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Subtask 2.9: Project Restrictions Analysis

North Carolina Flood Resiliency Blueprint

Prepared for the North Carolina Department of Environmental Quality by AECOM

October 2024

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Definitions

A comprehensive list of definitions applicable to multiple Flood Resiliency Blueprint documents is provided in a separate document.

Acronyms

APNEP- Albemarle-Pamlico National Estuary Partnership

ARC – Appalachian Regional Commission

ARPA – American Rescue Plan Act

CAMA – Coastal Area Management Act

CATEX- Categorical Exclusion

CEQ- Council of Environmental Quality

CFR – Code of Federal Regulations

COG- Council of Governments

CRRP – Climate Risk Assessment and Resilience Plan

DCI – Distressed Communities Index

DOE- Department of Energy

DOT- Department of Transportation

EIS- Environmental Impact Statement

EMAP- Emergency Management Accreditation Program

EO- Executive Order

E-SHMP – State of North Carolina Enhanced State Hazard Mitigation Plan

FAPIIS – Federal Awardee Performance and Integrity Information System

FAST- Fixing America's Surface Transportation

FEMA – Federal Emergency Management Agency

FFATA- Federal Funding Accountability and Transparency Act

FHWA – Federal Highway Administration

FSRS – Federal Subaward Reporting System

GICC – Geographic Information Coordinating Council

GIS – Geographic Information System

HUD – U.S. Department of Housing and Urban Development

IIJA – Infrastructure Investment and Jobs Act

LASII- Local Assistance for Stormwater Infrastructure Investments

LMI- Low Moderate Income

LMISD- Low Moderate Income Summary Data

N.C. or NC – North Carolina

NCCIA- North Carolina Commission of Indian Affairs

NCCMP- North Carolina Coastal Management Program

NCDEM- North Carolina Division of Emergency Management

NCDEQ – N.C. Department of Environmental Quality

NCDPS - N.C. Department of Public Safety

NCEOP – N.C Emergency Operations Plan

NCFMP- North Carolina Floodplain Mapping Program

NCFRB- North Carolina Flood Resiliency Blueprint

NCORR – N.C. Office of Recovery and Resiliency

NCSU – N.C. State University

NEPA- National Environmental Policy Act

NFIP - National Flood Insurance Program

NOAA- National Oceanic and Atmospheric Administration

NOPR- Notice of Proposed Rulemaking

NPDES- National Pollutant Discharge Elimination System Permit

OFD- One Federal Decision

OIG- Office of Inspector General

RARR- Risk Assessment and Risk Reduction

ROD- Record of Decision

SHPO- State Historic Preservation Offices

SLFRF- State and Local Fiscal Recovery Funds

SMAC- Statewide Mapping Advisory Committee

TDHE – Tribally Designated Housing Entity

THPO- Tribal Historic Preservation Offices

UDO - Unified Development Ordinances

UNC- University of North Carolina

U.S. or US – United States

USDOI – U.S. Department of Interior

WGBF- Working Group for Building Footprints

1 Introduction

Purpose Statement: Identify existing federal, tribal, and state regulations/requirements that impact the ability of state and local governments to implement flood resilience strategies identified in the best management practices created with the other tasks in phase 1 of blueprint such as ***Subtask 2.6: Flood Risk Reduction Project Funding Analysis*** *and* ***Subtask 2.7: Existing Inventory of Toolkit Flood Resilience Strategies*** (e.g., match fund requirements, complex reporting requirements, permitting). Note that restrictions are frequently changing and those detailed in this document are analyzed for the current conditions during preparation of this report.

This document identifies and evaluates the ability of the state government and local governments to implement flood resilience strategies that were identified in the best management practices analysis that is dependent on federal, state, and local restrictions. Restrictions of and to flood resilience strategy implementation are divided into the following sections in this report:

- North Carolina's Interdependencies
- Quality of the Governance
- Hazards
- Basin-Wide Approaches to Flood Resiliency Planning
- Practicability
- Permitting Requirements
- Funding Requirements
- Complex Funding Reporting Requirements

Flood resiliency strategies are multi-dimensional and provide a community with the conditions to cope, adapt, or transform before, during, and after a disaster. These strategies define a community's capacities and thresholds for addressing hazards triggered by an event or by a trend related to land use and climate. The capacity of critical functions and services after an event are impacted by the community's preexisting vulnerability. Those vulnerabilities are defined by likely impacts to people, assets, or ecosystems. Plans at many levels are required to help create mitigation strategies that increase communities' resilience.

2 Background

The development of resilience plans across the United States (US) has historically been based on climate action, resilience, and mitigation components. These components are used to direct flood responses, emergency management, water and coastal management, hazard mitigation, and combined hazard mitigation and climate issues that address environmental hazards.

Plans previously created had a plethora of missing data and overlooked concerns. Historically there was little to no meaningful incorporation of social vulnerability measures such as health, safety, supplies, food, or agricultural production in the mitigation plans mentioned above. Many plans did not include appropriate time for purposeful and relevant public engagement of those affected by hazards. Most plans lacked strategies to assist low-capacity localities (e. g., geographically defined areas with limited government resources, low funding, or a lack of technical skills). Some plans did not track and/ or monitor improvements in a local capacity to address flood hazards. The state emergency management department-led plans provided local connections and institutional knowledge in the process, but sometimes limited innovative planning, while privately developed plans lacked vital communication with the public.

A large portion of North Carolina's (NC) flood resiliency plan restrictions and funding is centered around the state's previous and existing experiences with flooding. Restrictions are heavily influenced by the fact that not all floodplains in North Carolina are FEMA mapped floodplains. As of 2015 there was only a population of around 431,190 living in FEMA mapped 100-year floodplains according to 2017 NYU Furman Center Report. Communities across the state face both riverain and coastal flood hazards that change based on increases in land use and storm intensity and frequency. Often the changes occur without mapping data being updated to reflect those changes. Updated data is required to apply for financial assistance to improve flood conditions in unmapped floodplain areas.

The coastal and central Piedmont regions of NC are highly vulnerable to destructive flooding from hurricanes and tropical storms. In addition to occasional significant impacts from tropical cyclones and remnants of tropical cyclones, the mountainous western region of the state is vulnerable to flash flooding, rockslides, washed-out roads, mudflows, and snowmelt runoff from the mountains due to droughts and heavy rains. North Carolina experienced twenty-one (21) flood-related disasters between 2010 and 2023. These disasters include two (2) consecutive events within two years from Hurricane Matthew in 2016 ($4.8 billion in damages) and Hurricane Florence in 2018 ($22 billion in damages). Climbing costs of recovery efforts following these events led to the signing of Executive Order 80 by Governor Roy Cooper. In 2021, Tropical Storm Fred's damages in the NC mountains totaled approximately $300 million, causing 100 foot by 800 foot sections of natural ground landslides, destroying 225 structures, and leaving seven dead in Haywood County.

2.1 North Carolina's Existing State Resilience Strategy

This is not currently a single planned strategy, but a combination of plans completed through the execution of Executive Order 80 that will include the North Carolina Climate Science Report, State Agency Resilience Strategies, Statewide Vulnerability Assessments and Resilience Strategies, and the North Carolina Enhanced Hazard Mitigation Plan (details outlining the full strategy and any additional components not outlined in this report can be found in the links provided in the footnotes). In November 2021, the state budget dedicated $800 million over a two-year period to disaster recovery, flood prevention, and other needs related to more intense storms and climate change. House Bill 500

(Filed April 8, 2021) permanently funded three (3) positions in the N.C. Office of Recovery and Resiliency (NCORR), which were originally temporary. Additional technical assistance was added to build funds to match federal disaster funding and build the local capacity for flood planning, and the physical and natural flood protection infrastructure. The 2021 state budget included funds dedicated to development of a draft Statewide Flood Resiliency Blueprint by the N.C. Department of Environmental Quality (NCDEQ) Division of Mitigation Services. A 2022 progress report for Executive Order 80 was published by NCDEQ detailing the status of its plans.[i] Existing plans and actions as required under Executive Order 80 that related to North Carolina's commitment to addressing climate change and transition to a clean energy economy include the following:

- Climate Change Interagency Council development
- North Carolina Climate Science Report
- State agency resilience strategies
- Statewide vulnerability assessment and resilience strategies
- North Carolina Enhanced Hazard Mitigation Plan
- North Carolina Climate Risk Assessment and Resilience Plan (CRRP)

2.2 Executive Order 80

Executive Order 80, signed by NC Governor Roy Cooper on October 29, 2018, required each state agency to evaluate the impacts of climate change on its programs, provide an annual status report on the progress, and directly address climate change. Before Executive Order 80, flood planning in the state was piecemeal, lacking both a comprehensive plan and a planning entity.

2.3 The North Carolina Climate Risk Assessment and Resilience Plan

Released June 15, 2020, The North Carolina Climate Risk Assessment and Resilience Plan (CRRP) was developed by NCDEQ with the climate data from the North Carolina Institute for Climate Studies at North Carolina State University (NCSU). CRRP helped form a qualitative discussion and framework regarding flooding issues, while Blueprint will define the concrete goals and metrics for flood resiliency in the state. The public engagement process for CRRP was led by NCDEQ with NCORR involvement in the stakeholder engagement portion. NCDEQ conducted five comprehensive working group and engagement sessions across the state. They also brought in local experts, local government staff, local councils, and community members to participate in discussions of climate risk and impacts in their areas.

Funding initiatives identified in the CRRP have begun. They include funding the interagency resilience team, which will coordinate resilience planning and activities across the state government, incorporating risk assessments into the next SHMP, building local resilience capacity through the North Carolina Resilient Communities Program, and creating agency resilience strategy reports.

The NC CRRP framework identified the North Carolina Office of Recovery and Resiliency to lead and manage communication efforts and prioritize and implement resilience in the framework of activities in North Carolina through guiding state actions, engaging policymakers and stakeholders, facilitating collaboration across the state, focusing the state's attention on climate resilience actions and addressing underlying stressors (e. g. the changing climate, aging infrastructure, socio-economic disparities, etc.), and outlining competing development priorities.

The NC CRRP provides the follow state-sourced data:

- Projected changes in climate
- Climate justice impacts
- State infrastructure, assets, programs, and services within 11 critical sectors vulnerable and at risk to climate and non-climate stressors
- Actions currently underway
- Recommendations for nature-based solutions to enhance ecosystem resiliency and sequester carbon in the state's natural and working lands

The NC CRRP establishes the North Carolina Resilience Strategy, which includes four elements:

- North Carolina Climate Science Report
- State Agency Resilience Strategies
- Statewide Vulnerability Assessment and Resilience Strategies
- North Carolina Enhanced Hazard Mitigation Plan

3 North Carolina Flood Response Interdependencies

North Carolina's flood response interdependencies are based on three parts: the ability to regulate, coordinate plans, and fund projects. Historically, states are limited from extending their comprehensive approach to addressing flood hazards beyond the minimum federal requirements. The limitation generally implies the state cannot maintain assistance for preempted local land use decisions, and the community leadership is hard-pressed to work across the programs of emergency management, water utility commissions, environmental policy, and housing and community developments with only the availability of local resources to outline increases in potential flood exposures. The state commonly becomes dependent on the National Flood Insurance Program (NFIP) and local community participation in that program.

North Carolina local governments only have powers and duties that are expressly or necessarily granted to them by the state. North Carolina state agencies establish and implement flood hazard mitigation and adaptation efforts, in addition to coordinating aspects of post-flood response and recovery. The state serves as an important intermediary and regulator between local governments and special water districts that implement mitigation and land development activities on the ground and federal agencies tasked with overseeing floodplain management and funding.

The updated National Flood Insurance Program, signed by the president on December 30, 2022, is awaiting authorization from the US Congress and was updated to extend the plan’s aim to reduce the impact of flooding on private and public structures. It does so by providing insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. However, the NFIP is operating with a growing financial deficit for several reasons including two key challenges. First, the program insures repetitive-loss properties, and some policyholders file damage claims that total more than the value of the property. Secondly, NFIP costs cover program participants living in high-risk areas, which encourages additional building and rebuilding in the areas likely to experience repetitive flooding.

Rather than focus on short-term efforts to prepare for individual flooding events, North Carolina is prioritizing investments in flood mitigation efforts intended to reduce flooding severity over time. The state developed and is developing guiding efforts that range from large infrastructure projects, such as the reconstruction of inland communities and coastal systems, to public education around flood risk and home flood insurance. Additionally, the state determines how federal allocations made to North Carolina will be spent during each cycle of funding, be that from the U.S. Department of Housing and Urban Development (HUD), FEMA, or any other federal entity that has allocated funds to the state.

Building North Carolina's resilience requires the participation of every branch, agency, and decision-maker in state and local government and the cooperation of North Carolina’s complex interdependent network, centering on stakeholder engagement. Lack of coordination, transparent communication of schedule adjustments, and updates to data often reveal gaps in plan intentions and their successful implementation.

