RiskMAP
Increasing Resilience Together

Flood Risk Review (FRR) Meeting

Greenbrier County, West Virginia
September 15, 2020

FEMA

Agenda

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

Welcome and Introductions

FEMA

Risk MAP

Where We Are - Draft Maps

FEMA

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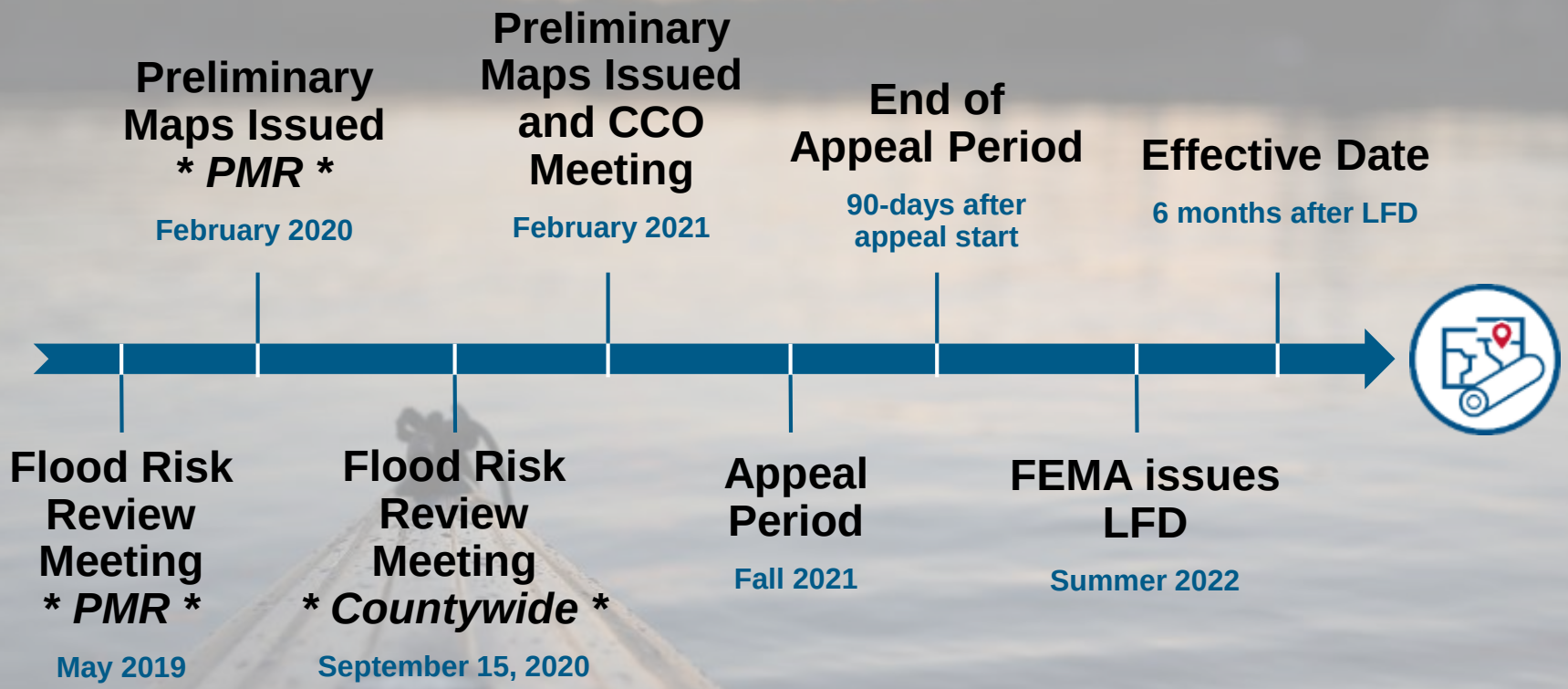
3 Reasons We Are Here Today

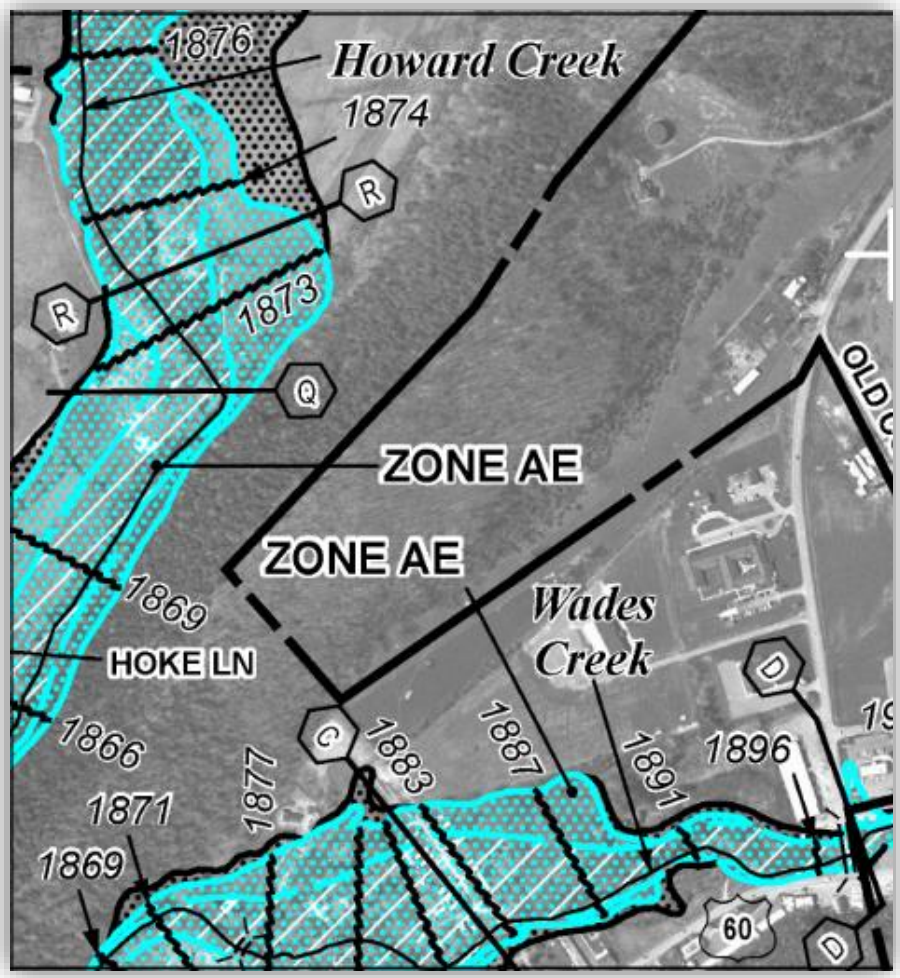
- To preview and discuss the updated Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for Greenbrier County, West Virginia
- To examine the new study areas, discuss how the analysis and mapping have changed since the previous FIRM, and work collaboratively to ensure that the needs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

