

MCDOWELL COUNTY RISK ASSESSMENT with Notes

Compiled by WV GIS Technical Center, 10/31/2024

ENVIRONMENTAL JUSTICE FACTORS*

- McDowell County is the **8th-poorest county** in the U.S., indicating social disparities in environmental exposures and health exist. *Source* [StatsAmerica](#).
- McDowell County has the **highest social vulnerability index** in the state. *Sources* [WV Risk Explorer](#) / [Rationale](#).
- McDowell County's municipalities have the **highest racial minority percentage** in the state. *Source* [Census](#).
- McDowell County is the **4th most racially diverse county** in the state. *Source* [Census](#).
- McDowell County has the **highest percentage of African American flood deaths** in the state. *Sources* [WVFRF Flood Fatality Dashboard](#) and [Newspaper Archives](#).
- McDowell County has the **lowest median household income** (\$28,972) in the nation. *Source* [StatsAmerica](#).
- McDowell County's **geographical area is comprised of 45% by Community Disaster Resiliency Zones** designated by FEMA, the most at-risk and in-need jurisdictions designated by FEMA. *Sources* [WV Hazard Library](#) / [FEMA](#).

FLOOD IMPACT CONDITIONS

- McDowell County has the **third highest cumulative flood risk score** (96%) in the state, signifying greater environmental, physical, and human exposures to flooding. *Sources* [WV Flood Explorer](#) / [Cumulative Flood Risk](#).
 - McDowell County **ranks 1st in the WV Social Vulnerability Index**, a socio-economic resiliency indicator, revealing which communities less likely to recover from a flood disaster quickly and fully. *Source* [WV Risk Explorer](#); same as Item #2 above.
 - McDowell County **ranks 1st in the state with the highest ratio of population at 45% residing in the high-risk floodplains to total population**, since many of the floodprone communities were established in the early-20th century along narrow river valleys and steep mountainsides during the boom of coal mining and timbering extraction industries. *Sources* [WV Risk Explorer](#) / [Rationale](#).
 - McDowell County **ranks 2nd in the building exposure category** that consists of building floodplain count (3rd), building floodway count (3rd), building floodplain ratio (5th), and building density (3rd). *Sources* [WV Risk Explorer](#) / [Building Exposure Indicators](#) / [Rationale](#).
 - McDowell County **ranks 3rd for critical infrastructure** (essential facilities and roads) category vulnerable to flooding. *Sources* [WV Risk Explorer](#) / [Rationale](#).
 - McDowell County **ranks 2nd for non-historical community assets** vulnerable to flooding. *Sources* [WV Risk Explorer](#) / [Rationale](#).
 - McDowell County **8th in building damage loss risk category** and **ranks 6th in previous damage claims**, indicating high building debris and severe environmental impacts associated with flood damage. *Sources*: [WV Risk Explorer](#) / [Damage Loss Indicators](#) / [Rationale](#).
- McDowell County has **four municipalities scoring in the top 10% cumulative flood risk** of all incorporated places in the state. *Sources*: [WV Flood Explorer](#) / [Cumulative Flood Risk](#).
- McDowell County is in the **Tug Fork Watershed** which has a **very high cumulative flood risk** (94%), which **ranks 3rd of 33 watersheds** in the state. *Source* [WV Flood Explorer](#).

- McDowell County has the **Tug Fork** (86%) and **Elkhorn Creek** (84%) in the **top 20%** for cumulative flood risk index score. Source [WV Flood Explorer](#).
- McDowell County is situated in the Ohio River Basin in which **USACE climate change models predict higher stream flows** in the future for central and southern West Virginia. Source [USACE](#).