Figure 3-1 shows the interdependencies of North Carolina regulations. This three-branch division consists of the Council of State orexecutive branch, led by the Governor, the bicameral legislature made up by the Senate and House and referred to as the General Assembly, and the state court system that directly impacts the ability to organize state resources. The interdependences shown are

examples and do not include a list of all possible designations, such as Coastal Area Management Act (CAMA) counties.

FIGURE 1 INTERDEPENDENCIES OF NORTH CAROLINA

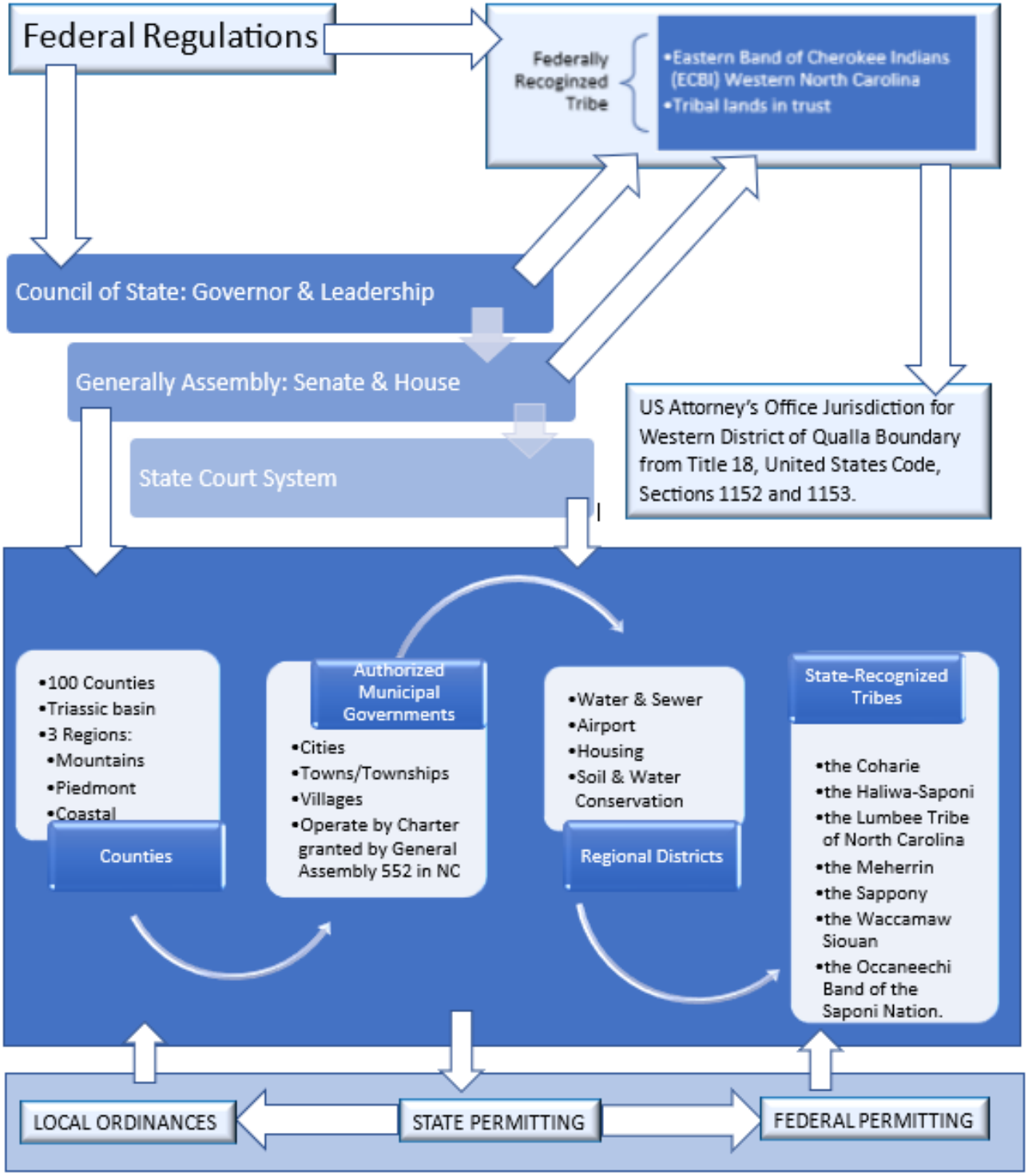

Figure 3-1: NC Independency Network Flow Chart

Figure 3-2 shows the 100 counties in North Carolina, including the 20 on the coast having special designation under CAMA regulation, the 552 NC General Assembly authorized municipal governments, one (1) federally recognized tribe, and seven (7) state recognized tribes. The CAMA counties are subject to the rules and policies of the Coastal Resources Commission, which administers the CAMA. The 14 potential types of special or regional districts and authorities (water, sewer, airport, housing, soil, watersheds, drainage, and water conservation) have governing authority over projects in North Carolina as provisioned by the state. The interdependences shown do not include potential differencessuch as special geologic features or physiographic provinces.

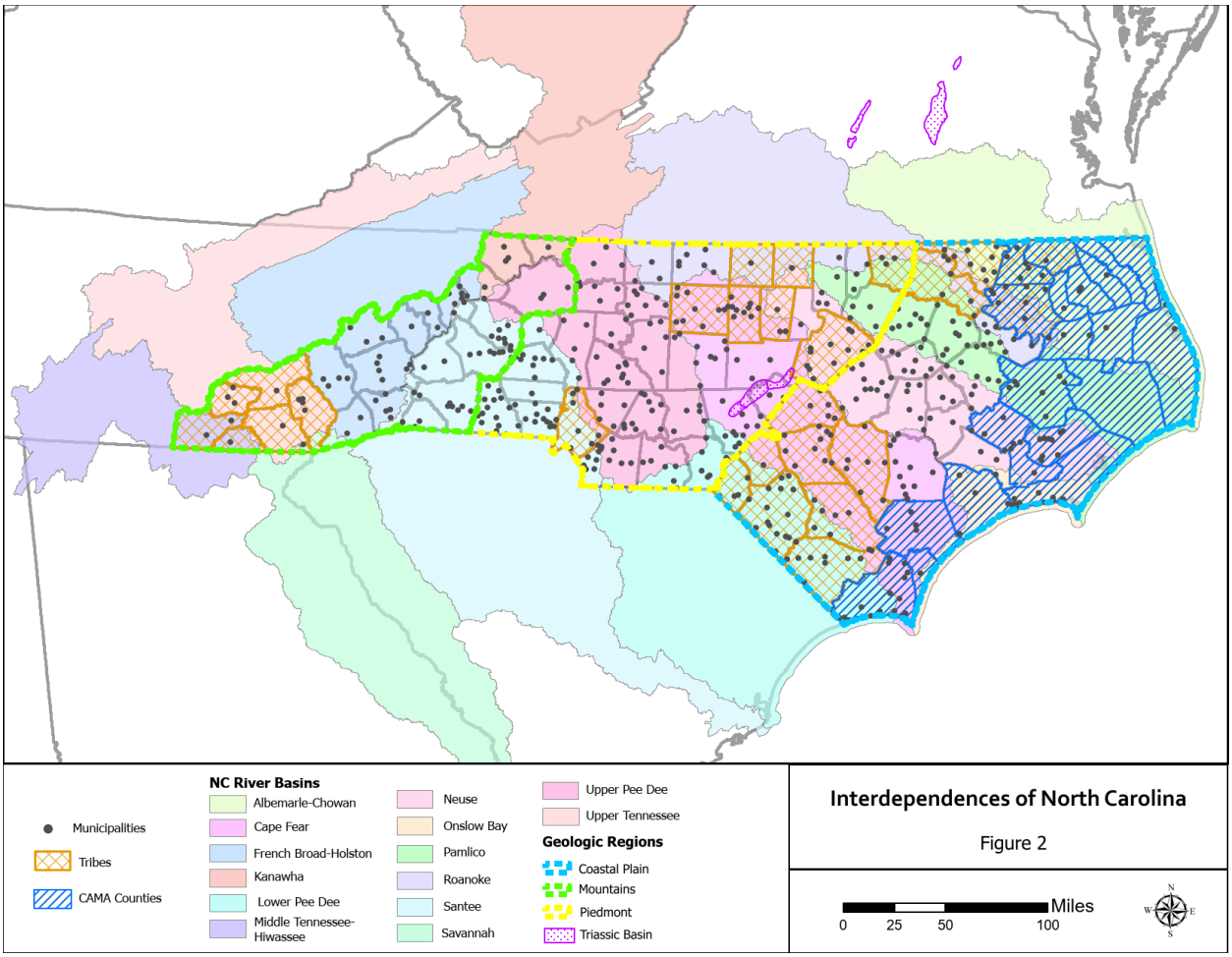

Figure 3-2: Interdependences (Map) of NC

3.1 State offices that manage flooding

3.1.1 North Carolina Office of Recovery and Resiliency (NCORR):

NCORR was established under the N.C. Department of Public Safety (NCDPS) in September 2018 following Hurricane Florence. NCORR manages Community Development Block Grant Disaster Recovery and Mitigation funding as well as additional state funding from the State Disaster Recovery Acts of 2017 and 2018 and the Storm Recovery Act of 2019. In addition to recovery efforts, NCORR serves as the central point of leadership for resilience in the state, leading the state's strategic buyout

program, funding affordable housing developments with disaster-resilient features, and investing in resilient infrastructure.

3.1.2 North Carolina Division of Emergency Management (NCDEM):

NCDEM was established under the NCDPS and is responsible for administering disaster preparedness activities and programs available to the state through FEMA, including the Building Resilient Infrastructure and Communities program. In addition to preparedness efforts, NCDEM maintains the state floodplain mapping program and the NFIP. NCDEM is also responsible for developing and updating the State Hazard Mitigation Plan (SHMP) and reviewing local mitigation plans.

3.1.3 North Carolina Department of Environmental Quality (NCDEQ):

NCDEQ was established to manage the state's resources of Air, Coastal, Land, Marine Fisheries, Waste, and Water of North Carolina with ten (10) Divisions and Environmental Permitting Categories that total 132 permits. In addition, NCDEQ administers the Coastal Zone Management Act and the development of the Section 309 strategy the 2020 CRRP, as directed by Executive Order 80, and maintenance of coastal storm damage mitigation and stream debris cleaning activities.

Flood resilience plan development depends on the state government offices and related bodies' ability to coordinate data and data activities. Questions when it comes to the coordination of data include who owns that data, when was the data created, and when can the data be accessed?

Coordination of activities includes the frequency of updates and recommendation for needed updates. Coordination assumes that the local and state-level stakeholders can align with federal requirements and lock into a framework that translates data, training, preparation, and mitigation efforts between the agencies of the state and subsequent local communities. Because the local communities lack the regulatory authority the state is granted, they depend on clear guidance and communication developed by the state agencies in the form of plans and practices. Those state plans currently lack the framework for interdependence and true networking for flood resilience purposes across jurisdictions and are oriented around mitigation and prevention-based improvements. Over the last few years, the following plans have moved the needle for a resilience framework with the gaps being the push for preparation, planning, and the subsequent funding that is needed to accomplish that forward push.

3.2 State plans that manage flooding

3.2.1 The 2018 State of North Carolina E-SHMP Update

The 2018 E-SHMP update was completed by the Risk Mitigation Branch of North Carolina Emergency Management. In alignment with FEMA requirements, the plan incorporated climate projections in the risk and vulnerability assessment using National Oceanic and Atmospheric Administration (NOAA) data. The North Carolina Flood Mapping Program produced digital flood hazard maps for all counties in the state based on historical data for the flood hazard risk assessment and did not include any modeling of projected climate change. The 2018 E-SHMP reflected elevated levels of coordination with local communities and across government agencies, but it included only a limited discussion of social vulnerability and did not incorporate social vulnerability into the risk and vulnerability assessment. The mitigation actions outlined in the 2018 plan included several direct actions by the state, including property acquisition and elevation. However, the plan still focused on encouraging

and supporting local hazard mitigation planning, allowing for some land use and taxation tools to be leveraged by local governments. The 2018 E-SHMP update and CRRP were not yet coordinated, whereas the 2020 update of the latter calls for the two plans to form the core of a state resilience approach.

3.2.2 2020 CRRP Development

The 2020 CRRP, although developed with an awareness of the 2018 E-SHMP, was completed separately from the 2018 E-SHMP update; the two plans did not directly dovetail. The integration of the two plans was a goal for future E-SHMP updates. When NCDEQ developed the 2020 CRRP, many of the initiatives described in the "Path Forward" section of the plan were housed within NCORR. Neither the 2018 E-SHMP nor the 2020 CRRP had regulatory authority to enforce the implementation of the plans. The 2020 CRRP specified that more locally specific climate projections are to be outlined and incorporated into the following E-SHMP, which was completed in January of 2023. The incorporation of the 2020 CRRP into the E-SHMP update included not only statewide data but also regional, watershed-level data.

