

INDICATOR 2

FLOODS & DROUGHTS



OVERVIEW

The Susquehanna River Basin experiences major flooding on the mainstem rivers on average once every 14 years and flash flooding throughout the basin annually. The mainstem Susquehanna is also subject to ice jams and flooding – to a greater extent than any river east of the Rocky Mountains.

Since the beginning of the 1900s, the basin has experienced severe droughts, with the recent decades being particularly problematic. From 1990 to 2011, emergency drought status was declared 17 times for counties within the basin; in addition, drought warning status was declared in counties 11 out of the 21 years.

EFFECTS OF TROPICAL STORM LEE

In September 2011, the remnants of Tropical Storm Lee dumped more than 15 inches of rain (see rainfall graphic, page 7) throughout the basin displacing nearly 100,000 people and causing an estimated \$1 billion in damages in Pennsylvania.

On September 8, the President declared an emergency for 32 Pennsylvania counties within the basin (17 of which were declared as Major Disasters); seven New York counties and two Maryland counties in the basin were also federally declared disasters. The Susquehanna River reached a record high of 32.75 feet at Bloomsburg, Pa.; Swatara Creek in Hershey, Pa., crested at a record high of 26.8 feet, nearly double its 14-foot major flood stage (see hydrograph).

Due to the major widespread impacts of Tropical Storm Lee, SRBC’s Susquehanna Inundation Map Viewer

Overarching Issue

The Susquehanna River Basin is one of the most flood-prone watersheds in the nation, experiencing on average tens of millions of dollars in damages each year. On the other side of the hydrologic spectrum, the basin experiences severe droughts about once every decade. The network of rain, stream and groundwater gages throughout the basin, maintained and operated by the U.S. Geological Survey (USGS), are critical for monitoring hydrologic conditions and informing management decisions. Unfortunately, funding for this critical water infrastructure continues to be a perennial challenge.

INDICATOR CRITERIA

Criteria	Assessment Period	
	Jan 1 - Dec 31, 2009	Jan 1 - Dec 31, 2011
Number of river forecast points (RFPs) with flood inundation mapping	17 (23% of RFPs)	18 (24% of RFPs)
Occurrences of major flood exceedance at RFPs	no major floods	25 (32% of RFPs)
Number of county drought declarations (% of year)	Warning: 4 (7% of year)	Warning: 4 (8% of year) Watch: 28 (19% of year)
Approved surface water (SW) & groundwater (GW) withdrawals & % with passby flow requirements	GW: 54 approvals, 13% w/ passby SW: 54 approvals, 69% w/ passby	GW: 27 approvals, 28% w/ passby SW: 67 approvals, 69% w/ passby

Data Sources: SRBC water use data, State Drought Coordination Committees, National Weather Service

(SIMV) received 14,703 hits from September 6 to September 12, 2011. The availability of SIMV during Tropical Storm Lee provided emergency management personnel and at-risk communities with a valuable tool for assessing flood risk and making informed decisions during the extreme hydrologic event.



