

# Building Count in SFHA (BLDG SFHA)



West Virginia University  
WV GIS Technical Center

February 2024

# Building Count in SFHA

Major Category	Detailed Category	Code	Indicator	Short Description	Unit
Structure Risk	Building Counts / Ratios	<b>BLDG_SFHA</b>	<b>Building Count in SFHA</b>	All primary insurable structures in the effective 100-year Floodplain or Special Flood Hazard Area (SFHA)	#

Rationale	Recommendations	Data Source
<p>The higher number of buildings in the floodplain indicates higher physical and human exposure to riverine flooding.</p> <p>If a building owner has a mortgage from a federally regulated lender and the property is in the Special Flood Hazard Area, then the building owner is required by Federal law to carry flood insurance.</p> <p>The building count in the SFHA is a programming variable required for those communities participating in FEMA's Community Rating System (CRS) program.</p>	<p>Communities with a high floodplain building count should actively engage property owners about flood insurance and minimizing flood losses of property owners. See <a href="http://Floodsmart.gov">Floodsmart.gov</a> for more information.</p> <p>Communities can become more resilient to flooding by exceeding the minimum NFIP requirements. Higher building standards adopted by local communities may include increasing the freeboard of the base flood elevation; or encourage property owners to build to the higher 500-year flood elevation or historical high-water mark.</p> <p>Floodplain managers and emergency planners should pre-load at-risk structures into substantial damage estimator software. Local officials should review early warning systems as well as short-term shelters located outside the floodplain and away from inundated roads.</p> <p>State and county leaders should prioritize pre-disaster planning for communities with many flood-prone buildings.</p>	<p>All political scales: FEMA Special Flood Hazard Area (SFHA) for effective 1%-Annual-Chance Floodplains; Watershed and Stream scales: Effective and Advisory Floodplains for 1% Annual-Chance event; BLRA</p>

# Building Count in SFHA; Top 20% Rankings

RANK	All Communities	Percent_Rank	Incorporated Communities	Percent_Rank	Unincorporated Areas	Percent_Rank	Counties	Percent_Rank	Regions	Percent_Rank
1	Kanawha County*	100.0%	Wheeling**	100.0%	Kanawha County*	100.0%	KANAWHA	100.0%	3	100%
2	Logan County*	99.6%	Charleston	99.5%	Logan County*	98.1%	LOGAN	98.1%	2	90%
3	Wheeling**	99.2%	Dunbar	99.0%	Mingo County*	96.2%	OHIO	96.2%	1	80%
4	Mingo County*	98.8%	Wellsburg	98.5%	Boone County*	94.4%	BOONE	94.4%		
5	Boone County*	98.4%	New Martinsville	98.0%	Lincoln County*	92.5%	MINGO	92.5%		
6	Lincoln County*	98.1%	Huntington**	97.6%	Mercer County*	90.7%	CABELL	90.7%		
7	Mercer County*	97.7%	Buckhannon	97.1%	Raleigh County*	88.8%	MCDOWELL	88.8%		
8	Raleigh County*	97.3%	Milton	96.6%	Wayne County*	87.0%	WAYNE	87.0%		
9	Wayne County*	96.9%	Clarksburg	96.1%	Cabell County*	85.1%	LINCOLN	85.1%		
10	Cabell County*	96.6%	Marlinton	95.7%	Putnam County*	83.3%	MERCER	83.3%		
11	Charleston	96.2%	South Charleston	95.2%	Wood County*	81.4%	WOOD	81.4%		
12	Putnam County*	95.8%	Rainelle	94.7%						
13	Wood County*	95.4%	Weston	94.2%						
14	McDowell County*	95.1%	Moundsville	93.8%						
15	Wyoming County*	94.7%	Welch	93.3%						
16	Randolph County*	94.3%	Benwood	92.8%						
17	Hampshire County*	93.9%	Vienna	92.3%						
18	Dunbar	93.6%	White Sulphur Springs	91.4%						
19	Mason County*	93.2%	Clendenin	91.4%						
20	Marion County*	92.8%	Buffalo	90.9%						
21	Greenbrier County*	92.4%	Parkersburg	90.4%						
22	Fayette County*	92.1%	Madison	90.0%						
23	Clay County*	91.7%	Gary	89.5%						
24	Wetzel County*	91.3%	Keyser	89.0%						
25	Jackson County*	90.9%	Richwood	88.5%						
26	Webster County*	90.6%	Philippi	88.0%						
27	Harrison County*	90.2%	Parsons	87.6%						
28	Wellsburg	89.8%	Princeton	87.1%						
29	New Martinsville	89.4%	Elkins	86.6%						
30	Summers County*	89.0%	Wayne	86.1%						
31	Huntington**	88.7%	Spencer	85.7%						
32	Monongalia County*	88.3%	Hartford	85.2%						
33	Braxton County*	87.9%	Mannington	84.7%						
34	Doddridge County*	87.5%	Chesapeake	84.2%						
35	Lewis County*	87.2%	St. Albans	83.8%						
36	Nicholas County*	86.8%	Oceana	83.3%						
37	Upshur County*	86.4%	Alderson**	82.8%						
38	Marshall County*	86.0%	New Cumberland	82.3%						
39	Roane County*	85.7%	Morgantown	81.9%						
40	Mineral County*	85.3%	Weirton**	81.4%						
41	Buckhannon	84.9%	Man	80.9%						
42	Tyler County*	84.5%	Ravenswood	80.4%						
43	Berkeley County*	84.2%	Bridgeport	80.0%						
44	Jefferson County*	83.8%								
45	Calhoun County*	83.4%								
46	Wirt County*	83.0%								
47	Morgan County*	82.7%								
48	Milton	82.3%								
49	Pocahontas County*	81.9%								
50	Clarksburg	81.5%								
51	Preston County*	81.2%								
52	Hardy County*	80.8%								
53	Marlinton	80.0%								
54	Monroe County*	80.0%								

**Colors:**

Black --> Incorporated areas

Brown --> Unincorporated areas

Green --> Counties (Total)

Red --> Split communities

Blue --> Incorporated communities participating in the National Flood Insurance Program (NFIP) with no regulatory Special Flood Hazard Area (SFHA)

Purple --> Incorporated communities with no regulatory Special Flood Hazard Area (SFHA) not participating in the National Flood Insurance Program (NFIP) (not mentioned in the FEMA's Community Status Book Report)

Black on blue: Six incorporated communities included in the detailed risk study (Camden-on-Gauley, Clendenin, Rainelle, Richwood, White Sulphur Springs, and Marlinton)

# Building Count in SFHA; Top 20% Rankings

## Top Building Counts in High Risk Effective and Advisory Floodplains (Percent rank $\geq$ 80%) at stream level

\* Only the Streams with more than 100 buildings in the above floodplains were considered.