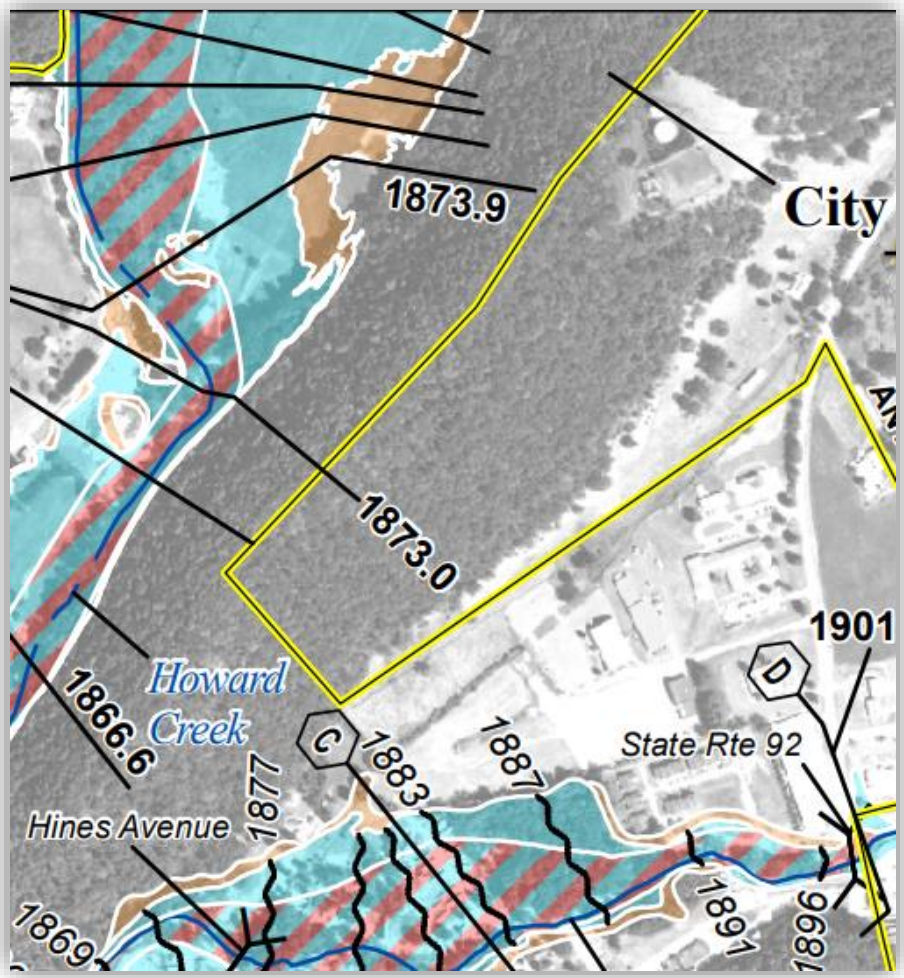
Timeline for Greenbrier County



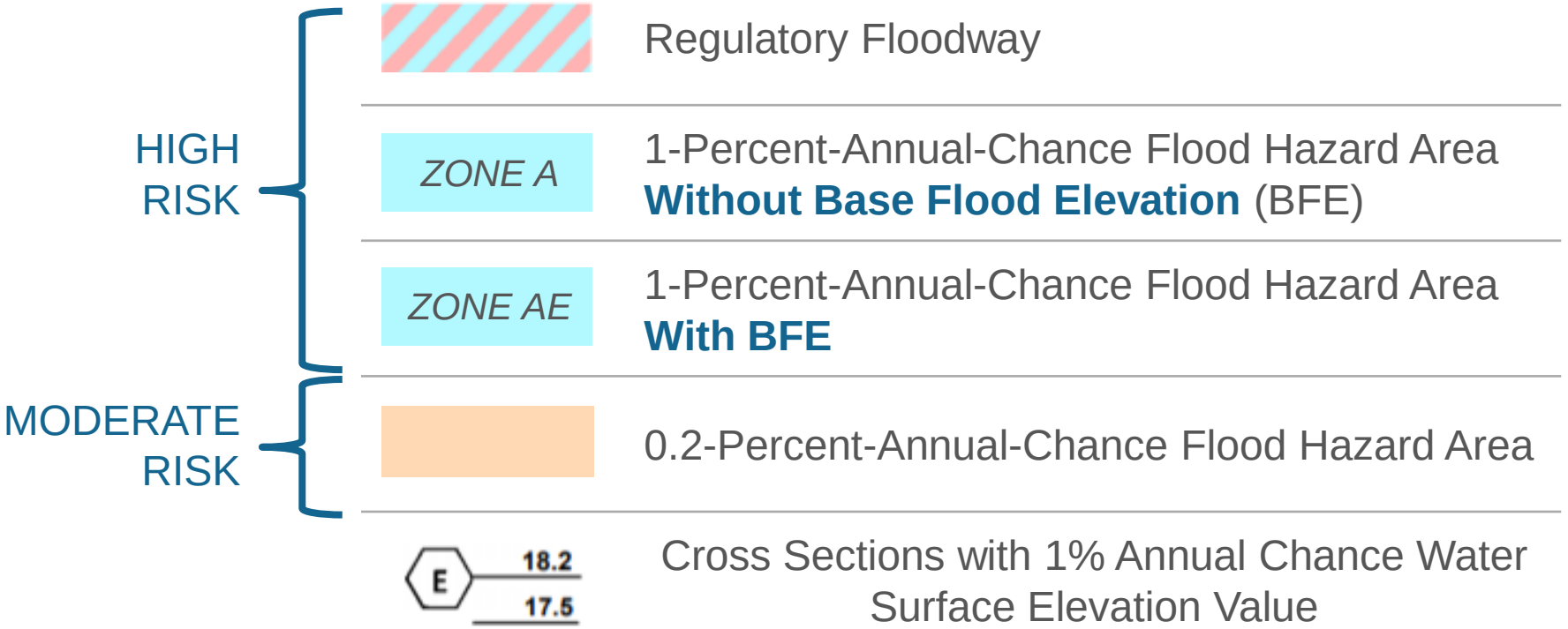
Flood Study Update

Current vs. New FIRM Panels