3.2.3 The 2020 NC Emergency Operations Plan (NCEOP) Update

This update established and improved the details concerning the capabilities, authorities, and responsibilities framework of the emergency management operations. In the plan, the Governor delegated activities for responsibility and authority to respond to emergencies and disasters as outlined under the NC Emergency Management Act, Chapter 166A of the NC General Statutes which aligns with the National Incident Management System. The plan establishes mutual understanding among federal, state, and local governments and organizations, as well as other public and private non-profit organizations limited to emergency management where NCEOP is designed for worst-case scenarios – to include catastrophic events.

The NCEOP is reviewed annually, with the most recent updates made in September and posted in December of 2020. Updates or revisions occur where more than 25% of the content has changed or needs to change after the annual review. Prior to the 2020 revision, the previous revision was published in August 2017. The current revision of the NCEOP overlaps with the Blueprint Resilience Plan development. The NCEOP is structured around planning activities, training, and exercises for response and recovery efforts for emergency management. Limited mitigation operations and no flood prevention management data, outlines, or changing climate conditions preparations are included.

3.2.4 The North Carolina Floodplain Mapping Program (NCFMP)[ii]

The NCFMP developed its database for flood vulnerability data that is used for hazard mitigation planning. It includes local, high-resolution data on statewide building footprints and first-floor elevations. This information is available on the public state flood risk portal, and additional information is available online.[iii] However, limited climate change data is incorporated at the state level into flood modeling. Communities across the state use the NFIP program as a basis for regulatory flood ordinances basing the Unified Development Ordinances (UDO) language on the federal and state standard UDO language provided in the NFIP program.

3.2.5 The 2023 State of North Carolina E-SHMP Update

The 2023 E-SHMP update was completed in January of 2023 by the Risk Mitigation Branch of North Carolina Emergency Management. The 2023 update incorporated the Disaster Mitigation Act of 2000 requirements for natural hazards identification into the 322 Plan; however, North Carolina Emergency Management determined that it will be the sole hazard identification and risk assessment source for all hazards and therefore, the North Carolina Enhanced Hazard Mitigation Plan also includes technological, manmade and human-caused hazards. The plan was supplemented with four appendices that included:

- State Enhanced Plan Review Tool
- EMAP Accreditation with Supporting Documentation
- Plan Maintenance Records
- Recommendations to the Governor's Cabinet

3.2.6 Disaster Mitigation Act of 2000 (DMA2K)

The DMA2K was passed into law in 2000 by the 106th United States Congress to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The purpose of DMA2K was to lessen the vulnerability of citizens to the natural hazards affecting communities through the strengthening of mitigation efforts at the state and local levels.

3.2.6.1 The 322 Plan

Section 322 of the DMA2K, requires that each state create a natural hazard mitigation plan to be submitted to FEMA for approval. The 322 Plan provides stakeholder involvement and integration of planning functions for the state. The North Carolina Enhanced Hazard Mitigation Plan has been updated three times since 2004, when the initial plan was written and approved. The hazard mitigation plan was initially required by DMA2K to be updated and submitted to FEMA for review and approval every three years. However, in 2014 DMA2K was amended requiring the state plans to be updated and submitted for review and approval every five years. The "enhanced" portion of the review tool was submitted to FEMA for review and approval as an appendix to the plan. On February 28 of 2014, North Carolina Emergency Management received an approval letter from FEMA approving the "enhanced" portion of the hazard mitigation plan. The "enhanced" designation is met when the State meets additional criteria which are defined in 44 Code of Federal Regulations (CFR) 201.5.

3.2.7 North Carolina Coastal Management Program (NCCMP)

Section 309, Strategy, in this report identifies nine priority areas and outlines coastal restoration projects. Sea level rise, coastal erosion, subsidence, and coastal flooding are the main flood hazards addressed in the plan; however, the risk analysis is high level and pulls from the E-SHMP.

3.3 Additional state program elements that affect flood management

3.3.1 Building footprint updates in North Carolina

In April 2022, the Geographic Information Coordinating Council (NCGICC) wrote a business plan for the Statewide Mapping Advisory Committee (SMAC) on building footprint updates in North Carolina. This

business case outlines the importance of an up-to-date statewide building footprint geographic information system (GIS) dataset. It also recommended a technical approach for how to efficiently maintain the dataset to represent current building geometry with sufficient accuracy and how to populate relevant attributes. The official sponsor of this business case and subsequent charter is the Geographic Information Coordinating Council (GICC). The SMAC, acting through the GICC, initiated the Working Group for Building Footprints (WGBF) to create this plan and outline a realistic approach to achieve an updated and maintainable framework dataset. This data would support and supply other framework datasets with the required information, and it would meet the business needs of many different state agencies, local governments, and private businesses.

Currently, NC OneMap maintains the ongoing updates of a data set collection consisting of polygons representing the roof line of built structures wholly or partially within the State of North Carolina political boundary. The building footprints are closed polygons with unique identifiers. The GIS data set is available online.[iv]

3.3.2 Spring 2023 LASII

The Priority Rating System Guidance for the Division of Water Infrastructure Stormwater Funding Program was initiated by the ARPA. It was published under the Local Assistance for Stormwater Infrastructure Investments Planning Studies and is published online along with other additional 2023 funding data.[v]

As part of process to score projects, when one or more of the following exists, additional points are awarded to the grant score:

- Sub-watershed that is impaired as noted on the most recent version of the Integrated Report
- Specific classified waters
- Nutrient Sensitive Waters such that the project will achieve at least a 35% reduction in both Total Nitrogen (TN) and Total Phosphorus (TP)
- NC Natural Heritage Program natural area

Funding calls out specific versions of a document such as the integrated report the description of what can be submitted would state, “Sub-watershed that is impaired as noted on the most recent final version of the Integrated Report.” If a new report is pending approval, it cannot be submitted to funding because it is not regulated, despite where the version allows more points for the community project to be allocated in funding. The points for that community are interdependent on the state's ability to regulate and implement the plans with the availability of funding being in flux annually based on a program’s budget.

Issues with the consistency of regulations and the subsequent interdependency create uniformity issues in funding. Municipalities often receive funding based on their ability to regulate a current challenge and the immediate needs associated with it rather than based on a goal of long-term prevention of the problem through pre-planning. A prime example is developing a set of regulations for known flooding problems that already plague an area instead of a setting an initiative-taking approach to establish future flooding resilience. If the funding process were set for an ‘either-or’ scenario, you could have a proactive approach to a problem that is not yet regulated or a situation where the funding points are the same for either scenario. For example, one could have 2 points for either option, rather than 3 points for the first and 1 for the second if the first option is a response to a problem and the second option is planning for the problem where the conditions exist for it to occur but have not as of the date. Flood resilience planning is dependent on the state government offices

and related bodies' ability to coordinate data and data activities. The quality of the governance becomes a cornerstone of efforts to establish resiliency and fund resilience activities.

4 Quality of the Governance

Local and regional governance follows political boundaries, yet flooding happens at a watershed scale, likely crossing those political boundaries. Communication during flooding events is easier than long-term planning because it is based on immediate rescue work and the parties involved, whereas developing plans for coordinated governance does not have this forced direct approach and requires proactive work across those boundaries. Most communities in North Carolina have sustainable development goals (SDGs) intended to incorporate economic, social, and environmental aspects but often do not address crossover with other communities and political boundaries. If they do not recognize that they are a part of regional network of communities in a watershed, then the quality of the governance is based on the level of connection with other communities. The extent of involvement by both the community officials and local stakeholders plays a critical role in making their communities safer and more resistant to disaster through sustainable measures and communication with neighboring communities. If planners are not aware of upstream conditions and future planning, then they cannot accurately predict how their communities will be impacted or the results of their own planning initiatives. Each community is implementing approaches and policies, but their level of coherence varies and includes multiple scales of governance – local, national, regional, and global. Local and regional governments are essential for delivering the economic, social, and environmental transformations needed for achieving measures required to sustain their communities. As the level of government closest to the people, local governments are in a unique political position to identify and respond to community gaps and safety needs related to the impacts of past and projected future disasters.

4.1 Localizing the level of coherence

Localizing the level of coherence is the ability to connect ideas and provide information in a fluid and comprehensible way that implies embedding flood resilience goals into local strategies, across communities that are connected in a watershed. When implemented, it is intentional fostering of collaboration between communities and leadership at the local level. It requires establishing environments that unlock the development potential of local and regional governments by localizing resources and creating a framework to ensure regionally based approaches for flood resilience. This methodology encompasses both future development and event-based preparation of local communities. Coherence greatly depends on local action and leadership, in coordination with all other levels of governance where the questions center on funding, jobs, and flood resilience of the local community and stakeholders.

The benefits of cultivating links between employment, skills, and economic development policies in a more integrated manner between local North Carolina communities to support coherent flood resilience decision-making are increasingly based on the quality and skill level of the local workforce.

For example, East Bend North Carolina is considered a bedroom community of Winston-Salem because a high percentage of the residents (population less than 1000) commute to work in Winston-Salem. That commute to Winston-Salem plays a vital role in the community's business, development, and safety decisions orientated around where it chooses to locate community services , and subsequently their ability to grow and create jobs.

One good example of this type of planning and integration of flood resilience decision-making in North Carolina is the replacement of a 71-year-old bridge located over Donnaha Park, in East Bend,

North Carolina, located on N.C. 67. The bridge spans the Yadkin River and connects Yadkin and Forsyth counties in a location where flooding has been a historical challenge for communities of both counties. The bridge is one of the longest bridges in western North Carolina and is scheduled to be replaced through a N.C. Department of Transportation contract for $9.5 million. During the replacement, traffic on N.C. 67 will continue driving on the existing bridge until the new bridge, which will span more than 1,000 feet across the river, is completed just to the north. This will eliminate the need for a long detour and will alleviate impacts for local commuters from the community of East Bends. Coordination between all parties involved with the project included communication with local recreation stakeholders through state organizations such as the N.C. Wildlife Resources Commission, which organized the temporary closure of Donnaha Park during bridge construction and posting signs, and the N.C Department of Transportation collaborating with paddling groups and river users to help update online access maps. The new bridge design will feature improvements for the community such as:

- 12-foot-wide lanes with 4-foot-shoulders
- Reflective paint and snow-plowable markers in the middle
- Realignment at the intersection of NC 67 and Donnaha Road in Forsyth County for safety

Decisions made in each of these policy areas can have substantive spill-over effects on the others and vice versa. The replacement of the Donnaha Park bridge on N.C. 67 translated to the local level of coherence when the Town of East Bend sought to address flooding concerns of the community where the flooding was not in the town but in the township or their economic area of impact. During the flooding from storms in 2020, several bridges were damaged, washed away, or overtopped. Inaccessibility of those bridges cut off the Town of East Bend from not only Yadkinville and Winston-Salem but also Jonesville and the East Bend Township that surrounds the historic town limits. In an example like the one above, when an area's need for access to a neighboring community is driven by critical factors like jobs or public services, it requires a deep understanding of local level of coherence to identify what groups should be contacted and coordinated with prior to implementing proposals to address local flood hazards. This coordination should include mutual brainstorming for how neighboring communities can participate in the solutions and it should refrain from casting blame or the appearance of overbearing influence. A knowledge of how neighboring communities can assist and how they can support or even lead portions of the solutions will improve the overall primary level of coherence.

4.2 Regulation design and coherence

All too often, governments design regulations and make plans that develop policies in an uncoordinated manner. These isolated plans and regulations address diverse objectives with varying timeframes and varying geographic scales, and because they not coordinated, this often leads to unsustainable choices in implementing plans and regulations that create unforeseen social, economic, and environmental costs. Lack of integrated approaches and coherence at the local level can undermine the achievement of the flood resilience goals and represents an obstacle to increasing the effectiveness of policies. If a town understands who should be involved from local or regional planners to the state and what each party is responsible for l, then they can adjust their approach to projects. Downstream communities need to have open channels of communication with upstream communities about topics of mutual concern like flood mitigation, elevating structures, or diverting water downstream. One potential example is the City of Raleigh Stormwater Division managing flood levels in Lake Johnson to alleviate loss of access to a neighborhood downstream from the lake due to

flooding during a large storm. After doing so, the Division would be equipped with the experience needed to understand how to incorporate future planning provisions or economic provisions that could help address these needs. They would also be prepared to work in unison with other local communities to communicate those needs to planners who are working on larger-scale projects that could impact this location in the future.

The main objectives and concerns for the state based on the level of coherence for flood resilience are the local governments' capacities to:

- Foster collaborations across the local government's economic, social, and environmental policy areas
- Identify trade-offs and reconcile local policy objectives with flood resilience policies that can be agreed on as objectives while addressing the spillovers of local policies into flood resilience policies
- Foster more integrated approaches between employment, skills, and flood resilience development at the local level
- Address state contributions to the creation of quality jobs, costs, and funding for the communities
- Address additional contributions from the state through the communication of policy implementation, innovative practices, stronger capacities, and integrated strategies for flood resilience at the local level
- Foster collaboration across local governments to work together at a regional scale and across political boundaries to cluster local governments where overlaps exist for transportation and economic effects
- Foster collaboration across local governments to work together across political boundaries at a watershed scale.

