

# Meteorological Trends at Nine Mile Point

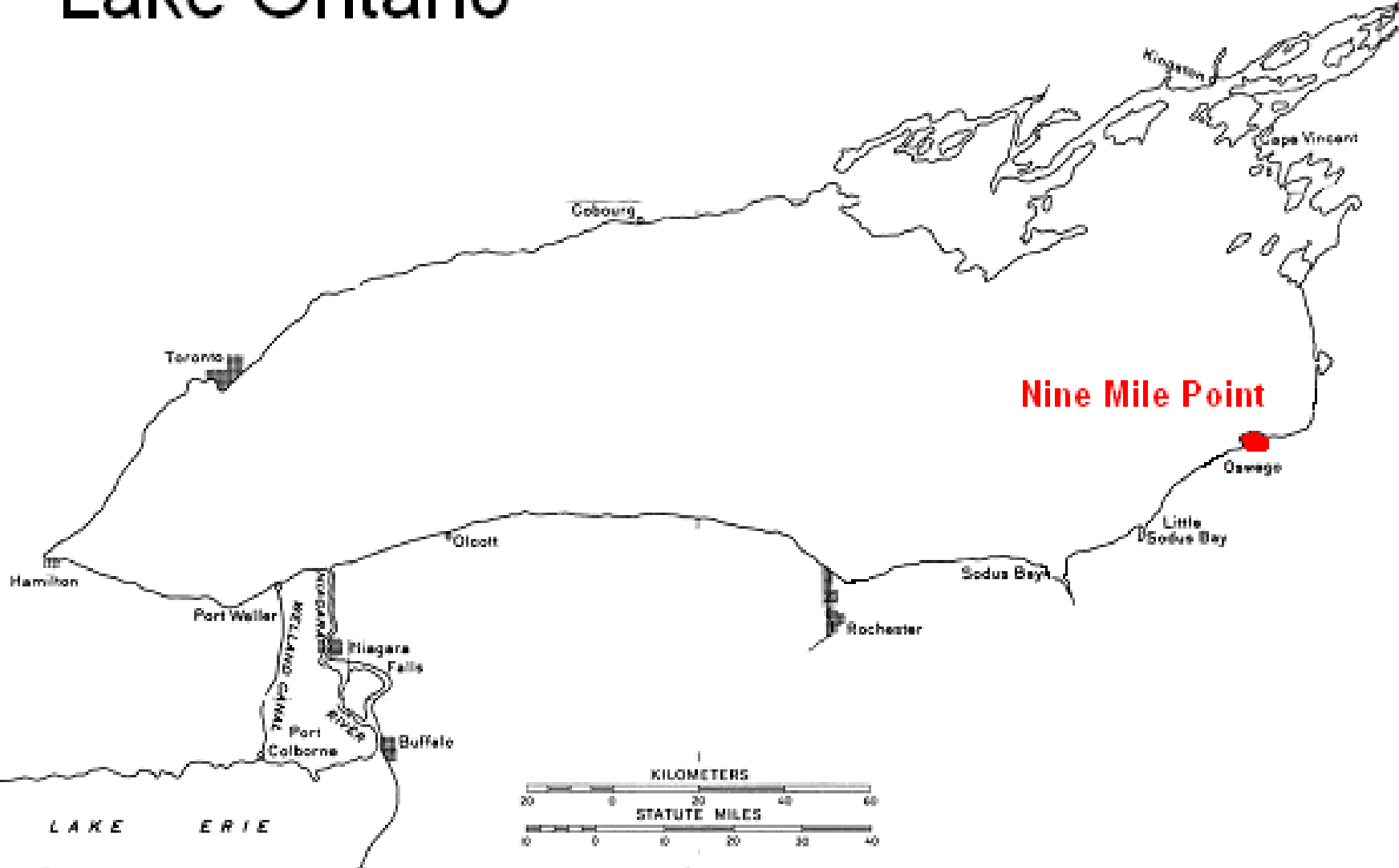
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NUMUG 2005

Analysis by On-site Meteorologists Thomas Galletta and Anthony Fabrizio

# Background Information

- Data is from Nine Mile Point Main Tower
- The Main Tower is instrumented at three levels (30', 100' & 200')
- The current database is 20 years
- An additional 10 years of Temperature data are included from a previous database