RANK	Streams with Building Counts > 100	Percent_Rank
1	Ohio River	100.0%
2	Kanawha River	99.3%
3	Elk River	98.7%
4	Greenbrier River	98.0%
5	Guyandotte River	97.4%
6	Tug Fork	96.7%
7	Little Kanawha River	96.1%
8	Mud River	95.4%
9	Island Creek	94.8%
10	Pond Fork	94.1%
11	Buckhannon River	93.5%
12	Coal River	92.9%
13	Buffalo Creek	92.2%
14	Big Coal River	91.6%
15	Pigeon Creek	90.9%
16	Tygart Valley River	90.3%
17	Wheeling Creek	89.6%
18	Fourpole Creek	89.0%
19	Twelvepole Creek	88.3%
20	Pocatalico River	87.7%
21	Campbells Creek	87.0%
22	New Creek	86.4%
23	West Fork River	85.1%
24	South Branch Potomac River	85.1%
25	Huff Creek	84.5%
26	Clear Fork	83.8%
27	Cabin Creek	83.2%
28	Dry Fork	82.5%
29	West Fork Twelvepole Creek	81.9%
30	Potomac River	81.2%
31	Middle Grave Creek	80.6%
32	Little Coal River	80.0%

## Top Building Counts in High Risk Effective and Advisory Floodplains (Percent rank $\geq$ 80%) at watershed level

RANK	Watershed	Percent_Rank
1		
2		
3		
4		
5		
6		
7		

# Building Count in SFHA; Maps

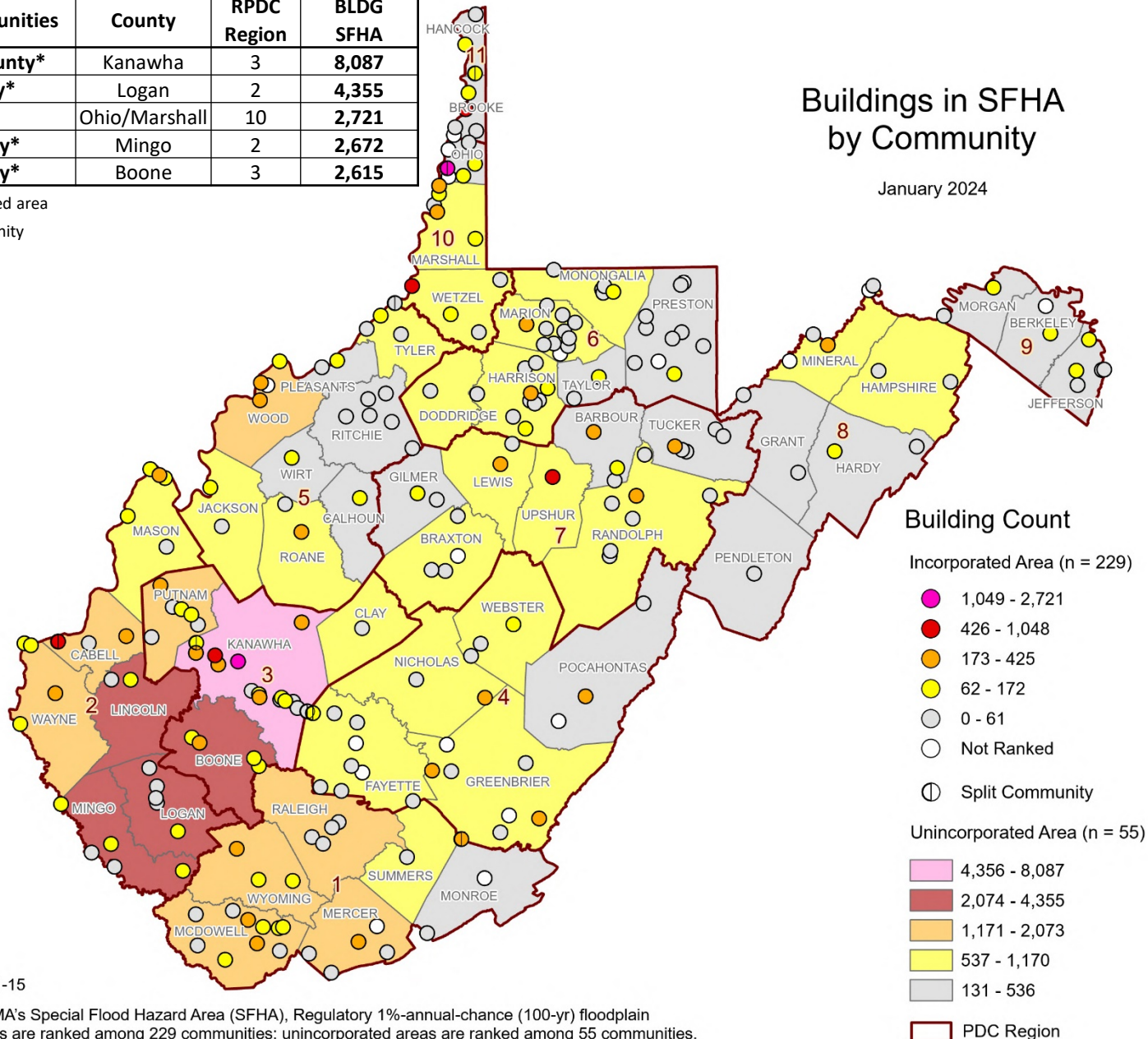
Top 5 Communities	County	RPDC Region	BLDG SFHA
<b>Kanawha County*</b>	Kanawha	3	<b>8,087</b>
<b>Logan County*</b>	Logan	2	<b>4,355</b>
<b>Wheeling**</b>	Ohio/Marshall	10	<b>2,721</b>
<b>Mingo County*</b>	Mingo	2	<b>2,672</b>
<b>Boone County*</b>	Boone	3	<b>2,615</b>

\* Unincorporated area

\*\* Split community

## Buildings in SFHA by Community

January 2024



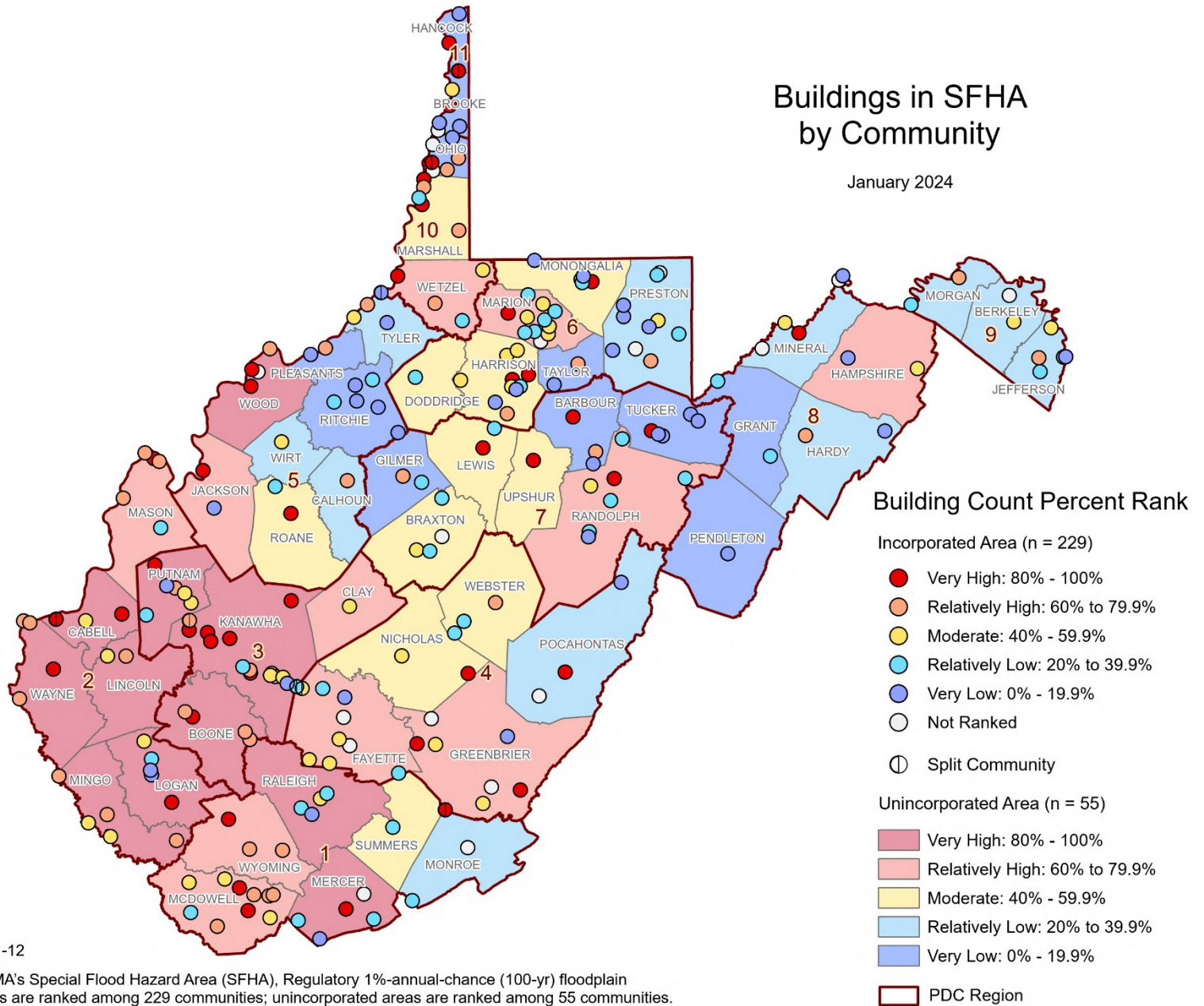
WVGISTC 2024-1-15

Data Source: FEMA's Special Flood Hazard Area (SFHA), Regulatory 1%-annual-chance (100-yr) floodplain  
 Incorporated areas are ranked among 229 communities; unincorporated areas are ranked among 55 communities.

