

# Local Climatology Information

In addition to reviewing these select slides, I highly recommend you investigate the below pages to learn more about local climate information:

<http://www.weather.gov/climate/xmacis.php?wfo=btv>

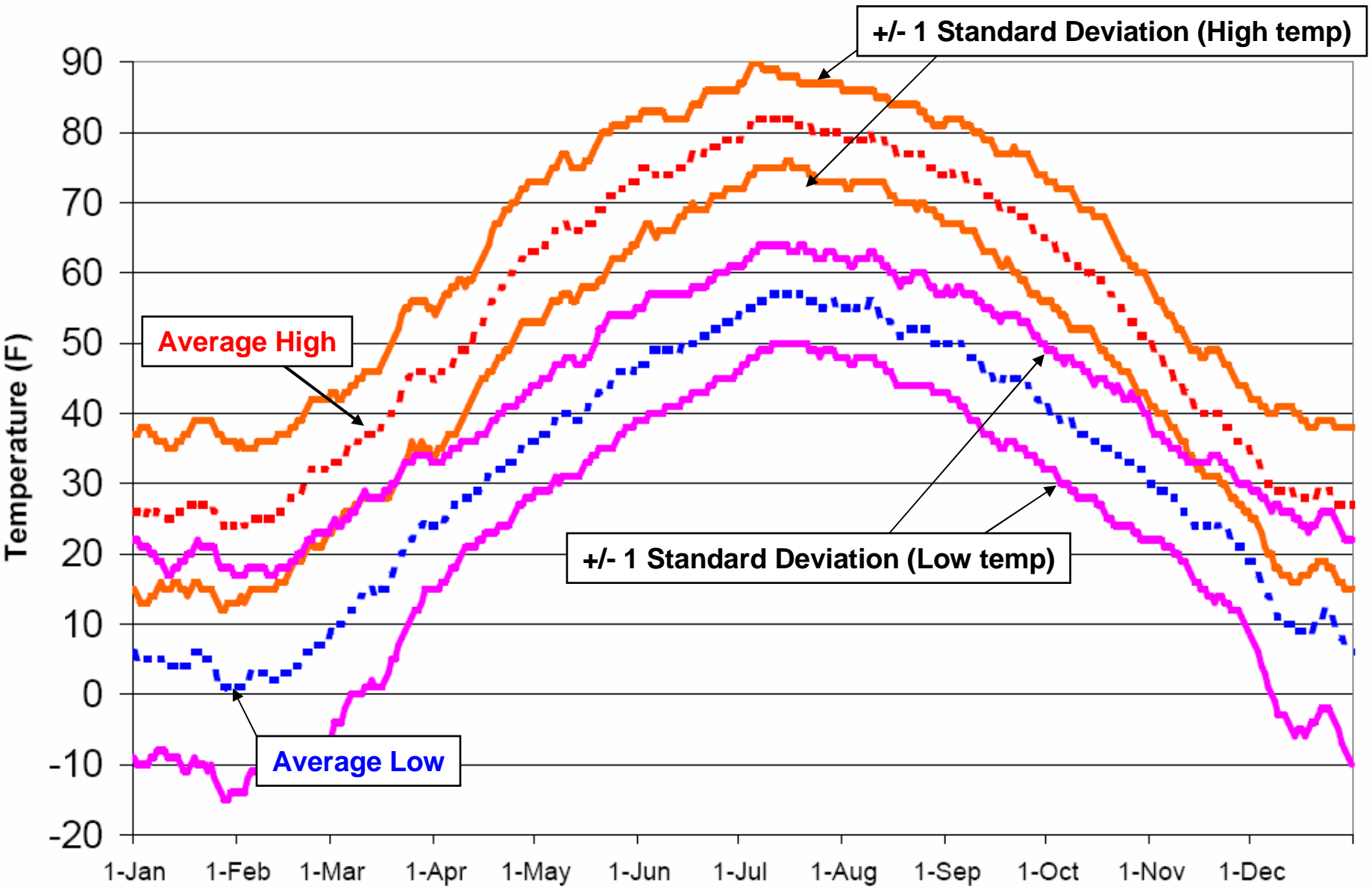
and

[http://www.weather.gov/climate/local\\_data.php?wfo=btv](http://www.weather.gov/climate/local_data.php?wfo=btv)

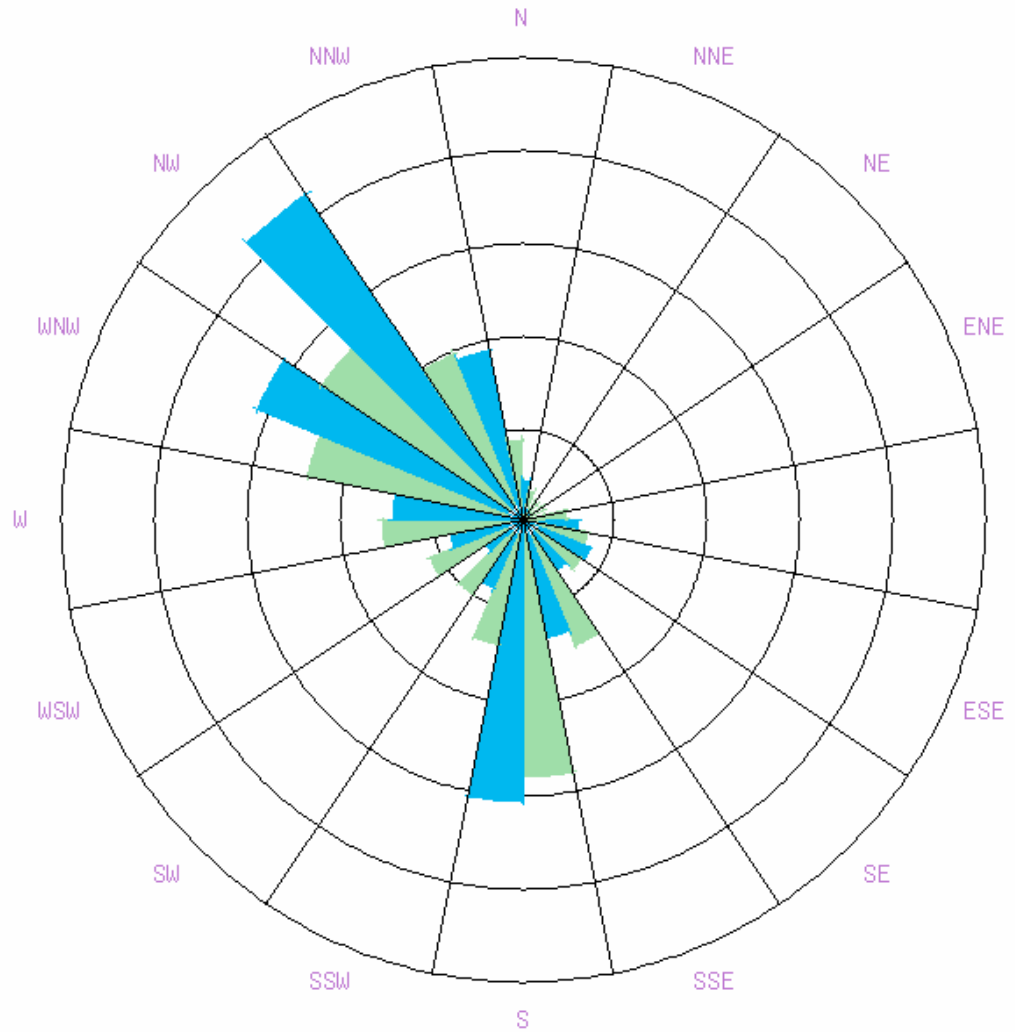
This presentation is provided to help one better understand our local weather and climate. It was prepared by Dr. Jason Shafer for his MET-3020 (Practicum in Forecasting and Broadcasting, and MET-4010 (Television Weathercasting) classes. 8/19/08

