Generating an Avg. Temp vs. % Leaf Fallen Graph

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Leaves, Buds, Global Warming Study

Define a Question

3 Types of Questions

- **Descriptive** – describes something; based on observations

  Ex. When did the study branches on Red Maple #1 lose all of their leaves?

- **Comparative** – compares two or more sites

  Ex. Do the leaves drop sooner in Williamstown or on Mt. Greylock?

- **Correlative** – explores a relationship between 2 variables

  Ex. What is the relationship between temperature and leaf drop dates?

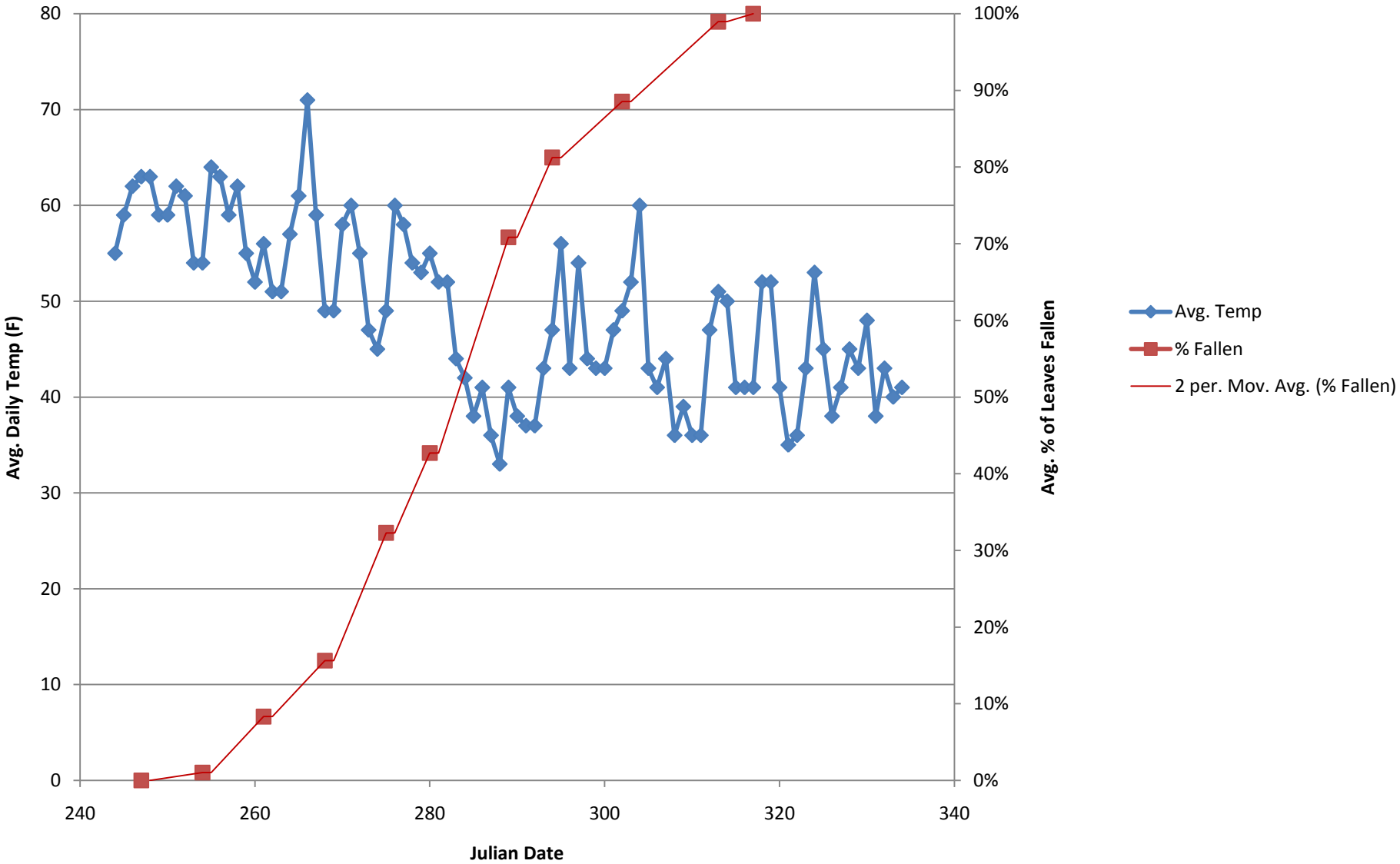
Choose an Appropriate Graph

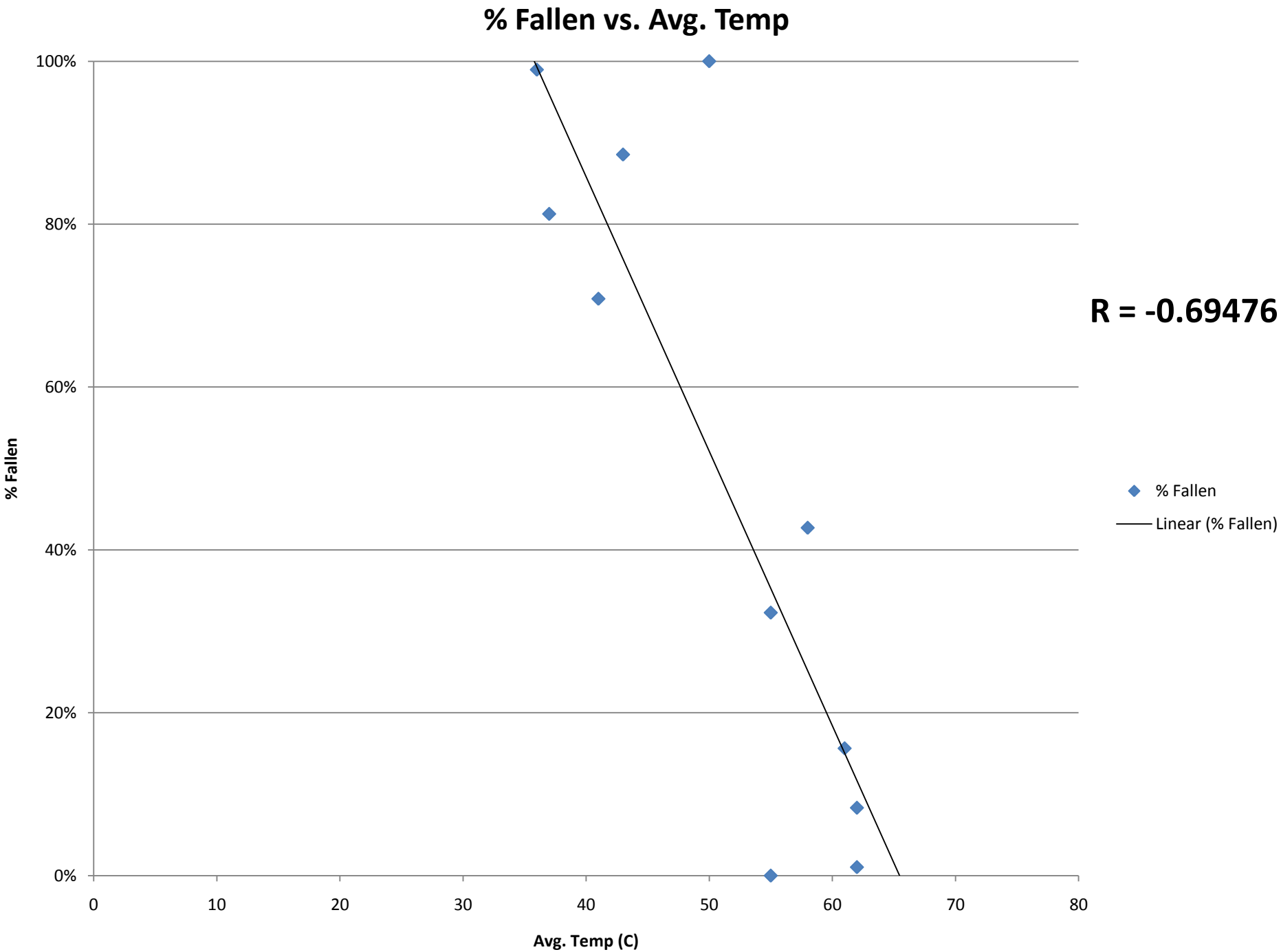
- % of a Whole – pie chart
- Comparisons – bar graphs
- Comparing % of a whole – stacked bar graph
- Relationships or Change Over Time – line graphs