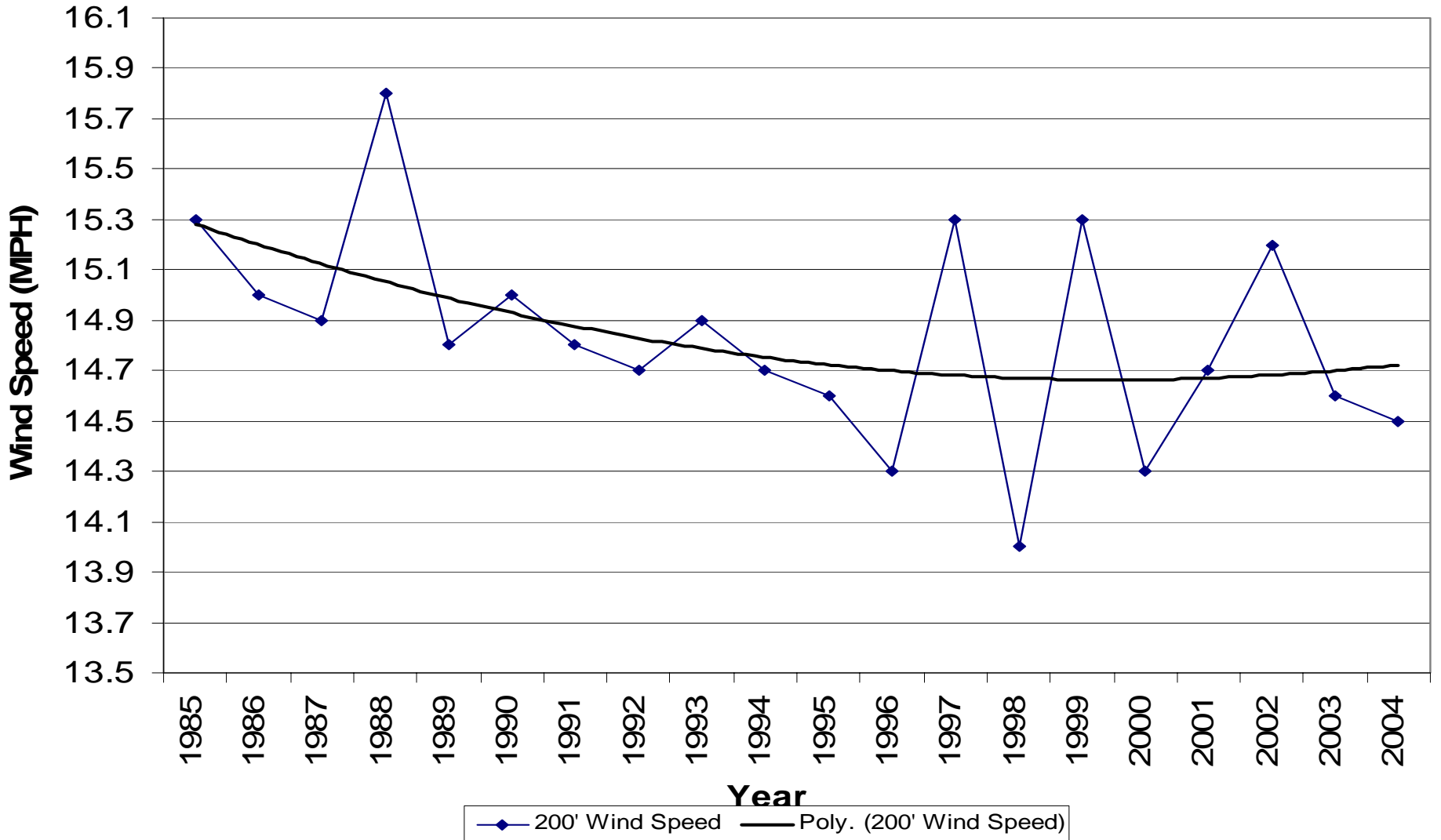
# Lake Ontario



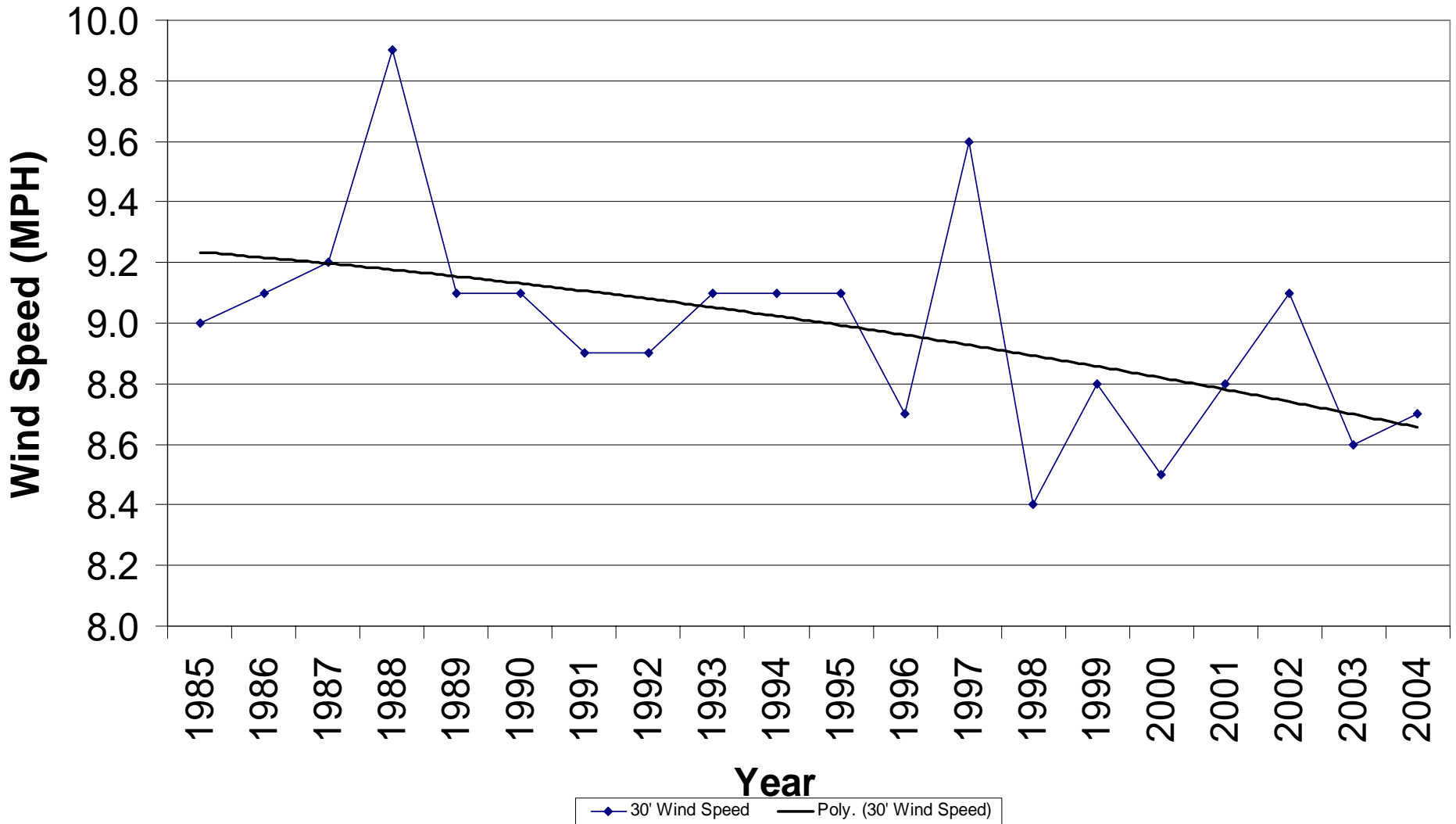
# Wind Speed Trend

- Wind Speed has decreased from 1985 to 2004
  - 4% at the 200' level
  - 6% at the 30' level
- The speed decrease is marked with spikes from year to year throughout the downward trend

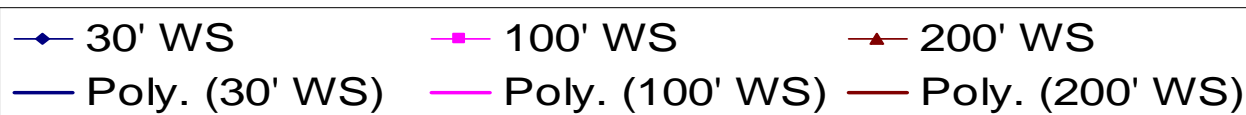
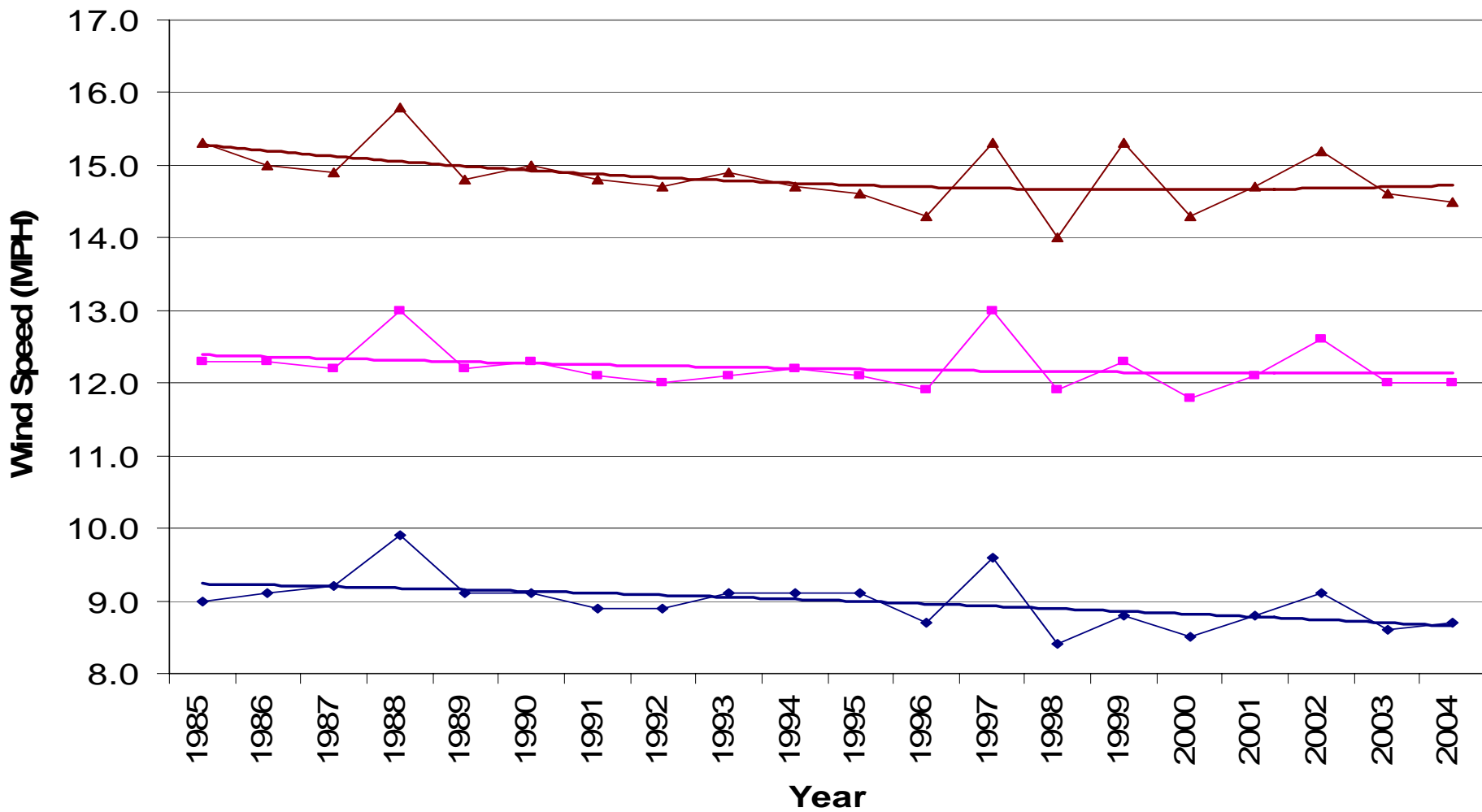
# NMP Annual Average Wind Speed 200' Level