# What are "normal" temperatures at St. Johnsbury?

Saint Johnsbury (1971-2000) Temperature Distribution



# Wind climatology near LSC



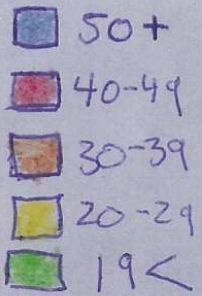
■ Percent of Total Wind Energy (Wh/m2)

■ Percent of Total Time

Center Point = 0%

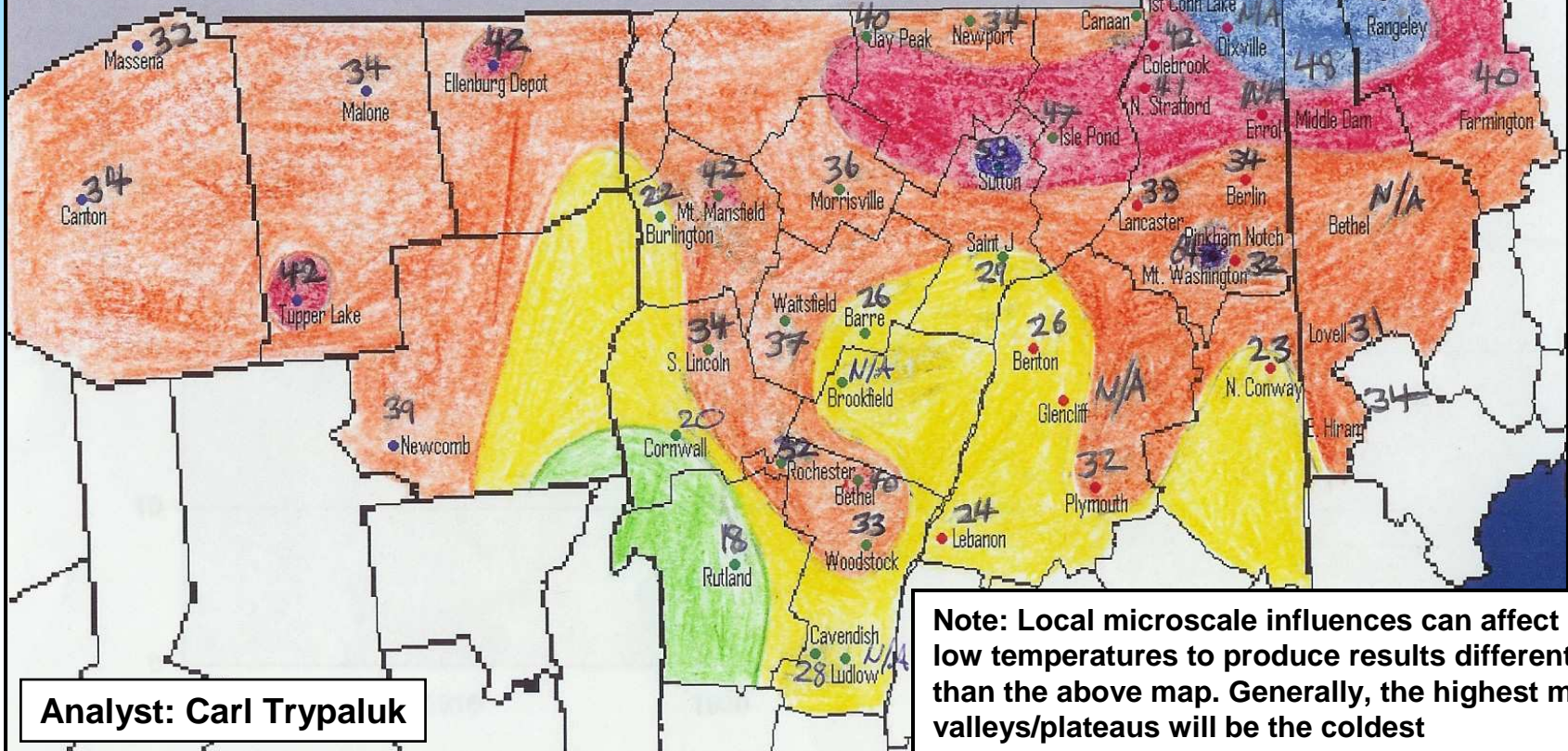
Each Outer Circle = +5%

Source: <http://truwind.teamcamelot.com/ne/>



Where are the coldest observing locations in the region?

