

WINTER STORM SUMMARY FOR MARCH 10, 2011 TO MARCH 13, 2011 EVENT

Synopsis

Strong low pressure with ample moisture led to a significant rain and flooding event across eastern Pennsylvania into northern and central New Jersey from March 10, 2011 through March 13, 2011. This low pressure system organized over the lower Mississippi Valley and progressed northeastward into the Ohio Valley, drawing in Gulf of Mexico moisture. From Thursday March 10 through Friday March 11, low pressure then tracked from the eastern Ohio Valley into southeastern Canada. Its associated cold front swept through the Middle Atlantic region during Thursday night into Friday. This large storm system also pulled in plenty of Atlantic moisture. Heavy rain fell throughout the region, with the highest totals found at points north and west of the I-95 corridor. Streams and creeks quickly spilled over their banks, and moderate to major river flooding resulted in northern New Jersey and eastern Pennsylvania.

Watches/Warnings/Advisories

With a previous heavy rain event having just occurred from March 6 into March 7, 2011 across the Middle Atlantic region, saturated ground and already high stages on area creeks and rivers raised concerns for a significant flood event. A Flood Watch was first issued at 418am Tuesday March 8 for the following areas: New Castle, Cecil, Sussex, Warren, Morris, Hunterdon, Somerset, Middlesex, Western Monmouth, Mercer, Gloucester, Camden, Northwestern Burlington, Carbon, Monroe, Berks, Lehigh, Northampton, Chester, Montgomery, Bucks, Delaware, and Philadelphia. The Flood Watch was then extended at 1100am Wednesday March 9 to include the remainder of New Jersey, Delaware, and the eastern shore of Maryland. During the course of Thursday March 10 and Friday March 11, dozens of river flood warnings were issued as water levels rose rapidly in response to the copious amount of rainfall. Flood warnings were raised for locations along the Passaic, Delaware, and Lehigh Rivers. Flood warnings were also issued for many points along smaller tributaries and creeks. In addition, Areal Flood Advisories and Warnings were also issued to account for widespread urban and small stream flooding.

Precipitation/Temperatures/Winds

Southeasterly surface winds provided a strong fetch of moisture off the Atlantic Ocean as low pressure and its associated cold front approached the Mid Atlantic region. The most significant rainfall came in two waves across the Mount Holly county warning area. During Thursday into Thursday evening, the first heavy band of rain tracked northward from Chesapeake Bay into southeastern Pennsylvania and the Lehigh Valley. Heavy rain then spread northward into the Poconos and northern New Jersey where upslope flow over the higher terrain enhanced precipitation efficiency and rainfall rates. By early evening Thursday March 10, locations in Carbon, Monroe, and Northampton counties were already reporting over 2 inches of rainfall. A second extensive band of heavy rain then developed off the Delmarva Peninsula during the late evening hours of Thursday March 10. This large area of rain spread northward through early Friday providing all of the county warning area with another round of heavy precipitation.

Storm total rainfall from this event was quite impressive. Rainfall ranged from 2.5 to 5 inches along and north of interstate 78 to between 1 and 2.5 inches elsewhere. Rainfall from this event and the one previous on Sunday March 6 into Monday March 7 totaled between 7 and 8 inches in some upslope regions of the Poconos and far northern New Jersey. These amounts pushed many rivers, streams, and creeks out of their banks, and widespread flooding was the result. Several locations along the Passaic River basin in northern New Jersey experienced major flooding as a result of this event. Along the Passaic, the 5th and 6th highest

crests on record were recorded at Little Falls and Pine Brook, respectively. These are preliminary determinations with final analysis of crest data being performed by the USGS. Moderate flooding was experienced along the Lehigh River at Walnutport, with the 3rd highest crest on record occurring Friday morning March 11. Several locations from Tocks Island to Trenton along the Delaware River reported minor to moderate flooding, but crests did not approach record levels during this event.