# NMP Annual Average Wind Speed 30' Level



# NMP Annual Average Wind Speed All Levels



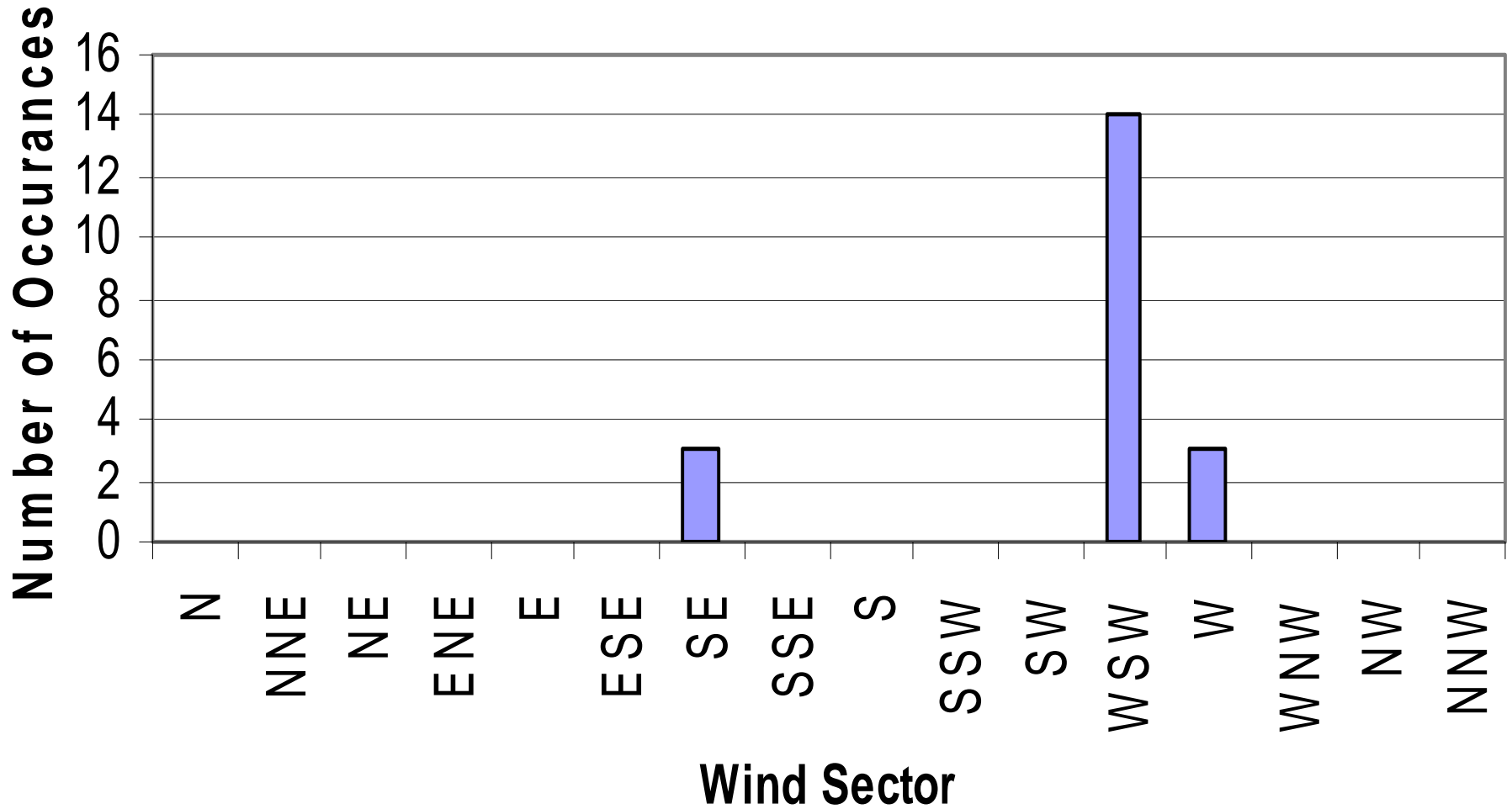


# Wind Direction Trend

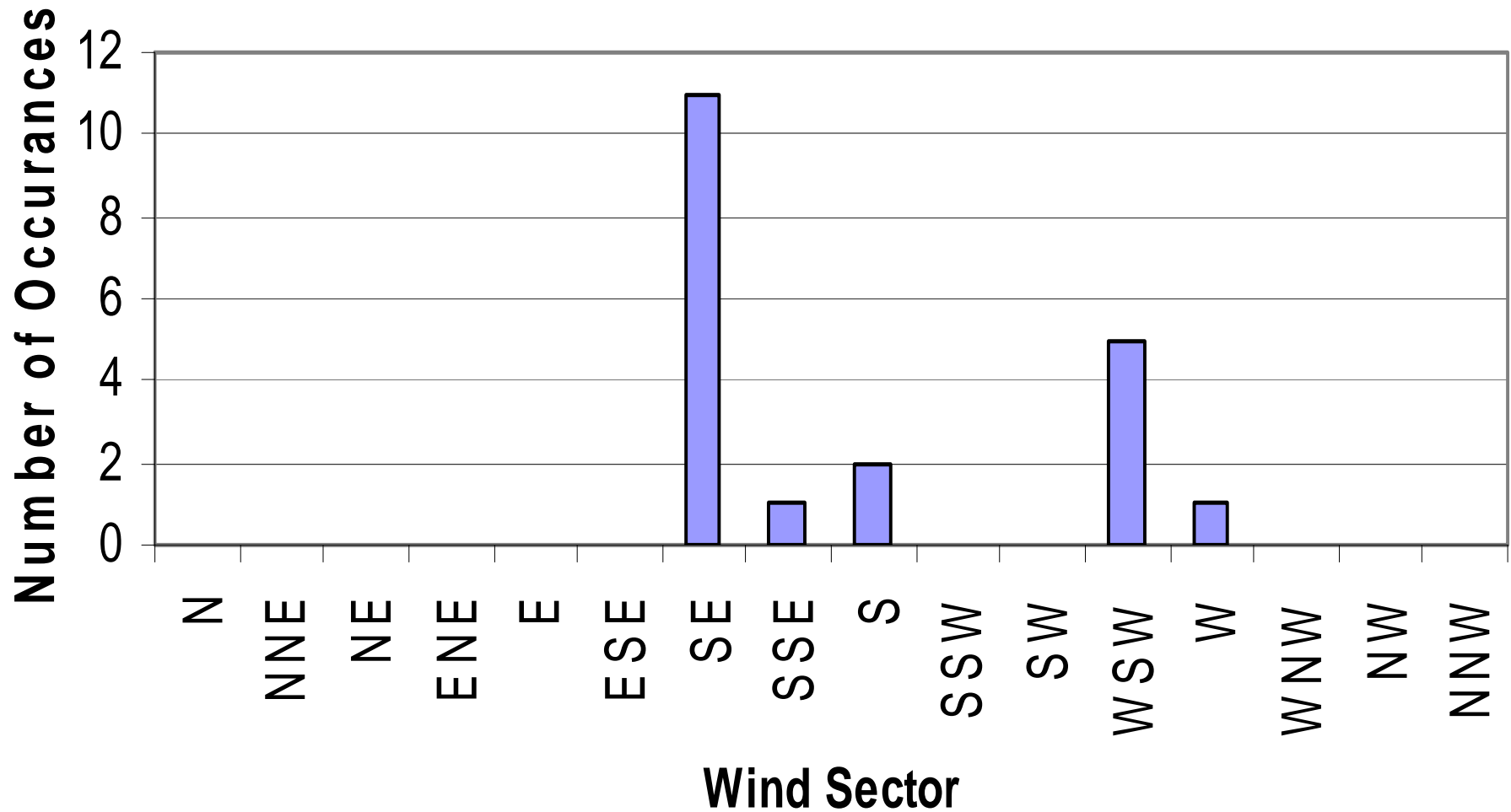
- Prevailing Wind Direction at 200' has been primarily WSW
  - With three different predominant sectors evident over the 20 year period
  - Within the limited 20 year data set we see the predominant wind sector change on a period of about 10 years
- Prevailing Wind Direction at 30' has been primarily SE
  - But five different sectors have predominated over the recent 20 year period



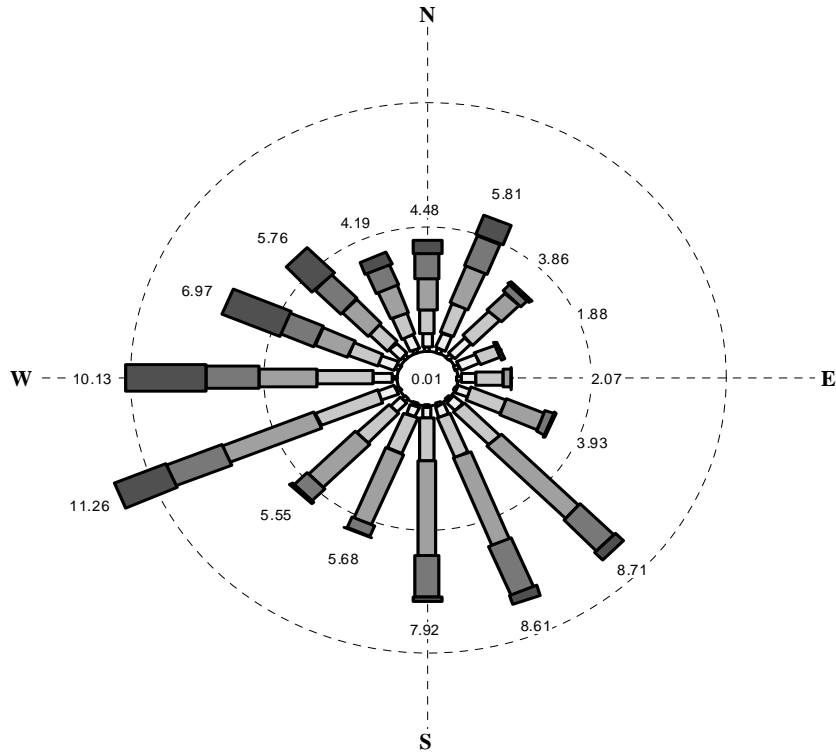
# NMP Frequency of Prevailing Wind Sector 200' Level



