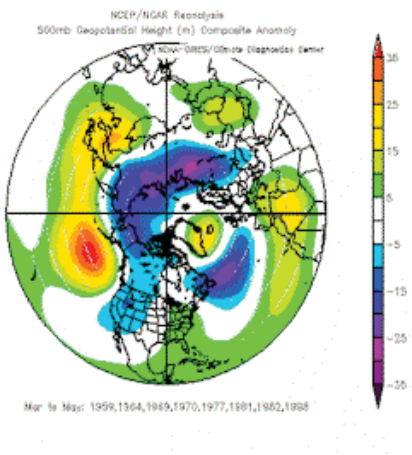
The Pennsylvania Observer

The Pennsylvania State Climatologist



May Climate Highlight:

Prepared by Steve Travis

How do the Precipitation Trends in Preceding Months affect Summer Conditions of the Same Year?

The May 2009 climate highlight focuses on historical trends of summer temperatures (specifically, those days in which temperatures greater than or equal to 90° Fahrenheit were observed) as they relate to observed precipitation trends in the preceding months. 2009 began with a below normal amount of precipitation for January, February and March and near normal precipitation amounts for April and May. Historically, previous years that followed this trend experienced a negative anomaly of days in which the temperature reached 90° Fahrenheit.

To determine this information, years in which precipitation totals for January, February and March were more than one standard deviation lower than the mean AND precipitation totals for April and May were within one standard deviation of the mean were grouped together. These years are shown in Table 1. The number of 90°+ days was then tabulated for the months of June, July and August in these years for five major cities in Pennsylvania (Philadelphia, Allentown, Middletown, Pittsburgh, and Erie) that encompassed the majority of the commonwealth.

In performing the data analysis, two outliers surfaced for the years of 1988 and 1995. Unlike the other years analyzed, these two years showed a rather substantial amount of 90°+ days. This is likely due to unprecedented and highly anomalous heat waves that dominated the summer months of those years. These outliers were thus subsequently removed and the rest of the data were reanalyzed in order to provide a more accurate depiction of the trends.

Year
1895*
1918*
1919*
1920*
1934*
1957
1968
1969
1970
1980
1985
1987
1988[1]
1995[1]
2001

Table 1: The years in which a climatologically dry Jan. /Feb. /Mar. were coupled with a near average amount of precipitation for Apr/May.
* No data were available for these years
[1] Outlier Years

Location	Average # 90F+ Days for Anomalous Years	Average # 90F+ Days for Anomalous Years Not Including Outliers	Average # 90F+ Days for All Years
Pittsburgh	10.4	5.9	8.4
Erie	3.3	1.2	2.5
Middletown	18.7	15.5	22.4
Philadelphia	22.1	17.3	25.7
Allentown	13.3	10.9	14.4

Table 2: Comparison between average number of 90°F+ days recorded for June/July/Aug. in years in which the aforementioned criteria were met (see Table 1) and the average number of days for all years. The second column throws out the years 1988 and 1995 because of a perceived bias as a result of highly anomalous heat waves in those years.

The table above shows that in years in which a dry start to the calendar year were met with a near average spring, the summer months were noticeably cooler, on average. Based solely on this climatological data, the summer of 2009 may not be as warm as in years past.