FEMA Region 3

Flood Risk Review Meeting

Morgan County, WV - May 9, 2025

FEMA

Agenda

1. Welcome and Introductions
2. Where We Are - Draft Maps
3. Flood Study Update
4. Using Flood Risk Data to Reduce Risk
5. Floodplain Management
6. Discussion

FEMA

Introductions

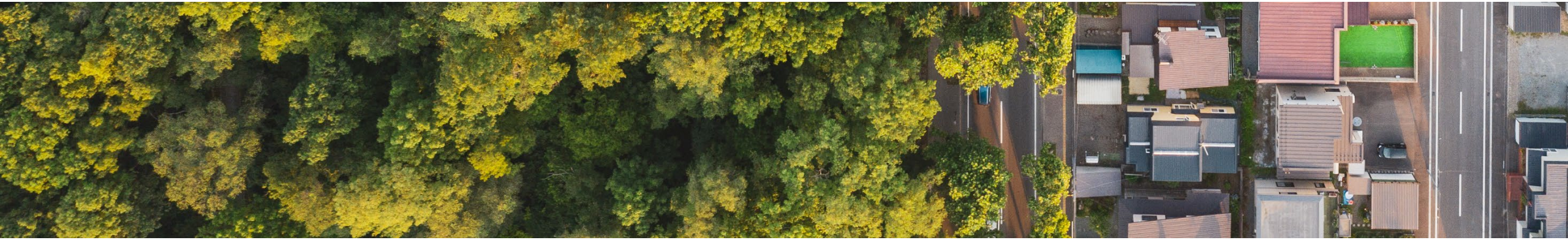
Please Introduce Yourself

- Name.
- Position.
- Organization.

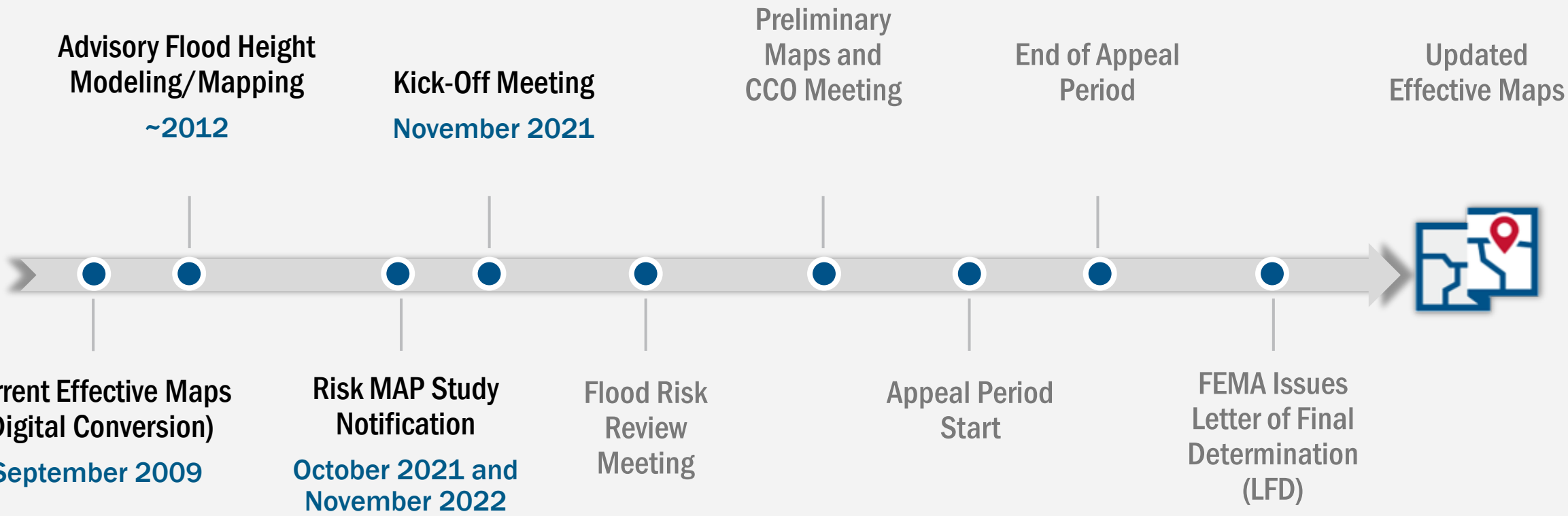
Where We Are – Draft Maps

3 Reasons We Are Here Today

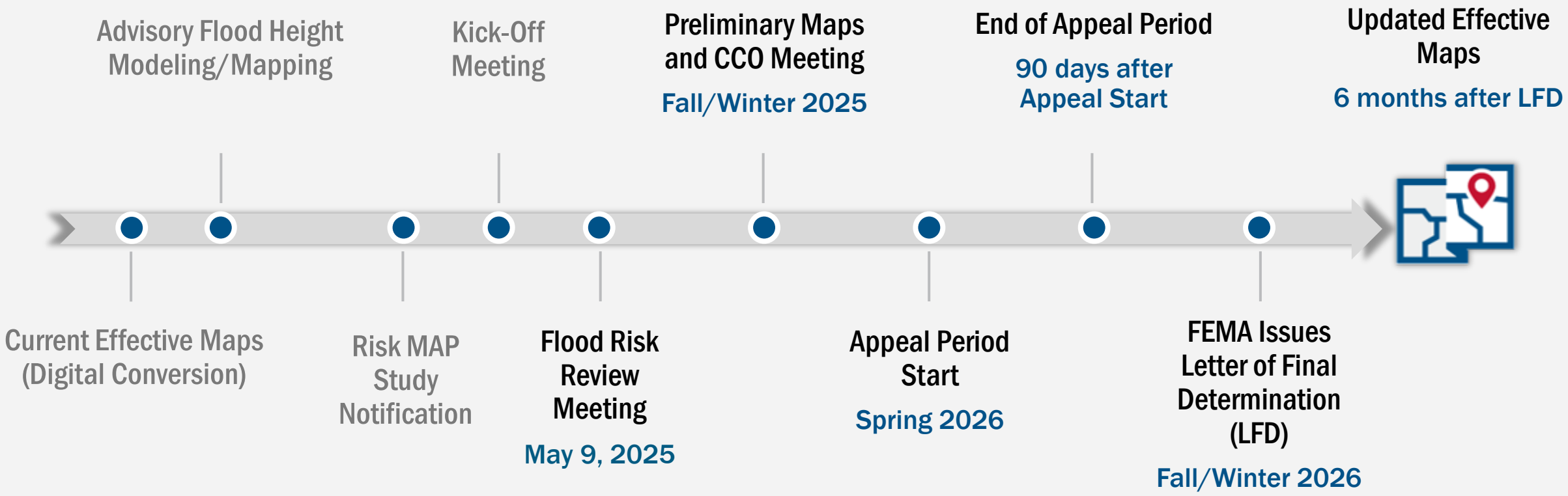
- To preview and discuss the updated Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for Morgan County, West Virginia
- To examine the new study areas, discuss how the analysis and mapping have changed since the previous FIRM, and discuss current and future implications for these changes
- To present a timeline of next steps



Timeline – Looking Back



Timeline – Looking Ahead

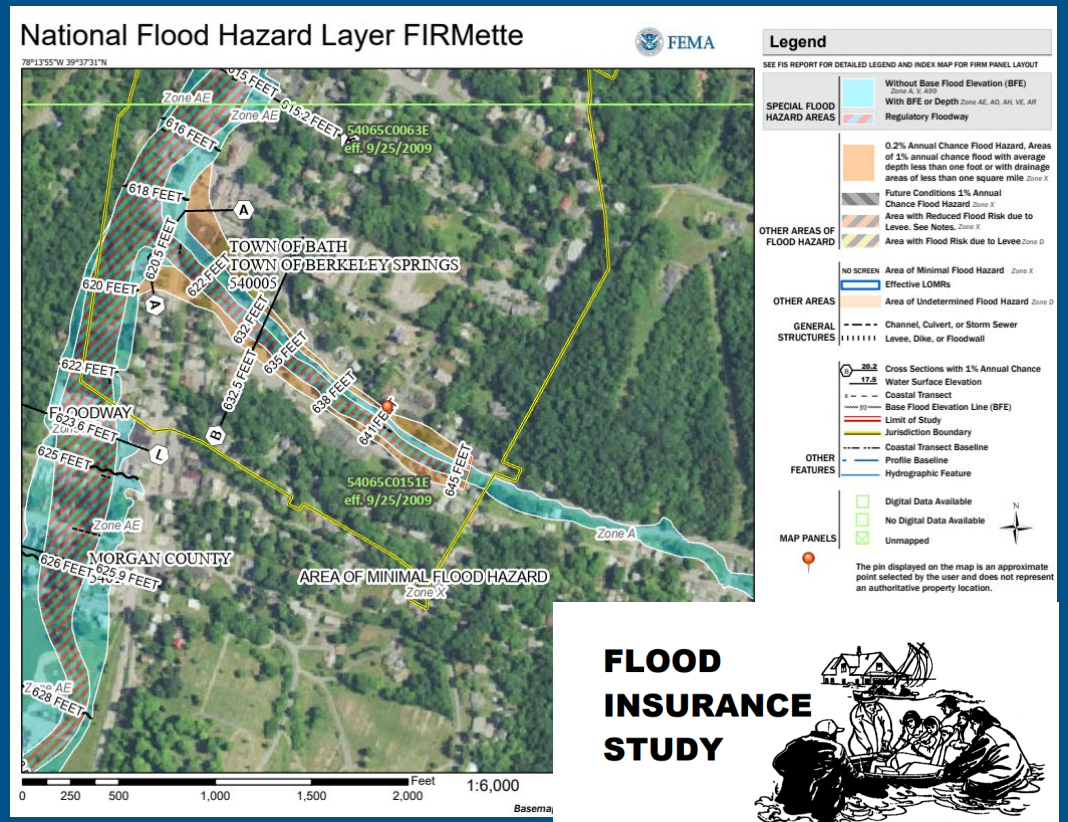


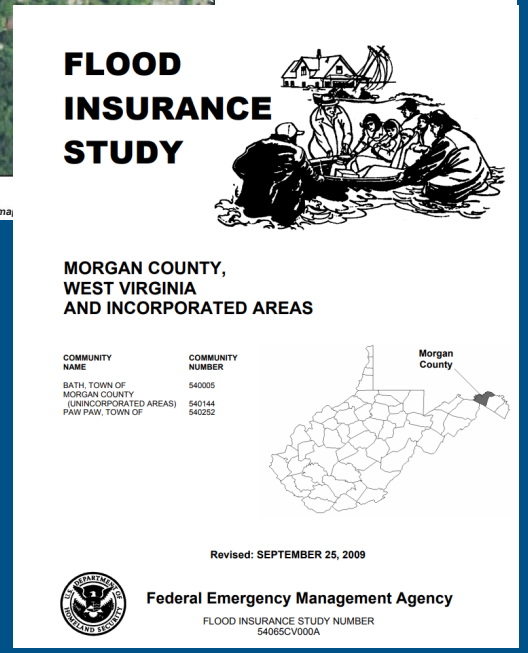
Flood Study Update

Flood Insurance Rate Maps and Studies

Key Terms:

