



# Flood Risk Review (FRR) Meeting

Pocahontas County, WV and Incorporated Areas  
December 9, 2022



**FEMA**

# Agenda

- Welcome and Introductions
- Where We Are - Draft Maps
- Flood Study Update
- Using Flood Risk Data to Reduce Risk
- Discussion





# Welcome and Introductions



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**RISKMAP**  
Translating Resilience Into Action





# Where We Are - Draft Maps



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**RiskMAP**  
Increasing Resilience Together



# 3 Reasons We Are Here Today

- To preview and discuss the updated Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for Pocahontas County, WV
- To examine the new study areas, discuss how the analysis and mapping have changed since the previous FIRM, and work collaboratively to ensure that the needs of the community and its partners are met.  
**BECAUSE THE EARLIER YOU KNOW THE BETTER!**
- To present a timeline of next steps





# Timeline – Looking Back

**Effective FIRM**  
*(Digital Conversion)*  
November 2010

**Risk MAP  
Kickoff Meeting**  
June 2021

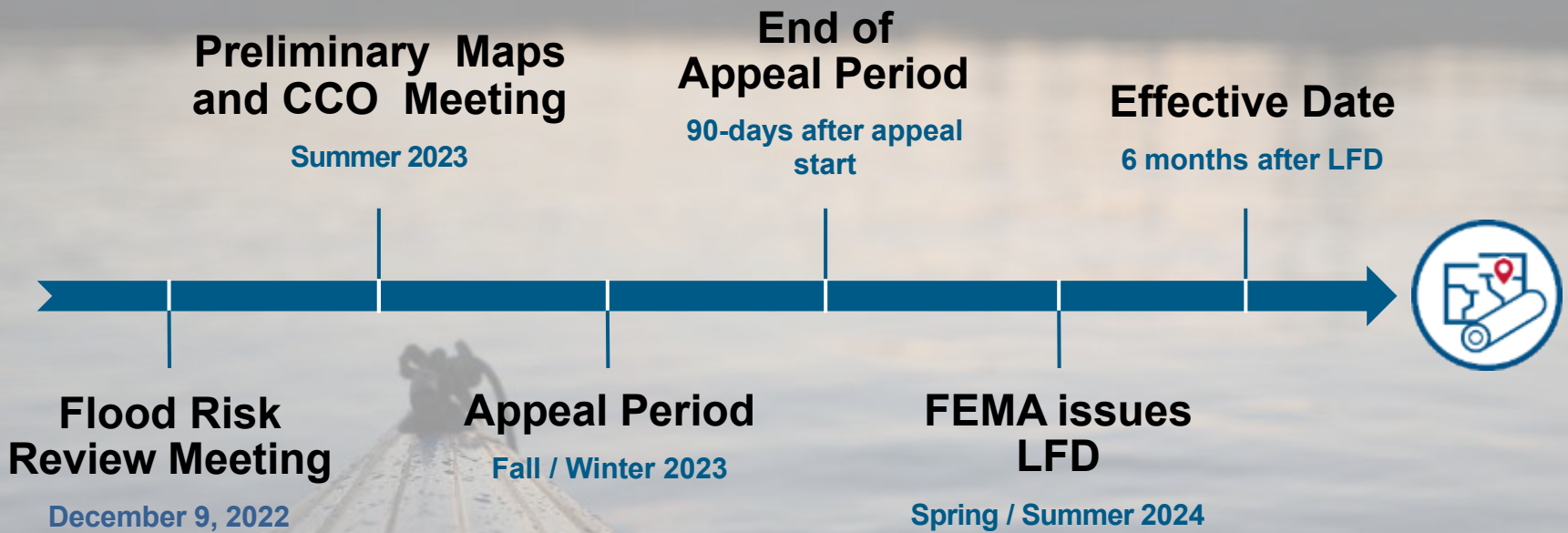
**Risk MAP  
Study  
Notification**  
May 2021

**Flood Risk Review  
Meeting**  
December 9, 2022





# Timeline – Looking Ahead







# Flood Study Update

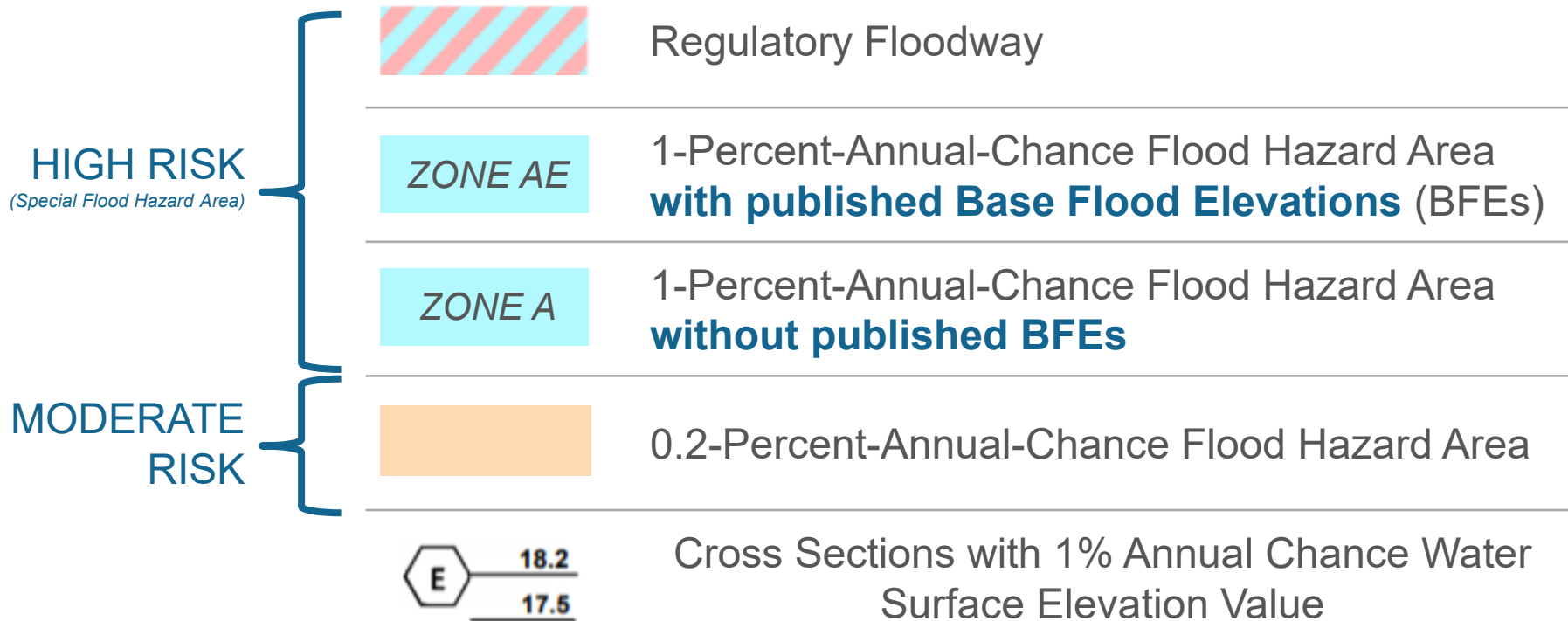


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**RiskMAP**  
Increasing Resilience Together



# Floodplain Map Overview



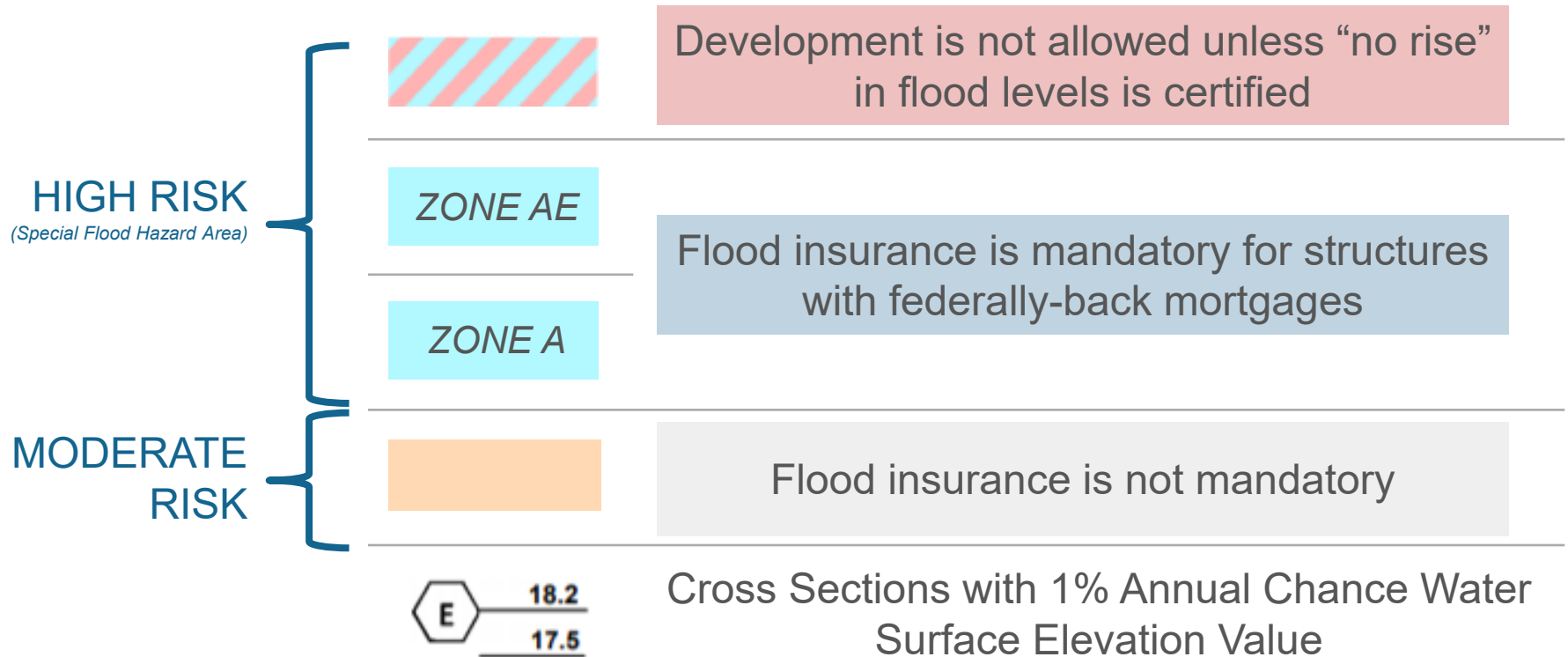
["The 100-Year Flood Zone Explained"](#)