Significant Impacts/Aspects

The widespread flooding that occurred across the region as a result of heavy rainfall forced the closure of many major and secondary area roadways. Flooding of homes and businesses was also common near the swollen rivers and creeks. Locations along the Passaic River remained above flood stage for more than a week following this event. Saturated ground and brief gusty winds also resulted in a few downed trees across the region.

Notes

Information contained in this summary is preliminary. More complete and/or detailed information may be contained in subsequent monthly NOAA storm data publications.

NOUS41 KPHI 111424 CCA
PNSPHI
DEZ001>004-MDZ008-012-015-019-020-NJZ001-007>010-012>027-PAZ054-055-
060>062-067>071-120212-

PUBLIC INFORMATION STATEMENT
SPOTTER REPORTS
NATIONAL WEATHER SERVICE MOUNT HOLLY NJ
925 AM EST FRI MAR 11 2011

THE FOLLOWING ARE UNOFFICIAL OBSERVATIONS TAKEN DURING THE PAST 24 HOURS FOR THE STORM THAT HAS BEEN AFFECTING OUR REGION. APPRECIATION IS EXTENDED TO HIGHWAY DEPARTMENTS...COOPERATIVE OBSERVERS...SKYWARN SPOTTERS AND MEDIA FOR THESE REPORTS. THIS SUMMARY IS ALSO AVAILABLE ON OUR HOME PAGE AT WEATHER.GOV/PHI

*****STORM TOTAL RAINFALL*****

LOCATION	STORM TOTAL	TIME/DATE	COMMENTS
	RAINFALL	OF	
	/INCHES/	MEASUREMENT	

DELAWARE

...NEW CASTLE COUNTY...

HOCKESSIN	1.77	908 AM	3/11
-----------	------	--------	------

WILMINGTON	1.45	400 AM	3/11
------------	------	--------	------

NEW JERSEY

...CUMBERLAND COUNTY...

1 N VINELAND	1.72	740 AM	3/11
VINELAND	1.40	727 AM	3/11

...GLOUCESTER COUNTY...

MALAGA	1.54	307 AM	3/11
--------	------	--------	------

...HUNTERDON COUNTY...

CALIFON	3.67	745 AM	3/11
HIGH BRIDGE	2.31	1000 PM	3/10
WHITEHOUSE STATION	2.23	717 AM	3/11

...MERCER COUNTY...

EWING	1.50	1015 PM	3/10
-------	------	---------	------

...MIDDLESEX COUNTY...

ISELIN	1.69	910 AM	3/11
--------	------	--------	------

...MONMOUTH COUNTY...

CREAM RIDGE	1.51	738 AM	3/11
-------------	------	--------	------

...MORRIS COUNTY...

JEFFERSON TWP	4.86	400 AM	3/11
CHARLOTTEBURG	4.82	400 AM	3/11
MILTON	4.79	835 AM	3/11
BUTLER	4.20	530 AM	3/11
PEQUANNOCK	3.53	400 AM	3/11
LAKE HOPATCONG	3.31	400 AM	3/11
BOONTON	3.19	400 AM	3/11
MORRIS PLAINS	2.87	400 AM	3/11
IRONIA	2.60	400 AM	3/11
MORRISTOWN	2.56	400 AM	3/11
BOONTON TWP	2.18	840 AM	3/11

...OCEAN COUNTY...

LAKESWOOD	1.55	400 AM	3/11
-----------	------	--------	------

...SUSSEX COUNTY...

ANDOVER	2.42	400 AM	3/11
FLATBROOKVILLE	2.42	400 AM	3/11

...WARREN COUNTY...

STEWARTSVILLE	2.73	838 AM	3/11
COLUMBIA	2.48	400 AM	3/11

PHILLIPSBURG	2.15	719 AM	3/11
--------------	------	--------	------

PENNSYLVANIA

...BERKS COUNTY...

BETHEL	3.03	400 AM	3/11
BECHTELSVILLE	2.69	757 AM	3/11
PRICETOWN	2.26	150 AM	3/11

...BUCKS COUNTY...

