

# Susquehanna River Flood Study Update

Snyder, Northumberland, Union, Montour, Columbia, Luzerne, Wyoming, Bradford Counties - Pennsylvania

## Fact Sheet – Summer 2020

### Why was the Susquehanna River Study Updated?

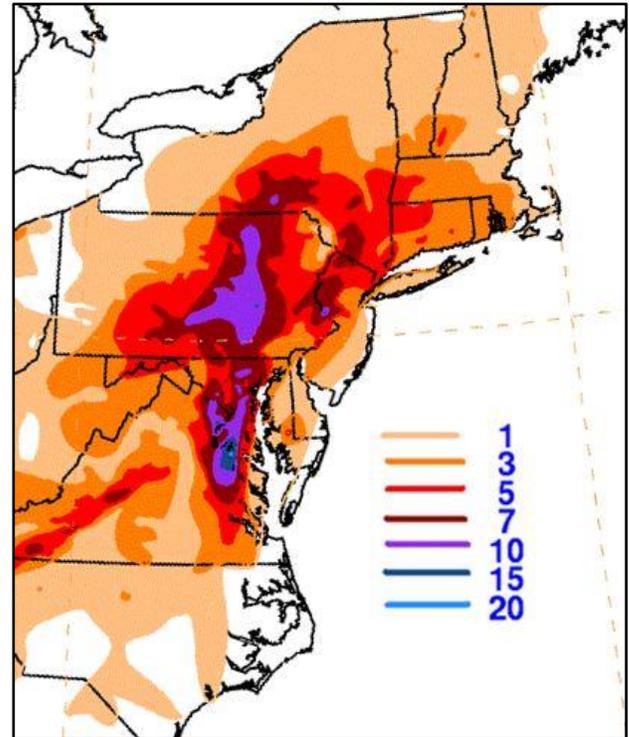
In early September 2011, Tropical Storm Lee dropped record-breaking rain on the Susquehanna River region of Pennsylvania, producing widespread flooding (see Total Rainfall map). In response, FEMA and the U.S. Army Corps of Engineers (USACE) began a basin-wide Susquehanna River flood data re-assessment and re-mapping update with the goal to understand hydrologic and hydraulic changes that have occurred since the last time the area was studied. The study area includes the following counties: Snyder, Northumberland, Union, Montour, Columbia, Luzerne, Wyoming, and Bradford. See Study Area map on Page 2.

### The Effective Flood Studies

The effective Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the Susquehanna River in Snyder, Northumberland, Union, Montour, Columbia, and Luzerne counties, is based on a detailed USACE study from 2003 that spans 101 miles. The effective FIS and FIRM for the Susquehanna River in Bradford and Wyoming counties spans 80 miles and is based on a detailed 1987 study.

### The Update Process

The updated study used topographic data, field surveys of river channel geometry, and bridge/culvert openings to conduct hydrologic and hydraulic analyses and floodplain mapping. By incorporating river flow records up to and including Tropical Storm Lee, and the best available data, the updated study more accurately represents flood risk in the area.



**Tropical Storm Lee Total Rainfall in Inches**  
(Source: NOAA)

### Results of the Updated Study

The updated flood study found that 1- percent-annual-chance **flood elevations have generally increased between 1 and 6 feet** in various locations along the Susquehanna River from Snyder and Northumberland Counties to Bradford County. Such increases in flood elevations are significant and indicate an increased flood risk for communities along the river in the study area. Preliminary flood maps showing this increased risk are available for most of the study area. **Continue reading to learn more about the study, the importance of flood insurance, and how to reduce your flood risk on the following pages.**

### RISK MAPPING, ASSESSMENT, AND PLANNING PROGRAM (RISK MAP)

The Federal Emergency Management Agency's Risk MAP Program delivers quality data that increases public awareness and leads to action to reduce risk to life and property. Risk MAP is a nationwide program that works in collaboration with States, Tribes, and Local communities using best available science, rigorously vetted standards, and expert analysis to identify risk and promote mitigation action, resulting in safer, more resilient communities.