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# Floodplain Map Overview

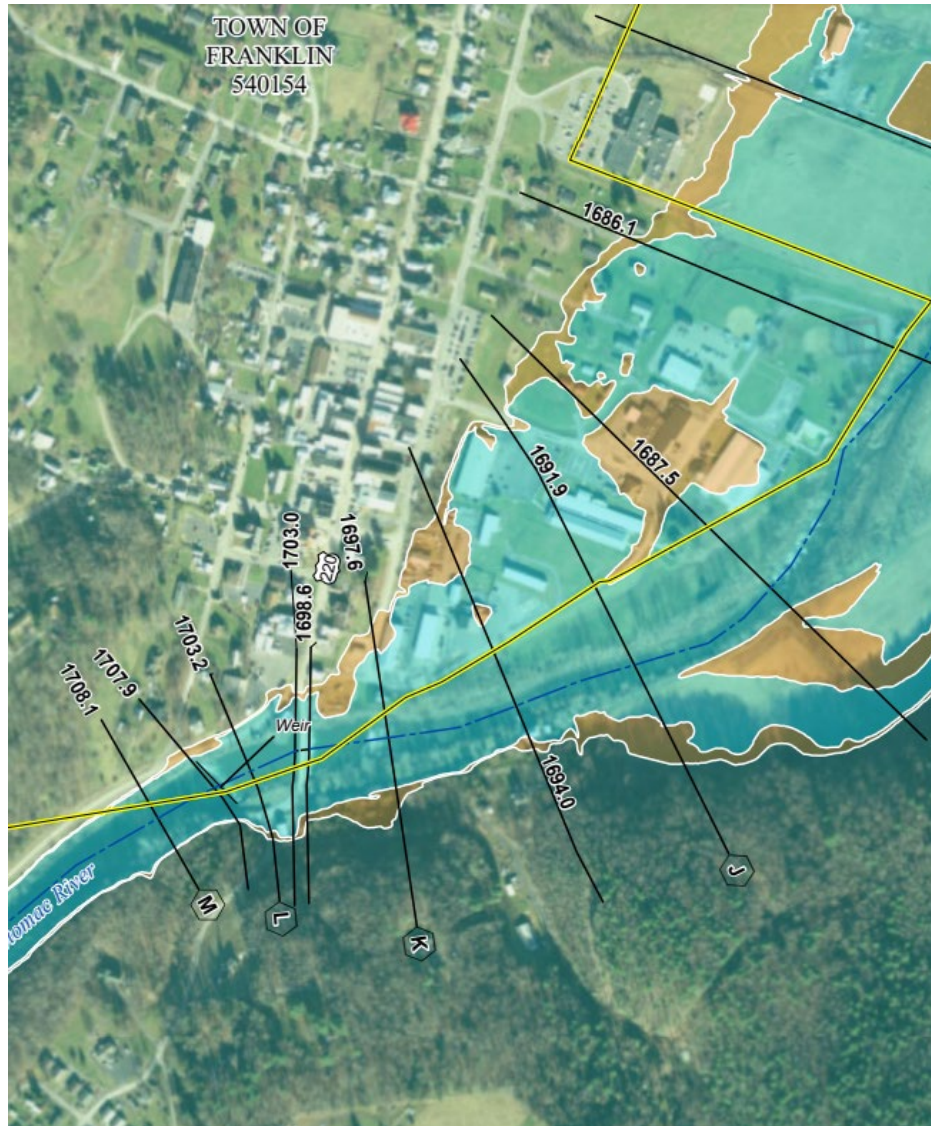








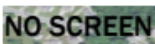



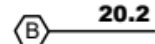
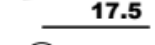
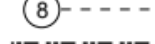






[“The 100-Year Flood Zone Explained”](#)



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# Floodplain Map Overview



<b>SPECIAL FLOOD HAZARD AREAS</b>		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR Regulatory Floodway
<b>OTHER AREAS OF FLOOD HAZARD</b>		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
		Area with Flood Risk due to Levee Zone D
<b>OTHER AREAS</b>		NO SCREEN Area of Minimal Flood Hazard Zone X
		Area of Undetermined Flood Hazard Zone D
<b>GENERAL STRUCTURES</b>		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
<b>OTHER FEATURES</b>		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		513 Base Flood Elevation Line (BFE)
	Limit of Study	
	Jurisdiction Boundary	



# Study Overview

## Revised Modeling and Mapping, including:

- Updated GIS-based regulatory products, including:
  - Updated maps / database / report formats based on new FEMA guidelines and specifications
- Utilization of high-resolution topographic data (for modeling and mapping)
- ***Detailed 'Zone AE' Studies – 79.8 miles***
- ***Model-backed Approximate 'Zone A' Studies – 442.4 miles***
- Production of associated non-regulatory flood risk datasets








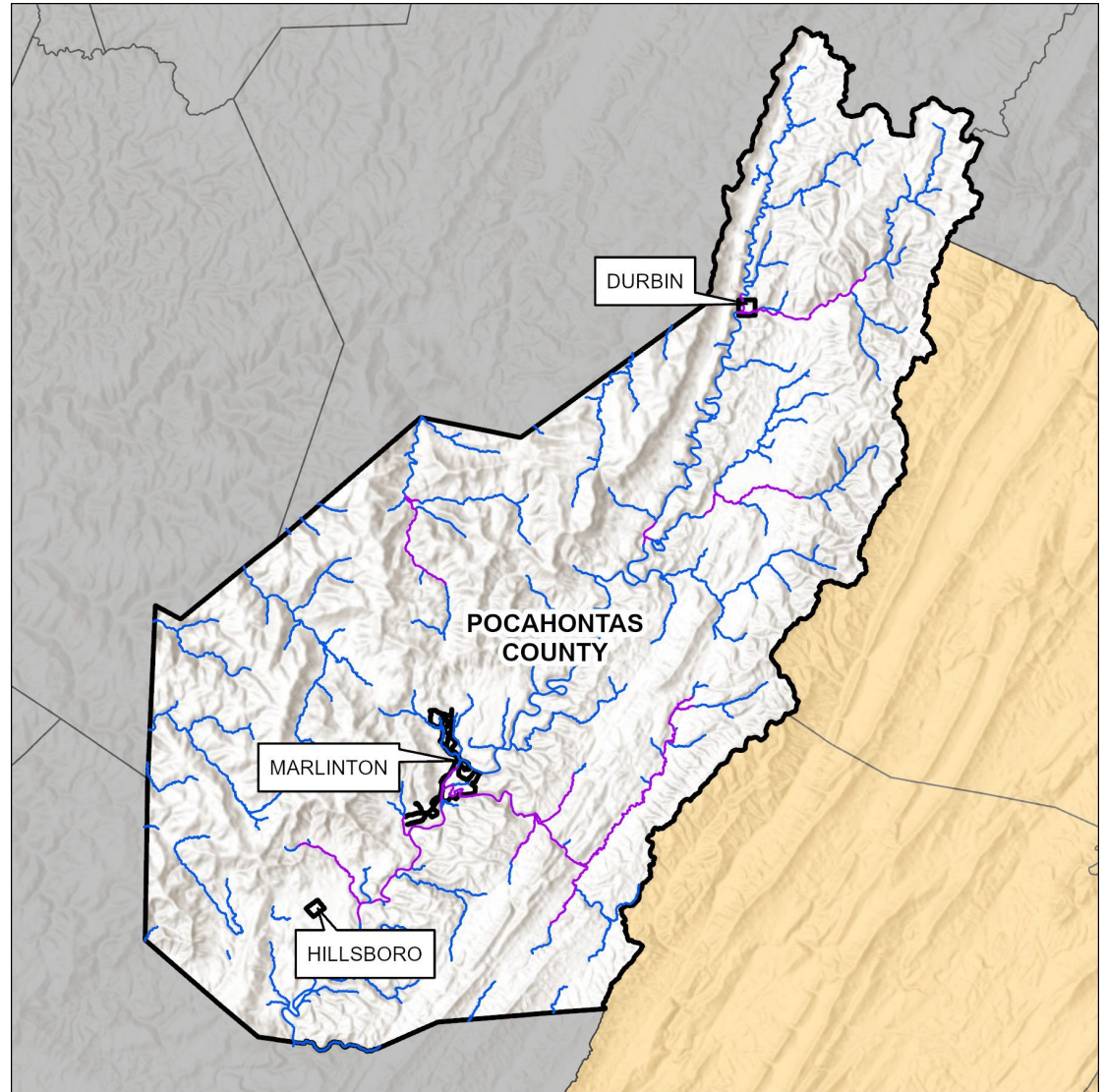
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# Study Overview MAP

## The Project Area

### LEGEND

-  Zone A Streams
-  Zone AE Streams
-  Pocahontas County Boundary
-  West Virginia County Boundaries
-  Virginia County Boundaries



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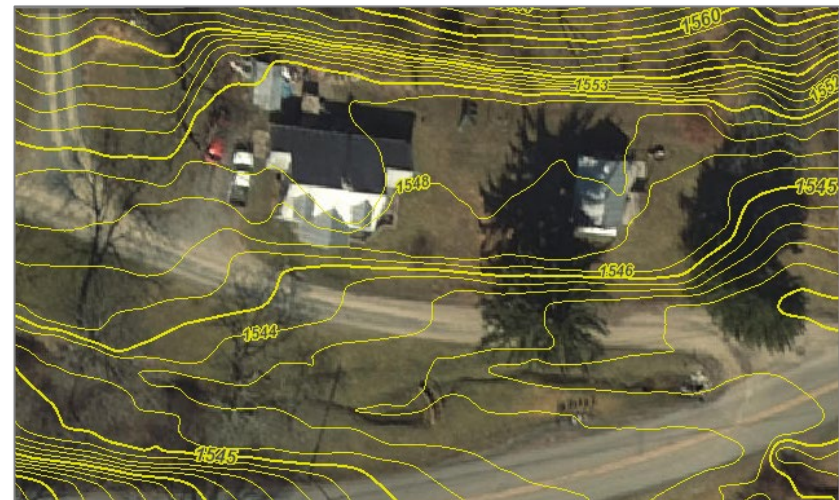


# Topographic Data

## 2016 and 2018/19 LiDAR Based DEM

**LiDAR** = Light Detection and Ranging

- *Uses light pulses and GPS to survey elevation data*
- *Improves the level of detail for hydraulic modeling and floodplain delineation*



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# Hydrologic Analyses

Peak discharges for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance storm events were computed using Regional Regression Equations (RRE) defined in “***Estimation of Flood-Frequency Discharges for Rural, Unregulated Streams in West Virginia***” – [USGS SIR2010-5033](#) (Wiley and Atkins, 2010)

Hydrologic Study Method	Study Type	Stream Names	Reach Lengths (Miles)
Gage Analysis weighted with Regional Regression Equations	AE	Greenbrier River, East Fork Greenbrier River, Knapp Creek, Old Field Fork	52.3
Gage Analysis weighted with Regional Regression Equations	A	Brush Run, Cranberry River, East Fork Greenbrier River, Greenbrier River, Knapp Creek, North Fork Cranberry River, Old Field Fork, Shavers Fork	95.6
Regional Regression Equations	AE	Big Spring Fork, Browns Creek, Cummings Creek, Deer Creek, Douthat Creek, North Fork, Sugar Camp Run, Stamping Creek, Swago Creek, West Fork Greenbrier River	27.5
Regional Regression Equations	A	All remaining approximate studies	346.6





# Hydrologic Analyses

Summary information will be published in the forthcoming Flood Insurance Study Report (to a greater degree for detailed Zone AE study reaches)

But a more focused, comprehensive **Hydrology Report** has been already been prepared with full details of the sources and methodology, along with comparative evaluation between effective and draft / proposed restudied discharges.

## Key Finding

The proposed discharges are generally **lower** than the effective discharges (dating back to the 1980s).

Flows derived from flood frequency analyses at gaged locations are generally higher than both effective flows and regression-based flows, which may be due to the influence of more recent flood events (i.e. not accounted for in the regression analysis).

Regardless, proposed discharges will be used in place of effective discharges to reflect updates over the past half century in hydrologic methods (e.g. regression equations), topography, and land use.

Sample page from the Pocahontas Risk MAP Hydrology Report

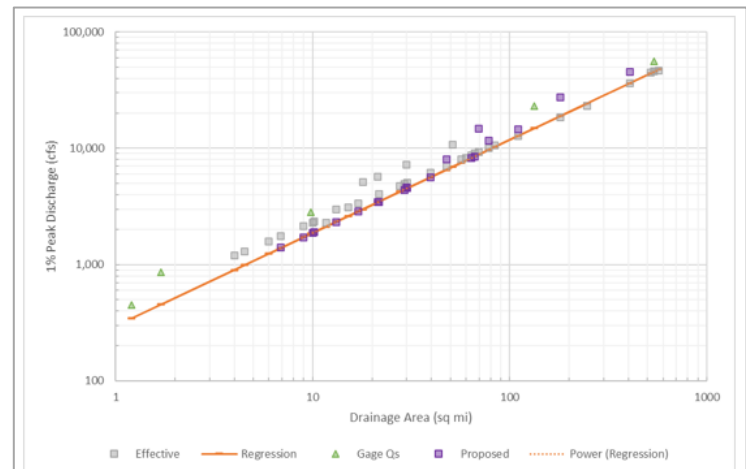


Figure 8: Comparison of 1% Discharges

The table below compares the 1% discharges proposed in this study with the Effective discharges (FEMA, 2010).

