

waterfrontline

The water's edge is the front line.

Eastern Kentucky: Life Inside the Vicious Cycle. Magoffin, Floyd, Pike, Johnson, Harlan, and Breathitt counties, plus an appearance by western counties Hickman & Fulton. 2019.

What happens when a contributing factor to the environmental risk a community faces is considered to be a downstream outcome of the major local businesses?

Let's say you lived in a small valley with steep sloped walls topped with narrow ridges. Each sloped wall, at its peak, immediately descends down the other side to another similar valley.



Now, take your typical annual rainfall, but instead of getting it spread out in regular showers get it in irregular torrents, with more time between downpours.

What if the periods between those torrents, in addition to being longer than before, were also hotter than before, killing vegetation whose roots held the soil together — both in the valley and on the steep slopes of the mountainsides that frame it?

In that scenario, with the sun-baked surfaces less likely to support root systems that would hold varied rock structures together — where would be the worst place to be when it rained?

In the small towns of the coal country areas of Appalachia, mudslides and rockslides are battling with flash floods for supremacy as dangers to the lives and livelihoods there.

Eastern Kentucky — Pike, Floyd, Magoffin, Breathitt, Johnson, and other counties in the area — has been particularly hard hit. As with rising waters, landslides and mudslides hit the hardest against the most vulnerable communities first. In Kentucky's Magoffin County (population 13,333) the median income is under \$30,000 (https://en.wikipedia.org/wiki/Magoffin_County,_Kentucky). Homeowners there who lose their homes, or their access to their jobs, suffer disproportionate impact from losses. They can't afford to miss work because the road is out; they need the paycheck for their cash flow for housing and basic life necessities. There are few industries to choose from in the immediate area, leading to the continued cycle of coal extraction at work in neighboring counties that ultimately reinforces fossil fuel usage, and therefore the climate changes resulting from fossil fuel burning that then impacts the residents there. It is a self-reinforcing feedback loop with negative consequences: a vicious cycle.



The county seat of Magoffin County is Salyersville, population 1,883. In February 2019, it was dealing with a downpour: local flooding, local roads washed out, and the closure of Mountain Parkway, the major route to Breathitt County (major employers: Arch Coal and US Coal, https://en.wikipedia.org/wiki/Breathitt_County,_Kentucky#Coal_companies). (Below: see <https://www.salyersvilleindependent.com/magoffin-devastated-flood>. Copyright the Salyersville Independent:)

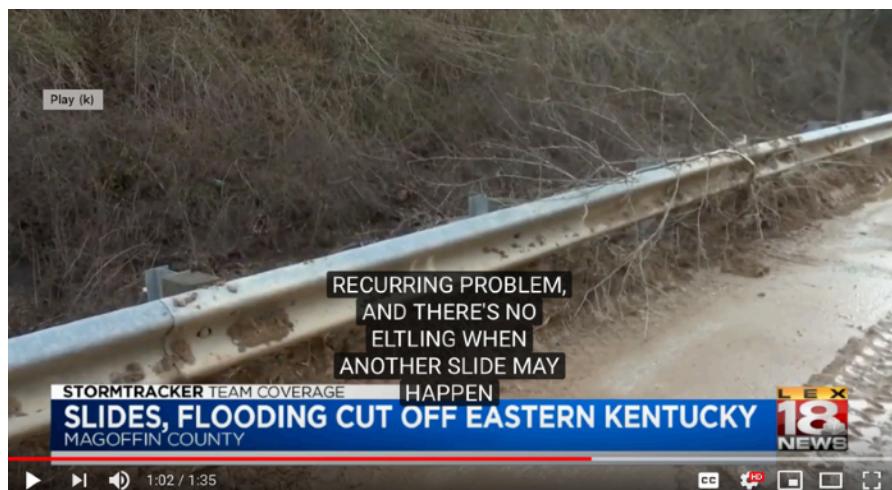
MAGOFFIN – As the region was pummeled with rain over the weekend, widespread flooding, mudslides, and road damages led to a state of emergency being called for the county, as well as the state.

With the ground already saturated, when the hard rains hit on Saturday, the water had nowhere to go but up. By 9 p.m. on Saturday, February 23, at least eight roads were reported as having water over the road or blocked by mudslides, including the Mountain Parkway, which was shut down at mile marker 66. By 10 p.m., authorities were urging residents to stay off the roadway and by 11:30 p.m. Magoffin County Judge-Executive Matt Wireman had declared a state of emergency for Magoffin County.

