



# 7 Project Portfolio

## 7.1 Selecting Priority Projects

Phase 2 of the RCCP develops a portfolio of resilience projects aimed at reducing exposure and sensitivity to hazards as well as strengthening the adaptive capacity of community assets and vulnerable populations. This strategy builds upon foundational plans and projects (detailed in Section 4) and prioritizes recommendations for the Project Portfolio.

A list of potential projects was shared during the May Open House and with the CAT to gain feedback and clarity on what projects would be prioritized for the City. Each priority project is provided a description based on the prescribed information provided in the RCCP Planning Handbook.

### The priority projects for the City include:

- Knobbs Creek Recreation Center Resilience Updates and Nature-Based Solutions
- Stormwater Ordinance Update and Resilient Best Management Practices Handbook
- College Park Living Shoreline
- Resilience Upgrades for City-owned Facilities
- Site-Scale Vulnerability Assessment of the Wastewater Treatment Plant (WWTP)
- Site-Suitability Analysis for Pump Stations
- Join the FEMA Community Rating System
- Update the Local Land Use Plan and Zoning Ordinances
- Hire a Stormwater Program Manager
- Integrate Climate Resilience into Open Space/Parks Plan



# Knobbs Creek Recreation Center Resilience Updates and Nature-Based Solutions

## Project Description

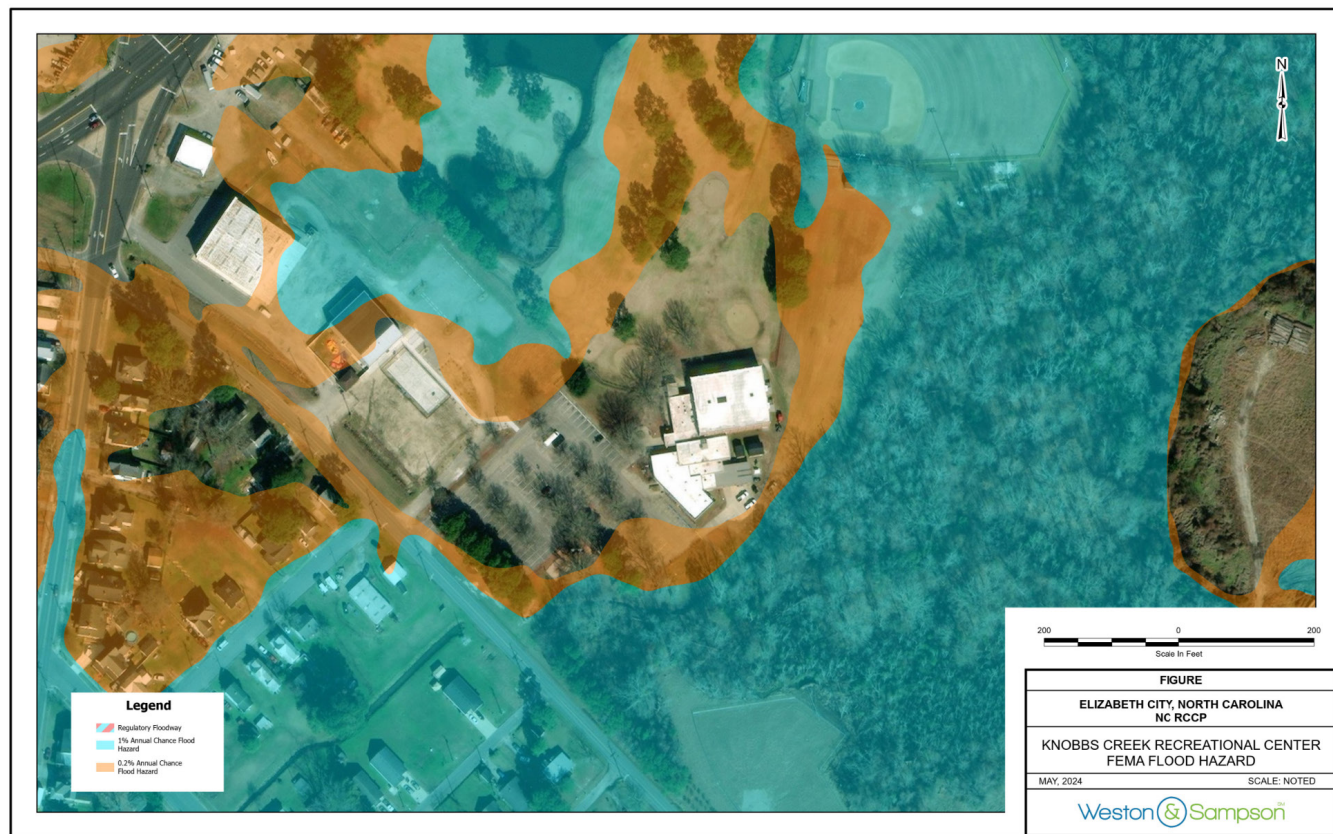
The Knobbs Creek Recreation Center currently serves as a shelter and a FEMA community lifeline during storm events. This action proposes retrofits and modifications so that the center can function as a “resilience hub” day to day.

