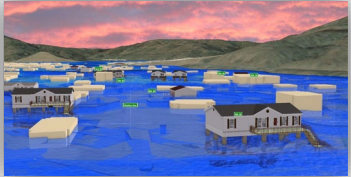




# WV Flood Resiliency Framework

*A virtual hub of risk assessment, visualization, planning, and training resources for building community flood resiliency in WV*

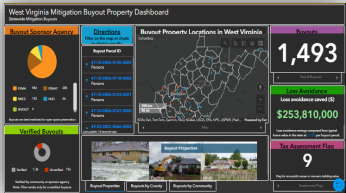
## Flood Visualizations



## WV Flood Tool



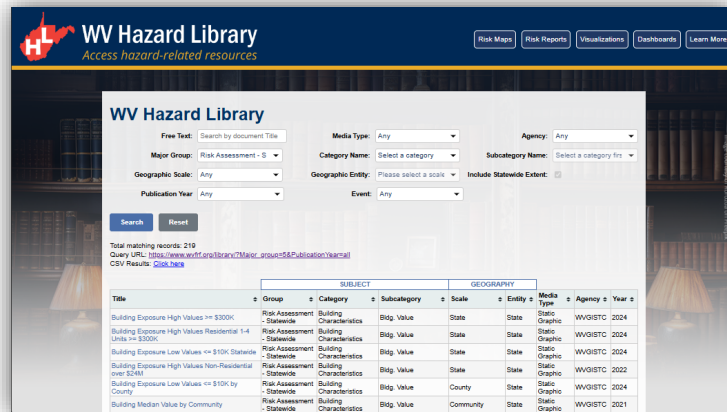
## Flood Dashboards



## WV Risk Explorer



## Example Risk Tools



## Hazard Library

## RISK TOOLS

- WV Risk Explorer
- WV Flood Tool
- Visualizations
- Dashboards

*9 Geographic Scales*

## COMMUNITY ENGAGEMENT

- Focused Outreach Meetings
- Flood Symposium
- Resiliency Tools & Products
- Learning Resources & Reports

## HAZARD LIBRARY

Search online hazard resources by title, subject, media, event, geography, data, etc.

## STAKEHOLDERS

- Risk Reduction Associates
- Emergency Responders
- Floodplain Managers
- Local Officials
- Volunteers
- Public



**Community Engagement Meeting**



**Flood Symposium Stakeholders**



# WVFRF Tools at Multiple Scales

GEOGRAPHIC SCALES		APPLICATIONS				WVFRF TOOLS		
Geographic Unit	# Units	Floodplain Management & Mitigation	FEMA Mapping	Risk Planning	Disaster Management	WV Risk Tools (WV Flood Tool & WV Explorer)	Flood Visualization Tools	Hazard Library (Document Center Tool)
PROPERTY LEVEL								
Structures <sup>1</sup>	98,000	X	X	X	X	Yes	Yes	Yes
Parcels	275,000	X	X	X	X	Yes		Yes
Other Features <sup>2</sup>		X	X	X	X	Yes		Yes
COMMUNITY LEVEL								
Incorporated Places	211	X	X	X	X	Yes	Yes	Yes
Unincorporated Areas	55	X	X	X	X	Yes	Yes	Yes
Communities (NFIP) <sup>3</sup>	266	X	X	X	X	Yes	Yes	Yes
COUNTY-REGION-STATE LEVEL								
Counties	55	X	X	X	X	Yes	Yes	Yes
Regions (RPDCs)	11	X	X	X	X	Yes		Yes
State	1	X	X	X	X	Yes		Yes
DRAINAGE LEVEL								
Watersheds	32	X	X	X	X	Yes		Yes
Streams (named)	6,748	X	X	X	X	Yes	Yes	Yes

## NOTES:

<sup>1</sup> Primary structures located in high-risk effective and advisory floodplains (1%-annual-chance flood)

<sup>2</sup> Other Features include roads, bridges, National Register Areas, flood mitigation structures (dams, levees, floodwalls)

<sup>3</sup> Total 284 communities in state: 266 NFIP; 18 incorporated places not in NFIP



# WV Risk Tools

## *Analytical & Visualization Tools at multiple scales*

### WV RISK TOOLS

#### 2 KEY FLOOD RISK TOOLS

#### 9 GEOGRAPHIC SCALES

*<< Aggregate & Property Levels >>*

- **WV Risk Explorer**

- Risk Maps
- Risk Reports
- Bldg. Risk Tool
- Dashboards
- Visualizations
- Data Access

*<< Political Boundaries >>*

- 1) State
- 2) Region
- 3) County
- 4) Community
- 5) Incorporated Place
- 6) Unincorporated Area