Around 2 a.m. on February 24, crews started evacuating residents at the Salyersville Nursing Home. At that point, all roads were deemed impassable.

By 8 p.m. Sunday over 30 roads were still impassable, but the water was receding. The nursing home residents were back in the facility by late Sunday night, with no damage reported where the residents stay.

The local news report (<https://www.youtube.com/watch?v=CyLVWr9APvs&feature=youtu.be>) included shots from the Mountain Parkway site, noting it was a recurring problem:



This is the hill at mile marker 66 on the parkway the news report refers to as a repeat offender, in drier times (screen shot from Google Street View and Google Maps):



In that same set of storms, there was a rock slide in neighboring Pike County. As captured in its aftermath (see <https://youtu.be/BwzVn4zkIwg>), two massive boulders broke off and fell onto a car at an auto business. (Screen shot from video below)

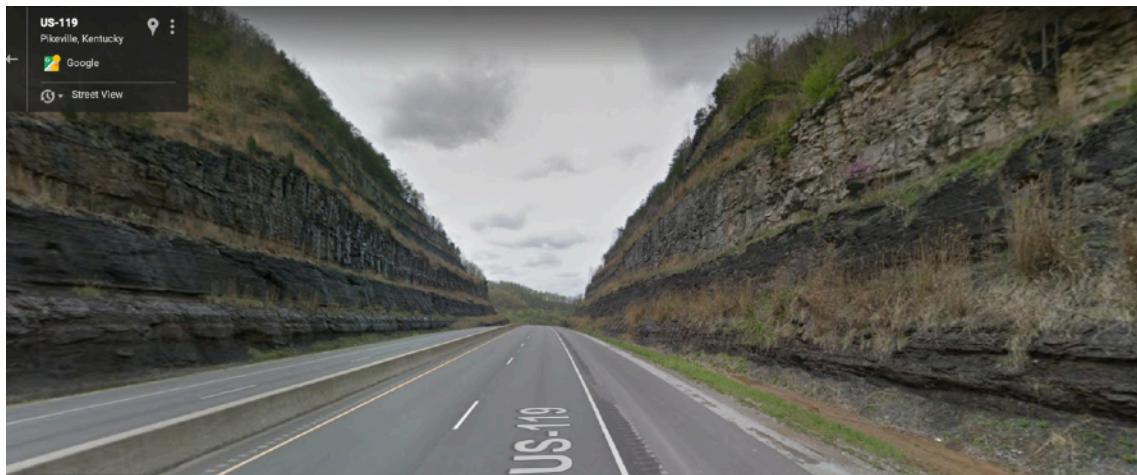


From the National Weather Service (https://www.weather.gov/jkl/201902_flood): “Other impacts included countless roads being inundated with standing water, pavement and water pipes breaking, water threatening homes, roads and bridges being washed away, and rising lake levels. Of the the 33 counties across eastern Kentucky, at least 27 were forced to declare States of Emergencies due to rainfall during and before this event.”

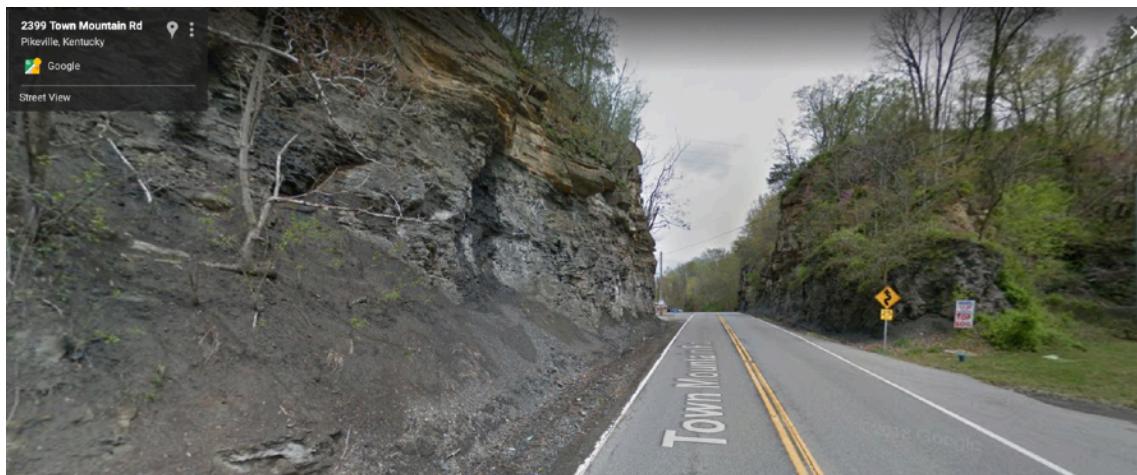
With an event of this wide an impact, everything is liable to be damaged. A county that could be spending money on incubating new businesses is instead replacing flooded school buses and municipal trucks: (screenshot from video at <https://youtu.be/fWMFRJOsvZ0?t=46>)



The changes in climate and storm structure could be expected to make living in an area with steep slopes and narrow ridges inherently more dangerous. There are many local highways that look like this (*from Google Maps Street View*):



and this:



on which people commute to work, go to the hospital, go to the store, or pick up their children from day care.