## Study Details

### Hydrologic Calculations

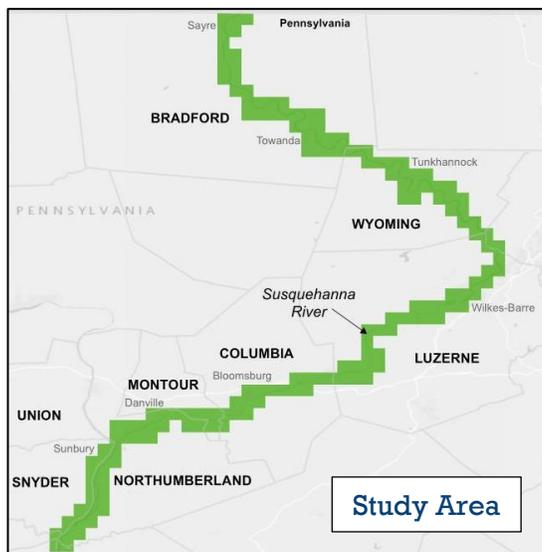
The peak flood flow for this update is based on a statistical analysis of past events measured at Susquehanna River gaging stations, including Tropical Storm Lee. The hydrologic analysis was revised by the USACE-Baltimore District and the United States Geological Survey (USGS). This analysis found that **peak flood flow estimates have increased up to 25% in various locations along the Susquehanna River in the study area.**

### Hydraulic Modeling

The existing hydraulic models were revised to use the updated flood flows, reflect physical changes that occurred at two bridges, and correct river channel geometry in Bloomsburg and downstream of PA Route 29. This model was calibrated to five historic events, including Tropical Storm Lee, and eight frequency-based events. After the model was calibrated, a multiple profile analysis for the 50-, 20-, 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events was performed. The regulatory floodway was recomputed for Bradford and Wyoming counties, but not for the other counties.

### Floodplain Mapping

Flood inundation boundaries were mapped for the 1 and 0.2-percent-annual-chance events. The inundation areas were created by comparing the water surface elevation profiles with the LiDAR-based topographic data from 2006-2008, available through the PA Spatial Data Access (PASDA) PAMAP Program.



## Timeline of Events

**September 2011** – Tropical Storm Lee arrived in the Susquehanna River Basin only a week after Hurricane Irene and caused historic flooding. FEMA and the USACE worked to assess how flood risk in the area had changed over time.

**Spring 2014** – Results of this assessment revealed flood flow and flood elevation increases along the Susquehanna River from Bradford County down to Snyder and Northumberland County. FEMA held meetings and sent letters to communities warning of increased flood risk that is not reflected on the Effective FIRMs.

**April 2015** – FEMA held Discovery Meetings with communities throughout the region to officially begin the Susquehanna River Risk Mapping, Assessment and Planning (Risk MAP) flood study. The flood maps from this study more accurately depict flood risk throughout the river basin.

**August 2017** – FEMA held Flood Risk Review (FRR) meetings with communities to share draft flood risk mapping data for the Susquehanna River.

**2018 to 2020** – FEMA releases preliminary flood maps throughout the region and holds Community Coordination and Outreach (CCO) meetings with community officials to review the maps.

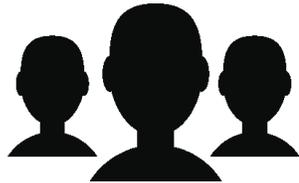
*(Note: Luzerne County preliminary release anticipated in Fall 2020.)*

**Levees** - Levees are designed to provide a specific level of protection. They can be overtopped or fail during flood events larger than those for which the levee was designed. Levees also decay over time, which may increase the likelihood of failure. They require regular maintenance and periodic upgrades to retain their level of protection. When levees fail, the resulting damage, including loss of life, may be much greater than if the levee system had not been built.

Many of the communities that lie along the banks of the Susquehanna River for this study have levees. Levee risk reduction may or may not have been considered in the preliminary mapping for communities depending on many factors, specific to each levee. See the individual **Levee Fact Sheets** created for this study for more information.

## WHAT'S WITHIN THE UPDATED SUSQUEHANNA RIVER 1%-ANNUAL-CHANCE FLOODPLAIN?\*

(In Snyder, Northumberland, Union, Montour, Columbia, Luzerne, Wyoming, and Bradford Counties)



**70,000**

People Live in the  
Susquehanna River  
Floodplain



**600**

Miles of Roadway and  
Railway in the  
Susquehanna River  
Floodplain



**23,000**

Structures in the  
Susquehanna River  
Floodplain



**70**

Critical Facilities\*\* in  
the Susquehanna River  
Floodplain

\*All numbers are estimates and are based on draft 1-percent-annual-chance floodplains, including levee impact areas that may show reduced risk.

\*\*Critical facilities include EMS, fire, and police stations, schools, and hospitals.

