

Western North Carolina Research for Recovery and Resilience

WNC R3 Workshop Outcomes: Intersecting Research and Community Experts for a More
Resilient Region
White Paper

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Executive Summary

On April 28, 2025, ninety stakeholders gathered on the campus of Appalachian State University to discuss the intersection of research and creative activity with the regional needs for Hurricane Helene recovery and future regional resilience. These stakeholders represented a broad range of academic and community sectors, including but not limited to: universities/colleges, community colleges, K-12 schools/districts, local/state government, and non-profit organizations. Invitees shared priority needs for regional recovery and resilience from their various perspectives, informing the workshop agenda and event design. Over seven hours together, participants reflected, networked, and moved through a series of structured interactions to explore the question “What are the top opportunities for research to address priority needs in the areas of Environment, Energy, & Infrastructure; Educational Access & Workforce Development Capacity; Rural Health & Wellness; and Culture, History, & Arts?” After the workshop concluded, all artifacts from the workshop, including pre-work materials, breakout session reports, and action cards, were collected and analyzed by the research team. All attendees and invitees of the Western North Carolina Research for Recovery and Resilience (WNC R3) workshop were invited to co-author this white paper project. The resulting research team for this white paper analysis included the two co-chairs for the WNC R3 event, Christine Ogilvie Hendren (Vice Chancellor of Research and Innovation) and Katie Shoaf (Office of Research and Innovation), along with three Appalachian State faculty volunteers: Margaret Sugg (Geography and Planning) who served as a workshop theme lead and part of the planning team, Sydeena Isaacs (Nutrition and Foods), a faculty attendee at the event, and Jennifer Schroeder Tyson (Public Health), who is engaged with Helene-related research, but was unable to attend the April 28 event. Each member of the research team resides in Western North Carolina and witnessed the effects of Hurricane Helene firsthand.

This white paper summarizes the recovery and resilience needs identified during the workshop aligned with research activities that could help meet those needs. The accompanying [expertise database](#) provides a starting point for identifying and connecting experts across the region who express interest in playing a role in advancing related efforts. The research team conducted a thematic analysis of the workshop products and artifacts to prepare this white paper. Seven primary themes were identified using reflexive thematic analysis (RTA), and these themes were corroborated by Latent Dirichlet Allocation (LDA), a probabilistic model that helps uncover the underlying thematic structure within a collection of documents. The seven themes identified during analysis are: (1) Infrastructure and Housing Resilience, (2) Mental Health and Community Well-being, (3) Economic Revitalization and Workforce Development, (4) Environmental Stewardship and Disaster Preparedness, (5) Educational Adaptation and Support, (6) Leveraging Arts and Culture for Recovery, and (7) Community Engagement, Collaboration, and Data-Driven Decision Making. These themes inform future research and community engagement projects that can help support Western North Carolina’s (WNC) ongoing recovery and resilience efforts in the wake of Hurricane Helene.

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Introduction and Background

Hurricane Helene made landfall in the Florida Big Bend region on September 26th, 2024, as an intense Category 4 hurricane. Spanning 400 miles across and traveling at an astounding 140 mph, the storm quickly moved toward the north-northeast, penetrating far inland (Hagen et al., 2025). One of the deadliest storms in US history, Hurricane Helene brought historic rainfall, strong winds, immense inland flooding, dangerous storm surge, landslides, and numerous tornadoes. Unfortunately, as it reached the southern Appalachian Mountains, it presented as a “worst-case scenario.”

Two days before Helene made landfall, WNC was already experiencing heavy rainfall, with many areas in this region receiving 8 to 12 inches. As a result, streams, creeks, and rivers rose and flooded in some cases, leaving the ground saturated with little room for more water. Nonetheless, the center of Helene reached the southern Appalachian Mountains on Friday morning, September 27th. Though downgraded to a tropical storm by this time, the mountainous topography of the region exacerbated the hurricane’s rainfall. As heavy winds hit the mountains, they effectively pushed the warm air upward, where it vaporized and produced additional heavy precipitation over an already heavily saturated area. Remarkably, some communities received a further 20 to 30 inches of rain over a few hours. In the days following, the significant destruction caused by Hurricane Helene became evident.

Although North Carolina has experienced storms of similar size and strength, such as Hurricane Florence in 2018, the mountainous terrain and regional isolation of the areas most impacted by Helene, coupled with large-scale flooding, landslides, and damage to communication networks, created complexities and financial losses that the state had never experienced before. The total estimated financial damages and needs amount to \$59.6 billion, comprising \$44.4 billion in direct costs and \$15.2 billion for strengthening and mitigation. This is nearly 3.5 times greater than the damage attributable to Hurricane Florence. Five categories — Economy, Housing, Transportation, Utilities and Natural Resources, and Agriculture — represent nearly 90% of the direct and indirect damage from Helene.