Floodplain Map Overview



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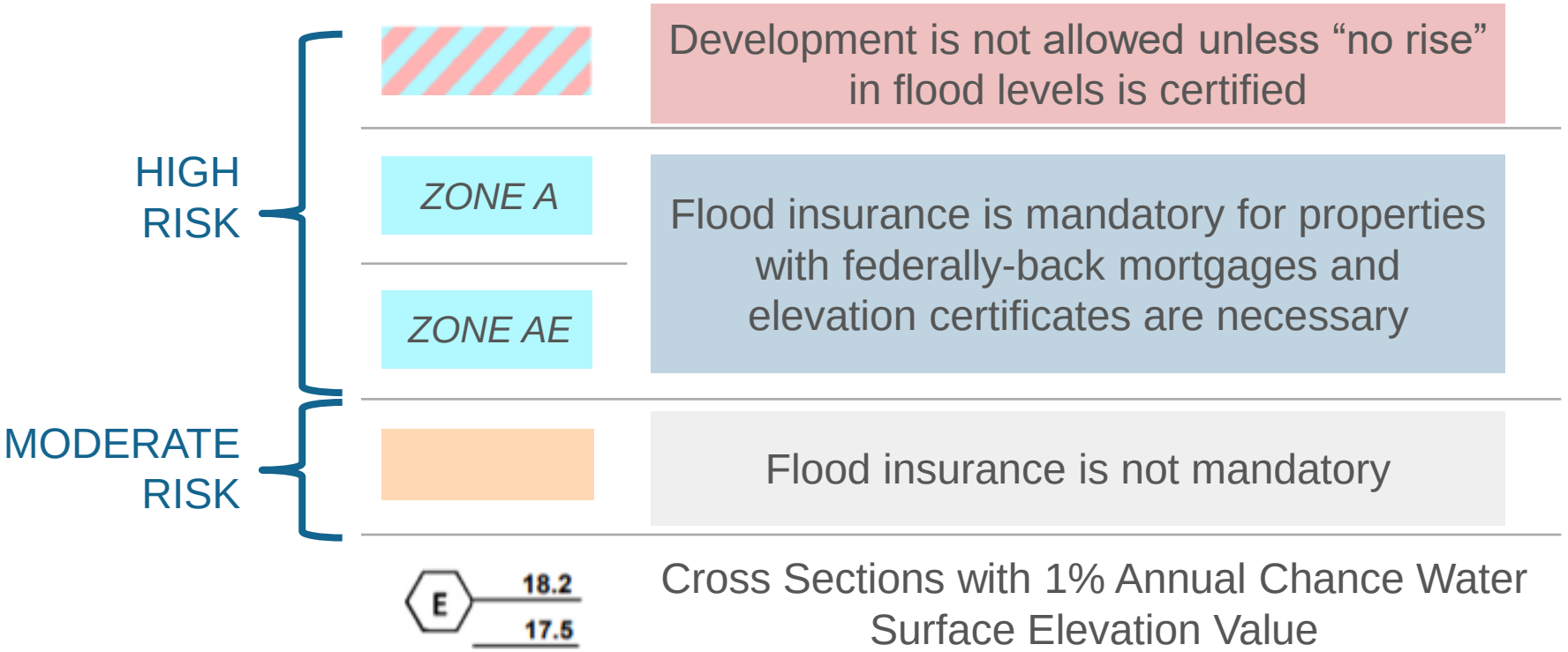
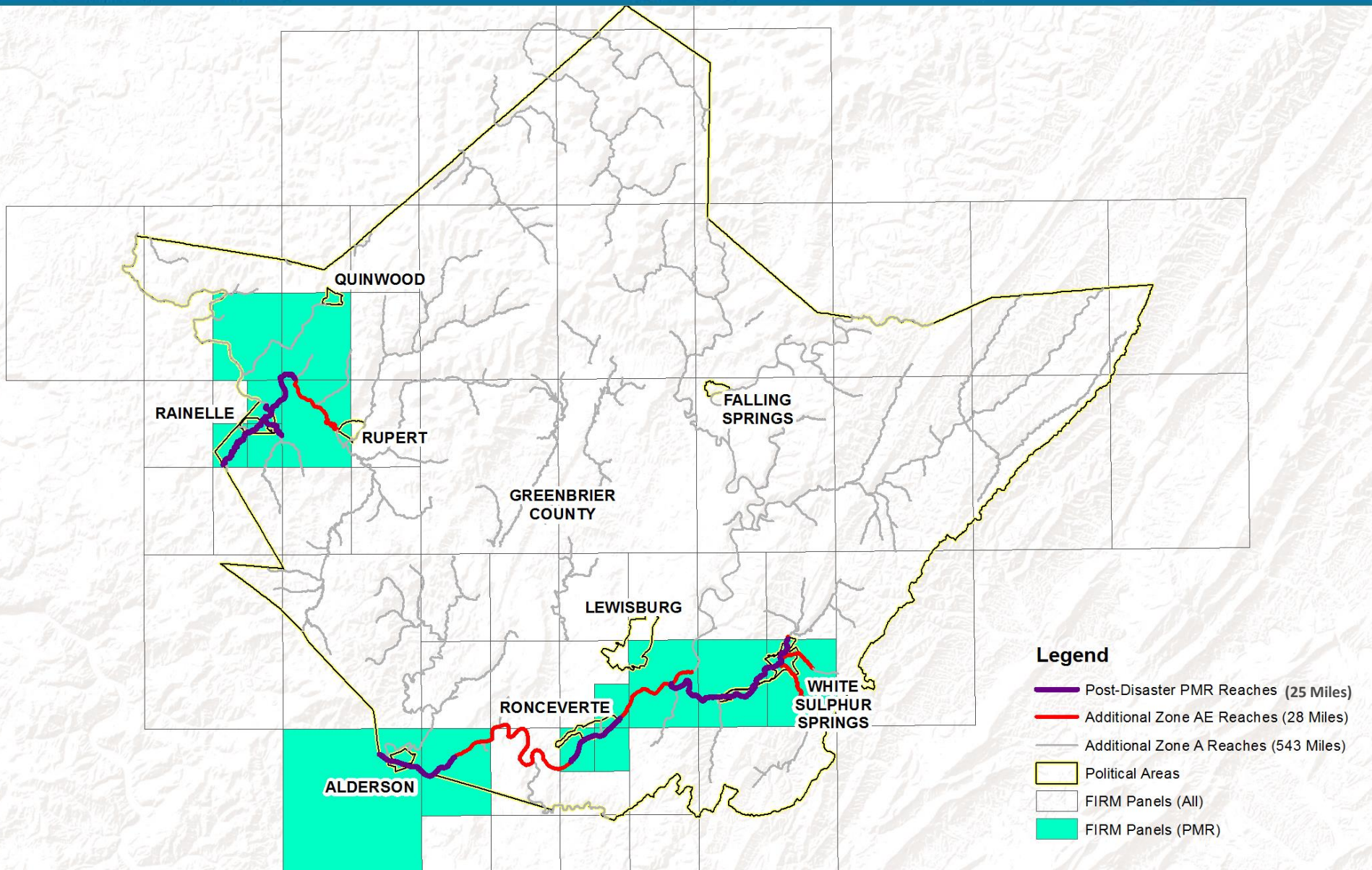