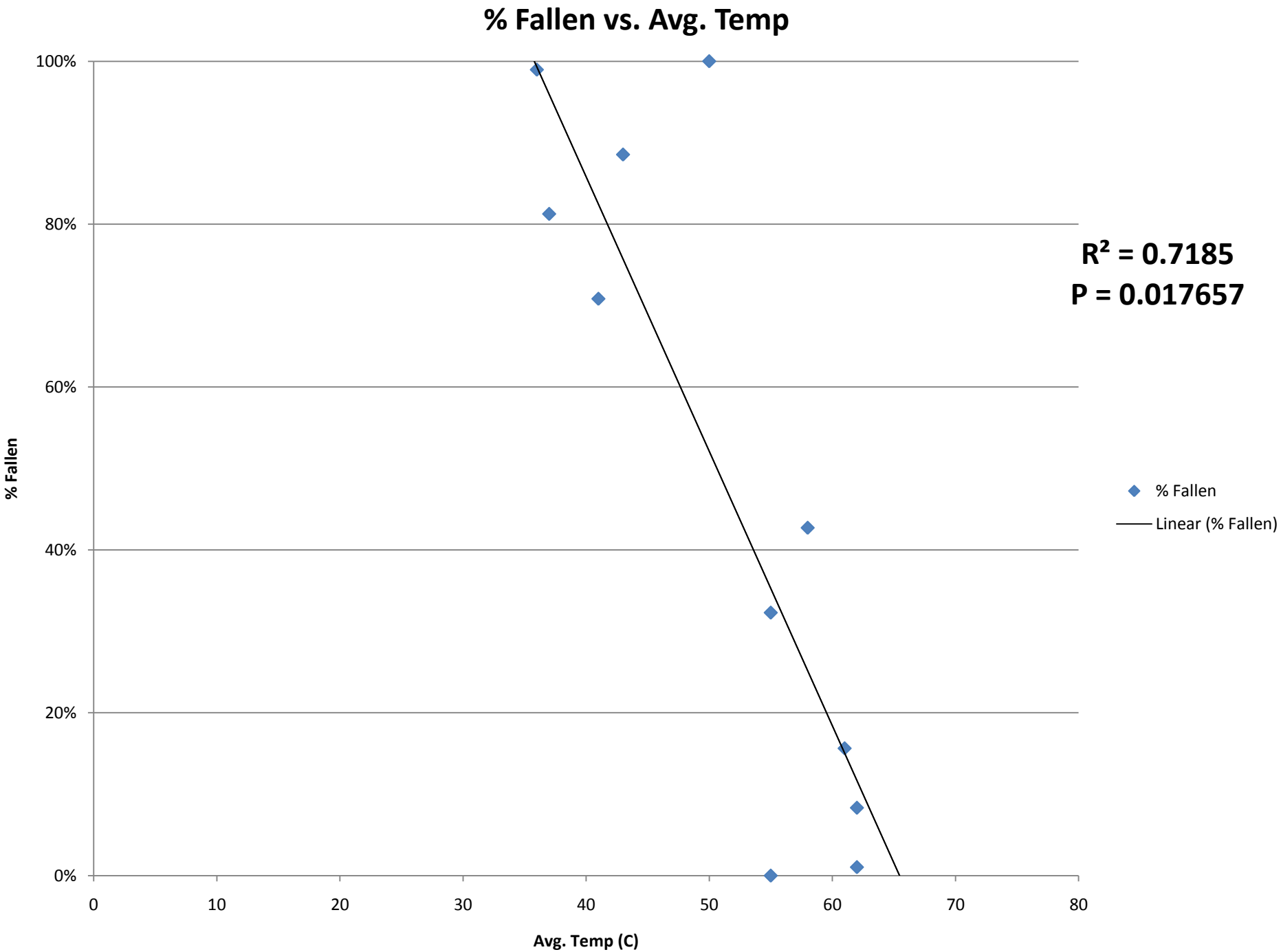
Statistical Analysis Tools

- **Comparison** – 2 sample T-test
- **Relationship** – correlation coefficient (R value)
- **Does y depend on x?** – coefficient of determination (R^2 value)
- Probability (P value)

Average Temperature and % of Leaves Fallen MAH (Bennington, VT Fall 2009)

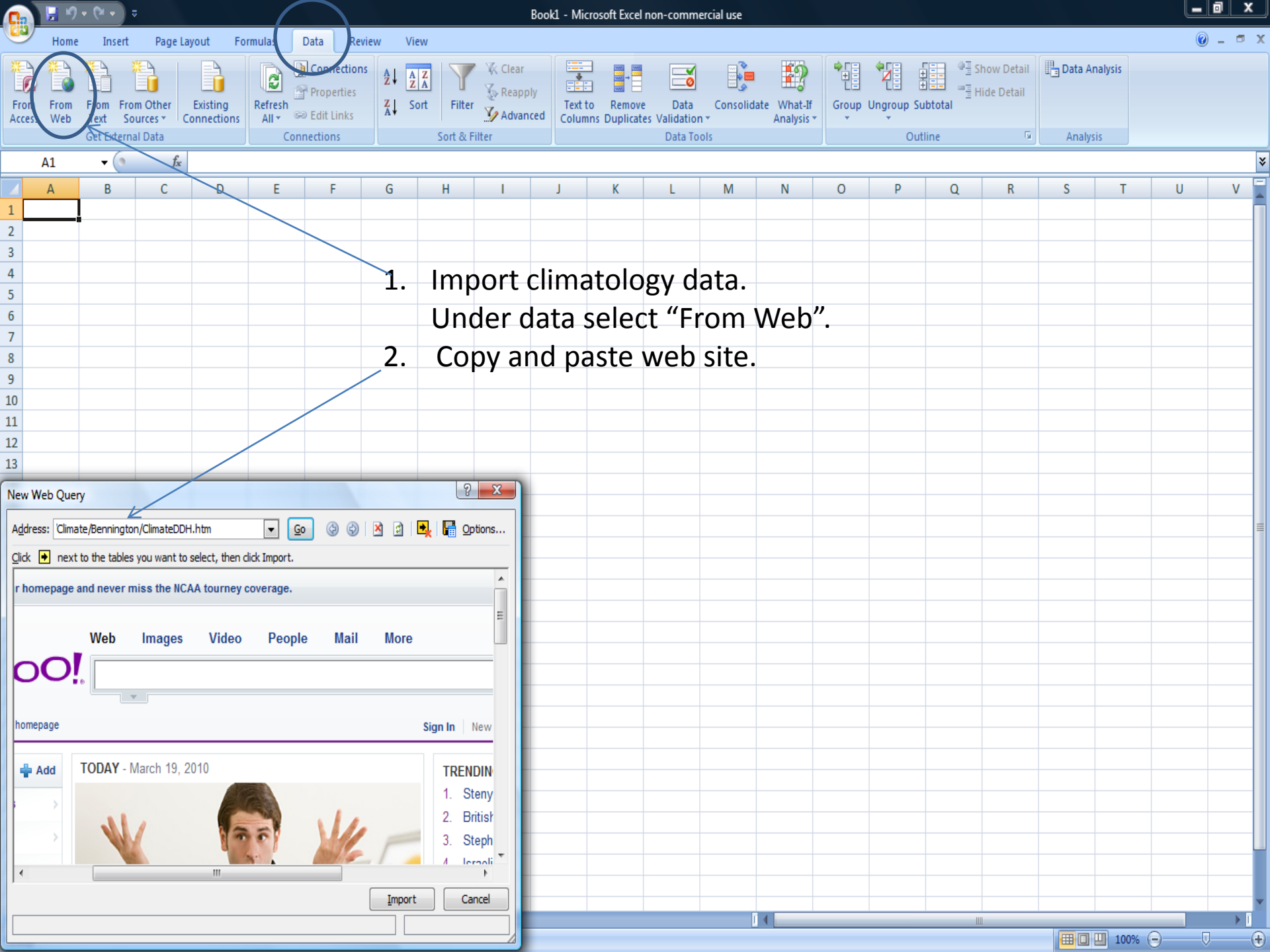



% Fallen vs. Avg. Temp
100%
80%
60%
40%
20%
0%
% Fallen
0
10
20
30
40
50
60
70
80
Avg. Temp (C)
R = -0.69476
% Fallen
Linear (% Fallen)


% Fallen vs. Avg. Temp
100%
80%
60%
40%
20%
0%
% Fallen
0
10
20
30
40
50
60
70
80
Avg. Temp (C)
R² = 0.7185
P = 0.017657
% Fallen
Linear (% Fallen)

Climatology Data

- http://www.erh.noaa.gov/aly/Climate/Bennington/ClimateDDH.htm



1. Import climatology data.
   Under data select “From Web”.
2. Copy and paste web site.

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Home | Insert | Page Layout | Formulas | Data | Review | View

From Access | From Web | From Text | From Other Sources | Existing Connections | Refresh All | Connections | Properties | Edit Links | Sort | Filter | Clear | Reapply | Advanced | Text to Columns | Remove Duplicates | Data Validation | Consolidate | What-If Analysis | Group | Ungroup | Subtotal | Show Detail | Hide Detail | Data Analysis

Get External Data | Connections | Sort & Filter | Data Tools | Outline | Analysis

A1

2. Click the arrow next to the tables you want to select
3. Click import

New Web Query

Address: http://www.erh.noaa.gov/aly/Climate/Bennington Go Options...

