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Flooding the Zone: Hurricane Helene and Recovery Challenges in Asheville, North Carolina

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Summary

In September 2024, Hurricane Helene, a Category 4 storm, caused catastrophic flooding and wind damage in Asheville and the surrounding areas of North Carolina. The storm brought sustained winds of up to 140 mph, storm surges exceeding 12 feet, and record-breaking rainfall that led to widespread flooding. The region was unprepared for the scale of destruction, and the recovery process was significantly complicated by disinformation circulating on social media. This case study examines the role of disinformation in the recovery, highlights FEMA's efforts to combat misinformation, and assesses the long-term impacts on Asheville's communities.

Keywords

Disaster Response
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Hurricane Helene and Its Impacts

Hurricane Helene formed in the Atlantic in early September 2024, rapidly intensifying due to unusually warm ocean temperatures. Hurricane Helene made its devastating impact on North Carolina in late September 2024, bringing unprecedented destruction to the western region of the state. Asheville and Buncombe County were among the areas hardest hit. The storm delivered record-breaking rainfall, with the Asheville Regional Airport recording 19.38 inches before communications systems failed; some localized mountainous areas reported totals exceeding 30 inches. This extreme precipitation overwhelmed local waterways, critically including the French Broad River and its tributaries, resulting in widespread and severe flooding across low-lying neighborhoods such as Biltmore Village and the River Arts District. Landslides, a significant consequence of the saturated terrain (with reports of over 300 in Buncombe County and nearly 2,000 across western North Carolina), further exacerbated the disaster, severing key transportation routes and isolating numerous mountain communities. More than 20 inches of rain fell within 24 hours, leading to flash floods that cut off major highways and isolated communities. The storm caused an estimated $10 billion in damages in North Carolina alone and resulted in 106 fatalities in the state (NCDHHS, 2025).

Despite previous warnings about Asheville's vulnerability to extreme rainfall, emergency response systems were overwhelmed. Many residents were unaware of the full extent of the risk due to outdated floodplain maps and the underestimation of storm surge effects inland (MountainXpress, 2024). Additionally, the region's topography, with steep slopes and river valleys, exacerbated flooding, causing landslides and infrastructure collapse (Florida Climate Center, 2024).

The human cost was tragic. In Buncombe County, reports indicated at least 42 fatalities, a figure that includes a catastrophic landslide in the Garren Creek community of Fairview that killed 13 individuals, many from a single extended family. Statewide in North Carolina, Hurricane Helene was responsible for over 100 deaths (reports ranged from 106 to 107). Infrastructure damage was widespread and severe. Major interstates, including I-40 and I-26, were rendered impassable for extended periods due to flooding and significant earth movement, with some sections requiring months of repair. Power and water service outages were extensive and prolonged across the region. The storm also severely damaged the National Centers for Environmental Information facility in Asheville, leading to reports that its critical climate and environmental data archives were temporarily inaccessible, which impacted national access to data.

In addition to the physical and infrastructural destruction, Hurricane Helene had profound socio-economic consequences. Asheville's vital tourism-driven economy suffered an estimated $584 million in losses during the final quarter of 2024, as reported by the Buncombe County Tourism Development Authority. This led to a sharp increase in unemployment in Buncombe County as numerous businesses faced damage and long-term operational disruptions. Health professionals in the region also reported a growing mental health crisis, citing an anticipated increase in post-traumatic stress disorder and other trauma-related symptoms among affected residents.

Environmental impacts were also considerable. According to reports from organizations like The Nature Conservancy, over 800,000 acres of timberland in western North Carolina were damaged, significantly increasing the region's vulnerability to subsequent climate-related hazards, such as wildfires, due to the vast accumulation of downed trees. The overall damage from Hurricane Helene in North Carolina was estimated at $59.6 billion, cementing its status as the costliest natural disaster in the state's history. The storm starkly underscored the vulnerability of inland Appalachian communities to extreme weather events and highlighted the urgent and growing need for climate-resilient infrastructure and enhanced disaster preparedness in regions that had been historically considered less susceptible to such direct hurricane impacts.