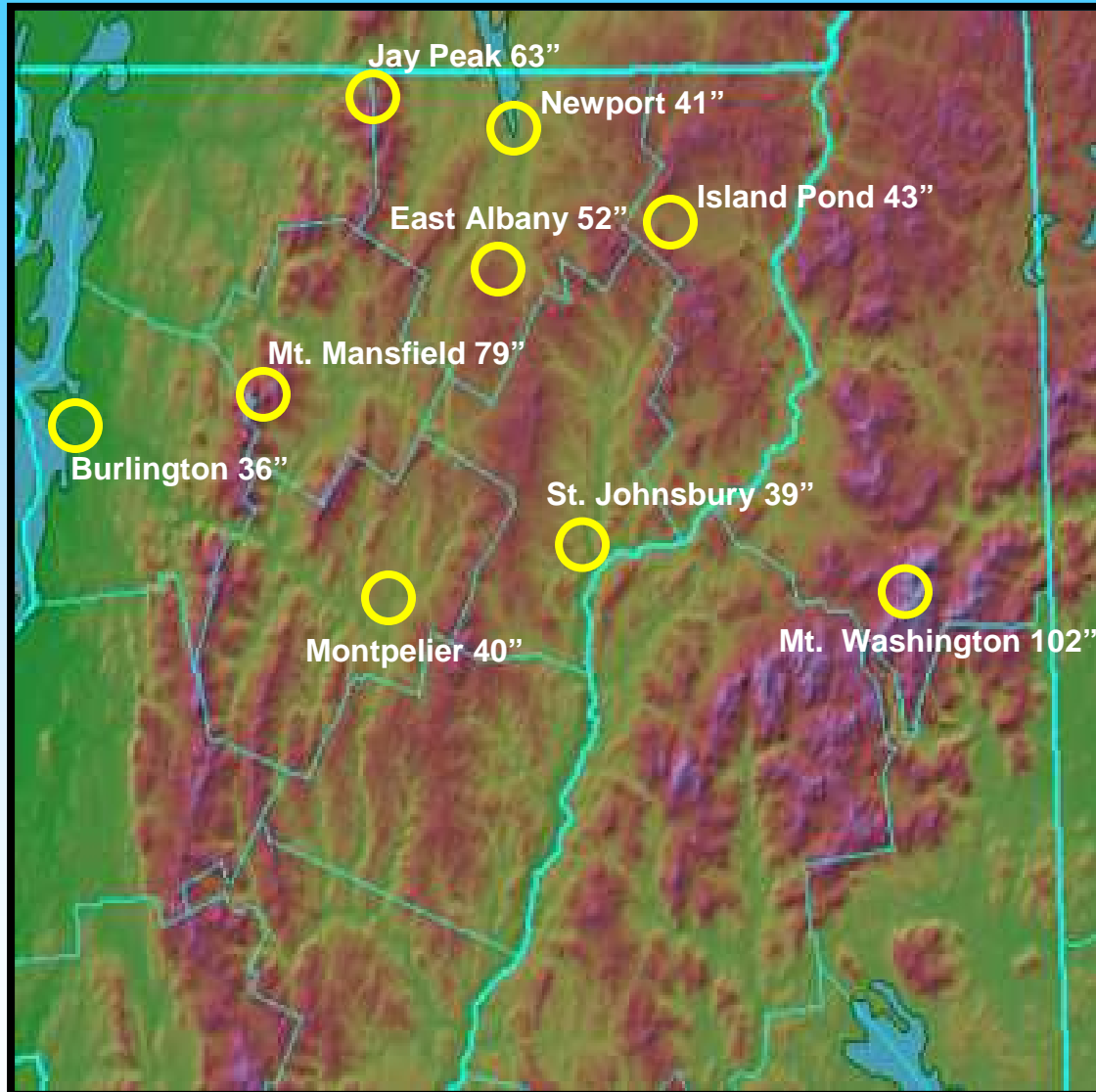
Average number of days a season with a low temperature at or below 0 deg F



Analyst: Carl Trypaluk

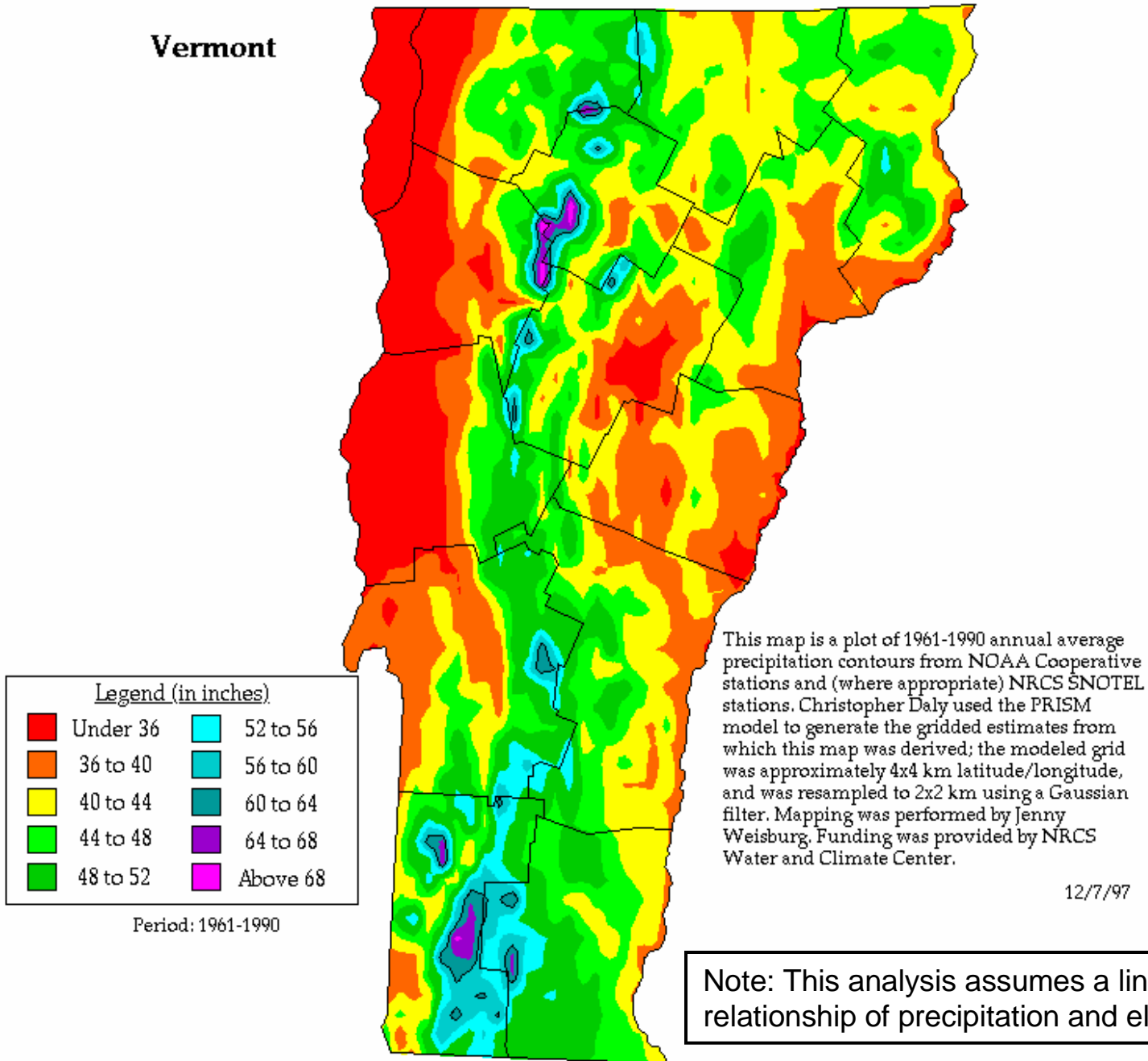
Note: Local microscale influences can affect low temperatures to produce results different than the above map. Generally, the highest mtn valleys/plateaus will be the coldest

