NC Flood Resiliency Blueprint

Tool Requirements/mockups/storyboards
and Preliminary Draft Neuse Action Strategy Review

December 19th, 2023

Background

Agenda

- Welcome- Shrikar Nunna
- Logistics and meeting purpose- Facilitator - Patrick Beggs
- Tool Recommendations review- Dave Canaan/ Judie Taylor
  - Questions - Patrick Beggs
- Preliminary Draft Neuse Action Strategy
  - DEQ - Introduction
  - Presentation - Nathan Slaughter
    - Questions- Patrick Beggs
- Day Logistics for Rooms, Lunch, and afternoon layout - Patrick Beggs

Flood Resiliency Blueprint Tool Requirements, Storyboards, Wireframes, and Mockups

North Carolina Flood Resiliency Blueprint

December 19, 2023

Requirements

Purpose of web application requirements:

- **Outline** the functionalities, features, and specification that the application must meet.
- Articulate the client's needs, goals, and user **expectations**.
- Provide a **foundation** for the design and development process.
- **Guide** the project team, align stakeholder expectations.
- Serve as a **reference point** for assessing the project's success.

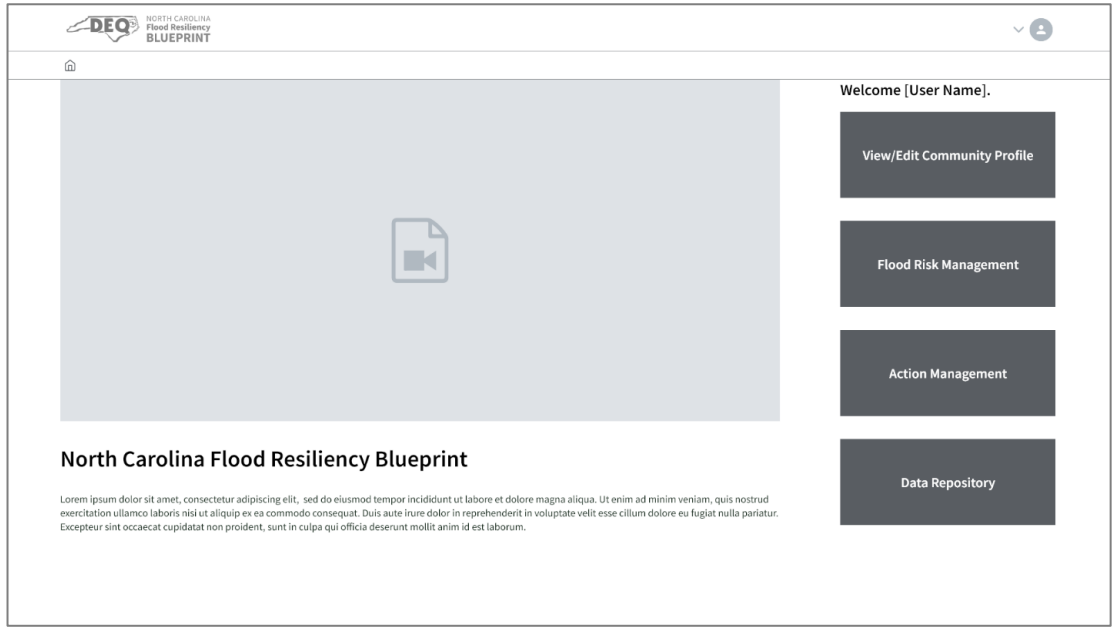
Storyboards

- Website **storyboards** serve as visual renderings.
- Outline the structure and flow of a website.
- Depict the arrangement of elements on each page.
- Illustrate the user journey and interactions.
- Each page in the storyboard includes:
  - A **wireframe** or a **mockup** of an application screen.
  - A listing of user roles that would interact with that screen and how that user would interact.
- Each storyboard page is presented in the order that users would interact.

