

Our Fragile Infrastructure: Lessons From Hurricane Helene

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Asheville, North Carolina, is known for its historic architecture, vibrant arts scene and as a gateway to the Blue Ridge Mountains. It was [a favorite escape](#) for “climate migrants” moving from California, Arizona, and other climate-challenged vicinities, until a “500 year flood” ravaged the city this fall.

Hurricane Helene was a wakeup call not just for stricken North Carolina residents but for people across the country following their [tragic stories](#) in the media and in the podcasts now [favored by young voters](#) for news. “Preppers” well equipped with supplies watched in helpless disbelief as homes washed away in a wall of water and mud, taking emergency supplies in the storm. [Streets turned into rivers](#), and many businesses and homes suffered extensive water damage if they were not lost altogether.

The raging floods were triggered by unprecedented rainfall and winds, but a network of fragile dams also played a role. On Sept 27, when the floods hit, evacuation orders were issued to residents near a number of critical dams due to their reported “imminent failure” or “catastrophic collapse.” Flood waters were overtopping the dams to the point that in some cases the top of the dam structure [could not be seen](#).

The dams did not collapse, but to avoid that catastrophe, floodgates and spillways had to be opened, releasing huge amounts of water over a number of days. Spokesmen said the dams had “[performed as designed](#),” but they were designed for an earlier era with more stable, predictable climates and no population buildup below the dams.

Five days after the floods hit in East Tennessee, [half a million gallons of water](#) were still being released *per second* from Douglas Dam, northwest of Asheville and upstream from Knoxville on the French Broad River. ([Video clip](#) of opened floodgates, watch below.) The Watauga Dam in Tennessee was also releasing record flows, surrounding nearby homes in water. [WTVC NewsChannel 9](#) Chattanooga reported that Chickamauga Dam, upstream from Chattanooga, released approximately 566,118 gallons of water per second.

The Nolichucky Dam, in Tennessee near the North Carolina border, was reported to have “withstood nearly [twice the water flow of Niagara Falls](#).” (See dramatic videos on [Fox Weather](#) showing the overflow and the floodgate release [continuing three weeks later](#), a similar clip from [11Alive](#) adding the damage downstream, and overflow footage on [WKYC Charlotte](#).) Other major dams in which the floodgates were opened included Cowans Ford Dam, north of Charlotte (see video clip of [the floodgate release](#), watch below); [and Waterville Dam](#) (also called Walters Dam), upstream from Newport in Tennessee ([video](#)). [Homeowners accused Duke Energy](#) of sacrificing poor neighborhoods for wealthier

properties, but as [one official said](#), the excess water had to go somewhere. It had to go downstream. They did what they had to do to avoid outright collapse of the dams, a much worse disaster.

Upriver from Asheville, the auxiliary spillway of the North Forks Dam was activated. It too is said to have "[performed as designed](#)," but the result was again significant flooding. Mandatory evacuation orders were put in place [from the dam to Biltmore Village](#) in Asheville, which suffered major damage. North Forks Dam is classified as a "high-hazard potential dam," meaning its failure could result in potential loss of life and serious property damage.

One concerned [Asheville podcaster complained](#) that the city had known for 20 years that the North Forks Dam was inadequate and a lethal danger under flood conditions, but it hadn't been repaired. The dam was put to the test in September, when residents were told there was no choice but for the flood gates to be opened to prevent the dam from breaking. The result was a 30 foot wall of water that swept homes and lives away, rushing so fast that people were found in the tops of trees. The podcaster's suspicions were aroused because [lithium worth billions of dollars](#) is located in Western North Carolina, where a mining company has been trying to restart operations since 2021, [over community protests](#).

That was also true of the nearby town of Spruce Pine, downstream from the North Toe Dam, which was [submerged under eight feet](#) of water from the combination of torrential rain and the release of the dam's floodgates. Spruce Pine is a [major producer of high-quality quartz](#), a rare but necessary resource for many tech products. Mining companies have been attempting to double their operations in Spruce Pine, but they too have met resistance from local landowners. For some controversial details, see [here](#).

Asheville is also downstream from Lake Lure Dam, which was [reported on Sept. 27](#) to be "at risk of imminent failure" as the river was [overtopping the dam](#). Most [heavily affected was Chimney Rock](#), the town immediately downstream from Lake Lure, known for both its rustic scenery and its lithium mines. The [damage](#) was extensive.

According to an Oct. 2 broadcast on WBTV News in Charlotte titled "[Lake Lure Dam 'high hazard' and needed repairs at time Helene hit](#)," the dam, completed in 1926, does not meet current state safety requirements. Repairs were ongoing but unfinished. Lake Lure Dam is one of 1,581 dams across the state considered "high hazard," and [according to a 2022 report](#), North Carolina has 194 high-hazard dams in poor or unsatisfactory condition, meaning they "may require immediate or emergency remedial action."

