?

Decide if each of the following phrases describes climate or weather.

# Climate? or Weather?

Tells us what kind of clothes to wear

# Weather

Tells us what kind of clothes to wear

# Climate? or Weather?

Tells us what kind of clothes to buy

# Climate?

Tells us what kind of clothes to buy

# Climate? or Weather?

Can change from year to year

# Weather

Can change from year to year

# Climate? or Weather?

The picture that comes to your mind  
when you think of a faraway place

# Climate?

The picture that comes to your mind  
when you think of a faraway place

# Climate? or Weather?

We usually have a winter storm during the last week of December

# Climate?

We usually have a winter storm during the last week of December

Match each phrase in the climate column to its comparison phrase in the weather column

## Climate

Average conditions •

Predictable patterns •

Calculated •

Requires decades •  
to detect change

## Weather

• Can change within an  
hour

• Observed

• Physical conditions

• Highly variable

Match each phrase in the climate column to its comparison phrase in the weather column

# Climate

# Weather

Average conditions

Can change within an hour

Predictable patterns

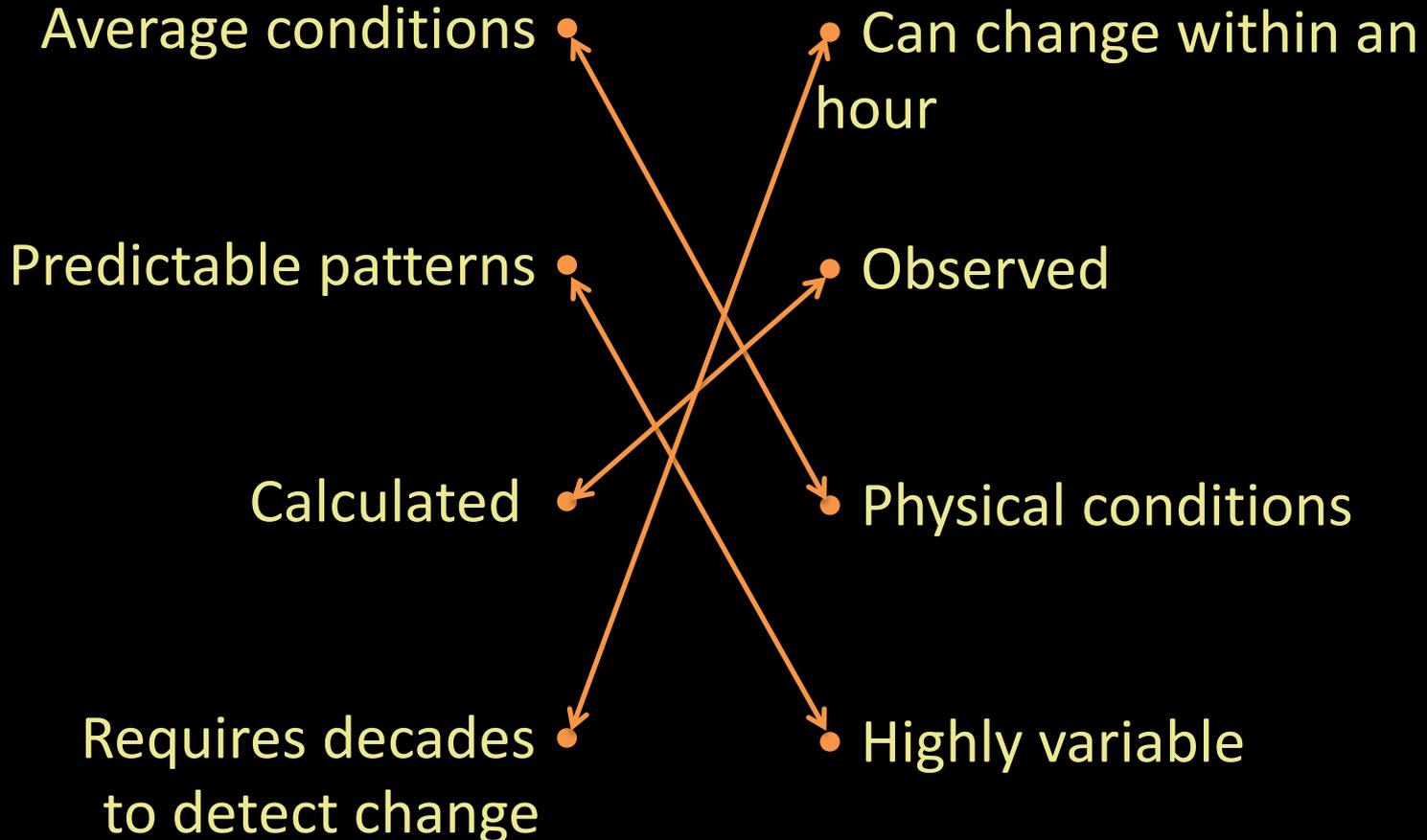
Observed

Calculated

Physical conditions

Requires decades to detect change

Highly variable



Presentation prepared by  
LuAnn Dahlman, NOAA Climate Program Office

The story in this presentation is fictional, but the data are real.

Credits for photos appear in the notes section on each slide.

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