OPEN SPACE PRESERVATION AND RESILIENT HOUSING

- McDowell County has the **highest number of buyout parcels** of protected floodplain open space in the state. Source [WVFRF Mitigation Buyout Property Dashboard](#).
- McDowell County's **land is largely owned by corporate entities** for the purposes of coal, mineral, and timber extraction. Sources: [WV Property Viewer](#) and [WV Encyclopedia](#).
- McDowell County has the **highest housing vacancy rate** in the state. Source: [WV NRCS Elkhorn Creek EA Plan](#).
- McDowell County has the **highest percentage of dilapidated properties** in the region and state which are environmental and public safety hazards. Sources: [WV Hazard Library](#) and [Region 1 PDC](#).
- McDowell County has **thousands of structures that straight-pipes discharging raw sewage** directly into rivers and streams, affecting water supplies. Source: [WV NRCS Elkhorn Creek EA Plan](#).
- McDowell County has one of the **lowest flood insurance penetration rates** in the state, whereby less than 3% of residential structures in the Special Flood Hazard Area have flood insurance to protect from flood losses. Sources [WV Hazard Library](#) and [FEMA Region 3](#).

**Environmental justice is the fair treatment of all people, regardless of their race, income, national origin, or other characteristics, in the development, implementation, and enforcement of environmental laws, regulations, and policies.*

<< ADDITIONAL NOTES >>

ENVIRONMENTAL JUSTICE FACTORS*

<< Socio-Economic Facts >>

McDowell County is the **8th-poorest county** in the U.S., indicating social disparities in environmental exposures and health exist.

https://www.statsamerica.org/USCP/r_output.aspx?item_set=6069&code_set=0&geo_set=54047&time_set=uspr_pov_year1&element_type=1&rank_type=D

<https://www.reconnectingmcdowell.org/about-us/about-reconnecting-mcdowell> (?)

McDowell County has the **highest social vulnerability index** in the state based on eight socioeconomic and demographic indicators. The select indicators are economic factors (Poverty Rate, Unemployment Rate), population characteristics (Vulnerable Ages Rate, Disability Rate, Population without a High School Education, Population Change), and housing (Median Housing Unit Value, Mobile Homes as Percentage of Housing). A community with a higher social vulnerability is less likely to be able to recover from flood and other disasters quickly and fully.

https://www.wvfrf.org/wvre/report/?scaleid=3&entityid=all&type=comparison&highlight=27#Table1_3
https://data.wvgis.wvu.edu/pub/RA/RI/WVRE/DOCS/WVRE_TechnicalDoc.pdf#page=29

McDowell County's **median household income** (2022) of \$28,972 is the lowest of all 3,143 counties in the nation, and thus a challenge for local communities to identify affordable, resilient, and energy-efficient housing outside of high-risk flood zones.

https://www.statsamerica.org/USCP/r_output.aspx?item_set=6066&code_set=0&geo_set=54047&time_set=uspr_med_inc1&element_type=1&rank_type=D

<< Minority Population Facts >>

McDowell County has the top three incorporated places in the state with the **highest racial minority percentage**: Northfork (66.7%), Keystone (64.2%), and Kimball (63.4%). These are the only three incorporated place communities in West Virginia where the minority population is the majority representation. Source: Census.

McDowell County is the **4th most racially diverse county** in the State. (Source: Census). There was a high influx of African Americans migrating to Southern West Virginia in the early 20th century to work in the coal industry.

McDowell County has a **higher percentage of African American flood deaths** in the state. Historically, black miners were frequently assigned the most hazardous and physically demanding jobs in coal mines, often working longer hours compared to their white counterparts due to systemic racism and discriminatory practices within the industry. Historically, low-quality housing and shanties of coal camps were built near the rivers and creeks, and thus highly exposed to flooding disasters. In June 1901, more than 40 people who lost their lives to flooding along tributaries of the Tug Fork River. A majority of the victims were African Americans living in the coal communities of Keystone and Northfork in the Elkhorn Creek Valley.

[WVFRF Flood Fatality Dashboard](#)

<< **FEMA Community Disaster Resiliency Zones** >>

McDowell County's **geographic area is comprised of 45% by Community Disaster Resiliency Zones** designated by FEMA, the most at-risk and in-need jurisdictions designated by FEMA.