# Average Annual Precipitation and Terrain



## Average Annual Precipitation

### Vermont

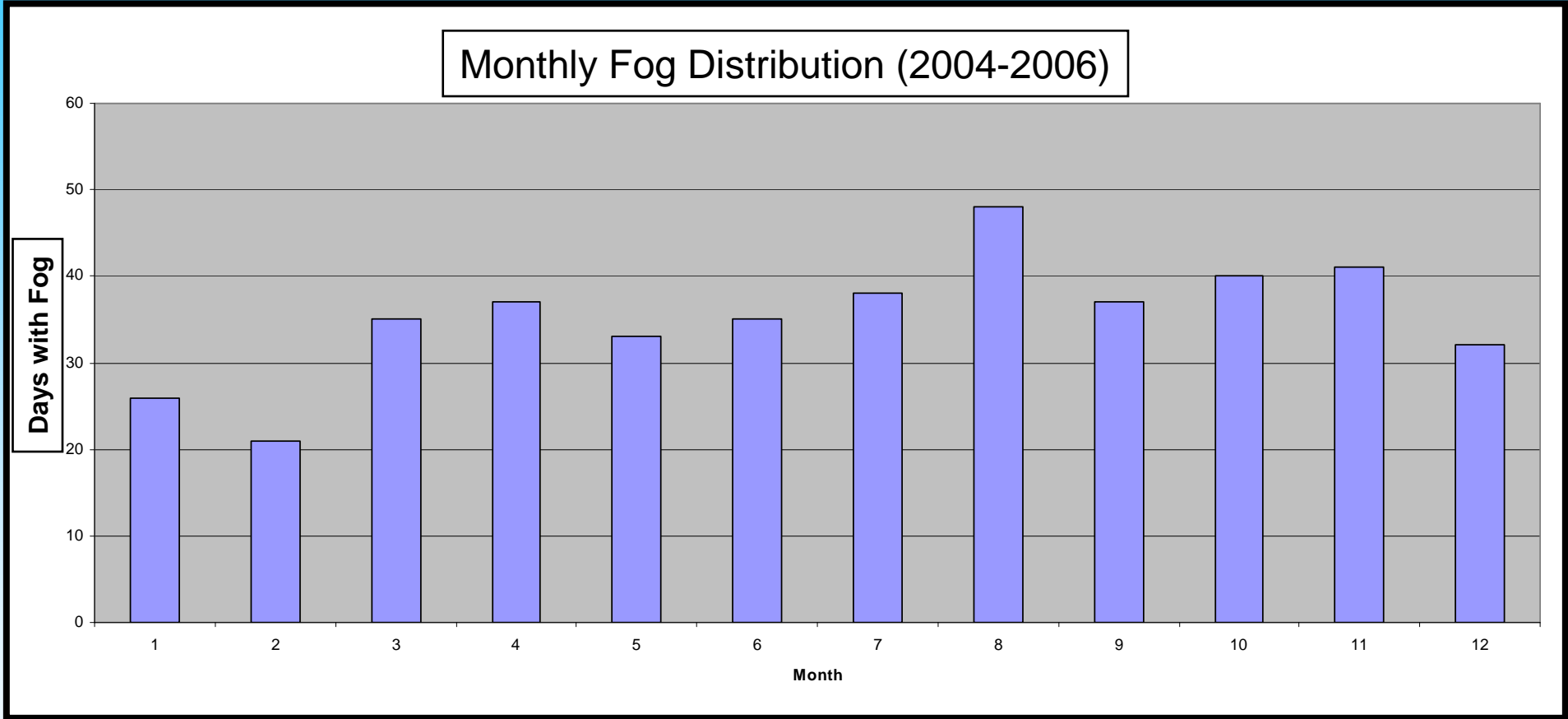


# Local Fog Climatology

This study was conducted as a lab in Analysis and Forecasting II, spring 2007. Fog conditions were determined by watching time-lapse footage of the Vail web camera.