Challenges Faced in Recovery

The recovery process following Hurricane Helene was marked by a range of significant challenges that impeded effective response and long-term rebuilding efforts in Asheville and surrounding areas. One of the most immediate difficulties was related to evacuation procedures. Despite the presence of emergency alert systems, many residents received delayed or conflicting evacuation notices due to an overwhelmed communication infrastructure. As a result, over 35,000 people were displaced, with many forced to seek shelter in overcrowded and under-resourced facilities (Guardian, 2025).

Physical hazards in the aftermath of the storm also complicated recovery operations. Contaminated floodwaters, unstable structures, and streets choked with debris delayed both reentry and reconstruction. Landslides caused by saturated soils further hindered cleanup efforts, especially in mountainous terrain (OSBM NC, 2024). Compounding these physical risks was the rapid spread of disinformation on social media platforms. False claims about FEMA aid distribution, shelter availability, and evacuation orders circulated widely. Some posts exaggerated the efficacy of the local response, while others promoted unsubstantiated rumors of abandoned rescue operations, contributing to public confusion and eroding trust in institutions (CBS News, 2024).

Financial and administrative barriers further slowed the pace of recovery. Over 70% of affected homeowners lacked flood insurance, leaving them financially stranded. For those seeking assistance, rising insurance premiums and a complex web of eligibility requirements posed additional obstacles to rebuilding (Asheville Watchdog, 2024). FEMA's initial response was also widely criticized for its sluggishness and bureaucratic complexity. Many residents, particularly those in rural or low-income areas with limited internet access, struggled to navigate the application process and access critical aid (CBS News, 2024).

Perhaps most concerning were the systemic flaws in risk assessment tools that preceded the disaster. A 2025 study by Klasa et al. used Hurricane Helene as a case study to evaluate the limitations of existing flood risk models. The research demonstrated that traditional models significantly underestimated disaster risk in inland regions. By applying a Bayesian hierarchical regression framework, the study showed how successive flood events had compounding effects that were not captured in federal risk assessments. Counties such as Buncombe, Catawba, and Avery—classified as low-risk by national models—proved to be disproportionately vulnerable to cascading flood impacts (Klasa et al., 2025). These findings underscore the need for improved, dynamic risk modeling that accounts for climate change and the cumulative nature of disasters.

Identifying the Intervention

On the Ground Response by Citizens

Due to the delay in response by the US military and FEMA because of logistical challenges owing to the terrain and the extent of damage, the Asheville community needed to take some of its emergency response into its own hands for immediate relief efforts. Local communities turned to each other for aid and relief, spinning up free supply distribution efforts at local firehouses, activating local builders and contractors to assist with road and infrastructure repair, and establishing charging and internet stations powered by solar power. This immediate, informal response provided a backstop for those impacted by Helene and often transcended social and political divides.

This stands in contrast to the response witnessed online, where divisions between social and political groups deepened in the aftermath of Helene, as disinformation and misinformation proliferated. Organizing these efforts in the immediate aftermath of the storm and floods was complicated by a lack of network connectivity. Asheville residents turned to on-the-ground and in-person organizing, moving from door-to-door to engage and organize neighbors to support their communities. A profile by The Nation speaks to the extent of the local civilian response: “It was unclear at the time what the state and local governments planned to do. At Firestorm, a group of medical workers hatched a plan for setting up a free clinic located at the Double Crown, a beloved neighborhood dive bar known for its rowdy “honky tonk” and gospel shows. While the government response and aid from nonprofit groups gradually took shape, residents quickly came together to not only operate a free medical clinic out of a dive bar but also set up more than 100 water stations throughout the city, conduct thousands of wellness checks, create complex supply distribution systems connecting the city with hard-hit rural areas, and even form a “flush brigade” that, day-after-day, bucket-flushed the toilets of people who weren’t able to lift a heavy pail of water.” (Simonton, 2025).

While differing views on the cause of Hurricane Helene existed amongst the Asheville community, it is clear that mutual aid sparked by a crisis can lead to ongoing organizing and broader societal change. Across the country, many mutual aid groups established during disasters have continued operating in order to meet community needs that are neglected (or created) by prevailing political

and economic systems. The long-term impacts on the Asheville community remain to be seen, but the social ties established in response to Helene may persist long into the future.