In addition to the 108 individuals who lost their lives, more than 74,000 homes were destroyed, and tens of thousands more were damaged. Millions of North Carolinians were deprived of essential services, including sewer and water, electricity, telecommunications, and access to healthcare facilities. Extensive damage to thousands of miles of roads and bridges further isolated communities and impeded both the evacuation of residents and the deployment of critical emergency response and recovery personnel. The 115,000 business establishments and 384,000 “mom and pop” shops in WNC, even those spared physical damage, will feel the long-lasting effects of business closures and limited access. Agricultural and tourism industries also suffered significant damage, including the loss of crops and plants, as well as damage to backcountry infrastructure and natural landscapes at state and national parks - some of which may take multiple seasons or years to recover.

Recovery and Resilience Needs

Following the devastation of Hurricane Helene in the WNC region, recovery efforts began immediately. In addition to emergency responders providing immediate care to individuals and families and governmental organizations mobilizing, community efforts sprouted up all throughout the region to provide shelter and resources to everyone affected. Cell tower outages and other infrastructure damage (roads, bridges) left many isolated, so college campuses, public schools, and places of worship became community hubs to connect residents with support. Communities immediately mobilized to care for one another, displaying unquestioned generosity, kindness and grit, and while it quickly became apparent that the recovery efforts would be ongoing for months and years, it was also evident that WNC was home to remarkable expertise that could be leveraged to enhance the region's resilience. This is where the impetus for the WNC R3 Workshop was born - in seeing the incredible community response and resources that exist here, and the opportunity to organize expertise, connect stakeholders, and strategically move forward in response to a devastating disaster. In early 2025, a proposal for a multistakeholder planning workshop was developed for the NC Collaboratory to bring together critical perspectives, skills, and resources as a nexus for research-based momentum for rebuilding WNC communities.

Workshop Process

Methods/Planning/Facilitation

Appalachian State University hosted the Western North Carolina Research for Recovery and Resilience (WNC R3) Workshop, a single-day multi-stakeholder event on April 29, 2025, on its Boone Campus, located within the impact area of Hurricane Helene in the northwestern part of the state. The workshop was supported financially by the North Carolina Collaboratory (NC Collaboratory), which partners with universities to translate research into practice for local NC communities (NC Collaboratory, 2025). Event design and planning were led by Dr. Christine Hendren, Vice Chancellor of Research and Innovation, and a team of co-facilitators who provide Convergence Facilitation services to support research strategy development at App State and beyond.

Note about shared materials/appendices: In sharing the below materials, our writing team would like to make explicit that, as we shared with participants at the event, our intent has been to share out all that we captured and co-created together on that day, so that the multitude of different stakeholders, audiences, and future potential collaborators who may read this can find as much value as possible in the resulting content. Therefore, the appendices may include imperfections and read conversationally, but we have accepted these shortcomings in favor of sharing the ideas broadly. Appendices have been anonymized to the extent possible.

Planning Timeline

- **In February 2025**, a planning team assembled to structure and organize the workshop. The planning team was co-led by Dr. Christine Hendren and Dr. Katie Shoaf, the Associate Director of Grants Resources and Services in the Office of Research and Innovation (ORI). Four themes served as anchors for the workshop content and direction; each theme had two leaders:
 - Environment, Energy, and Infrastructure,
 - Dr. Jamie Russell: Director of the Appalachian Energy Center, Professor, Sustainable Technology and the Built Environment
 - Grace Marasco-Plummer: Managing Director, Research Institute for Environment, Energy, and Economics (RIEEE), which houses the Convergence Facilitation services offered at App State.

- Rural Health and Wellness,
 - Dr. Adam Hege: Associate Dean for Research and Graduate Education, Beaver College of Health Sciences, Associate Professor of Public Health
 - Dr. Maggie Sugg: Associate Professor, Geography & Planning
 - Educational Access and Workforce Development Capacity,
 - Dr. James Beeler: Executive Director, College Access Partnerships
 - Corinne Smith: Deputy Director, College Access Partnerships
 - Culture, History, and Arts
 - Trevor McKenzie: Director, Center for Appalachian Studies
 - Dr. Julie Shepherd-Powell: Assistant Professor, Interdisciplinary Studies
- Whitney Wallett, Executive Assistant to the Vice Provost for Research and Innovation, assisted Hendren and Shoaf with the planning, logistics, and implementation of the workshop. George Baldwin, Executive Director for Corporate and Foundation Relations within ORI, also provided feedback, planning, and facilitation support for the workshop.
- **In early March 2025**, the planning team began articulating their [rationale, objectives, and deliverables](#) (Appendix 1) for the meeting and brainstorming potential participants and schedule. The following overarching objectives for the WNC R3 workshop were identified:
 - Collect research needs from a multi-stakeholder group related to building western NC resilience, and support recovery from Helene with a long-term resilience lens in mind.
 - Identify researchers in WNC whose expertise could address recovery and resilience needs identified in the workshop.
- Theme leaders also identified their own objectives for the workshop:
- Environment, Energy, & Infrastructure Objectives
 - Within the domains of the built environment (residential, commercial, civil), critical utilities (energy, water, communication), and the environmental systems these interact with and depend on:
 - Make space for participants to share successes and struggles during response and recovery
 - Identify coalitions and networks working in this space and the social, physical, and informational infrastructures still needed to bolster regional resilience and recovery.
 - Identify gaps in knowledge and implementation capacity essential to regional resilience and recovery that universities in the region can help address
 - Educational Access & Workforce Development Capacity Objectives
 - Discuss the known and hidden impacts of the hurricane on students, families, teachers, administrators, and others as well as the challenges faced by the education community.
 - Identify other data needed.
 - Discuss the concept of research teams and focused interventions
 - Who should participate in this work?
 - How might this work grow challenges into innovation?
 - Rural Health & Wellness Objectives
 - What immediate health consequences did Helene cause in Appalachian communities?
 - What was the extent of healthcare access disruption during and immediately after the Helene?