Table 5: Comparison of 1% Discharges

Reach	Description	Approximate DA	Proposed	Effective FIS	Change
BIG SPRING FORK	At Slaty Fork above confluence with Elk River	21	3,440	5,700	-40%
BROWNS CREEK	At Huntersville above confluence with Knapp Creek	10	1,880	2,300	-18%
CUMMINGS CREEK	At Huntersville above confluence with Knapp Creek	9	1,700	2,150	-21%
DEER CREEK	At Cass above confluence of Greenbrier River	67	8,510	9,000	-5%

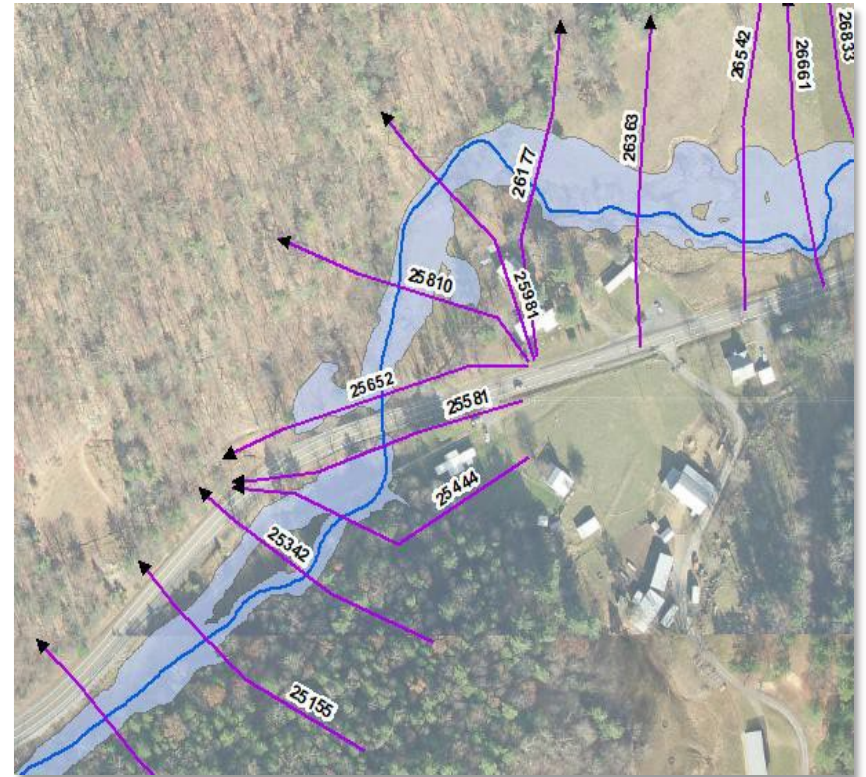


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# Hydraulic Analyses

## Approximate 'Zone A' Base Level Study (442.4 stream miles)

- Generally used in areas with lower development / lower development potential
- Cross-sections generated from LiDAR used for hydraulics:
  - Automated processes
  - Does not include information below normal water surface
  - No structures are modeled
  - No Floodway or BFEs (but modeled XS in FIRM database)
  - Multi-frequency flood values computed but only 1% annual chance on FIRM



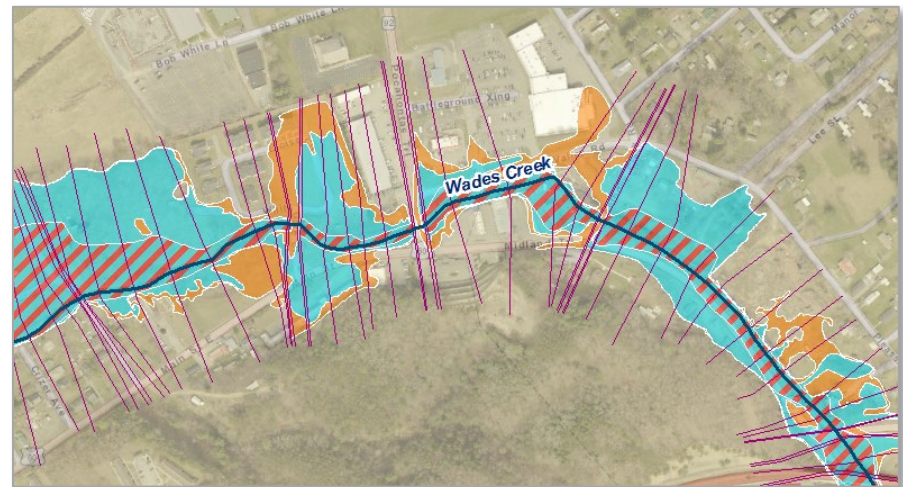
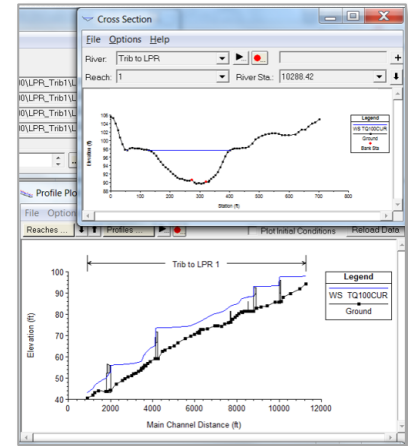
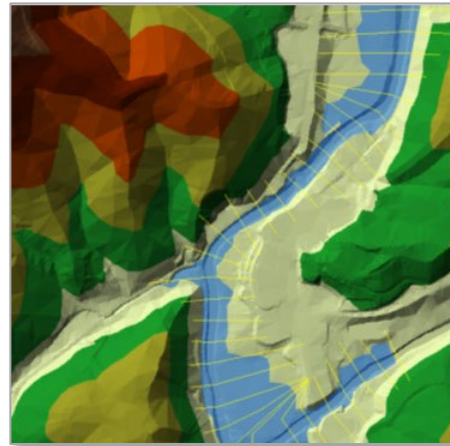
FEMA



# Hydraulic Analyses

## Detailed 'Zone AE' Restudy (79.8 stream miles)

- Used in areas with high development or high development potential
- Encroachments computed and regulatory floodways mapped
- Structures are modeled
- Channel bathymetry is obtained from Field Survey



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# Study Types

		Approximate	Detailed
Survey	Channel XS	None	Field survey at road crossings
	Hydraulic Structures	None	Field survey
Hydrology	Methodology	Regression Equations / Gage Analysis	Regression Equations / Gage Analysis
Hydraulics	Recurrence Interval	10%, 4%, 2%, 1%, 1%+ and 0.2% annual chance	
	Manning's "n"	Aerial Imagery (Horizontal Variation)	
	Channel Geometry	LiDAR	LiDAR; Supplemented with field survey
Mapping	Boundaries	1% annual chance	1% and 0.2% annual chance
	Flood Zones	Zone A (no published BFEs)	Zone AE (all XS with labeled WSELs, and Floodways) and 'Shaded' Zone X
FIS Report	Tables	Study Summaries	Study Summaries, Summary of Discharge, Floodway Data, Roughness Coefficient
	Profiles	None	10-, 4-, 2-, 1-, 0.2-% annual chance



# Study Impacts



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**RiskMAP**  
Increasing Resilience Together





# WV Flood Tool

Remember: When In Doubt, It's Not Out!

Views: Public | Expert | **Risk MAP**

Layers: Risk | Reference | Basemaps

Search: Address: e.g., 123 street name, city, state, zip

Tools: [Icons for various map functions]

Minus-Rated Structure

Building Damage Loss Estimate

CRITICAL INFRASTRUCTURE

FLOOD DEPTH

1% Flood Depth (HEC-RAS)

1% Flood Depth (HAZUS)

USGS High Water Marks

OTHER NATURAL HAZARDS

MITIGATED PROPERTIES & OPEN SPACE

PRIMARY FLOOD HAZARD LAYERS

PRELIMINARY/DRAFT FLOOD LAYERS

Preliminary NFHL Floodplain

Preliminary NFHL Cross Section

Change Since Last FIRM(CSLF)\*

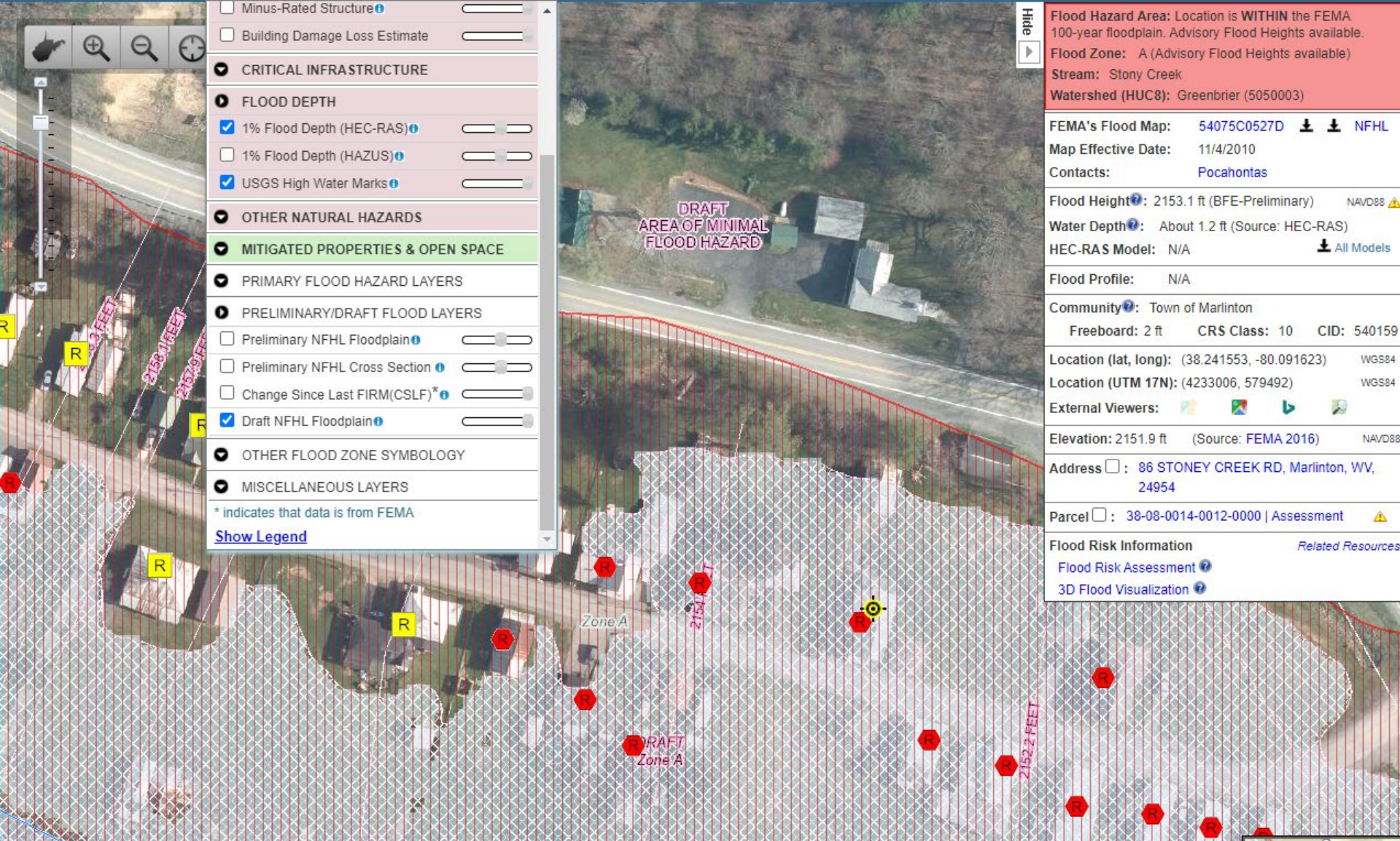
Draft NFHL Floodplain

OTHER FLOOD ZONE SYMBOLOGY

MISCELLANEOUS LAYERS

\* indicates that data is from FEMA

[Show Legend](#)



**Flood Hazard Area:** Location is **WITHIN** the FEMA 100-year floodplain. Advisory Flood Heights available.

**Flood Zone:** A (Advisory Flood Heights available)

**Stream:** Stony Creek

**Watershed (HUC8):** Greenbrier (5050003)

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**FEMA's Flood Map:** 54075C0527D [Download](#) [NFHL](#)

**Map Effective Date:** 11/4/2010

**Contacts:** Pocahontas

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**Flood Height:** 2153.1 ft (BFE-Preliminary) NAVD88