What We Studied



Data Collection

Because conditions change over time, FEMA's updated data analysis used the most recent available data:

- **Survey Data**: Bridges, culverts, and immediate upstream / downstream cross-sections
- **USGS**: Post-disaster assessments, incl. High Water Marks (HWMs), and initial hydrologic analyses (including stream gages)

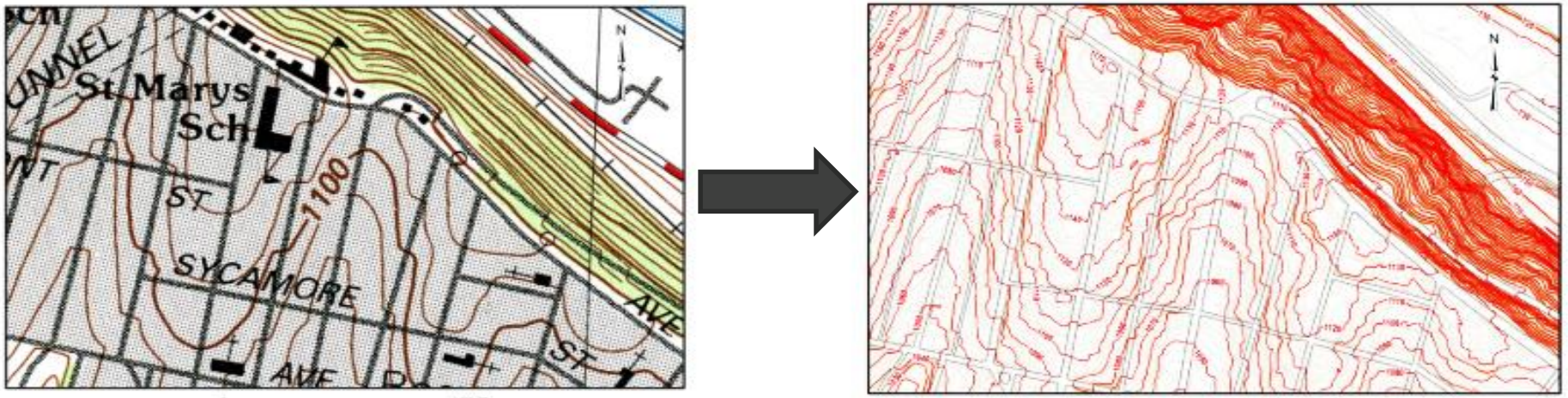
Data Collection

Topographic Data:

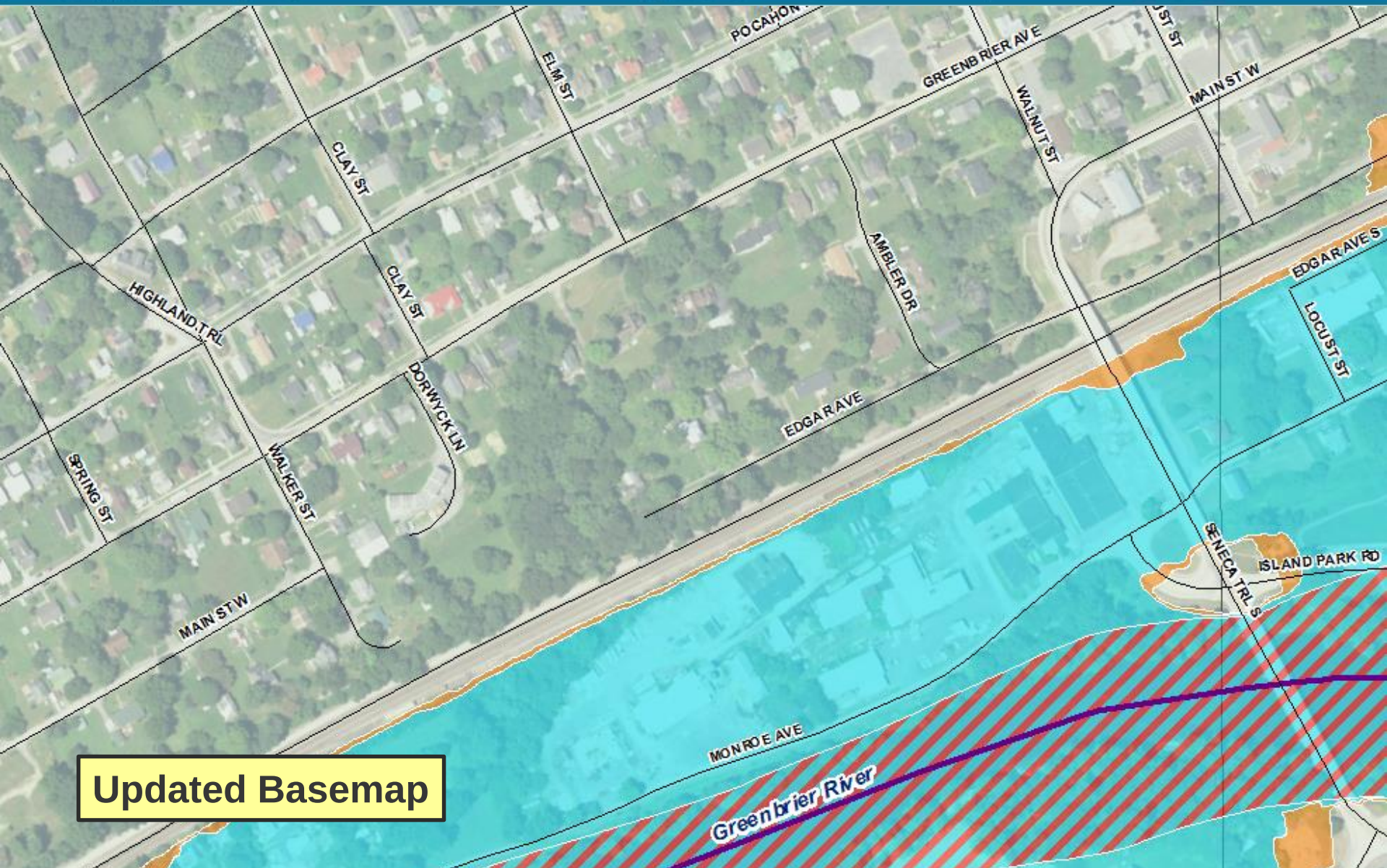
- WV 2016 QL2 LiDAR Acquisition

LiDAR = Light Detection and Ranging

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



Data Collection



Hydrologic Analyses

Hydrologic Study Method	Study Type	Stream Names	Reach Lengths (*Miles*)
Gage Analysis weighted with Regional Regression Equations	AE	Greenbrier River 2, Greenbrier River 4, Meadow River 3	23.7
Gage Analysis weighted with Regional Regression Equations	A	Anthony Creek, Greenbrier River 5, Meadow River 1, Meadow River 4, Second Creek	102.8
HEC-HMS	AE	Dry Creek 1, Wades Creek 1	4.7
HEC-HMS	A	Broad Run, Dry Creek 2, Harts Run, Howard Creek, Howard Creek Tributary 1, Jericho Draft, Jericho Draft Tributary 1, Laurel Branch, Slash Lick Run, Sulphur Lick Run, Tuckahoe Run, Wades Creek 2	32.3
Regional Regression Equations	A	All Remaining	371.2