- What specific health challenges do marginalized and low-income households face in recovery?
 - What gaps in emergency health response became most apparent?
 - For households with multiple vulnerabilities (e.g., low income, chronic health conditions, elderly caregivers), what integrated support models are most effective?
 - Community-Engaged Research Design: Centering local knowledge and lived experiences in research methodology (social and environmental challenges already faced pre-Helene and how they were further impacted)
- Culture, History, & Arts Objectives
 - What avenues are your organizations/your community groups using to engage arts and cultural heritage as a response to Hurricane Helene?
 - Can these initiatives/projects be sustained beyond our current moment?
 - How has the aftermath and initial recovery from Helene weakened/strengthened arts and culture initiatives/programs in regional communities?
 - What opportunities for community-based storytelling have emerged during the response to Helene?
- **By late March 2025**, over 200 potential participants had been identified. Theme leads and planning leaders suggested academic colleagues from Appalachian State and other regional universities, like UNC Asheville and Western Carolina University. Community college faculty and administrators were named alongside K-12 administrators and teachers. Potential participants also included non-profit leadership, grantmaking organization staff, local governmental organizations, and state/federal agencies.
- **In early April 2025**, a first wave of participants was invited, and then in mid-April, additional potential participants were identified, and a second wave of invitations went out. At the time of invitation, participants were invited to complete [pre-work](#) (Appendix 2) ahead of the workshop. They were asked to respond to the following questions:
 - What are the highest priority needs in WNC with regard to acute recovery from Hurricane Helene?
 - What are the highest priority needs in WNC with regard to long-term resilience to natural, social, or economic disasters?
 - What do you hope to gain from this workshop, or what does a successful workshop look like to you?
- **By the end of April 2025**, the event was full with nearly 120 “yes” RSVPs, and 90 participants attended the workshop in person on Appalachian State’s Boone campus. Of the 90 participants, 44 represented an academic perspective coming from a university or a community college. The remaining 46 participants represented non-academic community organizations and entities: K-12 schools, non-profit organizations, governmental agencies, etc.