**Water Depth:** About 1.2 ft (Source: HEC-RAS)

**HEC-RAS Model:** N/A [All Models](#)

---

**Flood Profile:** N/A

---

**Community:** Town of Marlinton

**Freeboard:** 2 ft **CRS Class:** 10 **CID:** 540159

---

**Location (lat, long):** (38.241553, -80.091623) WGS84

**Location (UTM 17N):** (4233006, 579492) WGS84

**External Viewers:** [Share](#) [Print](#) [Download](#)

---

**Elevation:** 2151.9 ft (Source: FEMA 2016) NAVD88

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**Address:** 86 STONEY CREEK RD, Marlinton, WV, 24954

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**Parcel:** 38-08-0014-0012-0000 | Assessment Warning

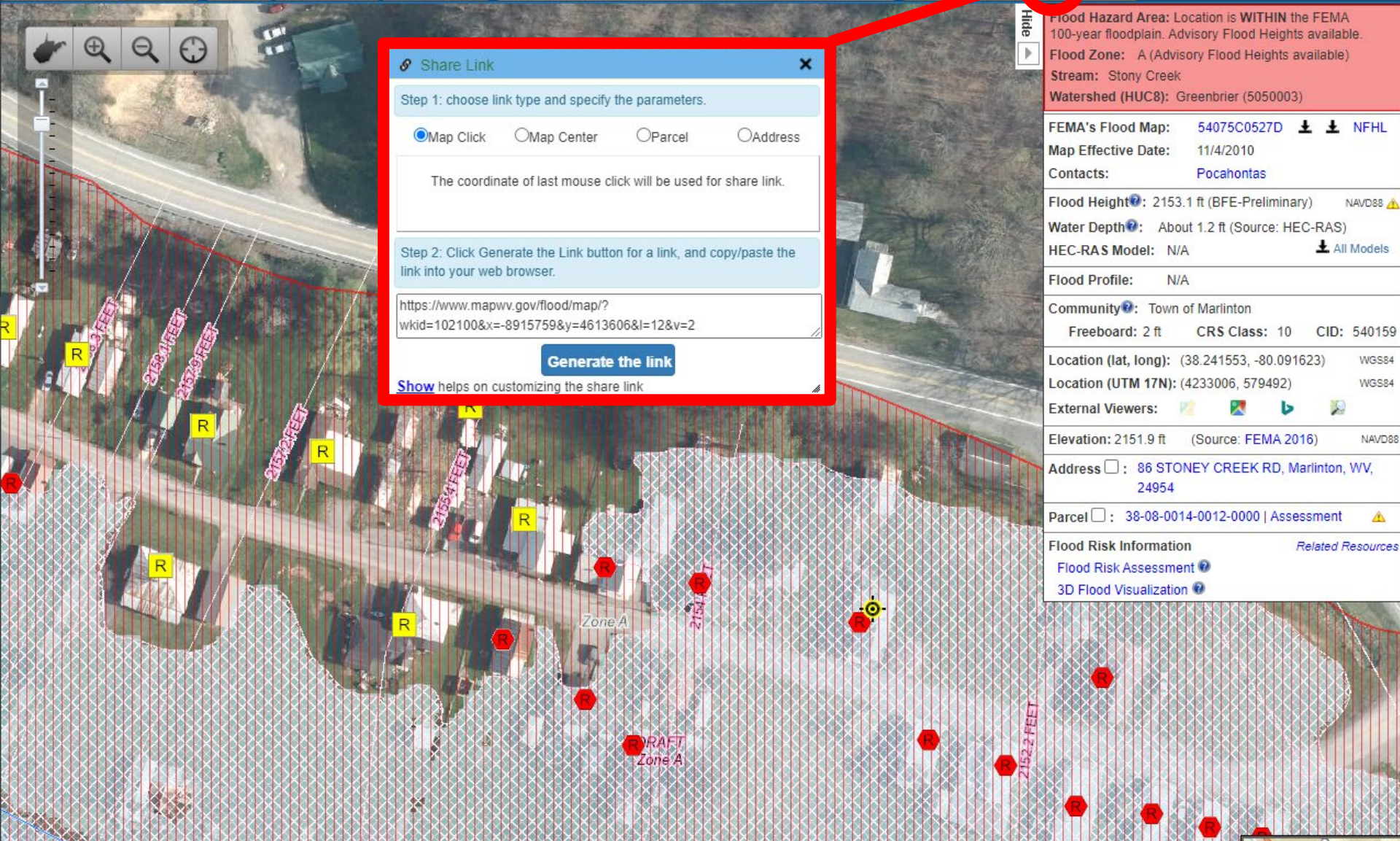
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**Flood Risk Information** [Related Resources](#)

[Flood Risk Assessment](#)

[3D Flood Visualization](#)





### Share Link

Step 1: choose link type and specify the parameters.

Map Click  Map Center  Parcel  Address

The coordinate of last mouse click will be used for share link.

Step 2: Click Generate the Link button for a link, and copy/paste the link into your web browser.

<https://www.mapwv.gov/flood/map/?wkid=102100&x=-8915759&y=4613606&l=12&v=2>

[Generate the link](#)

[Show](#) helps on customizing the share link

Flood Hazard Area: Location is **WITHIN** the FEMA 100-year floodplain. Advisory Flood Heights available.

Flood Zone: A (Advisory Flood Heights available)

Stream: Stony Creek

Watershed (HUC8): Greenbrier (5050003)

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FEMA's Flood Map: [54075C0527D](#) [↓](#) [↓](#) [NFHL](#)

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External Viewers: [Google Earth](#) [ArcGIS](#) [Twitter](#) [Facebook](#)

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Parcel:  38-08-0014-0012-0000 | [Assessment](#) ⚠

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Flood Risk Information [Related Resources](#)

[Flood Risk Assessment](#)

[3D Flood Visualization](#)



# How Did the Floodplain Maps Change?

FEMA Region 3 Changes Since Last FIRM (CSLF) Viewer:  
<https://arcg.is/1Pr5nL0>

Change in Floodplain Extents:

- Purple – Increase
- Blue – Still Floodplain
- Yellow – Decrease

**FEMA Region III Changes Since Last FIRM (CSLF)**

Find address or place

**About**

annual chance floodplains designated on the Flood Insurance Rate Maps (FIRMs) during a map update. The Changes Since Last FIRM (CSLF) coverage allows local community officials to use advanced mapping capabilities to view and analyze their community with a new perspective.

In developing effective floodplains, the data goes through three stages. The first stage is draft data, in which the earliest possible changes to the regulatory flood map are identified. Following the draft stage is preliminary data, which is for review and guidance purposes only, but closer to the final product. Finally, pending data is produced which reflects upcoming changes after a letter of final determination has been issued.

**Instructions:**

1. Find a location by using the top left search bar. You can search by address, county, or zip code. You can also reference the polygons on the map to locate areas where CSLF data is available.
2. When zoomed in far enough the CSLF layer will be turned on. For more information or to download a GIS file, click the increase or decrease colors on the map.

Legend:

- Pending Data Available
- Preliminary Data Available
- Draft Data Available

Increase in Flood Extent

Decrease in Flood Extent

Still Floodplain

600ft

-78.837 38.927 Degrees



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# National Flood Hazard Layer

Visit <https://www.fema.gov/national-flood-hazard-layer-nfhl> for multiple options to view and download NFHL data.

## Accessing the National Flood Hazard Layer

### Map Service Center

Access localized National Flood Hazard Layer data by searching FEMA's Map Service Center.

[FEMA's Map Service Center](#)

### NFHL ArcGIS Viewer

Or you may view, download, and print current local digital effective flood hazard data in an ArcGIS map.

[NFHL Viewer](#)

In the [NFHL Viewer](#), you can use the address search or map navigation to locate an area of interest and the NFHL Print Tool to download and print a full Flood Insurance Rate Map (FIRM) or FIRMette (a smaller, printable version of a FIRM) where modernized data exists. Technical GIS users can also utilize a series of dedicated GIS web services that allow the NFHL database to be incorporated into websites and GIS applications. For more information on available services, go to the [NFHL GIS Services User Guide](#).

You can also use the address search on the [FEMA Flood Map Service Center \(MSC\)](#) to view the NFHL data or download a FIRMette. Using the "Search All Products" on the MSC, you can download the NFHL data for a County or State in a GIS file format. This data can be used in most GIS applications to perform spatial analyses and for integration into custom maps and reports. To do so, you will need GIS or mapping software that can read data in shapefile format.

FEMA also offers a download of a KMZ (keyhole markup file zipped) file, which overlays the data in Google Earth™. For more information on using the data in Google Earth™, please see [Using the National Flood Hazard Layer Web Map Service \(WMS\) in Google Earth™](#).

### Draft National Flood Hazard Layer

The [Draft National Flood Hazard Layer](#) is for early awareness of possible changes to regulatory flood map information. Until the data becomes effective and it appears in the National Flood Hazard Layer, the data cannot be used to rate flood insurance policies or enforce the federal mandatory purchase requirement.

### Preliminary Flood Hazard Data

Preliminary flood hazard data provides the public an early look at their home or community's projected risk to flood hazards. Preliminary data may include new or revised Flood Insurance Rate Maps (FIRM), Flood Insurance Study (FIS) Reports and FIRM Databases. [View your community's preliminary flood hazard data.](#)

### Pending Flood Hazard Data

Pending flood hazard data provides the public an early look at their home or community's projected risk to flood hazards. Pending data may include new or revised Flood Insurance Rate Maps (FIRM), Flood Insurance Study (FIS) Reports and FIRM Databases. [View your community's preliminary flood hazard data.](#)

The screenshot displays the 'Draft National Flood Hazard Viewer' interface. The main map area shows an aerial view of a river system with flood hazard overlays. The overlays include a blue area labeled 'Draft Zone A' and a green area with orange dots. The river is labeled 'Leach River' and 'Whitehead Run'. The interface includes a search bar at the top right with the text 'Find address or place' and a magnifying glass icon. On the right side, there is a 'Layer List' panel with the following layers:

- Draft Changes Since Last FIRM Layer ...
- Draft National Flood Hazard Layer ...
- National Flood Hazard Layer ...
- Coastal Barrier Resources System Area (US FWS) ...
- NFHLREST\_FIRMette - Study\_Info ...

# Significant Impacts Overview

- The study resulted in **moderate changes to SFHA extents** with both narrowing and widening compared to effective SFHAs.
- **Extended Zone A study reaches** (with drainage areas of 2 square mile and greater, and not on current effective FIRM) result in new properties within the SFHA. Where effective Zone A SFHAs are present (particularly in headwaters), the draft Zone A SFHAs are narrower.

