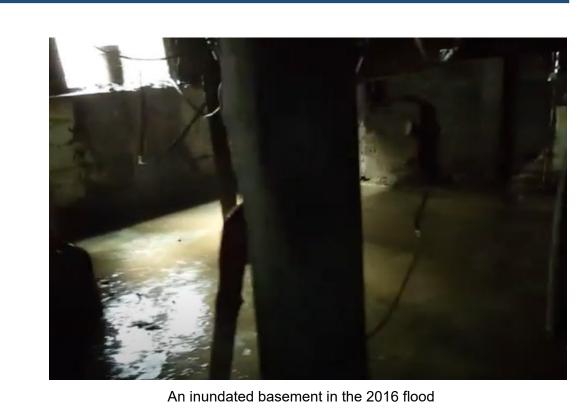
Flood Risk Assessment in White Sulphur Springs: Exposure, Vulnerability, and **Loss Indicators**

WV GIS Technical Center May 2023





Building Exposure White Sulphur Springs and Rainelle

Category	Exposure Indicator	White Sulphur Springs	Rainelle	Ratio* in WV Incorporated Areas (2021)
	Total Primary Building Count in Floodplain	425 (Rank***: 12 th)	338 (Rank: 18 th)	59 (Median)
$\overline{\bullet}$	Building Ratio b/w Floodplain & Community Total	26%	34%	9%
& Value	Total Primary Building Value in Floodplain of Community	\$41.02M (Rank: 16 th)	\$16.89M	\$6.42M (Median)
unt &	Median Building Value in Floodplain	\$49K	\$38K	\$42K
Buildings by Flood Zone (Count & Value)	Building Count in Floodway** (High Velocity)	105 (Rank: 6 th)	47 (Rank: 18 th)	12 (Avg.)
	Percent Building Count in Floodway** (High Velocity & Depth)	25%	14%	8%
	New Maps: Bldgs. "Mapped In" SFHA	75 (Rank: 11 th)	325 (Rank: 3 rd)	19 (Avg.)
	New Maps: Bldgs. % Count "Mapped In" SFHA	18%	96%	14%
	New Maps: Bldgs. "Mapped In" Floodway	14	38	97
	New Maps: Bldgs. "Mapped Out" SFHA	117 (Rank: 8 th)	1	19 (Avg.)
	New Maps: Bldgs. % Count "Mapped Out" SFHA	28%	0%	14%

Building Exposure... White Sulphur Springs and Rainelle

Category	Exposure Indicator	White Sulphur Springs	Rainelle	Ratio* in WV Incorporated Areas (2021)
ng ship	Owner Occupied Residential Buildings in Floodplain	208	153	
Building Ownership	Percent Owner Occupied Residential Buildings in Floodplain	49%	45%	65%
	Residential Building Count in Floodplain	372 (Rank: 12 th)	250	44
O	Percent Count Residential Building in Floodplain	88%	74%	81%
y Value	Non-Residential Building Count in Floodplain	53	88 (Rank: 11 th)	12
anc	Percent Count Non-Residential Bldgs. in Floodplain	12%	26%	19%
lpancy	Residential Building Value in Floodplain	\$20.45M (Rank: 16 th)	\$9.29M	\$2.11M
Occu	Percent Residential Value in Floodplain	50%	55%	31%
Building Occupancy and Value	Non-Residential Building Value in Floodplain	\$20.56M	\$7.60M	\$2.99M
	Percent Non-Residential Value in Floodplain	50%	45%	69%
	Mobile Homes in Floodplain	4	14	5
	Percent Mobile Homes in Residential Buildings in Floodplain	1%	4%	11%