FURLONG	2.18	841 AM	3/11
---------	------	--------	------

...CARBON COUNTY...

MECKESVILLE	4.37	400 AM	3/11
TOWAMENSING TRAILS	3.64	400 AM	3/11
LEHIGHTON	3.47	400 AM	3/11
SAYLORSVILLE	2.52	400 AM	3/11

...CHESTER COUNTY...

NORTHBROOK	3.30	400 AM	3/11
DOWNINGTOWN	3.07	400 AM	3/11
EXTON	2.84	838 AM	3/11
MODENA	2.75	400 AM	3/11
HONEY BROOK	2.60	836 AM	3/11
KENNETT SQUARE	2.57	400 AM	3/11
VALLEY FORGE	2.52	400 AM	3/11

...DELAWARE COUNTY...

CHADDS FORD	3.42	400 AM	3/11
MEDIA	1.89	643 AM	3/11

...LEHIGH COUNTY...

SLATINGTON	2.63	420 AM	3/11
ALLENTOWN	2.42	400 AM	3/11

...MONROE COUNTY...

MOUNT POCONO	5.08	800 AM	3/11
COOLBAUGH	4.45	400 AM	3/11
BLAKESLEE	4.14	400 AM	3/11
BRODHEADSVILLE	3.35	400 AM	3/11
EAST STROUDSBURG	3.05	1005 PM	3/10
KRESGEVILLE	3.03	400 AM	3/11

...MONTGOMERY COUNTY...

TOWAMENCIN TWP	3.56	200 AM	3/11
WYNNEWOOD	2.10	720 AM	3/11
AMBLER	1.87	615 AM	3/11

...NORTHAMPTON COUNTY...

WALNUTPORT	4.02	400 AM	3/11
PLAINFIELD TWP	2.60	911 AM	3/11

...PHILADELPHIA COUNTY...

PHILADELPHIA	1.41	400 AM	3/11
--------------	------	--------	------

*****24 HOUR RAINFALL*****

LOCATION	24 HOUR RAINFALL	TIME/DATE	COMMENTS
	/INCHES/	OF MEASUREMENT	

DELAWARE

...NEW CASTLE COUNTY...

2 WNW NEWPORT	1.42	700 AM	3/11	COCORAHS
---------------	------	--------	------	----------

MARYLAND

...CECIL COUNTY...

7 NNW ELKTON	1.68	600 AM	3/11	COCORAHS
--------------	------	--------	------	----------

NEW JERSEY

...BURLINGTON COUNTY...

3 NNW TABERNACLE TWP	1.50	700 AM	3/11	COCORAHS
2 SSE MEDFORD TWP	1.45	700 AM	3/11	COCORAHS

...CAMDEN COUNTY...

4 W WINSLOW TWP	1.41	700 AM	3/11	COCORAHS
-----------------	------	--------	------	----------

...HUNTERDON COUNTY...

1 NW CALIFON	3.01	800 AM	3/11	COCORAHS
4 N CLINTON TWP	2.87	800 AM	3/11	COCORAHS
3 N LEBANON	2.75	600 AM	3/11	COCORAHS
1 WNW HIGH BRIDGE	2.69	700 AM	3/11	COCORAHS
1 S BETHLEHEM TWP	2.11	800 AM	3/11	COCORAHS
2 ENE READINGTON TWP	2.09	700 AM	3/11	COCORAHS
3 SW LEBANON	2.09	700 AM	3/11	COCORAHS
4 NNW STOCKTON	1.95	700 AM	3/11	COCORAHS
2 WSW READINGTON TWP	1.85	700 AM	3/11	COCORAHS
E FLEMINGTON	1.77	630 AM	3/11	COCORAHS
3 NNE HOLLAND TWP	1.64	630 AM	3/11	COCORAHS

...MERCER COUNTY...

1 ENE PENNINGTON	1.48	810 AM	3/11	COCORAHS
------------------	------	--------	------	----------

2	SSW LAWRENCE TWP	1.41	800 AM	3/11	COCORAHS
---	------------------	------	--------	------	----------

...MIDDLESEX COUNTY...

