



Pennsylvania 2011 Ozone Season Summary

**Air Quality Technical Advisory Committee
(AQTAC)**

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Pennsylvania

2011 Ozone Season Summary

- **Statewide and Climate Division Summary**
 - Ozone Concentrations from April 1 through Sept 30
 - 2011 Data from PA DEP and US EPA AQS
 - 2011: 183 days × 49 monitors = 8,967 data points
- **Meteorology**
 - June-July-August (JJA) Temperatures and Precipitation
 - JJA is generally the “heart” of the ozone season
- **2011 vs. 2010**

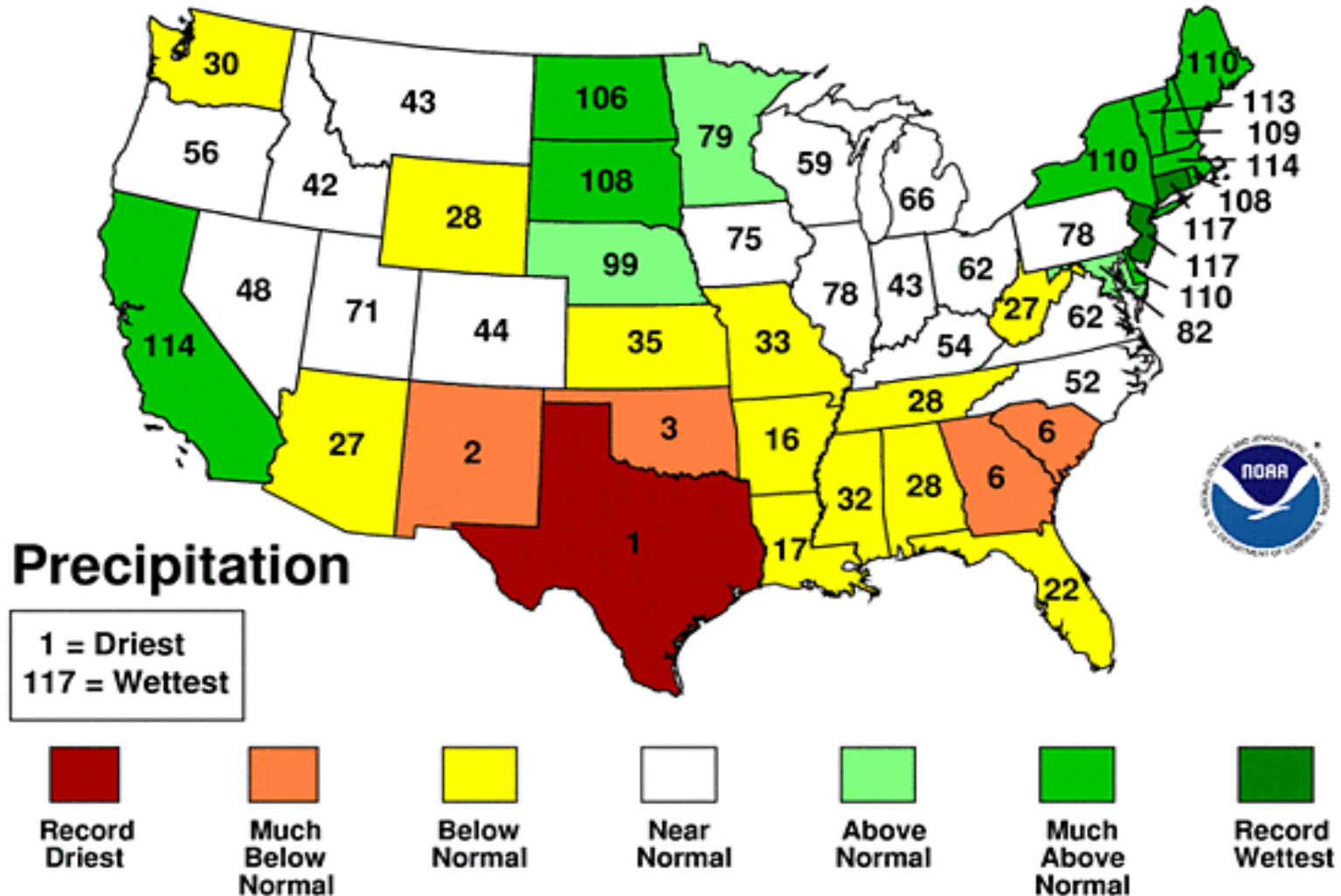
Pennsylvania

2011 Ozone Season Summary

- Overview of Meteorology
 - Temperature and Precipitation
 - Ozone correlates well with temperature and to some extent precipitation.
 - **Classic View:** High ozone during periods of warm temperatures, sunny skies and light winds.
 - O₃ is a function of NO_x, VOC, sunlight, background, meteorology
 - Survey of Statewide & Climate Division Temp and Precip
- Ozone vs. Seasonal Temperature and Precipitation
 - 2011 & 2010