What We Studied – Approximate Study

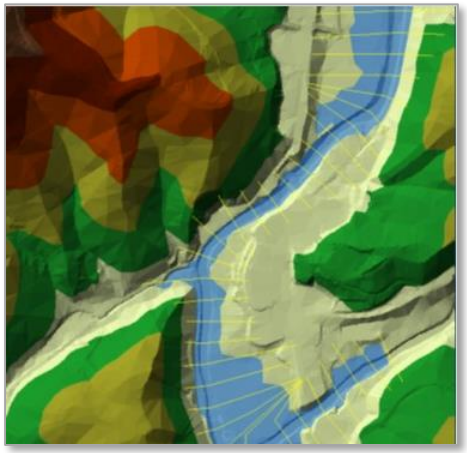
Approximate ‘Zone A’ Base Level Study

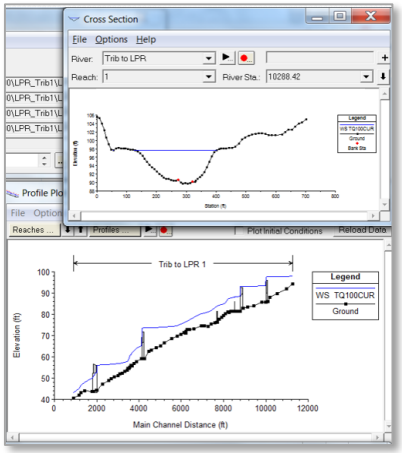
- 543 miles
- Studied all streams with drainage areas equal to 1 square mile or greater.
- Generally used in areas with low development / low development potential
- Cross-sections generated from LiDAR used for hydraulics:
  - Automated processes
  - Does not include information below normal water surface
  - 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

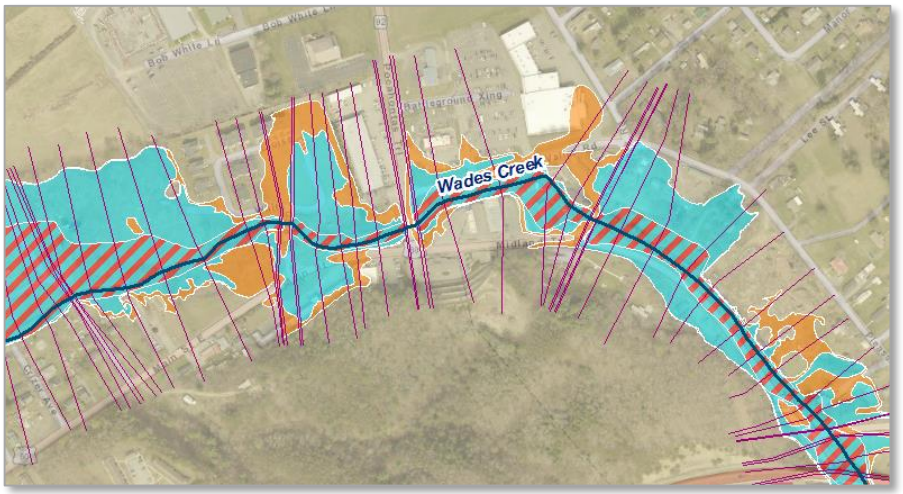
What We Studied – Detailed Study

Detailed ‘Zone AE’ Restudy

- 28 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







Significant Impacts

Greenbrier, 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[1] impact assessment.

The information presented below are estimates as of August 2020.

Flood insurance is available to **ALL COMMUNITIES**

1 COMMUNITY is taking advantage of the flood insurance savings offered through the Community Rating System

21
Flood-related presidential disaster declarations

7%
Of the population is in the draft flood high hazard area

0 levees and **0** dams

$23.9M
Total paid losses[2]

870
Total paid claims[2]

$831
Average premium

40%
Higher than the national average

112
Paid claims outside of the effective flood high hazard area[2]

$7.3M
Repetitive Loss (RL) paid losses[2]

122
RL properties[2]

413
Flood insurance policies in force

84%
In Greenbrier County Unincorporated Areas

255
Policies in the effective flood high hazard area

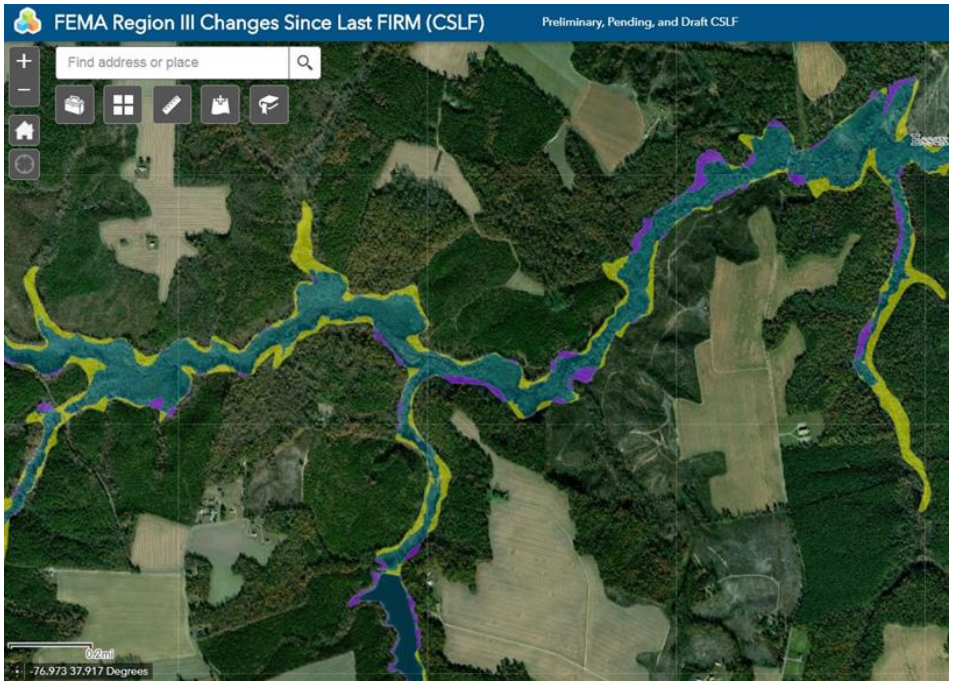
25,210
Estimated structures in the community

2,510
Estimated structures in the draft flood high hazard area

Estimated structures newly mapped in	Estimated structures newly mapped out
+1,020	-395

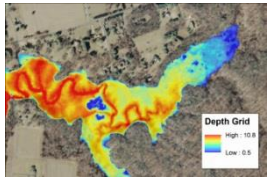
How Did the Floodplain Map Change?

