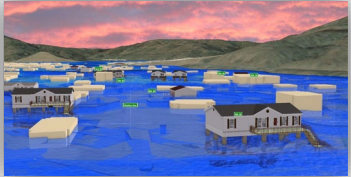




WV Flood Resiliency Framework

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

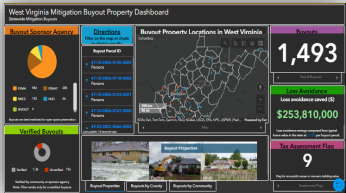
Flood Visualizations



WV Flood Tool



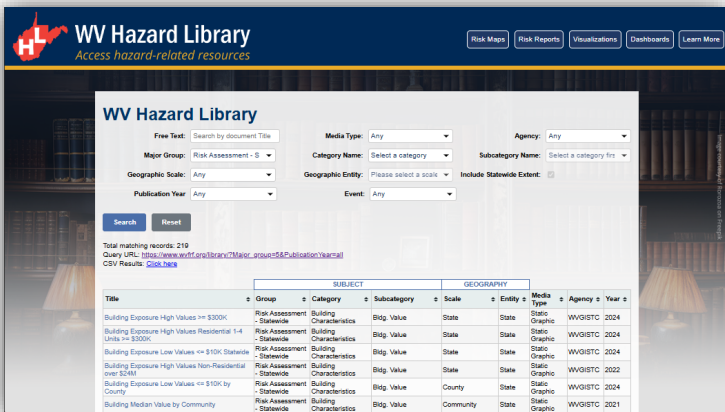
Flood Dashboards



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 ¹	98,000	X	X	X	X	Yes	Yes	Yes
Parcels	275,000	X	X	X	X	Yes		Yes
Other Features ²		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) ³	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:

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

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

³ 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

<< Property Level >>

- **WV Flood Tool**

- WV Property Viewer

<< 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 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

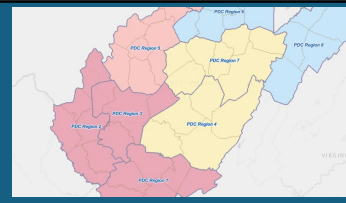


Political Boundaries

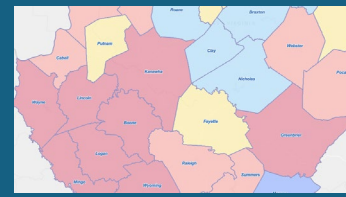
State



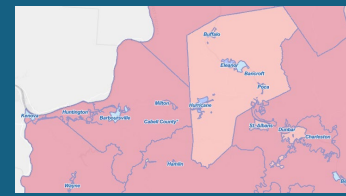
PDC Regions (11)



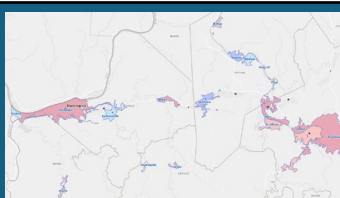
Counties (55)



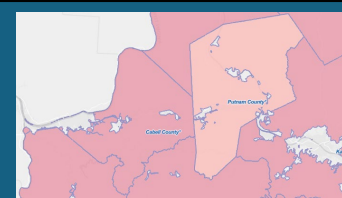
Communities (284)



**Incorporated
Places
(229)**

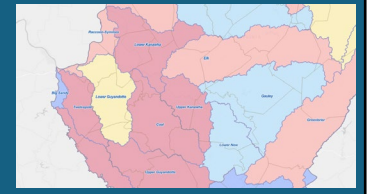


**Unincorporate
d Areas
(55)**

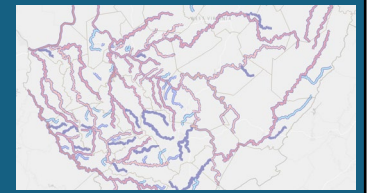


Drainage Areas / Streams

**Watersheds
(33)**



**Streams/River
s
(156)**

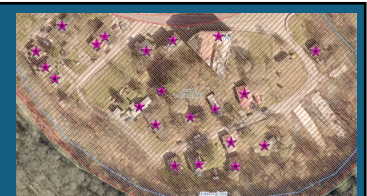


Property Levels

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



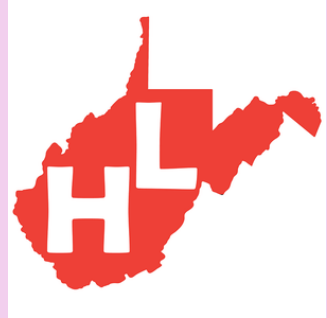
Applications:

- 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">• Risk Assessment & Planning<ul style="list-style-type: none">○ State Risk Assessments○ Local Risk Assessments○ Planning Resources○ Web Tools• Mitigation<ul style="list-style-type: none">○ Mitigation Measures○ Floodplain Mapping○ Floodplain Management○ Flood Insurance• Flood Disaster<ul style="list-style-type: none">○ Flood Event○ Flood Research○ Flood Forecast	<ul style="list-style-type: none">• 3D Movie• Bldg. Profile• Dashboard• Data• Flyer• Graphic• Guide• Letter• Multiple Types• Map• Metadata• News Article• Plan• Poster• Report• Slides• Story Map• Study• Survey• Table• Video• Viewshed• Web App• Website	<ul style="list-style-type: none">• Agency• Downloadable Data• Event Disaster• Event Meeting• Geographic Scale<ul style="list-style-type: none">○ Entity• Media Type• Publication Date• Subject<ul style="list-style-type: none">○ Major Group○ Category○ Subcategory○ <i>cross-indexing</i>• Stakeholder Type• Title (free text search)• Resource Type (learning, study, reference) 



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 ³
			Public	Expert	RiskMAP		
1	Floodplain Managers¹ – FM (includes surveyors and engineers)	FM		FM	FM	FM	FM-Learning
2	Risk Reduction Associates - RRA (planners, researchers, mitigation specialists, etc.)	RRA		RRA	RRA	RRA	RRA-Studies
3	Emergency Responders – ER	ER			ER	ER	ER-Learning
4	Local Officials	Officials	Officials			Officials	Off-Learning
5	Public (includes realtors and insurance officials)	Public	Public				Pub-Learning
6	Volunteers – Vols. (VOAD, Charities, etc.)	Vols.	Vols.				Vol-Learning



Popularity of Tools² by Stakeholder Group

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

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

³ **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**.