Jun-Aug 2011 Statewide Rank

National Climatic Data Center/NESDIS/NOAA

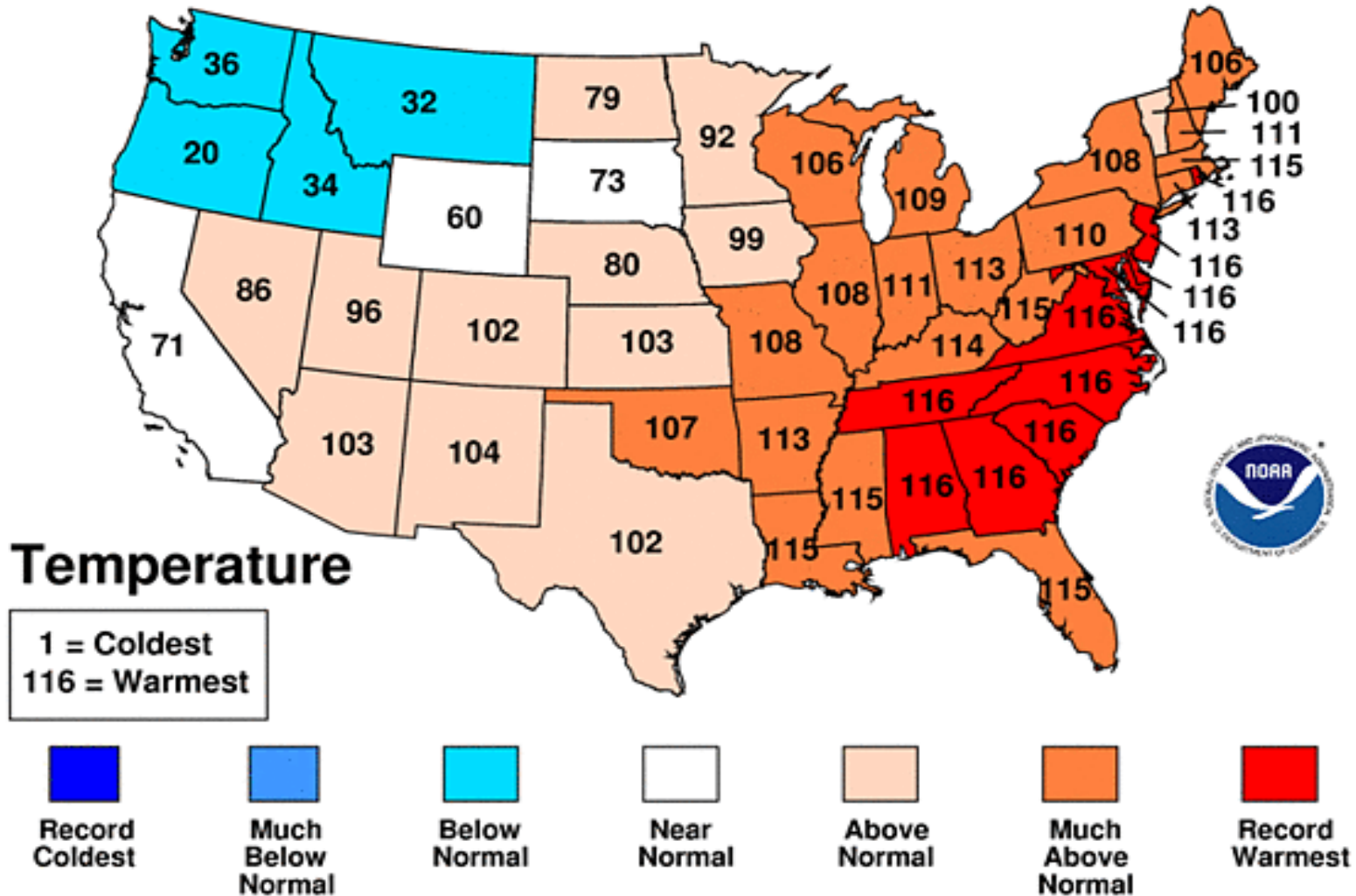


Pennsylvania 2011 Ozone Season Summary

- **Pennsylvania 2011 Climate:**
 - Statewide summer (JJA) temperatures and precipitation near climate normals.
- **Pennsylvania 2011 Ozone:**
 - Number of days above 75 ppb: 27
 - Total times a monitor was above 75 ppb: 134
 - Number of days above 84 ppb: 12
 - Total times a monitor was above 84 ppb: 26

June-August 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Pennsylvania 2010 Ozone Season Summary

- **Pennsylvania 2010 Climate:**
 - Statewide summer (JJA) temperatures and precipitation above climate normals.
- **Pennsylvania 2010 Ozone:**
 - Number of days above 75 ppb: 35
 - Total times a monitor was above 75 ppb: 224
 - Number of days above 84 ppb: 13
 - Total times a monitor was above 84 ppb: 46