<https://www.fema.gov/partnerships/community-disaster-resilience-zones>

https://data.wvgis.wvu.edu/pub/RA/HL/RA-L/GRAPHIC/RF7_PS3_3CTY_FEMA-Disaster-Res-Zones_McDowell_2024.pdf

<< WV Poort Health >>

<https://dhhr.wv.gov/HSC/SS/BRFSS/Pages/BRFSS.aspx#:~:text=West%20Virginia%20also%20ranked%20highest,poor%20physical%20or%20mental%20health.&text=The%20prevalence%20of%20obesity%20in,the%20highest%20in%20the%20nation.>

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FLOOD IMPACT CONDITIONS

<< FLOOD IMPACT FACTS >>

A statewide flood risk of 25 human and physical flood factors of reveals that **McDowell County ranks 3rd of 55 counties in the state with a Cumulative Flood Risk Score of 96.2%**. The county has the highest ratio of population residing in the high-risk floodplains at 45%, since the only inhabitable areas in McDowell County are narrow riverine valley bottomlands bounded by steep mountain slopes. More people residing in floodplains means higher human exposure to floods causing higher human loss. Besides a large percentage of the population residing in the high-risk flood areas, the building exposures and densities are among the highest in the state at a 98.1% ranking. Additionally, the essential facilities, community assets, and the road network have an extremely high exposure to riverine flooding. Additionally, building damage loss and severe environmental impact estimates from floods are a high concern in which debris and contaminants pollute the soil and water during major flood events. A higher ratio of buildings in the floodplain to total buildings signifies a greater physical and human exposure to flooding, including significant hazards to the environment.

<https://wvfrf.org/wvre/report/?scaleid=6&entityid=all&type=comparison>
<https://wvfrf.org/wvre/report/?scaleid=3&entityid=27&type=all>

Of 229 incorporated places in the state, the McDowell County towns of Kimball (ranked 5th), Northfork (8th), Keystone (13th), Gary (15th), and Welch (22nd) are in the **top 10% of all flood risk factors**

<https://wvfrf.org/wvre/report/?scaleid=5&entityid=128,150,177,198,224,230,231,269,331,335&type=comparison>

<< Climate Change Models >>

McDowell County is situated in the Ohio River Basin in which **USACE climate change models predict higher stream flows** in the future for central and southern West Virginia.

USACE Ohio River Basin Climate Change Models (Figure 1) forecast substantial stream flow increases for West Virginia. According to the report, watershed sub-basins located northeast, east, and south of the Ohio River are expected to experience greater precipitation and thus higher stream flows – up to 50% greater – during the period 2011-2099.

USACE forecast models predict higher stream flows in the future for central and southern West Virginia.

USACE Ohio River Basin Climate Change Models (Figure 1) forecast substantial stream flow increases for West Virginia. According to the report, watershed sub-basins located northeast, east, and south of the Ohio River are expected to experience greater precipitation and thus higher stream flows – up to 50% greater – during the period 2011-2099.

https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=339719

McDowell County has the **Tug Fork** (86%) and **Elkhorn Creek** (84%) in the **top 20%** for cumulative flood risk index score.

<https://wvfrf.org/wvre/report/?scaleid=8&entityid=384,392,496&type=comparison>

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OPEN SPACE PRESERVATION AND RESILIENT HOUSING

**** DILAPIDATED PROPERTIES, AFFORDABLE HOUSING, AND ENVIRONMENTAL IMPACT CONDITIONS ****

<< Dilapidated Properties and Affordable Housing Facts >>

McDowell County has the **highest percentage of dilapidated properties** in the region and state. A property inventory conducted by the Region 1 Planning and Development Council in 2020 identified nearly 1,000 uninhabited dilapidated structures that pose environmental and public safety hazards. Unabated asbestos and other toxins pose environmental hazards to the water quality and soils. Although McDowell County currently lacks a formal code enforcement program or inventory of vacant and uninhabitable structures, many structures appear uninhabitable due to visible evidence of structural decay, prior flooding impacts, and fire damage.

Region 1 Dilapidated Properties Inventory:

<https://region1.maps.arcgis.com/apps/dashboards/d2eb35e7f4a64d3e96bfd977dd3727d>

https://data.wvgis.wvu.edu/pub/RA/HL/MIT/graphic/MIT_Dilapidated-Properties_McDowell_CDRZ.pdf

More than 60% of land ownership in McDowell County is owned by corporations.