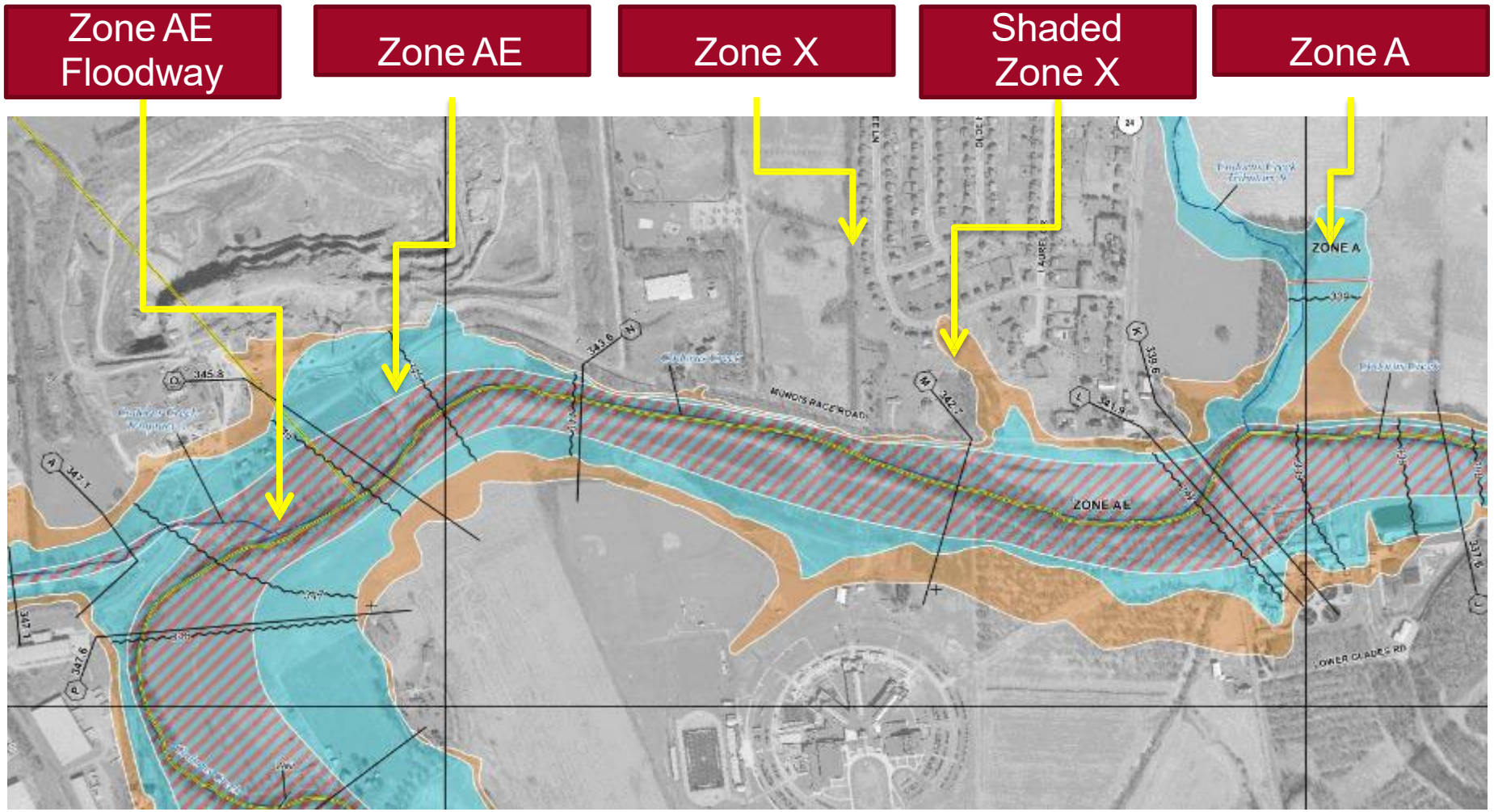
- Flood Insurance Rate Map (**FIRM**)
- Flood Insurance Study (**FIS**) Report
- Special Flood Hazard Area (**SFHA**)
- Flood Zone
- Base Flood Elevation (**BFE**)
- Regulatory Floodway
- Cross Section



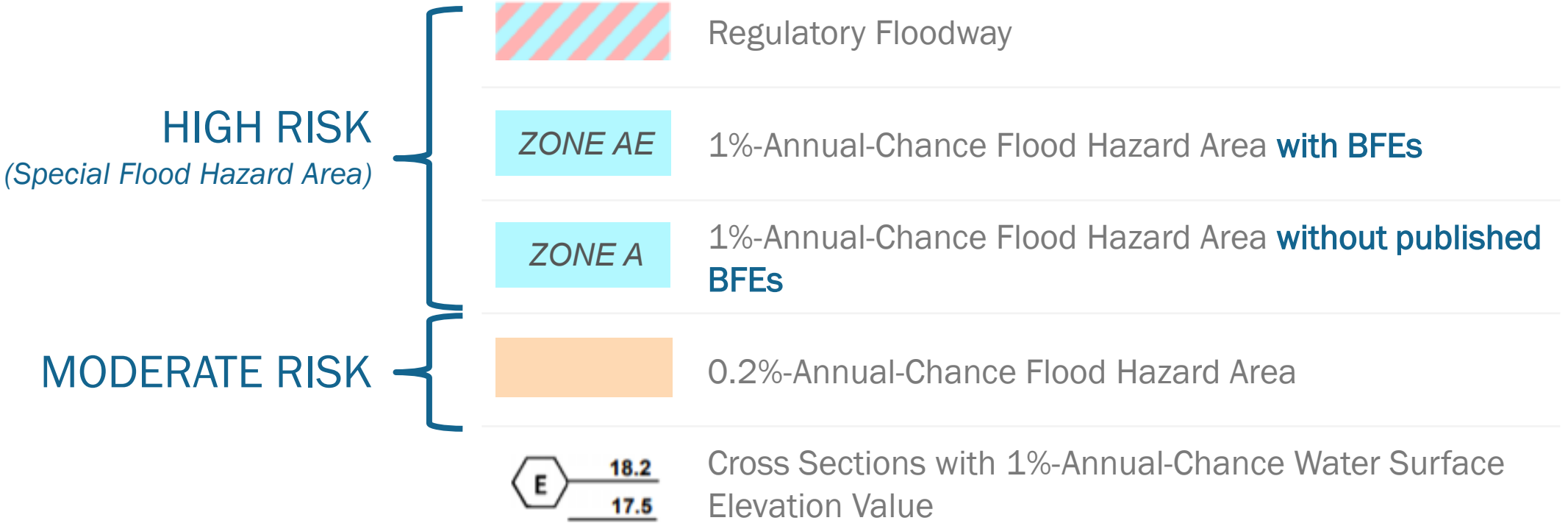


FEMA

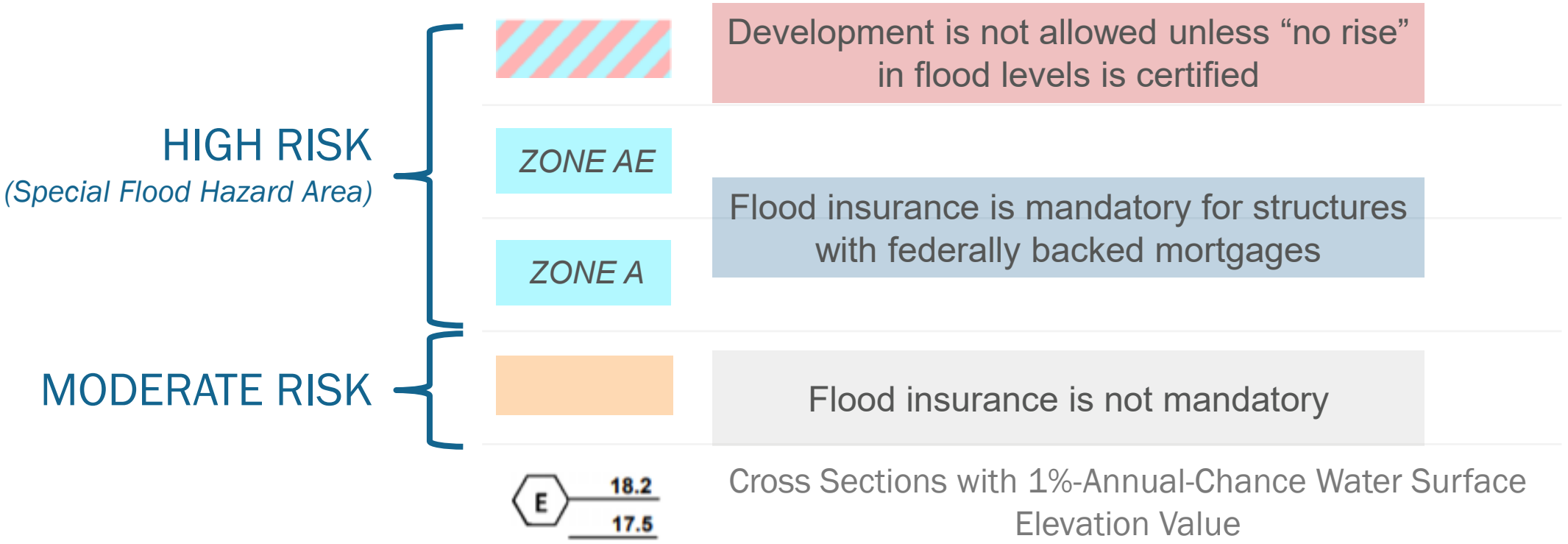
Typical FIRM Panel and Flood Zones



Floodplain Map Overview



Floodplain Map Overview



FEMA

Study Overview

Revised Modeling and Mapping, including:

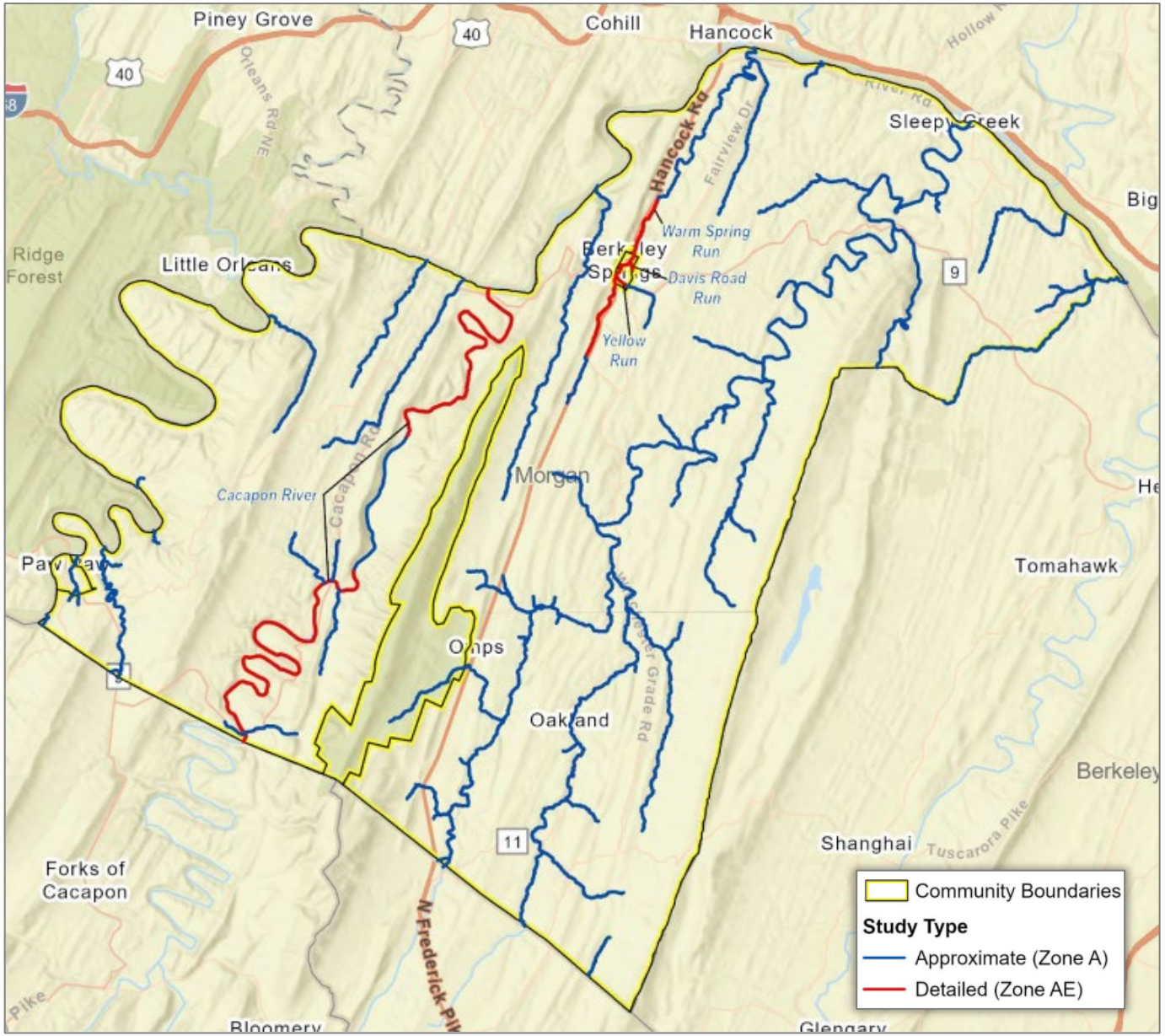
- ❑ Updated GIS-based regulatory products, including:
  - Updated FIRMs / GIS database / FIS report formats based on new FEMA guidelines and specifications
- ❑ High-resolution topographic data (for modeling and mapping)
- ❑ Detailed “Zone AE” Studies – 22 miles
- ❑ Model-backed Approximate “Zone A” Studies – 165 miles
- ❑ Floodplains on the Potomac River are **NOT** being updated as part of this study

Study Overview (continued)

Revised Modeling and Mapping, including:

- ❑ Evaluation of Letters of Map Change (LOMCs)
  - Case-by-case results shown in a Summary of Map Actions (SOMA) that is sent to applicable communities with Preliminary Maps and Letters of Final Determination (LFDs)
  - Letters of Map Revision (LOMRs)
  - Letters of Map Amendment (LOMAs) – including rectified LOMA locations on the WV Flood Tool
- ❑ Production of associated non-regulatory flood risk