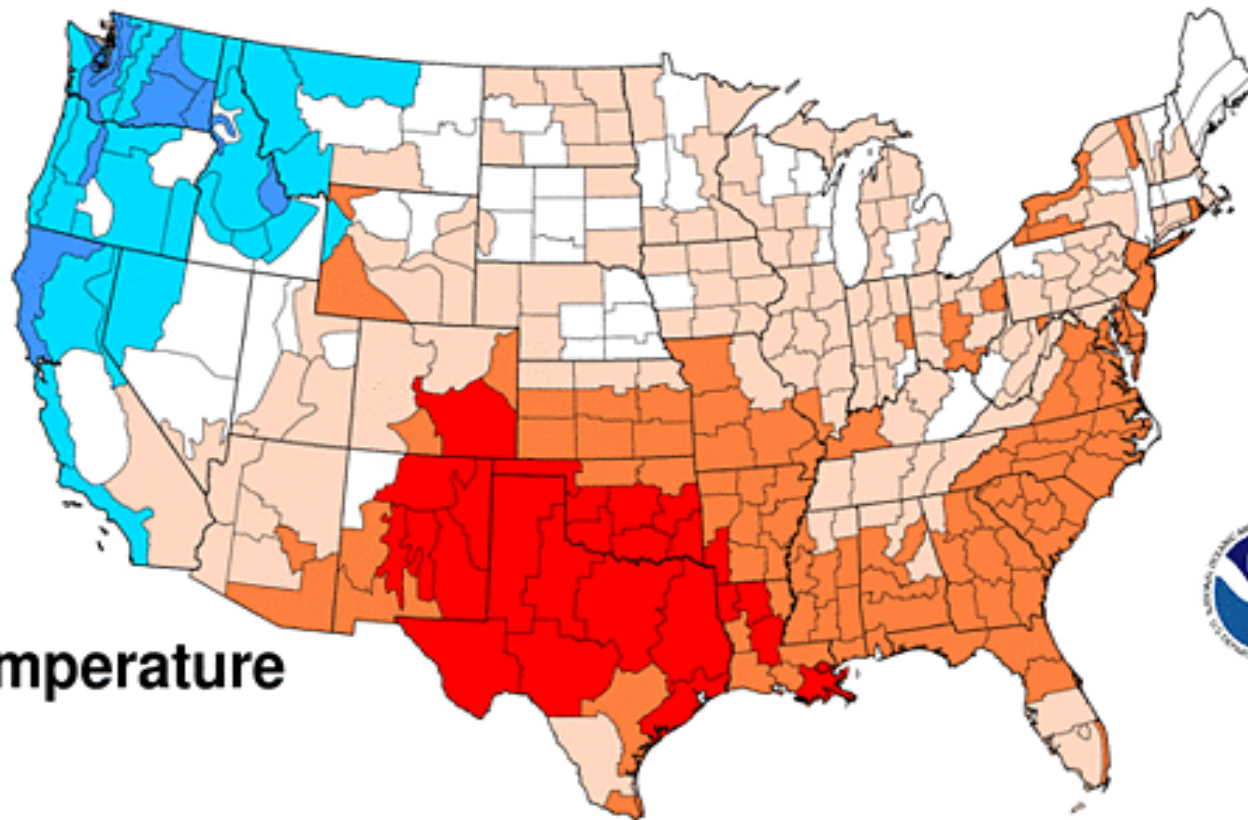
Pennsylvania 2011 Ozone Season Summary

Comparison

	<u>2011</u>	<u>2010</u>
Number of Days > 75 ppb	27	35
Number of Monitors > 75 ppb	134	224
Number of Days > 84 ppb	12	13
Number of Monitors > 84 ppb	26	46