# NMP Frequency of Prevailing Wind Sector 30' Level



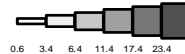
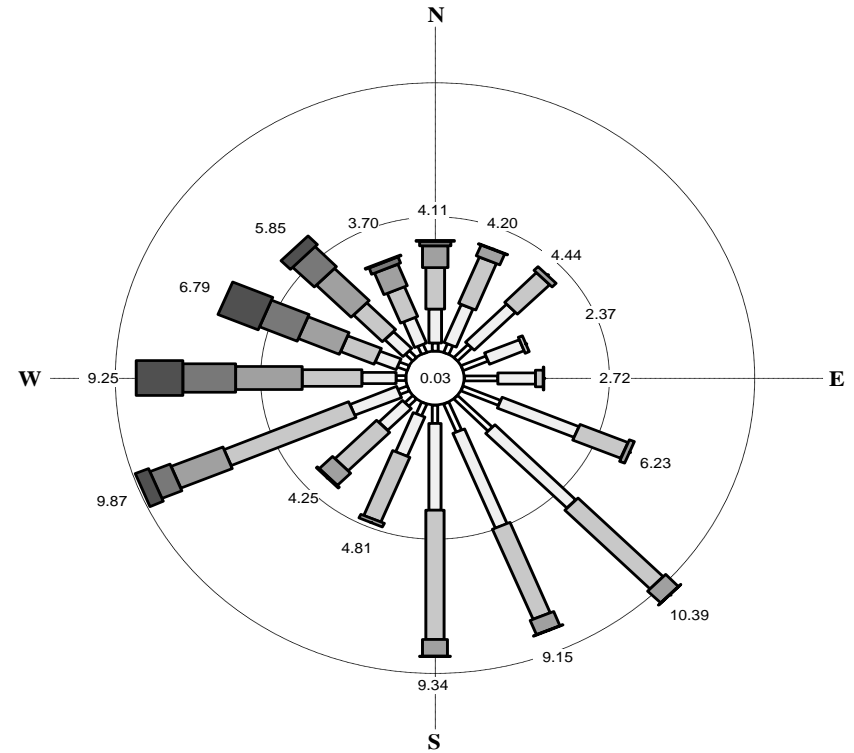
**Nine Mile Point  
200' Wind Rose  
1985-2004**



Wind Speed (Miles Per Hour)

Calms included at center.  
Rings drawn at 5% intervals.  
Wind flow is FROM the directions shown.  
3.20% of observations were missing.

**Nine Mile Point  
30' Wind Rose  
1985-2004**



Wind Speed (Miles Per Hour)

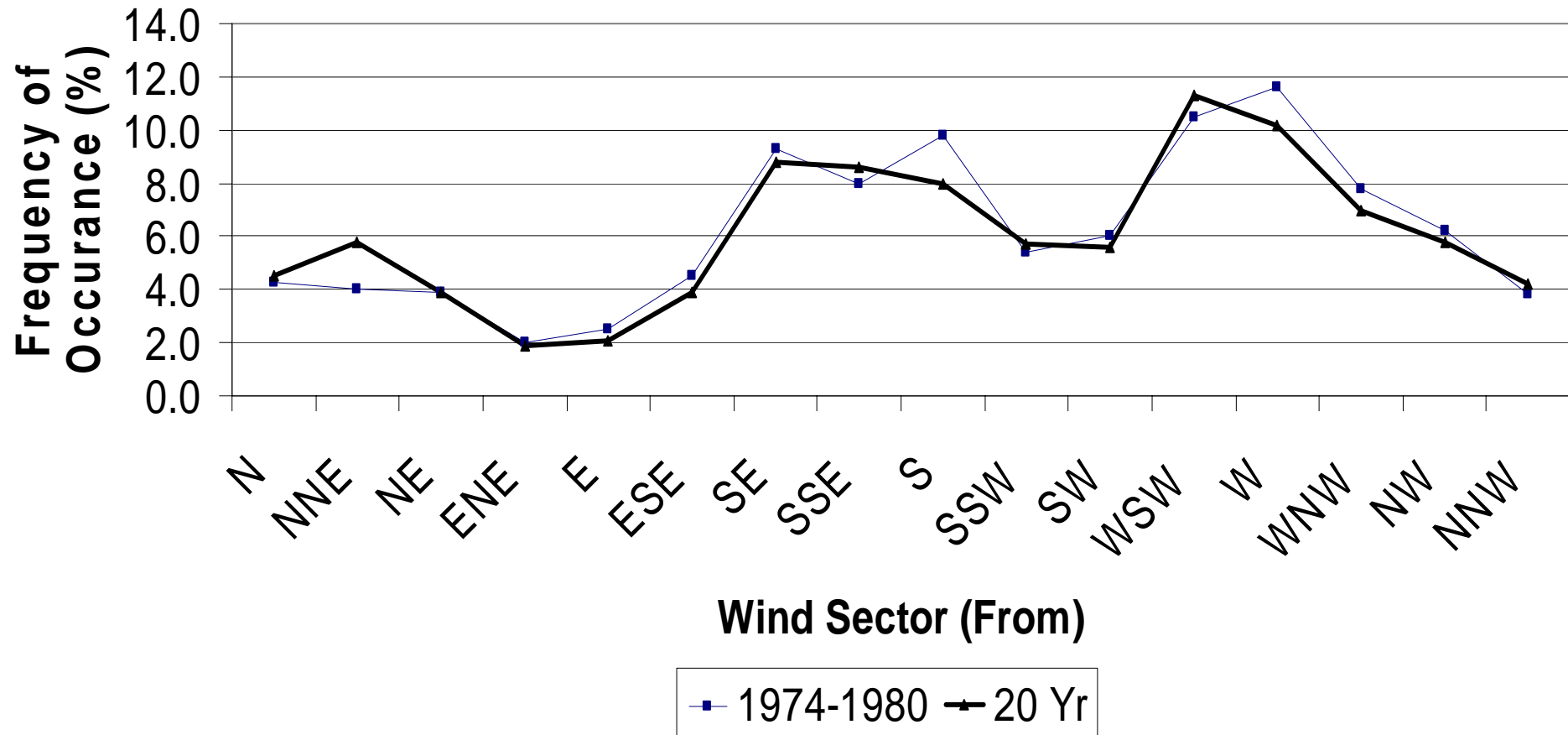
Calms included at center.  
Rings drawn at 5% intervals.  
Wind flow is FROM the directions shown.  
2.50% of observations were missing.