# Building Count in SFHA; Maps

## Buildings in SFHA by Community

January 2024



WVGISTC 2024-1-12

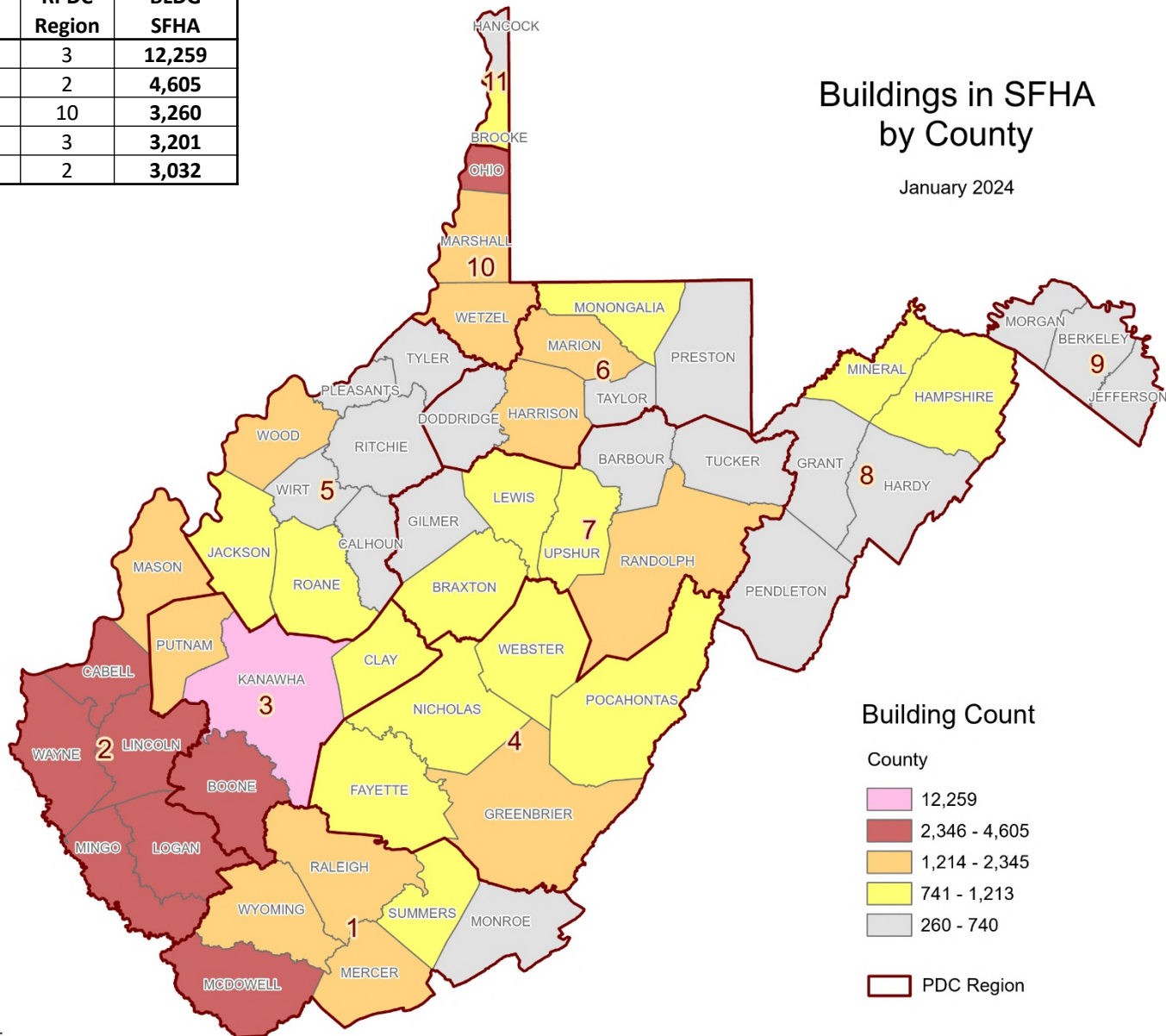
Data Source: FEMA's Special Flood Hazard Area (SFHA), Regulatory 1%-annual-chance (100-yr) floodplain  
Incorporated areas are ranked among 229 communities; unincorporated areas are ranked among 55 communities.

# Building Count in SFHA; Maps

Top 5 Counties	RPDC Region	BLDG SFHA
Kanawha	3	12,259
Logan	2	4,605
Ohio	10	3,260
Boone	3	3,201
Mingo	2	3,032

## Buildings in SFHA by County

January 2024



### Building Count

County

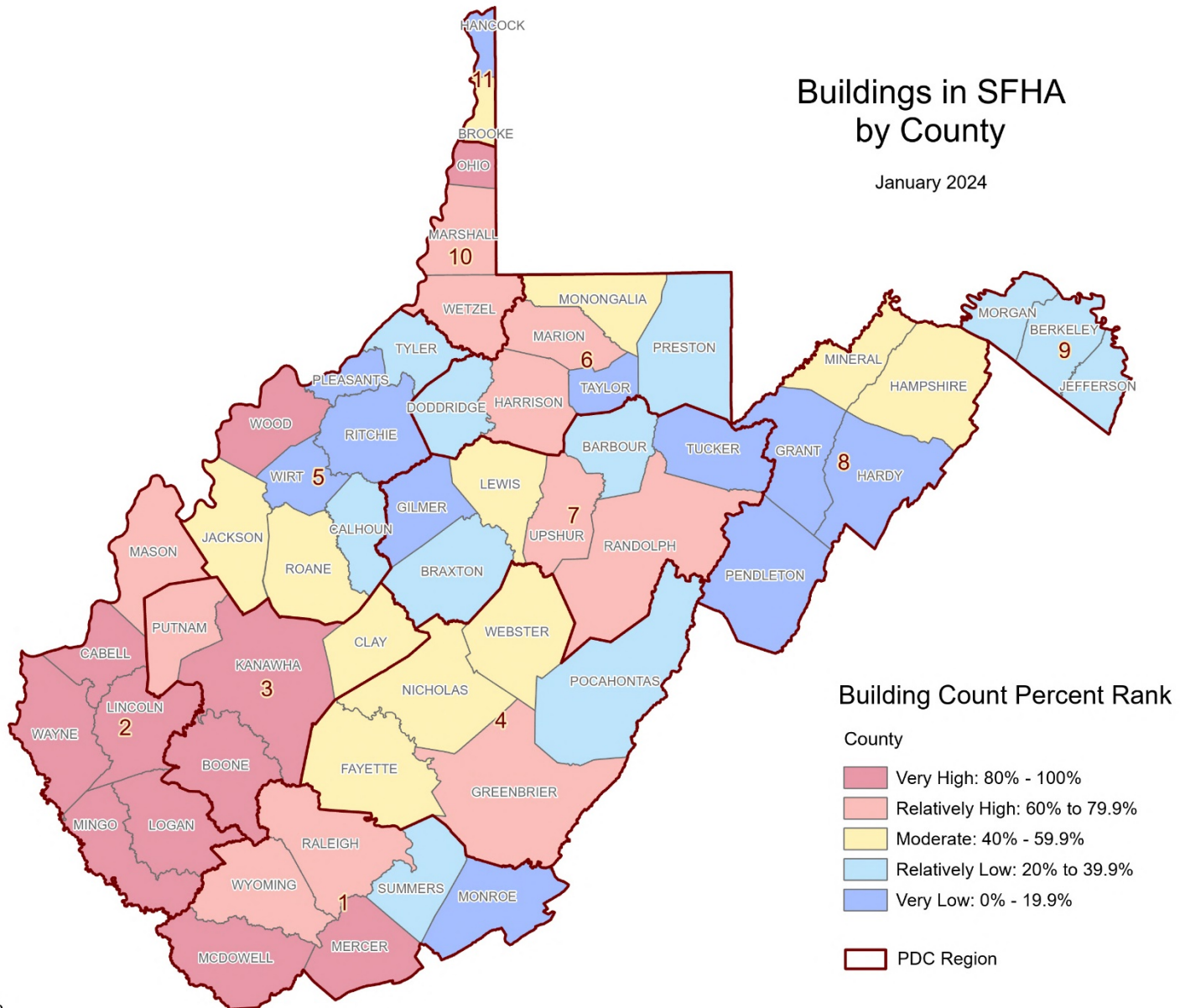
- 12,259
- 2,346 - 4,605
- 1,214 - 2,345
- 741 - 1,213
- 260 - 740

