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WV's past steeped in lethal floodwaters; more frequent events expected in future

By Rick Steelhammer Staff writer

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It killed 23 people, pushed rivers to record and near-record heights and caused an estimated \$1.1 billion in property loss, but the flash-flooding from torrential thunderstorms in West Virginia's Greenbrier, Elk and Gauley river basins five years ago this month was not an anomaly.

Eight previous West Virginia floods triggered by similar summer thunderstorms each killed 20 or more people, with five of the floods equaling or surpassing the death toll from 2016, according to Steve Kite, professor emeritus and former chairman of West Virginia University's Department of Geography and Geology.



Those floods, along with the 2016 event, all occurred during a seven-week period in early to mid-summer (June 22 to Aug. 9) with most of them involving high volumes of rain falling in a matter of a few hours, Kite said.

While the 2016 flood was tragic and locally exceptional, “it seems not to be unique,” Kite said.

According to the National Oceanic and Atmospheric Administration, observed extreme precipitation events have increased 55% in the past 60 years in the NOAA region that includes West Virginia, and the number of downpours is likely to increase in the years to come.



The Buffalo Creek flood left 125 people dead and injured 1,100 others. More than 4,000 people were left homeless.

Herald-Dispatch file photo

Heavier and more frequent rainfall does not automatically lead to more floods, but it does increase the potential for more frequent and severe floods to occur.

West Virginia’s landscape of steep hillsides, narrow valleys and shallow soil, coupled with spotty floodplain regulation, make it exceptionally vulnerable to flooding, according to Kite.

Each of West Virginia’s 55 counties reported at least 14 floods from 1991 to 2016, according to NOAA.

When a heavy downpour from a summer thunderstorm is released over

West Virginia, “there is very little storage capacity in the soil to allow runoff to

infiltrate into the ground,” Kite said. “Water runs off the landscape quite quickly and enters streams that drop steeply. It takes a lot shorter trip to reach a river here than it does in flatter country.”

In West Virginia, floodplains along even small streams often account for the only available flat ground for development and “are often occupied by roads, railroad tracks and a row or two of houses,” Kite said. “A 6-inch rainfall in a small watershed can have major consequences.”



In a paper on the 2016 flood that was presented at the annual meeting of the Geological Society of America late that year in Denver, Kite concluded, among other things, that “flood devastation can be traced to weak floodplain regulation.”

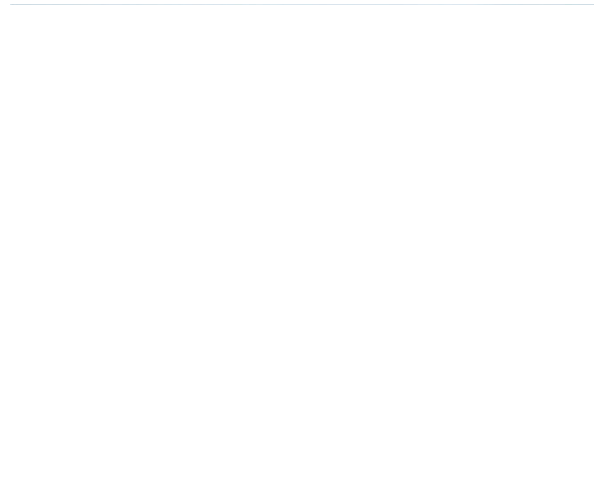
Kite said a major step toward correcting that deficiency has been taken by the West Virginia GIS Technical Center, which began work on a new statewide floodplain mapping project shortly after the 2016 flood that produced the now-available WV Flood Tool. Available online to anyone, the WV Flood Tool displays precise elevation contours, aerial maps and flood hazards, and information on how to mitigate them.

Kite’s paper also predicted that, even without taking future climate change into account, West Virginia can expect to experience floods as severe as 2016’s every 15 to 20 years. “If climate changes as expected, such floods will occur even more often,” he concluded.

In the wake of the 2016 event, Kite compiled ["Deadliest Floods in West Virginia History,"](#) which identifies, briefly describes and ranks state floods by the number of fatalities. On the list are 12 floods that occurred from 1870 to 2016 in which 20 to 125 people died.

