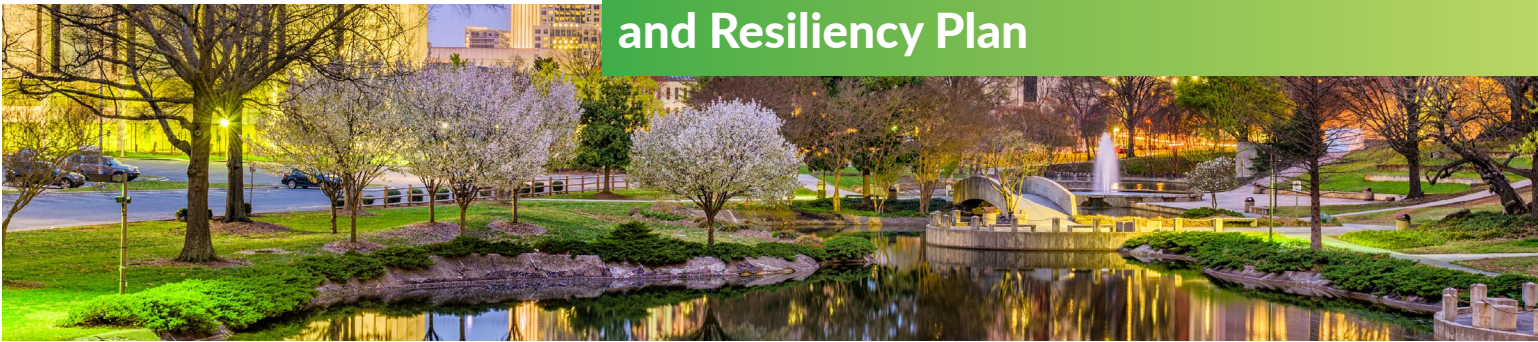


CASE STUDY

North Carolina Risk Assessment and Resiliency Plan



IDENTIFYING HAZARDS:

The resilience plan provides an **outline** of key climate change hazards facing North Carolina, their projected likelihoods, and how they interact with the state's non-climate stressors (e.g. population growth, aging infrastructure).

It then **provides** insights and recommendations for all infrastructure and economic sectors overseen by the state government (e.g. transportation, water, energy, fisheries, urban development) and assesses each on the likely climate hazards most relevant for the respective sector. See the text box below for an example of hazard classification.

North Carolina's Approach to Dam Failure Classification

Carolina has 17 Full time Equivalent (FTE) positions in eight offices around the state who **determine the hazard classification of these dams, work with dam owners to increase safety measures, and regularly inspect the dams.** Those classified as high hazards are inspected annually, while low-hazard structures are inspected every five years. In addition, all high- and medium-hazard dams are required to submit an Emergency Action Plan with particular emphasis on hurricane events. This classification system, along with expert FTEs able to apply the system in the field, allows the state to prioritize which dams to monitor.

The plan then **categorizes** critical infrastructure and **defines the sensitivity of that infrastructure based on quantitative guidance.** For example, for dams throughout the state, the plan uses a categorization of low, medium, and high sensitivity failure impacts to roads and estimated economic damage.

North Carolina



Climate Risk Classification for Dams

| | |
|--------|--|
| Low | Interrupt operations of a road used by <25 vehicles/day; estimated damage <\$30,000 |
| Medium | Interrupt operations of a road used by 25-250 vehicles/day; estimated damage between \$30,000 and \$200,000 |
| High | Any loss of human life; interrupt operations of a road used by more than 250 vehicles/day; estimated damage >\$200,000 |