Click next to the tables you want to select, then click Import.

Mesonet Obs
Lakes & Rivers
Rain/Snow Reports
Hourly Surface Data
Surface Analysis
Radar & Satellite
Albany, NY
Montague, NY
Northeast Sector
National Mosaic
Satellite
Forecasts
Activity Planner
Area Discussions
HPC Discussions
Local Products
Forecast Images
Quick Forecast

```
                                        STATION:   BEN
                                        MONTH:     FEB
                                        YEAR:      201
                                        LATITUDE:   42
                                        LONGITUDE:  73

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SU
=================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13
                                       12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MI
=================================================================

 1  25  15  20   M  45   0 0.00    M    M  8.3 18 240
 2  27  12  20   M  45   0    T    M    M  1.5 10 250
 3  27  18  23   M  42   0 0.03    M    M  1.7 19 240
 4  27  14  21   M  44   0    T    M    M  7.4 16 330
```

Import | Cancel

Done

100%

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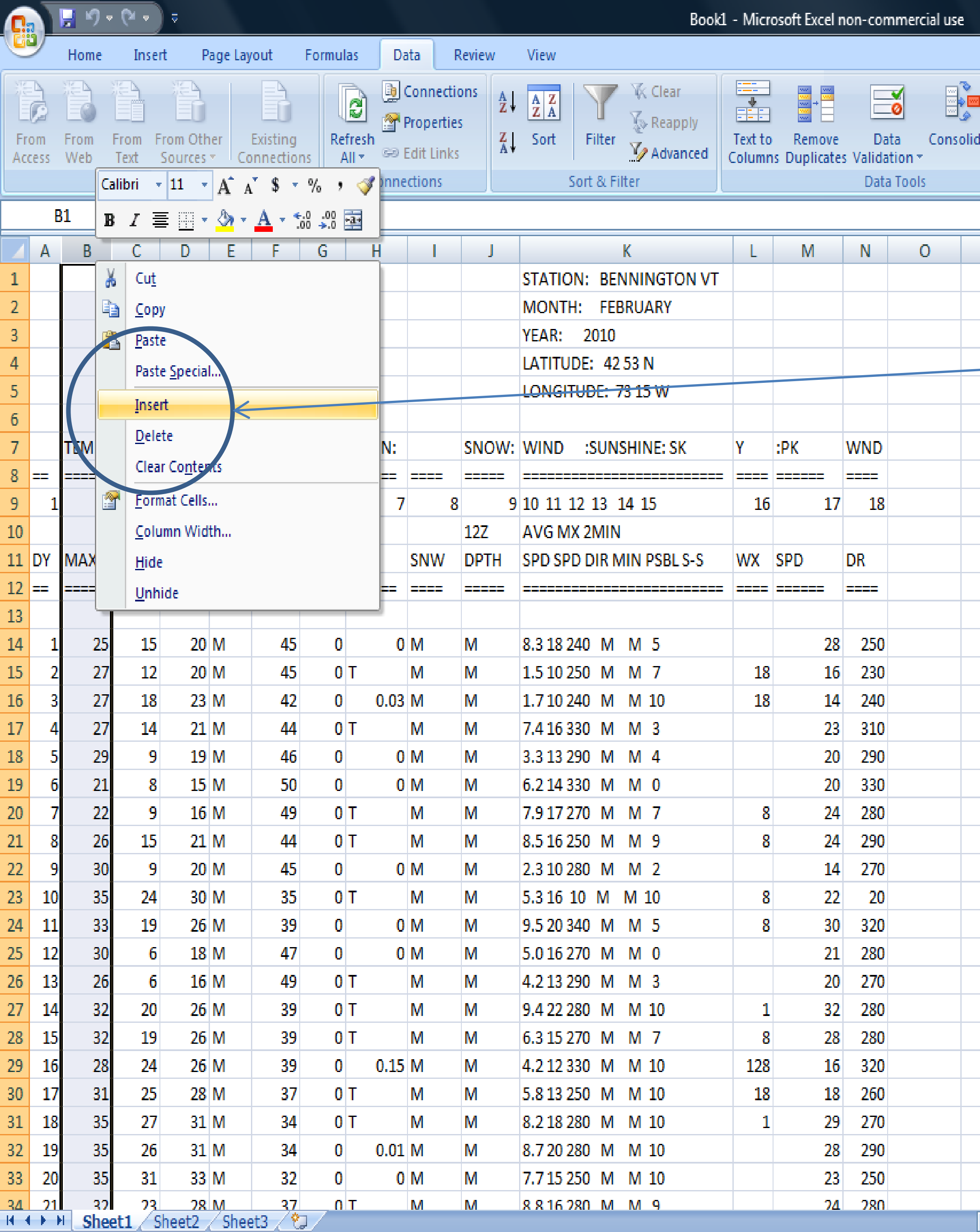
STATION: BENNINGTON VT
MONTH: FEBRUARY
YEAR: 2010
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

	TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND
==	====	====	====	====	====	====	======	====	=====	==========	====	======	====
1	2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18
									12Z	AVG MX 2MIN			
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR
==	====	====	====	====	====	====	======	====	=====	==========	====	======	====
1	25	15	20	M	45	0	0	M	M	8.3 18 240 M M 5		28	250
2	27	12	20	M	45	0	T	M	M	1.5 10 250 M M 7	18	16	230
3	27	18	23	M	42	0	0.03	M	M	1.7 10 240 M M 10	18	14	240
4	27	14	21	M	44	0	T	M	M	7.4 16 330 M M 3		23	310
5	29	9	19	M	46	0	0	M	M	3.3 13 290 M M 4		20	290
6	21	8	15	M	50	0	0	M	M	6.2 14 330 M M 0		20	330
7	22	9	16	M	49	0	T	M	M	7.9 17 270 M M 7	8	24	280
8	26	15	21	M	44	0	T	M	M	8.5 16 250 M M 9	8	24	290
9	30	9	20	M	45	0	0	M	M	2.3 10 280 M M 2		14	270
10	35	24	30	M	35	0	T	M	M	5.3 16 10 M M 10	8	22	20
11	33	19	26	M	39	0	0	M	M	9.5 20 340 M M 5	8	30	320
12	30	6	18	M	47	0	0	M	M	5.0 16 270 M M 0		21	280
13	26	6	16	M	49	0	T	M	M	4.2 13 290 M M 3		20	270
14	32	20	26	M	39	0	T	M	M	9.4 22 280 M M 10	1	32	280
15	32	19	26	M	39	0	T	M	M	6.3 15 270 M M 7	8	28	280
16	28	24	26	M	39	0	0.15	M	M	4.2 12 330 M M 10	128	16	320
17	31	25	28	M	37	0	T	M	M	5.8 13 250 M M 10	18	18	260
18	35	27	31	M	34	0	T	M	M	8.2 18 280 M M 10	1	29	270
19	35	26	31	M	34	0	0.01	M	M	8.7 20 280 M M 10		28	290
20	35	31	33	M	32	0	0	M	M	7.7 15 250 M M 10		23	250
21	32	23	28	M	37	0	T	M	M	8.8 16 280 M M 9		24	280



Insert new column for Julian Dates

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Get External Data: From Access, From Web, From Text, From Other Sources, Existing Connections
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Data Tools: Text to Columns, Remove Duplicates, Data Validation, Consolidate, What-If Analysis
Outline: Group, Ungroup, Subtotal, Show Detail, Hide Detail
Analysis: Data Analysis