Jun - Aug 2011

National Climatic Data Center/NESDIS/NOAA




Temperature


Record
Coldest


Much
Below
Normal


Below
Normal


Near
Normal

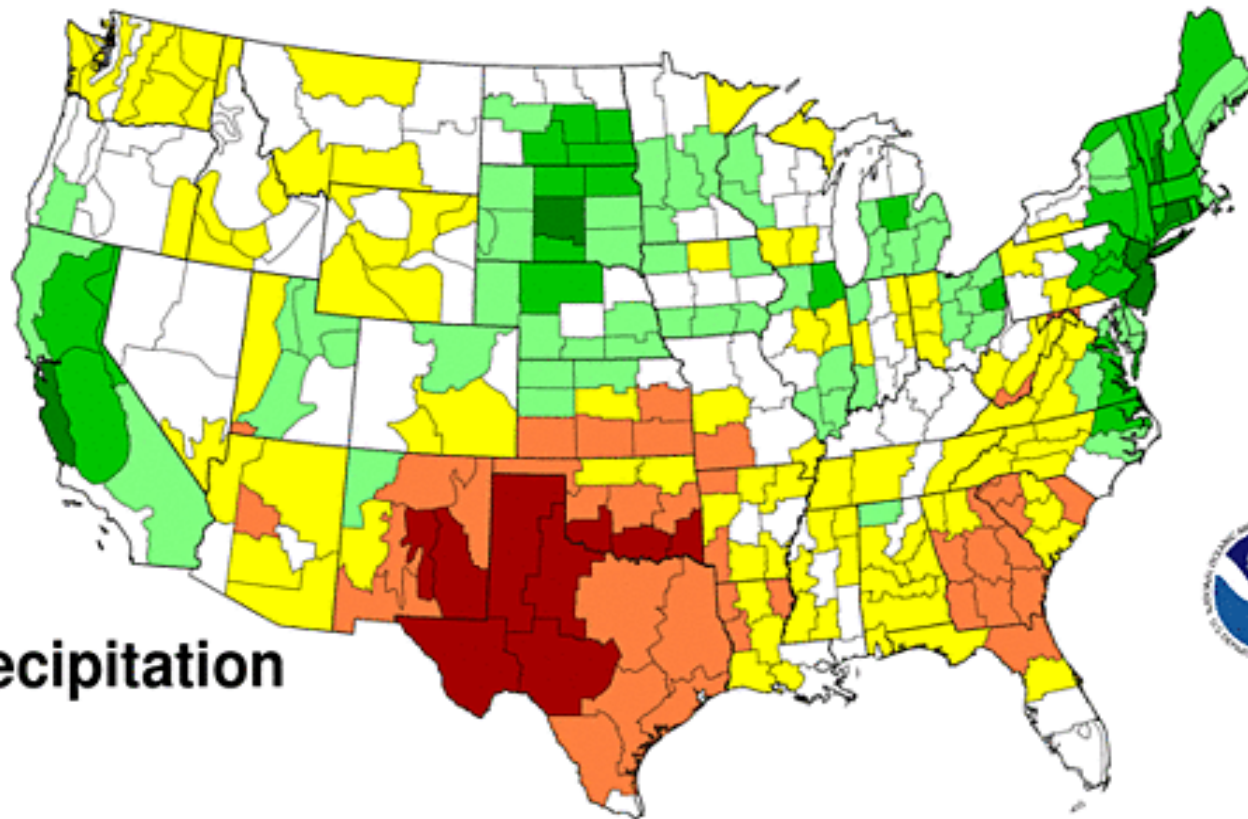

Above
Normal


Much
Above
Normal


Record
Warmest

Jun - Aug 2011

National Climatic Data Center/NESDIS/NOAA



Precipitation



Record
Driest



Much
Below
Normal



Below
Normal



Near
Normal



Above
Normal



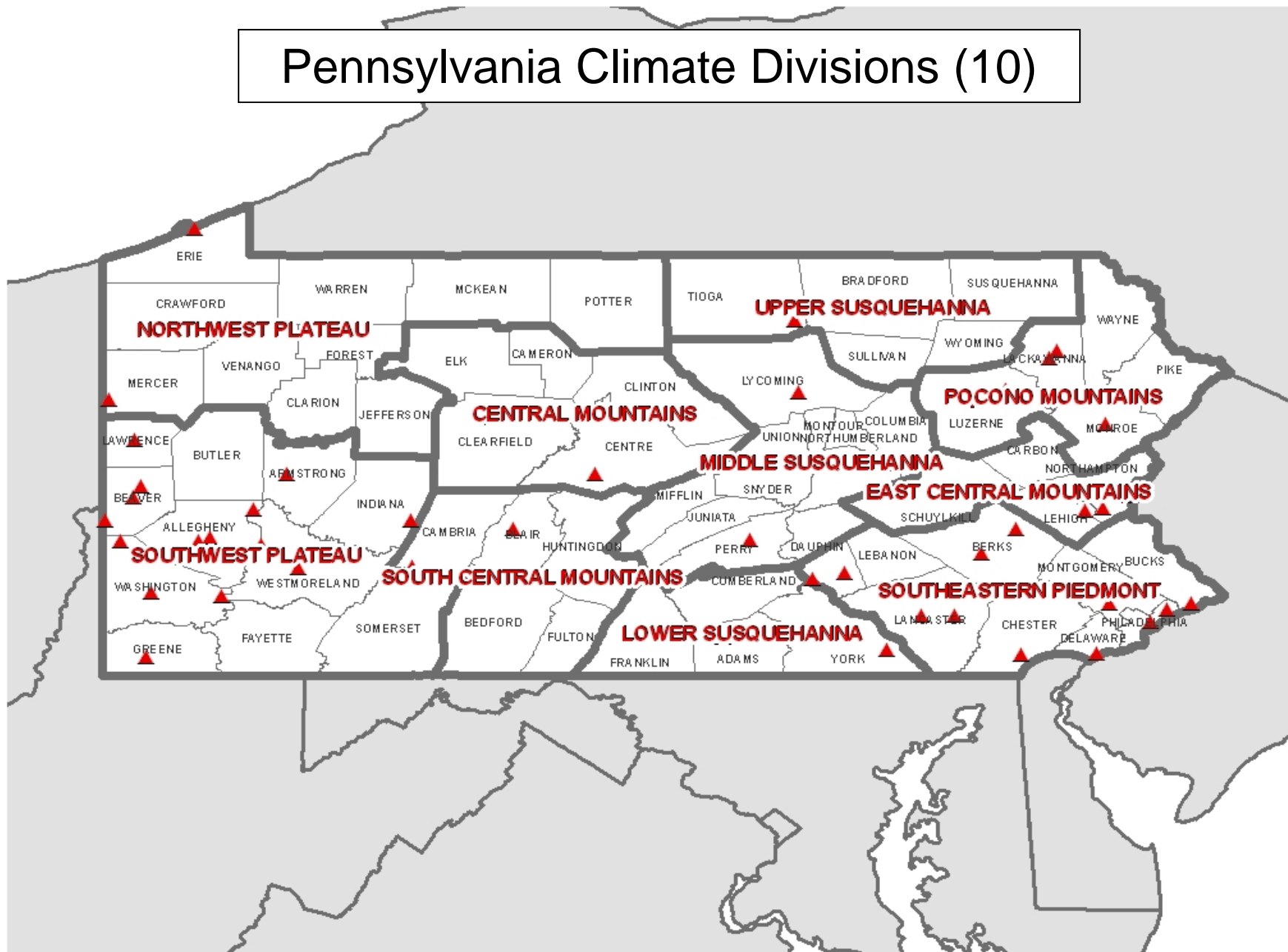
Much
Above
Normal



Record
Wettest



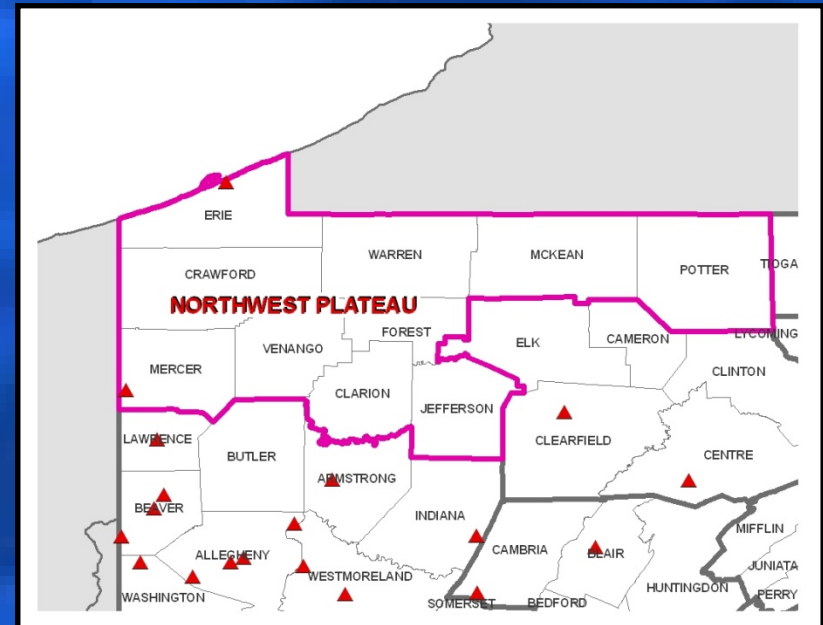
Pennsylvania Climate Divisions (10)