- FEMA Region III Changes Since Last FIRM (CSLF) Viewer: https://arcg.is/1Hrmvr0
- Change in Floodplain Extents:
  - Purple – Increase
  - Blue – Still Floodplain
  - Yellow – Decrease
- FEMA Draft National Flood Hazard Viewer: https://msc.fema.gov/draft



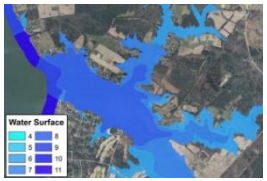
Using Flood Risk Data to Reduce Risk

Types of Flood Risk Products



Flood Depth & Analysis Grids

Changes Since Last FIRM

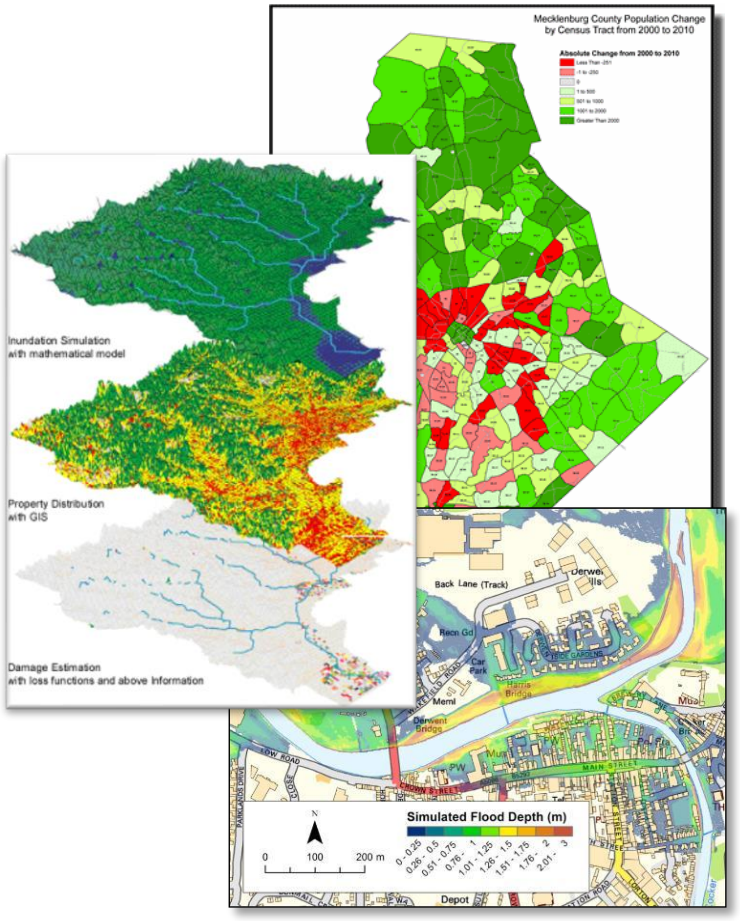


Water Surface Elevation Grids

Flood Risk Assessment /
Economic Loss Calculations

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



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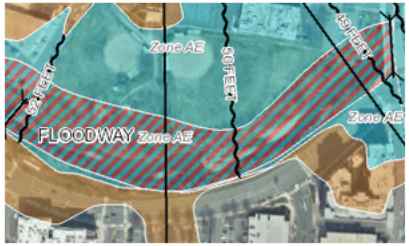
Where Can I Find Flood Risk Products?

FEMA Flood Map Service Center : Welcome!

Looking for a Flood Map?

Enter an address, a place, or longitude/latitude coordinates:

Enter an address, a place, or longitude/latitude coordinates | Search



Looking for more than just a current flood map?

Visit **Search All Products** to access the full range of flood risk products for your community.

About Flood Map Service Center

The FEMA Flood Map Service Center (MSC) is the official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). Use the MSC to find your official flood map, access a range of other flood hazard products, and take advantage of tools for better understanding flood risk.

https://msc.fema.gov/portal/home

Where Can I Find NFHL Data?

National Flood Hazard Layer (NFHL)