Over in Harlan County — where the fight to unionize the miners led to an Oscar-winning documentary (see trailer at <https://youtu.be/6PfaE4R4eA4>) — a state of emergency declaration had been issued earlier that February. As described by the county judge executive (see <https://www.wtvq.com/2019/02/07/harlan-county-declares-state-of-emergency-mudslide/>), “the county has expressed concerns to highway officials over the last several weeks about the area due to reports of debris falling at different times and damaging vehicles.”

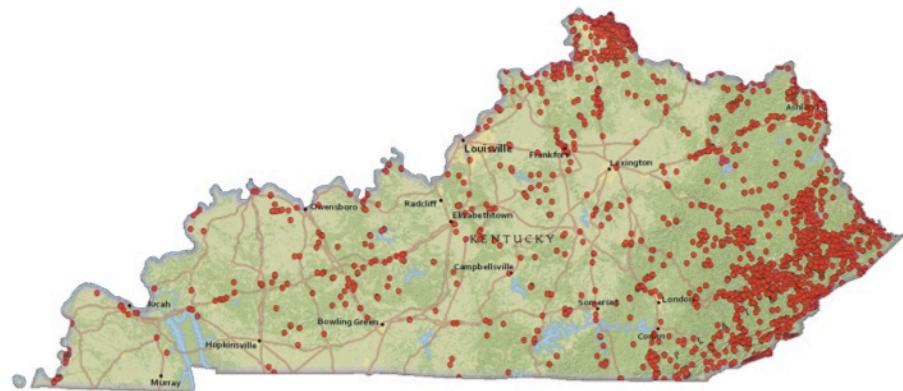
Clearing both lanes of Harlan’s Highway 72 took a month (see <https://www.wymt.com/content/news/Harlan-County-Judge-Executive-declares-State-of-Emergency-505508131.html>) during which the isolated residents suffered power outages due to trees taking out power lines.

More than a month later, Kentucky 72 back open to two lanes



By [Kyle Collier](#) | Posted: Thu 12:00 PM, Feb 07, 2019 | Updated: Mon 7:05 PM, Mar 25, 2019

If the current landscape and infrastructure suffers increasingly severe bursts of storms, that would add significant risk for the people there. To quantify that risk, the Kentucky Geological Survey (KGS) logged known landslides. The KGS site, <https://www.uky.edu/KGS/landslide/>, includes this map of the locations of past events:



Locations of selected known landslides in Kentucky. Although exact costs have not been documented, landslides affect roads, buildings, pipelines, private residences, and other parts of the built environment. Direct costs such as repair and maintenance exceed \$10 million per year, and indirect costs may exceed direct costs but are difficult to quantify. With a good landslide inventory, citizens can begin to understand landslides processes, assess risk, and prevent damage from the threats landslides pose.

The events featured in this article are in the southeastern portion of the state where those dots are clustered, which is where you'll find the Appalachian mountains and the coal mines. Next, the KGS performed a detailed analysis of rock geology, slope maps, and past events to forecast susceptibility to future landslides and rockslides: (as reported in <https://kyem.ky.gov/recovery/Documents/CK-EHMP%202018,%20S3-S6,%20Risk%20Assessment,%20Hazard%20Identification,%207,%20Landslides,%20Revised%20Submittal.pdf>). Very little of the state is rated Moderate; in Kentucky, it's mostly either green or red.