# NMP Wind Direction Frequency 5 Yr (1974-1980 Spilt Period)

VS

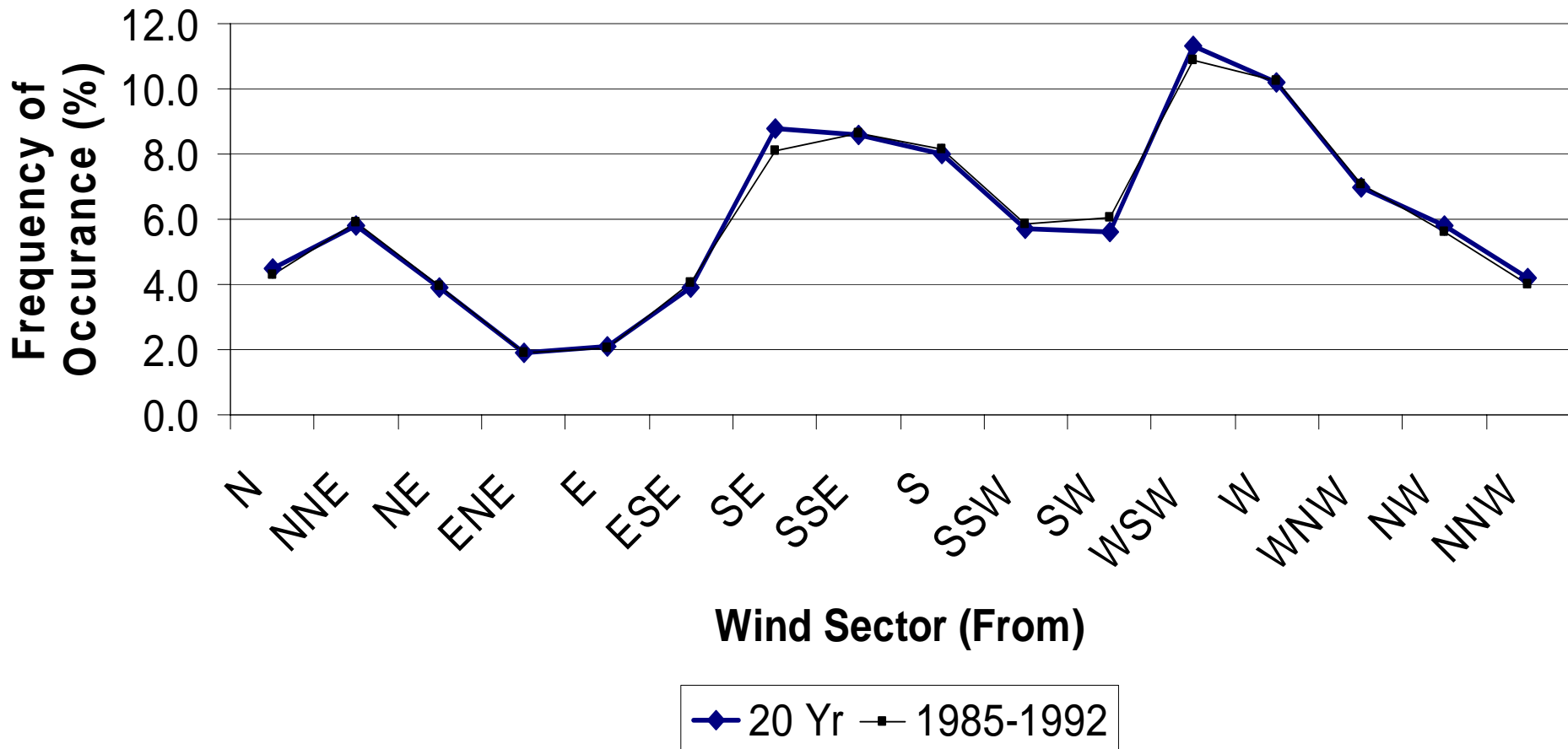
## 20 Yr (1985-2004)

