

# Flood Event of 9/30/2010 - 10/2/2010

## Brandywine

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Chadds Ford	9.00	10/1/2010	12.94	14,300	Moderate	Christina	Brandywine Creek	Delaware	Delaware
Wilmington	16.50	10/1/2010	17.69	-9,999	Minor	Christina	Brandywine Creek	New Castle	New Castle

## Delaware

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Cooks Falls	10.00	10/1/2010	15.69	30,700	Minor	Delaware	Beaver Kill	Delaware	Delaware
Fishs Eddy	13.00	10/1/2010	16.21	45,400	Moderate	Delaware	Delaware River	Delaware	Delaware
Walton	9.50	10/1/2010	14.75	19,700	Moderate	Delaware	West Branch Delaware River	Delaware	Delaware

## Lehigh

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Walnutport	8.00	10/1/2010	9.11	2,300	Minor	Lehigh	Lehigh River	Northampton	Northampton

## Main Stem Delaware

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Barryville	17.00	10/1/2010	17.18	64,300	Minor	Main Stem Delaware	Delaware River	Sullivan	Sullivan
Callicoon	12.00	10/1/2010	13.10	63,800	Moderate	Main Stem Delaware	Delaware River	Wayne	Sullivan

### Main Stem Susquehanna

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Harper Tavern	9.00	10/1/2010	11.75	11,300	Minor	Swatara	Swatara Creek	Lebanon	Lebanon
Hershey	7.00	10/1/2010	7.63	9,890	Minor	Swatara	Swatara Creek	Dauphin	Dauphin
Lancaster	11.00	10/1/2010	11.35	8,180	Minor	Conestoga	Conestoga River	Lancaster	Lancaster
Middletown (Old Site)	11.00	10/1/2010	11.20	-9,999	Minor	Lower Main Stem Susquehanna	Swatara Creek	Dauphin	Dauphin

### Neshaminy

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Langhorne	9.00	10/1/2010	10.48	9,090	Moderate	Neshaminy	Neshaminy Creek	Bucks	Bucks

### North Branch Susquehanna

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Cortland	8.00	10/1/2010	11.31	8,230	Moderate	North Branch Susquehanna	Tioughnioga River	Cortland	Cortland
Unadilla	11.00	10/2/2010	11.07	13,300	Minor	North Branch Susquehanna	North Branch Susquehanna River	Otsego	Otsego
Waverly	11.00	10/1/2010	11.26	43,900	Minor	North Branch Susquehanna	North Branch Susquehanna River	Bradford	Tioga

### Passaic

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Boonton above Reservoir (Old Site)	5.00	10/1/2010	5.33	2,370	Minor	Passaic	Rockaway River	Morris	Morris
Lodi	6.00	10/1/2010	6.42	2,010	Minor	Passaic	Saddle River	Bergen	Bergen

## Raritan

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Stanton	8.00	10/1/2010	8.79	4,930	Minor	Raritan	South Branch Raritan River	Hunterdon	Hunterdon

## Schuylkill

Site	Flood Stage	Date	Crest	Flow	Category	Basin	Stream	County of Gage	County of Forecast Point
Graterford	11.00	10/1/2010	14.18	27,700	Moderate	Schuylkill	Perkiomen Creek	Montgomery	Montgomery
Norristown	17.00	10/1/2010	18.31	72,100	Minor	Schuylkill	Schuylkill River	Montgomery	Montgomery
Philadelphia	11.00	10/1/2010	13.05	76,300	Moderate	Schuylkill	Schuylkill River	Philadelphia	Philadelphia

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## Weather Summary

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A surge of tropical moisture ahead of a general north-south frontal boundary and the interaction the remnant circulation of short-lived tropical storm Nicole were critical in producing heavy rainfall. A slow moving north-south oriented frontal boundary and surges of tropical moisture along this boundary produced heavy rainfall in the eastern United States. Rainfall amounts over 4 inches were common from Virginia into eastern Pennsylvania. A broad area of 4 to 5 inches extended from North Carolina into Pennsylvania with embedded areas of over 10 inches of rainfall. Maximum estimated rainfall values over 20 inches were reported in North Carolina. Based on 24-hour rainfall amounts from the Unified Precipitation data set this event will likely be one of the top 24-hour rainfall events since 1948. – (MARFC) The surge of tropical moisture up and ahead of a general north-south frontal boundary and the interaction the remnant circulation of short-lived tropical storm Nicole were critical in producing heavy rainfall. A slow moving north-south oriented frontal boundary and surges of tropical moisture along this boundary produced heavy rainfall in the eastern United States. Rainfall amounts over 4 inches were common from Virginia into eastern Pennsylvania. A broad area of 4 to 5 inches extended from North Carolina into Pennsylvania with embedded areas of over 10 inches of rainfall. Maximum estimated rainfall values over 20 inches were reported in North Carolina. Based on 24-hour rainfall amounts from the Unified Precipitation data set this event will likely be one of the top 24-hour rainfall events since 1948. North-south frontal systems with surges of high precipitable water air in the warm sector typify the Maddox Synoptic rainfall events (Maddox et al. 1979). The interaction of this event type has historically produced some of the most significant heavy rainfall events in the Mid-Atlantic region. This record event, the interaction of Maddox-Synoptic Pattern with a tropical system is termed a Synoptic-Tropical event. This is simply a hybrid of the more generalized Maddox-Synoptic Event type. This event was associated with a plume of deep moisture of tropical origins. This atmospheric river (AR: Ralph et al. 2006) was associated with significant precipitable water standardized anomalies (Hart and Grumm 2001). Precipitable water anomalies on the order of 2 to 4 $\sigma$  above normal have been shown to be good predictors of heavy

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## Crest Statistics and Flood Information

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First flood of 1 that occurred in Sep, 2010

Ninth flood of 10 that occurred in 2010

Number of Floods at MARFC Forecast Points - 22

Number of Floods Cresting in Minor Range - 14

Number of Floods Cresting in Moderate Range - 8

Number of Floods Cresting in Major Range - 0

Number of Floods Cresting in Missing Range - 0