Increased flexibility in the state's top-down methods of policy creation could help launch potential collaboration at the local level where the intersections between employment, skill, economics, and flood resilience policy areas are most evident. Developing an integrated, coordinated, and strategic local approach can help local stakeholders combine resources and build capacity to exploit new opportunities and state considerations while prioritizing local governments' concerns for job creation, infrastructure development, and social protection programs. Flexibility in the planning requirements, grant applications, and processes is significantly different than providing assistance where there is a capacity issue. Given the capacity issue, the need for technical assistance is the most significant barrier and has the least flexibility in the process due to human resource and tool shortages. National and local governments should harmonize development objectives (e.g., enhanced rural access) to heighten the effectiveness of programs occupying shared geographic and technical space (e.g., poverty, environment). Identification of conflicting state-local objectives can result in state-local dialogue to develop innovative scenarios and situations.

Considerations from the state should include barriers to policy coherence and integration at the local level based on the state's ability to be flexible, and in some cases provide technical assistance, due to differences in situational complexity. A flexible process is needed when a community asks for assistance but may not understand or have experience with technical areas that would help them receive the best assistance possible. For example, they may not recognize that when applying for funding there are multiple resources available. They may lack the personnel or knowledge to act quickly enough to receive funding due to the context and timeframe was provided. Currently, in these

types of situations, local planners encounter a low level of state flexibility when seeking to assist their communities. Staffing in small towns can range between a couple of staff members to twenty (20), whereas larger communities have double or triple these numbers. The smaller the community, the smaller number of staff of who are available to work through complex resilience related processes and paperwork. These communities also have a smaller tax base and utility funds to do improvements and generally do not budget for funding preparations or funding applications or administrative costs. There is an obvious lack of funding for services of preparation where towns do not have the staffing capacity to prepare plans and coordinate funding efforts while running the everyday operations of the community. Knowledge of who actively runs a community is also limited and would assist the state with the development of plan updates and communication of legislation and funding availability. An understanding of community governance is also recommended for communication methods such as the presentation of materials that involve changes to community operations from a resilience perspective.

4.3 Community flood resilience priorities

The state and the local communities will need to agree on a set of priorities that can be broken down and communicated with clarity to navigate the potential funding and settlements and to enhance the local community's involvement in the funding process of flood resilience activities. The funding requirements are often complicated and time-consuming for limited staff to complete the process. The funding requirements are in response regulation created to ensure funds are reported correctly and to prevent fraud.

The focus of a local community in flood resilience activities goes back to the state's flexibility and interest in the local communities. Local communities' intensity of interest is based on how the state approaches the issues their community has with flood resilience and the involvement of the local stakeholders. One example of intensity can be seen in the eight (8) state-recognized tribes of North Carolina: the Coharie, the Eastern Band of Cherokee Indians (also federally-recognized), the Haliwa-Saponi, the Lumbee Tribe of North Carolina, the Meherrin, the Sappony, the Occaneechi Band of the Saponi Nation, and the Waccamaw Siouan. The tribes have developed a network under the North Carolina Commission of Indian Affairs (NCCIA) to partner with organizations to support tribal communities across North Carolina.

One related example is the development of a project as part of the Albemarle-Pamlico watershed planning by the community for tribal support. The project was developed by Albemarle-Pamlico National Estuary Partnership (APNEP) in coordination with representatives from tribal communities in the Albemarle-Pamlico watershed and coastal plain to increase engagement between tribal organizations, government agencies, and university faculty. It was also intended to acknowledge the unique knowledge and cultural perspectives of tribal communities surrounding climate change impacts. The project's overarching goal is to protect the environmental health of the waterways and natural resources in the Albemarle-Pamlico region, and the communities that live in, visit, and depend upon them. Core project partners include the NCCIA, APNEP, NCSU, and the Virginia Coastal Policy Center. Other project advisors include the UNC American Indian Center, the North Carolina Office of Recovery and Resiliency, and the Southeast Climate Adaptation Science Center. The Albemarle-Pamlico Estuarine System overlaps both North Carolina and Virginia and creates the opportunity to share resources within both states. The project was backed by supplemental funding awarded to APNEP from the Environmental Protection Agency. In addition to the original award, APNEP funds the Virginia Coastal Policy Center's coordination with tribal communities in the Albemarle region of

Virginia. This project supports the implementation of North Carolina’s Executive Order 80 and the State Climate Risk and Resiliency Plan, similar directives in Virginia, and APNEP’s Comprehensive Conservation and Management Plan. The tribal network under NCCIA is an initiative that was dependent onboth states' ability to be flexible and establish communication around planning efforts with the tribal communities and the local communities of the Albemarle-Pamlico region.

5 Hazards

Different hazard types affect the state, but the pattern of risk reflects the social construction of exposure and vulnerability in different communities. Located along the Atlantic Ocean, North Carolina has about 12,331 miles of coastal and estuarine shoreline giving it a unique set of hazard conditions. In addition, the state has seventeen major river basins that cover part of North Carolina with river flow, with around 387 miles of riverine shoreline, and 193.5 miles of stream. Past hurricanes include Hazel (1954), Hugo (1989), Fran (1996), Matthew (2016), and Florence (2018), causing billions in damages and disaster recovery that stretched for years afterward.

Hurricane Matthew struck the southeastern part of North Carolina in 2016, traveling along the eastern coastline to Buxton, where it went back out into the Atlantic Ocean. This led to areas of the coastal plain experiencing massive amounts of flooding, resulting in over $1.5 billion in damages. North Carolina then experienced another event two years later in 2018 when Hurricane Florence made landfall and moved further inland through the middle and western portions of the state, causing over $22 billion in damages. The two events left behind a combined cost of $27 Billion in damages. The consecutive storms exacerbated damages, with recovery efforts to the tune of $3.5 Billion on top of the combined costs still ongoing.

5.1 Historical tension

Historical tension between ongoing recovery efforts versus longer-term strategic planning is compounded during events like Hurricanes Matthew and Hurricane Florence. There is difficulty when trying to garner political assistance for extended planning when there are unmet immediate needs of residents waiting for home repairs, buyouts, or elevation re-surveying. Between the $20 million in funding for a statewide flood resilience framework and ther $167 million for a range of physical flood mitigation infrastructure projects in the proposed state legislative budget, here exists both a recognition of the need to plan, consolidate data, and select priorities, along with pressure to move forward with projects and see positive impact.

Repeating history is a statewide concern. Following Hurricane Floyd in 1999, there was an influx of federal funding for flood hazard mitigation, but because the state did not backfill that with state funds, programs dried up when the federal money ran out.

North Carolina’s view of hazard identification, as outlined in the 322 Plan, is based on hazard identification and risk assessment through a revised holistic view. That view is the reduction of hazards and risk as defined by the drivers that result from the complex interaction between the development processes of the community. the generated conditions of exposure, community vulnerability, and identified hazards. North Carolina’s 322 Plan has identified hazards asatural, technological, and human causes.

The ability of local governments to implement flood resilience strategies is dependent on the assessment of the combined hazard severity and frequency with respect to the number of people and assets and their vulnerability to damage by the hazard. The community’s assessment provides a baseline to inform the response from the state post hazard. Regulation and funding sources' response to project implementation is based on the dynamics of the risk in relation to the community response to this assessment. In the past, funding provided as a risk response was aligned with the type of risk; for example, the likelihood of loss of life, destruction, and damage in a given period that could occur.

Past flood resiliency planning in North Carolina tended to not address invisible hazard risks associated with low-impact events. Low-impact events often emerge with complexity and many processes, including the consideration of climate change and new interconnected risks created by globalized economic development. Historically, restrictions on communities were based on how they classify risk by hazard conditions. The National Risk Index is a recent online mapping application from FEMA that identifies the communities most at risk of eighteen (18) natural hazards. This application visualizes natural hazard risk metrics and includes data about expected annual losses from natural hazards, social vulnerability, and community resilience. Until recently, communities along riverine shorelines planned for potentially one event, but due to the increasing number of hazards recognized by vulnerability and risk drivers, they are planning for multiple events.

A high majority of funding and legislation is based on the singular hazards' metric explained above, where probability is defined through:

- Flood maps
- Erosion zones
- Wave action/velocity

Consequences are then based on singular values rather than multiple aspects of the built environment, including but not limited to critical facilities, buildings, infrastructure, and stormwater assets. Flood risk is then weighted by funding and mitigation actions. From the community's perspective, mitigation and funding need to be based on multiple hazards and support community values. Whereas communities that currently have the structure to fund projects by individual hazards and strategies may not want criteria to be based on multiple hazards.

6 Basin-wide Approaches to Flood Resiliency Planning

Currently, there is no holistic statewide approach in NC to evaluate a basin's flood resiliency. This is in part because of challenges that exist from diverse geographical or political boundaries, statewide water planning efforts that focus on issues other than flooding, along with a historical response approach to flood management in the state.

6.1 Existing North Carolina watershed strategies

Flood resilience is often impeded by the inability to create a holistic watershed perspective because of the lack of representation of all communities impacted. This cohesive response is needed to provide input on the community conditions of the watershed extending from upstream to downstream. Advocating for the understanding of communities to consider both upstream and downstream impacts, even where impoundment is absent, should be the primary emphasis for the actions submitted by the communities. This perspective is often an issue as local officials do not have the authority to make decisions outside of their area. The current use of basin management programs is a great option because of the ability to work alongside neighboring jurisdictions but has been limited. These occur in the central area of the state where planning programs were created after local communities had championed work through the basics of the planning process with Neuse, Jordan, and Tar Pamlico watershed plans, and focused more on water quality issues than flooding.

6.2 Existing flood resiliency practices and restrictions

6.2.1 Federal Land Use

Federal land use is based on constitutional authority, meaning the federal government cannot directly intervene in local land use or building construction practices. However, a significant incentive to change these practices exists for the federal government. Every hazard causes the federal government to face an increasing annual cost for disaster recovery. Attempts by the federal government to reduce disaster losses include reducing hazard exposure of floods through the development of an extensive program of dams and levees, where limitations of sole reliance on this approach became increasingly evident. In response, Congress provided a legal basis for the federal government to intervene indirectly in local land use and building construction practices by passing the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. Under Section 409, state governments are required to prepare and update state hazard mitigation plans within six months of a Presidential Disaster Declaration as a condition for receiving federal disaster assistance.

6.2.2 Risk Disclosure

Risk disclosure is a primary concern where development in the floodplain is centered. Disclosure of risk to the new homeowner, association, or business should be vital and transparent. Property ownership transfers from the developer to the new landowner and future owners through land purchased. Development in floodplains is not prohibited in most communities in North Carolina and can contain considerable risk as development is only restricted as a means of flood resilience. Therefore if there is an issue at construction this is carried forward with the property. This can lead to unknown risk if disclosure is not required. Due to the legal classification of property and the associated rights in North Carolina, real property consists of the land, the airspace above the land,

and the subsurface or soils. There are restrictions on a community to condemn a property to “prevent development” or “forced buy-out" however; restricting the use of a property and voluntary buyouts are means for a community using ordinances to control property that is impacted by the floodplain.

6.2.3 Land restriction approaches

Land restriction approaches in North Carolina are based on how one acquires, possesses, and disposes of the property. Depending on its classification, the property has federal protections that exist under the Fourth and Fifth Amendments providing protections where “Unreasonable searches and seizures by the government (Fourth Amendment)” occurs or “The right to private property in two ways (Fifth Amendment)” listed as follows:

1. A person may not be deprived of property by the government without “due process of law,” or fair procedures.
2. Setting limits on the traditional practice of eminent domain, such as when the government takes private property, and such takings must be for a “public use” and require “just compensation” at market value for the property seized.

6.2.4 Floodplain buyouts and development restrictions on parcels

Floodplain Buyouts and development restrictions on parcels are the closest things North Carolina has come to this approach. Over the last 30 years, government-led acquisition and removal of flood-prone residential properties has become a popular method for reducing future flood damages in the United States. Buyouts are attractive, as they are voluntary and permanently remove vulnerable homes from flood hazard areas. Homeowners typically receive pre-flood, fair-market value for their homes. The downside is that buyout projects occur within a complex intergovernmental framework, which makes buyouts somewhat unpredictable and time-consuming. Generally, federally administered buyouts take 2-5 years to complete. In addition, buyouts are reactive, with most funding becoming available only after a major disaster. State and local governments have adopted a variety of mechanisms to fund buyouts, including bonds, stormwater management fees, grants, and sales taxes. As of 2021, there are 34 total funding programs nationwide. Many are aimed to promote autonomy from federal mitigation programs, and ultimately, faster buyout processes. Many communities that have implemented buyouts concurrently allow (or even facilitate) additional development in their floodplains, thus countering any reduction in vulnerability to flooding stemming from the buyout.