Climate Hazards Considered for Different Water Infrastructure Types

| ASSETS, SERVICES, REGULATIONS | EXTREME HEAT | FLOODING (RIVER AND LAND) | WATER SHORTAGE (DROUGHT) | CHANGED SEASONS | LANDSLIDES | SALTWATER INTRUSION | STORM SURGE | TIDAL FLOODING | WILDFIRE | DAM FAILURE |
|--|--------------|---------------------------|--------------------------|-----------------|------------|---------------------|-------------|----------------|----------|-------------|
| LAND AND WATER QUALITY | | | | | | | | | | |
| Sedimentation, stormwater and wastewater permitting | * | * | * | | | * | * | * | * | * |
| State-owned groundwater monitoring wells | | * | | | | * | | * | | |
| Monitoring, survey and invasive species removal programs for waterbodies | * | * | * | * | | * | | | | |
| State stream and wetland restoration sites | * | * | * | | | * | | | | * |
| Landslide mapping program | * | * | | | * | | | | * | |
| Shellfish Growing Area Program | * | * | | * | | * | * | * | | |
| Recreational Water Quality Program | * | * | | * | | | * | * | | |
| WATER QUANTITY | | | | | | | | | | |
| Municipal water supply | | | * | | * | * | | | * | * |
| Agricultural water use | * | * | * | * | | * | * | | | * |
| Various water supply watersheds statewide | | * | | | | * | | | | * |
| WATER INFRASTRUCTURE | | | | | | | | | | |
| Public water systems | * | * | * | | * | * | * | * | | * |
| Wastewater treatment plants | * | * | | | | | * | * | | * |
| Septic systems | | * | | | | * | * | * | | |
| Water treatment plants | * | * | * | | | * | * | * | | * |
| DAMS | | | | | | | | | | |
| State-owned dams | | * | | | * | | | | * | * |
| Dam safety program | | * | | | * | | | | | * |
| Privately owned dams | | * | | | * | | | | * | * |
| MINES | | | | | | | | | | |
| Regulation of active mines | * | * | * | | * | | * | | * | * |
| OTHER | | | | | | | | | | |
| DEQ Staff | * | * | * | | * | | * | * | * | * |
| Floodplain development | | * | | | | | | | | * |

POLICY APPROACHES TO INCREASE RESILIENCE:

State and local government guidelines, including the [North Carolina Flood Act \(2000\)](#), encourage the siting of water infrastructure, including potential pollution sources like wastewater treatment plants away from riparian areas and floodplains. Certain projects are outright prohibited in 100-year floodplains (e.g. new solid waste disposal facilities) and the state encourages greater water infrastructure resilience through a points system for projects which, among other aspects, prioritizes projects in 500-year floodplains vice 100-year floodplains through awarding higher points in the former. The Risk Assessment and Resiliency Plan also mentions that “regulatory floodplains have not proven consistent predictors of the location of flooding in recent storms;”¹ indicating that these classifications may require updating based on improved climate modelling and exposure maps. **The Department of Water Resources also partners with universities** to improve data sources that are needed for understanding hazards, their impacts, and choices for greater resilience. The resilience plan also **includes recommendations for policies that would also increase resilience.**

PRIORITIZE RESILIENCE EFFORTS:

- **By type:** North Carolina classifies climate risks into Priority 1 and Priority 2 challenges. Priority 1 includes extreme events and actions potentially eligible for federal funding, such as Enhanced Hazard Mitigation Plan funding. Priority 2 are longer-term issues. The state plans to use data gathered as part of addressing Priority 1 challenges to inform the updated Enhanced Hazard Mitigation Plan due in 2023.
- **By time horizon:** Strategies are categorized along time horizons from short- to long-term.
- **By industry:** The resilience plan also **provides information for industries most affected by water infrastructure hazards** (e.g. agriculture, energy) and includes industry-specific recommendations.
- **By topography:** The resilience plan covers the **impacts of hazards on the variety of topographies** in the state and assessments of which hazards are more relevant for different areas including the **economic sectors and non-climate stressors on the state's water infrastructure in that area.**

¹ North Carolina Climate Risk Assessment and Resilience Plan, 2020, p 84

Interested in learning more about this work or Climate Finance Advisors, contact us here: info@climate-fa.com

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