Pennsylvania 2011 Ozone Season Summary

Northwest Plateau:

	<u>2011</u>	<u>2010</u>
Temperature	Near	Above
Precipitation	Below	Above
Days > 75 ppb	4	6
Monitors > 75 ppb	5	7
Days > 84 ppb	1	0
Monitors > 84 ppb	1	0
Monitors	2	2

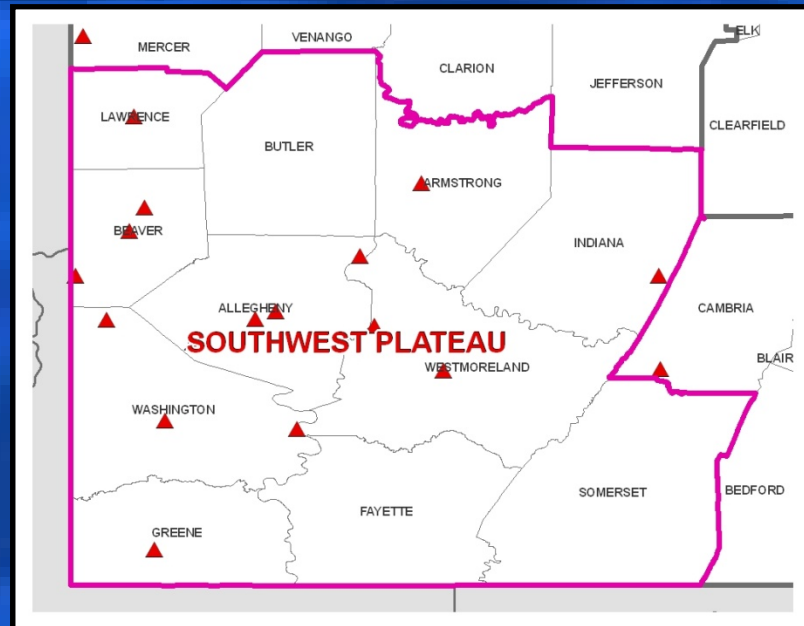


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2011 Ozone Season Summary

Southwest Plateau:

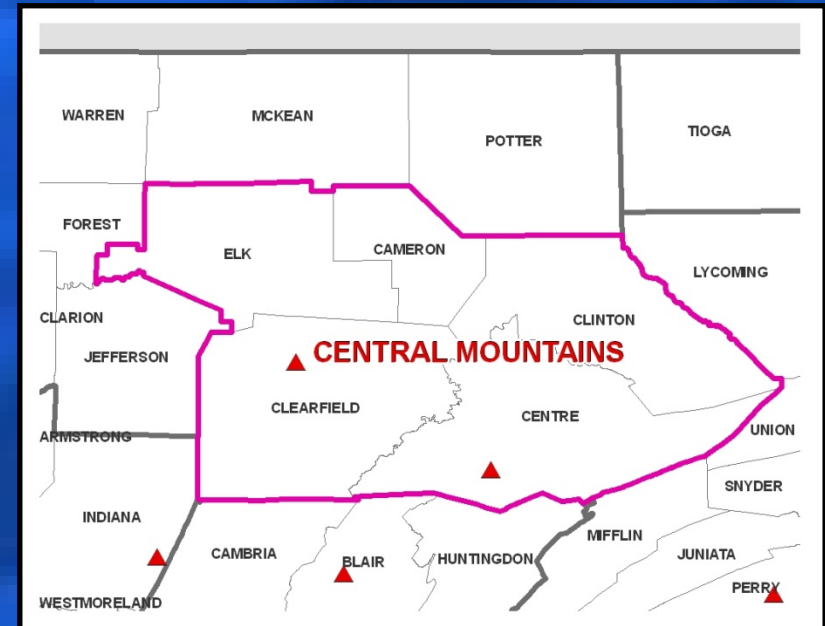
	<u>2011</u>	<u>2010</u>
Temperature	Above	Above
Precipitation	Near	Near
Days > 75 ppb	12	15
Monitors > 75 ppb	28	57
Days > 84 ppb	2	6
Monitors > 84 ppb	3	12
Monitors	16	16



Pennsylvania 2011 Ozone Season Summary

Central Mountains:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Above
Precipitation	Near	Near
Days > 75 ppb	3	5
Monitors > 75 ppb	4	6
Days > 84 ppb	0	0
Monitors > 84 ppb	0	0
Monitors	2	2