Modifications may include elevating essential mechanical and electrical systems, installing battery storage and solar panels, floodproofing areas below the design flood elevation, and designing and installing nature-based solutions like a rain garden to help manage stormwater on site.



## Location & Project Map

Knobbs Creek Recreation Center, 200 E. Ward Street



## Source

City and Weston & Sampson

## Scoping Questions

- At what elevation are critical systems, such as mechanical and electrical, currently located at in comparison to the base flood elevation?
- What resilience measures would bolster protection of the center as an emergency shelter?
- Where is the best location for a rain garden to serve as a model for the community?

## Hazards Addressed

- Flooding
- Other
- All Hazards

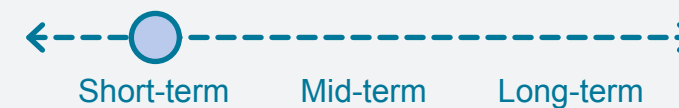
## Supporting Function

Emergency response, shelters

## Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other: Building adaptation; emergency preparedness

## Estimated Timeline



## Responsible Entity

Elizabeth City/Pasquotank County Parks & Recreation

## Potential Partners

- Boys and Girls Club
- Resiliency Contractor
- Elizabeth City/Pasquotank County Youth Programming

## Existing Funding

NC RCCP Phase 3 (Applying for funding for rain garden design and installation)

## Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF)
- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Flood Mitigation Assistance Grant Program (FMA)

## Estimated Cost



- Raingarden design and engineering – \$20k
- Raingarden installation – \$10k
- Recreation center resiliency improvements – \$500k-\$1M

## Anticipated Benefit



This project will have a significant benefit because it provides an emergency shelter for citizens during storm events, will expand the role of the recreation center as a “resilience hub,” and improve the project site with nature-based solutions.

## Priority Rating





# Stormwater Ordinance Update and Resilient Best Management Practices Handbook

## Project Description

The City of Elizabeth City proposes to modernize its stormwater ordinance, promote best and resilient practices, and engage the community in a demonstration project for nature-based solutions. The City will identify outdated and otherwise deficient provisions of the stormwater management ordinance, propose ordinance updates, create a “Best Management Practices” handbook for developers, and create a rain garden at our recreation center.

The updated ordinance may include development impact fees to account for the size of the development and impact on stormwater, urban heat island, and other climate impacts. Fees should be scaled based on the size and type of development.

## Location

City-wide with focus on areas vulnerable to precipitation-based flooding and stormwater impacts



## Source

City

## Scoping Questions

- Should the stormwater ordinance have varying standards for parts of the city based on their vulnerability to stormwater flooding?
- What are potential barriers to adoption and push-back that may be received by developers or private property owners?

## Hazards Addressed

- Flooding
- Other: Stormwater, Urban Heat Island, Extreme Heat
- All Hazards

## Supporting Function

Stormwater management

## Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

## Estimated Timeline



## Responsible Entity

Elizabeth City Department of Public Works

## Potential Partners

- Elizabeth City Community Development Department Planning Division
- Elizabeth City Parks and Recreation Department

## Existing Funding

None identified

## Potential Funding Sources

NC RCCP Phase 3

## Estimated Cost



## Anticipated Benefit



This project will create funding for additional mitigation actions.