B14

STATION: BENNINGTON VT
MONTH: FEBRUARY
YEAR: 2010
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND
8	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18
10											12Z	AVG MX 2MIN			
11	DY	JDAY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR
12	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====
13															
14	1		25	15	20	M	45	0	0	M	M	8.3 18 240 M M 5		28	250
15	2		27	12	20	M	45	0	T	M	M	1.5 10 250 M M 7	18	16	230
16	3		27	18	23	M	42	0	0.03	M	M	1.7 10 240 M M 10	18	14	240
17	4		27	14	21	M	44	0	T	M	M	7.4 16 330 M M 3		23	310
18	5		29	9	19	M	46	0	0	M	M	3.3 13 290 M M 4		20	290
19	6		21	8	15	M	50	0	0	M	M	6.2 14 330 M M 0		20	330
20	7		22	9	16	M	49	0	T	M	M	7.9 17 270 M M 7	8	24	280
21	8		26	15	21	M	44	0	T	M	M	8.5 16 250 M M 9	8	24	290
22	9		30	9	20	M	45	0	0	M	M	2.3 10 280 M M 2		14	270
23	10		35	24	30	M	35	0	T	M	M	5.3 16 10 M M 10	8	22	20
24	11		33	19	26	M	39	0	0	M	M	9.5 20 340 M M 5	8	30	320
25	12		30	6	18	M	47	0	0	M	M	5.0 16 270 M M 0		21	280
26	13		26	6	16	M	49	0	T	M	M	4.2 13 290 M M 3		20	270
27	14		32	20	26	M	39	0	T	M	M	9.4 22 280 M M 10	1	32	280
28	15		32	19	26	M	39	0	T	M	M	6.3 15 270 M M 7	8	28	280
29	16		28	24	26	M	39	0	0.15	M	M	4.2 12 330 M M 10	128	16	320
30	17		31	25	28	M	37	0	T	M	M	5.8 13 250 M M 10	18	18	260
31	18		35	27	31	M	34	0	T	M	M	8.2 18 280 M M 10	1	29	270
32	19		35	26	31	M	34	0	0.01	M	M	8.7 20 280 M M 10		28	290
33	20		35	31	33	M	32	0	0	M	M	7.7 15 250 M M 10		23	250
34	21		32	23	28	M	37	0	T	M	M	8.8 16 280 M M 9		24	280

New Column

Sheet1 | Sheet2 | Sheet3

Ready

100%

Julian Day

- http://www-air.larc.nasa.gov/tools/jday.htm

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B14 = 32

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1												STATION: BENNINGTON VT			
2												MONTH: FEBRUARY			
3												YEAR: 2010			
4												LATITUDE: 42 53 N			
5												LONGITUDE: 73 15 W			
6															
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND
8	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18
10											12Z	AVG MX 2MIN			
11	DY	JDAY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR
12	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====
13															
14	1	32	25	15	20	M	45	0	0	M	M	8.3 18 240 M M 5		28	250
15	2	33	27	12	20	M	45	0	T	M	M	1.5 10 250 M M 7	18	16	230
16	3		27	18	23	M	42	0	0.03	M	M	1.7 10 240 M M 10	18	14	240
17	4		27	14	21	M	44	0	T	M	M	7.4 16 330 M M 3		23	310
18	5		29	9	19	M	46	0	0	M	M	3.3 13 290 M M 4		20	290
19	6		21	8	15	M	50	0	0	M	M	6.2 14 330 M M 0		20	330
20	7		22	9	16	M	49	0	T	M	M	7.9 17 270 M M 7	8	24	280
21	8		26	15	21	M	44	0	T	M	M	8.5 16 250 M M 9	8	24	290
22	9		30	9	20	M	45	0	0	M	M	2.3 10 280 M M 2		14	270
23	10		35	24	30	M	35	0	T	M	M	5.3 16 10 M M 10	8	22	20
24	11		33	19	26	M	39	0	0	M	M	9.5 20 340 M M 5	8	30	320
25	12		30	6	18	M	47	0	0	M	M	5.0 16 270 M M 0		21	280
26	13		26	6	16	M	49	0	T	M	M	4.2 13 290 M M 3		20	270
27	14		32	20	26	M	39	0	T	M	M	9.4 22 280 M M 10	1	32	280
28	15		32	19	26	M	39	0	T	M	M	6.3 15 270 M M 7	8	28	280
29	16		28	24	26	M	39	0	0.15	M	M	4.2 12 330 M M 10	128	16	320
30	17		31	25	28	M	37	0	T	M	M	5.8 13 250 M M 10	18	18	260
31	18		35	27	31	M	34	0	T	M	M	8.2 18 280 M M 10	1	29	270
32	19		35	26	31	M	34	0	0.01	M	M	8.7 20 280 M M 10		28	290
33	20		35	31	33	M	32	0	0	M	M	7.7 15 250 M M 10		23	250
34	21		32	23	28	M	37	0	T	M	M	8.8 16 280 M M 9		24	280

Autofill Julian Dates

Sheet1 | Sheet2 | Sheet3

Ready | Average: 32.5 | Count: 2 | Sum: 65 | 100%

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Get External Data: From Access, From Web, From Text, From Other Sources, Existing Connections
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Analysis: Data Analysis

R40

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1												STATION: BENNINGTON VT				
2												MONTH: FEBRUARY				
3												YEAR: 2010				
4												LATITUDE: 42 53 N				
5												LONGITUDE: 73 15 W				
6																
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND	% Fallen
8	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18	
10											12Z	AVG MX 2MIN				
11	DY	JDAY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	
12	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
13																
14	1	32	25	15	20	M	45	0	0	M	M	8.3 18 240 M M 5		28	250	100
15	2	33	27	12	20	M	45	0	T	M	M	1.5 10 250 M M 7	18	16	230	100
16	3	34	27	18	23	M	42	0	0.03	M	M	1.7 10 240 M M 10	18	14	240	100
17	4	35	27	14	21	M	44	0	T	M	M	7.4 16 330 M M 3		23	310	100
18	5	36	29	9	19	M	46	0	0	M	M	3.3 13 290 M M 4		20	290	100
19	6	37	21	8	15	M	50	0	0	M	M	6.2 14 330 M M 0		20	330	100
20	7	38	22	9	16	M	49	0	T	M	M	7.9 17 270 M M 7	8	24	280	100
21	8	39	26	15	21	M	44	0	T	M	M	8.5 16 250 M M 9	8	24	290	100
22	9	40	30	9	20	M	45	0	0	M	M	2.3 10 280 M M 2		14	270	100
23	10	41	35	24	30	M	35	0	T	M	M	5.3 16 10 M M 10	8	22	20	100
24	11	42	33	19	26	M	39	0	0	M	M	9.5 20 340 M M 5	8	30	320	100
25	12	43	30	6	18	M	47	0	0	M	M	5.0 16 270 M M 0		21	280	100
26	13	44	26	6	16	M	49	0	T	M	M	4.2 13 290 M M 3		20	270	100
27	14	45	32	20	26	M	39	0	T	M	M	9.4 22 280 M M 10	1	32	280	100
28	15	46	32	19	26	M	39	0	T	M	M	6.3 15 270 M M 7	8	28	280	100
29	16	47	28	24	26	M	39	0	0.15	M	M	4.2 12 330 M M 10	128	16	320	100
30	17	48	31	25	28	M	37	0	T	M	M	5.8 13 250 M M 10	18	18	260	100
31	18	49	35	27	31	M	34	0	T	M	M	8.2 18 280 M M 10	1	29	270	100
32	19	50	35	26	31	M	34	0	0.01	M	M	8.7 20 280 M M 10		28	290	100
33	20	51	35	31	33	M	32	0	0	M	M	7.7 15 250 M M 10		23	250	100
34	21	52	32	23	28	M	37	0	T	M	M	8.8 16 280 M M 9		24	280	100

Insert % Fallen Column
& Enter Your Data

Sheet1 | Sheet2 | Sheet3

Ready 100%

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Security Warning Data connections have been disabled Options...

R17

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1												STATION: BENNINGTON VT				
2												MONTH: SEPTEMBER				
3												YEAR: 2009				
4												LATITUDE: 42 53 N				
5												LONGITUDE: 73 15 W				
6																
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND	
8	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18	
10											12Z	AVG MX 2MIN				
11	DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen
12	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
13																
14	1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30	
15	2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80	
16	3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260	
17	4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%
18	5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330	
19	6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150	
20	7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7	1	16	190	
21	8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3	12	21	220	
22	9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0	1	12	130	
23	10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1		38	200	
24	11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4	1	22	110	1.04%
25	12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9		14	100	
26	13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6	1	18	270	
27	14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2	1	17	230	
28	15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6	1	16	360	
29	16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130	
30	17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80	
31	18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%
32	19	262	63	38	51	M	14	0	0	M	M	2.5 12 280 M M 2		15	10	

Sheet1 Sheet2 Sheet3

Ready 100%

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PivotTable | Table | Picture | Clip Art | Shapes | SmartArt | Column | Line | Pie | Bar | Area | Scatter | Other Charts | Hyperlink | Text Box | Header & Footer | WordArt | Signature Line | Object | Symbol

Tables | Illustrations | Charts | Text

Security Warning Data connections have been disabled Options...