FEMA Response and Recovery Efforts

In the aftermath of Hurricane Helene, the Federal Emergency Management Agency (FEMA) activated multiple Recovery Support Functions (RSFs) to coordinate efforts across federal, state, and local agencies. These RSFs were critical in organizing a multi-dimensional response to the widespread physical, economic, and informational damage caused by the storm. One key priority was combating the surge of disinformation that emerged in the wake of the disaster. In response, FEMA implemented a suite of targeted communication strategies aimed at restoring public trust and countering false narratives. These efforts included the launch of dedicated web pages, such as a "Rumor Response" hub and the deployment of social media campaigns, working through various official channels to actively debunk myths and provide accurate, real-time information to the public (FEMA, 2025).

FEMA also provided substantial emergency financial assistance to support displaced and affected residents. Initial efforts included the distribution of tens of millions of dollars in upfront funding (such as Serious Needs Assistance) to survivors across the Southeast for immediate essential items. Over the course of the recovery, this expanded significantly; for instance, by early 2025, FEMA had approved over $370 million in Individual Assistance grants for North Carolina households alone. This broader aid was directed to fund temporary housing, essential home repairs, and other critical disaster-related expenses. Assistance was available to eligible individuals and households, including renters and homeowners, with a focus on addressing uninsured or underinsured losses and the acute financial hardship faced by many in the wake of the storm (FEMA, 2025).

In parallel, FEMA coordinated infrastructure recovery efforts in collaboration with state and municipal agencies. This work, funded through its Public Assistance program, included supporting the restoration of electrical grids, the repair of major highways and bridges, and the rebuilding of essential public facilities such as hospitals and water treatment plants (FEMA, 2024). To better serve impacted communities, FEMA established Disaster Recovery Centers (DRCs) in Asheville and surrounding counties. These centers provided in-person support for navigating the aid application process, offered access or referrals for legal and mental health services, and acted as reliable hubs for information dissemination. By integrating social support services with administrative assistance, the centers played a key role in stabilizing communities during the early phases of recovery (FEMA, 2025).

Despite FEMA's targeted communication efforts, disinformation continued to pose a serious challenge during the recovery process. Rumors and false claims about aid eligibility, shelter conditions, and government response efforts persisted across social media platforms, undermining public trust and complicating coordination efforts. These narratives not only distorted public perception but also slowed recovery by creating confusion around available resources and official guidance (NCDPS, 2025).

The aftermath of Hurricane Helene also exposed significant gaps in insurance coverage. A majority of Asheville residents affected by the flooding did not carry flood insurance, largely due to low perceived risk or financial constraints. This lack of coverage left many households unprepared for the financial burden of rebuilding, emphasizing the urgent need for improved risk communication, expanded insurance access, and targeted education around flood exposure and climate-related hazards (Asheville Watchdog, 2024).

More broadly, the storm highlighted systemic vulnerabilities in regional climate resilience. Hurricane Helene reinforced the necessity of comprehensive climate adaptation strategies, including the modernization of floodplain maps to reflect current and projected risks, enhanced stormwater management systems, and greater investment in resilient infrastructure. As the frequency and intensity of extreme weather events increase, these adaptive measures will be critical for reducing long-term disaster risk and ensuring community safety and sustainability (The Atlantic, 2024).

Non-Governmental Initiatives

Local and national nonprofits played a critical role in supplementing government efforts and combating disinformation:

- **Fact-Checking Collaborations:** Nonprofits partnered with tech companies to flag and remove false information related to the hurricane and recovery efforts (NCDPS, 2024).
- **Community-Led Information Networks:** Local groups organized to share verified information through trusted community leaders and networks (NC State Extension, 2024).
- **The North Carolina Disaster Relief Fund** and grassroots mutual aid efforts provided direct financial aid to families and small businesses, prioritizing those without insurance (NC Gov, 2024).