*<< Drainage Areas / Streams >>*

- 7) Watershed
- 8) Stream/River

*<< Property Level >>*

- **WV Flood Tool**

- WV Property Viewer

*<< Property Levels >>*

- 9a) Parcel
- 9b) Building

## *Risk Factors for riverine hazard assessments*

### WV RISK FACTORS

#### RISK INDICATORS

#### ENVIRONMENTS

- Floodplain Characteristics
- Building Exposure
- Building Characteristics
- Critical Infrastructure
- Community Assets
- People/Social Vulnerabilities
- Other Hazards

- Physical (Flood Factors, Topography, Hydrology, Hydraulics)
- Human (People)
- Social
- Economic
- Institutional
- Manmade (Buildings, Roads)

# Geographic Scales of Analytical & Visualization Tools

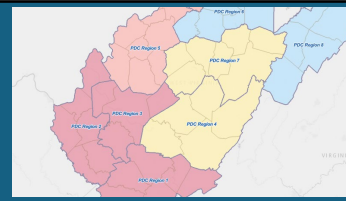


## Political Boundaries

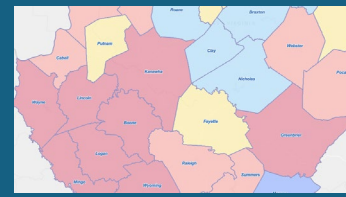
**State**



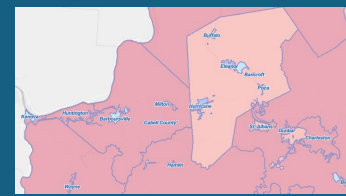
**PDC Regions (11)**



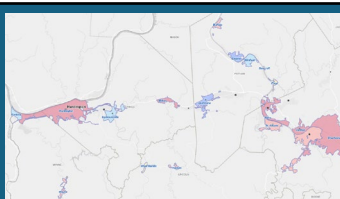
**Counties (55)**



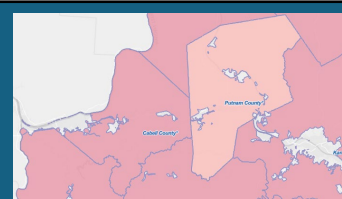
**Communities (284)**



**Incorporated  
Places  
(229)**

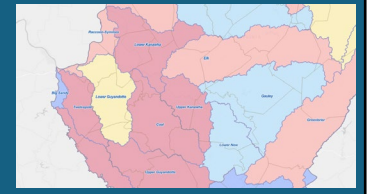


**Unincorporate  
d Areas  
(55)**

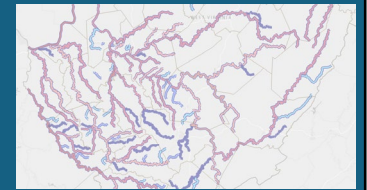


## Drainage Areas / Streams

**Watersheds  
(33)**



**Streams/River  
s  
(156)**



## Property Levels

**Parcels**



**Buildings**







# Risk Tools Comparison

## WV Flood Tool

Determine the degree of flood risk for a *specific area or property* using the Public and Expert Views. View building risk assessments and mitigation measures using the Risk Map View.

### Primary Components:

- Public View
- Expert View (Floodplain Management)
- RiskMap View (Risk Reduction)
- Reference Layers & Basemaps
- Property Search Tools
- Links to External Viewers & Resources



### Applications:

- Flood Risk Determinations at Property Level
- Floodplain Management
- Mitigation Measures
- Damage Assessments
- Property Identification
- Flood Visualizations & Risk Communications
- CRS Map Credits
- Other Hazards

## WV Risk Explorer

View and analyze riverine flood risk at the *aggregate level* for community, county, region, watershed, and stream scales. *Compare risk* among different geographic entities, complete with risk scores and rankings, from the building level to state scales.

### Primary Components:

- Risk Maps Tool
- Risk Reports Tool
- Risk & Mitigation Dashboard Tools
- Building Level Risk Tools
- Flood Visualization Tools
- Data linkages WV Flood Tool & Hazard Library




### Applications:

- Plans (Resiliency, Emergency Operations, Hazard Mitigation)
- Risk Studies (Risk MAP, Risk Reduction, Community Focused)
- Mitigation Measures, Tracking & Monitoring
- Flood Visualizations & Risk Communications
- CRS Programming Variables
- Other Hazards