Building Exposure/Physical Vulnerability White Sulphur Springs and Rainelle

Category	Exposure Indicator	White Sulphur Springs	Rainelle	Median & Ratio in WV Incorporated Areas (2021)	
ar on/ us	Median Construction Year in Floodplain	1940	1950	1947	
Building Year Construction/ FIRM Status	% Pre-FIRM Structures (includes "unknown")	88%	77%	77%	
Build Const FIRIV	% Post-FIRM Structures (also "mapped-in SFHA" Post-FIRM structures regulated to Pre-FIRM)	12%	23%	13%	
Physical Structural Vulnerability (Basements, Stories, & Value)	Primary Buildings with Basements in Floodplain	93	27		
	Percent Count Buildings with Basements in Floodplain	22%	8%	37%	
	One-Story Residential Buildings in Floodplain	336	292		
	Percent Count One-Story Residential Buildings in Floodplain	79%	86%	69%	
	Red Tag: Dilapidated/Vacant Residential & Commercial Buildings	20	56	6	
Phy:	Percent Low Valued (Red Tag) Structures	5%	17%	4%	

* For numbers and dollar values, used median, or average where the median was zero or too low, in the state's 213 incorporated areas ** Based on the floodway maps of 2023 *** Ranks mentioned based on the BLRA data of April 2022 where the community is among the top 20 incorporated areas in WV The red texts show large difference, to the risk side, from the state ratios.

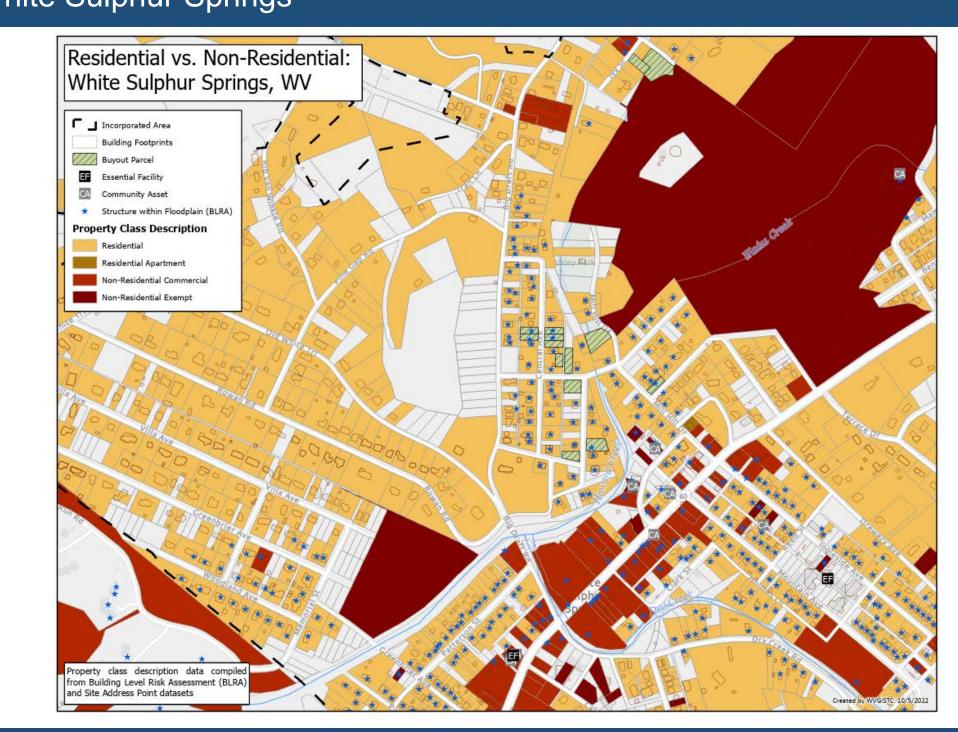
The green texts show large difference, to the resilience side, from the state ratios.