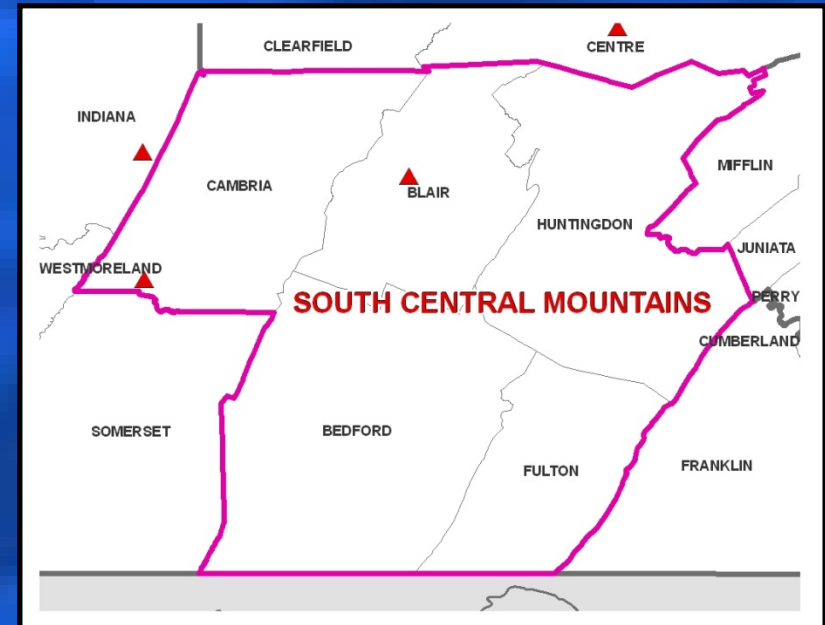


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2011 Ozone Season Summary

South Central Mountains:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Above
Precipitation	Below	Near
Days > 75 ppb	3	5
Monitors > 75 ppb	5	5
Days > 84 ppb	1	1
Monitors > 84 ppb	1	1
Monitors	2	2

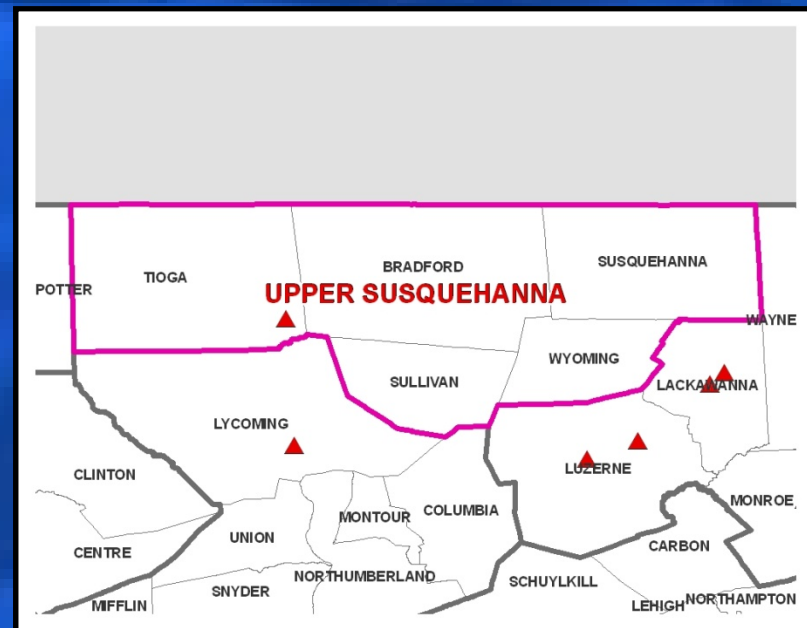


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2011 Ozone Season Summary

Upper Susquehanna:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Near
Precipitation	Near	Near
Days > 75 ppb	0	3
Monitors > 75 ppb	0	3
Days > 84 ppb	0	0
Monitors > 84 ppb	0	0
Monitors	1	1

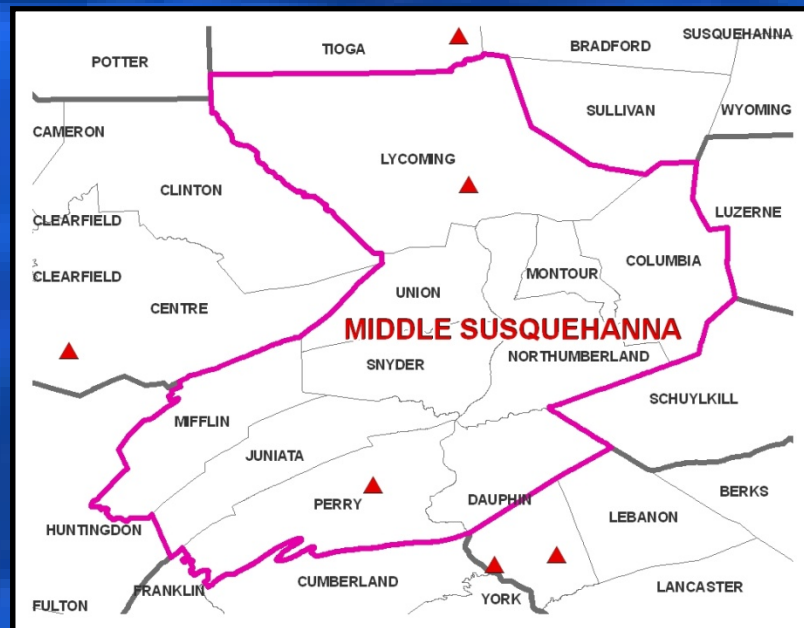


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2011 Ozone Season Summary

Middle Susquehanna:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Much Above
Precipitation	Much Above	Below
Days > 75 ppb	0	2
Monitors > 75 ppb	0	3
Days > 84 ppb	0	0
Monitors > 84 ppb	0	0
Monitors	2	2