PDC Region

# Building Count in SFHA; Maps

## Buildings in SFHA by County

January 2024



WVGISTC 2024-1-12

Data Source: FEMA's Special Flood Hazard Area (SFHA), Regulatory 1%-annual-chance (100-yr) floodplain

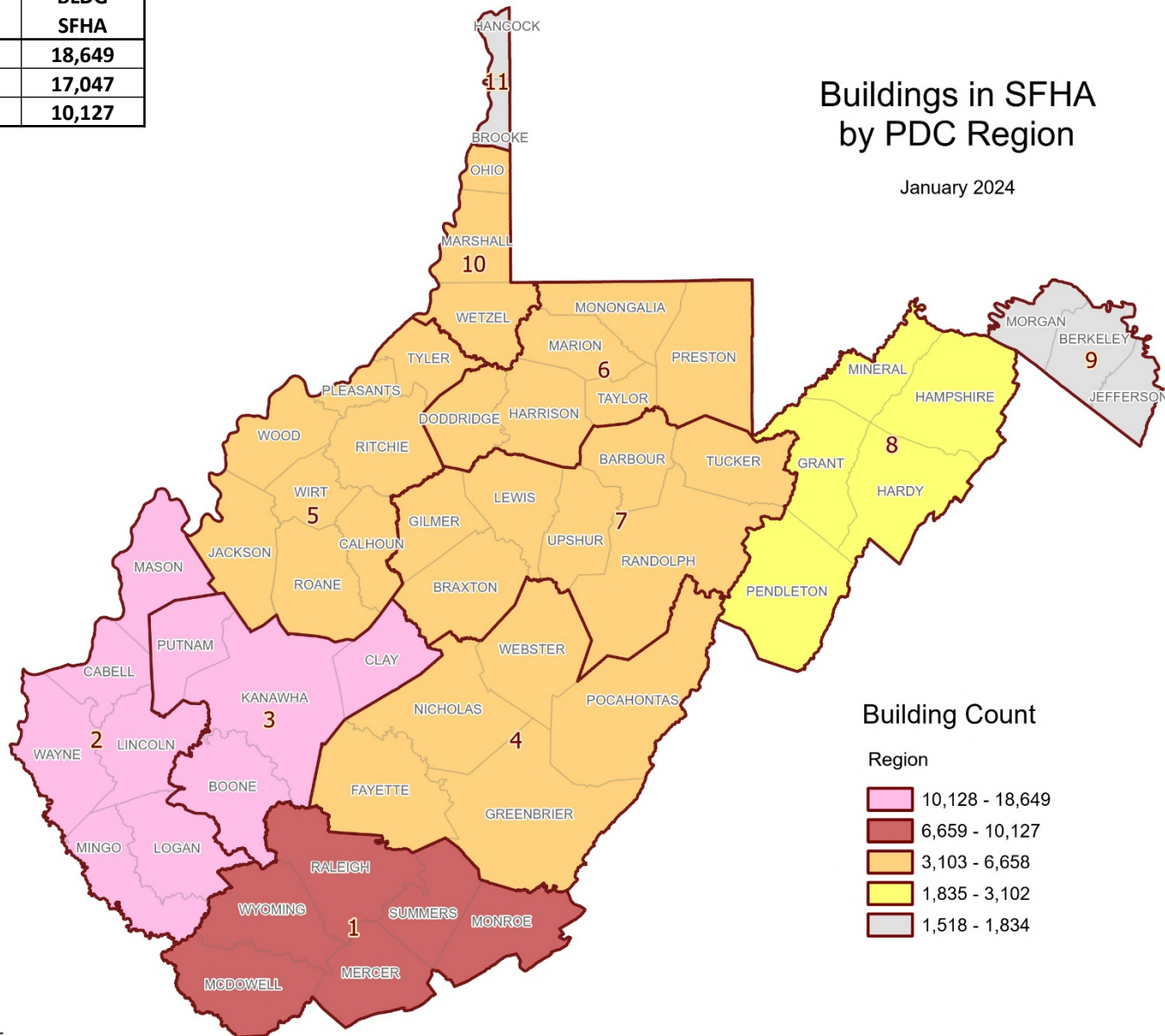


# Building Count in SFHA; Maps

Top 3 Regions	BLDG SFHA
3	18,649
2	17,047
1	10,127

## Buildings in SFHA by PDC Region

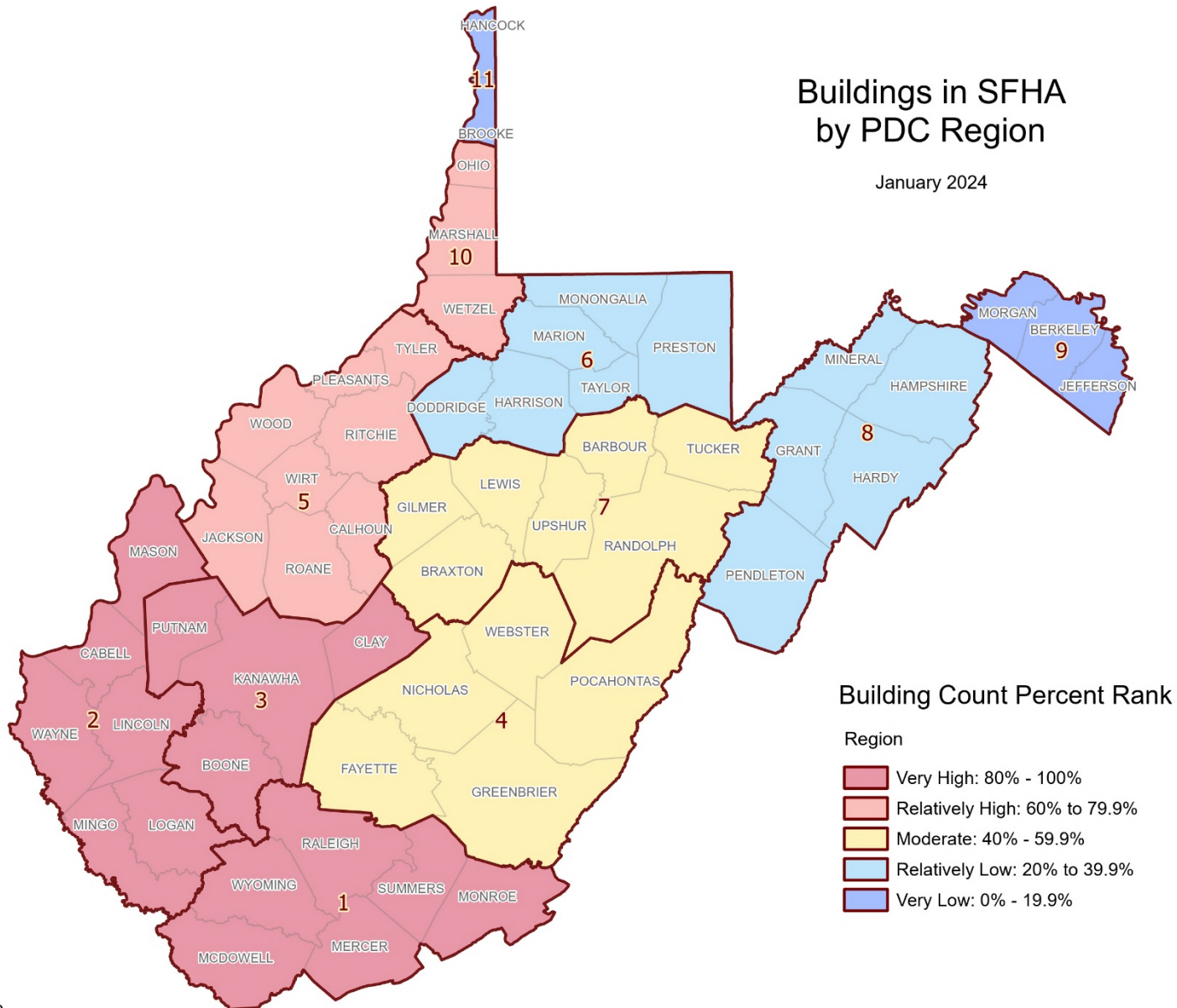
January 2024



# Building Count in SFHA; Maps

## Buildings in SFHA by PDC Region

January 2024



