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1977 Floods of Mingo County, West Virginia

Beginning on April 2, 1977, heavy rainfall poured down on the coalfields of Southern West Virginia. That rain would not cease until April 5th. The result was a devastating flood that caused at least 50 million dollars in damage to that area. Many towns and residences along the Tug Fork River were damaged or destroyed. Many people were forced to abandon and evacuate their homes as they would be destroyed by the record high waters. Others were left stranded until rescue could reach them or the water levels receded far enough for them to escape. Problems arose after the flood as well. Homeowners without sufficient insurance were left homeless. Entrepreneurs and business owners without appropriate insurance were left without a source of income; many of these businesses would never recover. The flooded region has long been prone to flooding, so the 1977 flood was not a particularly rare event. However, it was the worst flood in that area's recorded history of more than one hundred years. Some people have pointed to the region's main industries to causing or worsening the floods; this includes coal mining and logging, both of which often require severe changes to the landscape.

Williamson, West Virginia is the Seat of Mingo County. It is also its largest city in terms of physical size and population. The 2010 Census showed 3,191 residents; the 1970 census showed 5,831. The number of people living in Williamson has continued to decline since the early 1900's, dropping faster after the 1977 flood. Williamson was built

up by the coal industry, where it served and continues to serve as a major transportation site for coal. On April 4, 1977 the city would be changed forever. Nearly 15 inches of rain fell in a period of about 30 hours, way more than the ground could hold in that amount of time. The rain rapidly flowed down the steep terrain and into the Tug River. Soon, Williamson would find its streets covered in more than twenty feet of water. Many important buildings were partially or fully submersed, all of which were severely damaged.



1977 Williamson, West Virginia. Many homes were consumed by the flood.

Notable buildings, such as the court house, the Coal House, and the Mountaineer Hotel were all filled with water and extensively damaged. The train yard in Williamson was, and still is, a very large employer. Workers there, and those passing through, often stayed at the Mountaineer Hotel. At the time of the flood, multiple trains and crews were

trapped in the yard or in the hotel. One worker, L.W. Buckland Jr, or “Bucky”, recalls his stay at the Hotel very well. He and other workers were trapped on the third floor of the hotel for four days, with water even reaching the second floor. Making the best of the situation, he was able to craft a net; they fished many things out of the flood water, including alcohol and a tire. He and many people in similar situations eventually escaped and made it to a nearby school, where the Salvation Army had made a temporary headquarters. Unlike many places, the Mountaineer Hotel, the Coal House, and the court house were all able to recover from the flood. Today, they still remain intact, not showing



any of the damage that was previously caused.

1977 Williamson, West Virginia. Shows destruction of downtown, including many government buildings, private businesses, and the Coal House.

Matewan, West Virginia, which is just up-river from Williamson, was completely destroyed. Matewan was no stranger to flooding. In 1949, the town was flooded 36 times. In 1953, in the month between February 15th and March 15th, it flooded four times. In 1974, the US Army Corps of Engineers said that Matewan had the most severe flooding problem in all of America. That statement seemed accurate three years later when the 1977 flood wiped out the entire town. Within its city limits, a third of the private residences were destroyed. The same was true for many of the businesses. The town had two new-car dealerships, every car in them was covered in water and destroyed. Public facilities, such as the water and sewage treatment plants, the medical clinic, the bridge to Kentucky, and the community church were all destroyed by the flood waters. City property was also annihilated. The City Hall, along with the Fire Station and fire trucks, were buried in water by the flood. The town, or what was left of it, remained without electricity and water for two weeks. Fortunately, the flood did not prevent recovery.



1977Matewan, WV. Shows the flooded streets and buildings.

Despite the devastation to the city, Williamson can be seen as one of the lucky ones. Many towns other than Matewan were destroyed, such as Tacker and Lobata. Up to fifteen and a half inches of rain fell in certain parts of Southern West Virginia, more than enough to initiate massive flooding. The massive 1977 flood is the largest and most damaging flood in Southern West Virginia's history, and the second most damaging flood in the entirety of West Virginia. The US Army Corps of Engineers estimated that 50 million dollars in damage had been done to the Tug Fork Basin. However, many other estimates go well beyond that number. With a 12 month per-capita income of only \$20,609, and percentage of people living in poverty at 22.9% in 2013, it is obvious that these damages would be hard to pay for—especially without insurance.

By themselves, it would have been nearly impossible to rebuild their hometowns. However, it was even more than a community effort. During the flood's devastation, many citizens risked their own lives to rescue others, limiting the casualties and injuries resulting from the flood. In the cleanup process, citizens worked together to clear areas of debris, garbage, and mud. They were not alone; many local coal mining companies donated heavy equipment to aid in the effort, making the process much faster and more efficient. Federal dollars, such as Federal Disaster Assistance Funds, were given to communities to aid in rebuilding. For example, these types of funds were used in

Matewan to rebuild the bridge, medical clinic, and water and sewage treatment facilities.