1	ENE SOUTH PLAINFIE	1.89	700 AM	3/11	COCORAHS
2	W NORTH BRUNSWICK	1.69	700 AM	3/11	COCORAHS
	NE NEW BRUNSWICK	1.68	800 AM	3/11	COCORAHS
2	NE NORTH BRUNSWICK	1.57	815 AM	3/11	COCORAHS

...MONMOUTH COUNTY...

1	E HOLMDEL TWP	1.99	700 AM	3/11	COCORAHS
1	NE EATONTOWN	1.74	600 AM	3/11	COCORAHS
1	NW RED BANK	1.66	700 AM	3/11	COCORAHS
2	S HOWELL TWP	1.64	700 AM	3/11	COCORAHS
1	WNW FREEHOLD TWP	1.59	700 AM	3/11	COCORAHS
	E FAIR HAVEN	1.56	700 AM	3/11	COCORAHS

...MORRIS COUNTY...

2	ENE JEFFERSON TWP	4.59	700 AM	3/11	COCORAHS
1	NE ROCKAWAY TWP	4.25	800 AM	3/11	COCORAHS
	NE MINE HILL TWP	3.26	800 AM	3/11	COCORAHS
	NNW ROCKAWAY	3.18	800 AM	3/11	COCORAHS
2	E RANDOLPH TWP	2.97	800 AM	3/11	COCORAHS
2	SSE BOONTON TWP	2.96	500 AM	3/11	COCORAHS
2	WNW MOUNT OLIVE TW	2.95	600 AM	3/11	COCORAHS
1	W RANDOLPH TWP	2.79	600 AM	3/11	COCORAHS
1	NW CHATHAM	2.74	700 AM	3/11	COCORAHS
1	WSW PARSIPPANY-TRO	2.68	600 AM	3/11	COCORAHS
2	NNE DENVILLE TWP	2.58	700 AM	3/11	COCORAHS
3	NNW HARDING TWP	2.55	700 AM	3/11	COCORAHS
2	E PARSIPPANY-TROY	2.41	800 AM	3/11	COCORAHS

...OCEAN COUNTY...

1	SSW BERKELEY TWP	1.63	800 AM	3/11	COCORAHS
2	N BRICK TWP	1.52	700 AM	3/11	COCORAHS
4	NNW JACKSON TWP	1.51	700 AM	3/11	COCORAHS
2	NNE BRICK TWP	1.40	800 AM	3/11	COCORAHS

...SALEM COUNTY...

1	NW WOODSTOWN	1.43	700 AM	3/11	COCORAHS
---	--------------	------	--------	------	----------

...SOMERSET COUNTY...

1	ENE BERNARDS TWP	2.52	700 AM	3/11	COCORAHS
1	NNW BERNARDS TWP	2.33	728 AM	3/11	COCORAHS
3	ESE BEDMINSTER TWP	2.24	600 AM	3/11	COCORAHS
	ENE SOMERVILLE	2.03	800 AM	3/11	COCORAHS
3	NW BRIDGEWATER TWP	1.96	700 AM	3/11	COCORAHS
1	NW BERNARDS TWP	1.87	700 AM	3/11	COCORAHS
2	ENE FRANKLIN TWP	1.84	700 AM	3/11	COCORAHS

4	ENE FRANKLIN TWP	1.77	700 AM	3/11	COCORAHS
3	NE MONTGOMERY TWP	1.75	800 AM	3/11	COCORAHS
5	ESE HILLSBOROUGH T	1.63	700 AM	3/11	COCORAHS
1	ENE MONTGOMERY TWP	1.55	700 AM	3/11	COCORAHS
2	NNE MONTGOMERY TWP	1.42	700 AM	3/11	COCORAHS

...SUSSEX COUNTY...