### Building Count Percent Rank

Region

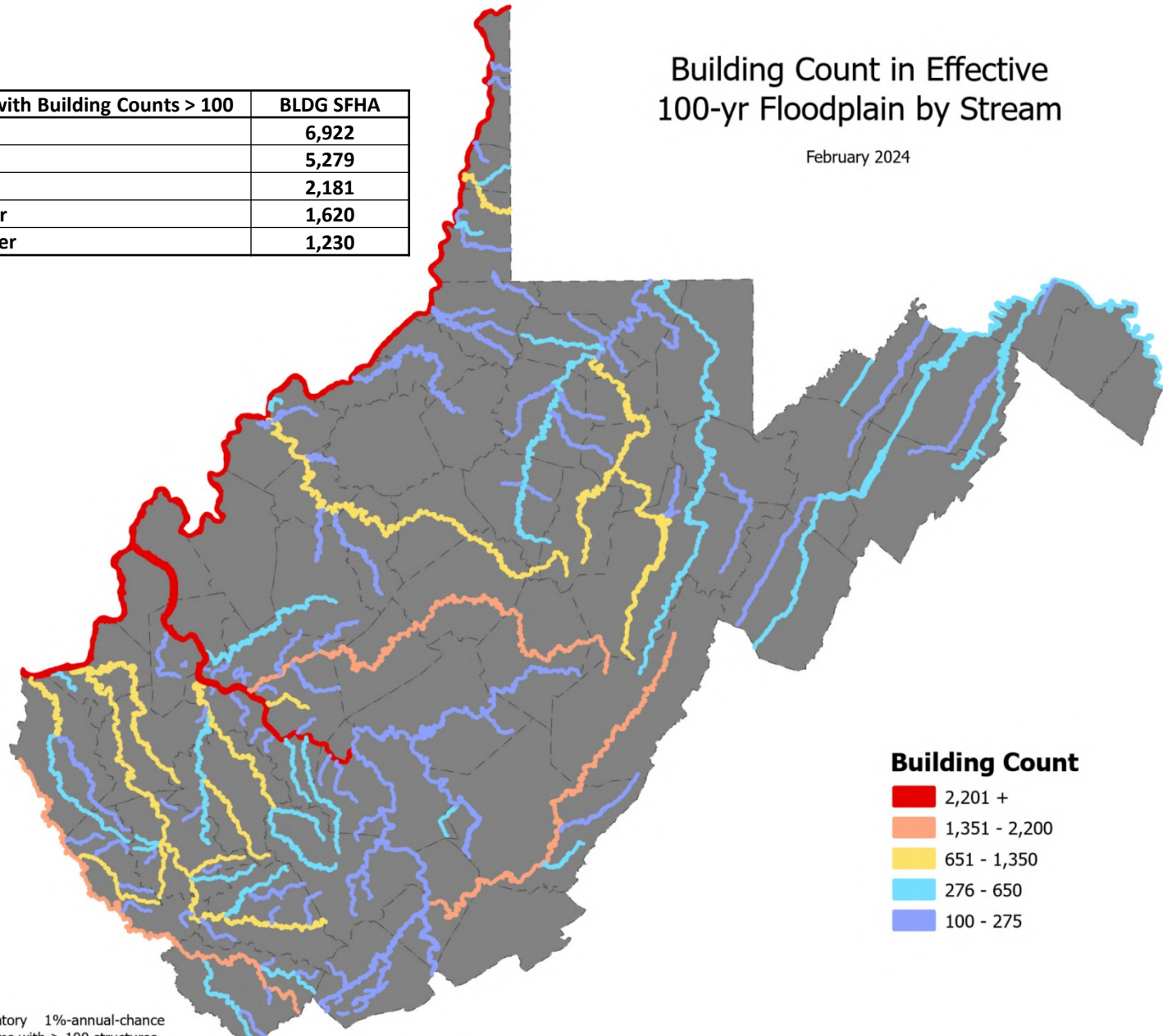
- Very High: 80% - 100%
- Relatively High: 60% to 79.9%
- Moderate: 40% - 59.9%
- Relatively Low: 20% to 39.9%
- Very Low: 0% - 19.9%

# Building Count in High-Risk Floodplain; Maps

## Building Count in Effective 100-yr Floodplain by Stream

February 2024

Top 5 Streams with Building Counts > 100	BLDG SFHA
Ohio River	6,922
Kanawha River	5,279
Elk River	2,181
Greenbrier River	1,620
Guyandotte River	1,230