In addition to this, people were granted access to low-interest loans to re-open businesses

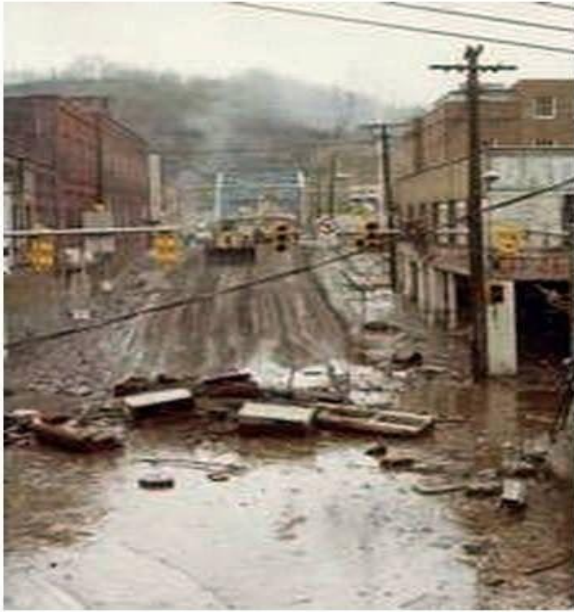


or to rebuild homes.

2015 Williamson, WV. Showing a fully recovered Mountaineer Hotel.



2015 Matewan, WV. Showing modern water treatment facility.



1977 Williamson, WV. Shows mine owned heavy equipment moving debris from a street.

The cities of Williamson and Matewan realized that they did not want a disaster like this in their town again, and they knew something had to be done to prevent it. In June of 1988, a hydraulic study along the river from Williamson to Kermit was done. As a result, it was determined that a flood prevention wall would be built around the city. During the flood, the river reached heights of up to 25 feet above flood stage, so the wall had to be built tall enough to protect against similar circumstances that might arise in the future. In addition, there would have to be huge, movable steel gates capable of sealing exits from the city, including two bridges directly over the Tug Fork River. When it was eventually completed in 1991, the Williamson flood wall cost around 41 million dollars. The floodwall in Matewan, completed six years later in 1997, was also very impressive,

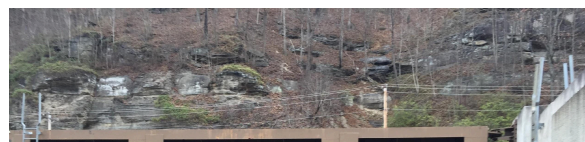
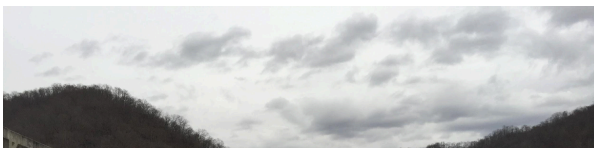
stretching 2,350 feet along the bank of the river. It also holds huge steel doors to seal the city during a flood. Flood walls around a city are often only seen as safeguards for citizens. However, the flood walls in Williamson and Matewan are engraved with different inscriptions and murals to help beautify the development as much as possible. In addition, they used the 1977 disaster to better the community. As of 2008, 37% of adults were obese in Mingo County. This has been a slowly increasing number that is common among the counties in Southern West Virginia. However, the flood wall may be able to help with this problem. Walking or running trails, along with parks, have been built along



the floodwall, giving people an extra opportunity to gain exercise.

2015 Williamson, WV. Current Flood Wall (above) and 2015 Matewan, WV Flood Wall and Gate (below)

On top of a flood wall, the 1977 flood helped to develop more anti-flood projects and prevention measures. Along with floods shortly after it, the 1977 flood inspired the creation of West Virginia's flood warning systems. At the time of the disaster, there were no systems even similar to this, so many people didn't get a warning in time or get a



warning at all. The result: they were trapped in their homes until they could escape or be rescued. The developments of a warning system helps to prevent situations like this by predicting floods in areas that may be affected, and often advising evacuation if it is deemed necessary. Even damage by flash floods can often be limited or eliminated by this project.

Floods are a very common natural disaster in West Virginia, particularly in Southern West Virginia where the steep terrain increases the amount of water running into streams and rivers. There are three main things that mainly cause flooding in West Virginia: thunderstorms, frontal systems, and tropical cyclones. Thunderstorms hit mainly in late spring, summer, or early fall. Major frontal system flooding occurs mainly in the colder months, such as late fall, winter, or early spring. Tropical cyclones, such as Atlantic Hurricanes and tropical storms, usually hit in late summer or early fall. Flash Floods are a major problem resulting from all three of these things. If heavy rains fall in a short amount of time, water quickly runs off into streams and rivers. The levels of these waterways rapidly rise above their banks, and often damage property and homes. These events happen quickly, and can be very dangerous if not avoided or properly dealt with.

The flooding event in 1977 saw more than 15 inches of rain falling in many places in Southern West Virginia over a relatively short period of time. This insane amount of water is more than enough to cause severe flash floods in many areas, all of which drain directly into the Tug Fork River. The river peaked at around 52 feet, more

than 25 feet above flood level. The destruction that resulted left the community wanting to prevent a similar event in the future, and it left many people wondering what had caused this massive flood. Obviously, the severe rains had led to the flooding. But, people began to look at things that may have made the flooding worse. As they searched for answers, it became apparent that industries such as coal mining and timbering may play a role in increased flooding.