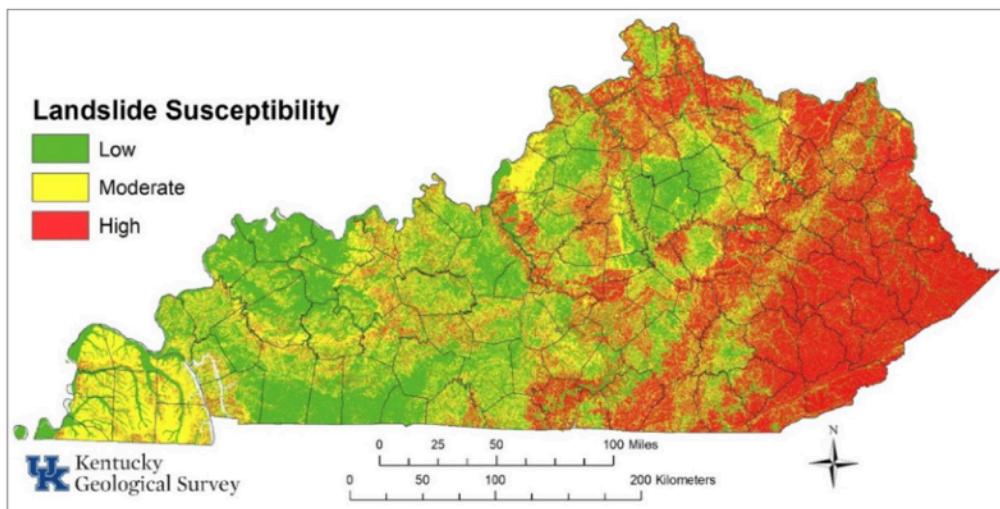


Figure 2-8. Landslide susceptibility of Kentucky. County outlines are in gray.

The KGS team then compared the land's susceptibility to those events to the population density in each area to determine a vulnerability risk for the local populations:

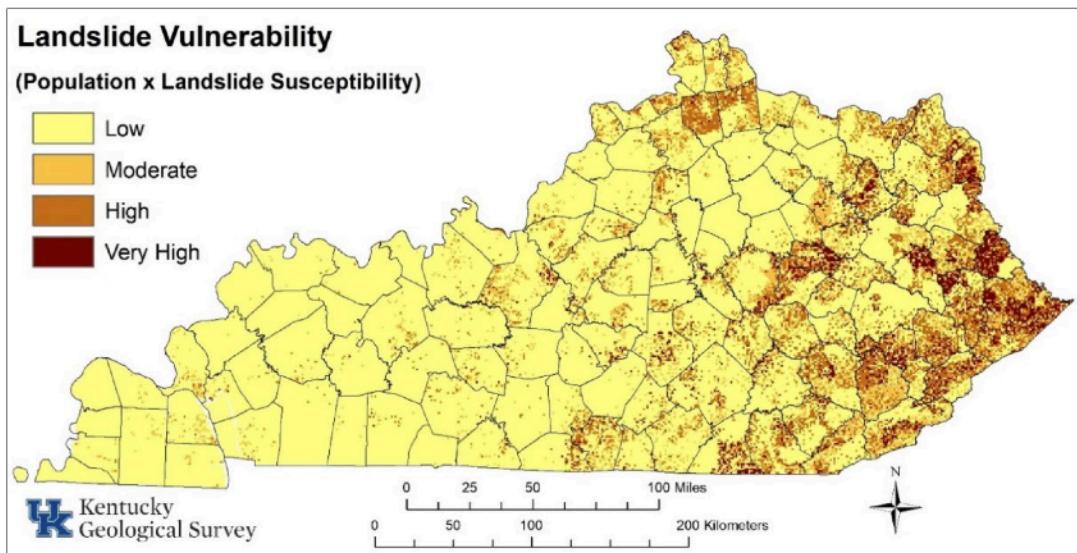


Figure 2-9. Landslide vulnerability in Kentucky. County outlines are in gray. Darker colors indicate areas of high population and high landslide susceptibility; lighter colors indicate low population and low to moderate susceptibility.

The report emphasizes that although the risk vulnerability is for future events, there was not a consensus among the governing groups regarding predicting such events or their number or frequency.

While the regional authorities discuss the risk forecasts and prioritize and plan mitigations for the risks that have been identified, here are three final things to consider.

Landslide in Hickman, KY inches closer to church buildings

1. This is from the southwestern corner of the state, marked as a Low probability area (screenshot from <https://www.kfvs12.com/2019/02/21/heavy-rain-causes-landslide-hickman-ky/>)



2. From the KGS report, the annual average number of landslides in Kentucky: "Based on documented landslides in the Kentucky Geological Survey landslide inventory from 2009–17, 859 landslides/9 years = 95.4."
3. Although this article has focused on landslides, don't underestimate the dangers of flash floods in these valleys. This video from 2015 is from Paintsville, the county seat of Johnson County.

Spend 25 seconds with the sound on: <https://youtu.be/d6gmHihj3P8>.

This is the front line.