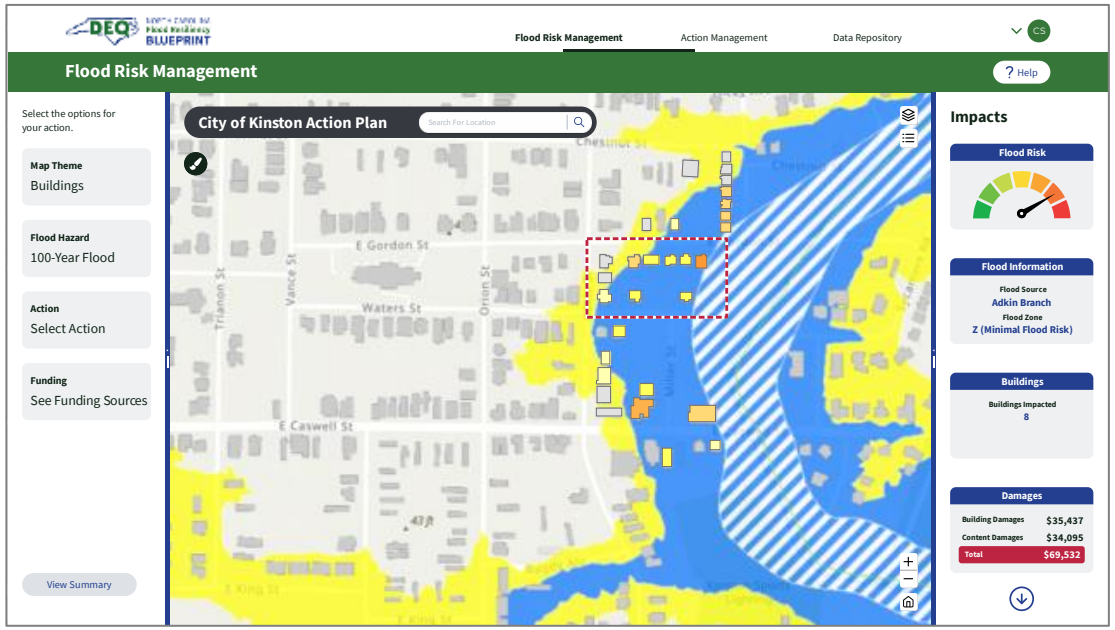
**All content and functionality will be subject to further refinement as part of Phase II*

Wireframes and Mockups

Wireframes



Mockups



- Skeletal, low-fidelity representation of layout and structure.
- Outlines the basic design elements and placement

- High-fidelity representation of a design.
- Provides a more realistic preview of how the final website will look.

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Hybrid Agile Workflow

Shortens design, analysis and planning, but lets you define project frames including budget and time of delivery.

Managing projects in Agile workflow emphasizes:

- Flexibility
- Collaboration
- Continuous Improvement/Continuous Delivery

Application Modules

1. Introductory Module
    a) Login & Homepage
    b) Community Flood Risk
    c) Community Profile
2. Flood Risk Management Module
3. Resiliency Action Evaluation Module
4. Action Management Module
5. Data Repository