Workshop/Facilitation Timeline

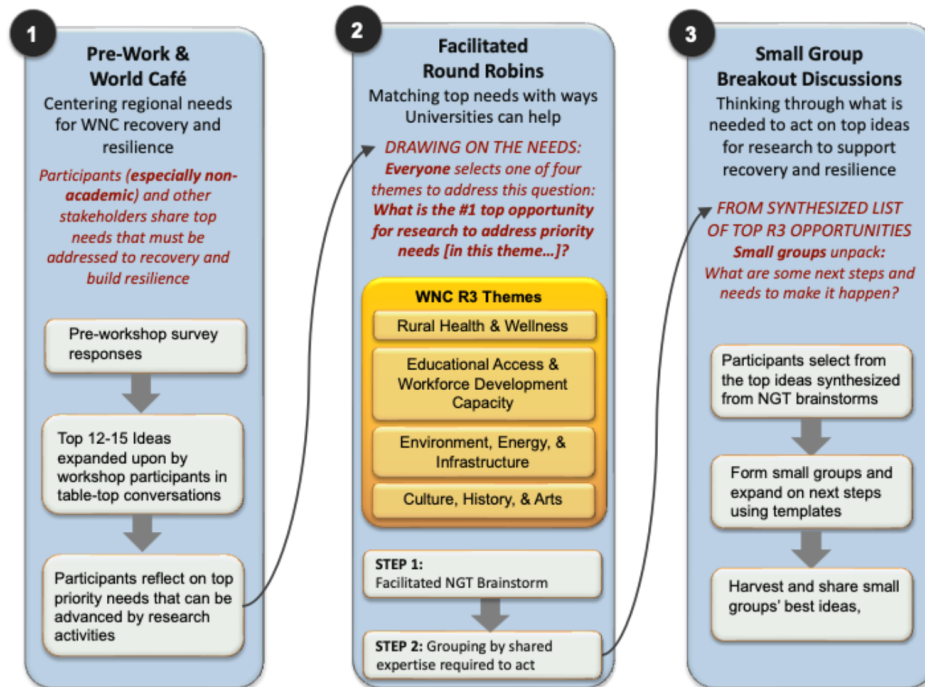


Figure 1. Workshop Inputs and Flow

- **The week before the workshop**, Shoaf and Hendren drew upon the collated pre-work document to identify [table topics](#) (Appendix 3) for the first group activity of the day: the World Cafe. An iterative process was applied by prompting ChatGPT to propose grouped topics and analyzing the groupings with judgment of the planners to ensure that all topics proposed by invitees were clearly included, and that the groupings would be likely to support productive conversations that led participants to think about what research and creative activity efforts could actually support the surfaced needs.
- **World Cafe:** A world cafe is a participatory way to collect data from large groups to facilitate engagement and feedback (Löhr et al., 2020). During the World Cafe, participants had 45 minutes to interact with the pre-submitted needs and ideas (we had three rotations) - problems and gaps that Helene highlighted for High Country resilience. This activity was designed to encourage participants to start ideating and responding to the thoughts of others.
- **Facilitated Round-Robin:** During the facilitated 90-minute round-robin session, facilitators employed a Pseudo-Nominal Group Technique (NGT) to elicit feedback from each participant in themed breakout sessions (two breakout sessions were offered for each theme) (Delbecq & Van de Ven, 1971; Powers et al., 2014). In this session, participants responded to the following prompt: "What is the number one top opportunity for research to address priority need(s) in [Select Theme: **Environment, Energy, & Infrastructure; Educational Access & Workforce Development Capacity; Rural Health & Wellness; Culture, History, & Arts**]" - and then they were asked to sort the responses using the following rule: "These ideas go together because the same project and team could coherently address them together, and would make sense to be part of the same funding proposal." Each round robin session had two facilitators and a scribe who was tasked with transcribing the session outputs verbatim.
- **Over lunch**, Hendren and Dr. Gabe Casale, Assistant Vice Provost for Research and Innovation, used the [Facilitated Round Robin outputs](#) (Appendix 4) to synthesize the

sorted outputs using Claude AI into 20 afternoon [breakout session topics](#) (Appendix 5), with five options for each theme.

- **Afternoon Breakouts:** For the two afternoon breakouts (45 mins each), participants self-sorted into breakout sessions by topic. Some groups chose the same topic. They were first asked to discuss the topic and fill out the [breakout room templates](#) (Appendix 6) with an eye to recovery, and then to resilience.
- **Action Cards:** At the close of the day, participants were asked to complete an [action card](#) (Appendix 7) and turn it in, thinking about the topic/project idea that they would most like to pursue in future conversations. After the event, Shoaf used Notebook LM (AI) to [synthesize the action card responses](#) (Appendix 8) by topic.
- **Post-Workshop Survey:** Approximately one week after the workshop, Shoaf sent a post-workshop survey to participants to complete. Participants were offered a \$50 Amazon Gift Card if they completed the survey.

Data Cleaning Process

The research team organized qualitative data from the workshop, pre-work submissions, discussion table notes, and action cards into a structured Google Sheet and applied a systematic data cleaning process. This included standardizing language and removing duplicates. For the discussion notes, we copied the direct text from the notes into the same Google Sheet. Action cards were aligned with breakout topics and clustered by similarity. Cleaning was performed using a manual review to ensure consistency, clarity, and readiness for synthesis.

Summative Themes

Thematic Analysis Methodology

For this analysis, two members of the research team (Shoaf and Schroeder Tyson) employed a reflexive thematic analysis (RTA) approach, which emphasizes the active role of the researcher in interpreting and constructing themes from the data, rather than merely "finding" them (Braun & Clarke, 2024). This method acknowledges that themes are products of a dynamic interaction between the researcher's perspective and the data, leading to a situated and coherent interpretation. For this analysis, it is important to note that Shoaf was co-chair of the workshop and a lead planner of the event, and Schroeder Tyson, although initially on the invite list, was unable to attend the workshop and supported the data cleaning and analysis for the white paper.

Independently, the researchers thoroughly read through the cleaned data from the WNC R3 Workshop. This initial immersion enabled an understanding of the breadth and depth of the workshop discussions and identified areas of common focus and concern. Instead of using a rigid "coding" process that seeks pre-existing data, the researchers engaged in a flexible approach, noting interesting features of the data that might be relevant to the workshop's purpose of identifying recovery and resilience needs and solutions. This involved identifying recurrent patterns, significant statements, and underlying meanings within the various breakout group discussions and pre-work outcomes. The researchers then grouped these initial ideas into broader, meaningful patterns that began to form conceptual, clustered themes. In RTA, themes are not simply topic summaries but capture the "essence" or "story" of a shared meaning across the dataset. For instance, instead of simply noting "roads," the researchers aimed to construct a theme such as "Infrastructure and Housing Resilience" to capture the broader narrative of rebuilding with an eye towards future stability. This iterative process involved moving back and forth between the identified patterns and the entire dataset to ensure thematic coherence. The candidate themes were reviewed against the full dataset to ensure they accurately reflected the meaning within the data and were distinct enough from one

another. Themes were refined to ensure they represented a "central organizing concept" and provided a rich, multifaceted story, rather than being thin or one-dimensional. For example, the concept of "community" appeared in various contexts, leading to the development of a theme focused on "Community Engagement and Collaboration," encompassing social cohesion and network building. Once Shoaf and Schroeder Tyson generated their theme lists, they were compared and integrated into one mutually established list. Each theme was then clearly defined, and a name was chosen that captured its core meaning. The theme names aim to be conceptual and interpretative, reflecting the active role in their creation. Finally, for each theme, the researchers outlined its meaning and significance, weaving in illustrative data extracts from the workshop materials. These extracts serve as evidence for the analytic claims, demonstrating the coherence between the interpretative narrative and the raw data. This process explicitly avoids treating data meaning as self-evident or simply paraphrasing data.