According to the June 2021 Collaboratory Flood Resiliency Study, prepared by the NC Policy Collaboratory at UNC-Chapel Hill, and developed for the North Carolina General Assembly, private sector involvement in the financing or management of buyouts could provide cost-savings with a more efficient buyout process. The report outlined the distribution of investment risks outside the public sector, re-structuring programs in a manner that achieves hazard mitigation objectives and better align stakeholder interests. Eminent domain is not an outcome of the resilience planning that blueprint will support.

However, a state focus on voluntary buyout programs at local and state level is needed and should be made available where the potential for a voluntary state buyout program would be more likely to receive support from the regional or local community programs. The need for practical funding for the floodplain buyouts means requiring new data management structure to be developed to accurately maintain buyout records for any policy analysis or evaluation purposes. Local governments seldom maintain any accounting of their total expenditures on buyout costs beyond the direct cost of

acquiring homes where known activities incur transaction costs. The absence of cost data inhibits the development of targeted policy reform and the adoption of best practices. There is a need for detailed, standardized data collection and reporting to develop an equitable buyout policy, as well as more efficient use of public resources. Historical data on buyouts are unreliable and difficult to use.

7 Practicable Resilience Projects

Once a policy is adopted or a project is built, it will need to weather future disasters. A practicable resilience project is one built or modified to withstand or recover quickly from, natural, technological, and human-made hazards, as well as to perform its intended design standard throughout its useful life. A practicable resilience project should also function in a changing climate based on a community-specific mitigation approach and conditions. To meet this goal, facilities should be designed to withstand hazard and climate-based conditions projected for the end of the facility's full life.

7.1 Facility specifications

Historically, projects have not been developed in a resilient manner and have not been designed for a useful life, but designed to a basic level of service, where the useful life represents the extended service life of a facility assuming regular maintenance. Some new facilities built today, including some buildings, may have an extended useful life beyond the values listed after undergoing substantial improvements later in their useful life. Therefore, the following list is illustrative and not exhaustive of how resilience should be used in the design and the following should be considered:

- The useful life of the facility overall and the useful life of its components within the project scope
- Incorporation of climate projections during design at the capital project level
- The impact of decisions on the facility level should be considered where feasible
- Utilize professional judgment to determine the useful lives of the facility and components in the design

Table 7-1: Facilities and components with a need for associated climate change and life cycle management projections

Facilities	Components
Temporary or rapidly replaced components and finishings	Interim & deployable flood protection measures
	Asphalt pavement, pavers, and other ROW finishings
	Green infrastructure
	Street furniture
	Temporary building structures
	Storage facilities
	Developing technology components (e.g., telecommunications equipment, batteries, solar photovoltaics, fuel cells)
Facility improvements, and components on a regular replacement cycle	Electrical, HVAC, and mechanical components
	Most building retrofits (substantial improvements)
	Concrete paving
	Infrastructural mechanical components (e.g., compressors, lifts, pumps)

Facilities	Components
	Outdoor recreational facilities
	At-site energy equipment (e.g., fuel tanks, conduit, emergency generators)
	Stormwater detention systems
Long-lived buildings and infrastructure	Most buildings (e.g., public, office, residential)
	Piers, wharves, and bulkheads
	Plazas
	Retaining walls
	Culverts
	On-site energy generation/co-generation plants
Assets that cannot be relocated	Major infrastructure (e.g., tunnels, bridges, wastewater treatment plants)
	Monumental buildings
	Road reconstruction
	Subgrade sewer infrastructure (e.g., sewers, catch basins, outfalls)

7.1.1 Components to consider and include in facility specifications

7.1.1.1 Project lifecycle management

Also known as regular operations and maintenance, project lifecycle management is a widespread problem within communities because there is no funding except where opportunities exist under the State Street-Aid Powell Bill Program. In this program, funds are used primarily to resurface municipal streets but also may be used to maintain, repair, construct, or widen streets, bridges, and drainage areas. Municipalities can also use Powell Bill funds to plan, construct, and maintain bike paths, greenways, or sidewalks. Some communities fully understand the comprehensive nature of the operation and maintenance of the community, and their system development programs and funds are used to support these functions. However, there are funding and staffing restrictions when communities initially create said programs and funds. The lack of funding for the preparation of the program and position support is another restriction on resilience. The operation and maintenance of programs in communities determine the useful life of capital projects and systems. If it cannot be maintained or operated, it will fail.

Resilient design choices should be added as an integral part of the community's project planning, risk management, and financial planning. Similarly, resilient design choices should be selected to

maximize the efficacy and efficiency of investments. Some ways this can be done include, but are not limited to:

- Integrating “soft” resiliency strategies (such as green infrastructure)
- Integrating “hard” resiliency strategies (built or create intensive investments)
- Operational resiliency strategies
- Addressing multiple climate hazards with single interventions
- Incorporating regional climate change projections
- Reducing climate change risk in concert with other goals (e.g., energy efficiency or reduction in greenhouse gas emissions)

7.1.1.2 A practicable set of resilience guidelines

For communities, a set of reliance guidelines does not currently exist for the development of critical and major projects. The minimum floodplain management regulations developed by FEMA are the closest guidelines for community development, but they do not address project review and development from a resilience perspective. Communities with critical facilities located in floodplains or areas of direct risk to hazards have increased vulnerability and could benefit from a set of guidelines for critical and major projects.

7.1.1.3 Critical infrastructure

Critical infrastructure is defined as facilities or components that are critical either because of the services they provide (e.g., hospitals and key transportation assets) or their importance during an emergency (e.g., designated shelters and backup energy generators). Developing a classification to determine levels of freeboard in the sea level rise adjustment would be beneficial for complex projects with multiple components, even if the whole facility is not considered critical allowing the identification of critical components. An example would be a non-critical vehicle maintenance yard, with some components that are critical to the functioning of the site, such as an emergency generator. Critical component protection should also be evaluated if a facility is expected to be fully operational during extreme weather, or if it is expected to quickly resume full operations after an event. Some examples of critical components include, but are not limited to:

- Boilers
- Chemical feed equipment
- Communications systems
- Electrical distribution and switching areas
- Elevators
- Emergency fuel supplies
- Emergency generators
- Fire alarms and suppression equipment
- Furnaces
- Hazardous material storage
- HVAC units
- Monitoring and safety equipment
- Motor-control centers

Capital projects with a total cost (design and construction) of $50 million or more are defined as “major projects” in these guidelines.

The practical use of climate change projection in community regulation is the result of state-of-the-art climate change modeling and analysis. However, there is uncertainty embedded within the projections. The ability to continue to develop, review, and synthesize the latest climate data and other new findings, will need to be incorporated into future versions of resilience for the North Carolina regions.

7.1.2 Community-based practicable resilience considerations

A practicable resilience project from a community perspective can boil down to the following questions on the community strategies based on education, size of the community, and experience of community members:

1. Does the community have the ability or understanding to use land use planning and flood risk education to steer development and infrastructure investments away from flood-prone areas to protect both residents and their properties? Can they:
    - Find it
    - Understand it
    - Manage it
    - Fund it
2. Can the community leverage existing funding resources? Can they:
    - Find it
    - Understand it
    - Manage it
    - Fund it
3. Does the community know how to leverage Resources across multiple vehicles with multiple benefits? Can they:
    - Understand the hazards of the community
    - Understand the tolerance or vulnerability of the community
    - Understand the benefits of resilience
    - Understand the legislation and funding available
    - Develop a project
    - Develop a budget
    - Develop an implementation schedule
    - Understand construction timing
    - Understand and find funding
    - Find partners to agree to participate
    - Complete the project funding and tracking requirements

7.1.2.1 Charlotte-Mecklenburg Stormwater Services

Communities that fully understand the comprehensive nature of FEMA funding programs are those that benefit the most from the various programs. A prime example of a community that benefits from funding resources is the Charlotte-Mecklenburg Stormwater Services Department. For over twenty-five years, Charlotte-Mecklenburg Stormwater Services has been a national leader in identifying, funding, and implementing flood hazard mitigation projects by utilizing FEMA and State funding sources such as:

- Building Resilient Infrastructure and Communities
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program on behalf of FEMA
- State Acquisition Relocation Fund

The primary reason behind this is Charlotte-Mecklenburg Stormwater Services continues to advance its flood mitigation program through innovative tools such as its Risk Assessment and Risk Reduction (RARR) Tool. The RARR Tool and the Losses Avoided Tool are critical to Charlotte-Mecklenburg by defining residual risk and driving their capital program to reach residual risk in the future. In addition, the department's stormwater utility fees are used to support its flood mitigation efforts. However, some smaller communities do not possess the staff with the knowledge or experience to implement those programs.

8 Permitting Requirements

Permitting requirements for resilience can go three ways: approve, postpone, or prevent. While it is important to balance regulation, it is often confusing and problematic for communities which have two concepts to deal with:

1. How an agency or local government obtains permits to build a (structural) resilience project (i.e., it is being regulated), and
2. How an agency or local government can use permitting requirements as a resilience strategy (i.e., it is the regulator)

When communities produce a project, the federal, state, and local permitting requirements must be considered. A well-designed permitting requirement can drive applicants toward safer or more efficient project options, or towards projects with significant co-benefits. The known impact is that permitting, as it applies to structural resilience projects, can be time-consuming and this must be taken into consideration in the timeline of the project.

8.1 Creating Permitting Restrictions Favoring Resilience

Communities can use permitting requirements as a basic land-use tool for resilience. Zoning can control the height of buildings, lot coverage, minimum distances (setbacks) from buildings to property lines or other features, the density of development, façade lines, building scale and bulk, allowable uses, requirements for certain uses, site access, utilities, parking, and more. The original intent of zoning was to avoid incompatible uses and nuisances, but it has developed into a powerful tool that can regulate the percentage of lot coverage and protect environmentally sensitive areas.

Carefully crafted land use laws can protect from erosion due to:

- human actions
- sea level rise
- storm surge
- flooding

8.1.1 Zoning

Zoning allows the community to target regulations to areas at risk from damage. This can be done by creating discrete districts, amending existing districts, or creating overlay districts that specifically address flooding issues, and by creating floating zoning districts (that move based on the community needs) with performance standards or specific criteria that would be applied in the event certain types of development were proposed. Several basic tools can be used to reach the same goals. For example, to protect forested lands, which retain stormwater and reduce flood risks, the governing board of a community may:

- adopt a new subsection in the existing zoning law addressing woodland and forest protection and make those requirements applicable to all zones
- draft similar protection language but add the new requirements only to specific districts through amendments to those chapters of the zoning law
- create a new chapter or subsection creating a “forest protection zone” and then amend the zoning map to show where the forest protection zone is located

Without adequate zoning, development, and redevelopment, situations will continue in ways that place people, property, and critical infrastructure at risk from storm damage. Large structures in at-risk areas create damage, increase emergency costs, impact adjacent properties, and are difficult to relocate or restore. Local coastal laws that establish setbacks based on rates of coastal erosion help secure community assets, reduce exposure to damages, and provide adaptive capacity for both human uses and environmental assets. Raleigh, NC is a good example of a city that has permitting restrictions favoring resilience and has implemented a buyout program to limit development in floodplain.

8.2 Permitting restrictions hindering (postponing or preventing) resilience

All projects have some sort of permitting requirements attached to the operation of the project design, be it through construction, design, or operations and maintenance after construction. Permits are a general set of rules that prevent additional issues in the process from forming, such as erosion and chemical spills during construction activities. Resilience projects are no different. Reports that provide a comprehensive critical issues analysis for a chosen site, detailing crucial information are generally available through professional services and present a significant cost to address project permitting. Some examples include but are not limited to, reports about:

- threatened and endangered species habitats
- the presence of wetlands, waterways, and even ghost waters that do not appear on the National Hydrology Dataset
- a list of the state and federal permits applicable to the site plan

Fully funded development projects still face regulatory hurdles that can cause significant delays or derail projects based on permitting and the associated costs of that permitting. The permitting process ensures that a project does not do damage to a system where it can be mitigated by the rules and methods outlined in the permit.

8.2.1 National Environmental Policy Act (NEPA)

A NEPA environmental review, is required for all projects that receive federal funds, occur on federal lands, or necessitate federal action, and can extend a project's timeline by several years. NEPA requires projects to comply with standards set by federal, state, and local governments, including the Clean Air Act, Clean Water Act, Endangered Species Act, National Historic Preservation Act, state siting aces, and many others, often referred to as the "NEPA Umbrella." An informed and comprehensive assessment can identify unintended consequences or critical threats and avoid wasting time and funding.

Following NEPA requirements, the Council of Environmental Quality (CEQ) 2020 study found that the average completion time for an Environmental Impact Statement (EIS) between 2013 and 2018 was 4.5 years, with one-quarter of EISs taking over six years to complete. An EIS is a government document that outlines the impact of a proposed project on its surrounding environment. Approximately 500 EISs are prepared each year. The environmental reviews are categorized into three (3) classes which could be streamlined to speed up local resilience projects. However, care should be taken to maintain the benefit of improving poorly conceived structural projects that could potentially do harm to a community.