## Priority Rating







## College Park Living Shoreline



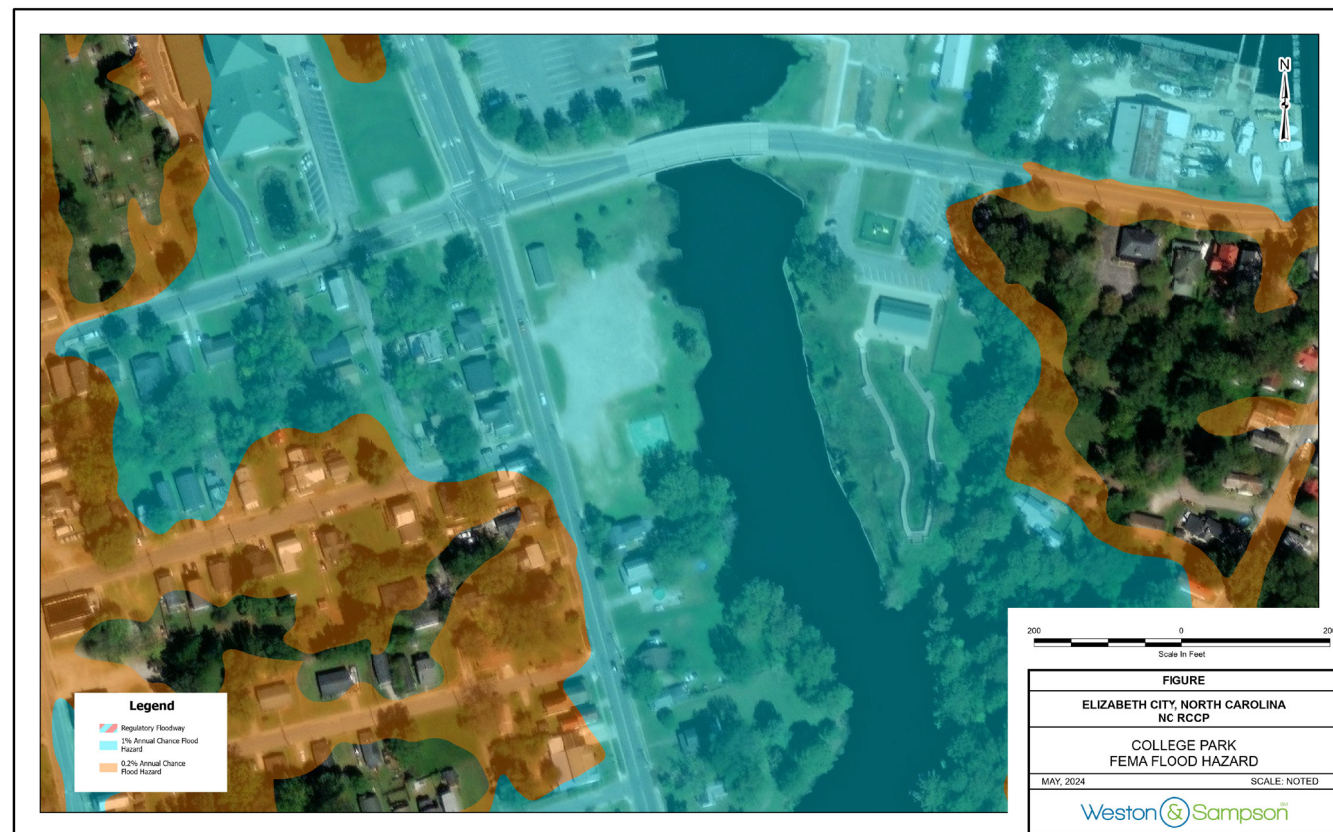
### Project Description

Design and implement a living shoreline at College Park. The College Park area is subject to frequent overtopping of the bulkhead creating dangerous conditions. A living shoreline would contribute to softening of the shoreline, ecosystem restoration, beautification of the park, and the creation of new amenity for the public.