Identified Themes

Based on the RTA process, the following themes capture the priorities and discussions from the WNC R3 Workshop:

1. **Infrastructure and Housing Resilience**
2. **Mental Health and Community Well-being**
3. **Economic Revitalization and Workforce Development**
4. **Environmental Stewardship and Disaster Preparedness**
5. **Educational Adaptation and Support**
6. **Leveraging Arts and Culture for Recovery**
7. **Community Engagement, Collaboration, and Data-Driven Decision Making**



Figure 2. Clustered Themes

In addition to these seven clustered themes, an overarching theme emerged, emphasizing Western North Carolina (WNC)-driven and -centered solutions. There were thoughts shared that stressed the importance of relying on the expertise and experience of the communities in WNC,

in contrast with the sense that “people from outside of our communities are taking charge of that work.”

Infrastructure and Housing Resilience: This theme encapsulates the urgent need to repair, rebuild, and future-proof physical infrastructure, including housing, roads, bridges, and utilities, with a particular emphasis on disaster-resilient design and addressing housing affordability. A significant priority for WNC, both in acute recovery and long-term resilience, revolves around the repair and enhancement of physical infrastructure. This includes restoring damaged roads, bridges, and culverts, addressing landslide areas, and rebuilding housing. There's a particular emphasis on housing reconstruction, especially for low-income and displaced communities, and an interest in incorporating flood-resilient construction techniques. Beyond roads and housing, the need for resilient energy infrastructure, such as microgrids and underground utilities, is highlighted to prevent future outages and ensure reliability. Communications infrastructure, including requiring battery backups for cell towers, is also crucial for preparedness and response.

Mental Health and Community Well-being: This theme highlights the critical importance of addressing the psychological, social, and emotional impacts of disasters, providing ongoing mental health support, reducing stigma, and fostering strong community cohesion. Specifically, participants in the workshop noted that “people are not seeking or accessing help due to 'mountain pride,' fear, distrust, or stigma.” Multiple groups discussed the need for improved healthcare access in general in the region, with one person noting that “the disaster amplified an existing need to improve healthcare in the community” and another stating that there remains a need for “mental health counseling and support to deal with grief, PTSD, etc.” following the storm.

Economic Revitalization and Workforce Development: This theme focuses on strategies for economic recovery and diversification, including supporting small businesses, attracting new industries, and developing a skilled workforce for both immediate recovery and long-term economic stability. Hurricane Helene caused significant economic loss, particularly affecting small businesses and the tourism sector. There is a strong call for financial assistance through grants and low-interest loans to help businesses recover and retain jobs. For long-term resilience, diversification of the tourism-dependent economy is a key priority, focusing on attracting advanced manufacturing and emerging technology industries like cyber, data, and robotics. This requires corresponding workforce development, including training in trades, healthcare, and technology-intensive industries, as well as supporting programs such as K-14 education and community colleges. The concept of “hyperlocal” initiatives and fostering an entrepreneurial environment is also mentioned.

Environmental Stewardship and Disaster Preparedness: This theme covers efforts aimed at restoring natural landscapes, mitigating environmental risks such as landslides and wildfires, and implementing proactive planning and education initiatives to enhance the region's readiness for future natural disasters. Environmental concerns related to Hurricane Helene, including debris removal from waterways, streambank restoration, erosion, and wildfire mitigation, were mentioned numerous times. There's a call for long-term planning for land use, including more restrictive floodplain regulations and moving homes/businesses out of vulnerable areas. Water quality, testing, and resilient sewage treatment are also highlighted. The importance of restoring agricultural land and supporting local food systems to increase self-sufficiency is also a key component of this theme.

Educational Adaptation and Support: This theme addresses the challenges and opportunities within educational settings, including learning recovery, providing social-emotional support for students and educators, developing resilient learning models, and leveraging schools as vital community resources during and after disasters. Breakout groupings from the day that focused on educational experiences during and after the hurricane began to ask the following questions: “What was lost? What are we continuing? What do we need? What did

school communities learn instead? How do we think about assessment differently to put the focus on what really matters to WNC communities today and tomorrow?”

Leveraging Arts and Culture for Recovery: This theme emphasizes the significant role of arts and cultural initiatives in facilitating healing, preserving community identity through storytelling and historical documentation, and contributing to economic recovery and community resilience. A project that was highlighted several times throughout the workshop is the [Hurricane Helene Archive](#), started by App State faculty member, Beth Davison. The archive can serve as a mechanism to facilitate "remembrance of this event for generations to come."