**All content and functionality will be subject to further refinement as part of Phase II*

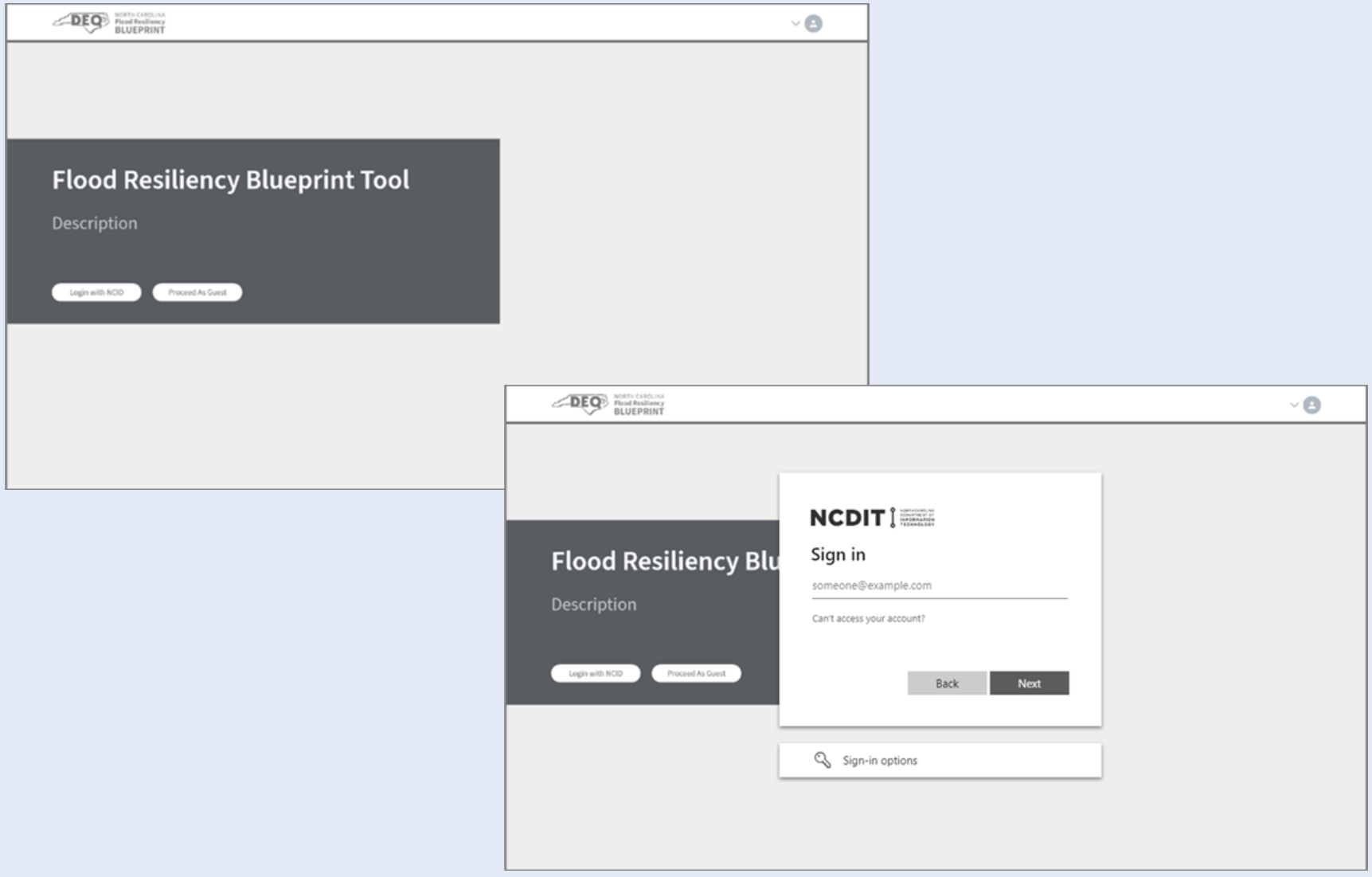
Flood Resiliency Blueprint Tool

Introductory Module

INTRODUCTORY MODULE

Login & Homepage

Login Screen



- Credentialed users click **Login with NCID** button, and the NCID login appears.
- General Public clicks **Proceed as Guest** to enter site.

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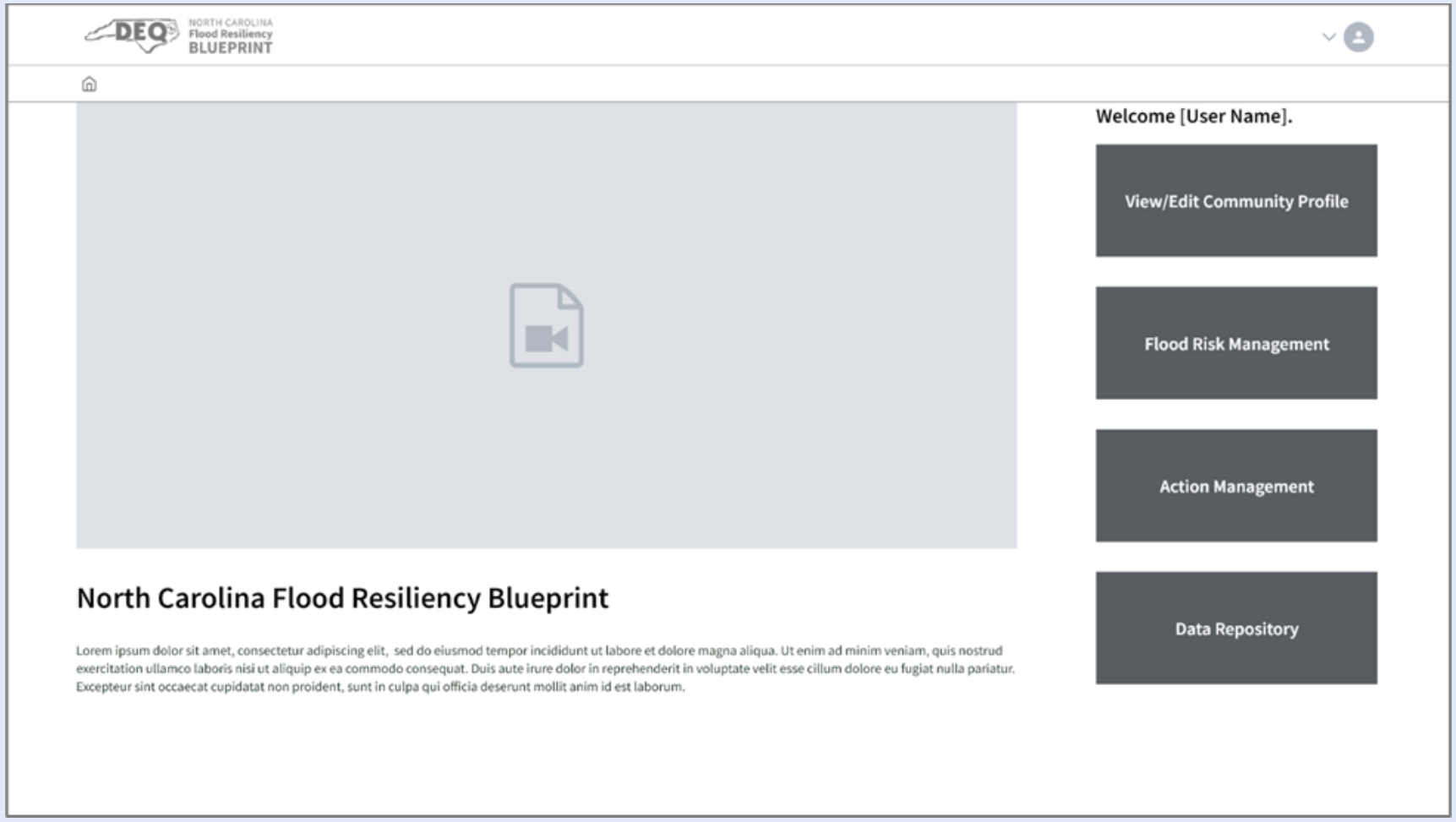
Homepage