### Location & Project Map

College Park, 600 Southern Avenue



### Source

CAT

### Scoping Questions

- What type of living shoreline is best suited for this location?
- Will the design include any engineered features such as a walkway or boardwalk?
- Is there an opportunity for marsh restoration with the living shoreline?

### Hazards Addressed

- Flooding
- Other: Erosion, Storm damage
- All Hazards

### Supporting Function

- Ecosystem restoration
- Habitat Creation
- Recreation
- Beautification

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

Elizabeth City/Pasquotank County Parks & Recreation

### Potential Partners

- Elizabeth City Department of Public Works, Community Development
- North Carolina SeaGrant
- The Nature Conservancy

### Existing Funding

None identified

### Potential Funding Sources

- NC DEQ Coastal and Water Grants
- NC Agriculture Community Conservation Assistance Program (CCAP)
- National Fish and Wildlife Foundation (NFWF)

### Estimated Cost



Estimated cost considers design and construction.

### Anticipated Benefit



A living shoreline here could help stabilize the shoreline, mitigate erosion and flooding, and allow this area to be used for recreation again.

### Priority Rating







## Resilience Upgrades for City-Owned Facilities



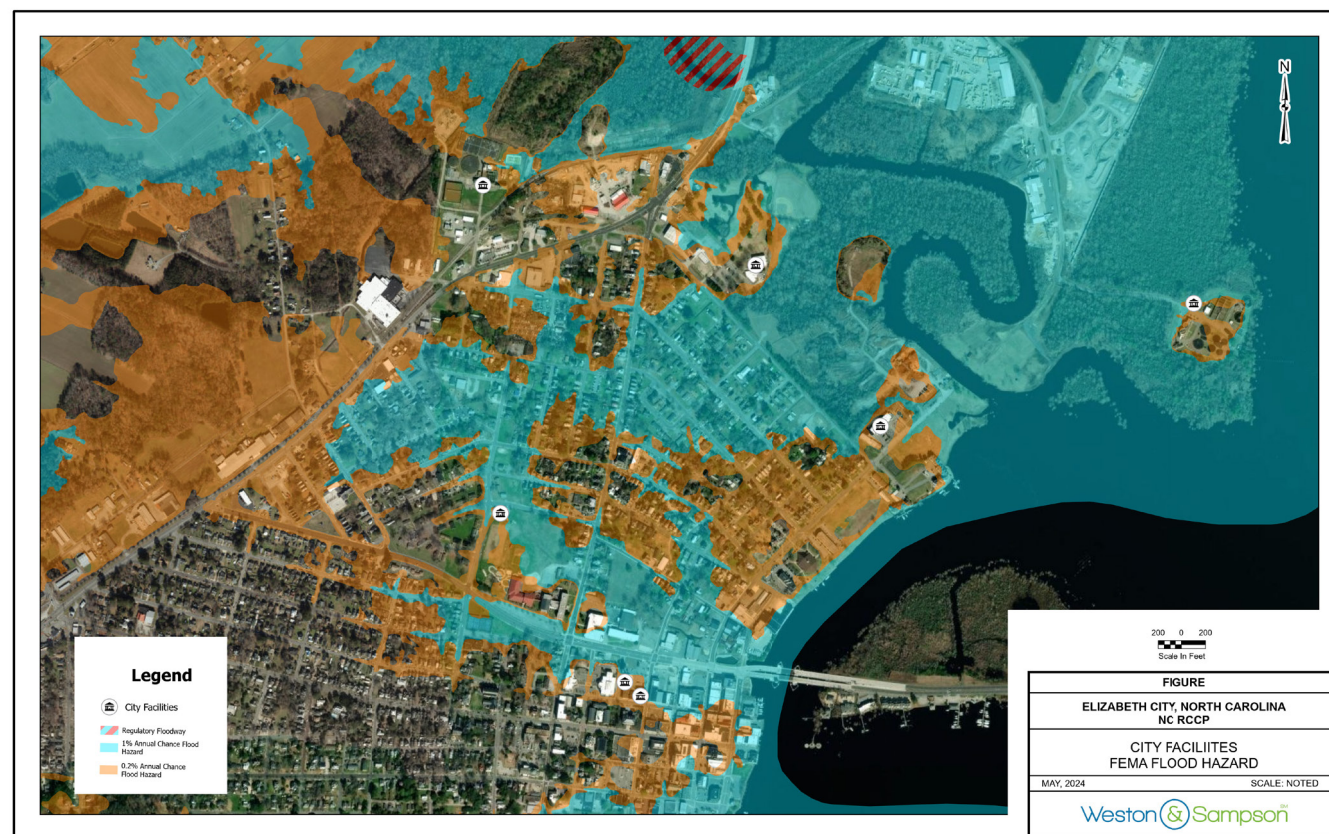