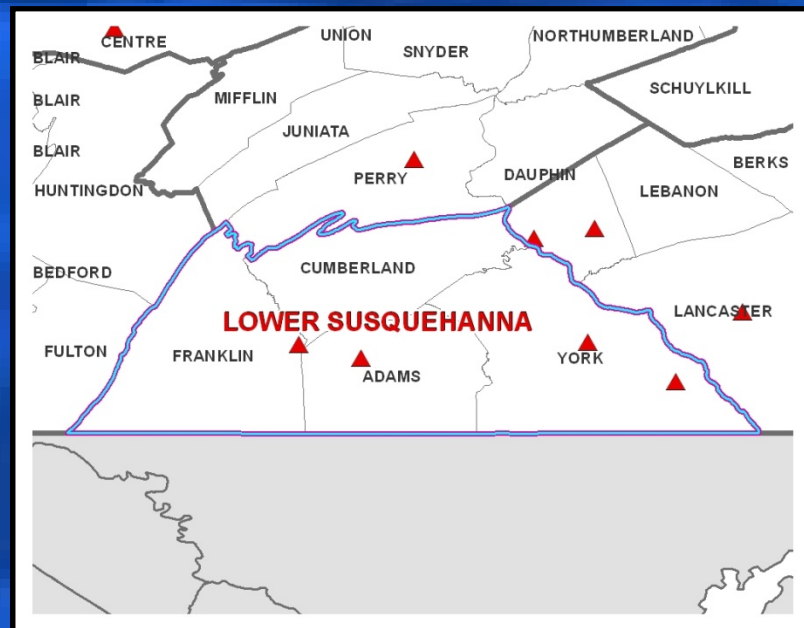


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2011 Ozone Season Summary

Lower Susquehanna:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Much Above
Precipitation	Below	Near
Days > 75 ppb	5	6
Monitors > 75 ppb	7	10
Days > 84 ppb	0	3
Monitors > 84 ppb	0	4
Monitors	4	4

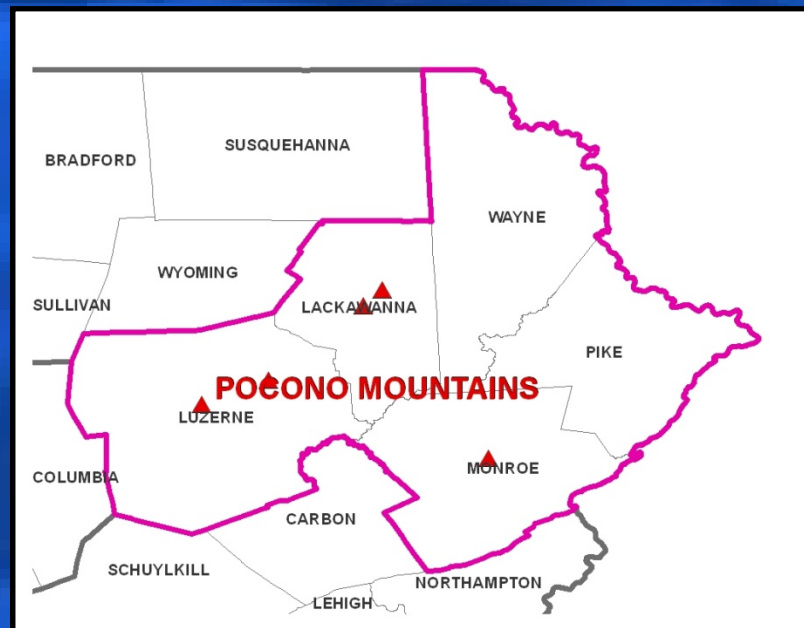


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2011 Ozone Season Summary

Pocono Mountains:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Much Above
Precipitation	Much Above	Near
Days > 75 ppb	0	7
Monitors > 75 ppb	0	11
Days > 84 ppb	0	0
Monitors > 84 ppb	0	0
Monitors	5	5

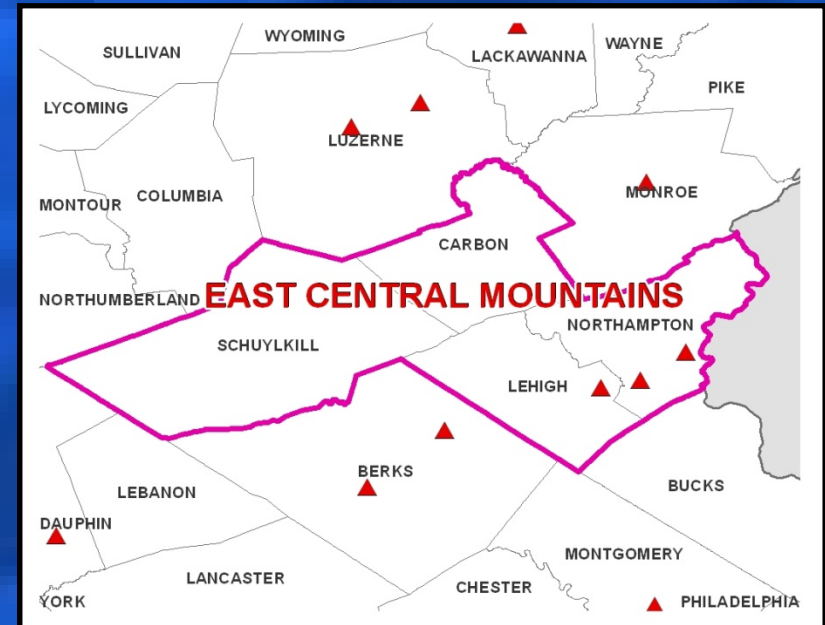


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2011 Ozone Season Summary

East Central Mountains:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Much Above
Precipitation	Much Above	Near
Days > 75 ppb	6	12
Monitors > 75 ppb	10	23
Days > 84 ppb	0	2
Monitors > 84 ppb	0	4
Monitors	3	3