U128

Scatter

Scatter with Smooth Lines and Markers

Compare pairs of values.

Use it when there are a few data points in x-axis order and the data represents a function.

All Chart Types...

Click on a blank cell & insert a Scatter Plot Graph

	A	B	C	D	E	F	G	H	I	J	K		P	Q	R	S	T	U	V	W	X	Y
1												STAT										
2												MON										
3												YEAR										
4												LATIT										
5												LONG										
6																						
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK		Y	:PK	WND						
8	==		====	====	====	====	====	====	======	====	=====	==========		====	======	====						
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15		16	17	18						
10											12Z	AVG MX 2MIN										
11	DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S		WX	SPD	DR	% Fallen					
12	==		====	====	====	====	====	====	======	====	=====	==========		====	======	====						
13																						
14	1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0		1	24	30						
15	2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0		1	18	80						
16	3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0		18	18	260						
17	4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0		1	13	320	0.00%					
18	5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1		18	24	330						
19	6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3			16	150						
20	7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7		1	16	190						
21	8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3		12	21	220						
22	9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0		1	12	130						
23	10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1			38	200						
24	11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4		1	22	110	1.04%					
25	12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9			14	100						
26	13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6		1	18	270						
27	14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2		1	17	230						
28	15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6		1	16	360						
29	16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7			18	130						
30	17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5		1	17	80						
31	18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6		1	28	260	8.33%					
32	19	262	63	38	51	M	14	0	0	M	M	2.5 12 280 M M 2			15	10						

Sheet1 | Sheet2 | Sheet3

Ready 100%

Chart Tools

BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Change Chart Type | Save As Template | Type

Switch Row/Column | Select Data | Data

Chart Layouts

Chart Styles

Move Chart | Location

Security Warning Data connections have been disabled Options...

R17

STATION: BENNINGTON VT
MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND	:SUNSHINE: SK	Y	:PK	WND		
==		====	====	====	====	====	====	======	====	=====	==========		====	======	====		
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15		16	17	18		
										12Z	AVG MX 2MIN						
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S		WX	SPD	DR	% Fallen	
==		====	====	====	====	====	====	======	====	=====	==========		====	======	====		
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0		1	24	30		
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0		1	18	80		
3											M M 0		18	18	260		
4											M M 0		1	13	320	0.00%	
5											0 M M 1		18	24	330		
6											0 M M 3			16	150		
7											M M 7		1	16	190		
8											M M 3		12	21	220		
9											M M 0		1	12	130		
10											0 M M 1			38	200		
11											0 M M 4		1	22	110	1.04%	

Under Design, Select Data & add a Legend Entry (Series)

Select Data Source

Chart data range: =Sheet1!$R$17

Switch Row/Column

Legend Entries (Series) | Horizontal (Category) Axis Labels

Add | Edit | Remove | Edit

Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Change Chart Type | Save As Template | Switch Row/Column | Select Data | Move Chart

Type | Data | Chart Layouts | Chart Styles | Location

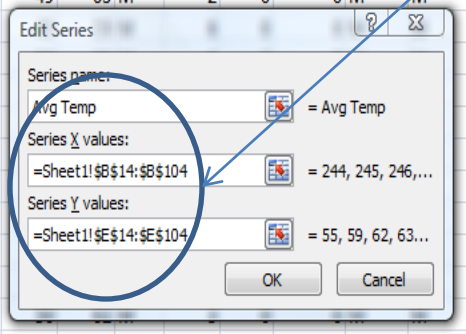
Security Warning: Data connections have been disabled — Options...

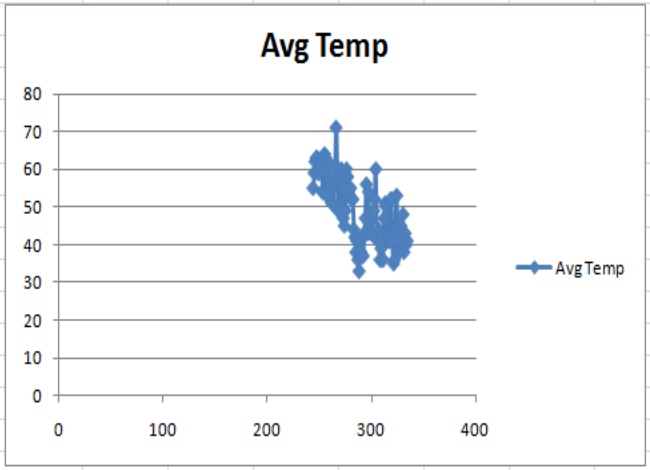
U128

STATION: BENNINGTON VT
MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

Select x axis values & y axis values for Avg. Temp

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND		
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18		
										12Z	AVG MX 2MIN					
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen	
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30		
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80		
3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260		
4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%	
5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330		
6	249	72									2.5 12 150 M M 3		16	150		
7	250	67									0.4 7 130 M M 7	1	16	190		
8	251	76									1.5 9 280 M M 3	12	21	220		
9	252	75									2.3 9 140 M M 0	1	12	130		
10	253	68									5.2 25 190 M M 1		38	200		
11	254	62									3.4 15 120 M M 4	1	22	110	1.04%	
12	255	71									2.2 9 360 M M 9		14	100		
13	256	74									2.5 12 260 M M 6	1	18	270		
14	257	72									3.3 13 240 M M 2	1	17	230		
15	258	73									1.8 12 360 M M 6	1	16	360		
16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130		
17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80		
18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%	
19	262	63	38	51	M	14	0	0	M	M	2.5 12 280 M M 2		15	10		





Sheet1 | Sheet2 | Sheet3

Ready — 100%

Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Change Chart Type | Save As Template | Switch Row/Column | Select Data | Chart Layouts | Chart Styles | Move Chart

Type | Data | Chart Layouts | Chart Styles | Location

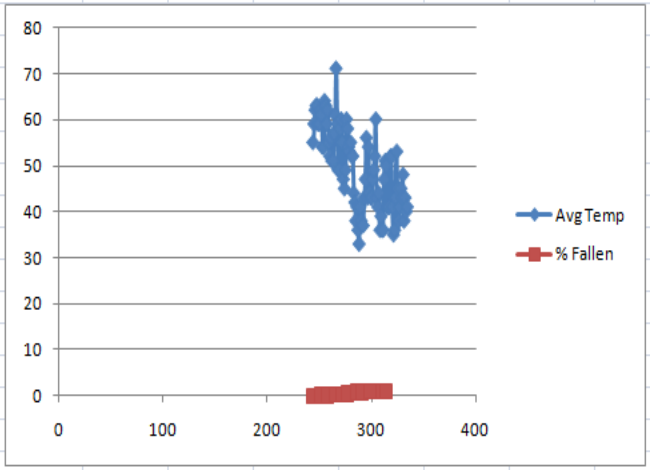
Security Warning Data connections have been disabled Options...

U128

MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND		
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18		
										12Z	AVG MX 2MIN					
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen	
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30		
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80		
3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260		
4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%	
5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330		
6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150		
7	250	67									0.4 7 130 M M 7	1	16	190		
8	251	76									1.5 9 280 M M 3	12	21	220		
9	252	75									2.3 9 140 M M 0	1	12	130		
10	253	68									5.2 25 190 M M 1		38	200		
11	254	62									3.4 15 120 M M 4	1	22	110	1.04%	
12	255	71									2.2 9 360 M M 9		14	100		
13	256	74									2.5 12 260 M M 6	1	18	270		
14	257	72									3.3 13 240 M M 2	1	17	230		
15	258	73									1.8 12 360 M M 6	1	16	360		
16	259	63									4.6 14 130 M M 7		18	130		
17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80		
18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%	
19	262	63	38	51	M	14	0	0	M	M	3.5 12 280 M M 2		15	10		
20	263	70	32	51	M	14	0	0	M	M	1.2 7 270 M M 1	1	10	320		

Add a new series (% Fallen) and enter x & y axis data



Edit Series

Series name:
="% Fallen" = % Fallen

Series X values:
=Sheet1!$B$14:$B$104 = 244, 245, 246,...