### Project Description

Upgrade city-owned facilities to align with FEMA standards and design recommendations for climate adapted critical facilities.



### Location & Project Map

Multiple facility locations



### Source

City and Weston & Sampson based on Vulnerability Assessment

### Scoping Questions

- Which facilities are most in need of an upgrade due to programming constraints, space needs, or outdated structure or equipment?
- What resilience retrofit method is the most appropriate for each facility?

### Hazards Addressed

- Flooding
- Other
- All Hazards

### Supporting Function

Multiple; different types of city-owned facilities

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

Elizabeth City, various departments

### Potential Partners

Contractor that specializes in facility design and resiliency retrofits

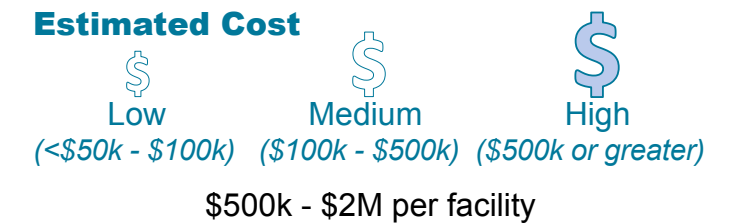
### Existing Funding

None identified

### Potential Funding Sources

- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Flood Mitigation Assistance (FMA)
- FEMA Building Resilient Infrastructure and Communities (BRIC)

### Estimated Cost



### Anticipated Benefit



### Priority Rating





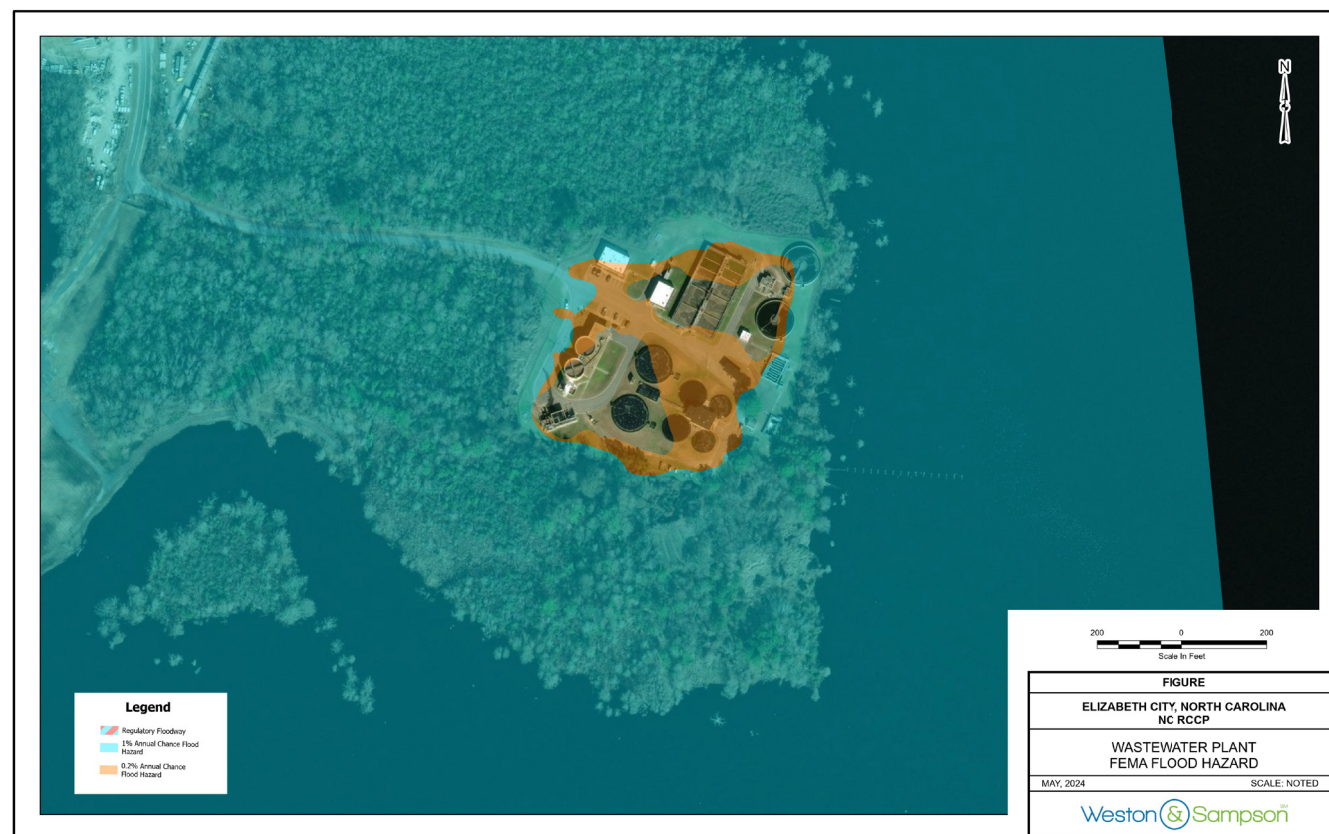
# Site-Scale Vulnerability Assessment of the Wastewater Treatment Plant (WWTP)