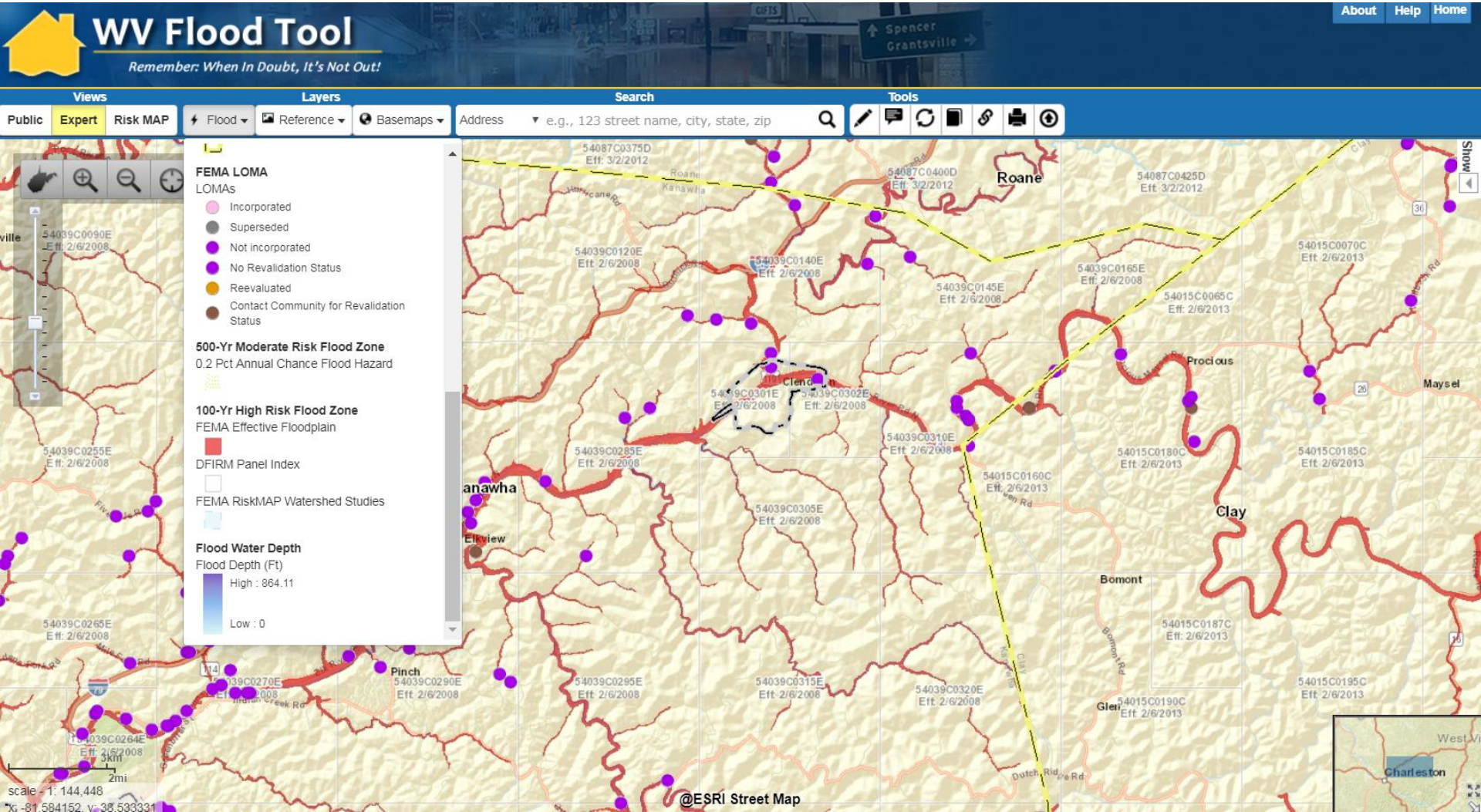
The National Flood Hazard Layer (NFHL) is a geospatial database that contains current effective flood hazard data. FEMA provides the flood hazard data to support the National Flood Insurance Program. You can use the information to better understand your level of flood risk and type of flooding. The simplest way for you to access the flood hazard data, including the NFHL, is through FEMAs Map Service Center (MSC).

If you want to explore the current digital effective flood hazard data in a map, the best tool to use is the NFHL Viewer. From the NFHL Viewer, you may view, download, and print flood maps for your location.

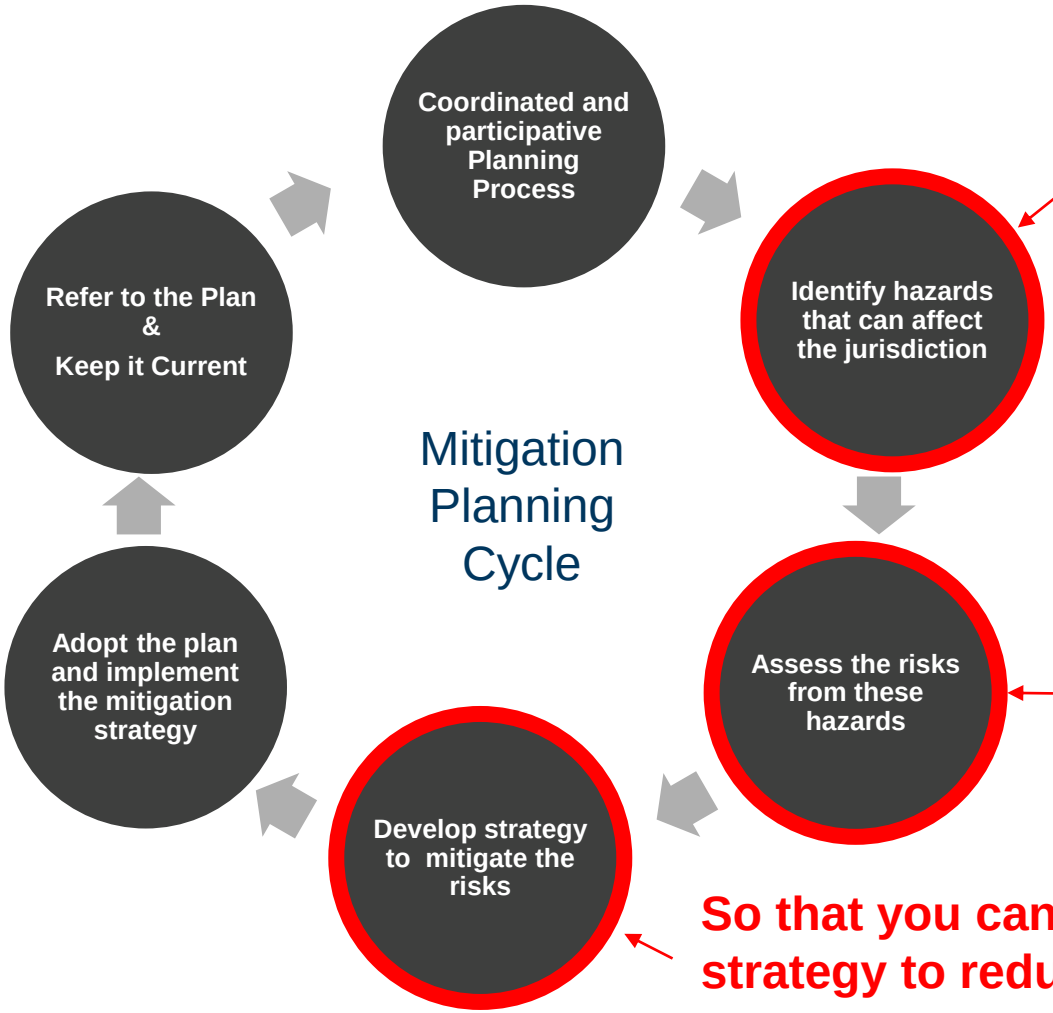
https://www.fema.gov/national-flood-hazard-layer-nfhl

WV Flood Tool

https://www.mapwv.gov/flood/map/



Flood Hazard Mitigation Planning



We are here!