WVGISTC 2024-2-9

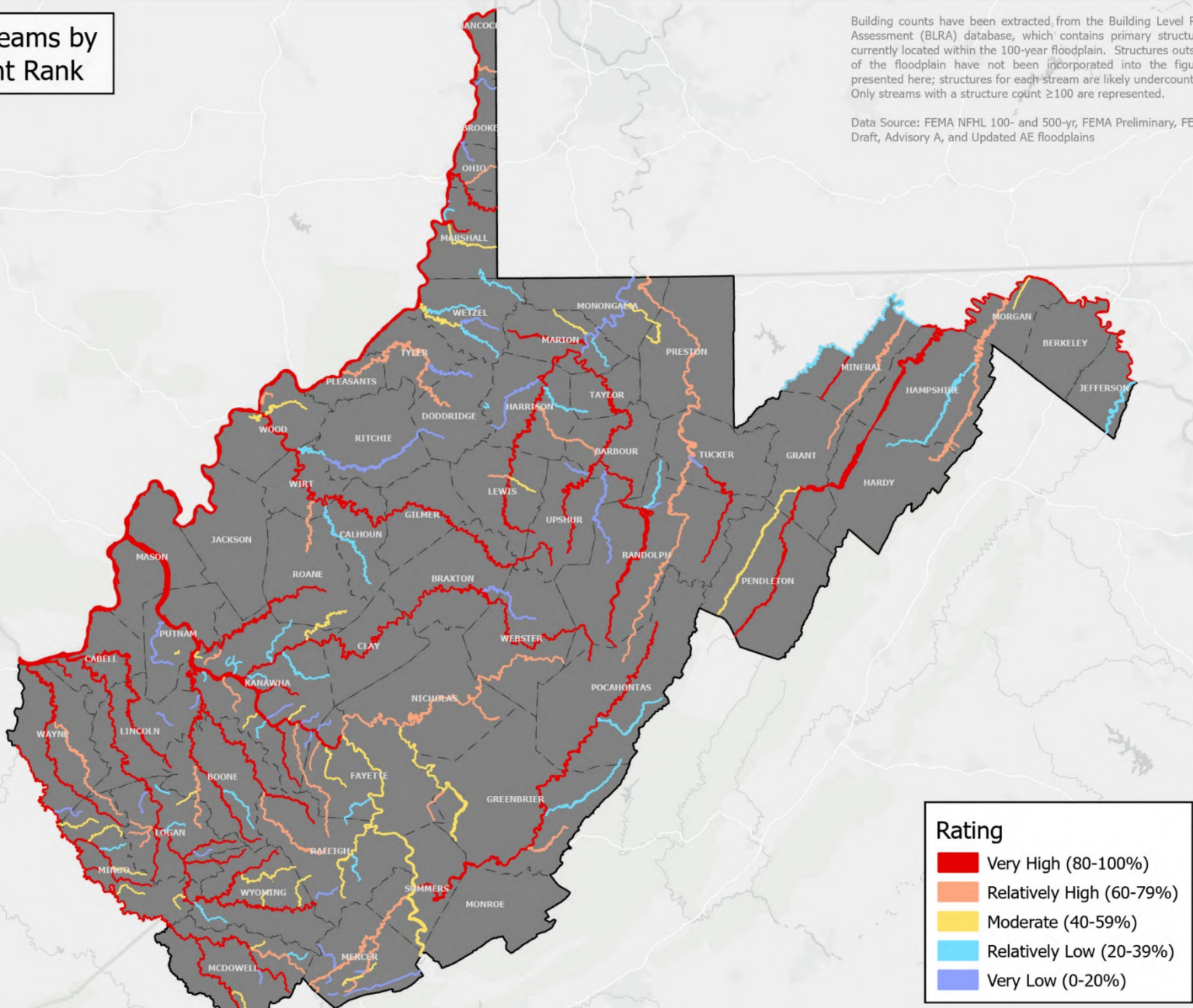
Data Source: Regulatory 1%-annual-chance (100-yr); includes streams with  $\geq 100$  structures

# Building Count in High-Risk Floodplain; Maps

## Top Streams by Percent Rank

Building counts have been extracted from the Building Level Risk Assessment (BLRA) database, which contains primary structures currently located within the 100-year floodplain. Structures outside of the floodplain have not been incorporated into the figures presented here; structures for each stream are likely undercounted. Only streams with a structure count  $\geq 100$  are represented.

Data Source: FEMA NFHL 100- and 500-yr, FEMA Preliminary, FEMA Draft, Advisory A, and Updated AE floodplains

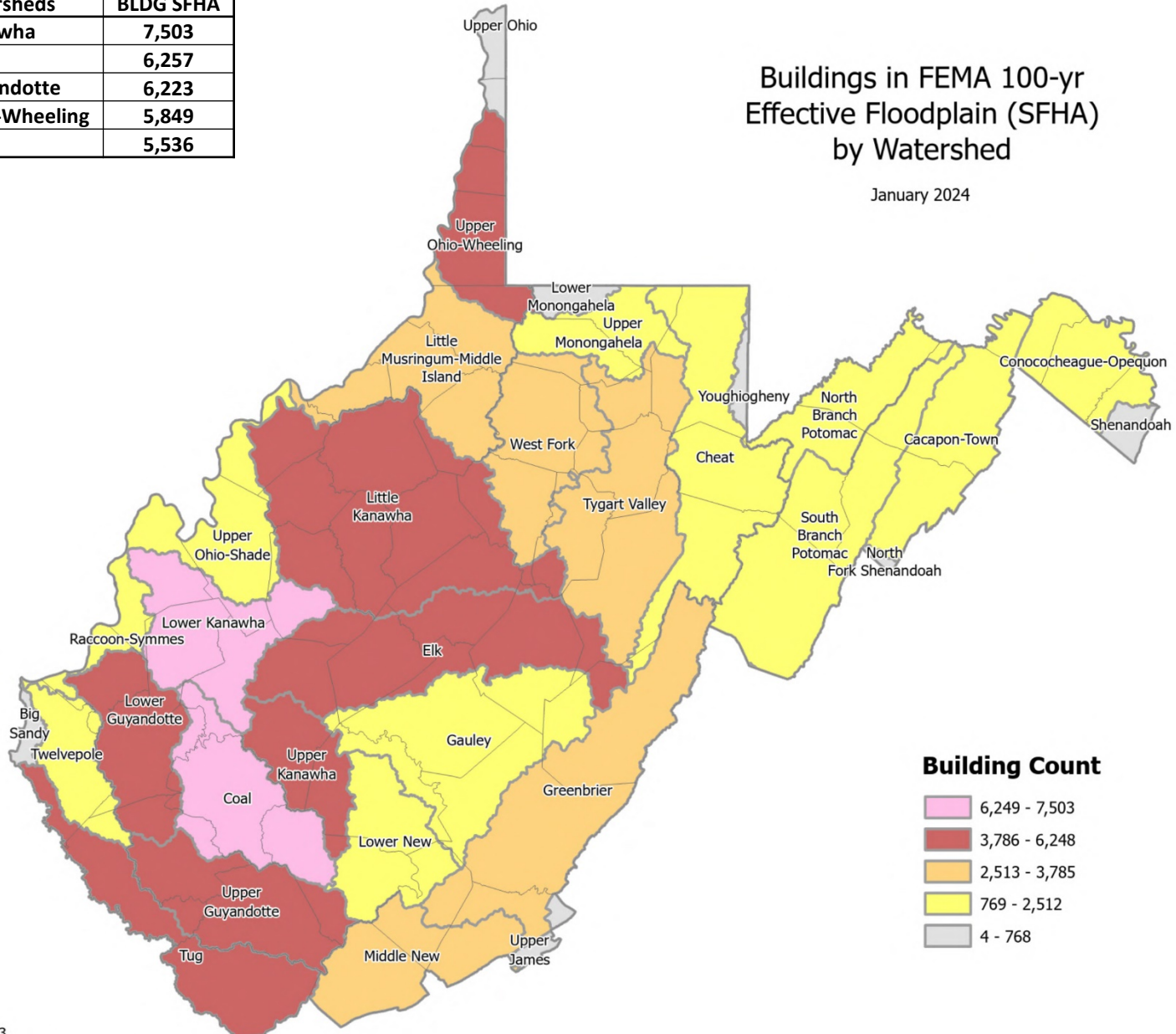


# Building Count in High-Risk Floodplain; Maps

Top 5 Watersheds	BLDG SFHA
Lower Kanawha	7,503
Coal	6,257
Upper Guyandotte	6,223
Upper Ohio-Wheeling	5,849
Tug	5,536