Study Area

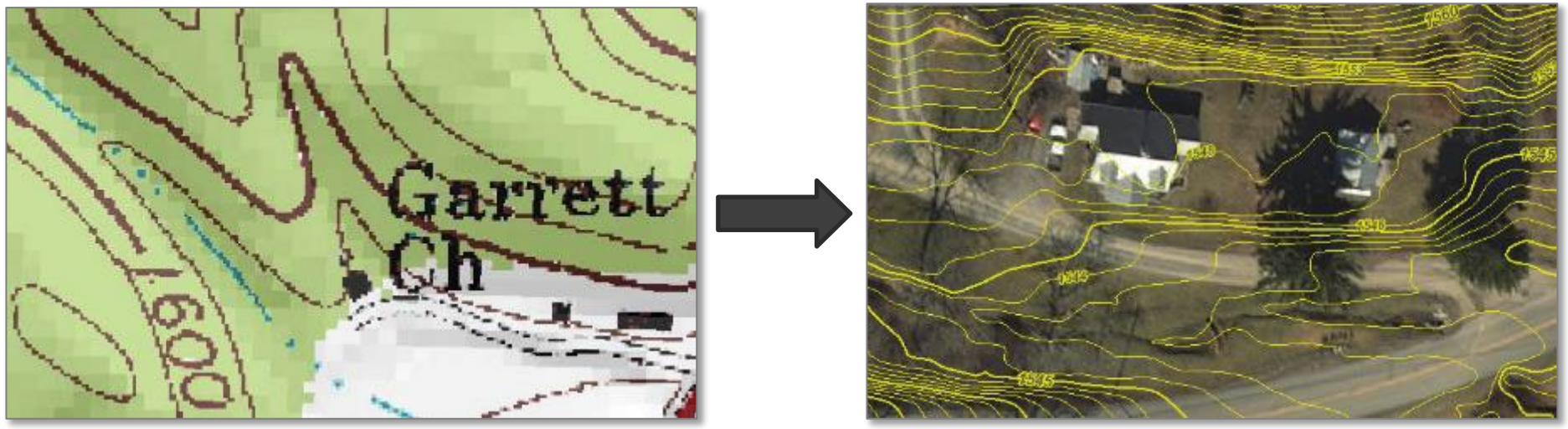

Piney Grove
Cohill
Hancock
Sleepy Creek
Big
Ridge Forest
Little Orleans
Berkeley Springs
Warm Spring Run
Davis Road Run
Yellow Run
Hancock Rd
Fairview Dr
Orleans Rd NE
Cacapon River
Cacapon Rd
Morgan
Tomahawk
Oakland
Berkeley
Shanghai
Tuscarora Pike
Forks of Cacapon
N Frederick Pike
Bloomery
Glengary
Community Boundaries
Study Type
Approximate (Zone A)
Detailed (Zone AE)

Topographic Data

2012 LiDAR-Based Digital Elevation Model

LiDAR = Light Detection and Ranging

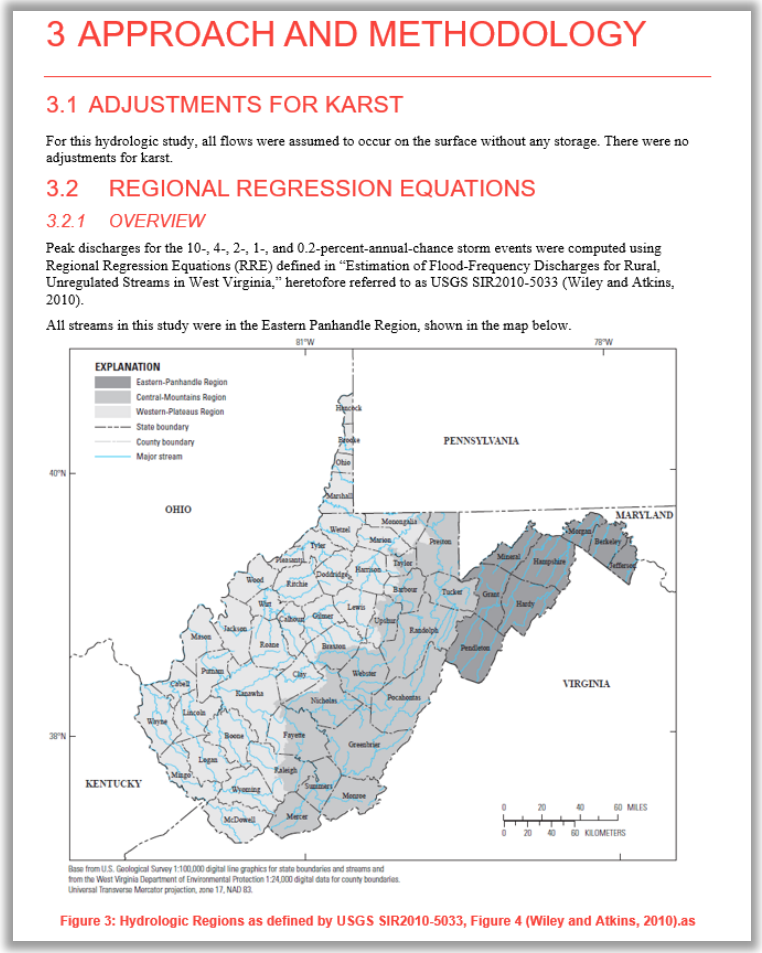
- *Uses light pulses and GPS to survey elevation data*
- *Improves the level of detail for hydraulic modeling and floodplain delineation*



Hydrologic Analyses

- Hydrologic study methods included:
  - USGS Regression Equations
  - Regression Equations Supplemented with USGS Gage Analysis (Bulletin 17C)
  - HEC-HMS 4.10, Rainfall-Runoff for Davis Road Run, Warm Spring Run, and Yellow Run.
- A comprehensive **Hydrology Report** details the study methods for each reach and compares the effective and proposed discharges.
- The hydrologic study methods will be summarized and published in the forthcoming FIS Report.

Sample page from the Risk MAP Hydrology Report



3 APPROACH AND METHODOLOGY

3.1 ADJUSTMENTS FOR KARST

For this hydrologic study, all flows were assumed to occur on the surface without any storage. There were no adjustments for karst.

3.2 REGIONAL REGRESSION EQUATIONS

3.2.1 OVERVIEW

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," heretofore referred to as USGS SIR2010-5033 (Wiley and Atkins, 2010).

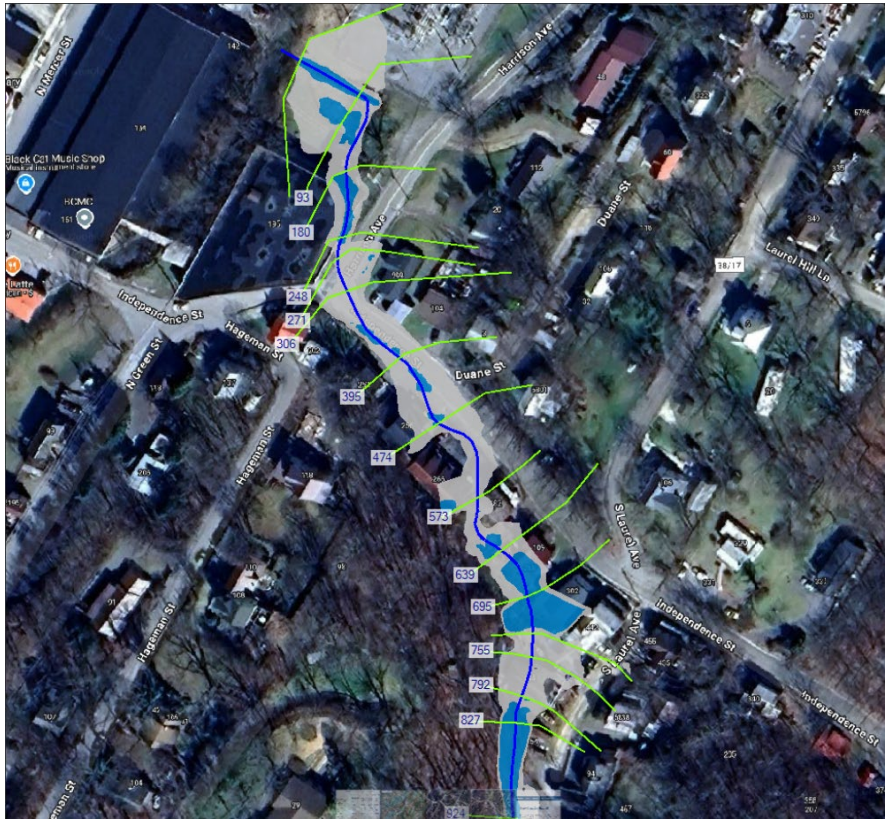
All streams in this study were in the Eastern Panhandle Region, shown in the map below.

Figure 3: Hydrologic Regions as defined by USGS SIR2010-5033, Figure 4 (Wiley and Atkins, 2010).as

Hydraulic Analyses – Zone A

Approximate "Zone A" Base Level Study (165 miles)

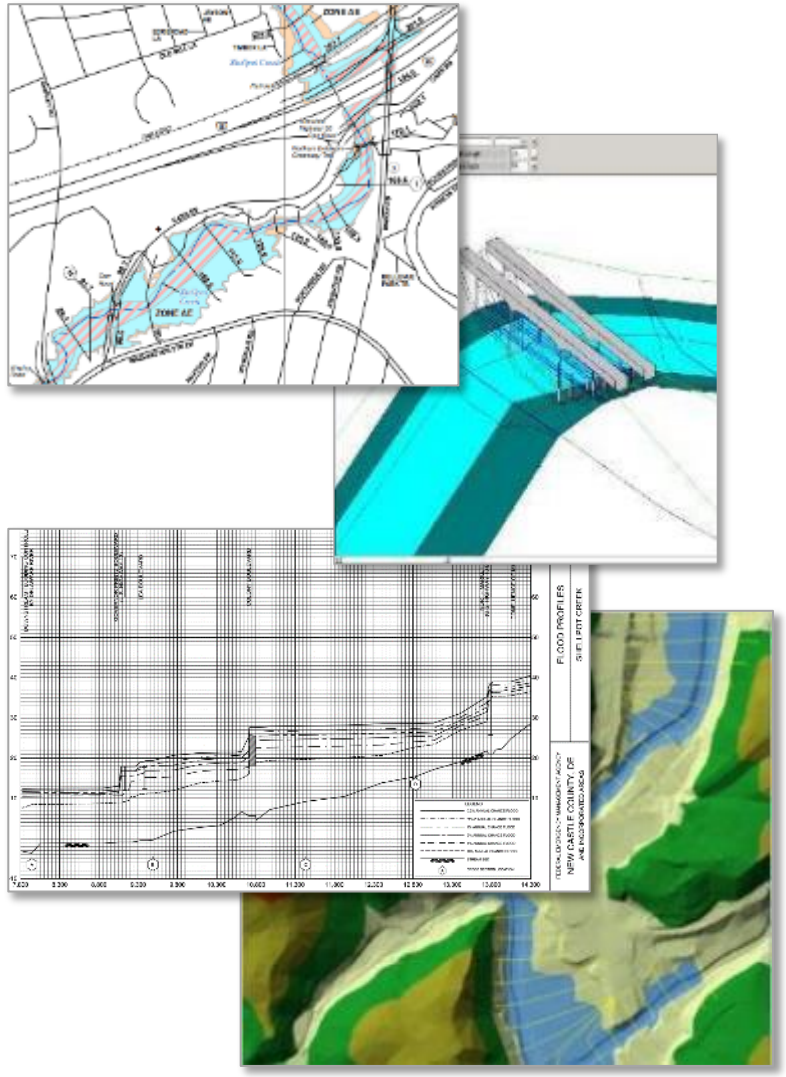
- Generally used in areas with lower development or lower development potential
- Cross sections generated from LiDAR
  - Does not include channel bathymetry
  - No hydraulic structures are surveyed or modeled
- FIRMs **will not** show Floodway or BFEs (but FIRM database will include cross sections and their associated water surface elevations in the FIRM GIS Database)
- FIS Report **will not** show flood profiles for Zone A reaches



Hydraulic Analyses – Zone AE

Detailed “Zone AE” Study (22 miles)

- Generally used in areas with higher development or higher development potential
- Cross sections use information from survey and field reconnaissance
  - Include channel bathymetry
  - Structures are modeled (e.g., culverts, bridges)
- Detailed hydraulic parameter refinement (coefficients, obstructions, Manning's ‘n’ values)
- FIRMs **will** show Floodway, BFEs, 1% and 0.2%-annual-chance event floodplains
- FIS Report **will** show flood profiles for 10-, 4-, 2-, 1-, 0.2-, and 1% Plus flood frequencies



LOMCs and SOMAs

Summary of Maps Actions (SOMA)

- Forthcoming with preliminary maps and again with Letters of Final Determination (LFDs)
- Identifies previously issued Letter of Map Change (LOMCs) and how those determinations are impacted by the new mapping effort.

