

Flood Event of 6/13/2009 - 6/14/2009

Southeastern Pennsylvania

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Langhorne	9.00	6/14/2009	11.90	11,800	Moderate	Neshaminy	Neshaminy Creek	Bucks	Bucks

Weather Summary

A mesoscale flash flood event occurred along the Neshaminy Creek in southeast Pennsylvania during the afternoon and evening of Saturday June 13, 2009. An intense slow moving complex of thunderstorms produced a small area of 3 to 5 inches of rainfall (based on QC'd MPE) in about 4 hours. The runoff from this rainfall went quickly into the Neshaminy Creek, causing a rapid rise of about 10 feet in 6 hours. The resulting crest of 11.9 ft produced moderate flooding and was just 0.1 ft short of a major flood. There were several contributing factors that were responsible for producing this flash flood event. Any one of these factors on its own would not have been enough to cause a significant rainfall event, but together with the proper timing during the heating of the day produced very heavy rainfall in just a few hours. At 18z Saturday June 13, 2009, a very well developed low pressure trough had formed in the lee of the mountains over southeast Pennsylvania separating a very unstable airmass to the southeast with surface dewpoints of 65 to 70 degree F with a more stable air mass to the northwest. This inverted trough had very good cyclonic convergence plus speed convergence from the southeast. The trough separated a very unstable air mass to the southeast with surface dewpoints of 65 to 70 degrees from a more stable air mass to the northwest. Steering winds at this time in the lower atmosphere were very weak and Upper level winds were out of the southwest and nearly parallel to the thunderstorm complex that formed. An anomalous area of precipitable water (about 1 standard deviation above normal) was also present across southeast PA and southern NJ from 18-22z that afternoon. As the thunderstorm complex developed between Philadelphia and Allentown around midday, convergent low level winds continued to feed the inflow and allowed for development to continue after the thunderstorm complex reached maturity. The weak low level steering winds did not allow for much movement and the upper level winds aided in the evacuation of air at the top of the complex. From 18-22z, the complex propagated toward the south-southwest or toward the area of greatest instability. Eventually the inflow was cut off and the complex weakened, but not before dropping significant rainfall and causing moderate flooding at Langhorne on the Neshaminy Creek.

Crest Statistics and Flood Information

First flood of 1 that occurred in Jun, 2009

Seventh flood of 17 that occurred in 2009

Number of Floods at MARFC Forecast Points - 1

Number of Floods Cresting in Minor Range - 0

Number of Floods Cresting in Moderate Range - 1

Number of Floods Cresting in Major Range - 0

Number of Floods Cresting in Missing Range - 0