## Buildings in FEMA 100-yr Effective Floodplain (SFHA) by Watershed

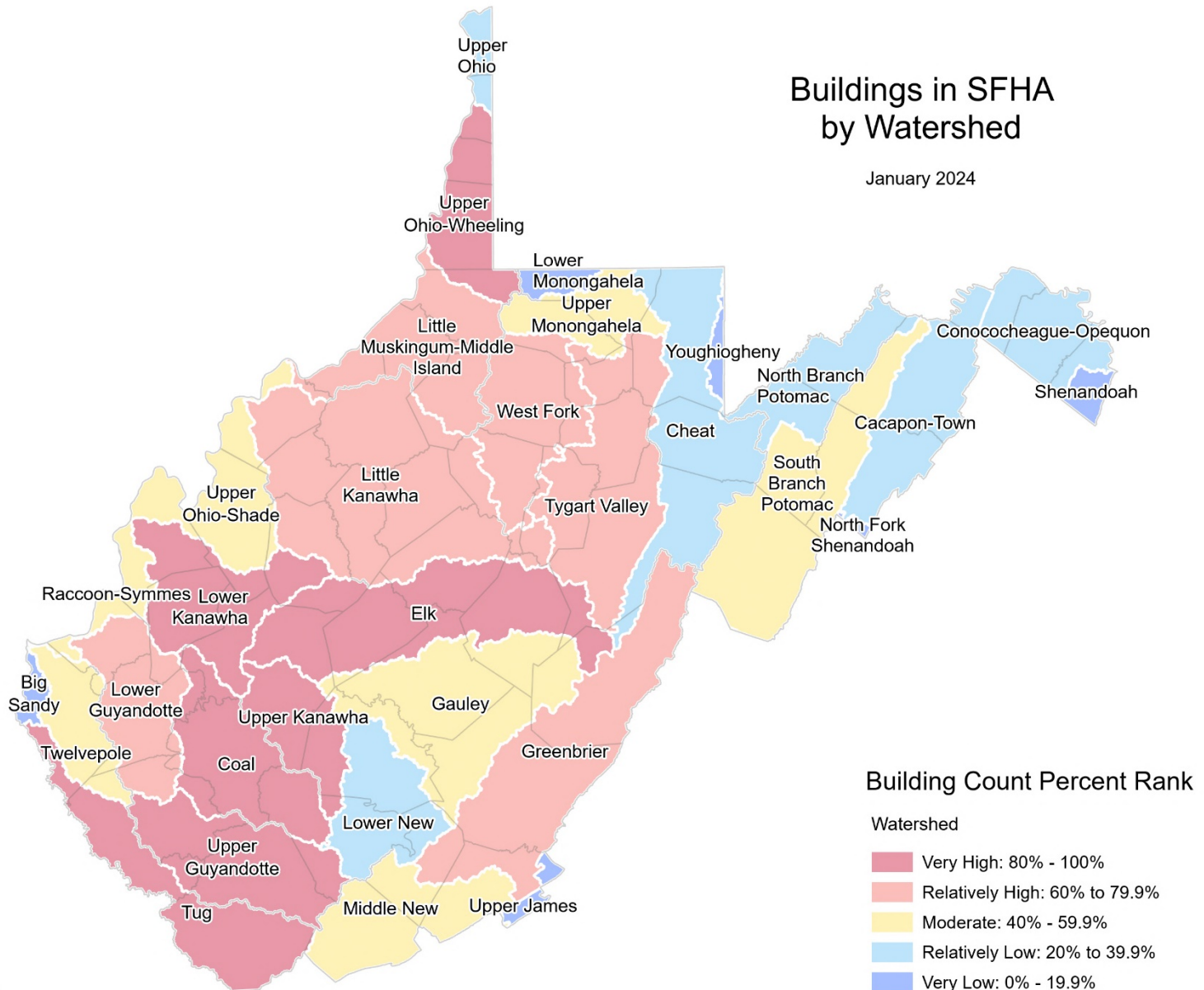
January 2024



# Building Count in High-Risk Floodplain; Maps

## Buildings in SFHA by Watershed

January 2024



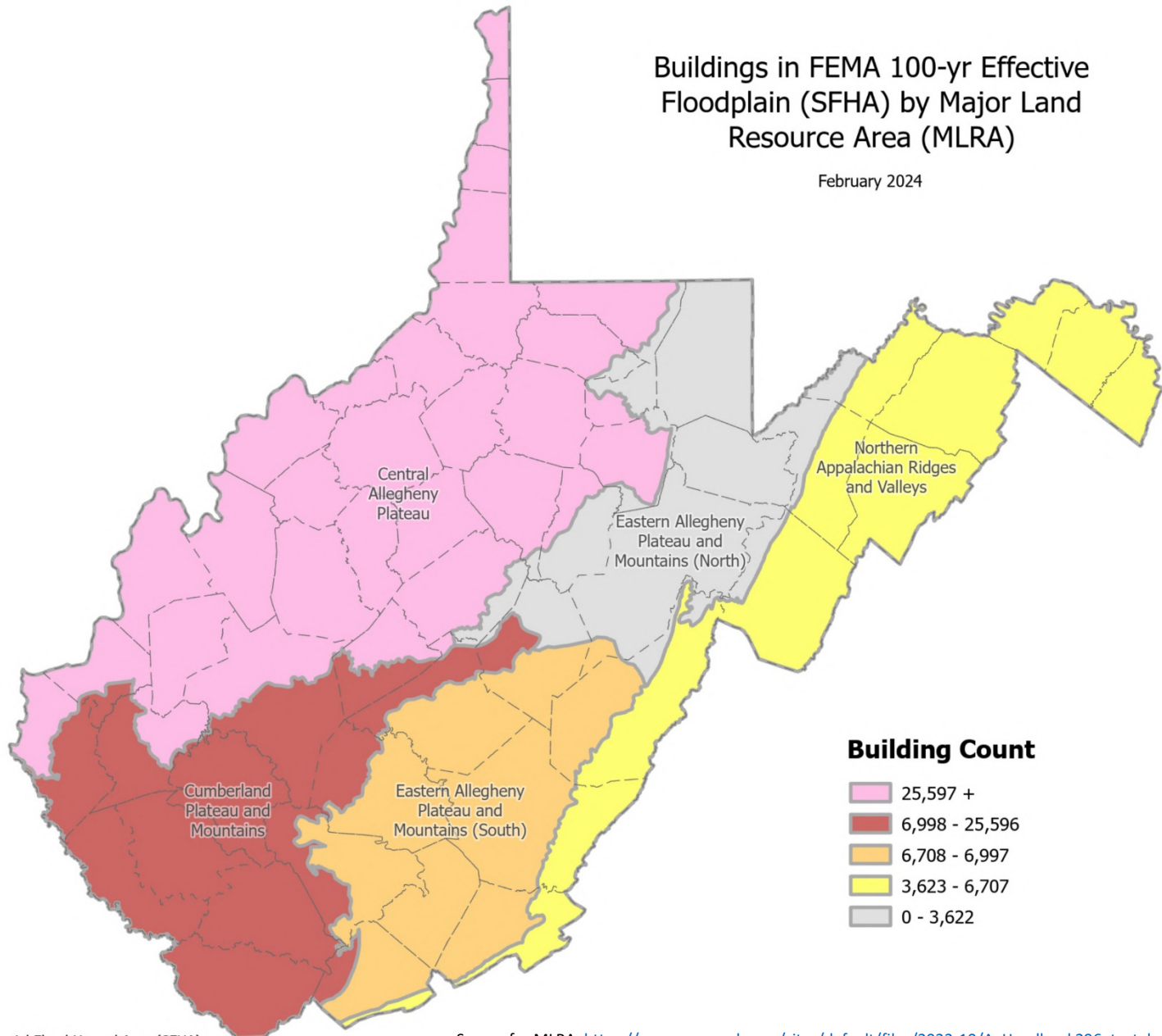
WVGISTC 2024-1-12

Data Source: FEMA's Special Flood Hazard Area (SFHA), Regulatory 1%-annual-chance (100-yr) floodplain