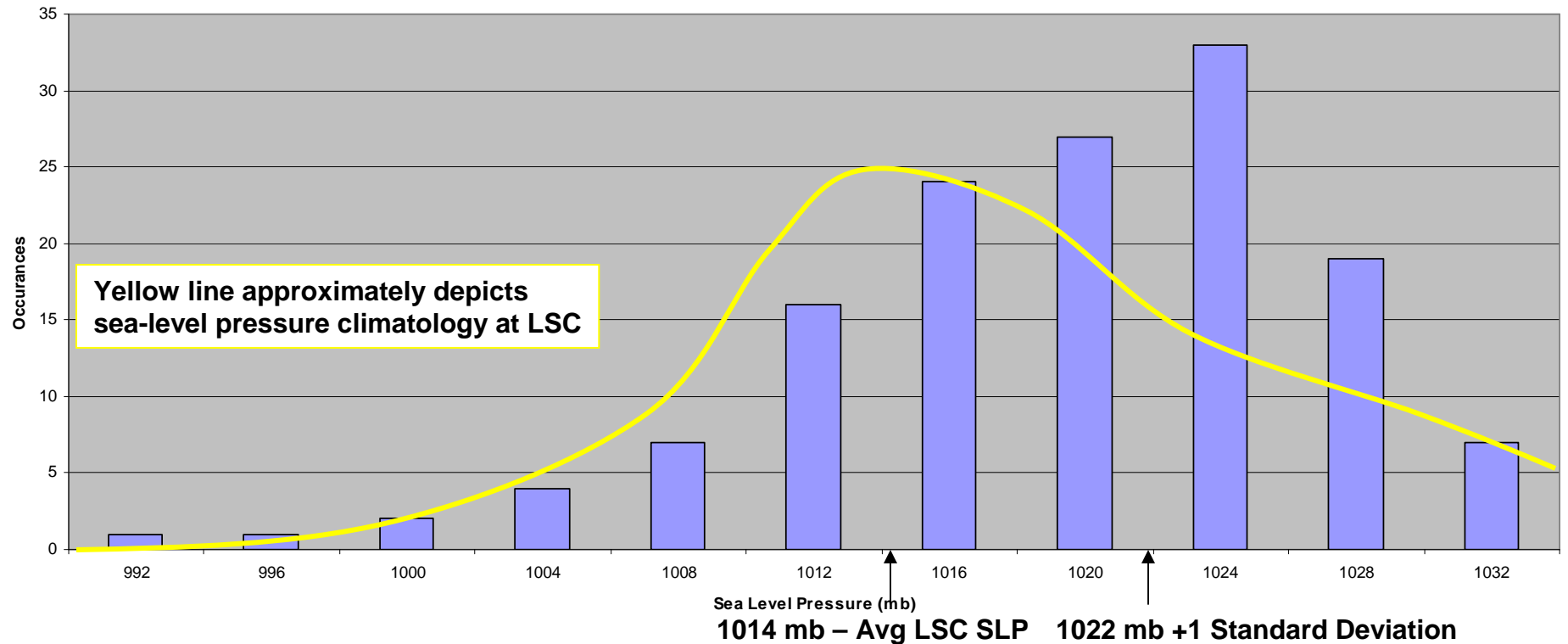
Valley fog, although usually benign, occurs relatively frequently within the Passumpsic and Connecticut River Valleys. Usually, fog occurs at night (radiative fog), as temperatures cool within the valley to the dewpoint. There are many important subtleties to fog formation, as will be shown.

Fog can have a high societal impact. Visibility can be severely impaired, icing can occur when it forms, and it can persist and affect daytime temperatures and sky cover.



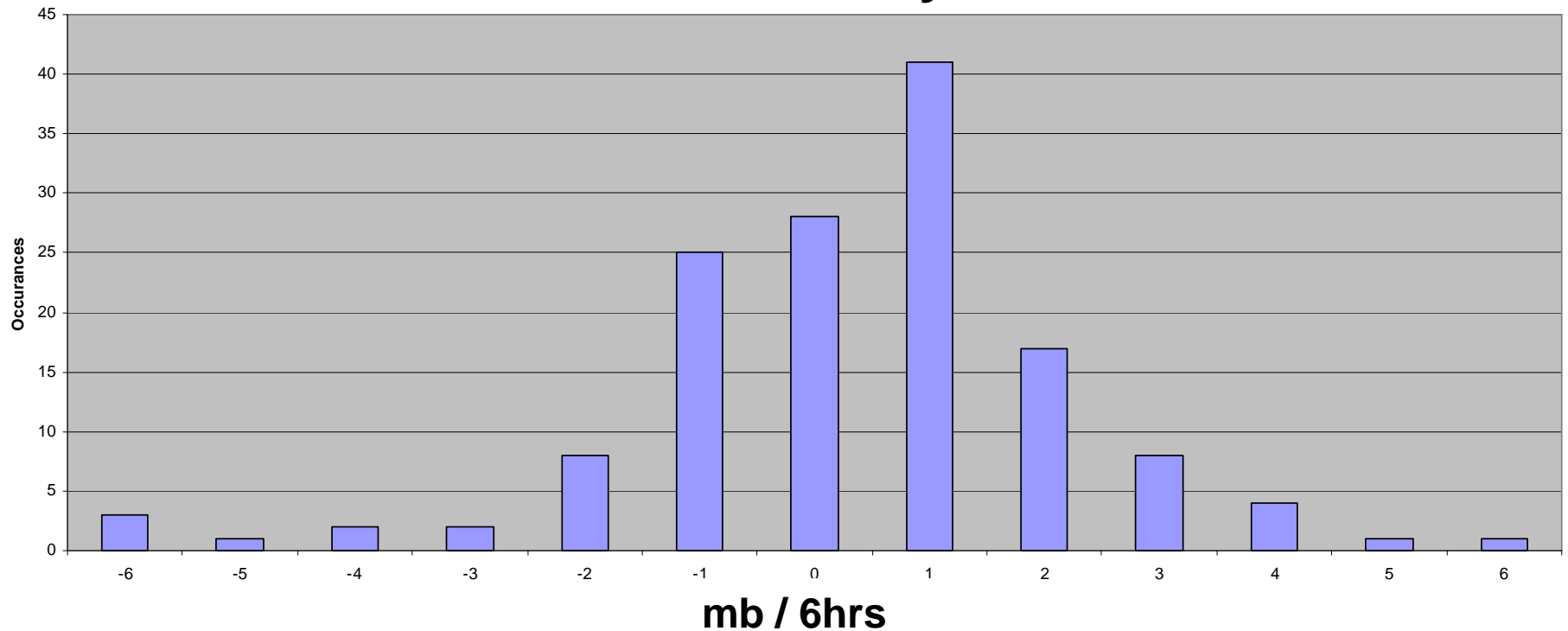
Fog can occur any time of the year, although it appears somewhat less likely in the winter.

## Sea Level Pressure Distribution with Fog Occurrence



Fog tends to occur under higher pressure situations, when skies tend to be clearer at night. The above distribution shows a strong skew toward higher pressures.

## Pressure Tendency Distribution



Pressure tendency shows some skew towards rising pressures, but fog also can occur under falling pressures. This suggests fog may be more likely when high pressure system first builds in.