While significant projects may experience considerable savings in time and paperwork, most projects will undergo similar environmental permitting timelines and should continue to avoid developing on protected natural resources, such as wetlands, endangered species habitats, and properties on the National Register of Historic Places. Permitting process changes in the Infrastructure Investment and Jobs Act (IIJA) was not the first attempt to clarify and streamline environmental reviews under NEPA.

Flooding and resilience are heavily dependent on regulations, permitting, and funding which all affect the timing of a project. Project scheduling is often outlined with start dates that reflect an expected permit timeframe or meet the dates funding is available for use. No community wants to lose its funding and it is often the case that a schedule can be defined by funding dates. Where funding and permitting can become complicated for a community is when material availability can push the projected project schedule, which can also cause an increase percent cost for materials or availably in certain regions. Because funding and permitting processes play a key role in resilience, it is important to see the timelines for both and understand how they could impact the resilience project. Timelines of permitting could push a project back months or years causing more damage to the community or project area, and potentially could change the cost of the project. In response to the permitting and funding there have been the following:

8.2.2 Permitting and Funding Responses

8.2.2.1 Fixing America's Surface Transportation (FAST), FAST-41

In 2015, the Fixing America's Surface Transportation (FAST) Act, Title 41 of FAST, referred to as FAST-41, established new environmental review procedures that hastened the review of over 50 infrastructure projects. FAST-41 created an online permitting dashboard for regulatory agencies to coordinate reviews. FAST-41 also established the Federal Permitting Improvement Steering Council, which includes interagency deputy secretaries "charged with improving the transparency, predictability, and outcomes of the federal environmental review and reauthorization process." FAST-41 created procedures intended to streamline the environmental review process for "covered projects," which are infrastructure projects exceeding $200 million subject to a NEPA permit but are not eligible for abbreviated processes. It also set a two-year statute of limitations for lawsuits to be filed against projects filed under FAST-41, reduced from the previous six-year statute of limitations. FAST-41 was set to expire in December 2022; however, the IIJA codified FAST-41, making it permanent.

8.2.2.2 Other Infrastructure Investment and Jobs Act (IIJA) processes

IIJA codified the One Federal Decision (OFD) process, which sets a government-wide goal to reduce the average timeline for environmental reviews to two years. The OFD process was developed in response to Executive Order (EO) 13807, issued in 2017. Initially revoked through an executive order by President Biden on his first day in office, EO 13807 directs federal agencies responsible for conducting environmental reviews for major infrastructure projects to develop a single permitting timeline, prepare a single EIS document, and sign a single record of decision (ROD). The OFD shortens the lead agency's time to invite other agencies to review from 45 to 21 days. The OFD also requires permitting agencies to issue an ROD within 90 days of issuing a final EIS, reduced from an average of five months.

The EIS process experienced the most meaningful changes from the passage of the IIJA. Land developers seeking NEPA approval for major projects may experience a multi-year reduction in their permit timeline and alleviate frustrations by preparing only a single EIS document, with a 200-page

limit to the main body of the EIS. NEPA permittees may request the preparation of multiple documents if preferred. EIS applicants can also expect to receive a ROD much quicker than before. Most NEPA projects do not require an EIS.

The IIJA funding also made some changes to the CATEX process. The IIJA directs the Secretary of Transportation to consult with the Departments of the Interior, Army, Commerce, Agriculture, Energy, Defense, and other agencies that have participated in an environmental review process to "identify the categorical exclusions that would accelerate delivery of a project if those categorical exclusions were available to those agencies" within six months of IIJA enactment and every four years after that. The IIJA was outlining areas that might restrict funding for resilience or other projects that could impact the communities.

After the Secretary of Transportation has provided this list to cooperating agencies, the agency will have one year to publish a notice of proposed rulemaking (NOPR) to present any categorical exclusions from the list applicable to the agency. The agency issuing the NOPR may solicit public comment regarding the categorical exclusions' eligibility criteria.

In 2019, the U.S. Department of Transportation published the "Interim Policies on Page Limits for National Environmental Policy Act Documents and the Application of the One Federal Decision Process for DOT Projects," which attempted to set a 150-page limit for EISs and a 75-page limit for EAs. The IIJA requires the preparation of a single document for EAs and a two-year timeline for significant projects; however, it does not establish a page limit for EAs.

Some programs will require more time and a comprehensive plan to determine how the IIJA funds will be spent. Competitive grants are expected to take longer than formula fund programs. About $100 billion will be allocated through competitive grants; however, the timeline for these grants remains unclear.

9 Funding Requirements

Communities need funding to implement their resilience strategies and individual projects. Impediments to obtaining funding can be grouped into four broad categories: (1) identifying appropriate funding sources; While there is a wide array of funding vehicles available to support the North Carolina Flood Resiliency Blueprint actions, the identification, capture, and management of funding can be daunting. (2) matching priority projects to available sources; actions must be searched strategically to meet the location and action needs both geographically and functionally. With the number of funding opportunities exceeding 200 options, this can be an overwhelming task. (3) meeting eligibility requirements for funding sources; projects will often have multiple funding sources as the restrictions will only have one of many tasks that would be covered by the funding. An example is a major damage structure that needs to be torn down and moved out of the way but is in a tax base location and therefore would need to be considered carefully to ensure that restrictions will not stop rebuilding in the area. The coordination and effort to make sure all options are left open for the community takes a significant amount of time. Smaller communities with smaller budgets and limited staff tend to limit the ability to find the appropriate funding. (4) preparing and submitting competitive applications for funds. be limited due to the available time of community staff to review funding data and not being able to access every direct vehicle funding source. Many communities look for reliable sources of funding data that identify, capture and manage source information with existing tools and applications, such as Grants.gov, SAM.gov, NC.gov, or those listed in Section 2.6 of the Blueprint. Currently, no data source has a complete list or provides continuous status updates regularly of available funding opportunities. Most data sources are usually updated by the funding vehicles directly as funding options are added. Data is truly what drives a grant process. Information and analysis for the project will be a requirement for any grant request. Communities look at a source of information and data for funding for resilience or flooding based on:

- Who owns that data?
- When was the data created?
- When can the data be accessed?
- How often the data is updated?
- How can they request or recommend updates?

Vehicle funding for resilience or flooding requirements or restrictions is limited based on the availability of funds to:

- Location
- The legal mechanisms for funding
- The Applicant type, financial history, and community conditions
- The project purpose or related purpose to flood resilience
- The maximum allocation, project amounts, and number of awards per program
- The frequency of available funding opportunities (supplemental and annual)
- The provisions of funding (Link to online data and any registration requirements to access and download)

When searching and applying for funding the community will need to outline where they are, what type of applicant they are, and how they intend to use the funds. The search for funds is a potential

restriction if the community is not aware of funding based on a location that overlaps with their community.

9.1 Location requirements

Determining the service area restricts funding opportunities due to the physical location of the projects or applicants based on how proposals are worded by the funding vehicle. The federal and state allocations of funding break down a percentage of money for each state and region across the United States. The percentage breakdown in funding translates to competitive funding sources as seen with grants. The percentage breakdown ensures population per state where all states and tribes can receive a portion of the funding. In some rare cases, funding can be allocated from future years where the project and availability exist. For funding for the NCFRB, the potential reference to locations is based on the following information:

- United States Region: South-East
- State: North Carolina
- Geographic Areas: Appalachian Mountain Region, Piedmont Region, Coastal Atlantic Region
- Geologic Regions: Carolina Terrane and Triassic Basins
- Waters to include: All NC Riverine and Coastal Headwaters and Watersheds

When pulling data for a funding opportunity from the federal database, the project location must be selected for North Carolina or a geographic area of North Carolina. There would be no point in selecting a grant for a coastal region of North Carolina where the project is located in the mountains of North Carolina. The ability to filter data by location is a limitation where communities may not understand the various types of locations the sources for funding vehicles use. The information used by an applicant to allow matching present and anticipated funding with stakeholder projects is primarily the location, applicant type, and project type. In the reverse, if a project location is in the mountain region of North Carolina they would potentially qualify for a grant that in the past was applied to areas of Virginia, West Virginia, or Tennessee under the Appalachian Regional Commission (ARC).

9.1.1 The determination of service area

The determination of service area, in addition to location, is then determined based on choosing a reasonable service area and then referring to equivalent geography. Applicants can choose to take additional steps to delineate service areas for diverse types of funding such as using market studies. Activity service areas should be reasonably delineated based on the intended beneficiaries of the project activity. Once the service area has been reasonably delineated, the geographies that correspond the most are chosen. The service area is not drawn to include Low Moderate Income (LMI) persons that would not benefit, nor allowed to be drawn to exclude non-LMI persons that would benefit, where LMI is for locations and service areas of project activities located with communities. The determination of the service area can be scalable to accommodate COG Regions but often is limited to specific funding opportunities as seen with the use by the ARC.

9.1.2 Legal mechanisms

Requirements for funding are controlled by the categories of fund sources, where there are grant-making agencies with subsequent programs to be leveraged by specific applicants designated as tribes, the public, and private groups that could be but are not limited to non-traditional and non-

governmental organizations. The legal mechanisms translate into funding source mechanisms from the grant-making agencies where:

- For programs funded by discretionary funding, the statutory authority cited is the implicit or explicit authorization of appropriations
- The statutory authority cited for mandatory programs is the appropriation (or other funding-related instructions in the case of appropriated mandatory spending) in the authorization law
- Definite appropriations are specified in terms of a total dollar amount
- Indefinite appropriations are for "such sums as necessary," in such instances, the actual amount of spending that occurs may be based on eligibility criteria and payment formula
- The initial appropriations for federal funding are generally (unless otherwise stated) established for five years, but in recent years this funding stream has been operating under a series of temporary extensions

Congressional appropriations per fund are to be divided among the States and Tribes according to an apportionment formula. An example of funding formulas is the State Historic Preservation Offices (SHPO) which are divided between the 50 states, 5 territories, 3 freely associated states, and the District of Columbia which reflects the base award and the use of the current census data for Tiers development. The apportionment formula is composed of the following components:

1. Tier 1 Base Award of the equal division all SHPOs received a base amount of $400,00000, with a percentage set aside for the Freely Associated States
2. Tier 2 Census Award was based on 2020 US Census data factors for acreage, population, and number of residential structures over 50 years old
3. Tier 3 Statute Award (54 USC 302902(c)(4)) allocated appropriations above $65 million by applying Tier 2 US Census calculations and, by statute, requiring each state to award 50% of that calculated amount to its Certified Local Government partners

From the total appropriation, agencies allot a small amount, typically about 10%, of the appropriation, to fund project grants under the Tribal Program established in parallel to the primary funding programs. The remaining funds are divided among the eligible Tribal Historic Preservation Offices (THPO) to support each tribe's program. For appropriation of the THPOs, approximately 80% of the total appropriation is divided equally among all THPOs and the remaining 20% is apportioned based on the associated governing Tribal Act. Funding types under the legal mechanisms include grants, loans, or other services.

9.1.3 Applicant Requirement Restrictions

For those mechanisms, the purposes of the NCFRB outline the potential applicants based on who they are, their financial history and conditions, and what they are required to know to apply for funding. For example, federal and subsequent state funding now requires the use of the Unique Entity Identifier and Active Registration with Sam.gov. Communities now must register unless they are subject to the exceptions listed in 2 CFR 25.110 for grants, cooperative agreements, loans, and other types of assistance.

The following would be how applicants would need to identify during the selection of their funding opportunities:

- The State of North Carolina
- The North Carolina County (100 possibilities)

- The North Carolina's General Assembly Authorized Municipal Governments (552 possibilities)
- Recognized tribes and tribally designated housing entities (TDHEs) either by the state or federal designation: Eastern Band of Cherokee Indians
- For Federal Highway Administration (FHWA) projects: FHWA partnering with tribes or communities

Additional identification and restrictions are placed on resilience funding where designations are narrowed to public bodies, non-profit organizations, or qualified private (for-profit) organizations. The identification of the applicant will determine restrictions and exclusions to funding by legislative requirements and restrictions of use.

For example, there are separate allocations of funding for tribal communities set aside in federal and state funding. However, federal funds and legislation are based on the exercise of the tribe's sovereign power, and the federal and state commitment to tribal communities. The only North Carolina federally recognized tribe is the Eastern Band of Cherokee Indians where federally recognized tribes and Tribally Designated Housing Entities (TDHE) established are excluded from the coverage of the Byrd Amendment, but state-recognized tribes and TDHEs established only under state law are required to comply with the Byrd Amendment. For the state-recognized tribes of the Coharie, Haliwa-Saponi, Lumbee, Meherrin, Occaneechi Band of the Saponi Nation, Sappony, and Waccamaw-Siouan, the Byrd Amendment is a restriction to funding.