## Project Description

Conduct a site-scale vulnerability assessment of the wastewater treatment plant and determine adaptation options to either retrofit the building or design and implement nature-based site strategies to mitigate flooding.

## Location & Project Map

Wastewater Treatment Plant, 450 Knobbs Creek Drive



## Source

City and Weston & Sampson based on Vulnerability Assessment

## Scoping Questions

- What are the findings of the detailed vulnerability assessment?
- Does the plant need facility upgrades to maintain continuity of service, or can flood mitigation be accomplished through site strategies such as berms, bioswales, living shorelines, and other measures?

## Hazards Addressed

- Flooding
- Other
- All Hazards

## Supporting Function

Wastewater Treatment

## Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

## Estimated Timeline



## Responsible Entity

- Wastewater Treatment Facility
- Andrew Edwards, Wastewater Treatment Plant Superintendent

## Potential Partners

- Elizabeth City Chief Operator WWTP
- Supporting staff
- Department of Public Works

## Existing Funding

None identified

## Potential Funding Sources

- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Flood Mitigation Assistance (FMA)
- FEMA Building Resilient Infrastructure and Communities (BRIC)

## Estimated Cost



## Anticipated Benefit



This project would support uninterrupted treatment of wastewater for Elizabeth City.

## Priority Rating







## Site-Suitability Analysis for Pump Stations



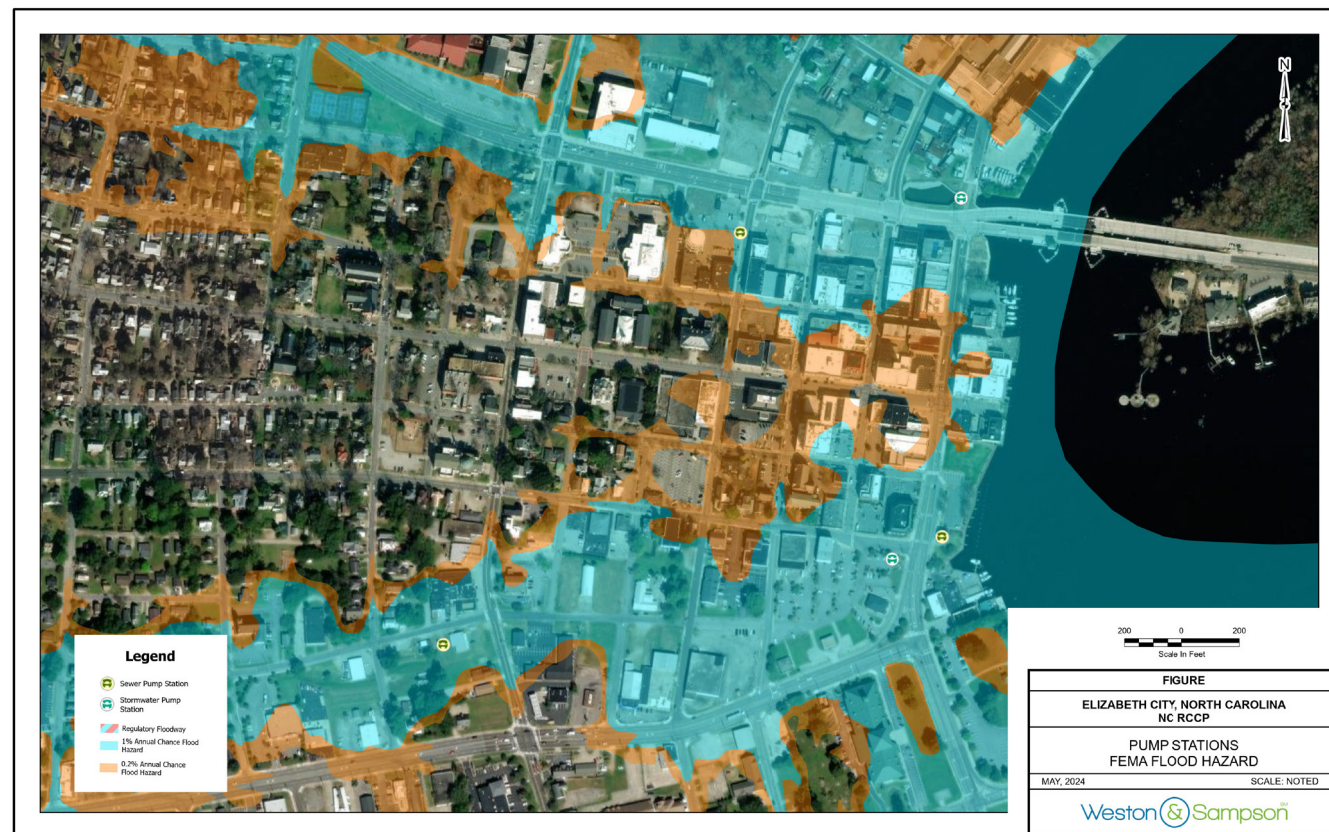