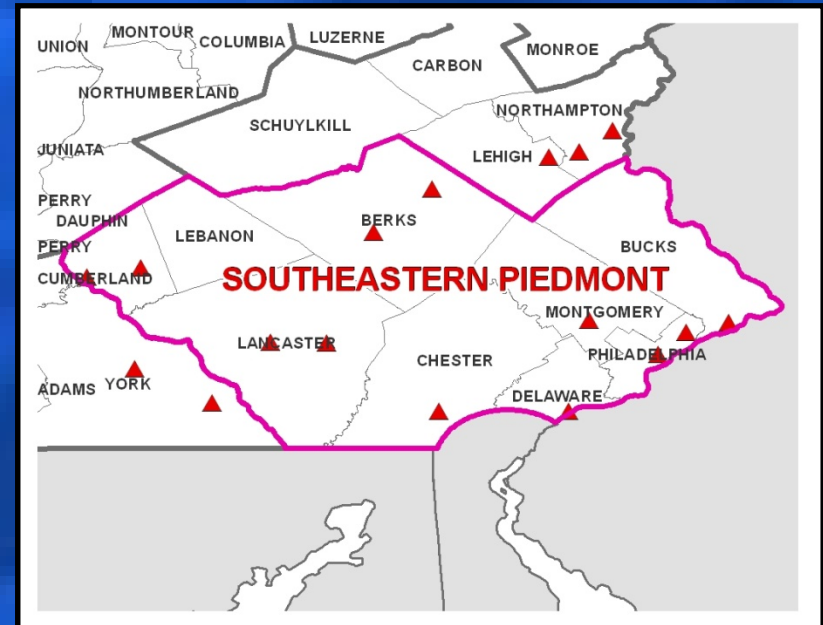


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2011 Ozone Season Summary

Southeastern Piedmont:

	<u>2011</u>	<u>2010</u>
Temperature	Above	Much Above
Precipitation	Much Above	Below
Days > 75 ppb	20	27
Monitors > 75 ppb	75	99
Days > 84 ppb	9	8
Monitors > 84 ppb	21	25
Monitors	13	12



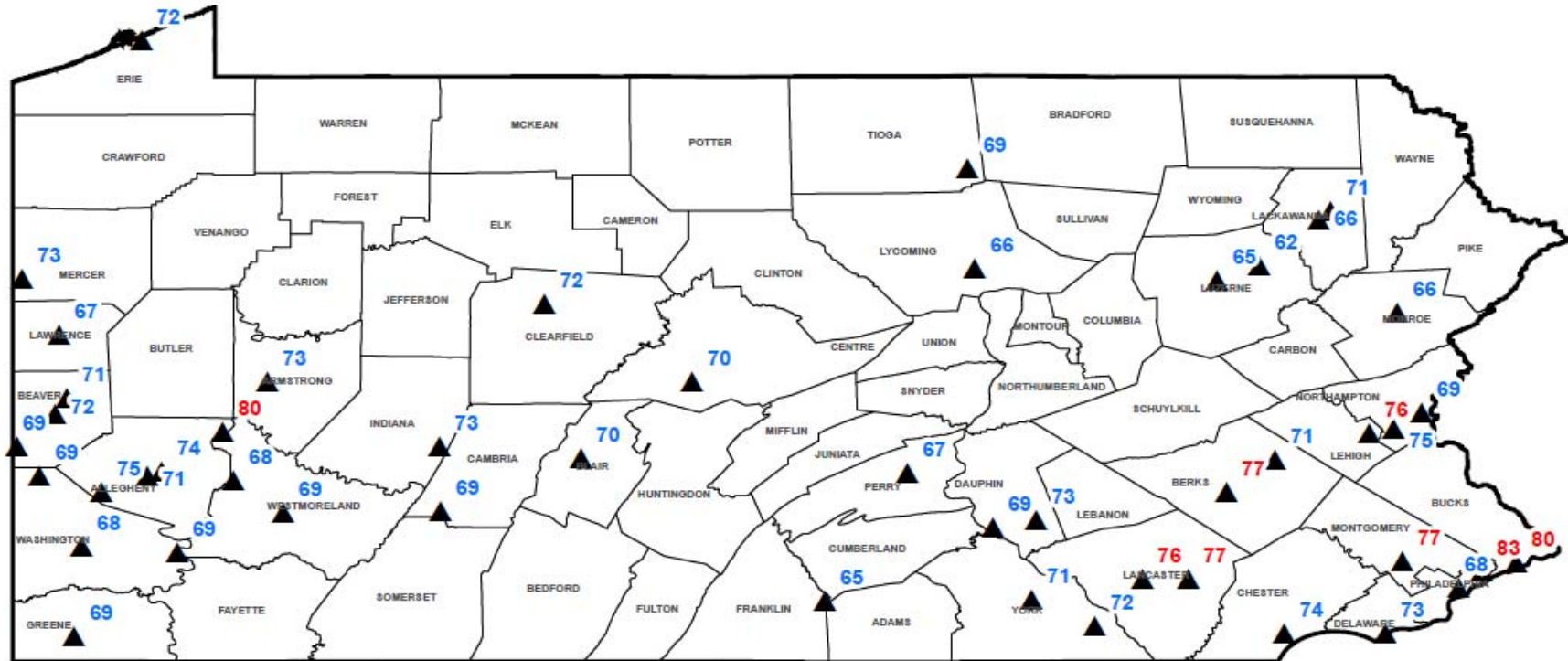
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2011 Ozone Season Summary

- 2011 8-Hour Ozone Design Values
 - 8-hour ozone design values are calculated over a three year period (the 2011 design value calculation encompasses data from 2009, 2010 and 2011)
 - 8-hour ozone design values utilize the 4th high concentration of each one of those years. Once the 4th highs are tabulated, they are averaged together and then truncated to achieve the necessary design value.

$$\frac{(2009 \text{ 4th high} + 2010 \text{ 4th high} + 2011 \text{ 4th high})}{3} = 2011 \text{ Design Value}$$

Pennsylvania 2011 8-Hour Ozone Design Values



Appearing in Red - 2011 8-Hour Ozone Design Value above 75 ppb

Appearing in Blue - 2011 8-Hour Ozone Design Value at or below 75 ppb