# Fog occurrence and precipitation

- Many fog days are associated with precipitation prior (24 hrs prior to) its occurrence
- Further, there appears to be a good correlation between fog duration/thickness and how much precipitation (esp. rainfall) falls prior. Why? Precipitation adds moisture to the PBL

# Are low temperatures generally above, below, or near average when fog occurs?

Fog formation appears to be more likely associated with below average temperatures in the winter

Why? Probably associated with cold, clear nights and high pressure

Fog formation appears to be more likely associated with above average temperatures in the summer

Why? Above average low temps correlate fairly well with above average dewpoints, thus there is more moisture in the PBL and it doesn't take as much cooling to produce fog

| Month          | Avg T | % Above       | % Near        | % Below       |
|----------------|-------|---------------|---------------|---------------|
| 1              | 17°   | 24%           | 12%           | 64%           |
| 2              | 20.2° | 19%           | 29%           | 52%           |
| 3              | 31°   | 29%           | 40%           | 31%           |
| 4              | 43.5° | 39%           | 31%           | 31%           |
| 5              | 56.3° | 73%           | 21%           | 6%            |
| 6              | 64.6° | 55%           | 27%           | 18%           |
| 7              | 68.6° | 74%           | 26%           | 0%            |
| 8              | 66.8° | 71%           | 29%           | 0%            |
| 9              | 58.4° | 76%           | 22%           | 2%            |
| 10             | 47°   | 50%           | 30%           | 20%           |
| 11             | 35.5° | 20%           | 48%           | 37%           |
| 12             | 22.6° | 25%           | 19%           | 56%           |
| <i>Average</i> |       | <i>46.25%</i> | <i>27.83%</i> | <i>26.42%</i> |

# Fog and snow cover

Since the land surface properties change dramatically during the winter, we investigated fog occurrence over snow cover.

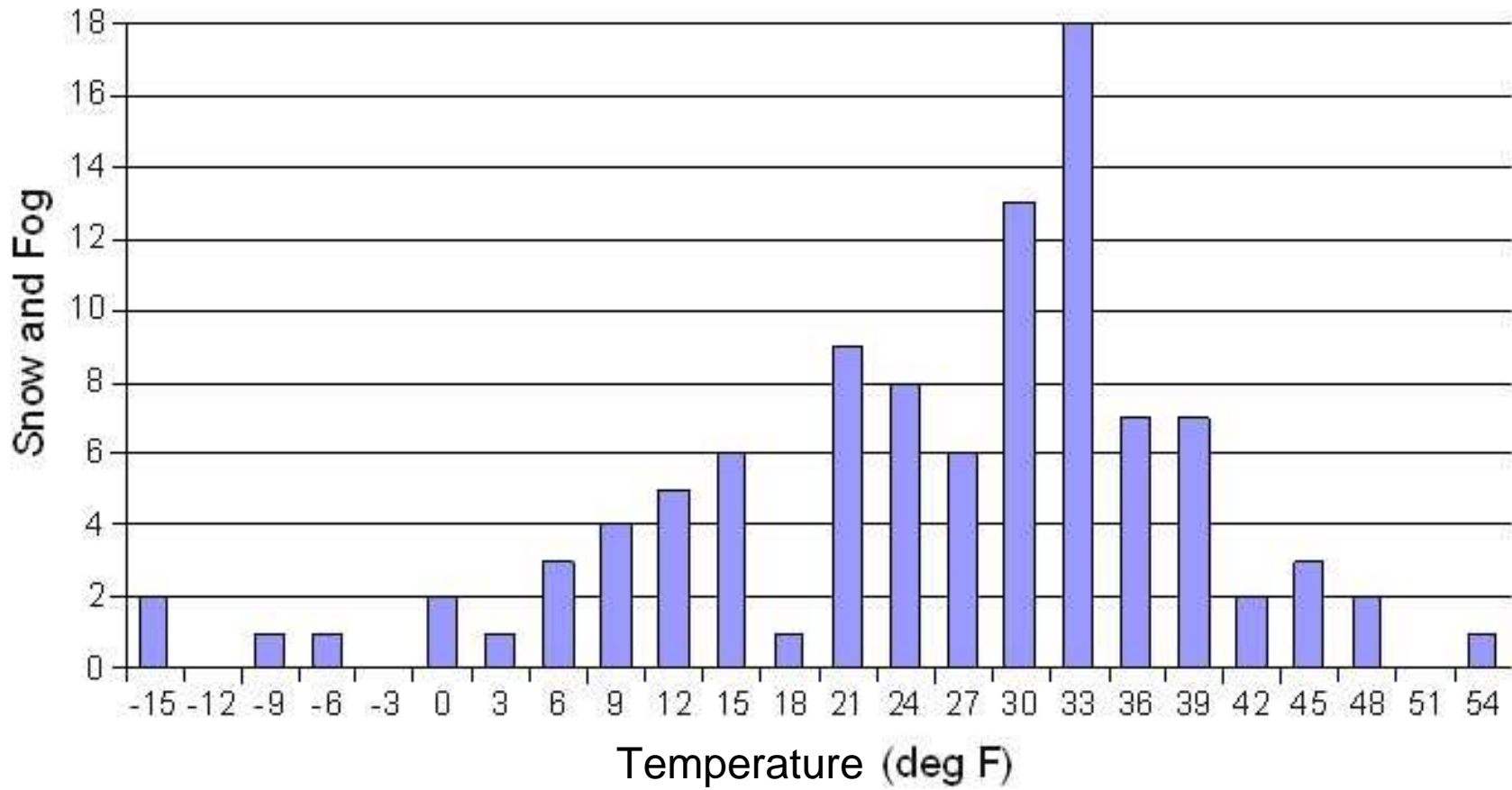
Some of our major conclusions were:

Fog appears more likely when precipitation falls 24 hrs or less prior.

Fog appears to occur most often near and around 32 deg F (see next slide).

Recipe for dense fog to occur any time of the day: rain on snow cover, especially at/near a temperature of 32 deg F. Continuous rainfall over snow cover will produce dense fog. The heavier the rainfall, the thicker the fog as well.