Inter-organizational Collaboration and Data-Driven Decision Making: This theme underscores the necessity for improved communication, stronger research networks, and coordinated efforts across diverse stakeholders (government, academia, community organizations) to facilitate effective, informed, and equitable disaster response and long-term planning. As an example, breakout groups throughout the day brought up multiple datasets that already exist on a state or organizational level and the need for the development of new datasets. Conversations pointed out that shared, central access or cataloging of these datasets would improve intersectional, impactful analyses and research that can support resilience efforts in the region.

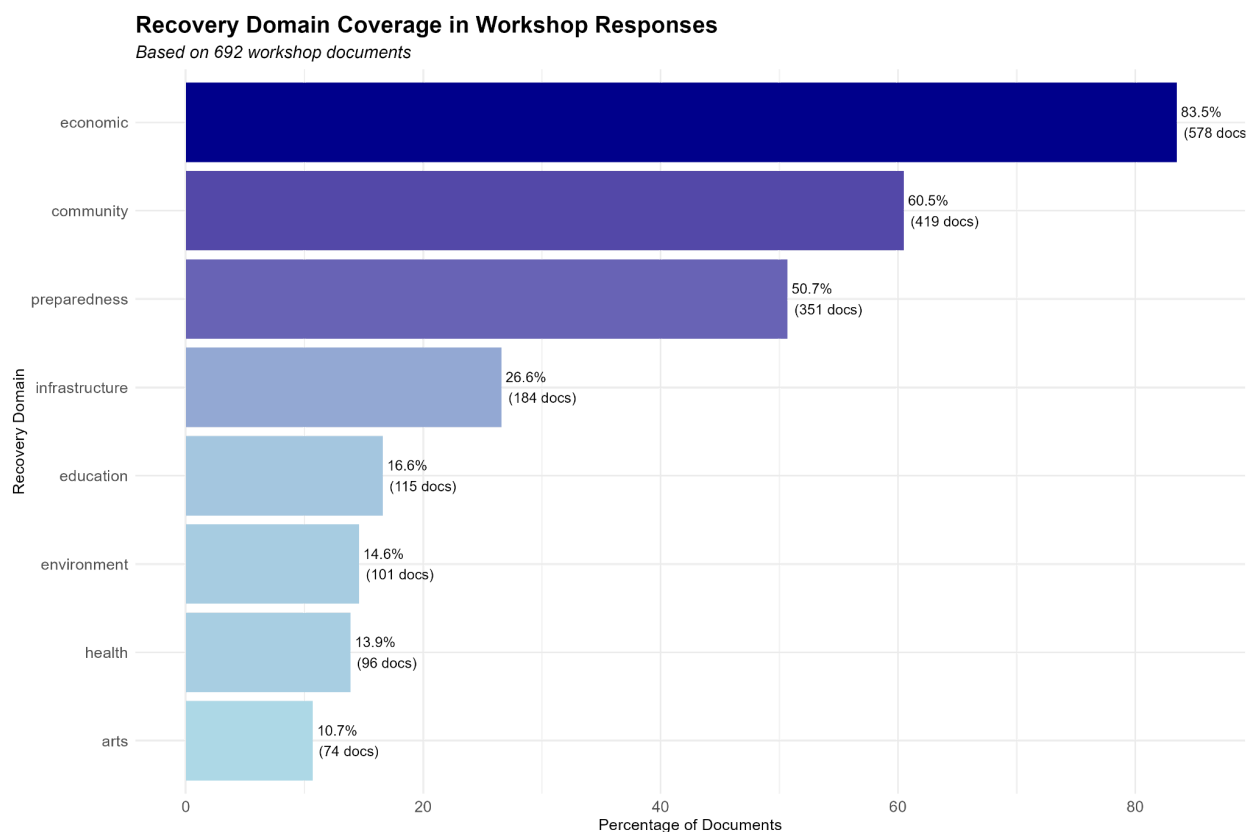


Figure 3: Recovery domain coverage across workshop responses. Bars indicate the percentage of documents (n=692) mentioning terms from each recovery domain, with darker shading representing higher coverage.

Thematic Overlap and Intersections

Each of the seven identified themes shares an overlap and intersection with others, as shown in Figure 3. These overlaps underscore the importance of open lines of communication and collaboration to maximize the efforts of groups pursuing projects in each of these areas. All

WNC R3 participants share the common goal of seeking progress in the areas of recovery and resilience for our region, while contributing in different, but complementary, meaningful ways.



Figure 4. Thematic Overlap and Intersection

The reflexive thematic analysis process provided insights into the areas of overlap and opportunity for shared efforts; these are detailed in Table 1. Potential partners were identified for some action items as well, which can be seen in Table 2.