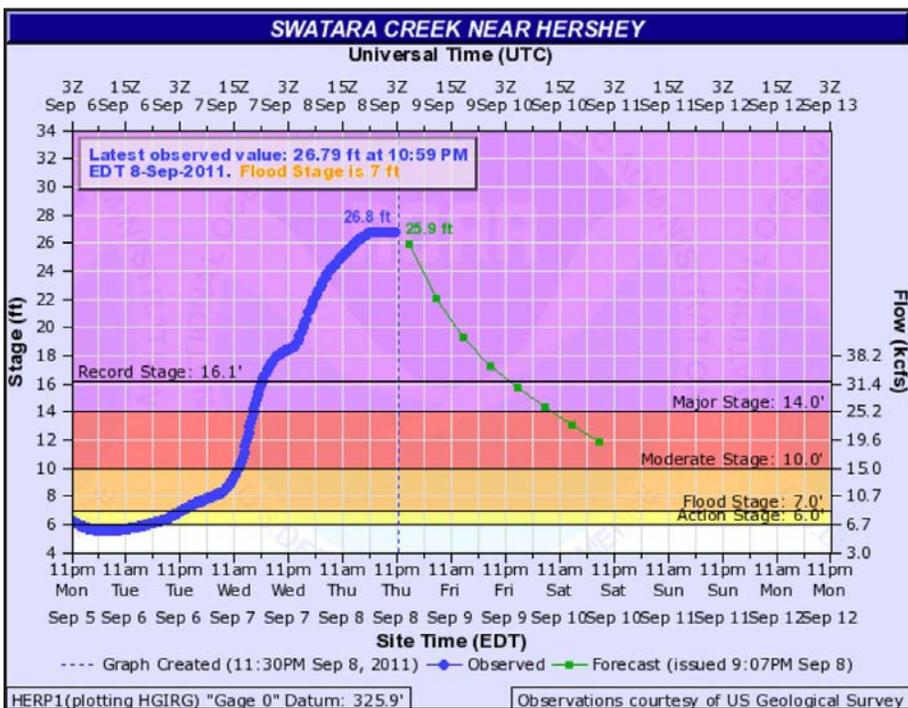
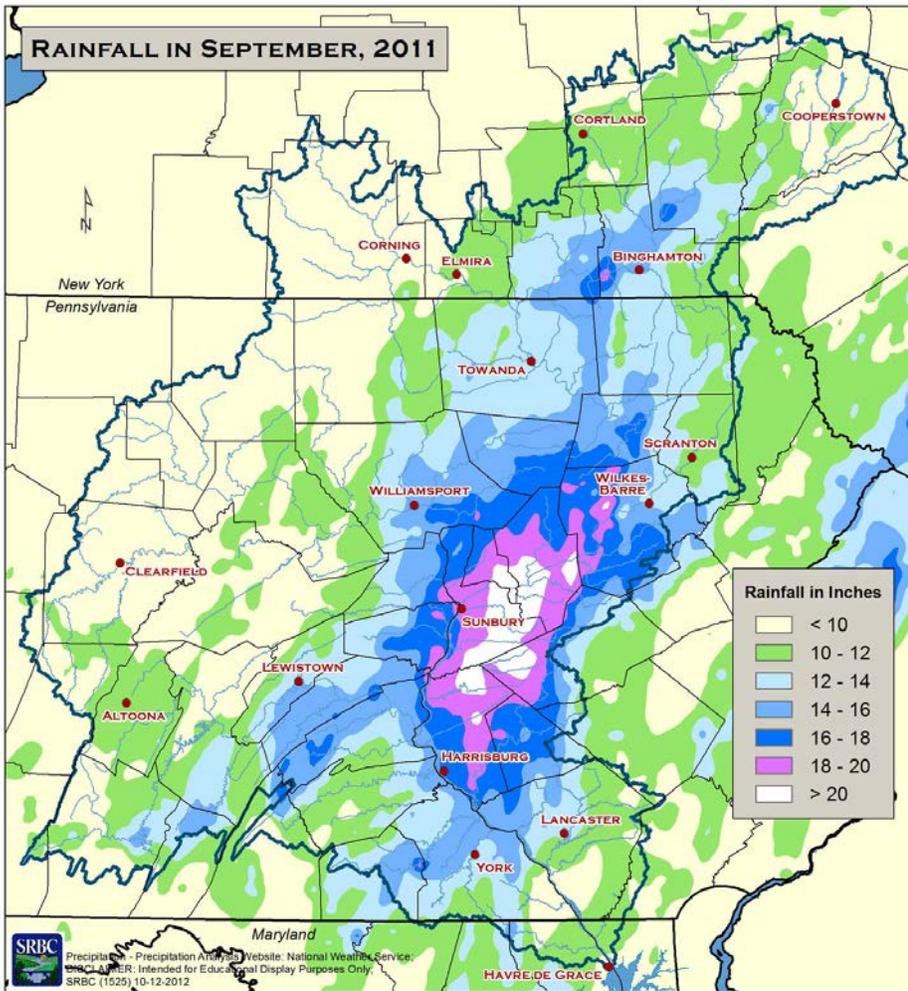
Susquehanna River flooding in Athens, Pa., September 2011.

PA SILVER JACKETS PARTNERSHIP TO DEVELOP HARRISBURG FLOOD INUNDATION MAPPING



'The Silver Jackets' is an innovative federal program that brings together multiple state, federal and local agencies to learn from one another and apply their knowledge to identify, prioritize and address risk management issues and implement solutions. The PA Silver Jackets, an interagency flood risk management team, is comprised of many agencies, including SRBC, U.S. Army Corps of Engineers, National Weather Service, USGS, City of Harrisburg, Pennsylvania Emergency Management Agency and Federal Emergency Management Agency.

Given the area's risk to flooding, in 2011, the PA Silver Jackets team selected the City of Harrisburg and surrounding areas for the Harrisburg Flood Inundation Mapping project. The team, along with the Harrisburg Authority, performed the technical work in 2011 and 2012 and is expected to complete the flood inundation maps and make them available on the Internet by spring 2013. This mapping project covers a 20-mile stretch of the Susquehanna River including the city and those communities to the north and south.



Hydrograph for Swatara Creek near Hershey, Pa., during September 2011 flooding from Tropical Storm Lee. Note the observed crest of 26.8 feet, which is 12.8 feet above major flood stage and 10.7 feet above the record flood stage for this location. Also note that streamflows remained above major flood stage for a period of approximately 2 days from September 7 - 9, 2011.



Silver Jackets workshop, May 2012.