Initial Impacts

By early 2025, significant progress had been made in infrastructure repair and housing recovery. However, disparities in recovery persisted. Low-income and rural communities experienced slower rebuilding timelines, while wealthier neighborhoods had faster access to insurance payouts and permits for rebuilding.

- **Recovery Timelines:** FEMA estimated that full rebuilding efforts in Asheville would take at least five years, with over 60% of displaced residents unable to return to their homes within the first year (FEMA, 2025).
- **Housing Disparities:** Many renters and uninsured homeowners struggled to secure stable housing. Temporary FEMA housing programs assisted 12,000 households, but long-term solutions remained uncertain (Business Insider, 2024).
- **Public Trust Issues:** Misinformation about aid delays and resource shortages continued to fuel community frustration, making it harder for local governments and federal agencies to coordinate effective response efforts (CBS News, 2024).

Further Opportunities for Intervention

Many residents faced financial hardship due to insufficient insurance coverage and rising premiums following the disaster. The lack of comprehensive flood insurance coverage left thousands of homeowners with no financial safety net, forcing them to rely on limited federal assistance or personal savings to rebuild (News and Observer, 2024). This presents an opportunity for emergency response agencies to improve public awareness of flood risk, expand access to affordable insurance policies, and advocate for policies that incentivize homeowners to obtain coverage before disasters strike. Strengthening risk education and creating incentives for private insurers to offer competitive flood insurance rates could reduce financial strain on disaster survivors.

Online platforms played a significant role in spreading rumors about the recovery process, undermining trust in official sources. The rapid spread of false information—such as exaggerated FEMA delays, incorrect eligibility criteria for aid, and conspiracy theories about resource allocation—created unnecessary panic and slowed response efforts (NCDPS, 2025).

This highlights the need for emergency management agencies to establish real-time misinformation monitoring systems, strengthen partnerships with social media companies, and proactively distribute verified information through trusted community leaders. During these events, most Twitter users focus on three topics: “health impact,” “damage,” and “evacuation (Ma, 2024). By improving communication strategies and ensuring accurate information reaches the public, agencies can enhance trust and facilitate a more effective recovery process. Technology can also aid in this effort. A recent research paper examining hurricane–related social media topics longitudinally and at scale demonstrated the ability to identify themes relating to the emergency (Murthy et al., 2025). Emergency response professionals could use technology like this to identify and counter troubling themes before they spread too widely.

Climate Resilience

The hurricane underscored the need for more robust climate adaptation strategies, including updated building codes, improved flood defenses, and investment in resilient infrastructure. The destruction caused by Helene exposed weaknesses in current urban planning, such as inadequate drainage systems and homes built in high-risk flood zones (OSBM NC, 2024). Future disaster response can be improved by incorporating climate resilience into long-term recovery planning. This includes enforcing stricter construction standards, expanding natural flood barriers, upgrading stormwater management systems, and securing dedicated funding for pre-disaster mitigation projects. Investing in resilience measures before disasters occur will not only protect communities but also reduce the long-term costs of recovery efforts.

New Frameworks for Disaster Response

Changes to our disaster response frameworks may create the conditions for improved recovery. The authors of one study addressing this issue identify a few changes to response frameworks, including:

1. **Developing new predictive models** incorporating compound threats and cascading impacts,
2. **Strengthening data-driven decision-makin**g using advanced analytics and real-time monitoring,
3. **Enhancing collaborati**on between government agencies, the private sector, and local communities to improve crisis coordination. Implementing pre-disaster resilience strategies, such as better resource planning and infrastructure investment, to reduce system brittleness and,
4. **Establishing clear leadership structures** for multi-crisis scenarios to avoid confusion and delays in response efforts (Klasa et al., 2025)

Discussion Questions:

1. How did disinformation affect the recovery process, and what strategies can be implemented to improve public trust in official communications?
2. What role can social media platforms play in preventing the spread of disinformation during disasters? What role *should* they play?
3. What measures should be taken to improve flood insurance accessibility and affordability for vulnerable communities?
4. How can Asheville and similar communities better prepare for extreme weather events in terms of infrastructure, policy, and community engagement?
5. What changes to the disaster response framework would have created better conditions for recovery in Asheville following Hurricane Helene?

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