# Building Count in High-Risk Floodplain; Maps

## Buildings in FEMA 100-yr Effective Floodplain (SFHA) by Major Land Resource Area (MLRA)

February 2024



WVGISTC 2024-2-9

Data Source: FEMA's Special Flood Hazard Area (SFHA)

Source for MLRA: [https://www.nrcs.usda.gov/sites/default/files/2022-10/AgHandbook296\\_text\\_low-res.pdf](https://www.nrcs.usda.gov/sites/default/files/2022-10/AgHandbook296_text_low-res.pdf)

# Building Count in SFHA; Exposure Images



Clendenin, June 2016 ([Image link](#))



Rainelle, June 2016 ([Image link](#))



# Building Count in SFHA; Focus Communities

Indicator	White Sulphur Springs	Rainelle	Clendenin	Richwood	Marlinton	Camden-on-Gauley	Statewide Median
Count in Approx. A	0	0	0	0	68	4	0
Count in AE	219	293	301	137	275	17	32
Count in AE Floodway	83	43	1	124	14	0	0
Count in AO	0	0	0	0	0	0	0
Count in AH	0	0	0	0	0	0	0
Count in Detailed Sum	302	336	302	261	289	17	39
<b>Building Count in SFHA</b>	<b>302</b>	<b>336</b>	<b>302</b>	<b>261</b>	<b>357</b>	<b>21</b>	<b>49</b>
<b>Building Count in SFHA Percent Ranks</b>	<b>91.4% (Very High)</b>	<b>94.7% (Very High)</b>	<b>91.4% (Very High)</b>	<b>88.5% (Very High)</b>	<b>95.7% (Very High)</b>	<b>23.8% (Relatively Low)</b>	-

Percent Rank Legend:

- Very High: 80% to 100%  
Red: 90% to 100%
- Relatively High: 60% to 79.9%
- Moderate: 40% to 59.9%
- Relatively Low: 20% to 39.9%
- Very Low: 0% to 19.9%

# Building Count in SFHA; Findings

## Top 10 communities with the highest building counts in SFHA:

BLDG SFHA, Top 10 Communities											
Rank	Community	County	RPDC Region	Approx. A	AE	AE Floodway	AO	AH	Detailed Sum	Effective SFHA Total	Percent Rank
<b>INCORPORATED</b>											
1	<b>Wheeling**</b>	Ohio/Marshall	10	15	176	176	0	0	2,706	<b>2,721</b>	<b>100.0%</b>
2	<b>Charleston</b>	Kanawha	3	261	1,396	22	0	0	1,418	<b>1,679</b>	<b>99.5%</b>
3	<b>Dunbar</b>	Kanawha	3	72	975	1	0	0	976	<b>1,048</b>	<b>99.0%</b>
4	<b>Wellsburg</b>	Brooke	11	0	790	1	0	0	791	<b>791</b>	<b>98.5%</b>
5	<b>New Martinsville</b>	Wetzel	10	0	701	89	0	0	790	<b>790</b>	<b>98.0%</b>
6	<b>Huntington**</b>	Cabell/Wayne	2	4	106	106	0	0	769	<b>773</b>	<b>97.6%</b>
7	<b>Buckhannon</b>	Upshur	7	10	570	18	0	0	588	<b>598</b>	<b>97.1%</b>
8	<b>Milton</b>	Cabell	2	0	382	43	0	0	425	<b>425</b>	<b>96.6%</b>
9	<b>Clarksburg</b>	Harrison	6	0	329	64	0	0	393	<b>393</b>	<b>96.1%</b>
10	<b>Marlinton</b>	Pocahontas	4	68	275	14	0	0	289	<b>357</b>	<b>95.7%</b>

\*\* Split community

Rank	Community	RPDC Region	Approx. A	AE	AE Floodway	AO	AH	Detailed Sum	Effective SFHA Total	Percent Rank
<b>UNINCORPORATED</b>										
1	<b>Kanawha</b>	3	1,962	4,765	1,360	0	0	6,125	<b>8,087</b>	<b>100.0%</b>
2	<b>Logan</b>	2	883	2,541	931	0	0	3,472	<b>4,355</b>	<b>98.1%</b>
3	<b>Mingo</b>	2	848	1,429	395	0	0	1,824	<b>2,672</b>	<b>96.2%</b>
4	<b>Boone</b>	3	575	1,621	419	0	0	2,040	<b>2,615</b>	<b>94.4%</b>
5	<b>Lincoln</b>	2	1,944	442	61	0	0	503	<b>2,447</b>	<b>92.5%</b>
6	<b>Mercer</b>	1	885	998	190	0	0	1,188	<b>2,073</b>	<b>90.7%</b>
7	<b>Raleigh</b>	1	1,215	780	10	0	0	790	<b>2,005</b>	<b>88.8%</b>
8	<b>Wayne</b>	2	670	1,024	222	0	0	1,246	<b>1,916</b>	<b>87.0%</b>
9	<b>Cabell</b>	2	720	917	65	0	0	982	<b>1,702</b>	<b>85.1%</b>
10	<b>Putnam</b>	3	329	1,237	18	0	0	1,255	<b>1,584</b>	<b>83.3%</b>

## Top 5 counties with the highest building counts in SFHA:

Rank	County	RPDC Region	Approx. A	AE	AE Floodway	AO	AH	Detailed Sum	Effective SFHA Total	Percent Rank
1	<b>KANAWHA</b>	3	2,426	8,404	1,429	0	0	9,833	<b>12,259</b>	<b>100.0%</b>
2	<b>LOGAN</b>	2	884	2,785	936	0	0	3,721	<b>4,605</b>	<b>98.1%</b>
3	<b>OHIO</b>	10	426	2,644	190	0	0	2,834	<b>3,260</b>	<b>96.2%</b>
4	<b>BOONE</b>	3	579	2,115	507	0	0	2,622	<b>3,201</b>	<b>94.4%</b>
5	<b>MINGO</b>	2	848	1,711	473	0	0	2,184	<b>3,032</b>	<b>92.5%</b>

# Building Count in SFHA; Findings

## Summary of Findings:

- At the **county level**, **Kanawha County** has the highest number of primary structures located in the effective high-risk (100-year) floodplain or SFHA with 12,259 structures followed by **Logan County** with 4,605 exposed buildings.
- Among all **incorporated communities** in the state, **Wheeling** has the highest number of primary structures located in the effective high-risk (100-year) floodplain or SFHA with 2,721 structures followed by **Charleston** and **Dunbar** with 1,679 and 1,048 exposed buildings, respectively.
- Among all **unincorporated areas** in the state, **Kanawha** is ranked first for the number of primary structures located in the effective high-risk (100-year) floodplain or SFHA with 8,087 structures followed by **Logan Unincorporated Area** with 4,355 exposed buildings.
- At the **stream level**, the **Ohio River** has the highest number of buildings exposed to a 1%-annual-chance (100-year) high-risk flood with 7,257 structures followed by the **Kanawha River** with 6,490 exposed buildings.
- The higher number of primary buildings located in the high-risk floodplain can indicate higher physical and human exposure to such floods which can lead to higher losses.

## Building Count in SFHA Spatial Distribution:

- Counties with the **highest** number of primary structures located in the SFHA are clustered in the **Southwestern part** of the state.

## Focus Communities Highlights:

- **Marlinton** (n=357), **Rainelle** (n= 336), **White Sulphur Springs** (n= 302), and **Clendenin** (n= 302), are among the **top 10% incorporated communities** in terms of the number of primary structures located in the effective high-risk (100-year) floodplain or SFHA.
- **Marlinton** is also among the **top 20% communities (both incorporated and unincorporated)** for the number of primary structures located in the SFHA.
- **Richwood** (n=261) is among the **top 20% incorporated communities** for the number of primary structures located in the SFHA.