Page 1 of 2 | Date: April 21, 2023 | Case No.: 23-03-0506A | LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

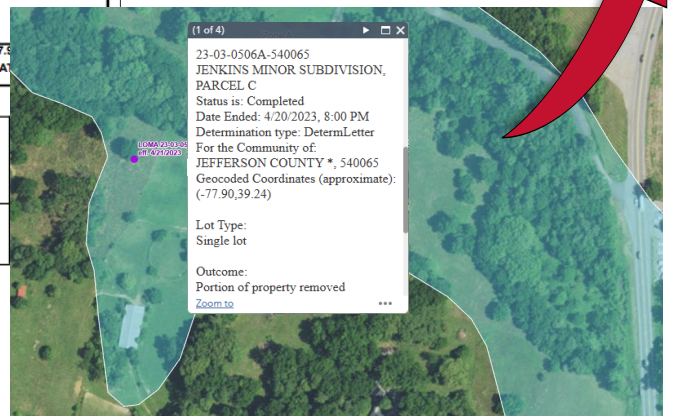
COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	JEFFERSON COUNTY, WEST VIRGINIA (Unincorporated Areas)	Lot C, Jenkins Minor Subd ... d recorded as Instrument No. 201900000999, in the Office of the County Clerk, Jefferson County, West Virginia The portion of property is more particularly described by the following metes and bounds:
	COMMUNITY NO.: 540065	
AFFECTED MAP PANEL	NUMBER: 54037C0225E	
	DATE: 12/18/2009	
FLOODING SOURCE: BULLSKIN RUN		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY:39.236553, -77.[illegible] SOURCE OF LAT & LONG: LOMA LOGIC DA[illegible]

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)
C	--	Jenkind Minor	Wheatland Road	Portion of Property	X (unshaded)	--	--

2A. LOMCs on Revised Panels

LOMC	Case No.	Date Issued	Project Identifier	Original Panel	Current Panel
LOMA	22-03-0423A	02/23/2022	PARCELS A & B -- 1816 POTOMAC STREET	54037C0135E	54037C0135F
LOMA	22-03-0585A	03/28/2022	SHEPHERDSTOWN DISTRICT -- 4995 ENGLE MOLER	54037C0045E	54037C0045F
LOMA	23-03-0506A	04/21/2023	JENKINS MINOR SUBDIVISION, PARCEL C	54037C0225E	54037C0225F
LOMA	24-03-0580A	05/06/202[illegible]	[illegible]RESOLVED PV) 853 RIVER ROAD	54037C0045E	54037C0045F



Study Impacts

Significant Impacts Overview

- Compared to the effective FIRMs, widening and narrowing of draft 1%-annual-chance floodplain (SFHA) extents were observed throughout the county.
  - SFHA increases: Sleepy Creek
  - SFHA decreases: Cacapon Creek, Warm Spring Run
- Extended study reaches (with drainage areas of 1 square miles and greater, and not on current effective FIRMs) result in new properties within the SFHA.
- More structures will be mapped out than mapped in: -222/ +48

WV Flood Tool – SFHA Future Map Conditions*

Community	No Change SFHA	Mapped In SFHA	Mapped Out SFHA	Total Structures
Bath, Town of	43	2	46	115
Paw Paw, Town of	10	1	20	31
Morgan County, Unincorporated Areas	228	45	156	491
Total	281	48	222	637

Flood Risk Dashboard

NFIP FLOOD CLAIM PAYOUTS

CLAIMS OUTSIDE OF THE SFHA

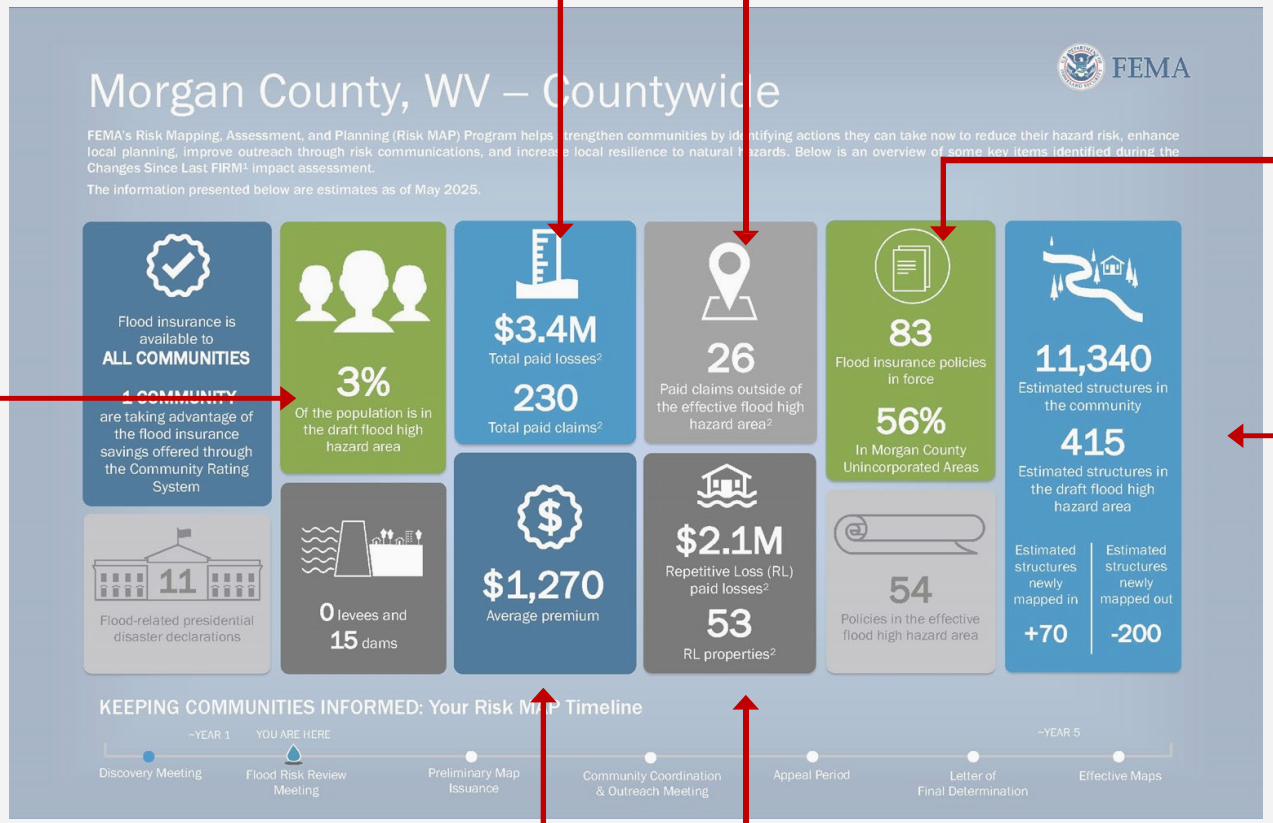
NFIP FLOOD POLICIES

AFFECTED RESIDENTS

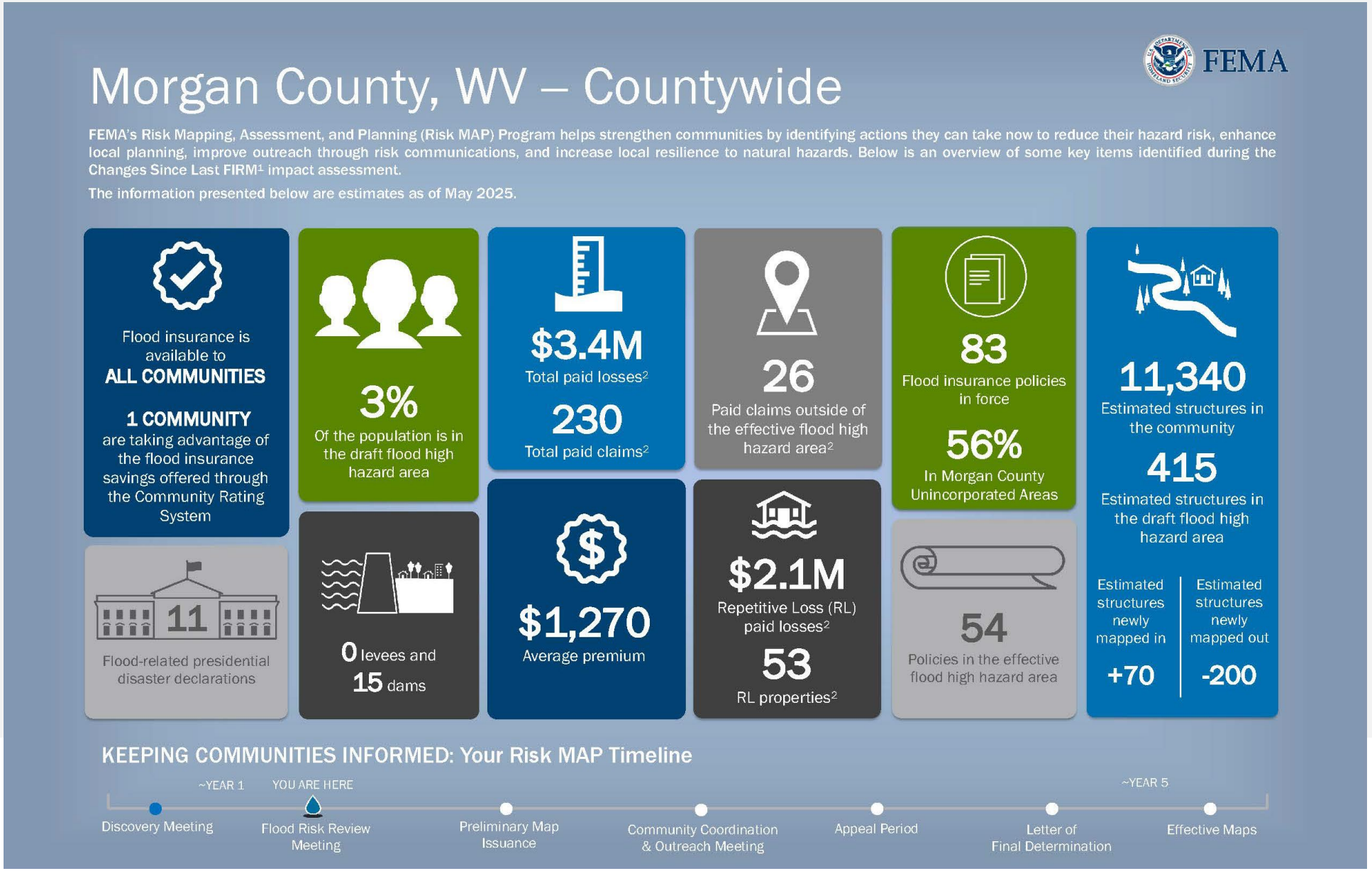
HIGH-RISK STRUCTURES

AVERAGE PREMIUM

REPETITIVE LOSSES



Flood Risk Dashboard



Flood Risk Dashboard (page 2)

TAKE ACTION: Next Steps

Your Hazard Mitigation Plan has been approved through January 31, 2027. Now may be the time to update and review. Some projects you identified to reduce flood risk were:

- Use property acquisition to remove existing properties from flood hazard areas and limit new development.
- Support the county's efforts in the CRS program by providing training to municipalities.

Find ideas to mitigate flood risk here:

Mitigation Ideas (fema.gov)

Immediate Next Steps:

1. **Attend the Flood Risk Review Meeting**

FRR Meeting is on **Friday, May 9, 2025 from 10:00 a.m. - 11:30 a.m.**
Virtual Teams Meeting

2. **Review and comment on draft data**

Review and comment on draft data ahead of preliminary FIRMs[1] anticipated for **Fall/Winter 2025.**

What's on the Horizon:

1. Preliminary FIRMs[1] and **Community Coordination and Outreach (CCO) Meeting**

2. 90-day regulatory **Appeal Period** following the Community Coordination and Outreach Meeting

3. Letter of Final Determination issued following Appeal Period

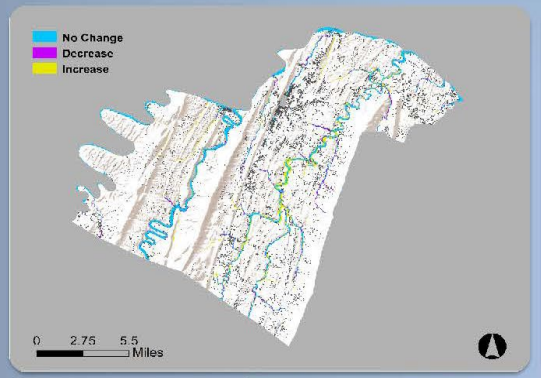
[1] Flood Insurance Rate Map / Flood Insurance Study (FIRM/FIS)
[2] Since 1978

Flood Risk Dashboard

FEMA

Unincorporated Areas / Morgan County, WV

KNOW YOUR RISK (The information presented below are estimates as of May 2025. [1] Flood Insurance Rate Map. [2] Since 1978.)



07/01/1987
Initial FIRM[1] date

09/25/2009
Effective FIRM date

$2.9M
Total paid losses[2]

199
Total paid claims[2]

74
Flood insurance policies in force

47
Policies in the effective flood high hazard area

9 CRS

10,700
Estimated structures in the community

335
Estimated structures in the draft flood high hazard area

Estimated structures newly mapped in	Estimated structures newly mapped out
+65	-155

2%
Of the population is in the draft flood high hazard area

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

22
Paid claims outside of the effective flood high hazard area[2]

$1.8M
Repetitive Loss (RL) paid losses[2]

48
RL properties[2]

11
Flood-related countywide presidential disaster declarations

KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline

~YEAR 1 — YOU ARE HERE — ~YEAR 5

- Discovery Meeting
- Flood Risk Review Meeting
- Preliminary Map Issuance
- Community Coordination and Outreach Meeting
- Appeal Period
- Letter of Final Determination
- Effective Maps

Flood Risk Dashboard

FEMA

Town of Bath / Morgan County, WV

KNOW YOUR RISK (The information presented below are estimates as of May 2025. [1] Flood Insurance Rate Map. [2] Since 1978.)