At the top of the list is the Feb. 26, 1972, Buffalo Creek flood in Logan County that left 125 dead after a dam containing a coal slurry pond failed, sending 132 million gallons of water and sludge down a narrow, 18-mile-long valley packed with coal mining communities.

Like the Buffalo Creek Flood, the floods ranked third- and fourth-deadliest on Kite's list were not products of summer thunderstorms.



The November 1985 flood, which left 47 dead and caused \$1.7 billion in property damage (in 2021 dollars) in 29 counties, took place after a front associated with the remnants of a hurricane passed over the state's already saturated Eastern Highlands, dropping nearly a foot of rain in 48 hours.



A photo from Clarksburg shows part of the damage from the Nov. 4-5, 1985, flooding in north-central and eastern West Virginia that killed 47 people.

Gazette-Mail file photo

A tropical storm also is believed to have been the source of a Sept. 30, 1870, flood that killed 42 people on Virginus Island, an outcrop in the Shenandoah River, just off the Harpers Ferry shoreline.

Water channeled from the Shenandoah had long been used to power industrial machinery on the island, site of a federal firearms factory before the Civil War. At the time of the flood, five factories, some providing workers' housing, were operating there.

The flood, produced by two days of heavy rain over a wide basin more than 100 miles upstream, arrived without warning, rapidly sweeping away footbridges to the Harpers Ferry shore before demolishing most of the homes and all but one factory on the island.

Of the nine floods caused by summer thunderstorms on the “Deadliest Floods” list, a flash flood that focused its energy on the Cabin Creek watershed produced the most fatalities. It took place 100 years before the 2016 flood, on Aug. 9, 1916, when “a cloudburst of immense volume” descended on the coalfields of Southeastern Kanawha County “with the suddenness of a bolt of lightning,” according to a Charleston Gazette account.

The lower 16 miles of the 20-mile creek were described as “a scene of absolute desolation” in a New York Times article that appeared the day after the flood.

While no official rain measurements were taken along Cabin Creek on the day of the cloudburst, a weather observer 20 miles to the west, at Madison, where flooding along the Little Coal River was produced by the same storm, reported that 6 inches of rain fell in a five-hour period. An unofficial observer using a ruler-equipped ice cream can as a rain gauge at Kayford, near the head of Cabin Creek, recorded 5.8 inches of rain, most of which, he said, fell between 4:30 and 9 a.m.

Along Cabin Creek, the flood is believed to have demolished about 900 homes and destroyed nearly 18 miles of railroad track, along with nearly all trestles along the route.

On rail tracks along the Little Coal River, a train carrying 210 picnickers on a church outing from St. Albans to a site in Boone County was marooned for two days after bridges behind and in front of the train collapsed.



The Cabin Creek flood of 1916 was caused by “a cloudburst of immense volume” according to a Charleston Gazette account.

WV Encyclopedia | Courtesy photo

According to a Charleston Gazette account, one of the church group’s younger members wrote a message detailing their predicament, sealed it in a bottle and threw it in the river. The bottle was recovered and the message read 10 days later at Buffalo, on the Kanawha River, nearly 60 miles downstream.

Among those lending aid in the wake of the flood were 200 West Virginia National Guard troops who had been stationed at a camp in what is now Kanawha City, preparing to ship out for Texas to help protect U.S. border towns from raids by Mexican revolutionary Pancho Villa. The Guardsmen put that deployment on hold to make their way up Cabin Creek to reach families left homeless by the flood. Once located, the displaced flood victims were provided food from the soldiers’ rations, and temporary shelter in tents, cots and blankets.

After an initial relief mission up the creek, the Guardsmen returned, using a mule train to haul in additional supplies and medicine.

The death toll from the flood, initially estimated at more than 100, was later downgraded, as many of the missing were gradually accounted for. Four days after the flood, the Charleston Daily Mail reported that 61 bodies had been identified, and predicted the final death toll would be “somewhat in excess of 70.”

After spending several weeks in the flood zone disinfecting water wells, administering typhoid vaccinations and speaking with the people who lived there, Mayo Tolman, the state Health Department’s chief engineer, reported that the total number of fatalities from the event was 71.

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A death toll of 35 was recorded after a flash flood from a thunderstorm struck southernmost West Virginia on the night of June 21-22, 1901, carving a path of destruction along Elkhorn Creek, in McDowell County, where nearly 6,000 coal miners and their families were living and working at the time.