3	SE HARDYSTON TWP	4.10	800 AM	3/11	COCORAHS
4	E SPARTA TWP	3.05	700 AM	3/11	COCORAHS
2	N VERNON TWP	2.21	700 AM	3/11	COCORAHS
2	SW WANTAGE TWP	1.79	700 AM	3/11	COCORAHS

...WARREN COUNTY...

3	E FRANKLIN TWP	2.60	730 AM	3/11	COCORAHS
1	W HACKETTSTOWN	2.43	700 AM	3/11	COCORAHS
3	WNW MANSFIELD TWP	2.12	700 AM	3/11	COCORAHS
1	ENE WASHINGTON	2.00	600 AM	3/11	COCORAHS
2	SE BLAIRSTOWN TWP	1.73	700 AM	3/11	COCORAHS
2	NNW ALLAMUCHY TWP	1.72	800 AM	3/11	COCORAHS

PENNSYLVANIA

...BERKS COUNTY...

3	WNW BOYERTOWN	3.21	700 AM	3/11	COCORAHS
1	SSE WEST LAWN	1.99	700 AM	3/11	COCORAHS
1	SW READING	1.95	800 AM	3/11	COCORAHS
2	ESE FLEETWOOD	1.76	800 AM	3/11	COCORAHS

...CARBON COUNTY...

1	NNE JIM THORPE	3.87	700 AM	3/11	COCORAHS
4	NE PALMERTON	3.46	800 AM	3/11	COCORAHS
3	WSW LEHIGHTON	3.32	700 AM	3/11	COCORAHS
1	W WEATHERLY	3.31	700 AM	3/11	COCORAHS

...CHESTER COUNTY...

2	SSE WEST CHESTER	2.49	700 AM	3/11	COCORAHS
---	------------------	------	--------	------	----------

...DELAWARE COUNTY...

1	NE DREXEL HILL	1.66	730 AM	3/11	COCORAHS
---	----------------	------	--------	------	----------

...LEHIGH COUNTY...

3	SW SCHNECKSVILLE	2.18	700 AM	3/11	COCORAHS
4	W ALLENTOWN	2.06	745 AM	3/11	COCORAHS

...MONTGOMERY COUNTY...

3	NW COLLEGEVILLE	1.99	700 AM	3/11	COCORAHS
	SSW HATFIELD	1.85	600 AM	3/11	COCORAHS
3	S HARLEYSVILLE	1.82	639 AM	3/11	COCORAHS

4	ESE SCHWENKSVILLE	1.71	730 AM	3/11	COCORAHS
2	NNE POTTSTOWN	1.71	700 AM	3/11	COCORAHS
1	NNW SOUDERTON	1.68	700 AM	3/11	COCORAHS
2	WSW HATFIELD	1.57	727 AM	3/11	COCORAHS
3	SSW KULPSVILLE	1.50	700 AM	3/11	COCORAHS

...NORTHAMPTON COUNTY...

2	N NAZARETH	2.15	700 AM	3/11	COCORAHS
4	S GLENDON	2.08	700 AM	3/11	COCORAHS
E	MARTINS CREEK	1.83	600 AM	3/11	COCORAHS

...PHILADELPHIA COUNTY...

3	SSW WYNDMOOR	1.74	700 AM	3/11	COCORAHS
---	--------------	------	--------	------	----------

*****PEAK WIND GUST*****

LOCATION	MAX WIND	TIME/DATE	COMMENTS
	GUST	OF	
	MPH	MEASUREMENT	

DELAWARE

...NEW CASTLE COUNTY...

WILMINGTON	51	825 PM	3/10
------------	----	--------	------

NEW JERSEY

...ATLANTIC COUNTY...

ATLANTIC CITY	47	950 PM	3/10
---------------	----	--------	------

*****SUSTAINED WIND*****

LOCATION	WIND	TIME/DATE	COMMENTS
	SPEED	OF	
	MPH	MEASUREMENT	

DELAWARE

...NEW CASTLE COUNTY...

WILMINGTON	31	351 PM	3/10
------------	----	--------	------

\$\$