01/02/1980
Initial FIRM[1] date

09/25/2009
Effective FIRM date

$400K
Total paid losses[2]

25
Total paid claims[2]

5
Flood insurance policies in force

3
Policies in the effective flood high hazard area

340
Estimated structures in the community

50
Estimated structures in the draft flood high hazard area

Estimated structures newly mapped in	Estimated structures newly mapped out
+5	-40

10%
Of the population is in the draft flood high hazard area

32%
Of households spend 30% or more of their income on housing

4
Paid claims outside of the effective flood high hazard area[2]

$280K
Repetitive Loss (RL) paid losses[2]

5
RL properties[2]

11
Flood-related countywide presidential disaster declarations

KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline

~YEAR 1 — YOU ARE HERE — ~YEAR 5

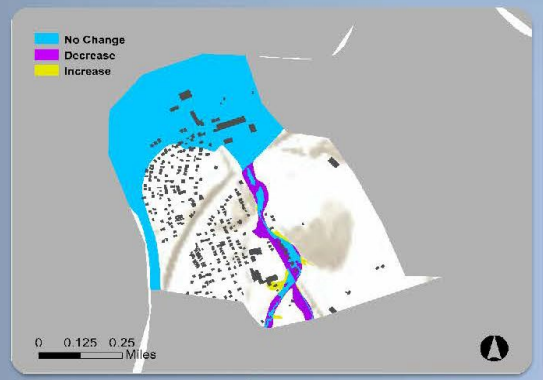
Discovery Meeting → Flood Risk Review Meeting → Preliminary Map Issuance → Community Coordination and Outreach Meeting → Appeal Period → Letter of Final Determination → Effective Maps

Flood Risk Dashboard

FEMA

Town of Paw Paw / Morgan County, WV

KNOW YOUR RISK (The information presented below are estimates as of May 2025. [1] Flood Insurance Rate Map. [2] Since 1978.)



11/15/1974
Initial FIRM[1] date

09/25/2009
Effective FIRM date

$80K
Total paid losses[2]

6
Total paid claims[2]

4
Flood insurance policies in force

4
Policies in the effective flood high hazard area

290
Estimated structures in the community

35
Estimated structures in the draft flood high hazard area

Estimated structures newly mapped in **+1**

Estimated structures newly mapped out **-5**

12%
Of the population is in the draft flood high hazard area

16%
Of households spend 30% or more of their income on housing

0
Paid claims outside of the effective flood high hazard area[2]

$0
Repetitive Loss (RL) paid losses[2]

0
RL properties[2]

11
Flood-related countywide presidential disaster declarations

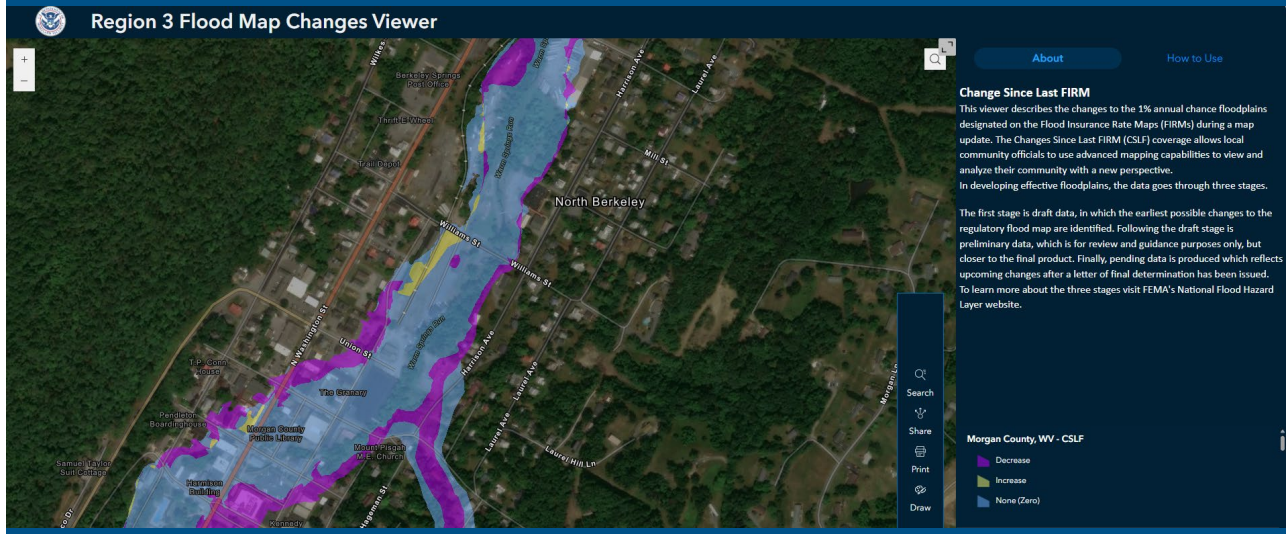
KEEPING COMMUNITIES INFORMED: Your Risk MAP Timeline

Discovery Meeting	Flood Risk Review Meeting	Preliminary Map Issuance	Community Coordination and Outreach Meeting	Appeal Period	Letter of Final Determination	Effective Maps
	~YEAR 1 YOU ARE HERE					~YEAR 5

How Did the Floodplain Maps Change?

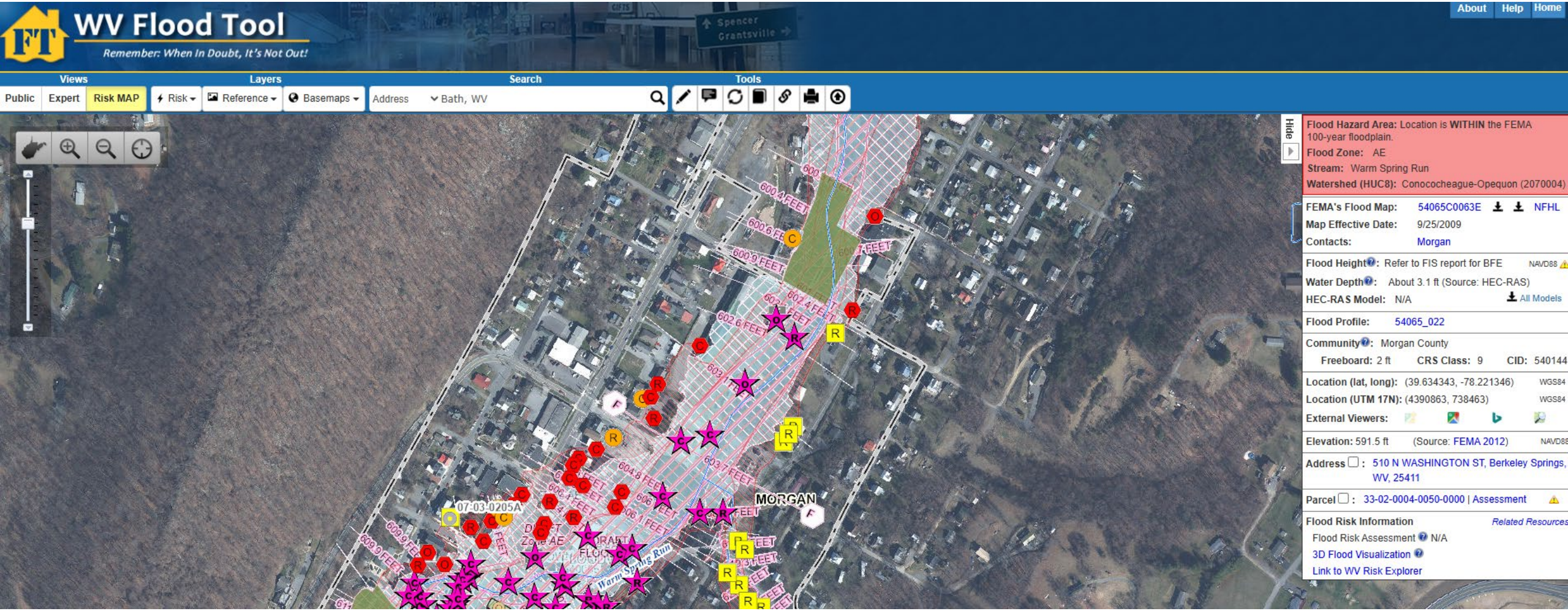
- FEMA Region 3
  Changes Since Last FIRM (CSLF) Viewer:
  https://arcg.is/1HmKLT1
- Change in Floodplain Extents:
  - Purple – Decrease
  - Blue – Still Floodplain
  - Yellow – Increase

*Map view has scale-dependent layers

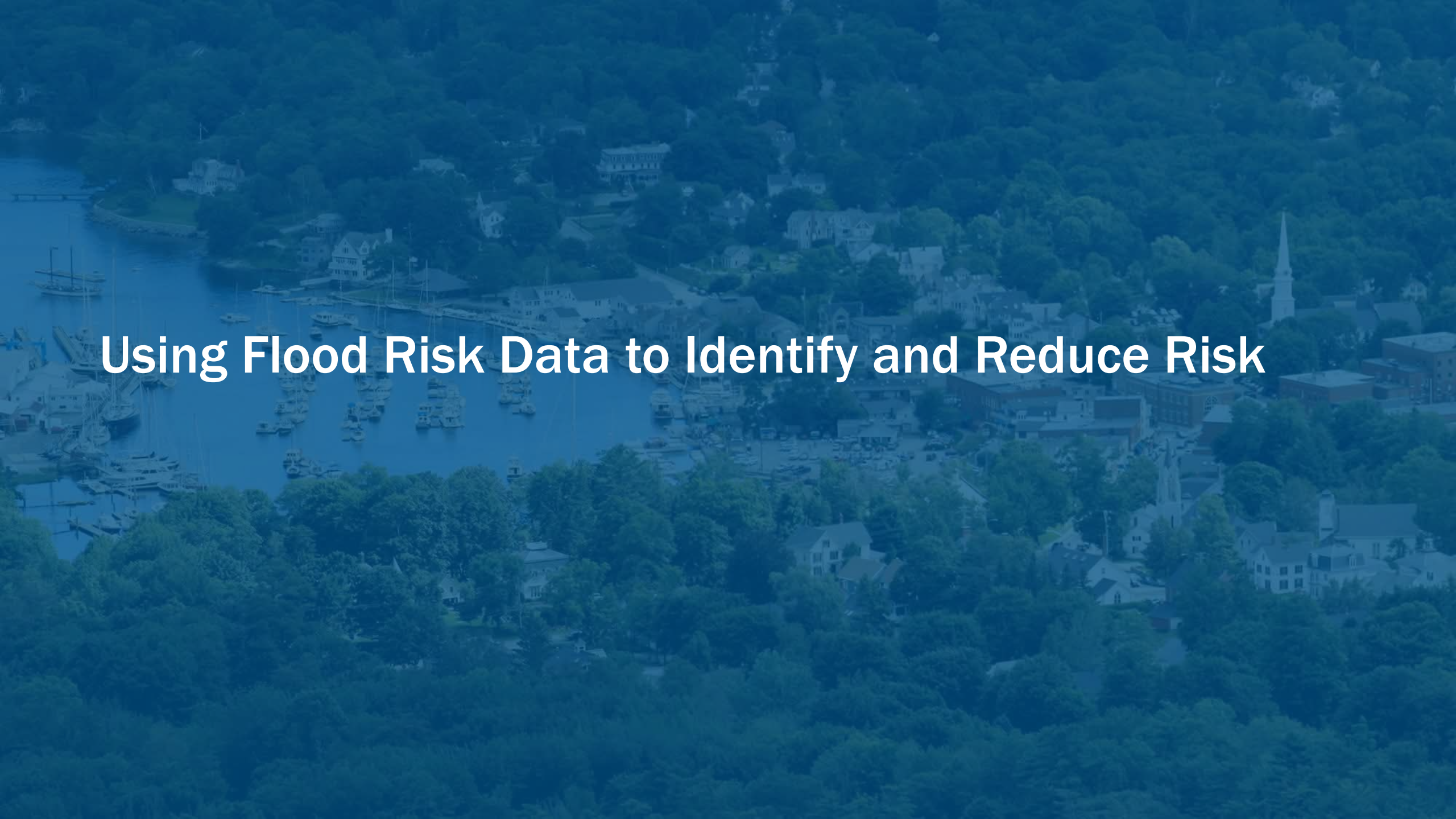


FEMA

West Virginia Flood Risk Tool



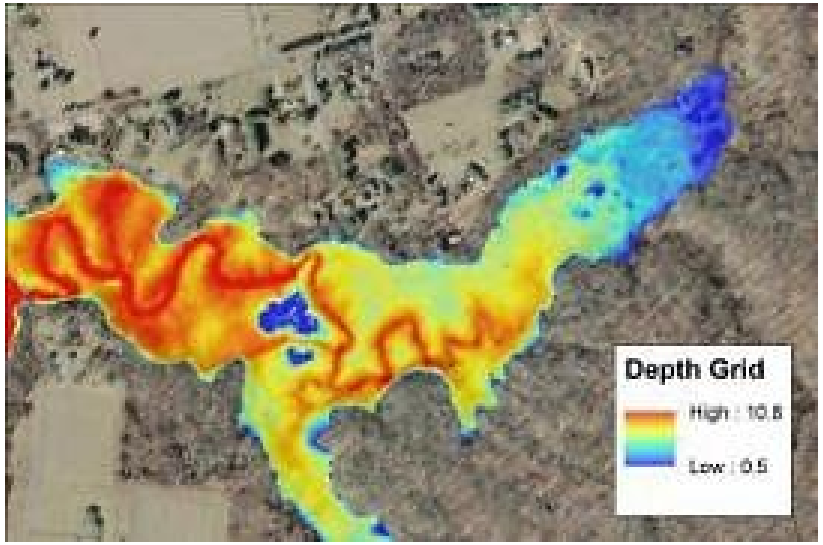
[WV Flood Tool (mapwv.gov)]