It's time to start assessing the impacts of the new floodplain boundaries

So that you can develop a strategy to reduce flood risk

Floodplain Management

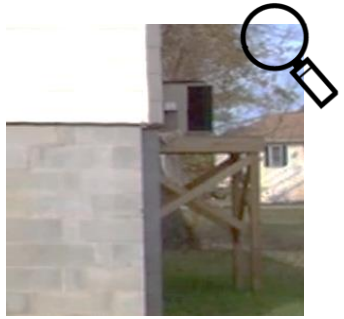
- **Permits are Required for ALL Development in the floodplain!**
- Development means any **manmade change** to improved or unimproved real estate
- Build it **right** and insurance premiums will be more affordable
- Build it **wrong** and premiums will be very expensive

Greenbrier County, WV
(Climate.gov)

Floodplain Management

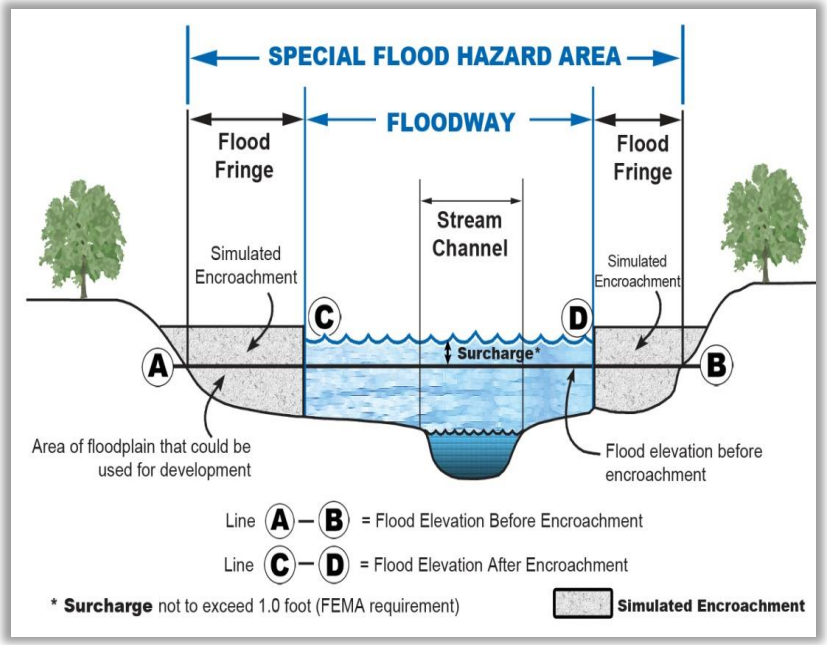
- Communities must regulate based on FIRMs
- Development should be reasonably safe from flooding
- Permits are required for all development
- State/federal permits are required
- Elevate and/or construct with flood-resistant materials
- Locate and design mechanicals to minimize or eliminate flood damage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



Considerations for Floodways

- Development must prove “no rise”
  - No rise = zero foot (0.00’) rise in flood heights
  - Rise is tracked both upstream and downstream of the development location
- Documentation requirement
  - Hydraulic and Hydrologic (H&H) study
  - In the case of improvements to an existing structure, the footprint shall not expand




Project Timeline
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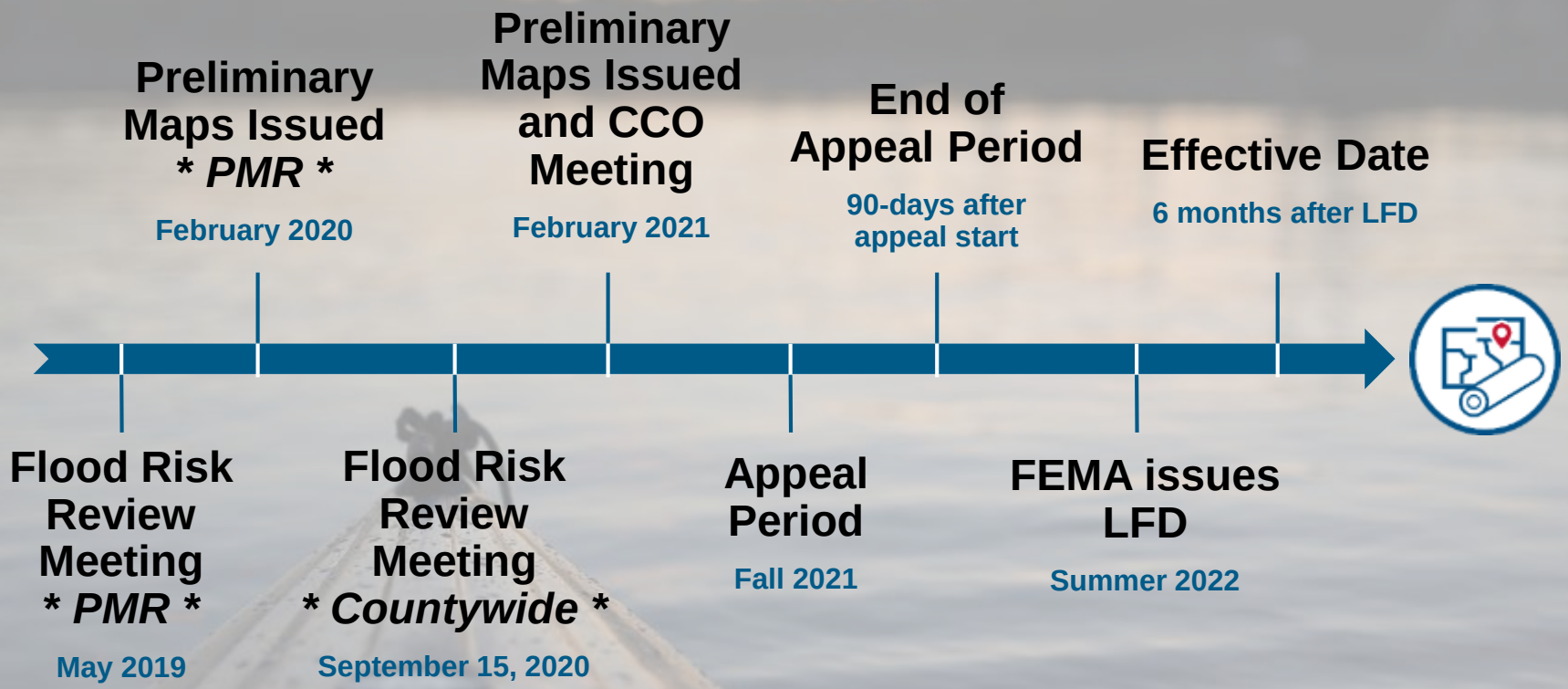
Timeline for Greenbrier County




Discussion
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We want to hear from you!

- 30 day comment period
- Changes Since Last FIRM viewer located at: https://arcg.is/1Hrmvr0
- 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!***

For More Information

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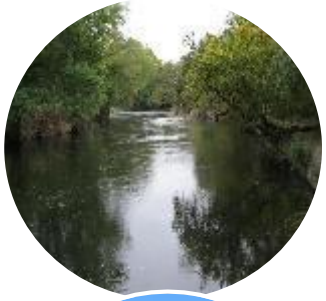

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