Because of economic convenience, surface mining grew in popularity in the 1970's. Often, the mining companies practiced mountaintop removal, quite literally removing hundreds of feet off of the top of a mountain to expose the coal found inside of it. This would drastically change the landscape of that area, and it would have many immediately negative effects. The large amount of material removed from a mountain would have to be placed somewhere; so, it was placed in the valleys between mountains, giving this process the name "valley fills". That process would also severely change that location's landscape and contours. As can be expected, this destruction of land causes direct damage to the environment and the organisms living there. Many native plant species are destroyed by this. Many native animal species are pushed away and displaced. The direct exposure of soil leads to increased rates of erosion around a mining or logging site, making it harder for an ecosystem to recover. The machinery used in the process can directly pollute the air and the water nearby. The process of mining coal results in toxic sludge production that must be stored and carefully dealt with to prevent many ecological and human health issues. Despite the negative impacts, coal mining is a driving force of

West Virginia's economy, an industry to which the state leans on for economic support, and to which many residents rely on for a steady income.



Two examples of mountaintop removal sites in WV.

Vegetation helps to slow down the rate at which water flows over land, and it helps to prevent erosion of that land. Undoubtedly, strip mining removes this vegetation and prevents the natural slowing down of water. Some people say that this does not have a huge impact on the rate at which water leaves a mountain and the rate of flooding in an area. Others claim that this event has a huge impact on flooding in susceptible areas, and that mining severely affects the natural flow of water. As related to the 1977 flood, it seems unclear to if the flood damage was increased by mountaintop removal sites. Philip Zinn, a hydrologist for the National Weather Service, believed that strip mining may have

been a factor in the flooding, but it is impossible to tell for sure. In addition, he believes that even without strip mining, the flood would not have been prevented.

In 2001, a report was given to Randy Dye of the West Virginia Division of Forestry by representatives of the Gillespie Forest Service, West Virginia University's Forestry Department, and the U.S. Forest Service. In this, they cited many studies done by various forest hydrologists claiming that "forest operations," such as mining and logging, "do not seriously increase flood flows". They assured Mr. Dye that there was no contradicting evidence to that conclusion, and that it was widely agreed on by foresters and engineers. Of course, not everyone agrees on this conclusion, and not everyone agreed on it even in 2001. In fact, many expert studies have suggested a completely different conclusion. Jack Spadaro, a former mining engineer and safety instructor, has said the EPA and other government agencies were able to show a link between flooding and surface mining in Southern West Virginia. That conclusion has also been drawn from various other studies. However, people remain split on the topic.

Valley Fills have caused a major controversy in the coal fields of West Virginia and Kentucky. These huge amounts of sediments are piled into valleys and drains, filling up the natural habitat of that area. That process directly changes the natural flow of water running toward the river. In addition, it decreases water quality by allowing more sediment to flow downstream. This process is often done incorrectly, resulting in loosely packed soil and debris that can be easily eroded away, increasing runoff into streams and

rivers. That excess runoff alone would suggest that this process furthers the extent of flood damage. In an interview with *Living on Earth*, Steve Kite, a geology professor at West Virginia University, says that the “well-completed mountaintop removal valley fills sites were not as big of a problem as the abandoned mines.” However, he admitted that these sites caused drastic changes to the land. Still, it seems obvious that “not as big of a problem” is still a problem, and it should be dealt with. The flooding problem, whatever the cause, has left many people homeless in West Virginia over the past fifty years alone. The belief that flooding is made worse by mining and timber cutting has spread throughout the area, and many people decided to join lawsuits against the companies in order to make up for damages. Perhaps the most notable of these came in 2002.

In May of 2002, a case came into the court of US Federal Judge Charles Haden. This was a collective effect by many citizens who claimed to have been affected by flooding that was amplified by valley fill sites near their homes. Upon hearing the case, Judge Haden eventually sided with those residents and attorney Joe Lovett, stating that under Section 404 of the Clean Water Act companies could only use the valley fill method for a constructive purpose. This seemed like a great victory for the residents and those who may suffer from increased flooding near valley fills sites. However, that victory was short lived. In 2003, less than a year later, the Bush Administration altered Section 404 of the Clean Water Act, removing the portion that supported the 2002 case. As a result, mines could now use the valley fill method almost unconditionally.



WV Valley Fill Site, a relatively small one.

The flooding in both Matewan and Williamson, West Virginia were undeniably caused by the extreme rainfall that fell between the second and fifth of April, 1977. However, it is at least possible that mountaintop removal in that area caused the flood to grow, if only to a small extent. Still, that small increase could have resulted in further damage to public and private property. The communities were mostly able to rebuild, and they have taken steps to further prevent a similar catastrophe. In this prevention process, mountaintop removal sites should be limited and regulated. Their Valley Fills should remain monitored and inspected. Both of these things may help prevent unnatural erosion of the soil, water diversion, and increased flooding in Southern West Virginia.

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