### 200' Level



# NMP Wind Direction Frequency 1985-1992

VS  
20 Yr (1985-2004)  
200' Level



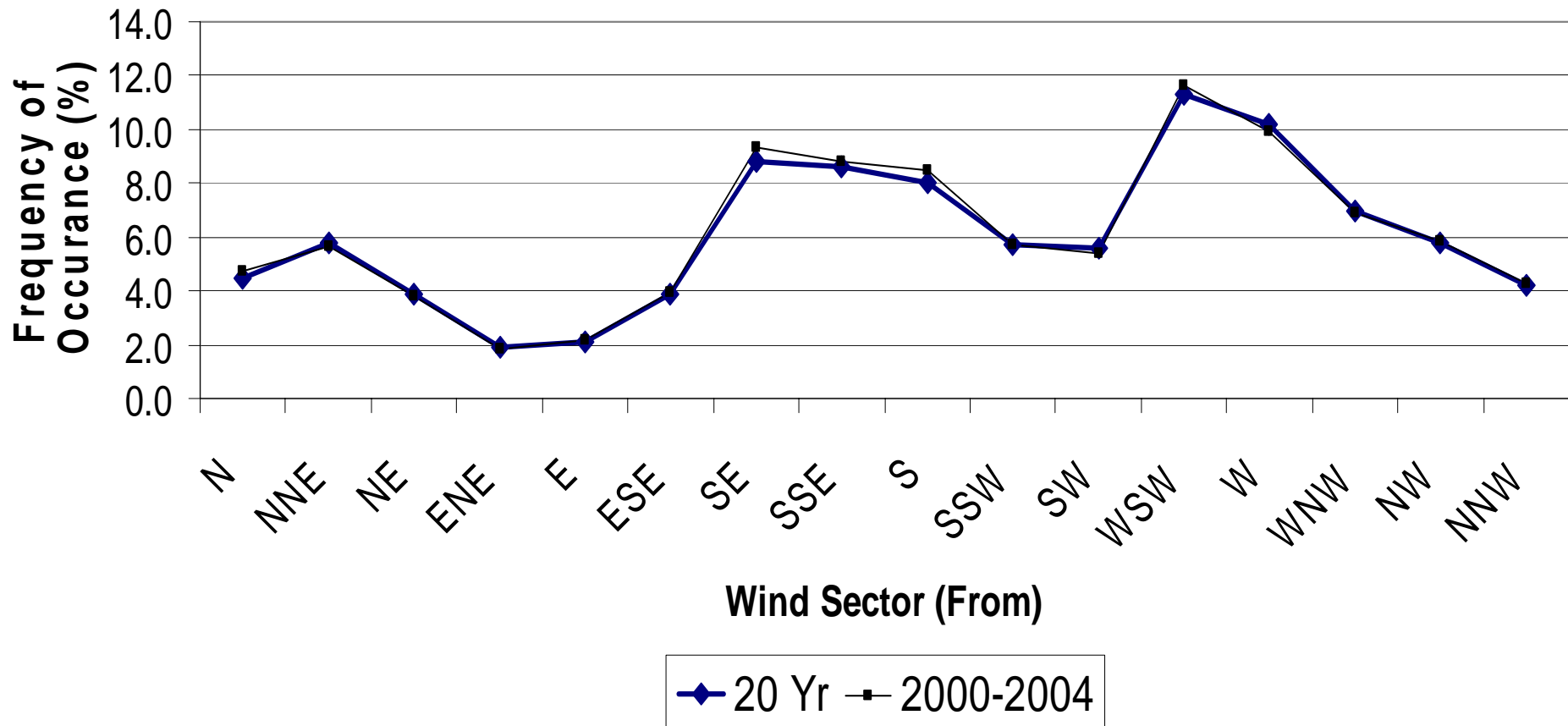
# NMP Wind Direction Frequency

## 5 Yr (2000-2004)

VS

## 20 Yr (1985-2004)

### 200' Level



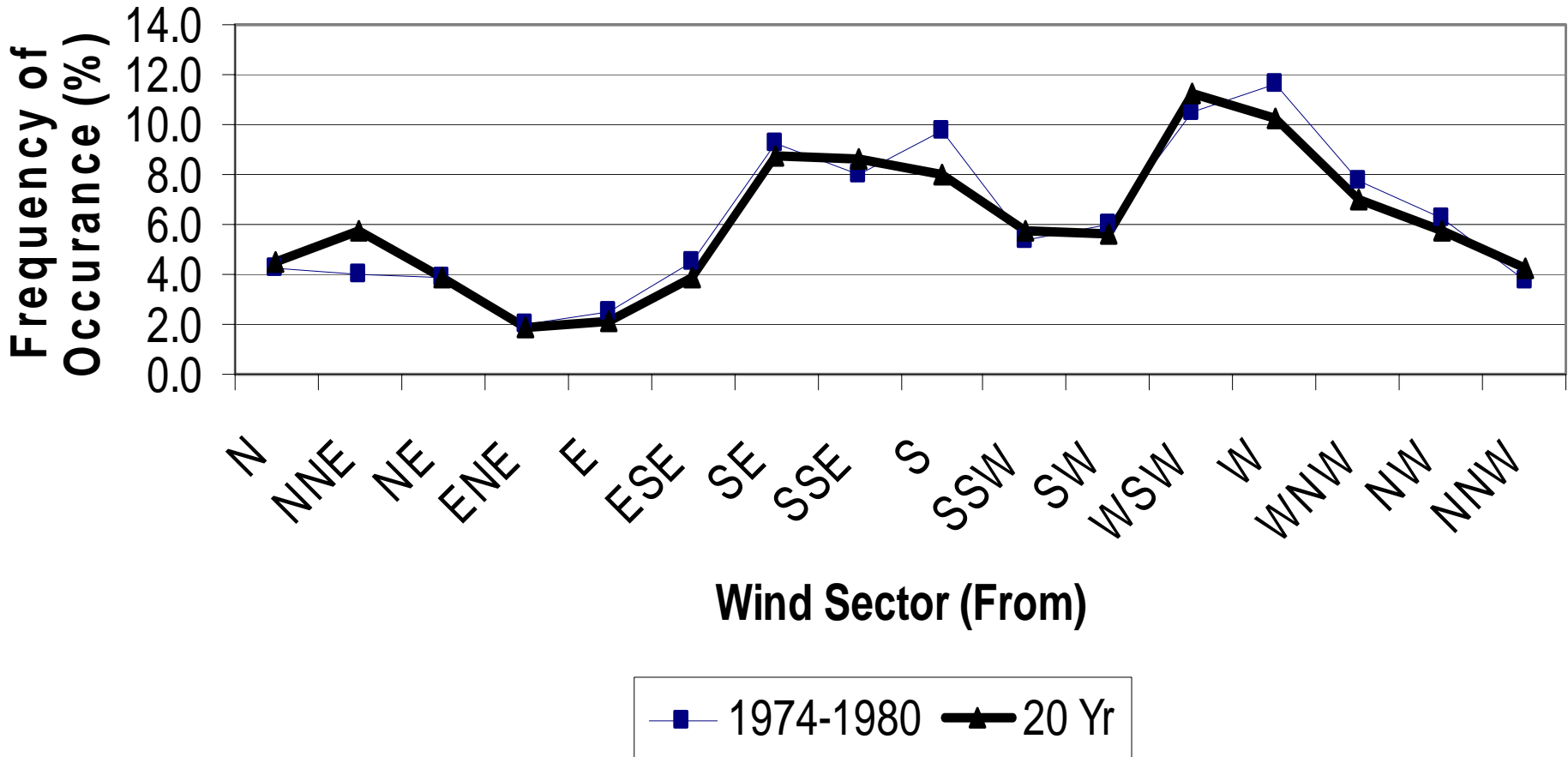


# NMP Wind Direction Frequency 5 Yr (1974-1980 Spilt Period)

VS

## 5 Yr (2000-2004)

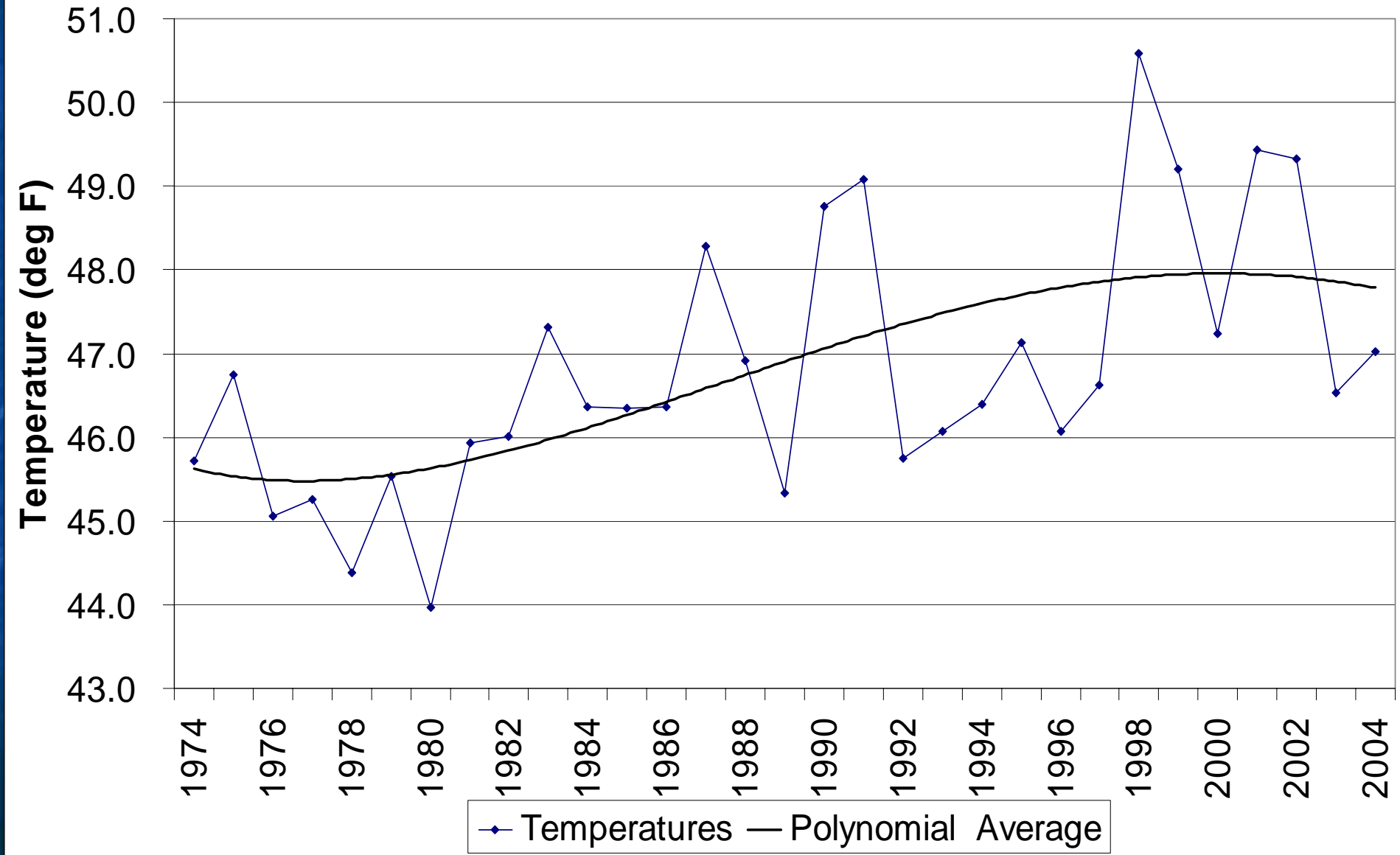
### 200' Level



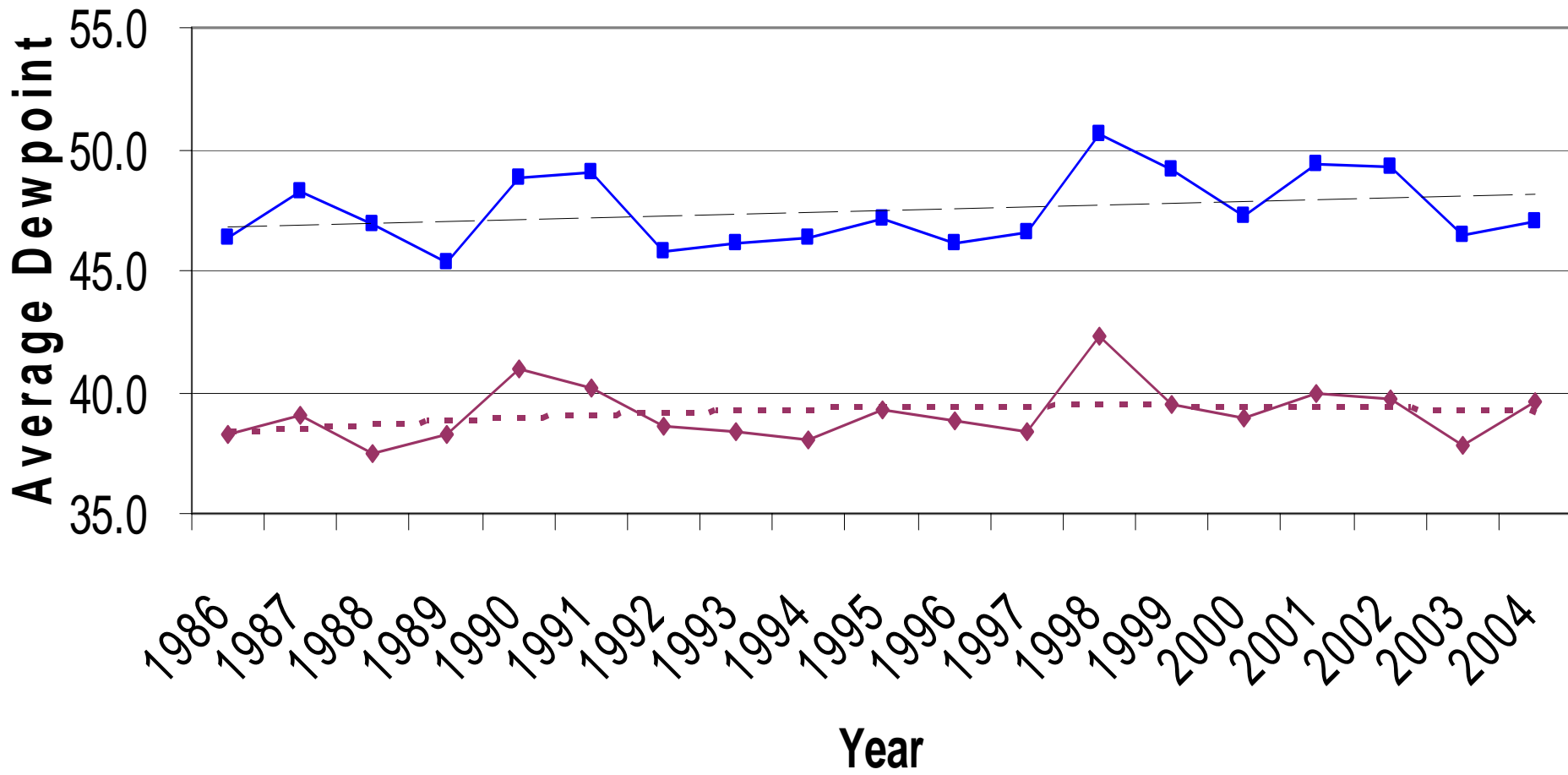
# Temperature-Dew Point Trend

- Temperature-Dew Point increase ~5%.
  - Temperature increase 2.2°F in 30 years
- Dew Point trend follows Temperature
  - Average Relative Humidity ~75%