Series Y values:
=Sheet1!$P$17:$P$87 = 0.00%, , , , ,...

OK | Cancel

Sheet1 | Sheet2 | Sheet3

Ready 100%

Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Chart Area | Format Selection | Reset to Match Style — Current Selection

Picture | Shapes | Text Box — Insert

Chart Title | Axis Titles | Legend | Data Labels | Data Table — Axes

Axes | Gridlines

Plot Area | Chart Wall | Chart Floor | 3-D Rotation — Background

Trendline | Lines | Up/Down Bars | Error Bars — Analysis

Chart Name: Chart 5 — Properties

Primary Horizontal Axis Title

Primary Vertical Axis Title

Security Warning Data connections have been disabled

Chart 5

Under Layout add chart titles & axis titles

MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND		
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18		
										12Z	AVG MX 2MIN					
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen	
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30		
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80		
3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260		
4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%	
5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330		
6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150		
7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7	1	16	190		
8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3	12	21	220		
9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0	1	12	130		
10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1		38	200		
11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4	1	22	110	1.04%	
12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9		14	100		
13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6	1	18	270		
14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2	1	17	230		
15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6	1	16	360		
16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130		
17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80		
18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%	
19	262	63	38	51	M	14	0	0	M	M	3.5 12 280 M M 2		15	10		

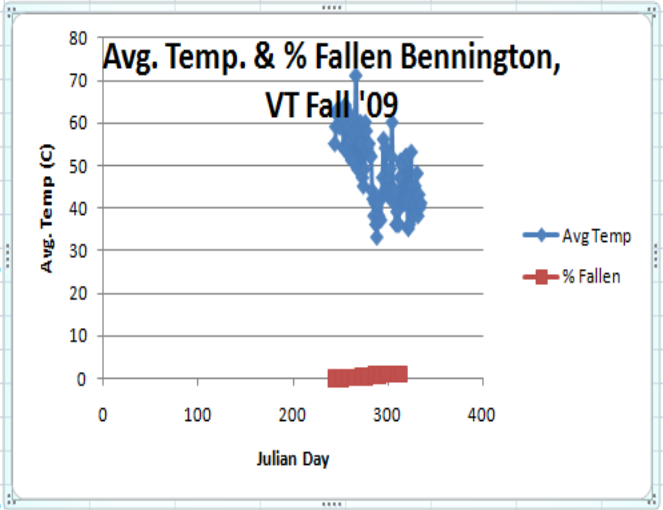


Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

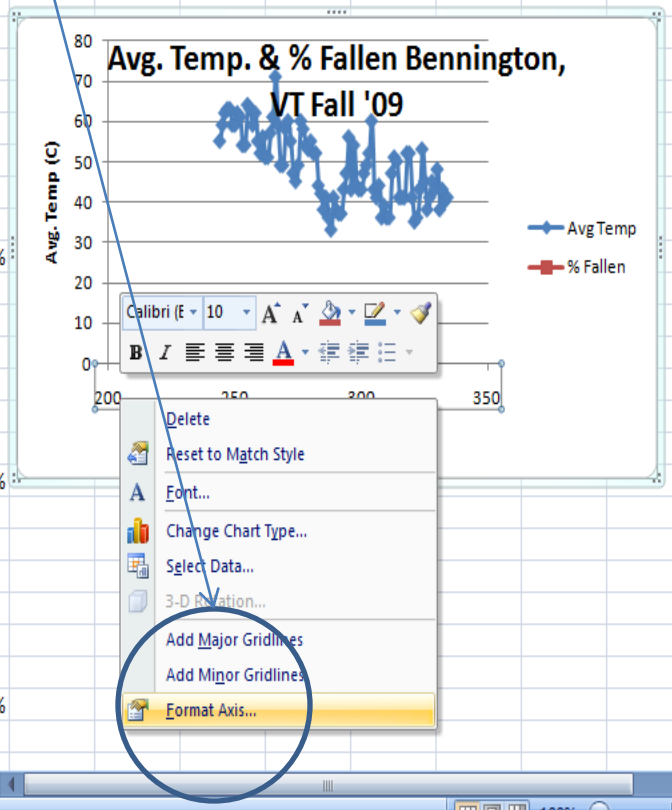
Horizontal (Value) Axis | Format Selection | Reset to Match Style — Current Selection
Picture | Shapes | Text Box — Insert
Chart Title | Axis Titles | Legend | Data Labels | Data Table — Labels
Axes | Gridlines — Axes
Plot Area | Chart Wall | Chart Floor | 3-D Rotation — Background
Trendline | Lines | Up/Down Bars | Error Bars — Analysis
Chart Name: Chart 5 — Properties

Security Warning Data connections have been disabled Options...

Chart 5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2												MONTH: SEPTEMBER				
3												YEAR: 2009				
4												LATITUDE: 42 53 N				
5												LONGITUDE: 73 15 W				
6																
7			TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND	
8	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
9	1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18	
10											12Z	AVG MX 2MIN				
11	DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen
12	==		====	====	====	====	====	====	======	====	=====	==========	====	======	====	
13																
14	1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30	
15	2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80	
16	3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260	
17	4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%
18	5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330	
19	6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150	
20	7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7	1	16	190	
21	8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3	12	21	220	
22	9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0	1	12	130	
23	10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1		38	200	
24	11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4	1	22	110	1.04%
25	12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9		14	100	
26	13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6	1	18	270	
27	14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2	1	17	230	
28	15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6	1	16	360	
29	16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130	
30	17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80	
31	18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%
32	19	262	63	38	51	M	14	0	0	M	M	3.5 12 280 M M 2		15	10	
33	20	263	70	32	51	M	14	0	0	M	M	1.2 7 270 M M 1	1	10	320	

Format x axis & change minimum & maximum values



Sheet1 | Sheet2 | Sheet3

Ready 100%

Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Horizontal (Value) Axis

- Chart Area
- Chart Title
- Horizontal (Value) Axis
- Horizontal (Value) Axis Title
- Legend
- Plot Area
- Vertical (Value) Axis
- Vertical (Value) Axis Major Gridlines
- Vertical (Value) Axis Title
- Series "Avg Temp"
- Series "% Fallen"

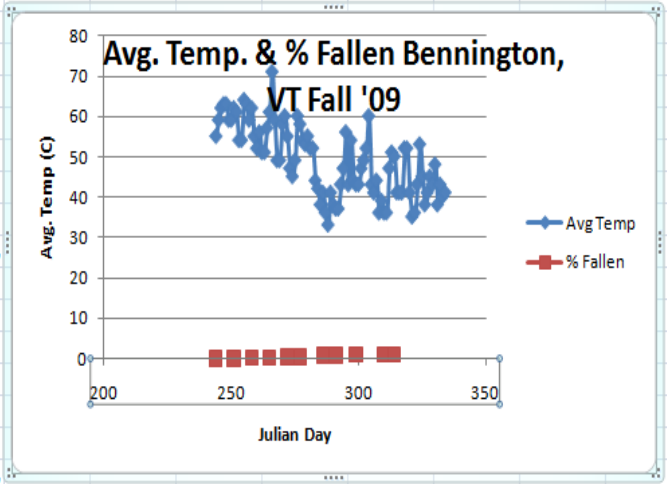
Shape Fill | Shape Outline | Shape Effects | Shape Styles | Text Fill | Text Outline | Text Effects | WordArt Styles | Bring to Front | Send to Back | Selection Pane | Align | Group | Rotate | Arrange | Height: 3" | Width: 5" | Size

...ions have been disabled | Options...

MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

Under format select "series % fallen"

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND		
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18		
										12Z	AVG MX 2MIN					
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen	
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====		
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30		
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80		
3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260		
4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%	
5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330		
6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150		
7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7	1	16	190		
8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3	12	21	220		
9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0	1	12	130		
10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1		38	200		
11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4	1	22	110	1.04%	
12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9		14	100		
13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6	1	18	270		
14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2	1	17	230		
15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6	1	16	360		
16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130		
17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80		
18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%	
19	262	63	38	51	M	14	0	0	M	M	3.5 12 280 M M 2		15	10		
20	263	70	32	51	M	14	0	0	M	M	1.2 7 270 M M 1	1	10	320		



Sheet1 | Sheet2 | Sheet3

Ready | 100%

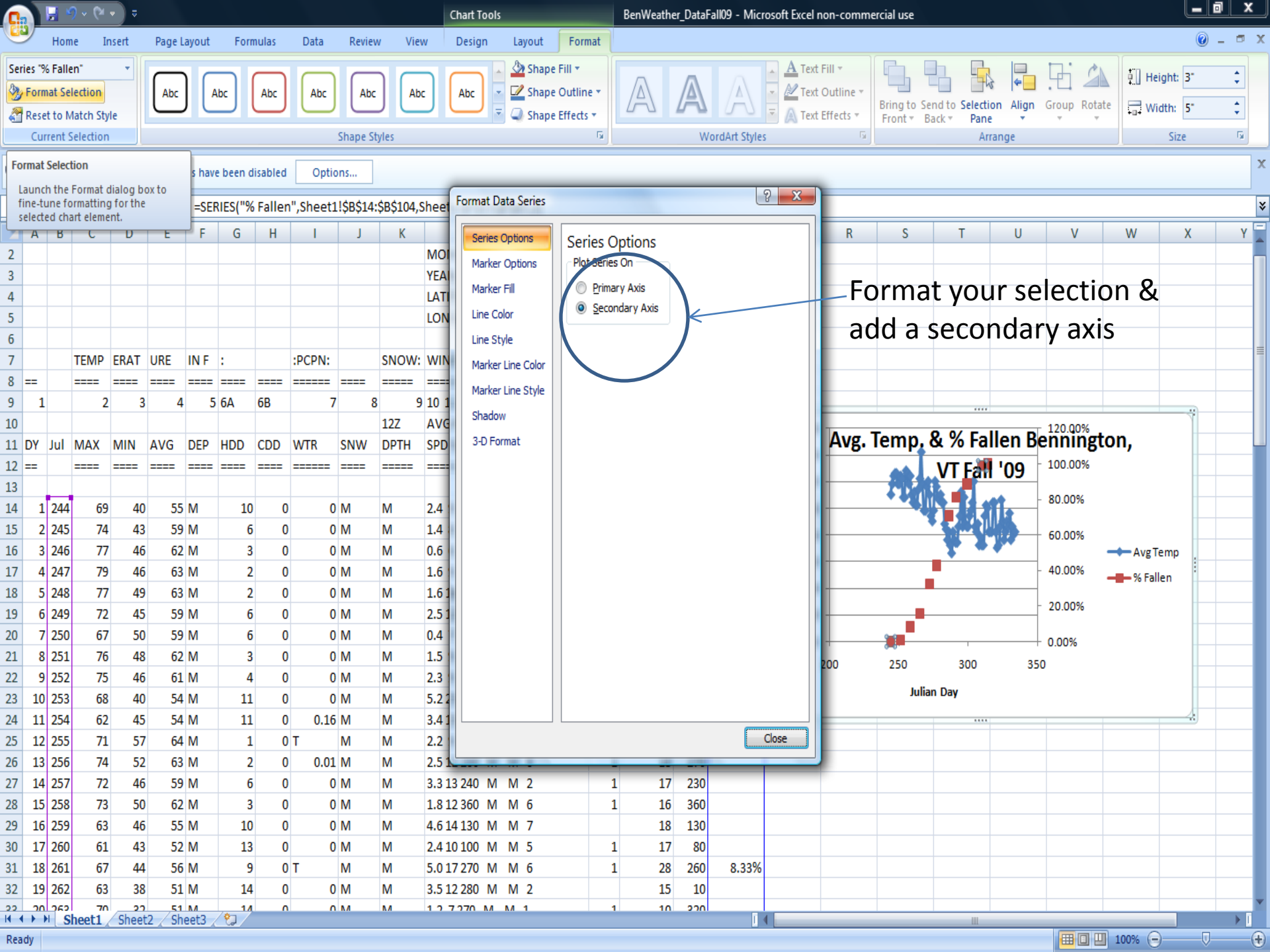


Chart Tools
BenWeather_DataFall09 - Microsoft Excel non-commercial use
Home
Insert
Page Layout
Formulas
Data
Review
View
Design
Layout
Format
Series "% Fallen"
Format Selection
Reset to Match Style
Current Selection
Shape Styles
Shape Fill
Shape Outline
Shape Effects
WordArt Styles
Text Fill
Text Outline
Text Effects
Bring to Front
Send to Back
Selection Pane
Align
Group
Rotate
Arrange
Height: 3"
Width: 5"
Size
Format Selection
Launch the Format dialog box to fine-tune formatting for the selected chart element.
Options...
=SERIES("% Fallen",Sheet1!$B$14:$B$104,Sheet
Format Data Series
Series Options
Marker Options
Marker Fill
Line Color
Line Style
Marker Line Color
Marker Line Style
Shadow
3-D Format
Series Options
Plot Series On
Primary Axis
Secondary Axis
Close
Format your selection & add a secondary axis
Avg. Temp, & % Fallen Bennington, VT Fall '09
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
200
250
300
350
Julian Day
Avg Temp
% Fallen
Sheet1
Sheet2
Sheet3
Ready
100%

Chart Tools — BenWeather_DataFall09 - Microsoft Excel non-commercial use

Home | Insert | Page Layout | Formulas | Data | Review | View | Design | Layout | Format

Series "% Fallen" Point "2" | Format Selection | Reset to Match Style | Current Selection | Shape Styles | Shape Fill | Shape Outline | Shape Effects | WordArt Styles | Text Fill | Text Outline | Text Effects | Bring to Front | Send to Back | Selection Pane | Align | Group | Rotate | Arrange | Height: 3" | Width: 5" | Size

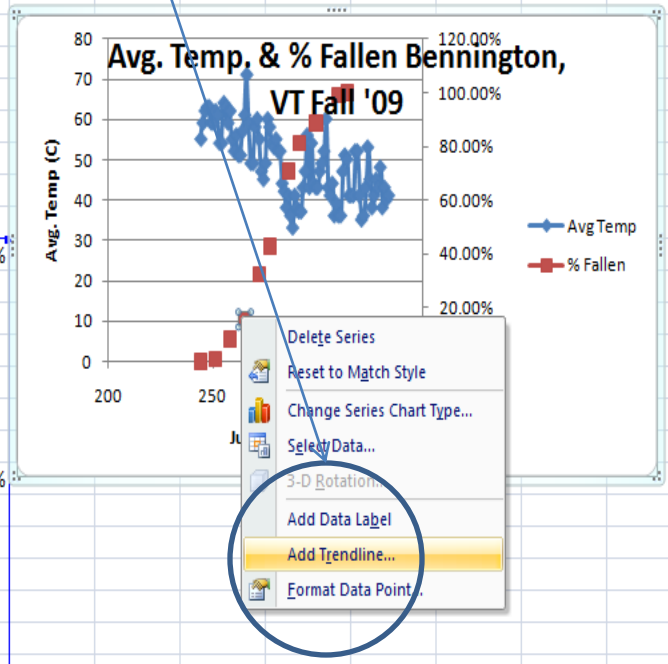
Security Warning Data connections have been disabled Options...

Chart 5 | =SERIES("% Fallen",Sheet1!$B$14:$B$104,Sheet1!$P$17:$P$87,2)

MONTH: SEPTEMBER
YEAR: 2009
LATITUDE: 42 53 N
LONGITUDE: 73 15 W

		TEMP	ERAT	URE	IN F	:		:PCPN:		SNOW:	WIND :SUNSHINE: SK	Y	:PK	WND			
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====			
1		2	3	4	5	6A	6B	7	8	9	10 11 12 13 14 15	16	17	18			
										12Z	AVG MX 2MIN						
DY	Jul	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD SPD DIR MIN PSBL S-S	WX	SPD	DR	% Fallen		
==		====	====	====	====	====	====	======	====	=====	==========	====	======	====			
1	244	69	40	55	M	10	0	0	M	M	2.4 9 360 M M 0	1	24	30			
2	245	74	43	59	M	6	0	0	M	M	1.4 8 330 M M 0	1	18	80			
3	246	77	46	62	M	3	0	0	M	M	0.6 6 330 M M 0	18	18	260			
4	247	79	46	63	M	2	0	0	M	M	1.6 9 320 M M 0	1	13	320	0.00%		
5	248	77	49	63	M	2	0	0	M	M	1.6 10 360 M M 1	18	24	330			
6	249	72	45	59	M	6	0	0	M	M	2.5 12 150 M M 3		16	150			
7	250	67	50	59	M	6	0	0	M	M	0.4 7 130 M M 7	1	16	190			
8	251	76	48	62	M	3	0	0	M	M	1.5 9 280 M M 3	12	21	220			
9	252	75	46	61	M	4	0	0	M	M	2.3 9 140 M M 0	1	12	130			
10	253	68	40	54	M	11	0	0	M	M	5.2 25 190 M M 1		38	200			
11	254	62	45	54	M	11	0	0.16	M	M	3.4 15 120 M M 4	1	22	110	1.04%		
12	255	71	57	64	M	1	0	T	M	M	2.2 9 360 M M 9		14	100			
13	256	74	52	63	M	2	0	0.01	M	M	2.5 12 260 M M 6	1	18	270			
14	257	72	46	59	M	6	0	0	M	M	3.3 13 240 M M 2	1	17	230			
15	258	73	50	62	M	3	0	0	M	M	1.8 12 360 M M 6	1	16	360			
16	259	63	46	55	M	10	0	0	M	M	4.6 14 130 M M 7		18	130			
17	260	61	43	52	M	13	0	0	M	M	2.4 10 100 M M 5	1	17	80			
18	261	67	44	56	M	9	0	T	M	M	5.0 17 270 M M 6	1	28	260	8.33%		
19	262	63	38	51	M	14	0	0	M	M	3.5 12 280 M M 2		15	10			
20	263	70	32	51	M	14	0	0	M	M	1.2 7 270 M M 1	1	10	320			