## WV Flood Tool – SFHA Future Map Conditions

	Floodway	No Change SFHA	Mapped In SFHA	Mapped Out SFHA	Community Total
Durbin	1	4	9	2	16
Marlinton	14	317	43	30	404
Pocahontas County (Unincorporated Areas)	54	194	153	170	571
	<b>69</b>	<b>515</b>	<b>205</b>	<b>202</b>	<b>991</b>

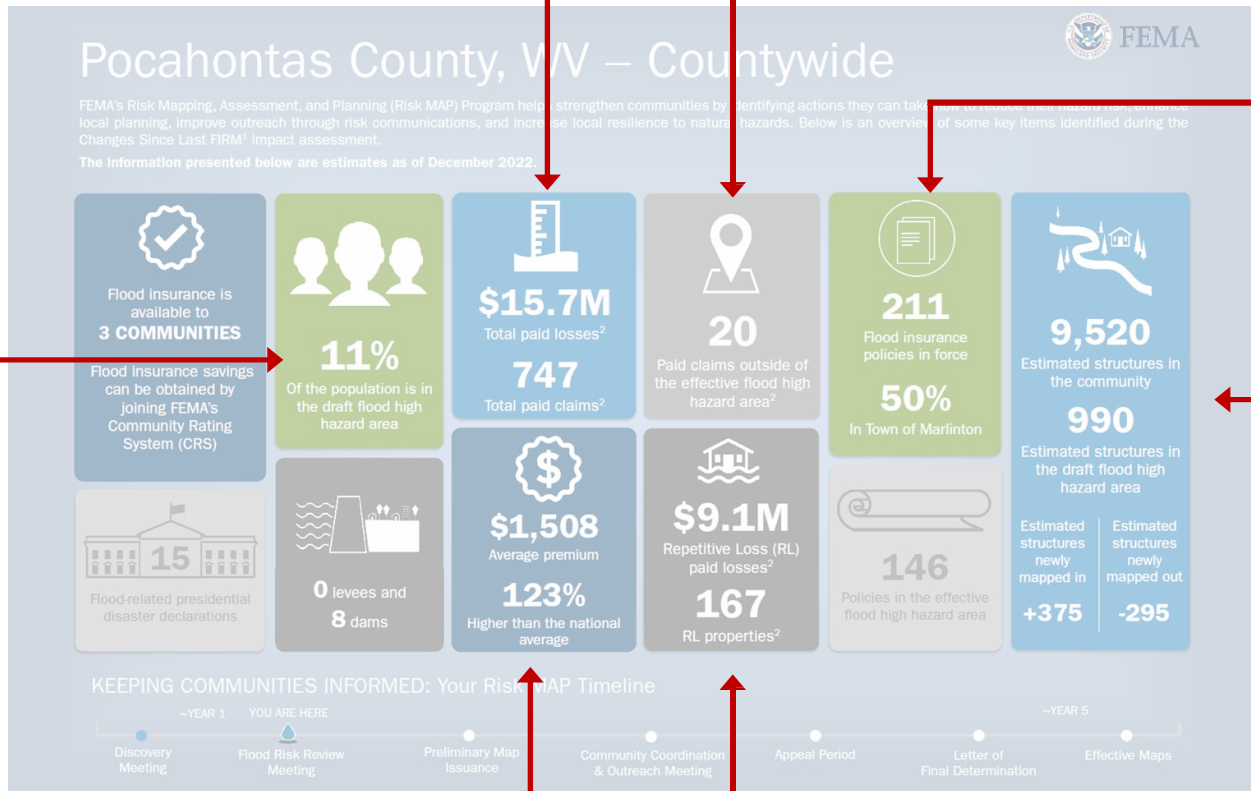




# Flood Risk Dashboard

## NFIP FLOOD CLAIM PAYOUTS

## CLAIMS OUTSIDE OF SFHA



AFFECTED RESIDENTS

NFIP FLOOD POLICIES

HIGH-RISK STRUCTURES



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AVERAGE PREMIUM

REPETITIVE LOSSES

# Flood Risk Dashboard



## Pocahontas County, WV – Countywide

FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) Program helps strengthen communities by identifying actions they can take now to reduce their hazard risk, enhance local planning, improve outreach through risk communications, and increase local resilience to natural hazards. Below is an overview of some key items identified during the Changes Since Last FIRM<sup>1</sup> impact assessment.

The information presented below are estimates as of December 2022.



### KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline

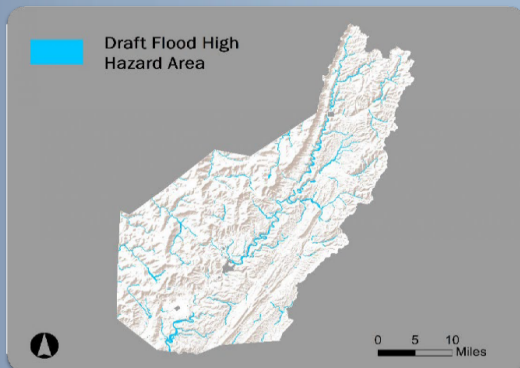




# Flood Risk Dashboard

## Unincorporated Areas/Pocahontas County, WV

**KNOW YOUR RISK** (The information presented below are estimates as of December 2022. <sup>1</sup>Flood Insurance Rate Map. <sup>2</sup>Since 1978.)



**10/17/1989**  
Initial FIRM<sup>1</sup> date

**11/4/2010**  
Effective FIRM date

**\$2.2M**  
Total paid losses<sup>2</sup>

**155**  
Total paid claims<sup>2</sup>

**104**  
Flood insurance policies in force

**60**  
Policies in the effective flood high hazard area

**8,450**  
Estimated structures in the community

**560**  
Estimated structures in the preliminary flood high hazard area

**5%**  
Of the population is in the preliminary flood high hazard area

**18%**  
Of households spend 30% or more of their income on housing

**9**  
Paid claims outside of the effective flood high hazard area<sup>2</sup>

**\$500K**  
Repetitive Loss (RL) paid losses<sup>2</sup>

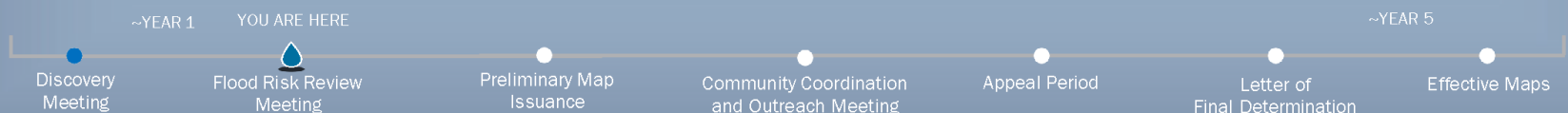
**13**  
RL properties<sup>2</sup>

**15**  
Flood-related countywide presidential disaster declarations

**+310** Estimated structures newly mapped in

**-250** Estimated structures newly mapped out

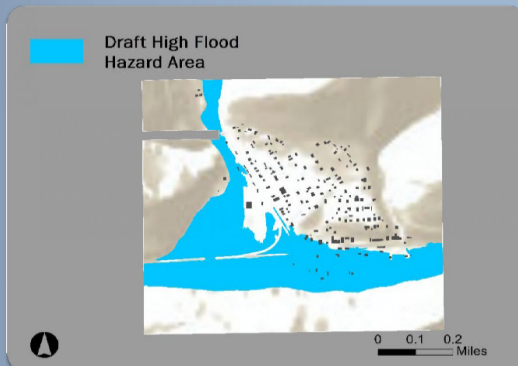
### KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline



# Flood Risk Dashboard

## Town of Durbin/Pocahontas County, WV

**KNOW YOUR RISK** (The information presented below are estimates as of December 2022. <sup>1</sup>Flood Insurance Rate Map. <sup>2</sup>Since 1978.)



**8/24/1984**  
Initial FIRM<sup>1</sup> date

**11/4/2010**  
Effective FIRM date

**\$39K**  
Total paid losses<sup>2</sup>

**5**  
Total paid claims<sup>2</sup>

**1**  
Flood insurance policies in force

**1**  
Policies in the effective flood high hazard area

**190**  
Estimated structures in the community

**20**  
Estimated structures in the preliminary flood high hazard area

**3.4%**  
Of the population is in the preliminary flood high hazard area

**17%**  
Of households spend 30% or more of their income on housing

**0**  
Paid claims outside of the effective flood high hazard area<sup>2</sup>

**\$0**  
Repetitive Loss (RL) paid losses<sup>2</sup>

**0**  
RL properties<sup>2</sup>

**15**  
Flood-related countywide presidential disaster declarations

**+15**  
Estimated structures newly mapped in

**-0**  
Estimated structures newly mapped out

### KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline

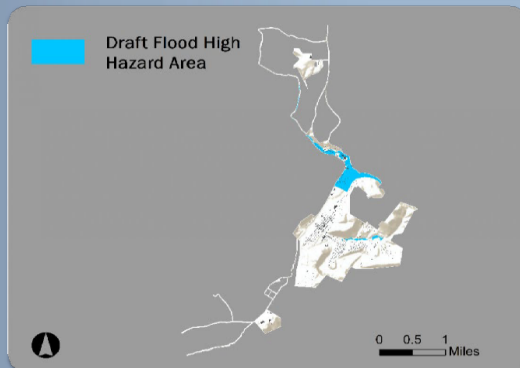




# Flood Risk Dashboard

## Town of Marlinton/Pocahontas County, WV

**KNOW YOUR RISK** (The information presented below are estimates as of December 2022. <sup>1</sup>Flood Insurance Rate Map. <sup>2</sup>Since 1978.)



**10/17/1989**  
Initial FIRM<sup>1</sup> date

**11/4/2010**  
Effective FIRM date

**\$13M**  
Total paid losses<sup>2</sup>

**585**  
Total paid claims<sup>2</sup>

**106**  
Flood insurance policies in force

**85**  
Policies in the effective flood high hazard area

**700**  
Estimated structures in the community

**410**  
Estimated structures in the preliminary flood high hazard area

**56%**  
Of the population is in the preliminary flood high hazard area

**28%**  
Of households spend 30% or more of their income on housing

**11**  
Paid claims outside of the effective flood high hazard area<sup>2</sup>

**\$8.6M**  
Repetitive Loss (RL) paid losses<sup>2</sup>

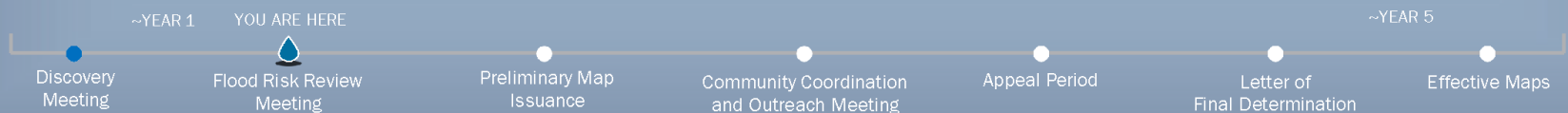
**154**  
RL properties<sup>2</sup>

**15**  
Flood-related countywide presidential disaster declarations

Estimated structures newly mapped in: **+50**

Estimated structures newly mapped out: **-45**

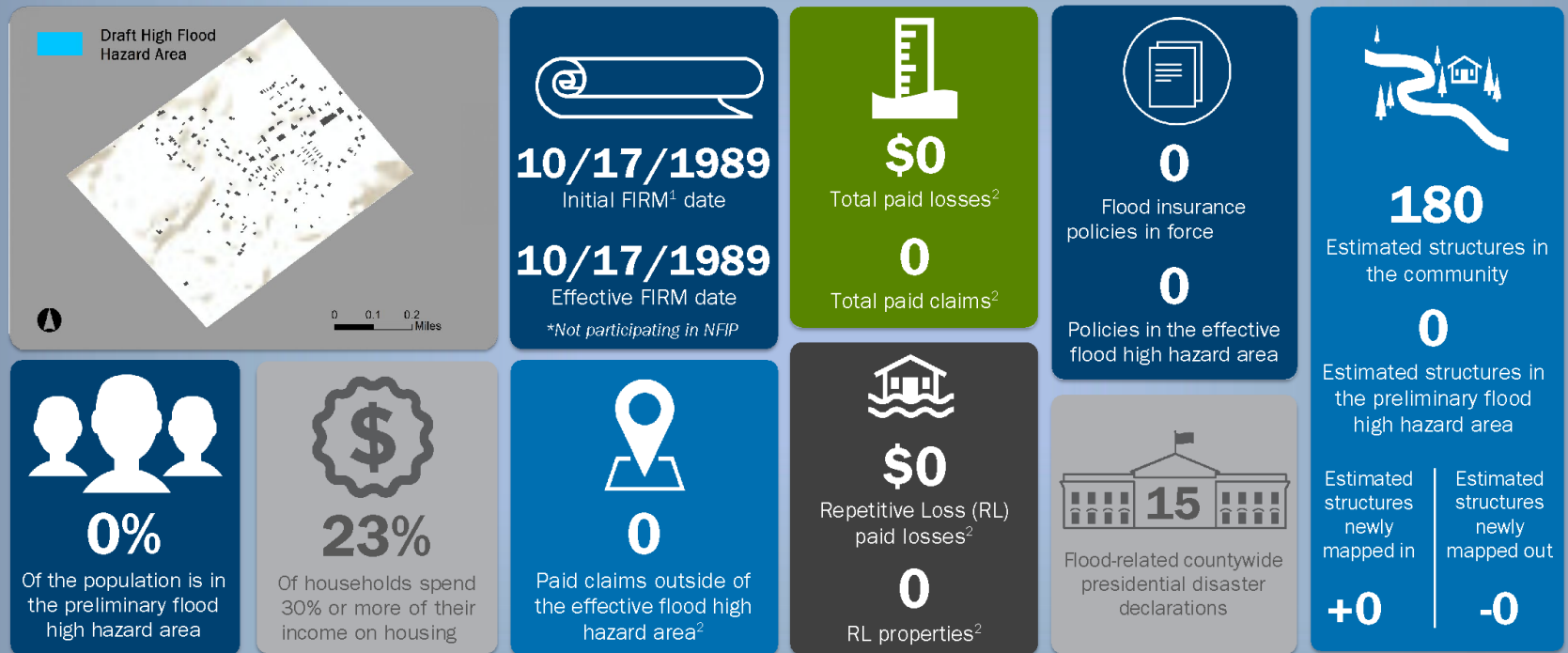
### KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline



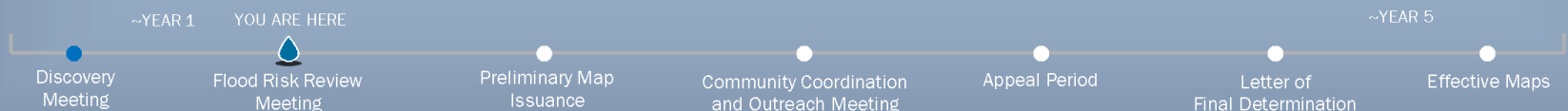
# Flood Risk Dashboard

## Town of Hillsboro/Pocahontas County, WV

**KNOW YOUR RISK** (The information presented below are estimates as of December 2022. <sup>1</sup>Flood Insurance Rate Map. <sup>2</sup>Since 1978.)



### KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline







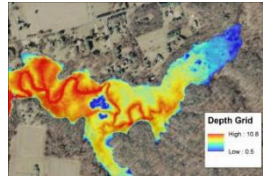
# Using Flood Risk Data to Identify and Reduce Risk



FEMA

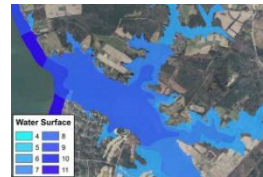
**RiskMAP**  
Increasing Resilience Together

# Types of Flood Risk Products



Flood Depth & Analysis Grids

Changes Since Last FIRM



Water Surface Elevation Grids

Flood Risk Assessment /  
Economic Loss Calculations



Areas of Mitigation Interest

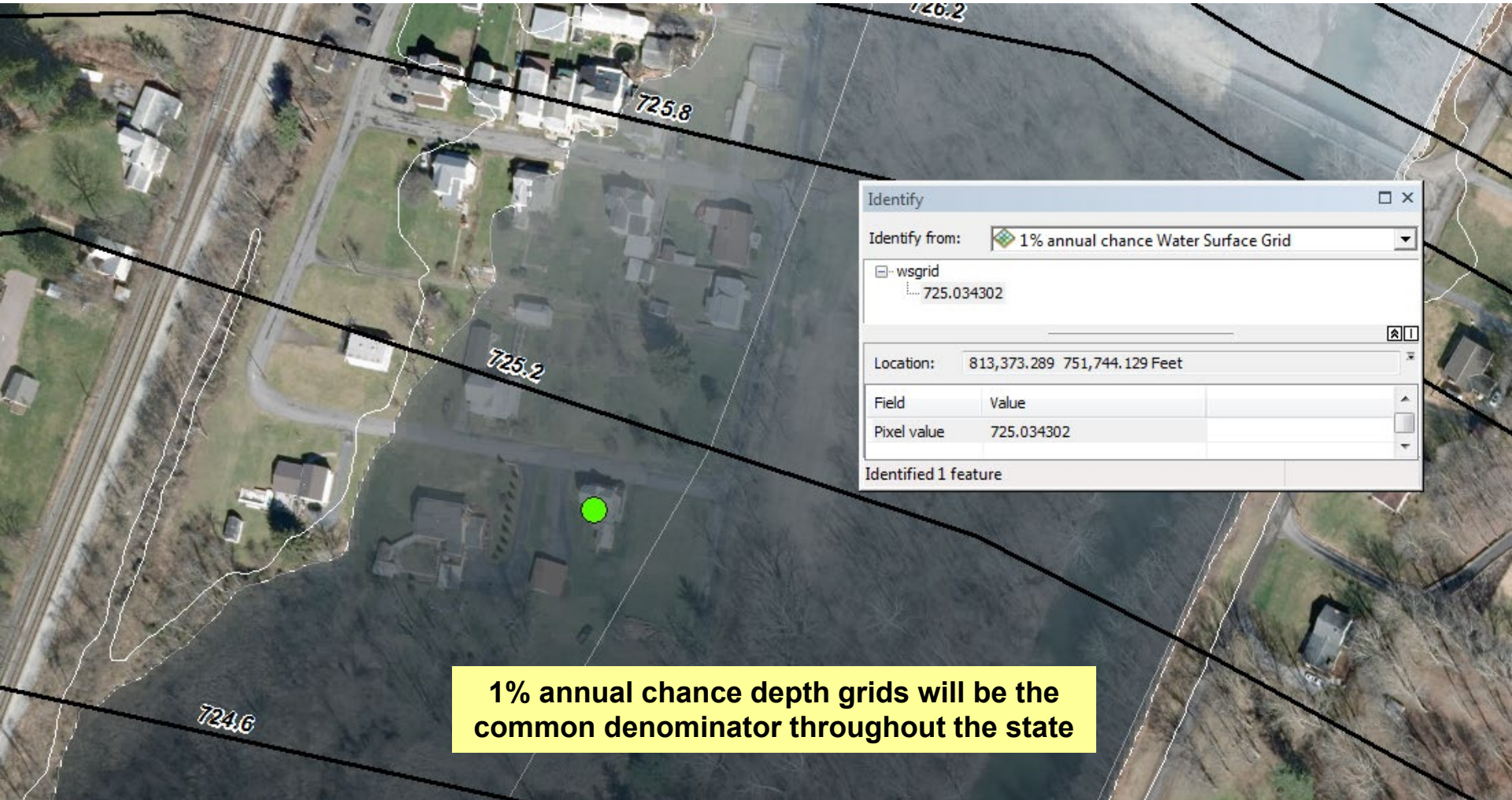


FEMA



# Water Surface Elevation Grids

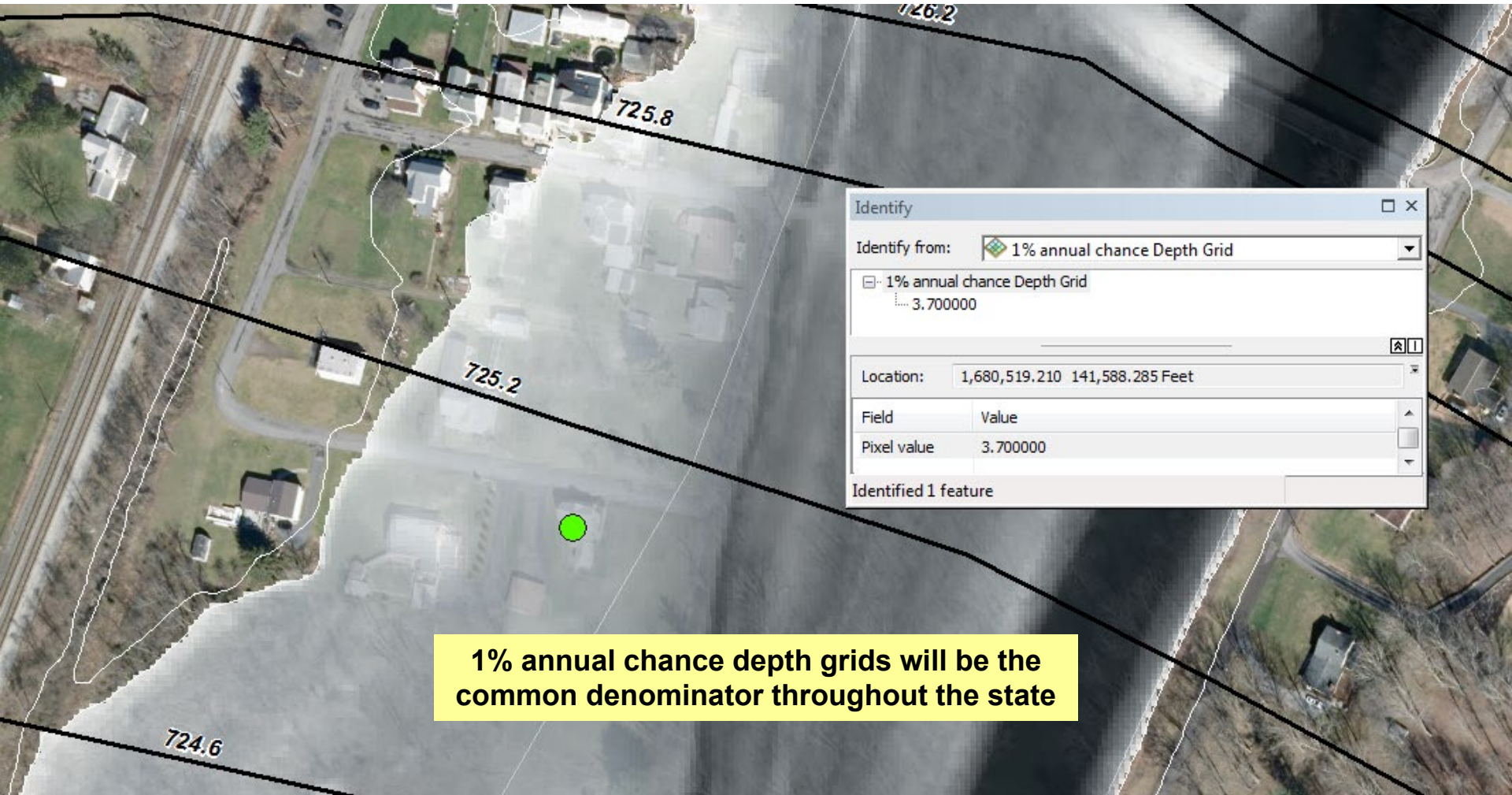
Represent the continuous water surface elevations as determined at modeled cross-sections and interpolated values between cross sections





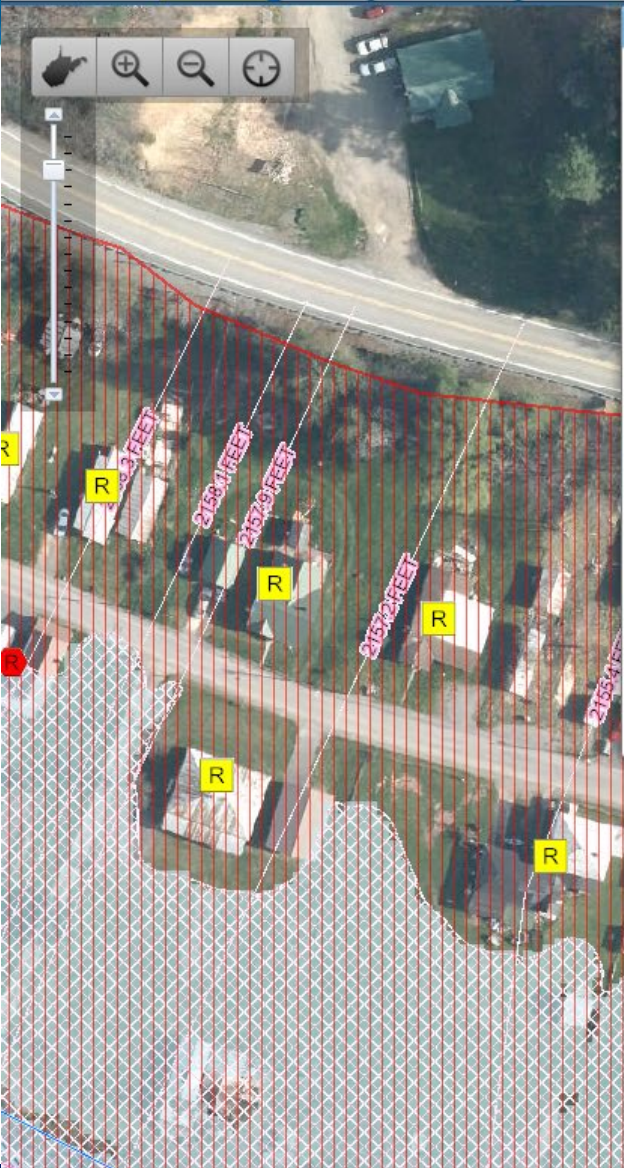
# Depth Grids

Represent the difference between the ground surface and the water surface elevations