Social Vulnerability Indicators White Sulphur Springs and Rainelle

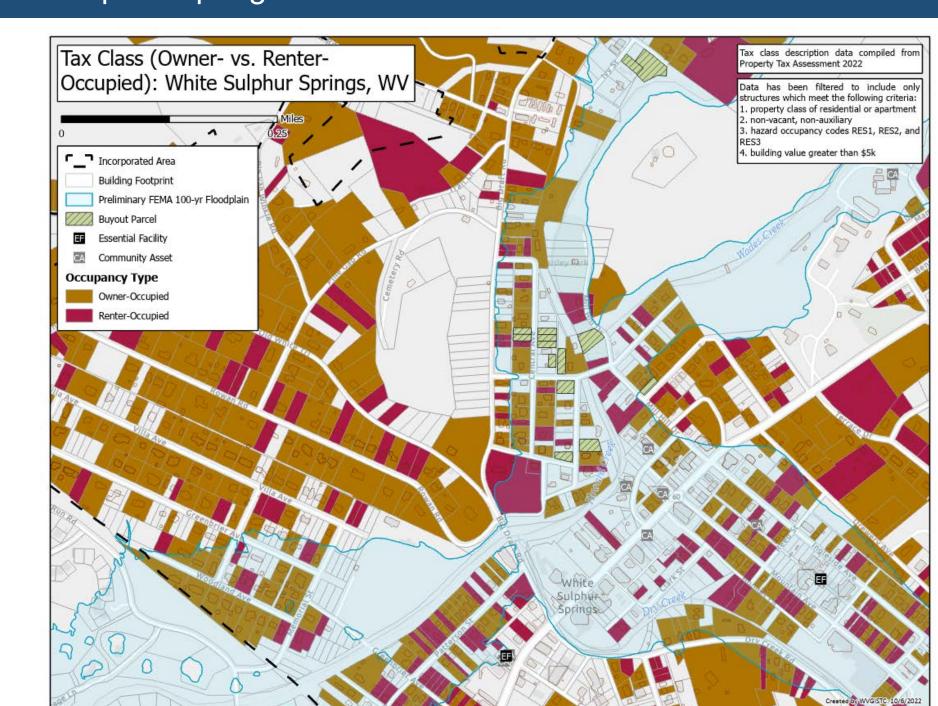
	Vulnerability Indicators	White Sulphur Springs	Rainelle	State Ratio	National Ratio
	Poverty Rate	14.4%	37.0%	17.3%	12.9%
JOBLESS III	Unemployment Rate	21.4%	33.6%	23.8%	14.7%
iħ	Vulnerable Ages Ratio	41.7%	39.8%	30.8%	28.3%
Ġ	Disability Ratio	17.8%	26.9%	18.7%	13.0%
	Population Growth Ratio	-9.1%	-20.9%	-3.2%	7.4%
RENT	Renter-Occupied Ratio	42.8%	43.0%	26.8%	36.0%
1 \$	Housing Values Less than \$50K	3.9%	37.5%	16.9%	6.6%
131	Housing Median Value	\$125,700	\$59,400	\$119,600	\$229,800

The red texts show more than 5% of difference, to the vulnerability side, from the state ratios.