An overnight rainfall of 5.8 inches was recorded at Keystone by observer J.J. Lincoln, according to the National Weather Service, producing flooding that demolished homes in coal camps from Keystone to Vivian, and damaged or destroyed more than 11 miles of recently installed railroad track.

Early newspaper accounts of the flood carried estimates of 300 to 600 deaths, possibly because so many homes and businesses had been demolished in the narrow valley encompassing the 23-mile-long stream. But those who lived along Elkhorn Creek apparently kept a close watch on the rising water, and when it approached flood stage, alerted neighbors.

“Warned to get to higher ground, most climbed the steep mountainsides,” according to “McDowell County History; A Pictorial History of McDowell County, West Virginia.”

Those aboard a passenger train stalled in floodwaters at Vivian “were rescued by ropes strung from car windows to coke ovens on the side of the valley,” according to a Charleston Gazette report.

After meeting with coal operators, county commissioners and railroad officials in McDowell County a few days after the flood, Gen. Edwin Boggs of the West Virginia Adjutant General’s Office reported that, contrary to previous accounts, no more than 50 people had perished in the flood.

According to a Charleston Gazette account, Boggs was told by the officials he met with in the flood zone that no outside assistance was needed to help in the flood recovery effort, even though thousands remained homeless and out of work. Had Boggs talked with flood victims, as well as county and industry officials about the need for flood aid, the people of the county would have been better served, a letter to the editor published in the Gazette a week later suggested.

As the whereabouts of those who fled their homes to avoid the floodwaters became fully known, the official death count was reduced to 35, according to “McDowell County History.”



The flooded west end of Salem was part of the disaster that struck on June 24, 1950, and left 33 people dead and hundreds of homes destroyed.

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In 1950, torrential rain hammered the countryside in Ritchie, Doddridge, Gilmer and Lewis counties with more than 14 inches falling June 24-26, causing flash floods in the West Fork, Hughes and Little Kanawha rivers, and their tributaries, that killed 34 to 35 people, according to Kite.

A thunderstorm producing up to 7 inches of rain in less than two hours descended on the Wheeling area July 19, 1888, producing flash floods that killed an estimated 25 people, according to Kite's "Deadliest Floods" list.

The late-afternoon rain “came down in nearly unbroken sheets” for about 90 minutes, according to a New York Times account of the storm.

As the rain tapered away, crowds of onlookers flocked to railroad bridges, under which creeks carrying floodwater surged. Some people gathered atop a wooden B&O Railroad trestle to watch the rising water below when the span cracked, then dropped into the raging stream, carrying a number of people clinging to planks from the structure toward the nearby Ohio River.



This July 19, 1888, photo shows flood damage in Ohio County.

Ohio County Public Library

An exceptionally violent thunderstorm that dumped up to 15 inches of rain in two hours over the Little Kanawha River basin in Gilmer, Ritchie, Wirt and Gilmer counties during the night of Aug. 4-5, 1943, killed 23 people.

Most of those who died were occupants of homes swept away by fast-rising Little Kanawha tributaries in the predawn hours of Aug. 5. The flood produced a record flood stage in the Little Kanawha near Burnsville.

Charleston's July 19, 1961, Magazine Hollow flood is ranked just below the 2016 flooding in east-central West Virginia on the "Deadliest Floods" list.

A four-hour cloudburst during the wettest July on record for Charleston caused flash-flooding and landslides that killed 22 people and left more than 200 families homeless along Garrison Avenue.

During the heart of the Great Depression, things got even tougher for those living along Paint and Armstrong creeks, along the Fayette-Kanawha county line, when flash-flooding from a powerful thunderstorm struck on the night of July 10-11, 1932. The flood killed 20 and left more than 500 homeless.

The Little Kanawha River Basin makes a third appearance on the "Deadliest Storms" list as its final entry, for a July 18, 1889, cloudburst that dumped torrential rain over parts of Wood, Wirt, Jackson and Ritchie counties that left between 19 and 23 people dead.

At Rockport in Wood County, the storm produced a world-record two-hour rainfall of 19.48 inches, according to the American Geophysical Union. That downpour played a role in causing nearby Tygart Creek to rise an epic 21.98 feet in one hour.

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Officials getting on same page in latest chapter of WV flood protection history full of stunted efforts

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