**1% annual chance depth grids will be the common denominator throughout the state**





Click on each tab to view information

Address Parcel Risk

**Building #1 in Parcel: 38-08-0014-0012-0000**

**Flood Exposure for Building: 38-08-0014-0012-0000\_86**

Building Replacement Cost	\$43,100
Content Cost	\$21,550
Building Info	Area: 1,344 sq ft   Stories: 2
Occupancy Class	RES1 (Single Family Dwelling)
Year Built	1900 (Pre-FIRM)
Foundation Type	Slab-on-Grade
First Floor Height	1.0 ft above ground
Water Depth-in-Structure	0.1 ft (minus rated -0 ft)

**Flood Damage Estimates for Building: 38-08-0014-0012-0000\_86**

Building Damage Pct	11% (Moderate Damage)
Building Loss USD	\$4,792
Content Damage Pct	8%
Content Loss USD	\$1,801

**Flood Hazard Area:** Location is **WITHIN** the FEMA 100-year floodplain. Advisory Flood Heights available.

**Flood Zone:** A (Advisory Flood Heights available)

**Stream:** Stony Creek

**Watershed (HUC8):** Greenbrier (5050003)

---

**FEMA's Flood Map:** 54075C0527D [Download](#) [Share](#) [NFHL](#)

**Map Effective Date:** 11/4/2010

**Contacts:** Pocahontas

---

**Flood Height:** 2153.1 ft (BFE-Preliminary) [NAVD88](#)

**Water Depth:** About 1.2 ft (Source: HEC-RAS)

**HEC-RAS Model:** N/A [All Models](#)

---

**Flood Profile:** N/A

---

**Community:** Town of Marlinton

Freeboard: 2 ft    CRS Class: 10    CID: 540159

---

**Location (lat, long):** (38.241553, -80.091623) [WGS84](#)

**Location (UTM 17N):** (4233006, 579492) [WGS84](#)

**External Viewers:** [Map](#) [Share](#) [Twitter](#) [Facebook](#)

---

**Elevation:** 2151.9 ft (Source: FEMA 2016) [NAVD88](#)

**Address:** 86 STONEY CREEK RD, Marlinton, WV, 24954

**Parcel:** 38-08-0014-0012-0000 | Assessment [Assessment](#)

---

**Flood Risk Information** [Related Resources](#)

[Flood Risk Assessment](#)

[3D Flood Visualization](#)



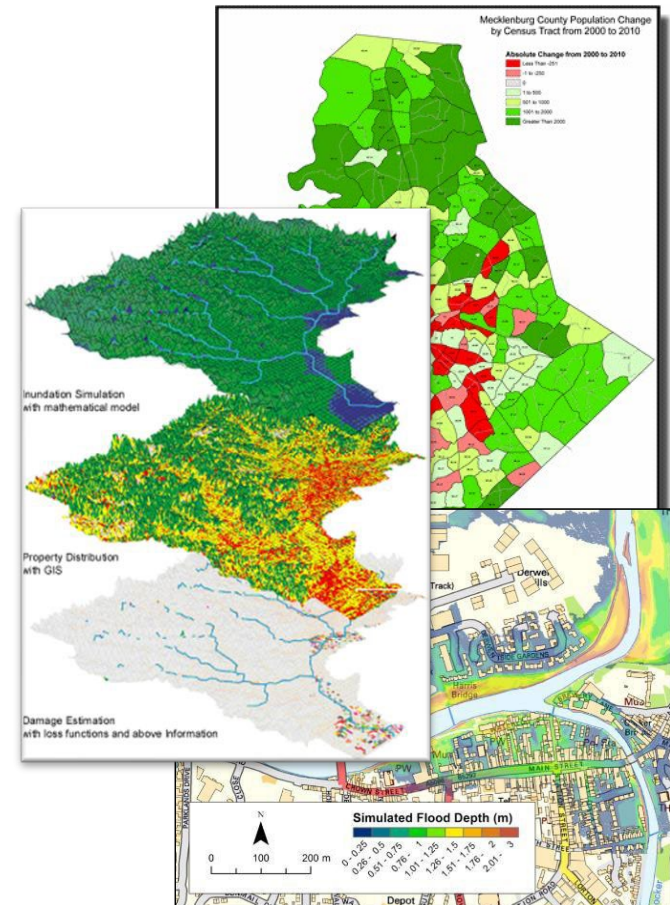
# Flood Hazard Mitigation Planning





# Using FRPs to Manage Development

- Structure-based depth of flooding analyses
- Prioritization of mitigation action
- Residential/commercial density in the floodplain
- Location/inundation area of historic events
- Properties with insurance policies and as a percentage of the population
- Areas of population growth
- Areas requiring protection







# Floodplain Management



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**RiskMAP**  
Increasing Resilience Together



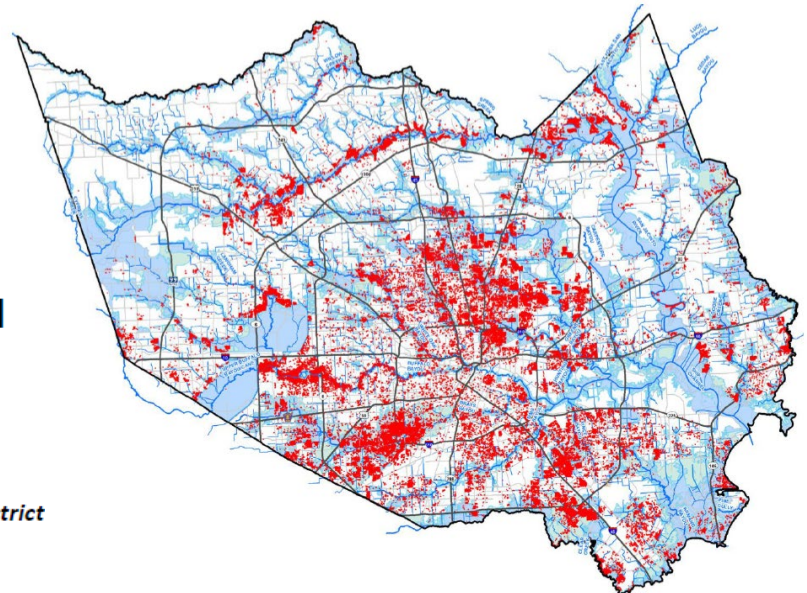
# Flood Risk Doesn't Stop at a Line

- 25% of all flood insurance claims come from outside high-risk areas.
- Your community can regulate to standards higher than the NFIP minimum standards. Consider strengthening regulations using:
  - 0.2% annual chance flood
  - “Freeboard”
  - Buffer around Special Flood Hazard Area (SFHA)
  - Flood depth grids

## **HURRICANE HARVEY GREATER HOUSTON**

**154,170 Homes Flooded**

32% < 100-yr  
23% > 100 yr, < 500 yr  
46% > 500 yr



**FEMA**

*SOURCE: Harris County Flood Control District*

# Floodplain Management

- **Permits are Required for ALL Development in the floodplain!**
- Development means any **manmade change** to improved or unimproved real estate
- Build it **right** and insurance premiums will be more affordable
- Build it **wrong** and premiums will be very expensive



*Taken from outside WVDOT office on Rt. 219 north of Marlinton, West Virginia (Pocahontas County)*



FEMA



# Floodplain Management

- Communities must regulate based on FIRMs
- Development should be reasonably safe from flooding
- Permits are required for all development
- State/federal permits are required
- Elevate and/or construct with flood-resistant materials
- Locate and design mechanicals to minimize or eliminate flood damage
- Locate and design public utilities and facilities to minimize or eliminate flood damage



**A Zones:** top of lowest floor (residential) elevated to or above the base flood level







# Discussion

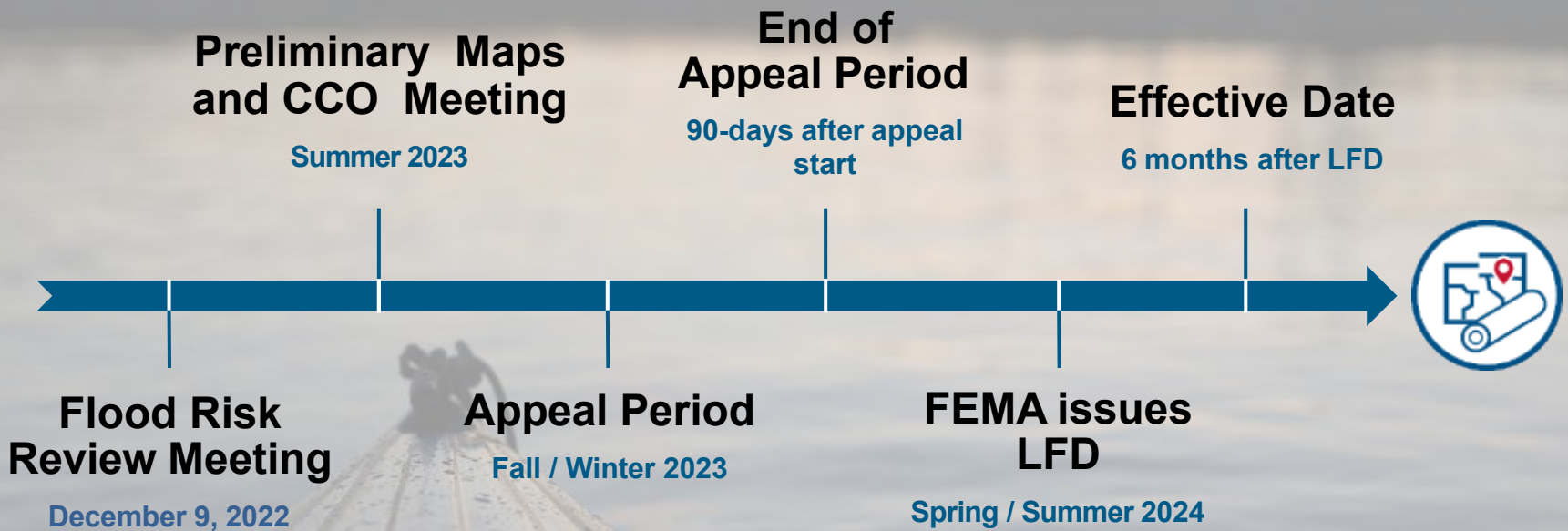


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**RiskMAP**  
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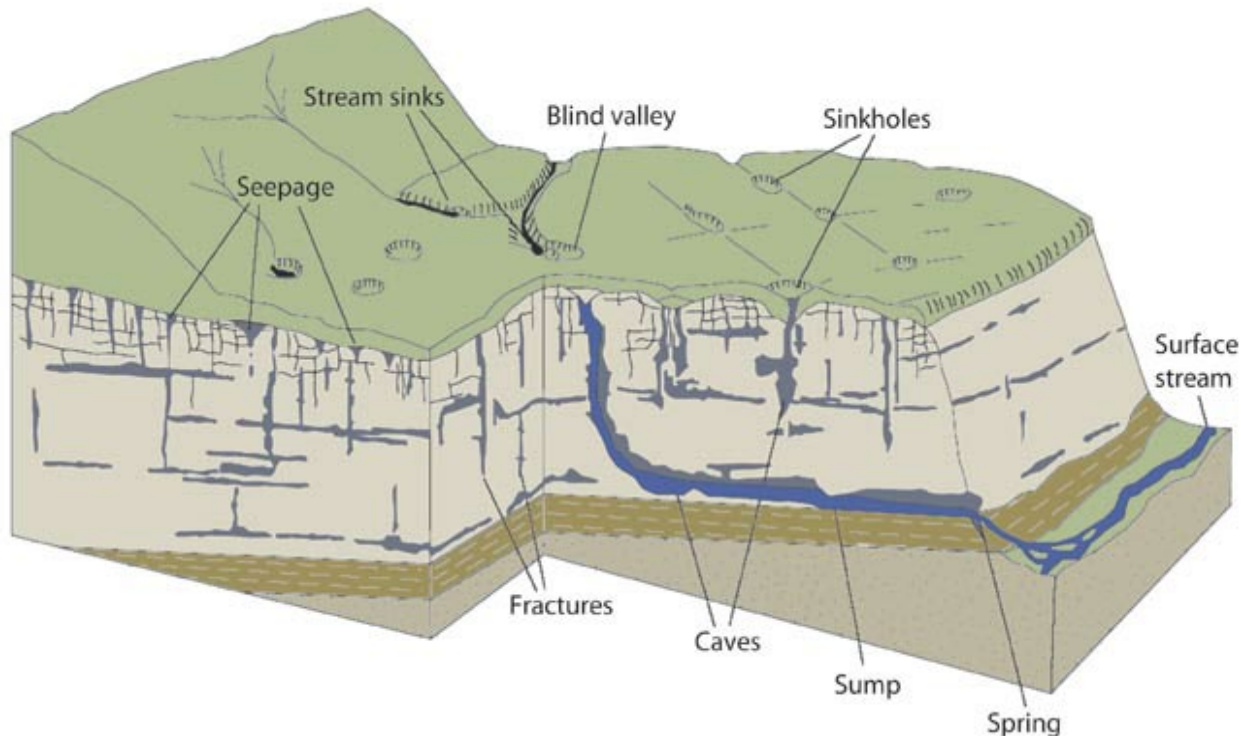