### Project Description

Conduct a site-suitability analysis of potential sites to relocate and reconstruct pump stations using adaptation strategies. Screen relocation sites based on their flood exposure, potential service area, parcel ownership, and environmental factors. Consider continuity of service and emergency services in the instance that the pump stations are out of service.



### Location & Project Map

Various pump stations



### Source

City and Weston & Sampson based on vulnerability assessment

### Scoping Question

Which pump stations are most in need of upgrades and are also highly vulnerable?

### Hazards Addressed

- Flooding
- Other
- All Hazards

### Supporting Function

Wastewater and stormwater pumping

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

Elizabeth City Department of Public Works

### Potential Partners

Wastewater Treatment Plant

### Existing Funding

None identified

### Potential Funding Sources

- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Building Resilient Infrastructure and Communities (BRIC)

### Estimated Cost



\$1M - \$20M (dependent on number of pump station projects)

### Anticipated Benefit



This project will ensure safe wastewater treatment and transport for Elizabeth City.

### Priority Rating







## Join the FEMA Community Rating System



### Project Description

Join the FEMA CRS to reduce flood insurance premiums. Elizabeth City has 1,106 active flood insurance policies with total annual payments over one million dollars. Joining CRS can be a way to incentivize improvements to floodplain management. Request info from FEMA on joining CRS.



### Location

City-wide



### Source

CAT, City, and Weston & Sampson

### Scoping Question

What activities are currently being implemented in Elizabeth City that would qualify for CRS credit?