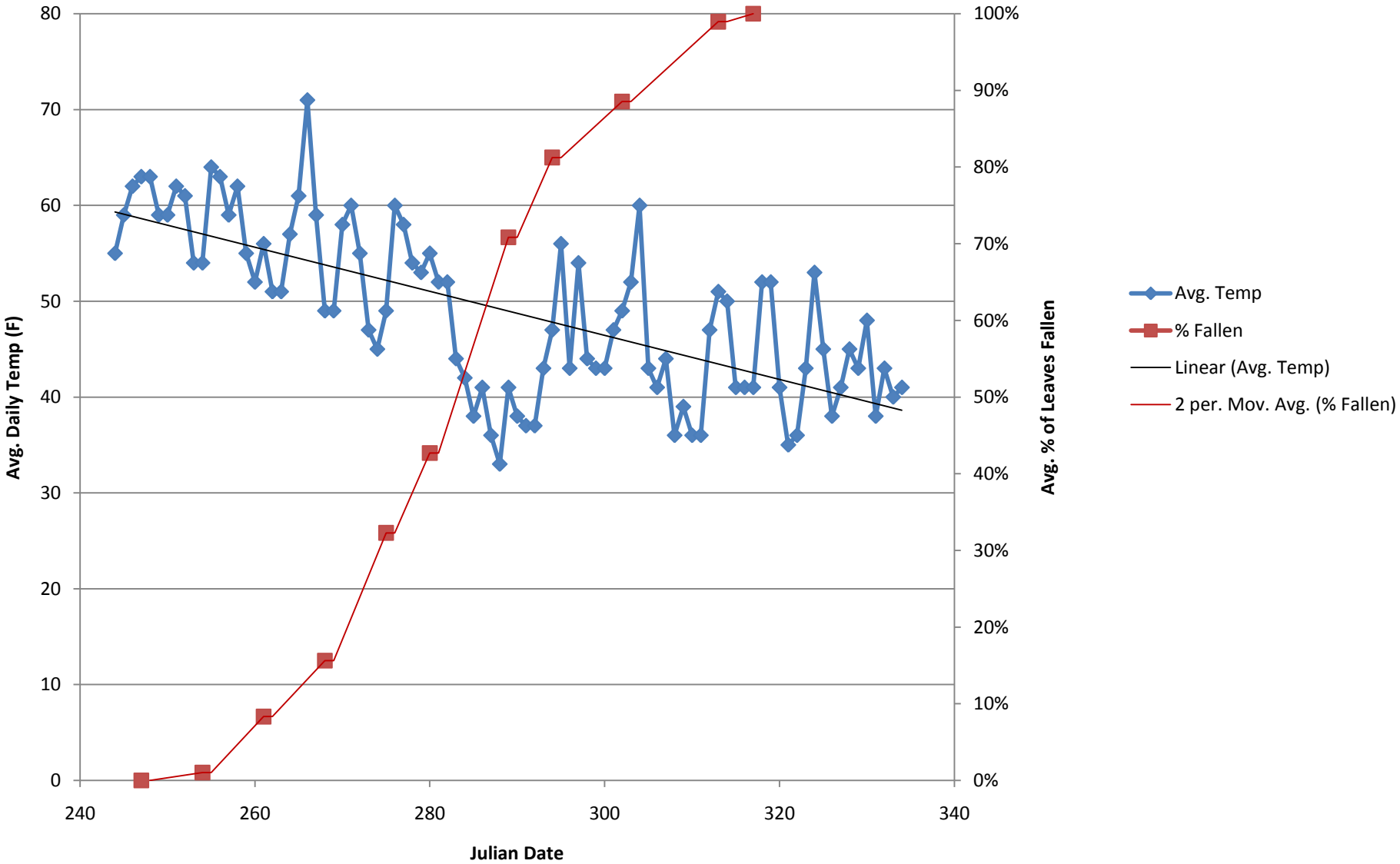
Right click a % Fallen point and add a 2nd Order Polynomial Trendline



Sheet1 | Sheet2 | Sheet3

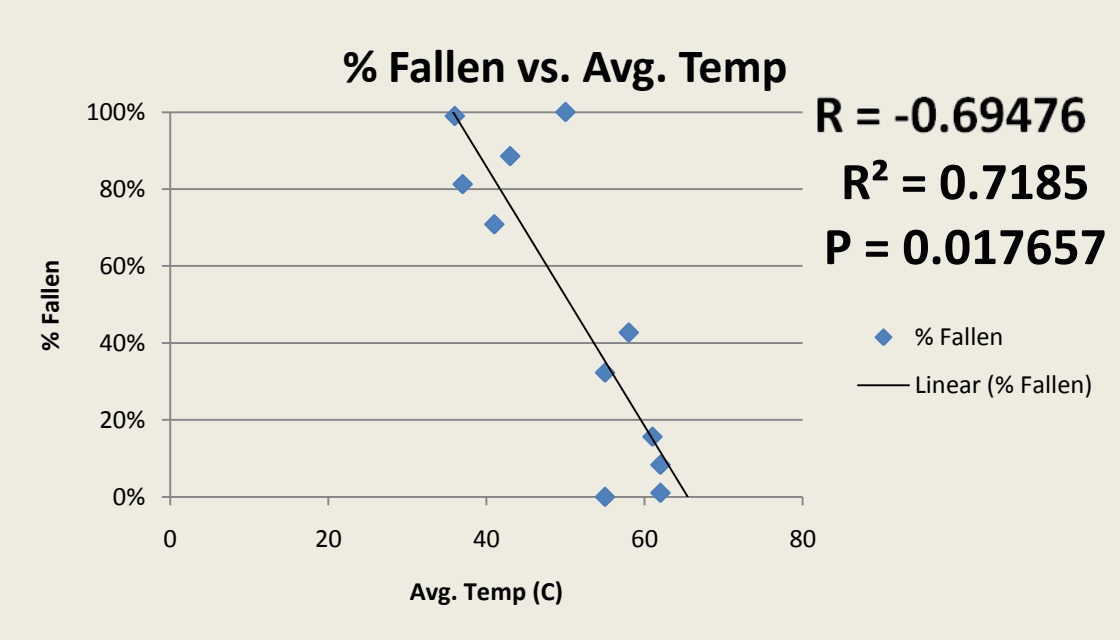
Ready 100%

Average Temperature and % of Leaves Fallen MAH (Bennington, VT Fall 2009)



Data Analysis

- What type of relationship is it?
  - Direct, inverse, quadratic?
- How strong is the relationship?
- What is the cause of the relationship?



Options for Graphing

- **Teacher Generated** – time constraints; students analyze data
- **Student Generated from Teacher Spreadsheet** – students generate & analyze graphs
- **Student Generated** – no time constraints; students learn to create spreadsheet, graph & analyze data

References

- http://www.uvm.edu/~streams/PDFFiles/tutorials/Data_Analyses_Tutorial_FINAL.pdf
- http://harvardforest.fas.harvard.edu/museum/data/k12/Colburn%202009%20Graphing%20Manual.pdf
- http://www.pacificeducationinstitute.org/resources/pdf/Field%20Investigation%20Guide%20updated%20April%202009.pdf
- http://www.erh.noaa.gov/aly/Climate/Bennington/ClimateDDH.htm
- http://www-air.larc.nasa.gov/tools/jday.htm

Generating an Avg. Temp vs. % Leaf Fallen Graph

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