### FLOOD INSURANCE IMPACTS

- **Flood insurance in high risk areas.** Properties with a federally-backed mortgage that are newly mapped into the Special Flood Hazard Area (SFHA), or 1-percent-annual-chance floodplain, where there is at least a 1 in 4 chance of flooding over the course of a 30-year mortgage, are **required** to carry flood insurance after the updated maps go into effect.
- **Flooding does not stop at a line on the map.** Even in areas where flood insurance is not required, residents and business owners should be aware that “**low risk**” does not mean “**no risk.**” Properties in moderate- and low-risk flood zones can and do flood.
- **Buy flood insurance now.** If your property is in a moderate- or low-risk flood zone (shown as B, C, or X on the flood map), you may be eligible for a **Preferred Risk Policy (PRP)** through the National Flood Insurance Program (NFIP) with costs starting at less than \$250 a year. If a new flood map indicates your flood risk is going to change to a high-risk zone (shown with letters beginning with A or V), renewing your PRP can result in your insurance agent being able to use a lower-cost rating option.

To learn more about the Preferred Risk Policy visit

<https://www.fema.gov/media-library/assets/documents/17576>

**Visit**  
**Floodsmart.gov**  
**for more**  
**information.**

### FLOOD INSURANCE FACTS



**25%**

Of flood insurance  
claims come from  
properties **OUTSIDE**  
the SFHA or 1-  
percent-annual-  
chance floodplain



**\$1,245**

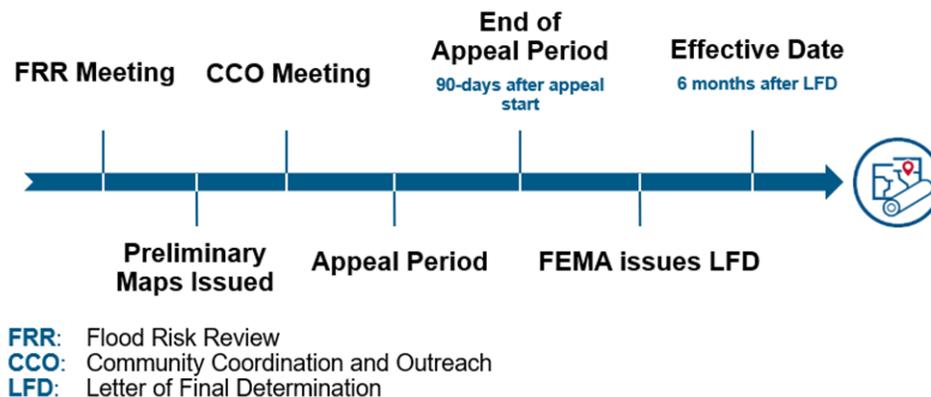
Average Annual  
Flood Insurance  
Premium for the  
Communities  
Impacted by this  
Update

## Reduce Your Risk and Flood Insurance Premium

- Flooding is the most common and costly natural disaster in the United States and can happen anywhere. Just **one inch of water can cause \$25,000 in damages** to your home.
- Don't wait for a flood to happen. You can make decisions and **take action now** to reduce the risk to your home and family. Elevating utilities, installing flood vents, and elevating your home can reduce the risk of flood damage and may lower flood insurance premiums. Read [Protecting Your Home From Flooding](#) for more information.
- Community officials are encouraged to incorporate this new flood data into **local hazard mitigation planning** efforts. Consider how land use and development impact flooding risk. Plan for mitigation in your communities by adopting higher floodplain standards, preserving open space, and promoting awareness.

## Next Steps

FEMA is at different stages in the Risk MAP project life cycle with each county that is part of the Susquehanna River update. The diagram below illustrates these stages. Check with your local, county, or state officials for more information about next steps for your community.



## Resources for Property Owners

- The FEMA Map Service Center (MSC), [msc.fema.gov](http://msc.fema.gov), is the official public source for flood hazard information produced in support of the NFIP. Use the MSC to find your effective flood map, access a range of flood hazard products, and take advantage of additional tools. To view the preliminary flood maps for your area and see how your flood risk has changed visit the Flood Map Changes Viewer, [msc.fema.gov/fmfv](http://msc.fema.gov/fmfv).
- More information related to the NFIP and flood insurance is available at [floodsmart.gov](http://floodsmart.gov).
- Map specialists are available at **the FEMA Mapping and Insurance eXchange (FMIX)** to assist stakeholders with locating and reading flood maps, applying for Letters of Map Change (LOMC), and obtaining and understanding Elevation Certificates. FMIX also serves to connect stakeholders with a wide range of technical subject matter experts.

Call: **1-877-FEMA MAP** (1-877-336-2627)

Email: [FEMAMapSpecialist@riskmapcds.com](mailto:FEMAMapSpecialist@riskmapcds.com)

Website and Live Chat: [floodmaps.fema.gov/fhm/fmx\\_main.html](http://floodmaps.fema.gov/fhm/fmx_main.html)

Hours of Operation: Monday – Friday, 8:00am - 6:30pm ET  
(After hours self-service and voicemail support provided.)