# Timeline – Looking Ahead



# Karst in Pocahontas County

Karst topography is formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterized by underground drainage systems with sinkholes and caves.





# Karst in Pocahontas County



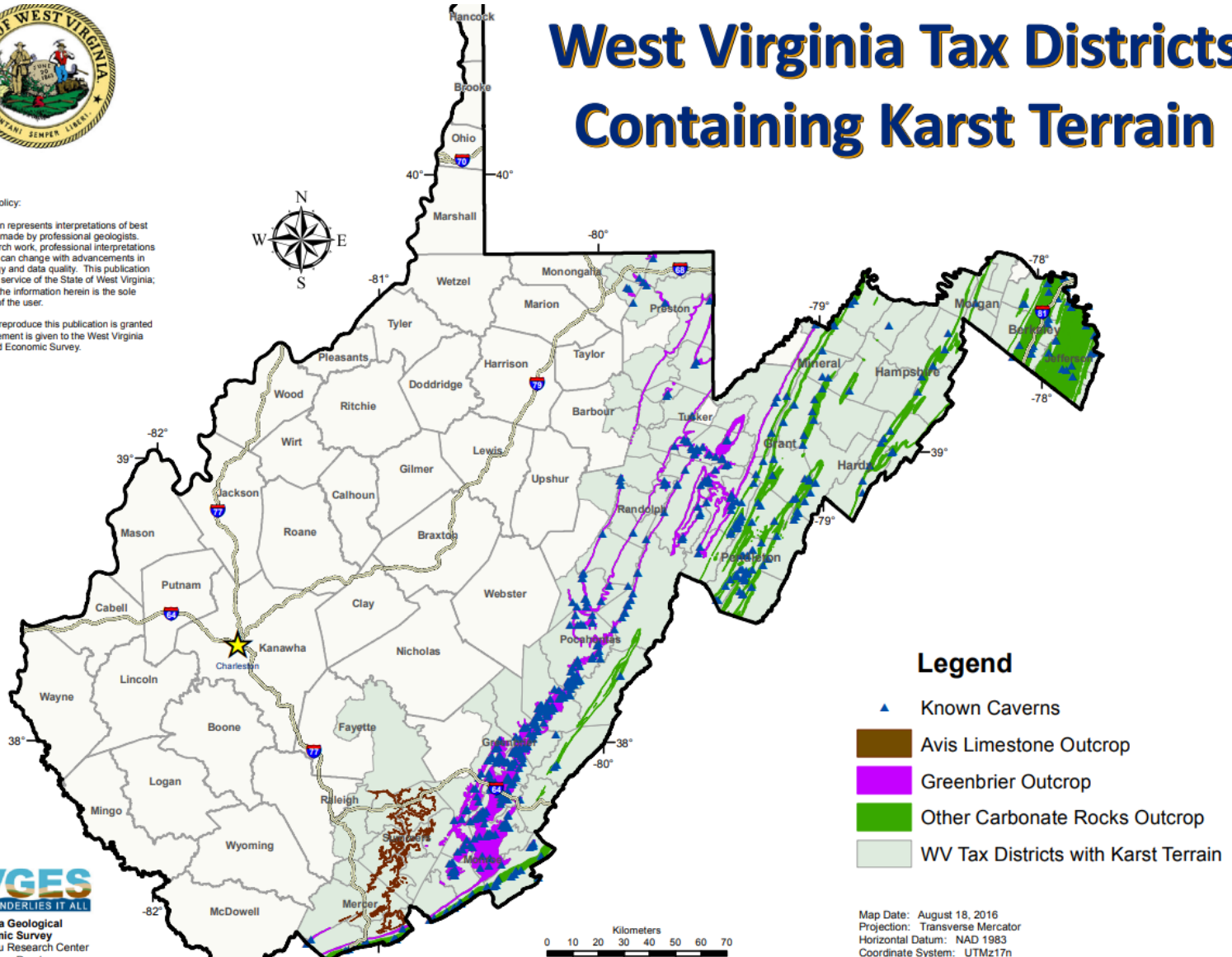
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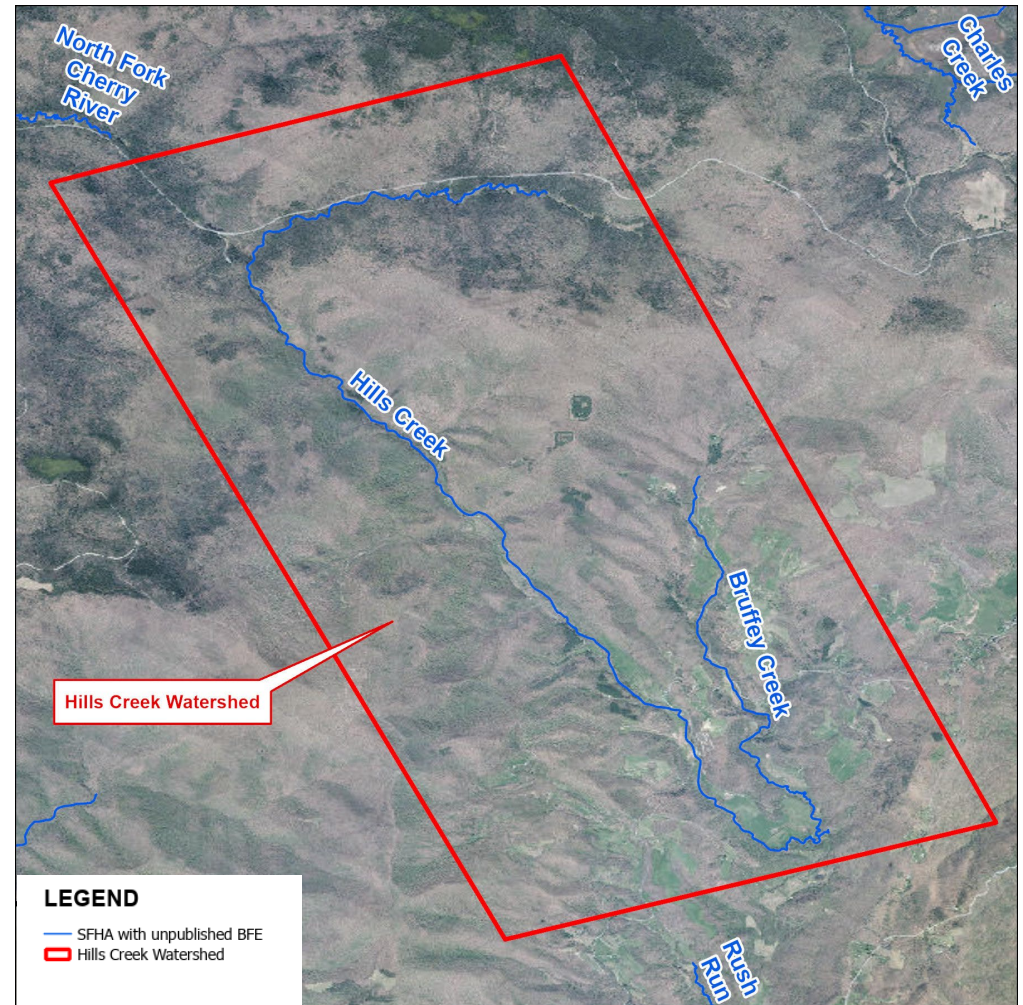
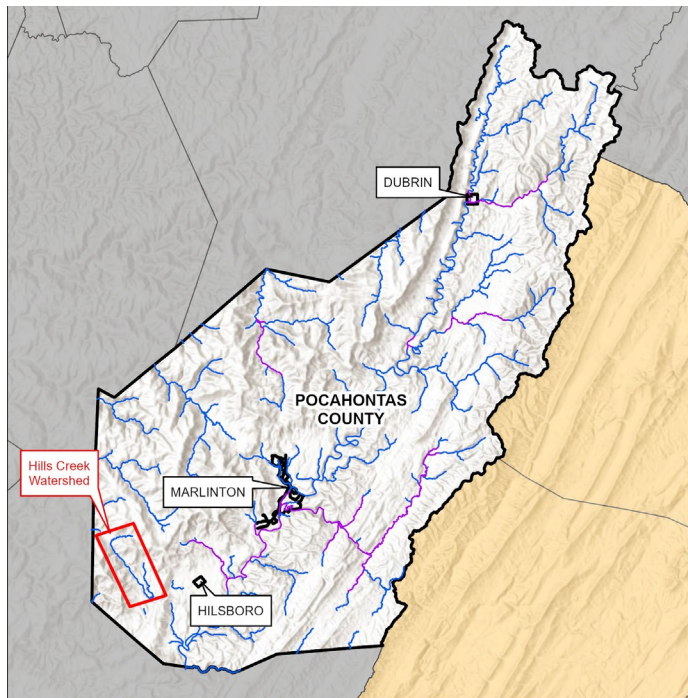
## West Virginia Tax Districts Containing Karst Terrain



West Virginia Geological and Economic Survey  
Mont Chateau Research Center  
100 West Raleigh Avenue  
Martinsburg, WV 26151

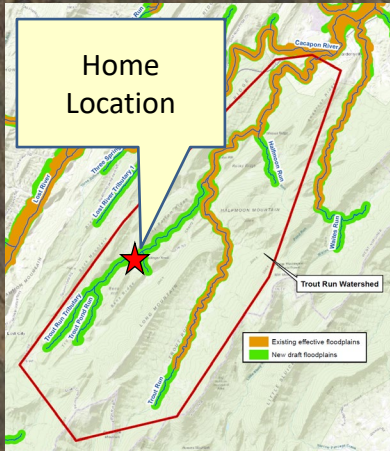
# Karst in Pocahontas County

The scope for this project expands beyond the current effective floodplain extents





# Karst Example from Hardy County



Home in floodplain

- Streams in this area are not well-defined in the LiDAR and may partially run underground
- Surface flow is not visible on aerial imagery
- Flooding may still occur during large rainfall events

# Karst in Pocahontas County

Options for floodplain management in karst areas:

- **Map floodplains as Zone A**
  - Flood insurance is mandatory for properties with federally-back mortgages
- **Map floodplains as Shaded Zone X**
  - Flood insurance is optional



FEMA



# We want to hear from you!

- 30-day review and comment period
- WV Flood Tool:  
<https://www.mapwv.gov/flood>
- Review the materials we will be sending you
- We are available to answer questions
- Talk about mitigation actions in your community
- ***Thank you for your participation!***



FEMA

# Project Contacts



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