## Temperature distribution for fog days with snow cover



# Snowfall Climatology from the BTV NWS

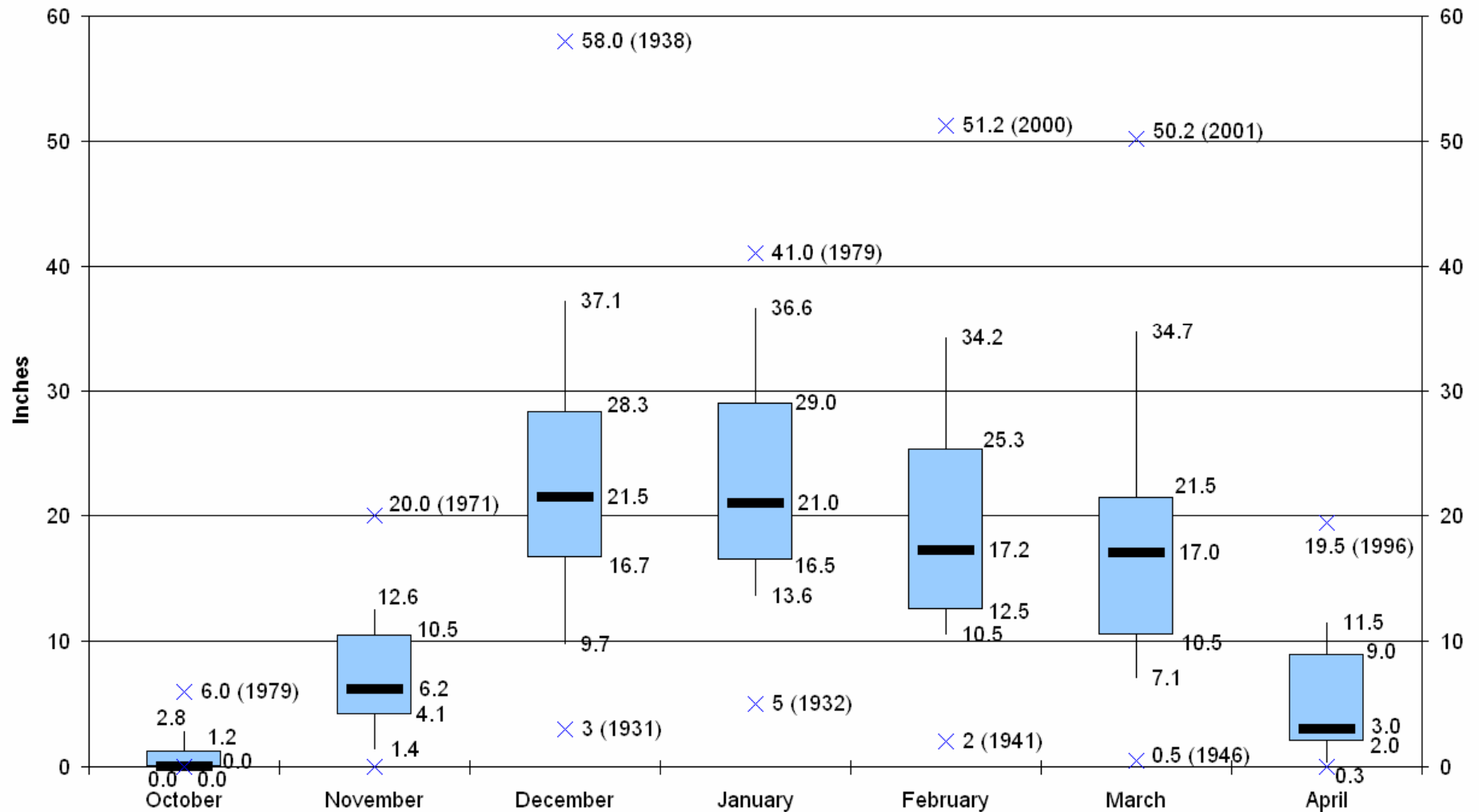
See: <http://www.erh.noaa.gov/btv/climo/snowclimo/snowfall.shtml> for  
a more complete climatology



## Snowfall By Month - West Burke, VT (1977-2007)



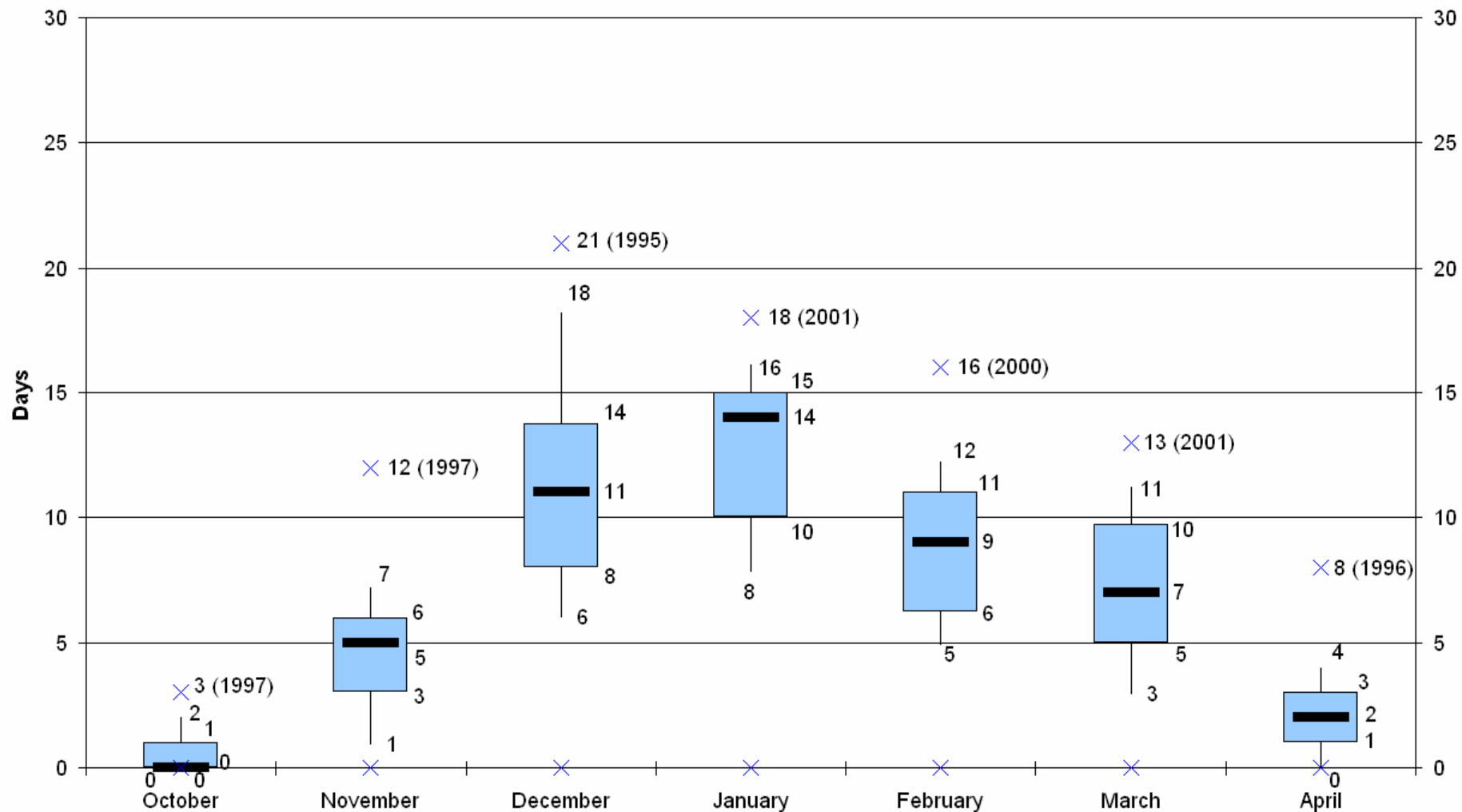
(solid bar - median seasonal value; boxes 25th - 75th percentile; whiskers 10th/90th percentile)  
(x - Extreme Monthly Snowfall Total)