Using Flood Risk Data to Identify and Reduce Risk

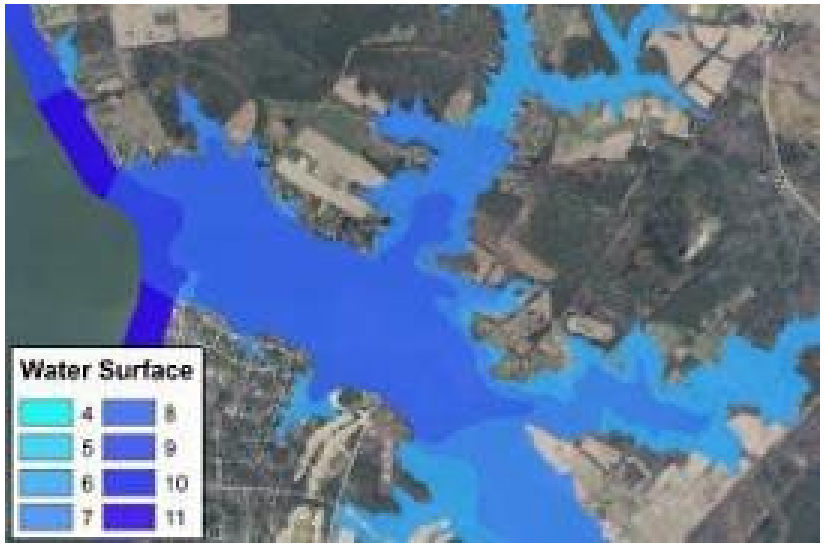
FEMA Flood Risk GIS Datasets

Flood Depth and Analysis Grids



Changes Since Last FIRM

Water Surface Elevation Grids



Flood Risk Assessment

Where to Find Flood Risk Data

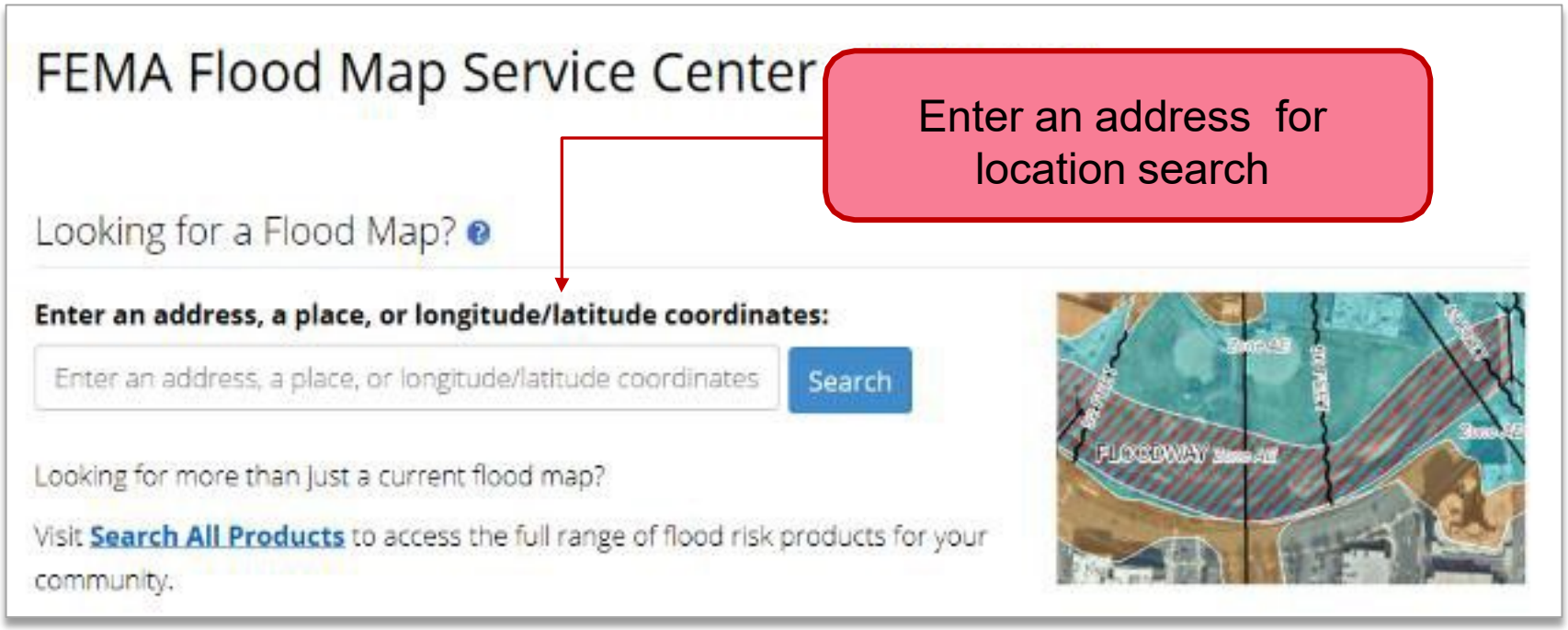
- **FEMA's Flood Map Service Center (MSC)**
  - Here, you can view effective maps online. You can also download current effective flood hazard data and additional hazard and risk data.
  - https://msc.fema.gov/portal/home

- **National Flood Hazard Layer (NFHL)**
  - This geospatial data viewer contains current effective flood hazard data.
  - https://www.fema.gov/flood-maps/national-flood-hazard-layer

- **State Flood Tool**
  - This geospatial data viewer contains current effective flood hazard data and additional hazard and risk data.

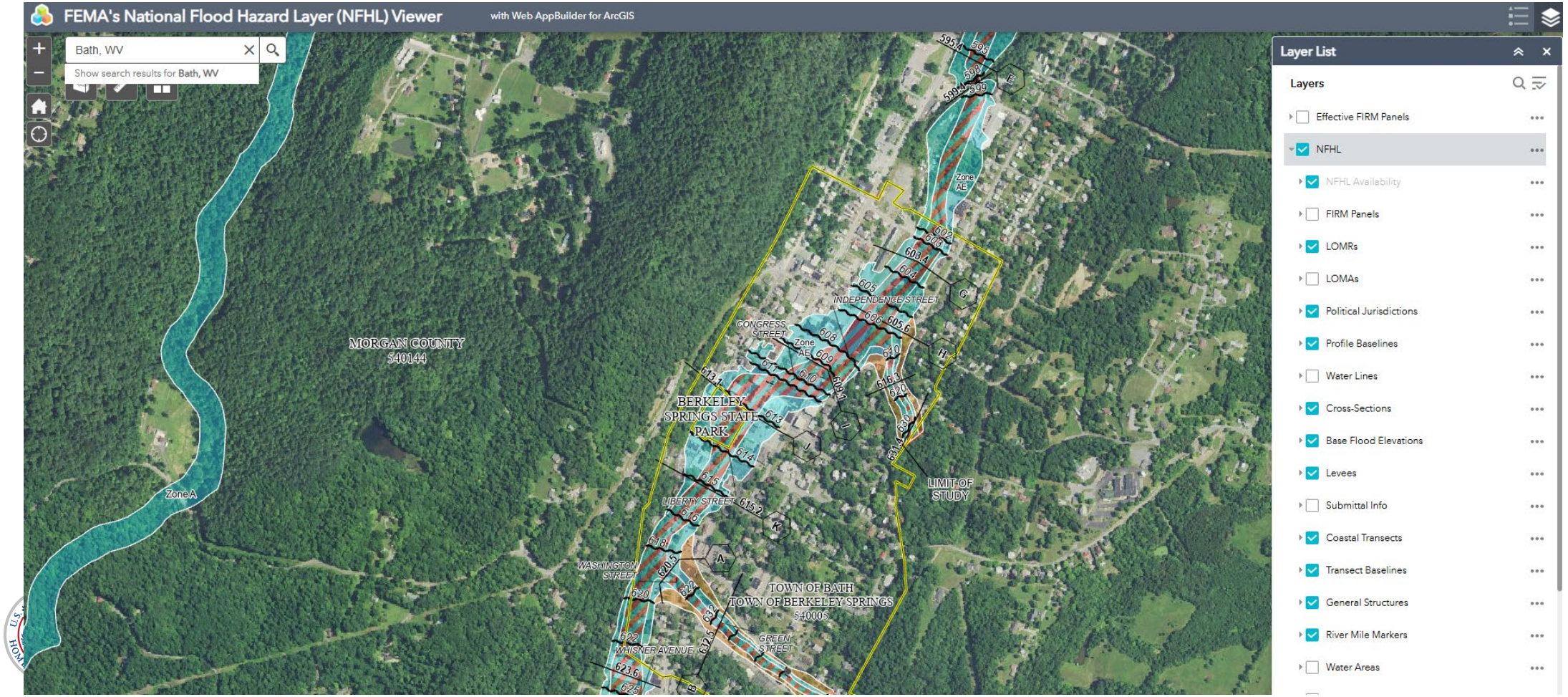
Where Can I Find My Flood Maps?

The FEMA Map Service Center (MSC) is the official public source for flood hazard information: https://msc.fema.gov/portal/home.



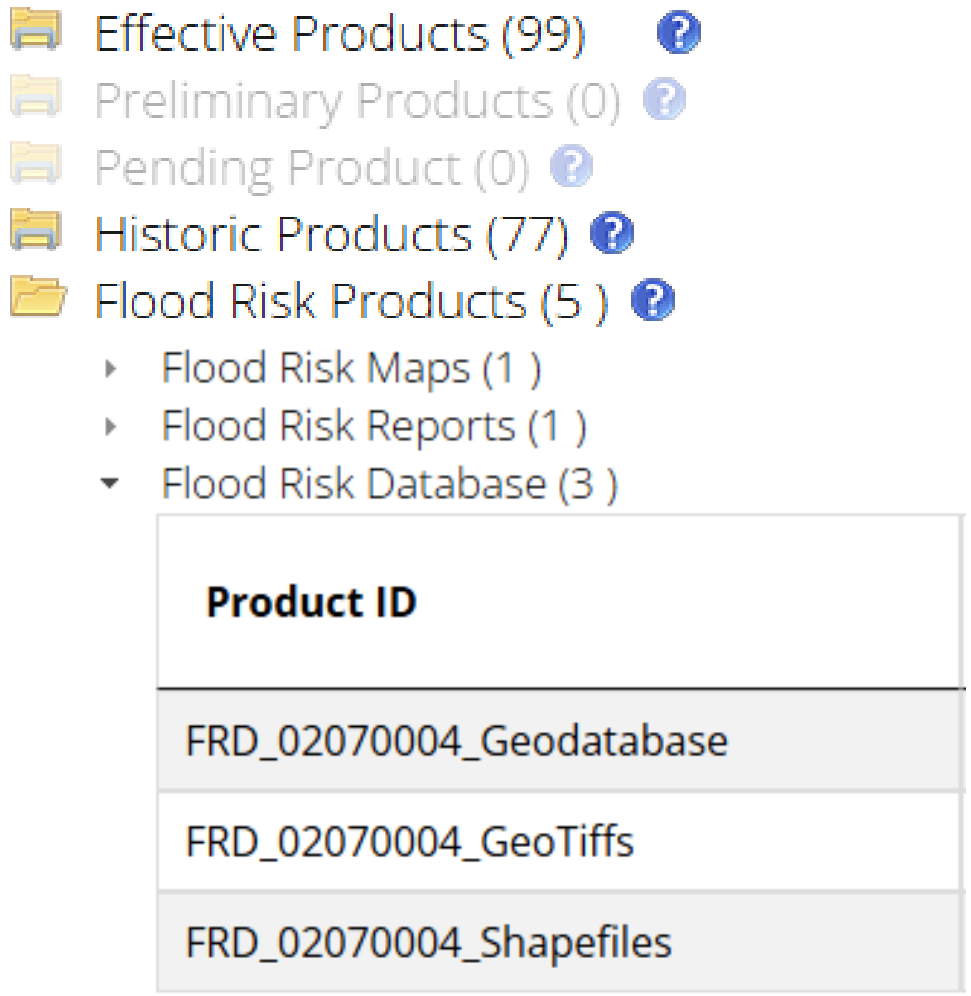
National Flood Hazard Layer

The NFHL shows the effective FEMA flood map data, including Letters of Map Revision (LOMRs).Visit https://www.fema.gov/national-flood-hazard-layer-nfhl for multiple options to view and download NFHL data.