9.2 Funding requirements of applicant financial history (considerations by funding agencies)

9.2.1 Pre-selection review of the performance

Applicants for resilience or flooding funding may be required to undergo a pre-selection review of performance and may restrict applicants where past debt is concerned. If an applicant has a delinquent federal debt of the type described in 31 U.S.C. 3720B, a judgment lien against the debtor's property, or is excluded from doing business with the Federal government, the applicant may be ineligible for an award.

In addition, before making a federal award, agencies will review information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information, such as the Federal Awardee Performance and Integrity Information System (FAPIIS), and the "Do Not Pay" website. Before making a federal award, agencies will consider all the information available through FAPIIS concerning the applicant and any immediate highest-level owner, predecessor (i.e., a non-Federal entity that is replaced by a successor), or subsidiary identified for that applicant in FAPIIS, if applicable.

At a minimum, the information in the system for a prior federal award recipient must demonstrate a satisfactory record of executing programs or activities under Federal grants, cooperative agreements, or procurement awards, and integrity and business ethics. Agencies may make an award to a recipient who does not fully meet these standards if it is determined that the information is not relevant to the current award under consideration, or if there are specific conditions that can appropriately mitigate the effects of the non-federal entity's risk per 2 CFR 200.208.

Agencies may consider other public sources such as newspapers, the Inspector General or Government Accountability Office reports or findings, or other complaints that have been proven to

have merit. Applicants may review and comment on any information in Federal Awardee Performance and Integrity Information System (FAPIIS) database through SAM.gov. Agencies reserve the right to:

- Deny funding, or with a renewal or continuing award, consider suspension or termination of an award immediately for a cause
- Require the removal of any key individual from association with management or implementation of the award
- Make provisions or revisions regarding the method of payment or financial reporting requirements
- Impose other specific conditions that can appropriately mitigate the effects of the non-Federal entity's risk per 2 CFR 200208

9.2.2 Denial of funding requests

9.2.2.1 Zero debarments

Zero debarments and suspensions requirements are restrictions to funding under 2 CFR part 2424, no award of Federal funds may be made to applicants that are debarred; suspended; proposed for debarment under 48 CFR part 9, subpart 9.4; or voluntarily excluded from doing business with the Federal government.

9.2.2.2 Outstanding Delinquent Federal Debts

Outstanding delinquent federal debts requirements are restrictions of knowledge consistent with the purposes and intent of 31 USC 3720B and 28 USC 3201(e), that applicants with outstanding delinquent federal debt or judgment liens against the debtor's property will not be eligible to receive an award of funds, unless:

- A negotiated repayment schedule is established, and the repayment schedule is not delinquent or
- Arrangements that are satisfactory to the funding agency are made before the award of funds by the agency

In most cases, if satisfactory arrangements cannot be completed within 90 days of notification of selection, agencies will not make an award of funds to the applicant and instead offer the award to the next eligible applicant. Some agencies such as HUD may act earlier than 90 days to ensure, in an agency's determination, that the funds can be obligated in a timely manner. Applicants selected for funding, or awarded funds, are required to report any changes in the status of current agreements covering the federal debt. In standard practice, agencies may withhold funding, terminate an award, or seek other remedies from a grantee if a previously agreed-upon payment schedule has not been followed or a new agreement with the agency to which the debt is owed has not been signed. Some agencies such as HUD review this information as available through the "Do Not Pay" website, an OMB-designated repository of government-wide eligibility qualification and financial integrity information.

9.2.2.3 Sufficiency of Financial Management System

Sufficiency of financial management system requirements is another set of applicant-based restrictions where agencies will not award or disburse funds to applicants who do not have a financial management system that meets federal standards as described in 2 CFR 200.302. Agencies may arrange for a survey of financial management systems for applicants selected for the award who have not previously received federal financial assistance, where agency program officials (such as HUD)

have reason to question whether a financial management system meets federal standards, or for applicants considered high risk based on past performance or financial management findings.

9.2.3 Economic level metric

Use of economic levels as funding requirements (conditions or qualities of well-being) for a community or county based on the ranking index of US values as a restriction, generally outlines what percentage of funding can be allocated for a community or county. Such as a distressed community or county that is within the worst 10% of the US or in attainment communities or counties that are within the 10% best of the US. The following are the primary standards for economic levels but may vary by funding opportunity in rare cases:

- Distressed communities or counties are the most economically depressed and rank in the worst 10 percent of the nation
- At-risk communities or counties are those at risk of becoming economically distressed, which rank between the worst 10 percent and 25 percent of the nation
- Transitional (mid-tier) communities or counties are those transitioning between strong and weak economies They make up the largest economic status designation and rank between the worst 25 percent and the best 25 percent of the nation
- Competitive (comfortable) communities or counties are those that can compete in the national economy but are not in the highest 10 percent of the nation in the ranking between the best 10 percent and 25 percent of the nation are classified as competitive
- Attainment (prosperous) communities or counties are the economically strongest counties and ranking in the best 10 percent of the nation are classified as attainment

An example of the use of the economic level to award project support, such as grants, can be seen with the ARC through the County assessment of resilience or flooding funding available by a project for the Appalachia region of the US per the national economic level:

- In distressed counties 80% of the project cost
- In At-Risk counties 70% of the project cost
- In transitional counties 50% of the project cost
- In competitive counties have 30% of the project cost
- In attainment counties 0% of the project cost

Stepping outside the requirements, (the ARC uses Counties as the standard and the state will use counties, municipalities, and even authorities) agencies and organizations will consider individual applicants where specific areas within counties or municipalities are considered economically distressed. Even if the county or municipality is not distressed, ARC assigns the “distressed area” designation to census tracts in at-risk and transitional counties that have a median family income no greater than 67 percent of the US average and a poverty rate of 150 percent of the US average or greater.

The Distressed Communities Index (DCI) can be used to meet some requirements of funding applications where the tool is used for measuring the comparative economic well-being of US communities and helps illuminate ground-level disparities across the country. The DCI is derived from national economic indicators, the US Census Bureau’s Business Patterns, and American Community Survey 5-Year Estimates for 2016-2020, and sorts zip codes into conditions. In all, the DCI captures US populations with at least 500 residents. Using this information would be dependent on the community.

9.2.3.1 National economic indicators

The national economic indicators are considered when developing requirements for resilience or flooding funding, generally a combination of 3-to-7 complementary economic indicators, which convey each community's standing relative to its peers. Those national economic indicators are, on average, based on a series of times referred to as fiscal years based on the most current data available at the beginning of the calendar year of computation. The time series used for each funding application is usually listed by economic indicator and fiscal year, either by table or direct reference in applications. National economic indicators are used to develop a majority of agency economic levels for funding, including but not limited to the following:

- Three–to-Five-Year Average Unemployment Rate: The three-year average unemployment rate is a measure of long-term structural unemployment The unemployment rate is calculated by dividing the three-year sum of persons unemployed by the three-year sum of the civilian labor force and expressing the result as a percentage
- Per Capita Market Income or Median Income Ratio: Per capita market income is calculated by dividing total personal income, fewer transfer payments, by population Transfer payments include retirement and disability insurance benefit payments, medical payments, income maintenance benefit payments, unemployment insurance benefit payments, veterans benefit payments, and other such payments
- Poverty Rate: The poverty rate is computed by dividing the number of persons living below the poverty threshold by the number of persons for whom poverty status has been determined

Other national economic indicators include, but are not limited to:

- Education,
- Housing Vacancy Rates
- Unemployment Rates
- Change in Employment Rates
- Change in Business Establishments
- Change in Population

9.2.4 Population size

Funding application population problems, where population numbers or change in population numbers are required, can be affected when residents are in dormitories, group quarters, the armed forces, institutional and or correctional facilities, or other similar arrangements (such as Butner, Tabor City, and Black Mountain). These communities would require adjustments to their numbers included in the economic indicators for funding applications to assure more accurate capture of community conditions.

Requirements referencing the size of the community generally follow financial conditions as a restriction for resilience or flooding funding applications due to assumptions based on the tax base and population correlations. In the last 10 years, funding applications have reverted from the use of the terms urban, suburban, or rural because of confusion when clarifying population sizes. Clarity was necessary because depending on the funding source, those terms could mean either size by people or by housing and can fluctuate by thousands of inhabitants in either form. The adjustments to a population-based breakpoint are easier for communities to understand and are often dependent on the agency for funding but on average are often designated as:

- Population greater than 200,000
- Population less than 200,000 and greater than or equal to 50,000
- A population of greater than 50,000 but less than 200,000
- Population areas of 5,000 to 200,000
- A population of 5,000 population or less or
- Any Area

Defining non-entitlement communities based on population numbers or incorporated municipalities or counties is broken down as follows:

- Incorporated Municipalities under 50,000 in population
- Incorporated counties under 200,000 in population

Rating projects by population conditions using the Low Moderate Income Summary Data (LMISD) or a related project location indicator like the Low- and Moderate-Income (LMI) is often used in qualifying activities for area benefit which is backed by US census data.

9.3 Project purpose

The purpose requirements or related purpose to flood resilience is based on the Blueprint cornerstone of coastal and riverine watersheds and flood resilience. However, traditional projects were based on floodplain mapping and disaster clean-up. Newer resilience projects are adjusting the project purpose requirement for funding to be centered around riverine watersheds and flood resilience interdependencies with the subsequent projects and associated data collection. The project purposes are based on the interdependencies of community services that intertwine, and during hazard events (such as floods) develop into cascading system failures which include but are not limited to power, water, transportation, communications, critical infrastructure, emergency services, and response.

9.4 Funding allocation amounts

9.4.1 How much?

After a community discusses what its needs are, the next question is “How much is this going to cost us?” The answer is based on the work value minus the maximum allocation the project can be awarded by the funding source for that opportunity and additional resources that can be leveraged to supplement the remaining project cost.

Each funding source has requirements based on the project amount available and how the maximum allocation for that project is outlined for an applicant based on the number of applicants and projects submitted to a program and the maximum allocation of the program budget per round.

9.4.2 Funding allocation

9.4.2.1 Coronavirus State and Local Fiscal Recovery Funds Example

Using some of the recent, significant federal investments as examples the maximum allocation of a program sets the ceiling for funding, for example American Rescue Plan Act of 2021-2022 (H.R. 1319) is a $1.9 trillion package, the Subtitle M—Coronavirus State and Local Fiscal Recovery Funds: (Sec. 9901) section provides funding to states, territories, and tribal governments to mitigate the fiscal effects

stemming from the COVID-19 public health emergency. Congress has allocated funds to tens of thousands of eligible states, local governments, territorial governments, and tribal governments awarded through the Coronavirus State and Local Fiscal Recovery Funds (SLFRF) program as part of ARPA. The current total SLFRF allocation for North Carolina was $5,439,309,692.20, of which individual allocations were outlined for funding for areas of investment in water, sewer, and stormwater infrastructure. This has become an important funding opportunity, established as a grant or forgivable zero-interest loan, allowing smaller communities to improve access to clean drinking water, support vital wastewater structures and programs, and improve stormwater infrastructure. The number of potential awards was dependent on awarded project amounts (not exceeding preset values during the application stage). Different funding will have different allocations per program and administration. Project requirements for ARPA were restricted to a point system, as are many funding opportunities, where amounts per award round are based on areas of investment (i.e., stormwater, water, and sanitary sewer) and the awarded points are outlined in the application.

9.4.2.2 Funding and grant application concerns

It is difficult to determine maximum funding allocations without having at least one reference point to start with. The initial information breakdown is often restrictive for smaller communities, where each section is often upwards of 50 to 80 acronyms and concepts that may apply to the grant. Applications can be complicated and contain multiple sections that require multiple documents, each with separate instructions. Some instructions may not be explained thoroughly or examples are not detailed enough for town officials to understand if the requirements apply to them.

Training on completing the application process generally involves program overviews and objectives of applications. Discussion during training events is generally a requirement for applications that are not straightforward for the range of education the individuals completing the applications may possess.

An example from the March 2023 ARPA funding training. The discussion was on making sure the DUNS number and the SAM IDs are provided on the application. The new reporting requirements are built into the applications with upwards of 30 or more pages of instructions. For federal applications there are only a couple of pages relevant to completing the application. Documents also contain information concerning what a community should do should they be awarded a grant. The process to manage the grant is separated and is not directly linked to the applications. A lack of process charts for the application process, the application breakdown and needs for submittal, the review, and the next step after the award is concerning.

The frequency of available funding opportunities (supplemental and annual) creates confusion for communities that are applying. Most applications are structure where applicants must search for dates and timelines for every opportunity and every application they create. If the funding source provided an illustration for the application's average grant cycle it would reduce the search and preparation time Especially in circumstances where that timeline has links attached for applications and follow-up, etc. Most funding data is written as excessive amounts of content versus visual outlines and references to create clear instructions.

The provisions of funding are often restricted and do not always have links to online data. There can be registration requirements for access to data, and smaller communities may not have funds dedicated to data retrieval or storage.