The High Cost of Repair

The catastrophic flooding and destruction in western North Carolina has caused a record \$53 billion or more in damages and recovery needs, [according to North Carolina Gov. Roy Cooper's administration](#). The storm and its aftermath caused 1,400 landslides and damaged over 160 water and sewer systems, at least 6,000 miles of roads, more than a thousand bridges and culverts, and an estimated 126,000 homes. Some 220,000 households are expected to apply for federal assistance.

Whether the federal government will have the funds, and how long it will take residents and

businesses to get assistance, are yet to be determined. On Oct. 2, **Homeland Security Secretary Alejandro Mayorkas** [told reporters](#) that the Federal Emergency Management Agency (FEMA) did not have enough funding to make it through the hurricane season, which runs to Nov. 30. [President Biden said](#) that the more urgent problem now is the Small Business Administration, which provides low interest loans to homeowners (up to \$500,000) and businesses (up to \$2 million) for rebuilding after disasters. The SBA [announced on Oct. 15](#) that its funds would soon run out and that it was pausing its loan offers to disaster survivors until Congress appropriates additional funds.

Applications for those funds are complicated, and reimbursement can take years — too late for demolished businesses to get back on their feet, or displaced homeowners living in tents on their properties to rebuild.

Failing Dams Are a Nationwide Problem

Dams in poor condition are found not just in Appalachia but across the country. A May 5, 2022 [NPR report](#) cites an Associated Press analysis of dams needing repair:

More than 2,200 dams built upstream from homes or communities are in poor condition across the U.S., likely endangering lives if they were to fail. The number of high-hazard dams in need of repairs is up substantially from a similar [AP review conducted just three years ago](#).

There are several reasons for the increased risk. Long-deferred maintenance has added more dams to the troubled list. A changing climate has subjected some dams to greater strain from intense rainstorms. Homes, businesses and highways also have cropped up below dams that were originally built in remote locations. ...

The nation's dams are on average over a half-century old. They have come under renewed focus following extreme floods, such as the one that caused the [failure of two Michigan dams](#) and the evacuation of 10,000 people in 2020.

The \$1 trillion infrastructure bill signed last year by President Joe Biden will pump about \$3 billion into dam-related projects, including hundreds of millions for state dam safety programs and repairs....

Yet it's still just a fraction of the nearly \$76 billion needed to fix the tens of thousands of dams owned by individuals, companies, community associations, state and local governments, and other entities besides the federal government, according to a [report by the Association of State Dam Safety Officials \[ASDSO\]](#).

Less than a year later, the [ASDSO announced](#) the release of a [new report dated February 2023](#), stating that the current cost of rehabilitating all non-federal U.S. dams is an estimated \$157.5 billion, more than double ASDSO's estimate from 2022.

Our Neglected National Infrastructure

Repairing dams is only one of a litany of infrastructure needs across the country, including roads, highways and bridges; public transportation; ports, harbors and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; and telecommunication networks. National spending on infrastructure has [fallen to its lowest level](#) in 70 years, to 2.5% of the nation's GDP. That's half the comparable level in

Europe and one-third the level in China. As a result, productivity, investment and manufacturing have collapsed; and we are losing our worldwide competitive edge.

The American Society of Civil Engineers (ASCE) estimated in its 2021 report that \$6.1 trillion is needed just to repair our nation's infrastructure, of which \$2.6 trillion is currently unfunded. The gap, which increases the longer the work is put off, is now \$2.9 trillion according to [the latest ASCE update](#). Meanwhile, the [federal debt is over \\$34.8 trillion](#), with the interest tab alone [topping \\$1 trillion](#) annually.

How can infrastructure requirements be met without driving the federal government \$3 trillion further into debt? We need some form of off-budget financing. We have done it before, notably when Congress was heavily in debt right after the American Revolution, and when the banking structure had completely collapsed in the Great Depression of the 1930s.

Alexander Hamilton, our first U.S. Treasury secretary, developed the national infrastructure bank model used by many other countries today. Winning our freedom from Great Britain left the country with what appeared to be an unpayable debt. Hamilton traded the debt along with a percentage of gold for shares in the First U.S. Bank, paying a 6% dividend. This capital was then leveraged many times over into credit to be used specifically for infrastructure and development. The Second U.S. Bank, based on the same model, funded the vibrant economic activity of the first decades of the new country.

Today, virtually our entire circulating money supply is [created by banks](#) in this way when they make loans. The new money is not inflationary so long as it creates new goods and services, allowing supply to rise with demand and keeping prices stable. The new money is liquidated when the loans are paid off with profits from sales.

In the 1930s, Roosevelt's government pulled the country out of the Great Depression by repurposing an agency created under President Hoover into a lending machine for development on the Hamiltonian model. The Reconstruction Finance Corporation was an off-budget source of revenue, allowing the government to build infrastructure all across the country and fund a world war while actually turning a profit. Many of today's dams were built with that credit, but they are nearly a century old. They need an upgrade, which can be financed by a national infrastructure bank on the same model. A fuller discussion is [here](#).