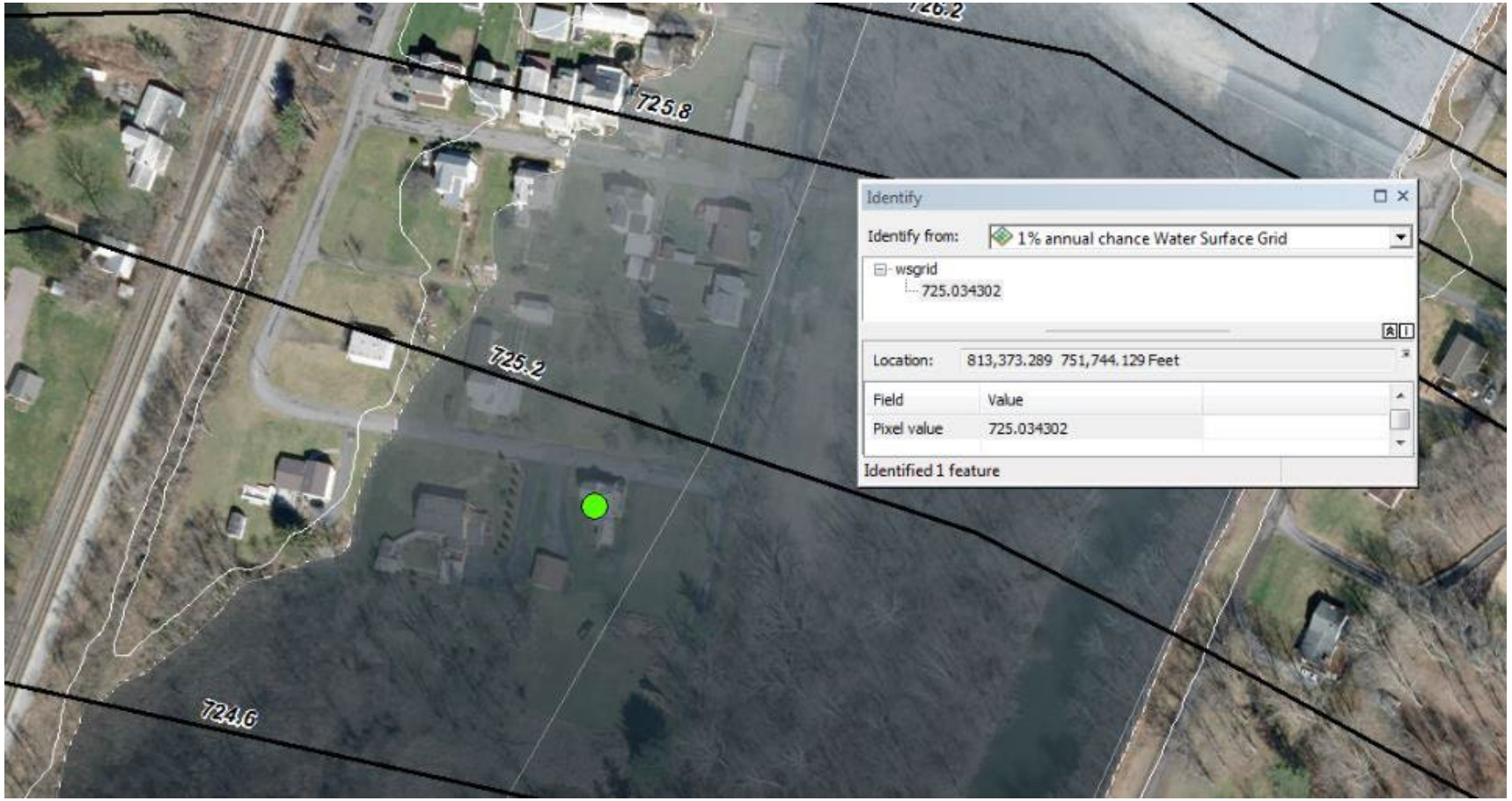
Additional Hazard and Risk Data

If additional hazard and risk data are available for your community, the MSC Search Results will allow you to expand the Flood Risk Products folder.



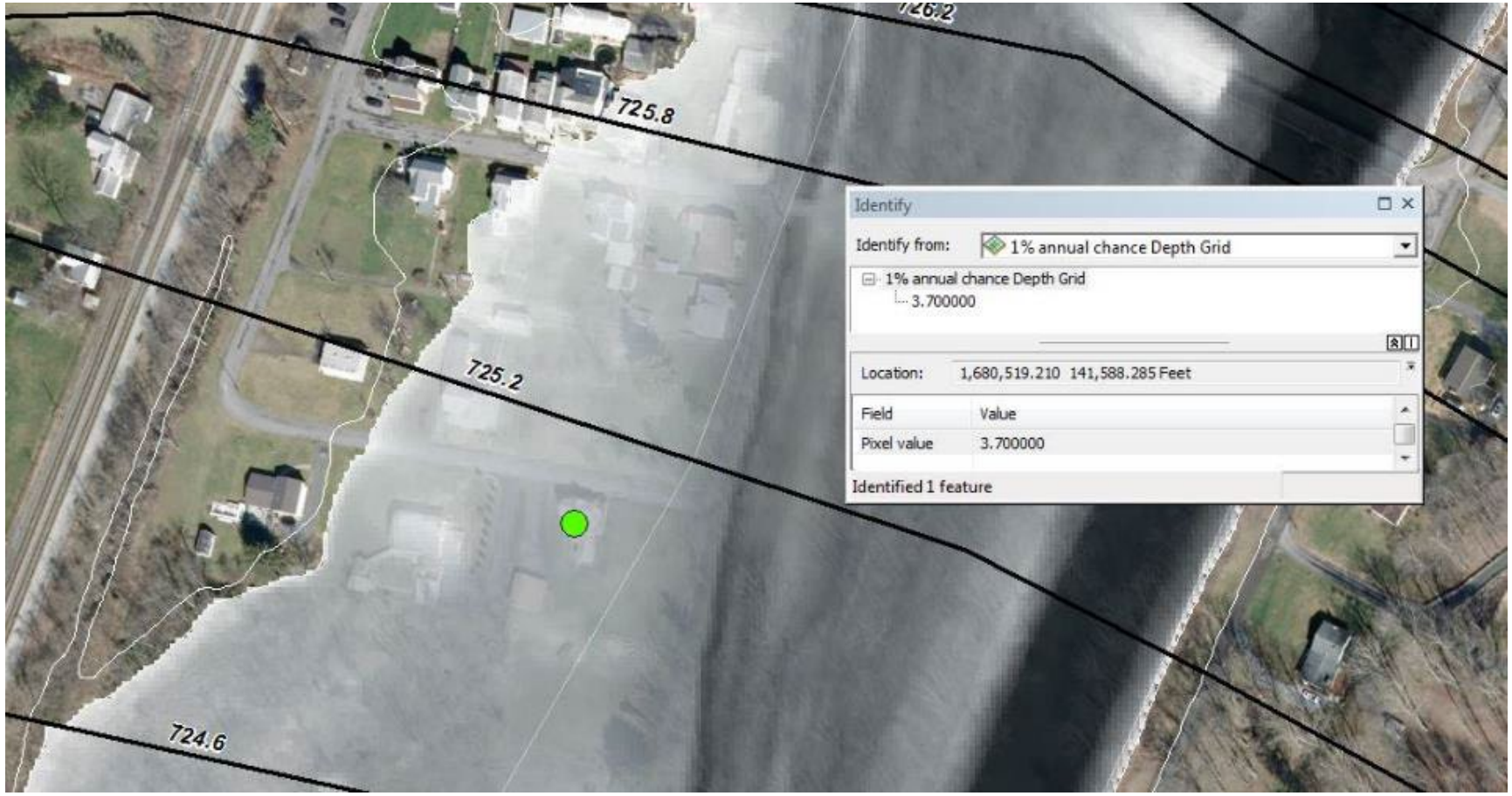
Water Surface Elevation Grids

Represents the continuous water surface elevations (as determined at modeled cross sections and interpolated between cross sections) for each of the modeled flood frequencies.

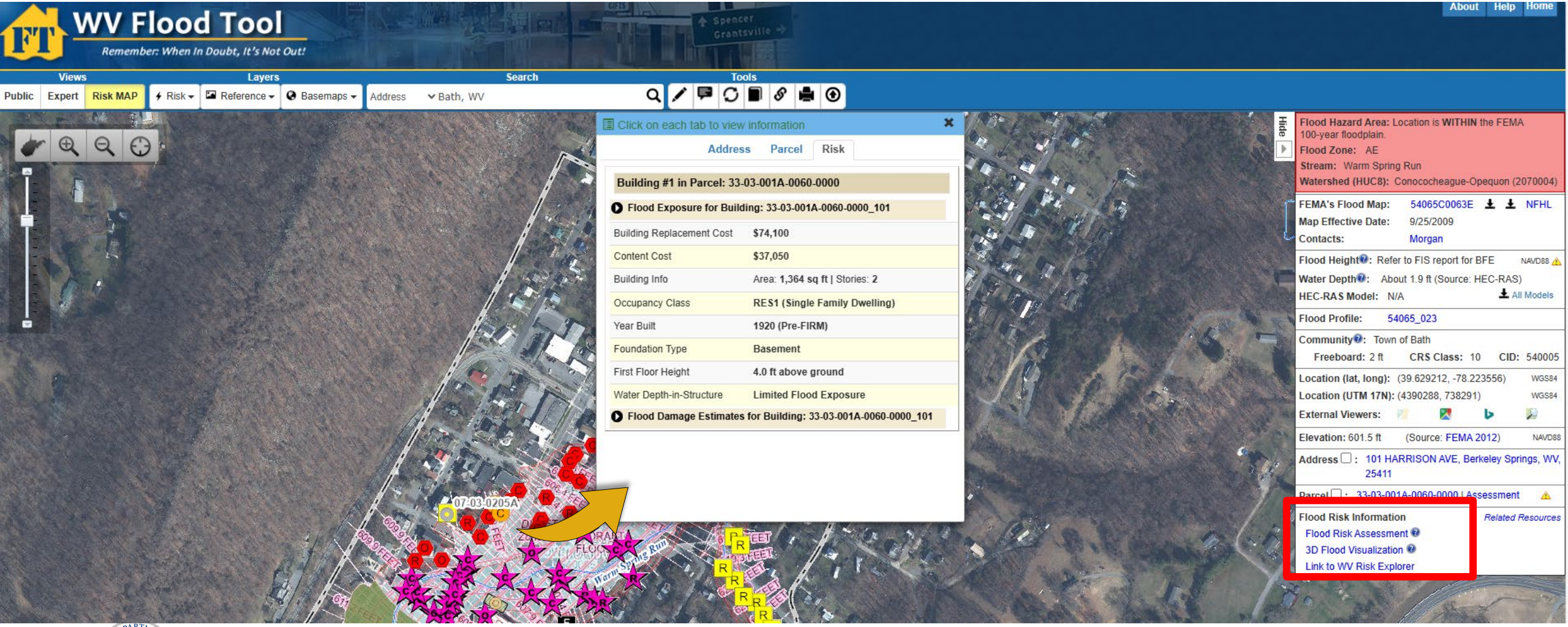


Depth Grids

Represents the difference between the ground surface elevation and the water surface elevations in feet for each of the modeled flood frequencies.