9.4.2.3 Matching funds

Matching funds as a restriction is required by a majority of federal agencies. Matching funds are required many grants - not just federal ones. In some instances, even if matching funds are not required, percents and sources of matching funds is factored into the application scoring. If the match is zero or a low percentage of the total funding request, the applicant may not score high enough to be awarded funds. This is a major constraint in a local government's ability to obtain grant funding. Matching funding for federal agencies is generally outlined as:

- Matching fund requirement equal to the amount of grant
- In-kind contributions cannot be used as matching funds
- Encouragement of partnerships with other federal, state, local, private, and nonprofit entities

States and communities' tax base is limited based on size of the population in the community but more importantly, resident incomes, the cost of housing and utilities, as well as transportation costs depending on their location in the community. Availability of public transportation, compounded by inflation creates challenges to having disposable income. Statistics on income recognizes that some communities have high rates of the population living paycheck to paycheck. These factors may affect what matches the applicant community may have as this data may skew match results. Allocations to states and tribes with different fund formulas, such as the SHPOs, set requirements that are implemented by statute for recipients to the fund appropriations. This would require a match of their awarded funding with a matching share in a ratio of 60% federal to 40% non-federal match by the awarded state, tribe, etc. (this is an example, actual values to vary by funding source, program allocations and administration of resources).

9.4.2.4 Status or lack of legislation

Legislation outlines the availability of funding due to recognition requirements. One of the most restrictive funding conditions is based on legislation restrictions on regional programs where applicants are called out by state, organization, or project status (active versus inactive). This refers to federal funding programs providing support, but where limitations are set by the status of the regional conditions or projects. The limitation is often where the federal legislation creates an unintended barrier for a community or creates barriers to funding knowing it will hinder communities based on size or community conditions.

9.4.3 The creation of unintended barriers

For a community, the creation of unintended funding barriers means navigating that barrier based on the needs of the community. One existing example of an unintended barrier is the U.S. Department of the Interior’s (USDOI’s) Office of Surface Mining Reclamation and Enforcement under the Surface Mining Control and Reclamation Act, which is responsible for mine operations and reclamation of abandoned mines. North Carolina’s oversite is through the Unified Interior Region 2 Office and the state office of North Carolina Department of Environmental Quality Mining Program for Abandoned Mine Lands (Title IV), Regulatory (Title V). By using the Abandoned Mine Reclamation Fund, watersheds can leverage additional resources in erosion control and restoration measures through the Abandoned Mine Reclamation Fund and the Appalachian Regional Reforestation Initiative.

However, North Carolina is known to contain coal beds of potential commercial importance in only one area, the Deep River coal field, which lies along the Deep River in Chatham, Moore, and Lee counties. The unintended barrier to using this funding option is assessing “coal-reliant communities” in the state where it is not as straightforward as it might be for other states. Because North Carolina

does not have an active coal mining industry, therefore it is not included under Office of Surface Mining Reclamation and Enforcement. The AML Fund currently does not apply to North Carolina communities for regulatory or funding purposes and most communities would not know that there are instances where petitioning for acceptance and applying where watersheds have experienced impacts due to the coal industry, such as via an abandoned coal mine can be done. With the assistance and partnership of the ARC, funding can potentially be obtained as part of a cross-regional opportunity. However, the existing restrictions outlined the under the USDOI department would not be considered for primary funding, especially where the average NC watershed restoration plan, mine reclamation, and restoration projects are part of the safety cross features of flood resilience.

Considering on average, North Carolina has 2,375 identified mines spread over the State's watersheds where annual mineral production and mineral resources complexly and geology vary across the state as well as the state ranking in phosphate rock production and crushed stone, sand and gravel, dimension stone, kaolin, peat, and gemstones production the local communities will have to consider mining in their watershed plans. Local communities are considering resiliency in watersheds that have issues with mines, prospects, and sinkholes as outlined under North Carolina's DEQ, Energy, Mineral, and Land Resources section for Geologic Hazards, however there is currently a gap between federal, state, and local communities where funding and resilience overlap the mining community.

9.4.3.1 Existing legislation

Existing legislation, including modifications, are other examples of unintended barriers. Based on legislation for use of tax base revenues, funding sources have shown that some exceptions can be made to availability of funding. However, limitations and exceptions can appear arbitrary in nature in how they were drawn because they had to be drawn out (as an example).

9.5 Existing ties to climate change and resilience

Through the Department of Energy (DOE), existing climate change ties are addressed about the Nation's energy, environmental, and nuclear challenges through transformative science and technology solutions. The National Environmental Policy Act (NEPA) is housed under the Department of Energy (DOE). DOE conducts Environmental Assessments under NEPA per policy and compliance. Those assessments can be leveraged during funding applications. There are resources available under the State Energy Program Competitive Award Generated Resources that can be utilized to advance energy efficiency or renewable energy goals based on modeling and implementation strategies. There are restrictions on DOE funding for resilience, but in North Carolina some steps have been taken such as the production of oil, natural gas, solar power, hydropower, and nuclear power. The next challenge is in the maintenance of those resources as the climate changes.

North Carolina is still among the nation's top five producers of electricity from nuclear power which should be accounted for in emergency evacuation routes. Planning for where the wastewater from energy production goes, as a mitigation measure for flood resiliency planning, should be considered. Consideration will also need to include other major energy sources and the need to fund preparation for worse case conditions for those types of projects. Be it new construction or revisions to their infrastructure, resilience measures under the NCFRB overlap in funding. Another energy overlap to address is North Carolina's Mesozoic Basin exposure in the Piedmont. A subterranean formations under the Atlantic Coastal Plain, in addition to the Outer Continental Shelf (N.C. Coastal waters 50 miles to the edge of the continental shelf), this documented presence of natural gas and oil have the potential for commercial quantity production. There is exploration history in both Lee and Bertie

County through coal and oil along the Dan River Basin and the Sanford sub-basin of the Deep River Basin. Noting that some of the exploration leases have expired, such as the Manteo Exploration Unit, there is potential funding that would overlap flood resilience where operations have occurred. Given future political climates, this funding is available through the Department of Energy under the Office of Resource Sustainability.

Funding resources under the U.S. Department of Energy are limited to identification but not resilience mitigation activities. Funding under Department of Homeland Security's FEMA weighted in response to disaster and recovery rather than mitigation activities.

10 Complex Funding Reporting Requirements

Understanding the Reporting and Oversight Process for any project is often a heavy restriction for communities. In 2006, the Federal Funding Accountability and Transparency Act (FFATA) set in motion a government-wide reporting procedure that continues to evolve. Communities currently do not have a list of points of contact for agencies or a clear outline for potential restrictions for funding. Restrictions on community resilience development with funding reporting are based on the requirements outlined in the grant, loan, or other types of assistance available to communities' section. The reporting requirements for funding are based on the application and audit processes by funding vehicles and are often interwoven between tracking and eligibility requirements in funding applications and awards.

10.1 Common funding sources

Common funding sources include a mix of sources that will vary across communities, depending on their particular circumstances and needs, such as:

- Taxes such as property, sales, and income levies
- Fees such as charges for inspections and permits
- State and federal grants such as those that support improvements to drinking water, wastewater, and stormwater systems
- Bonds enable communities to borrow money to pay for projects
- Loans to pay for projects and programs
- Public-Private Partnerships entail contractual agreements between a public agency and a private sector entity allowing for cooperation and collaboration in the financing, planning, design, construction, and maintenance of water infrastructure

Common Grant Funding includes:

- Competitive - Based on the Merit of a Proposed Project
- Formula – Awardees are Predetermined
- Continuation – Renewal of an Existing Grant
- Pass-Through – Issued by a Federal Agency

10.2 Rules around applying for and receiving funding

Before receiving awards, applicants are required to submit various reports, documents, and community performance information so sources can determine the applicant's ability to complete the activities proposed for funding.

10.2.1 False statements

False statements by applicants in an application are grounds for denial or termination of an award and may result in criminal, civil, and/or administrative sanctions, including fines, penalties, and imprisonment. Grantees must be truthful in all communications with funding agencies. The Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 CFR 200.415, specifically lists the criminal false statements and civil and administrative false claims act statutes under U.S. Code Title 18, Section 1001 and Title 31, Sections 3729-3730 and 3801-3812.

10.2.2 Mandatory disclosure requirements

Mandatory disclosure requirements ensure that each recipient or applicant for a federal award must disclose in writing credible evidence, to the Office of Inspector General (OIG) and the awarding Program Office at HUD, whenever, in connection with the award, performance, or closeout of this award or any sub-award agreement thereunder, the recipient or applicant has credible evidence that a principal, employee, agent, sub awardee, sub-recipient, or subcontractor of the recipient or applicant has committed: (a) violation of Federal criminal law involving fraud, conflict of interest, bribery, or gratuity violations potentially affecting the Federal award, or (b) a violation of the civil False Claims Act (31 USC 3729-3733).

This disclosure must be made at the time of application if credible evidence of such a violation exists at that time, or if the applicant or recipient becomes aware of the violation after applying within ten days after learning of credible evidence of the violation Recipients that have received a federal award including the terms and conditions outlined in Appendix XII to 2 CFR part 200—Award Term and Condition for Recipient Integrity and Performance Matters are required to report certain civil, criminal, or administrative proceedings to SAM Failure to make required disclosures as provided in 24 CFR 200113 can result in any of the remedies described in § 200339 Remedies for noncompliance, including suspension or debarment (See also 2 CFR parts 180 and 2424, 31 USC 3321 note 41 USC 2313).

10.2.3 Prohibition against lobbying activities

Applicants are subject to the provisions of Section 319 of Public Law 101-121, 31 U.S.C. 1352, (the Byrd Amendment), and 24 CFR part 87, which prohibit recipients of federal awards from using appropriated funds for lobbying the executive or legislative branches of the Federal government in connection with a Federal award.

All federal funding applicants must submit with their application the signed certification regarding lobbying included in the Application download from Grants.gov. In addition, applicants must disclose, using Standard Form LLL (SF-LLL), “Disclosure of Lobbying Activities,” any funds, other than federally appropriated funds, which will be or have been used to influence federal employees, members of Congress, or congressional staff regarding specific awards.

Federally recognized Indian tribes and TDHEs established by Federally recognized Indian tribes as a result of the exercise of the tribe’s sovereign power are excluded from the coverage of the Byrd Amendment, but state-recognized Indian tribes and TDHEs established only under state law shall comply with this requirement.

10.2.4 The Federal Funding Accountability and Transparency Act (FFATA)

The Federal Funding Accountability and Transparency Act (FFATA) was signed on September 26, 2006. The intent is to empower every American with the ability to hold the government accountable for each spending decision with the result to reduce wasteful spending in the government. The FFATA legislation requires information on federal awards (federal financial assistance and expenditures) to be made available to the public via a single, searchable website, which is www.USASpending.gov. The FFATA Subaward Reporting System (FSRS) is the reporting tool Federal prime awardees (i.e., prime contractors and prime grants recipients) use to capture and report sub-award and executive compensation data regarding their first-tier sub-awards to meet the FFATA reporting requirements. Prime contract awardees will report sub-contracts awarded. The sub-award information entered in

FSRS will then be displayed on www.USASpending.gov associated with the prime award furthering Federal spending transparency. Grant recipients must report sub-award, and executive compensation information regarding first-tier sub-awards greater than or equal to $25,000 into the FSRS. .

10.2.5 Funding reporting requirements as recipients

The kinds of data federal award recipients are expected to include in their reporting fall into one of three categories:

1. Financial data, such as expenses paid for with federal funds
2. Compliance information to ensure the recipient is following federal regulations
3. Project data highlighting progress and/or community impact

This information is used by agencies in part to gauge the success of their programs and initiatives. The required information may be collected through several different channels, including regular progress reports, site visits, and audits.

10.2.5.1 Progress Reports

Progress Reports are regularly submitted reports called either "Performance Progress Reports" or "Research Performance Progress Reports" documenting a project throughout its lifespan. These reports may include both expense-related data and quantitative information about the project's impact such as milestones, project activities, lessons learned, resultants, and impacts on the community.

10.2.5.2 Recipients of funding may receive site visits

Site visits provide an opportunity for two-way communication between the grantor and the award recipient. Site visits may also provide technical assistance provided by the grantor as a means for ensuring that the grant recipient is complying with the award agreement.

10.2.5.3 Audits

As outlined under the Single Audit Act (amended in 1996), the state that grant recipients may be subject to an audit once a year. The audit aims to ensure compliance with government regulations and evaluate financial information, including expenses paid for with federal award funds.

[i] Progress report for 2022 status of the Executive Order 80: https://www.deq.nc.gov/2021-eo80-status-report/download?attachment

[ii] Additional information located at http://flood.nc.gov/ncflood/)

[iii] https://fris.nc.gov/fris/Home.aspx?ST=NC

[iv] https://www.nconemap.gov/datasets/2d07f32b93184a758be29dc1f41344bd_0/explore?location=35.139257%2C-79.919600%2C7.87

[v] https://deq.nc.gov/about/divisions/water-infrastructure/i-need-funding/application-forms-and-additional-resources#Tab-PriorityRatingSystemsGuidanceDocuments-1823