# Days with 0.1 Inches of Snow or Greater per Month - West Burke, VT (1977-2007)

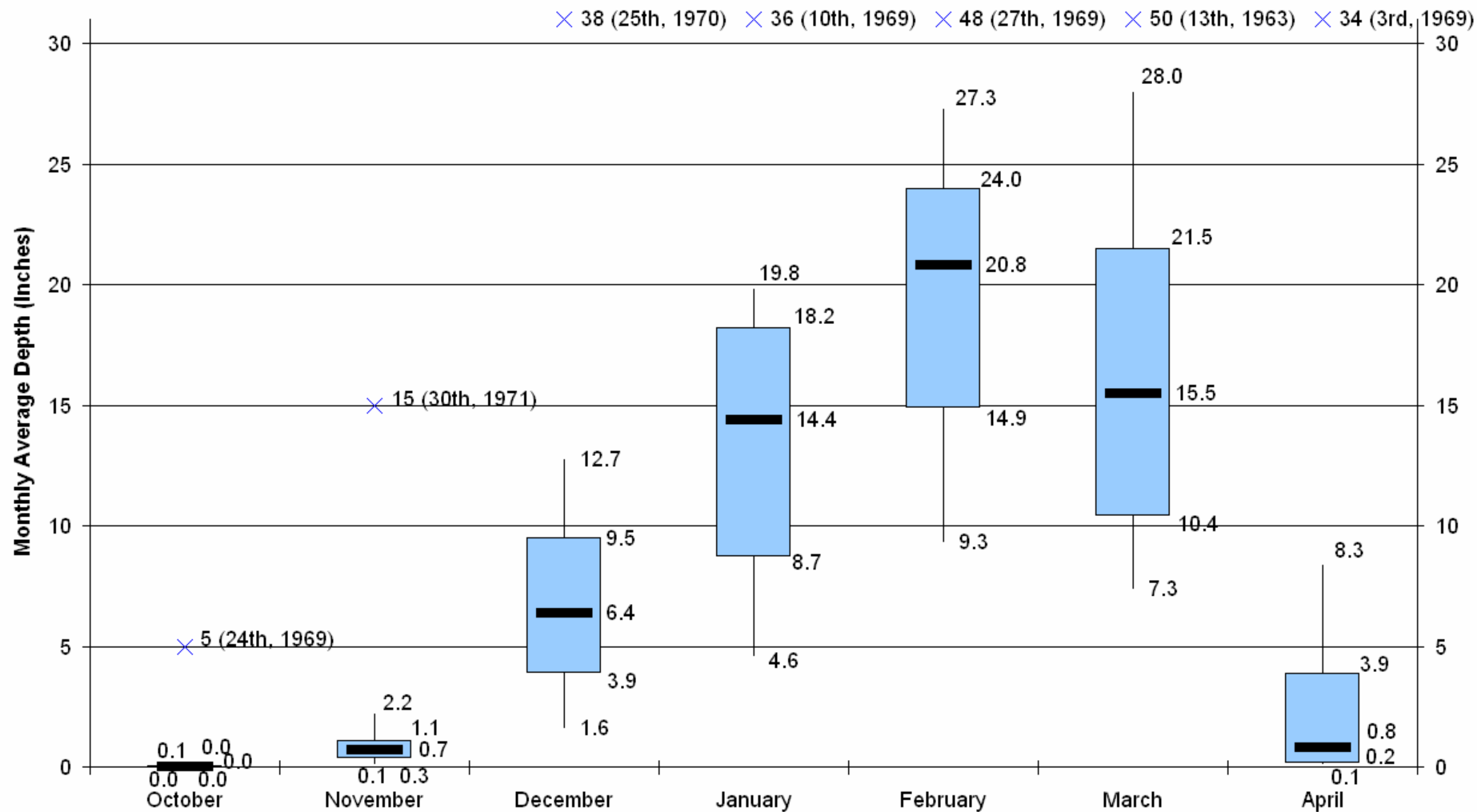
(solid bar - median seasonal value; boxes 25th - 75th percentile; whiskers 10th/90th percentile)  
(x - Extreme Monthly Total Snow Days)





## Monthly Average Snow Depth - West Burke, VT (1977-2007)

(solid bar - median seasonal value; boxes 25th - 75th percentile; whiskers 10th/90th percentile)  
(x - Extreme Daily Snow Depth for Month)





## Days with 4 inches of Snow or Greater per year (Winter Weather Advisory criteria) BTV WFO Area - Vermont (1977-2007)

(solid bar - median seasonal value; boxes 25th - 75th percentile; whiskers 10th/90th percentile)  
(x - Extreme Yearly Value)