# NMP Annual Average Temperature 1974-2004

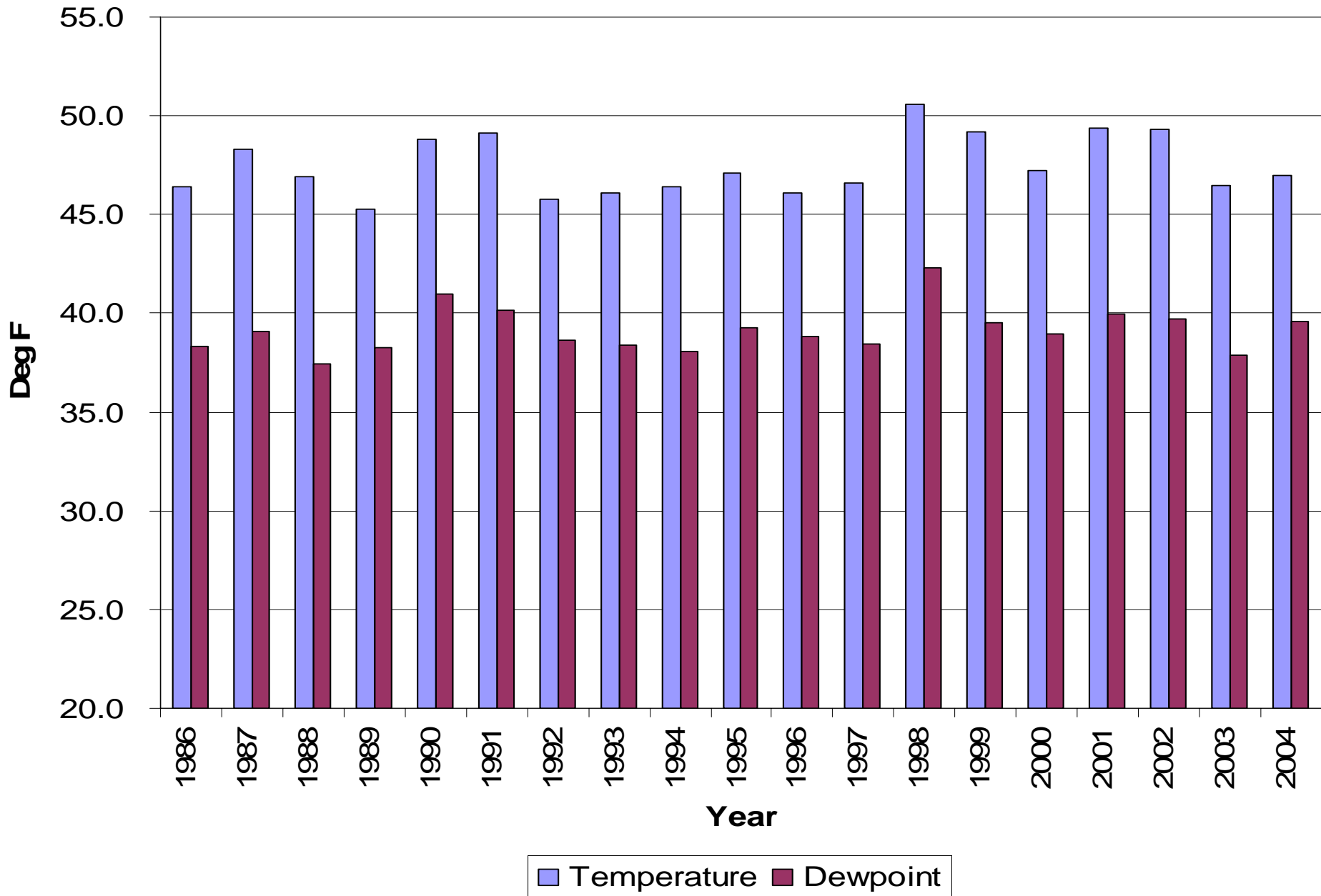


# NMP Annual Average Temperature and Dewpoint 1986-2004

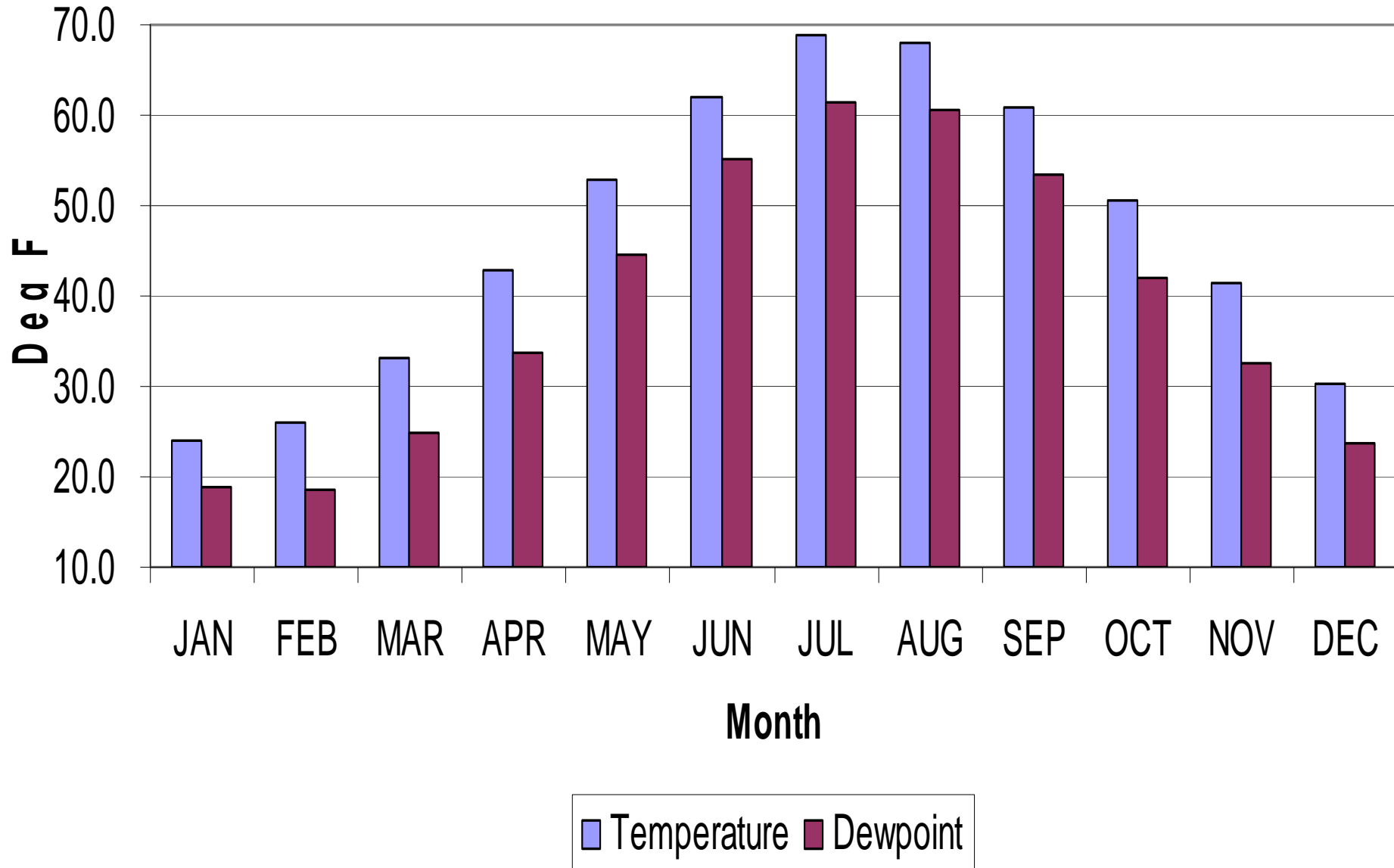


—◆— Dewpoint —■— Temperature - - - Poly. (Dewpoint) - - - Linear (Temperature)