West Virginia Flood Tool

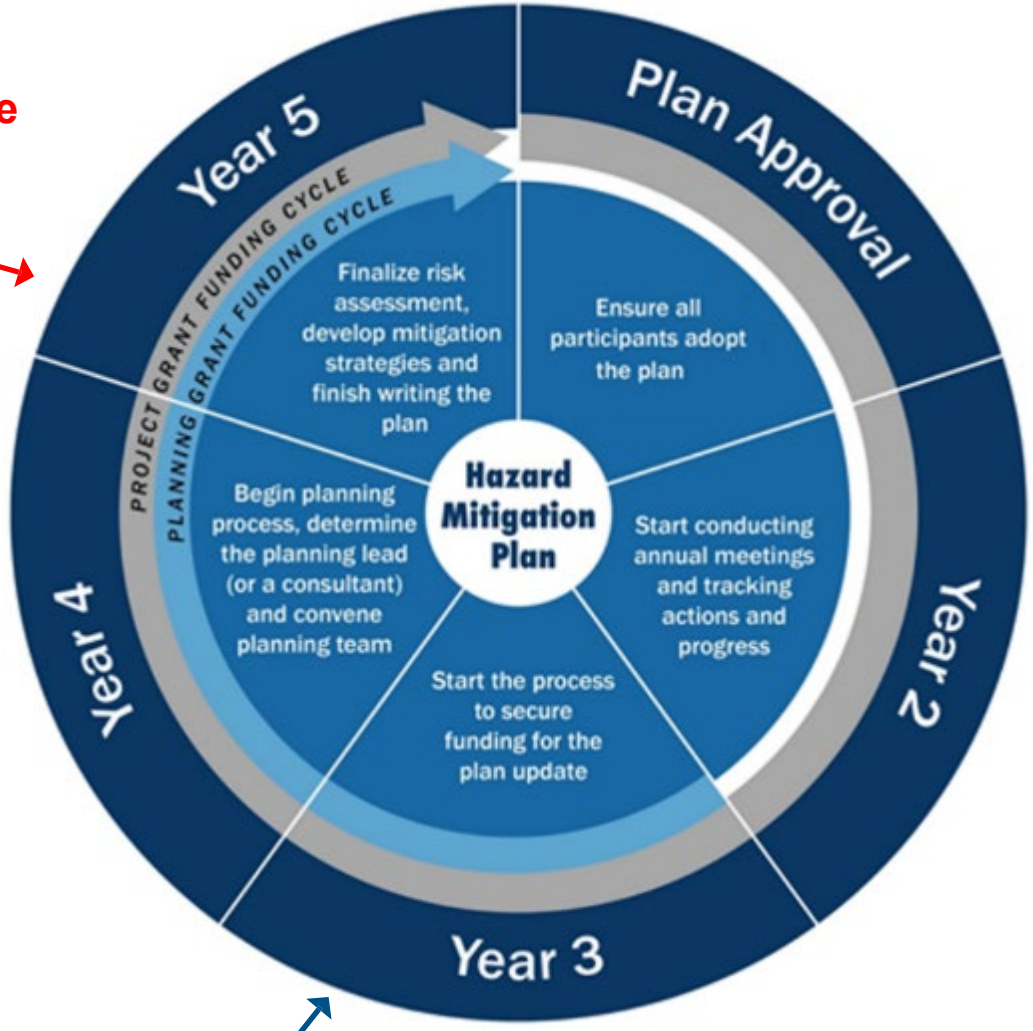


FEMA

WV Flood Tool (mapwv.gov)

Flood Hazard Mitigation Planning

It's time to update the risk assessment in your hazard mitigation plan

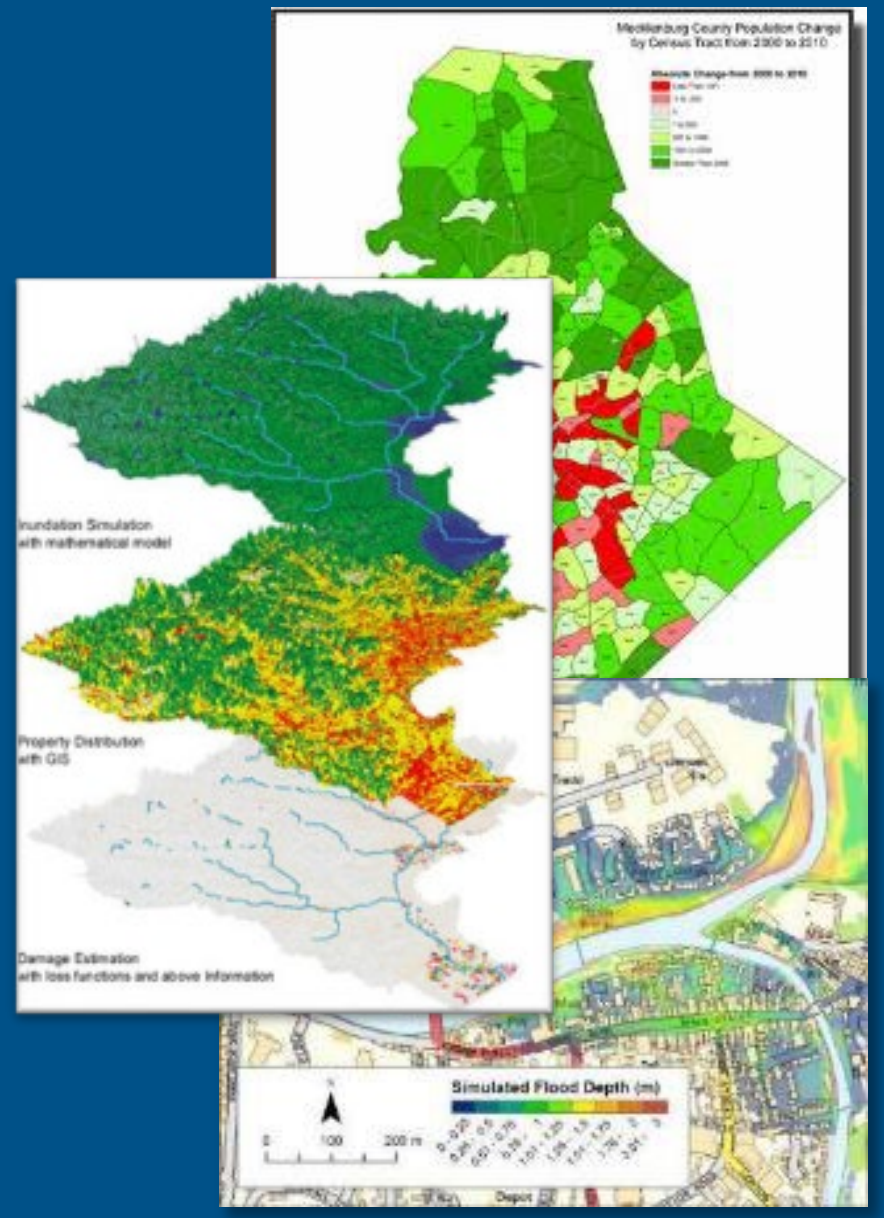


The Berkeley County HMP is here

FEMA

Using Flood Risk Data 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



FEMA

Floodplain Management

Flood Risk Doesn't Stop at a Line

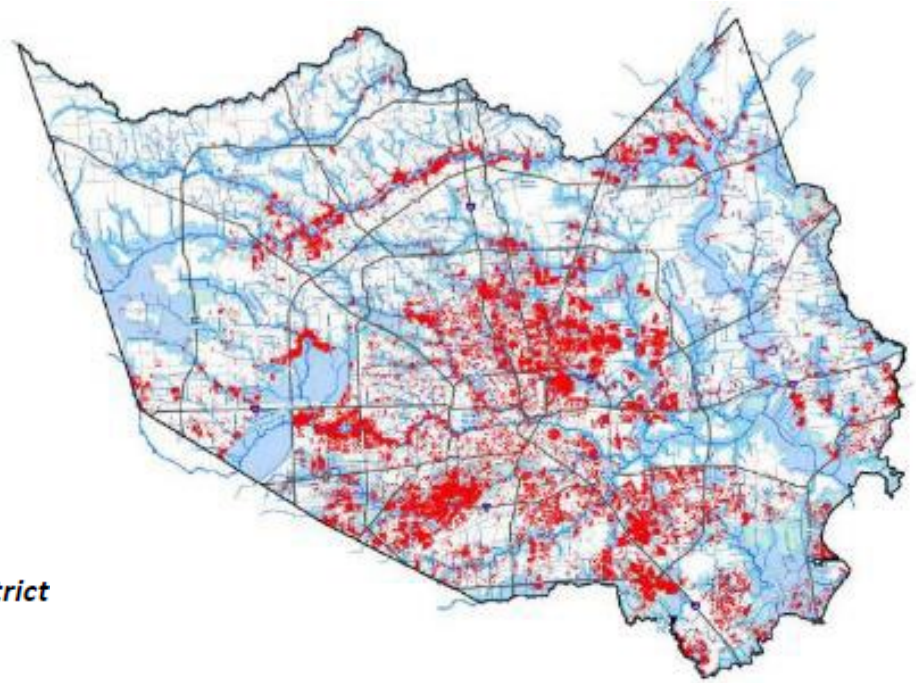
- 40% of all flood insurance claims come from outside high-risk areas.
- Your community can regulate to standards higher than the NFIP minimum standards. Consider strengthening regulations using:
  - 0.2%-annual-chance flood zone
  - "Freeboard" – require additional feet above a BFE
  - Buffer around SFHA
  - Flood depth grids

HURRICANE HARVEY
GREATER HOUSTON

154,170 Homes Flooded

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

SOURCE: Harris County Flood Control District



Floodplain Management at FRR

Look at where there are changes to the SFHA in your community

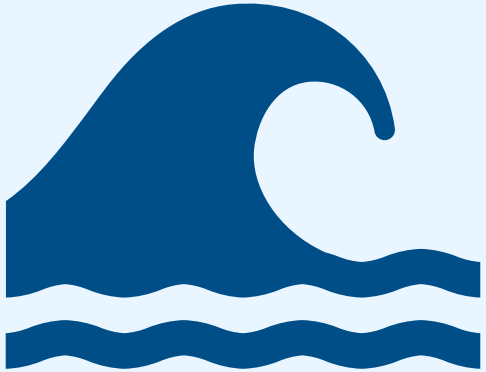
Share with permitting, planning, and other colleagues to direct development outside of the SFHA today and in future

Consider higher standards or joining the Community Rating System to support your community

FRR: Flood Risk Review
SFHA: Special Flood Hazard Area

Floodplain Management Big Picture

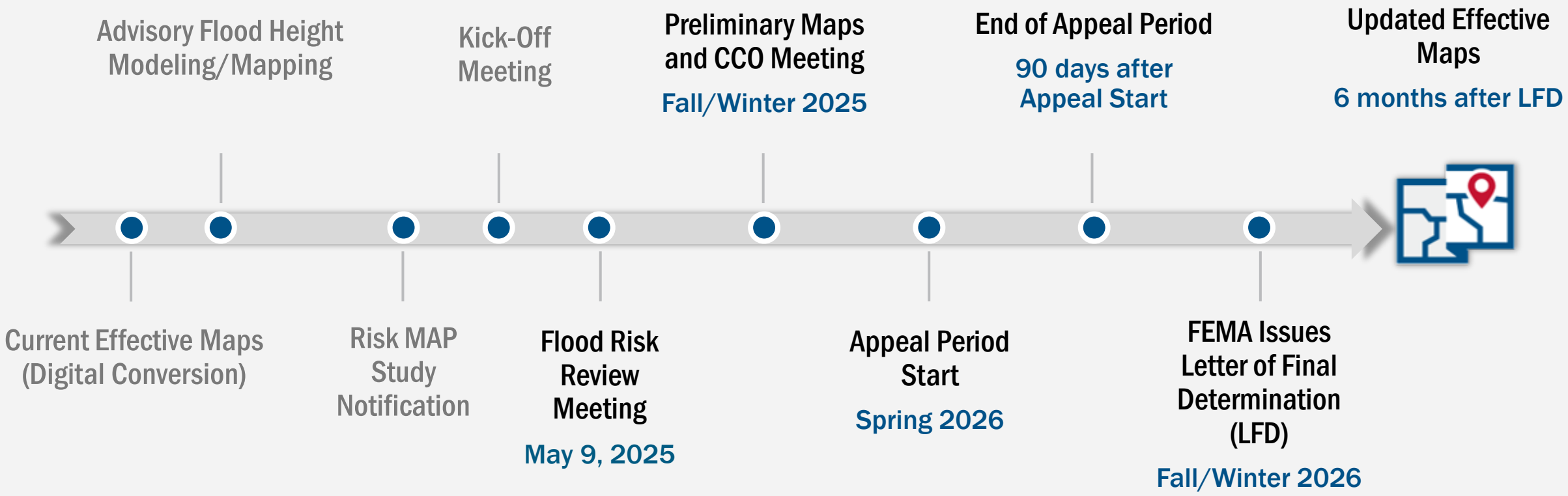
Build it right and lower the impact of future flood losses while improving resiliency



Build it wrong and the result could be increased flood losses and higher flood insurance premiums

Discussion

Timeline – Looking Ahead



Project Contacts – West Virginia

State NFIP/CTP Office:

Kevin Sneed
CTP Project Officer
304-957-2571
kevin.l.sneed@wv.gov

Julia Sears
State NFIP Coordinator
304-989-8330
julia.r.sears@wv.gov

Ginger Barnett
Chief of Mitigation and Recovery
304-414-7632
ginger.sc.barnett@wv.gov

FEMA Region 3:

Amanuel Ghebreegziabher
FEMA Project Officer
(202) 718-2759
amanuel.ghebreegziabher@fema.dhs.gov

Bill Kuhn
Community Planner
william.kuhn@fema.dhs.gov

Betsy Ranson
Floodplain Management Specialist
(215) 347-0686
elizabeth.ranson@fema.dhs.gov

Bill Bradfield
Insurance Specialist
(202) 880-5906
william.b.bradfield@fema.dhs.gov

FEMA