Residential vs. Non-Residential Parcels White Sulphur Springs



Tax Class, Owner- vs. Renter-Occupied Parcels White Sulphur Springs



Exposure, Examples of Low Valued Structures in Floodplain White Sulphur Springs



Building IDs: 13-17-0009-0270-0000_208 & 13-17-0009-0269-0000_196

Significant Structures Exposure White Sulphur Springs and Rainelle

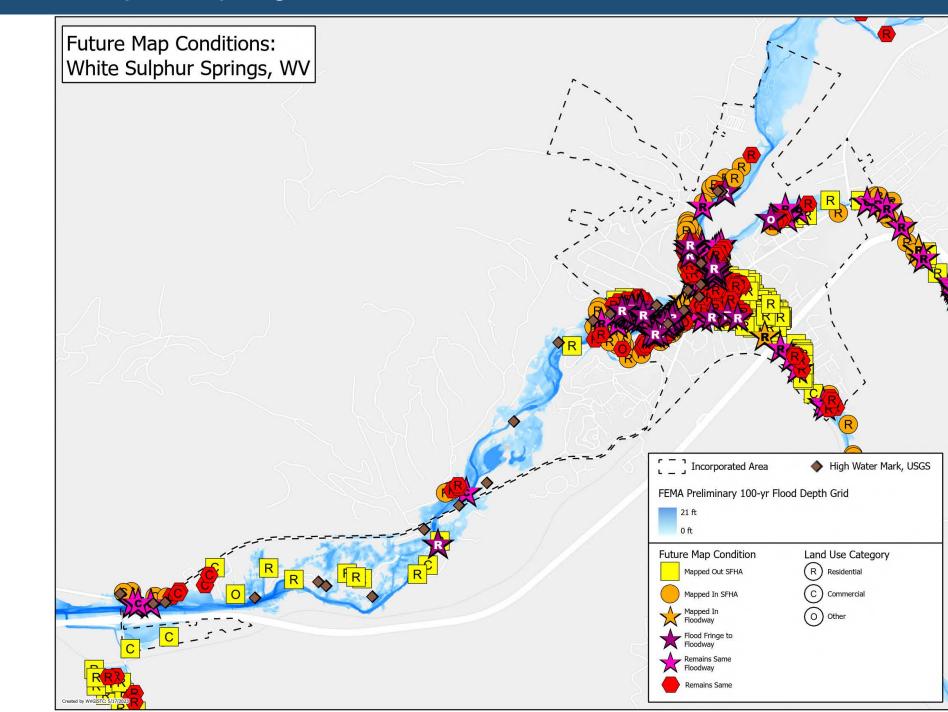
Category	Exposure Indicator	White Sulphur Springs	Rainelle	Average in WV Incorporated Areas (2021)
Significant Structures Count	Number of Essential Facilities in the Moderate Risk 0.2%-Annual-Chance Floodplain	2	2	2
	Number of Community Assets (Non-Historical) in the High-Risk 1%-Annual-Chance Floodplain	8	7	3

The red texts show large difference, to the risk side, from the state ratios.



White Sulphur Springs National Fish Hatchery: Hazard occupancy Class: GOV1 (Government, Federal) Appraised Value: \$425,073 (Highest in significant structures)

Building Exposure, Future Map Conditions White Sulphur Springs



Physical Flood Loss White Sulphur Springs and Rainelle

Category	Loss Indicator	White Sulphur Springs	Rainelle	Rate* in WV Incorporated Areas (2021)
	TEIF Building Dollar Loss Estimates	\$1,225K	\$994K	\$1,246K (Avg.)
	TEIF Building Loss Ratio	3%	6%	10%
ent	Median Individual Building Damage	\$3K	\$2K	\$7K (Mdn.)
oss od Ev	Substantial Damage (>50%) Estimates	0 89 in 2016 Flood	1	7 (Avg.)
Physical (Building) Loss By 1%-Annual-Chance Flood Event	Percent Substantial Damage Estimates	0%	0%	6% (Avg.)
	Moderate Damage (10-50%) Estimates	78 98 in 2016 Flood	106	47 (Avg.)
	Percent Moderate Damage Estimates	18%	31%	34% (Avg.)
	Building Debris Removal Estimates	450 ton	809 ton	165 ton (Mdn.)
	Number of Previous Paid Losses	89	152 (Rank**: 20 th)	63 (Avg.)
	Dollar Amount of Previous Insurance Claims	\$2,975K (Rank: 15 th)	\$3,720K (Rank: 10 th)	\$845K (Avg.)
	Number of Repetitive Loss Structures	2	23	3 (Mdn.)