“In the southern coalfields, land ownership is concentrated among corporations, with companies owning more than three-fourths of the surface acreage of Wyoming County and more than 60 percent of McDowell County and neighboring Logan County.”

<https://www.wvencyclopedia.org/entries/1247#:~:text=In%20the%20southern%20coalfields%2C%20land,County%20and%20neighboring%20Logan%20County.>

"Land in McDowell County is largely owned by corporate entities for the purposes of coal, mineral, and timber extraction. Corporate land is held as a long-term investment, typically irrespective of current market conditions for coal or timber. As a result, land outside the floodplain is generally unavailable to local residents, preventing new home construction elsewhere in the Elkhorn/Tug Fork Watershed. Existing housing is subject to repeated flooding and remains so, with few options to move to flood-free areas. The lack of access to developable land is a concern for local sponsors and an impediment to comprehensive community planning."

<https://www.nrcs.usda.gov/sites/default/files/2022-11/WV-Elkhorn%20Creek-Final%20EA%20Plan.pdf#page=37>

"McDowell County has the **highest housing vacancy rate** in West Virginia. According to the 2017 American Community Survey estimates, 31.4%, or roughly 3,500 of the county's 11,228 housing units, were vacant. By contrast, the statewide housing vacancy rate is 17%, while the national average is 12%. The City of Keystone, which is within the Elkhorn/Tug Fork Watershed, has the highest vacancy rate in the county, with 71% of all housing units being categorized as "vacant." Vacant units include both habitable and uninhabitable structures."

<https://www.nrcs.usda.gov/sites/default/files/2022-11/WV-Elkhorn%20Creek-Final%20EA%20Plan.pdf#page=37>

Due to repetitive flooding, McDowell County has the **highest number of buyout parcels** of protected open space in the state to restore floodplains and watersheds to their natural state. Currently there are active voluntary buyout programs in McDowell County sponsored by multiple federal agencies. Although acquiring buyouts or removing dilapidated structures and restores the land and water ways to their natural state, the strict land use management restrictions imposed result in less suitable flat lands in mountainous McDowell County for public housing.

<https://wvfrf.org/wvre/dashboard/?link=https://wvu.maps.arcgis.com/apps/dashboards/83e1bdae8f7d4780940d3d6bccd92719>

<< Water Quality Environmental Impact Factors >>

Beyond the severe threat to life and property posed by floods and flood impacts in the Elkhorn/Tug Fork Watershed, the lack of wastewater infrastructure also results in a water resource challenge for the area's residents. According to the McDowell County Coalition 2005 Wastewater Treatment Plan, "approximately 7,480 homes in McDowell County have inadequate wastewater treatment, and the vast majority of these are **straight-pipes discharging waste directly into rivers and streams.**" Raw sewage being discharged into waterways by straight-piping has been identified as "the biggest threat in water supplies throughout southern West Virginia . . . by a long shot."

<https://www.nrcs.usda.gov/sites/default/files/2022-11/WV-Elkhorn%20Creek-Final%20EA%20Plan.pdf#page=30>

"Along the entire length, Elkhorn Creek is plagued with **raw sewage discharge** and household garbage. Many segments of the Tug Fork are the same. Fish and wildlife habitats suffer as a result. Elkhorn Creek, however, boasts an unusual population of rainbow and brown trout. Owing to consistently cool discharges from old coal mines, these fish populations are able to spawn naturally."

<https://www.nrcs.usda.gov/sites/default/files/2022-11/WV-Elkhorn%20Creek-Final%20EA%20Plan.pdf#page=33>

<< Flood Insurance >>

Additionally, the higher cost of flood insurance required for federally backed loans in the Special Flood Hazard Areas is an additional challenge for most low-income residents.

McDowell County has one of the **lowest flood insurance penetration rates** in the state, whereby less than 3% of residential structures in the Special Flood Hazard Area have flood insurance to protect from flood losses.

<https://experience.arcgis.com/experience/2e5b9333487e4a818a8c35881f843ba6/page/Page/?views=About%2CCounty-Level>

https://data.wvgis.wvu.edu/pub/RA/HL/MIT/Insurance/INS_NFIP_3CTY_NFIP-penetration-rate_NatBrk_2024.pdf