### Hazards Addressed

- Flooding
- Other
- All Hazards

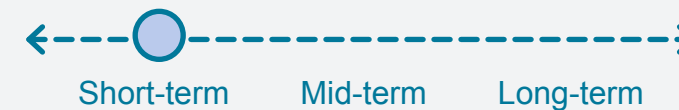
### Supporting Function

Floodplain Management

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

- City Administrator
- City CFM

### Potential Partners

- Elizabeth City Department of Public Works,
- Elizabeth City Community Development Department

### Existing Funding

None identified

### Potential Funding Sources

Annual budgeting process

### Estimated Cost



No cost to join CRS. Cost is representative of floodplain staff required to administer the program.

### Anticipated Benefit



This project will not only save citizens money on their flood insurance premiums, but it would also foster more stringent floodplain management in Elizabeth City.

### Priority Rating







## Update the Local Land Use Plan and Zoning Ordinances



### Project Description

Update the local land use plan (last updated in 2012) and zoning ordinances to adopt higher standards for climate resilience, stormwater management, and conservation of waterways and floodplains.



### Location

City-wide



### Source

CAT

### Scoping Questions

- Should the land use plan have its own resilience section?
- What spots in the ordinances could be updated to make the city more resilient with higher standards? What best practices or precedents should be referenced?

### Hazards Addressed

- Flooding
- Other
- All Hazards

### Supporting Function

Adapting the built environment to climate impacts

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

Elizabeth City Department of Community Development Planning Division

### Potential Partners

Elizabeth City Department of Public Works

### Existing Funding

General funds, staff time

### Potential Funding Sources

N/A

### Estimated Cost



### Anticipated Benefit



This project will increase the overall resilience of Elizabeth City.

### Priority Rating







## Hire a Stormwater Program Manager



### Project Description

Hire a stormwater program manager to monitor compliance of more stringent stormwater management standards and practices such as development fees, MS4 program, ordinance updates, stormwater utility, etc.



### Location

City Hall, Elizabeth City



### Source

CAT

### Scoping Questions

- Would multiple staff members be needed to manage the program?
- How does MS4 compliance impact the role of this individual?

### Hazards Addressed

- Flooding
- Other
- All Hazards

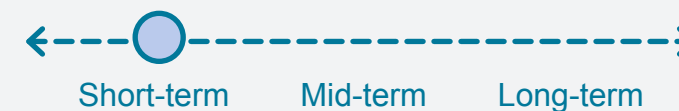
### Supporting Function

Stormwater Management

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other: Capacity Building

### Estimated Timeline



### Responsible Entity

Elizabeth City Department of Public Works

### Potential Partners

N/A

### Existing Funding

None identified

### Potential Funding Sources

City annual budgeting

### Estimated Cost



### Anticipated Benefit



This project will improve stormwater management and provide a point person for stormwater issues/inquiries.

### Priority Rating







## Integrate Climate Resilience into Open Space/Parks Plan



### Project Description

Integrate resilience considerations into the Open Space and Parks Masterplan. Create an implementation schedule for retrofitting park spaces to better accommodate or store flood waters in controlled ways.



### Location

Parks in Elizabeth City



### Source

CAT

### Scoping Questions

- Which parks experience the most flooding?
- Should parks be prioritized based on their rate of flooding or their ability to store floodwaters?
- Are there effective retrofits that are easy to implement and maintain across multiple parks?

### Hazards Addressed

- Flooding
- Other
- All Hazards

### Supporting Function

Recreation

### Type of Solution

- Plans, Policies, and Ordinances
- Nature-based Solution
- Infrastructure/Facility Retrofit
- Other

### Estimated Timeline



### Responsible Entity

Elizabeth City/Pasquotank County Parks & Recreation

### Potential Partners

Elizabeth City Department of Public Works

### Existing Funding

None identified

### Potential Funding Sources

City annual budgeting

### Estimated Cost



### Anticipated Benefit



This project will provide high-retrofitting park spaces to better accommodate stormwater flooding and will reduce problematic flooding in other areas.

### Priority Rating