HR 4052 (formerly HR 3339), titled "[The National Infrastructure Bank Act of 2023](#)," is currently before Congress and has 40 sponsors. It has been endorsed by dozens of legislatures, city and county councils, and many organizations. Like the First and Second U.S. Banks, it will be a depository bank capitalized with existing federal securities held by the private sector, for which the bank will pay an additional 2% over the interest paid by the government. The bank will then leverage this capital into roughly 10 times its value in loans, as all depository banks are entitled to do. The bill proposes to fund \$5 trillion in infrastructure capitalized over a 10-year period with \$500 billion in federal securities exchanged for preferred stock in the bank. Like the RFC, the bank will be a source of off-budget financing, adding no new costs to the federal budget. For more information, see [this](#).

State-owned Banks

Leveraging available funds into new credit-dollars for disaster relief can also be done locally at the state level. The possibilities are illustrated by the century-old Bank of North Dakota, currently our only state-owned bank. [The BND's emergency capabilities were demonstrated](#)

in 1997, when record flooding and fires devastated Grand Forks, North Dakota. The town and its sister city, East Grand Forks on the Minnesota side of the river, lay in ruins. Floodwaters covered virtually the entire city and took weeks to fully recede. Property losses topped \$3.5 billion.

In NC, [FEMA was criticized](#) for still being absent from recovery efforts a week after the Helene emergency was declared, too late for people trapped in rivers or under debris who could be reached only by helicopter. In North Dakota by contrast, the response of the state-owned bank was immediate and comprehensive.

Image: A man in October 2011 advertising the bank at Occupy Wall Street. (Licensed under CC BY 3.0)



Soon after the floodwaters swept through Grand Forks, the BND was helping families and businesses recover. The bank quickly established nearly \$70 million in credit lines – to the city, the state National Guard, the state Division of Emergency Management, the University of North Dakota in Grand Forks, and for individuals, businesses and farms. It also launched a Grand Forks disaster relief loan program and allocated \$5 million to help other areas affected by the spring floods. Local financial institutions matched these funds, making a total of more than \$70 million available.

Besides property damage, flooding swept away many jobs, leaving families without livelihoods. The BND coordinated with the U.S. Department of Education to ensure forbearance on student loans; worked closely with the Federal Housing Administration and Veterans Administration to gain forbearance on federally backed home loans; established a center where people could apply for federal/state housing assistance; and worked with the North Dakota Community Foundation to coordinate a disaster relief fund, for which the bank served as the deposit base. The bank also reduced interest rates on existing Family Farm and Farm Operating Dakota programs. Families used these low-interest loans to restructure debt

and cover operating losses caused by wet conditions in their fields.

The city was quickly rebuilt and restored. Remarkably, no lives were lost, vs. an [official death toll](#) to date in North Carolina of 98, thought to actually be much higher. Grand Forks lost only 3% of its population to emigration between the 1997 floods and 2000, while East Grand Forks, right across the river in Minnesota, lost 17% of its population.

Small businesses are now failing across the country [at increasingly high rates](#). That means layoffs, need for more government assistance, lower productivity, and higher taxes. But that's not true in North Dakota, which was [rated by Forbes Magazine](#) the best state in which to start a business in 2024. On Oct. 2, Truth in Accounting's annual [Financial State of the States report](#) rated North Dakota ND #1 in fiscal health, with a budget surplus per taxpayer of \$55,600.

Meanwhile in Helene-ravaged Appalachia

Publicly-owned state and federal banks are possibilities for future disasters, but they will be too late for the flood victims of Western North Carolina and Eastern Tennessee. Survivors' moods have been lifted in the meantime by the extraordinary generosity of local and out-of-state volunteers, who were on the ground immediately with supplies, equipment and labor.

But it has been a month, supplies are falling off, and the need is still great. According to a podcast titled "[Helene VICTIMS need THESE 5 things One Month Later!](#)," 98% of businesses are still open; but they are largely based on tourism, and tourists have been scarce because the news media have featured the disaster areas to the exclusion of the small surrounding towns that are still functional, beautiful and welcoming visitors. First on that podcaster's list of needs was prayer.

People whose houses have been lost are camping on their land, trying to hang onto properties that in some cases have been in their families for generations. With winter coming, they need heavy duty camping equipment— winter tents, winter sleeping bags, small propane tanks. Other supplies for which there is particular need are food and water, cold and flu medicines, and first aid kits.

Though the situation is still dire for many, an [Oct. 31 wrapup](#) from **Gov. Roy Cooper** and country music star **Eric Church**, following a visit to the state's mountain area, was hopeful. So, too, is this story told with soul: [HURRICANE HELENE — A Love Letter To Appalachia](#) ♡.

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Featured image: Devastation at the intersection of Swannanoa River Road (NC-81) and Azalea Road in Asheville on September 27, 2024. (Licensed under CC BY 2.0)

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