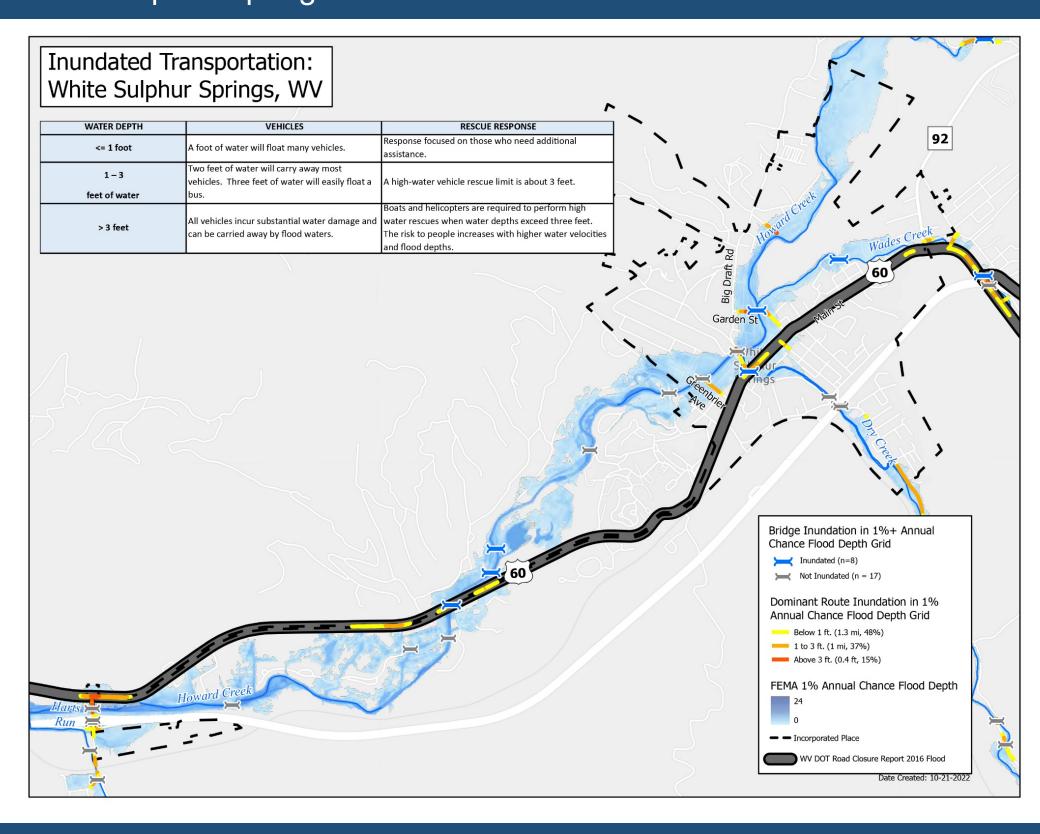
Human Exposure/Loss White Sulphur Springs and Rainelle

Category	Exposure Indicator	White Sulphur Springs	Rainelle	Median & Ratio in WV Incorporated Areas (2021)
nan sure	Estimated Population Residing in High-Risk Flood Zones	1026	582	114
Human Exposure	Percentage of Population Residing in High-Risk Flood Zones	39%	43%	10%
Human Loss By 1%-Annual- Chance Flood Event	Displaced Population Estimates	462 (Rank: 17 th)	487 (Rank: 16 th)	173 (Avg.)
	Percent of Community Population Displaced	17%	36%	13%
	Estimated Population in Need of Short-Term Shelter	104 (Rank: 18 th)	123 (Rank: 14 th)	37 (Avg.)

^{*} For numbers and dollar values, used median, or average where the median was zero or too low, in the state's 213 incorporated areas ** Ranks mentioned based on the BLRA data of April 2022 where the community is among the top 20 incorporated areas in WV The red texts show large difference, to the risk side, from the state ratios.

For Greenbrier County, Red Cross sheltering data from the 2016 flood was compared to the shelter model estimates. According to the Red Cross shelter data, a total of 114 people stayed at six designated Red Cross shelters during the flood event. However, many displaced residents also stayed at unregistered shelters, including the 300 people at the Greenbrier Resort and 129 people at the Baptist Church gymnasium in Rainelle. If the registered persons of the Red Cross Shelters requiring shelter are summed together at **543** people, then this estimate is close to the shelter need model estimate of **603** people for Greenbrier County.