Theme	Definition / Focus	Key Overlapping Themes
1. Infrastructure and Housing Resilience	Repairing, rebuilding, and future-proofing infrastructure (housing, roads, utilities, communications) with disaster-resilient and affordable designs.	- Environmental Stewardship (floodplain mgmt, disaster resilience) - Economic Revitalization (construction jobs, infrastructure investment) - Collaboration (planning and coordination) - Education (school buildings as resilient hubs)

2. Mental Health and Community Well-being	Supporting psychological and emotional recovery, reducing stigma, fostering social cohesion, and providing long-term care.	- Arts & Culture (healing, storytelling) - Education (student/teacher well-being) - Collaboration (community-wide strategies)
3. Economic Revitalization and Workforce Development	Supporting small businesses, diversifying the economy, attracting emerging industries, and developing a skilled workforce.	- Infrastructure (rebuilding jobs)- Education (training and K-14 pipeline) - Arts & Culture (cultural economy) - Collaboration (economic planning)
4. Environmental Stewardship and Disaster Preparedness	Restoring ecosystems, reducing environmental risk (landslides, floods), and enhancing readiness via proactive planning and education.	- Infrastructure (resilient siting and construction) - Education (disaster education) - Collaboration (data-sharing and planning)
5. Educational Adaptation and Support	Addressing learning loss, social-emotional learning, developing resilient education systems, and using schools as recovery assets.	- Mental Health (student support) - Economic (workforce readiness) - Infrastructure (school resilience) - Collaboration (policy and planning)
6. Leveraging Arts and Culture for Recovery	Using art and storytelling for healing, community identity, historical preservation, and economic revival.	- Mental Health (emotional recovery) - Economic (cultural tourism, creative industries) - Collaboration (community-led recovery efforts)
7. Community Engagement, Collaboration, and Data-Driven Decision Making	Coordinating across sectors (gov, academia, communities), improving communication, and using research/data for equitable recovery and planning.	Intersects with all themes by providing a foundational structure for communication, planning, data sharing, and equity

Table 1. Theme Overlap Detail

Theme	Action Items & Quotes (Summarized)	Partners / People / Projects Identified
1. Infrastructure and Housing Resilience	- “Bridge and road construction (public and private)” - “Resilient energy infrastructure (solar/storage microgrids...)” - “Housing - Rebuilding homes in safe locations and to improved standards” - “Construction Code enhancement and enforcement” - “Floodplain mapping/modeling, Emergency Management/Preparedness”	- NRLP (underground utilities project) - Footprint Project - Municipalities staff
2. Mental Health and Community Well-being	- “Expansion of healthcare access: rural clinics, telehealth” - “Addressing community trauma; support for families” - “Mental health resources in schools” - “Student and teacher social/emotional support” - “Incentivize providers to relocate to High Country”	- UNC Health Network - NC DHHS - DHHS Town Halls - Mental Health Crisis Text Line
3. Economic Revitalization and Workforce Development	- “Hyperlocal initiative to support grassroots entrepreneurship” - “Diversify economy—cyber, data, robotics” - “Reskill workforce—K–14 pipeline” - “Grants/loans for small businesses” - “Model: find farmers who test ag tech in exchange for equity”	- AppState & CCC&TI (training & entrepreneurship) - NC Dept of Commerce (tech + economic development) - Impact Fund (needs corporate partners)
4. Environmental Stewardship and Disaster Preparedness	- “Streambank restoration, wildfire mitigation, erosion control” - “Buyout programs for flood-prone areas” - “Ongoing water quality and soil testing” - “Clean-up of flood debris from rivers & personal property” - “Landslide risk quantification”	- Warren Wilson College (riparian plantings) - EEI (water quality & debris reporting) - Appalachian State Geography Dept (LiDAR/flood modeling)
5. Educational Adaptation and Support	- “Learning recovery—remediation programs, teacher resilience” - “Fund educational modules for remote learning” - “Trade-based education and disaster-related training” - “Development of curriculum for trauma recovery”	- McDowell Tech - K–14 system - App State faculty & resources - School systems as disaster conveners

	- "Improved coordination between public schools, colleges, and workforce programs"	
6. Leveraging Arts and Culture for Recovery	- "Oral histories, storytelling, public exhibits" - "Capture economic impact of the arts in recovery" - "Coordinate with County Arts Councils and NC Arts Council" - "Connect creative community with archives, nonprofits" - "Advocate % of recovery funds for arts sector"	- Watauga, Ashe, Lost Province Arts Councils - NC Arts Council - BRAHM (art & mental health) - Buskers Fest (archive idea)
7. Community Engagement, Collaboration, and Data-Driven Decision Making	- "Regional population health datasets" - "Participatory inventory; qualitative storytelling + data" - "Coordinate data across counties for real-time response" - "Facilitate cross-sector convos: K-12, industry, academia" - "Develop replicable disaster response models"	- Grow NC - Dogwood ECHO - NC Collaboratory - NCCORP

Table 2. Actions and Potential Partners

Recommendations

The WNC R3 Workshop on April 29, 2025, laid the groundwork for an expertise network to emerge that is collectively equipped to respond to the pressing needs of WNC as the area continues to recover, build back better, and plan for future disaster resilience. Consequently, each of the summative themes discussed above highlights a path or series of paths forward for research, creative, and outreach projects. One of the key outputs of the workshop is an [expertise database](#), which invites stakeholders with relevant interest and expertise to include their contact information and their key areas of potential future participation and collaboration in the WNC R3 initiative. This database should be leveraged to build teams to pursue projects of interest in the seven areas identified through the workshop: (1) Infrastructure and Housing Resilience, (2) Mental Health and Community Well-being, (3) Economic Revitalization and Workforce Development, (4) Environmental Stewardship and Disaster Preparedness, (5) Educational Adaptation and Support, (6) Leveraging Arts and Culture for Recovery, and (7) Community Engagement, Collaboration, and Data-Driven Decision Making.