# NMP Annual Temperature and Dewpoint



# NMP Monthly Temperature and Dewpoint

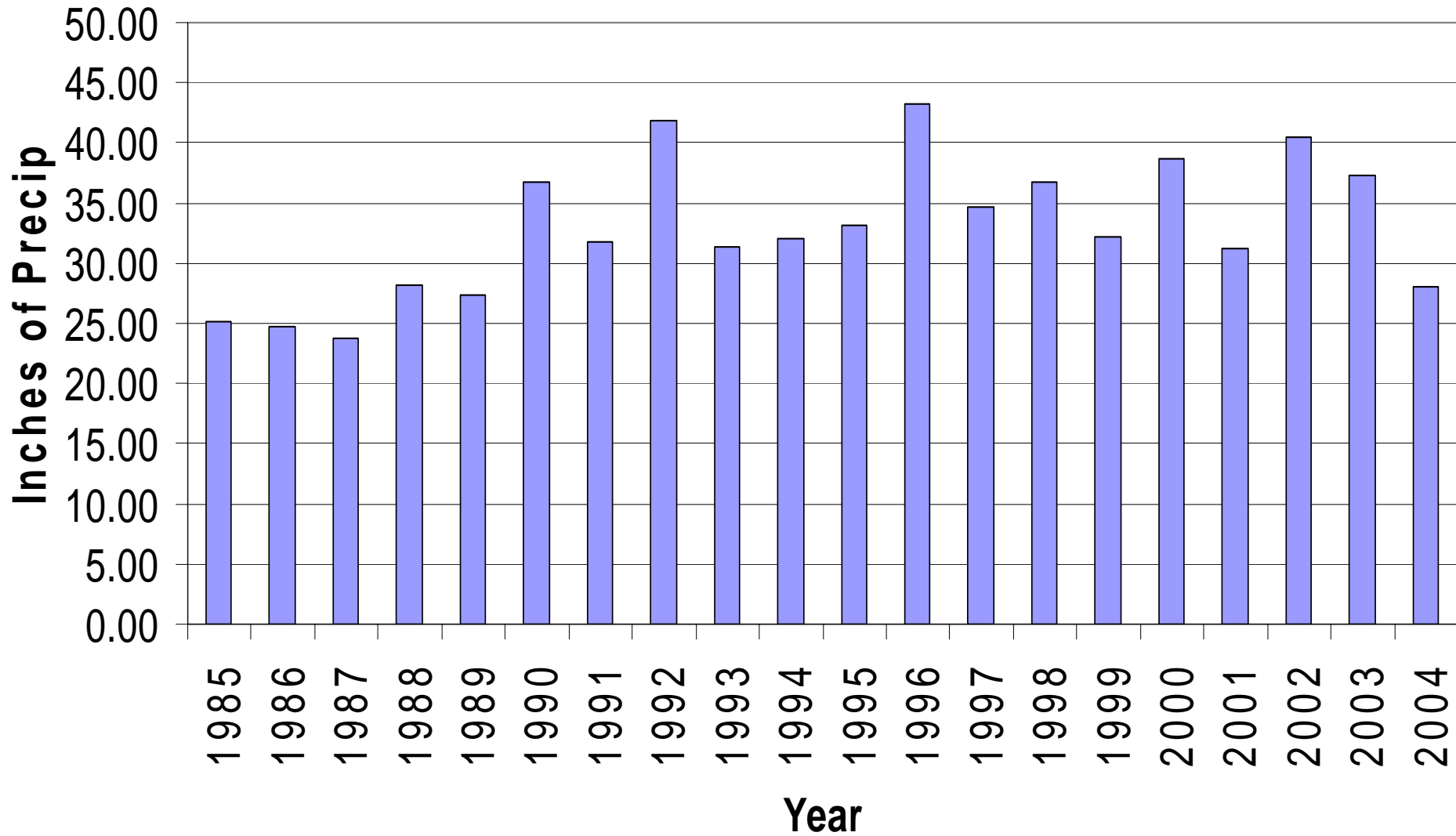




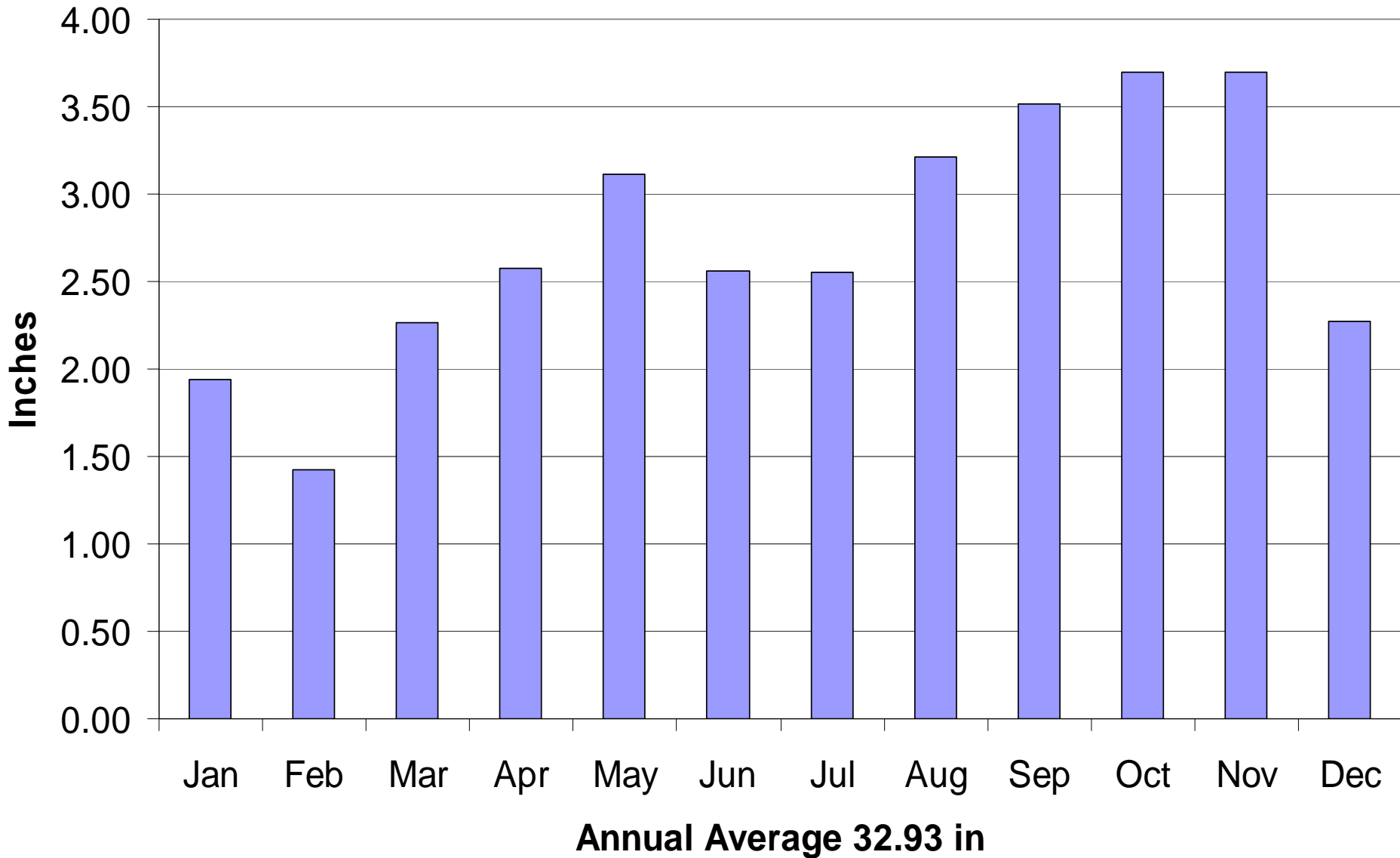
# Precipitation Trend

- Annual Average precip is ~33 inches
- October and November are the wettest months
- February is the driest month

# NMP Yearly Average Precip (1985-2004)



# NMP 20 Year Monthly Average Precip (1985-2004)



# Conclusion

- Wind Speeds at all levels have decreased
- Prevailing wind direction differs with height and displayed a periodic variation
- Temperature and dewpoint have increased ~5%
- Precipitation displayed no apparent trend