# WV Hazard Library

*Hazard Library of documents and visual media relevant to West Virginia*

WV HAZARD LIBRARY		
TOPICS	MEDIA TYPES	SEARCH TYPES
<ul style="list-style-type: none"><li>• <b>Risk Assessment &amp; Planning</b><ul style="list-style-type: none"><li>○ State Risk Assessments</li><li>○ Local Risk Assessments</li><li>○ Planning Resources</li><li>○ Web Tools</li></ul></li><li>• <b>Mitigation</b><ul style="list-style-type: none"><li>○ Flood Insurance</li><li>○ Floodplain Management</li><li>○ Floodplain Mapping</li><li>○ Other Mitigation Measures</li></ul></li><li>• <b>Flood Disaster</b><ul style="list-style-type: none"><li>○ Flood Event</li><li>○ Flood Research</li></ul></li></ul>	<ul style="list-style-type: none"><li>• 3D Movie</li><li>• Bldg. Profile</li><li>• Dashboard</li><li>• Data-GIS</li><li>• Data-Metadata</li><li>• Data-Table</li><li>• Flyer</li><li>• Graphic</li><li>• Guide</li><li>• Letter</li><li>• News Article</li><li>• Picture</li><li>• Plan</li><li>• Poster</li><li>• Report</li><li>• Slides</li><li>• Social Media</li><li>• Static Map</li><li>• Story Map</li><li>• Video</li><li>• Viewshed</li><li>• Web Info</li><li>• Web Tool</li></ul>	<ul style="list-style-type: none"><li>• Agency</li><li>• Downloadable Data</li><li>• Event Disaster</li><li>• Event Meeting</li><li>• Geographic Scale<ul style="list-style-type: none"><li>○ Entity</li></ul></li><li>• Media Type</li><li>• Publication Date</li><li>• Subject<ul style="list-style-type: none"><li>○ Major Group</li><li>○ Category</li><li>○ Subcategory</li><li>○ <i>cross-indexing</i></li></ul></li><li>• Stakeholder Type</li><li>• Title (free text search)</li><li>• Predefined Searches<ul style="list-style-type: none"><li>○ Visualizations</li><li>○ Floodplain Management Key Materials</li></ul></li></ul> 



# Community Engagement

***Community Engagement*** *modes to convey flood risk and build resiliency*

## COMMUNITY ENGAGEMENT METHODS

### **Focused Outreach Meetings**

- Risk Communications
- Risk Reduction Meetings

### **Resiliency Tools & Products**

- Risk Assessments (Detailed or Summarized)
- Mitigation Measures (Planned or Implemented)
- Flood Visualizations

### **Learning Resources & Published Reports**

- Best Practice Guides and Training Materials
- Lessons Learned
- Planning Documents
- Research and Policy Papers

*Risk information communicated via WV Risk Tools, WV Hazard Library, and other resources.*



Flood Symposium **Stakeholders**



Flood Symposium **Project Team**





# Community Engagement



White Sulphur Springs, WV (11/17/2022)



Rainelle, WV (11/18/2022)

## ■ Feedback desired from Focus Groups:

- What lessons were learned from the immediate response and longer-term recovery from the 2016 flood?
- What priorities are needed for a stronger flood response and recovery plan in the event of a future flood?

## ■ Feedback of Flood Study Products:

- Flood Characteristics and Models
- Flood Risk Assessment (vulnerability, exposure, loss)
- Mitigation Maps
- Flood Visualization Tools





# Stakeholders





# Tool Usage by Stakeholder Groups

## *Stakeholder Groups of anticipated usage of Risk Tools and Hazard Library*

		Property-Level Scale				All Geographic Scales	
#	Stakeholders	Property Viewer	Flood Tool			Risk Explorer Tools	Hazard Library <sup>3</sup>
			Public	Expert	RiskMAP		
1	<b>Floodplain Managers<sup>1</sup> – FM</b> (includes surveyors and engineers)	FM		FM	FM	FM	FM-Learning
2	<b>Risk Reduction Associates - RRA</b> (planners, researchers, mitigation specialists, etc.)	RRA		RRA	RRA	RRA	RRA-Studies
3	<b>Emergency Responders – ER</b>	ER			ER	ER	ER-Learning
4	<b>Local Officials</b>	Officials	Officials			Officials	Off-Learning
5	<b>Public</b> (includes realtors and insurance officials)	Public	Public				Pub-Learning
6	<b>Volunteers – Vols.</b> (VOAD, Charities, etc.)	Vols.	Vols.				Vol-Learning



*Popularity of Tools<sup>2</sup> by Stakeholder Group*

<sup>1</sup> **Floodplain Managers** may be representatives of other stakeholder groups such as E-911 Directors or Mayors.

<sup>2</sup> **Floodplain Managers** and **Risk Reduction Associates** stakeholders have the highest demand for flood resiliency tools.

<sup>3</sup> **All Stakeholders** benefit by using the Hazard Library which is broadly categorized into learning, study, and reference resources. The primary stakeholder group for the WV Property Viewer is the **Public**, while the main stakeholder group for WV Flood Tool is the **Floodplain Managers**, and for the WV Risk Explorer various **Risk Reduction Specialists**.