

Summer (June through August), 2012 Conditional Temperature Forecast for Philadelphia International Airport (PHL)

If the first heat wave occurs	The forecast mean summer temperature is:	67% confidence interval is:	90% confidence interval is:
June 1 – June 15	76.6	75.5 – 77.7	74.7 – 78.5
June 16 – June 30	76.4	75.3 – 77.5	74.5 – 78.3
July 1 – July 15	76.2	75.1 – 77.3	74.3 – 78.0
July 16 – July 31	76.0	74.8 – 77.1	74.1 – 77.8
August 1 – August 15	75.7	74.6 – 76.8	73.9 – 77.6
August 16 – August 31	75.5	74.4 – 76.6	73.6 – 77.4
September 1 – September 15	75.3	74.2 – 76.4	73.4 – 77.1
No heat wave	74.9	73.8 – 76.1	73.1 – 76.8

All forecast values are given in degrees Fahrenheit. The normal summer temperature at PHL is 76.0 degrees. Summer is defined as meteorological summer, i.e., the months of June through August.

The above conditional forecast is from a multiple linear regression equation that was derived from data from 1966 through 2011 that came from PHL. It was found that the combination of the Julian date of the first occurrence of 90 degrees or higher, the Julian date of the first heat wave of the season, the February through April Oceanic Nino Index (ONI, which is an index of the strength of El Nino or La Nina), the March through May ONI, and the mean April minimum temperature explains approximately 53 percent of the variance in the mean summer temperature.

The technique results in a specific forecast value and associated confidence intervals. So, if the first heat wave of the season begins on June 23, the forecast of the mean summer temperature is 76.4 degrees; there is a 67% chance that the actual mean summer temperature will fall between 75.3 and 77.5 degrees, and there is a 90% chance that the actual mean summer temperature will fall between 74.5 and 78.3 degrees.

A heat wave is defined as at least three consecutive days with maximum temperatures of at least 90 degrees. Based on data going back to 1966, the likelihood of no heat wave occurring during the summer season is approximately 9%, and the average date of the first heat wave over a season with at least one is June 20.