Infrastructure Exposure, Inundated Transportation White Sulphur Springs



Building Exposure, **High-Value** Structures White Sulphur Springs

Highest Value:

Building ID: 13-17-0009-0342-0000_150 (WSS Elementary) Hazard Occupancy Class: EDU1 (School) (New flood study mapped-out SFHA)

Highest Residential (RESx) Value:

Building ID: 13-17-0011-0246-0000_559 Hazard Occupancy Class: RES4 (Hotel/Motel - Low Rise) FIRM Status: Pre-FIRM (1951) Appraised Value: \$254,400 (New flood study mapped-in SFHA)

Highest Apartment Building Value:

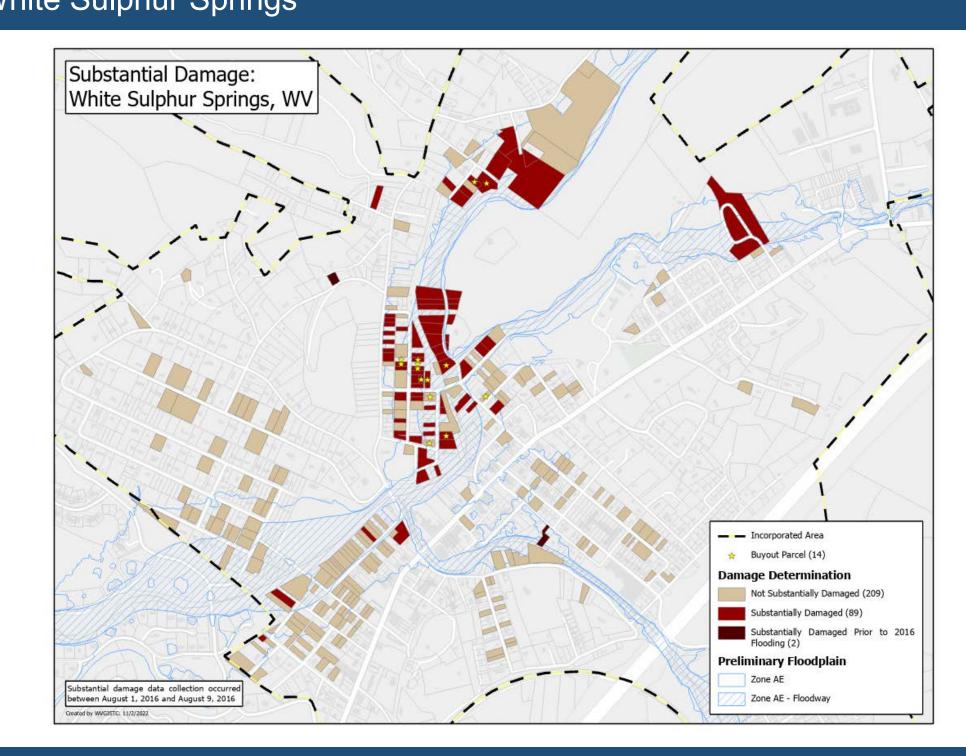
Building ID: 13-17-0009-0054-0001_767 Hazard Occupancy Class: RES3B (Multi-Family 3-4 Units) FIRM Status: Pre-FIRM (1950) Appraised Value: \$227,600

Highest Single-Family Value:

Building ID: 13-17-0008-0523-0000_192 Hazard Occupancy Class: RES1 (Residential 1 Family) FIRM Status: Post-FIRM (1993)

Appraised Value: \$192,700

Substantial Damage (2016 Flood) White Sulphur Springs



Structures with High Building Loss (Estimated) White Sulphur Springs

Highest Building Loss (USD) in White Sulphur Springs:

Building ID: 13-17-0008-0186-0000_703 Hazard Occupancy Class: COM8 (Restaurant) FIRM Status: Pre-FIRM (1968) Water Depth in Structure: 1.2 ft (minus rated -1 ft) Appraised Value: \$1,422,200 Estimated Building Loss: \$133,687 Building Damage Percentage: 10%



Highest Building Damage Percentage in White Sulphur Springs: Building ID: 13-17-0008-0435-0000_382

Hazard Occupancy Class: RES1 (Residential 1 Family) FIRM Status: Post-FIRM (1988) Water Depth in Structure: 3.9 ft (minus rated -4 ft) Appraised Value: \$62,200 Estimated Building Loss: \$28,799 Building Damage Percentage: 46%