Next Steps

There are three primary areas for next steps following the WNC R3 Workshop: (1) facilitated networking opportunities, (2) funding and/or funding opportunity identification, and (3) open communication with WNC R3 networks and colleagues about ongoing work.

Post-workshop survey responses and end-of-workshop Action Cards indicate broad interest in university-hosted networking opportunities or additional facilitated sessions to coalesce project ideas. Funding resources are also repeatedly mentioned as a need, so sharing opportunities as they are identified and established is another key next step for any group moving forward with a recovery or resilience project. Communication about projects in progress or resources that may be of shared use or interest is also recommended for maintaining forward

momentum. This will avoid duplication, foster collaborative team development, and can support storytelling and regional awareness of research/creative endeavors and opportunities to engage with the critical work to which many WNC residents feel deeply connected.

Action Items

- Infrastructure and Housing Resilience
 - Build and improve bridges and roads (public/private).
 - Develop resilient energy systems (solar/storage microgrids).
 - Rebuild homes in safer locations with higher standards.
 - Enhance and enforce construction codes.
 - Update floodplain mapping and emergency preparedness.
- Mental Health and Community Well-being
 - Expand healthcare access through rural clinics and telehealth.
 - Provide trauma support for families and communities.
 - Increase mental health resources in schools.
 - Support social/emotional well-being for students and teachers.
 - Incentivize health providers to work in High Country areas.
- Economic Revitalization and Workforce Development
 - Support grassroots entrepreneurship at the local level.
 - Diversify the economy with tech sectors (cyber, data, robotics).
 - Reskill the workforce via K–14 education pipeline.
 - Provide grants and loans for small businesses.
 - Implement ag tech pilot programs with farmers in exchange for equity.
- Environmental Stewardship and Disaster Preparedness
 - Restore streambanks, mitigate wildfires, and control erosion.
 - Launch buyout programs for flood-prone properties.
 - Conduct regular water quality and soil testing.
 - Clean flood debris from rivers and properties.
 - Quantify landslide risks with scientific methods.
- Educational Adaptation and Support
 - Implement learning recovery and remediation programs.
 - Fund remote learning educational modules.
 - Develop trade-based and disaster-related training.
 - Create trauma recovery curricula.
 - Improve coordination among schools, colleges, and workforce programs.
- Leveraging Arts and Culture for Recovery
 - Collect oral histories and storytelling projects.
 - Document the economic impact of the arts in recovery.
 - Coordinate with arts councils and nonprofits.
 - Connect creative communities with archives.
 - Advocate allocating recovery funds to the arts sector.
- Community Engagement, Collaboration, and Data-Driven Decision Making
 - Develop regional population health datasets.
 - Combine qualitative storytelling with data inventories.
 - Coordinate multi-county real-time data sharing.

- Facilitate cross-sector conversations (education, industry, academia).
- Create replicable disaster response models.

Works Cited

Braun, V., & Clarke, V. (2024). Supporting best practice in reflexive thematic analysis reporting in *Palliative Medicine*: A review of published research and introduction to the *Reflexive Thematic Analysis Reporting Guidelines* (RTARG). *Palliative medicine*, 38(6), 608–616. <https://doi.org/10.1177/02692163241234800>

Cooper, R. (2024). Hurricane Helene Recovery Revised Damage and Needs Assessment (p. 133). North Carolina Office of State Budget and Management. <https://www.osbm.nc.gov/budget/hurricane-helene-damage-needs-assessment>

Delbecq, A. L., & Van de Ven, A. H. (1971). A group process model for problem identification and program planning. *The journal of applied behavioral science*, 7(4), 466-492.

Hagen, A. B., Cangialosi, J. P., Chenard, M., Alaka, L., & Delgado, S. (2025). NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT HURRICANE HELENE (AL092024). National Weather Service.

Löhr, K., Weinhardt, M., & Sieber, S. (2020). The “World Café” as a Participatory Method for Collecting Qualitative Data. *International Journal of Qualitative Methods*, 19, 1-15. <https://doi.org/10.1177/1609406920916976>

NC Collaboratory. (2025). *About*. <https://collaboratory.unc.edu/about/>

Powers, C., Hendren, C., Wang, A., & Davis, J. M. (2014). Transparent stakeholder engagement in practice: Lessons learned from applying comprehensive environmental assessment to research planning for nanomaterials. *Integrated Environmental Assessment and Management*, 10(4), 498-510.