- Users land on a home page upon login.
- Contents determined by user role.
- Buttons link users to functionality they have access to.

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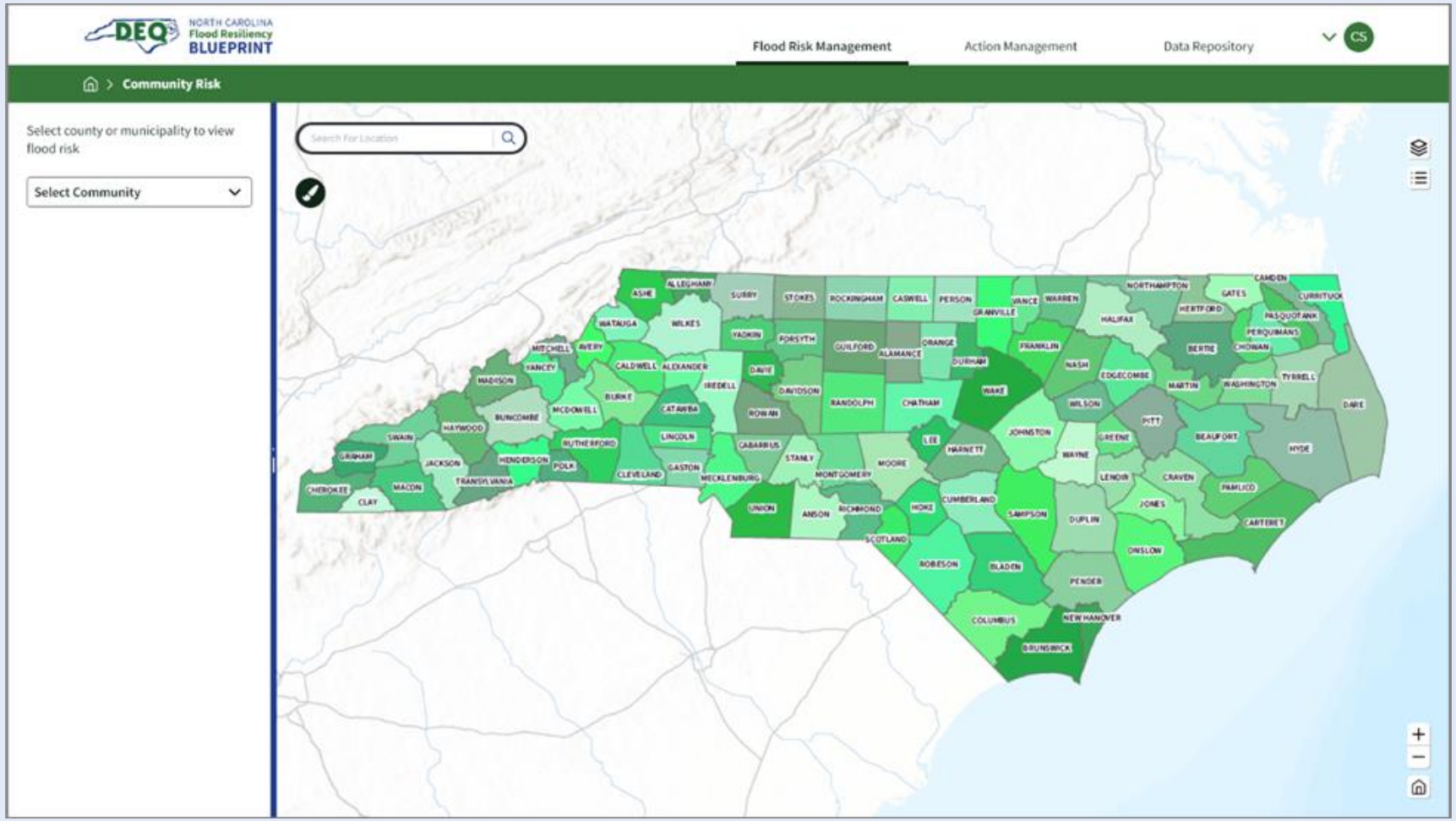
INTRODUCTORY MODULE

Community Flood Risk

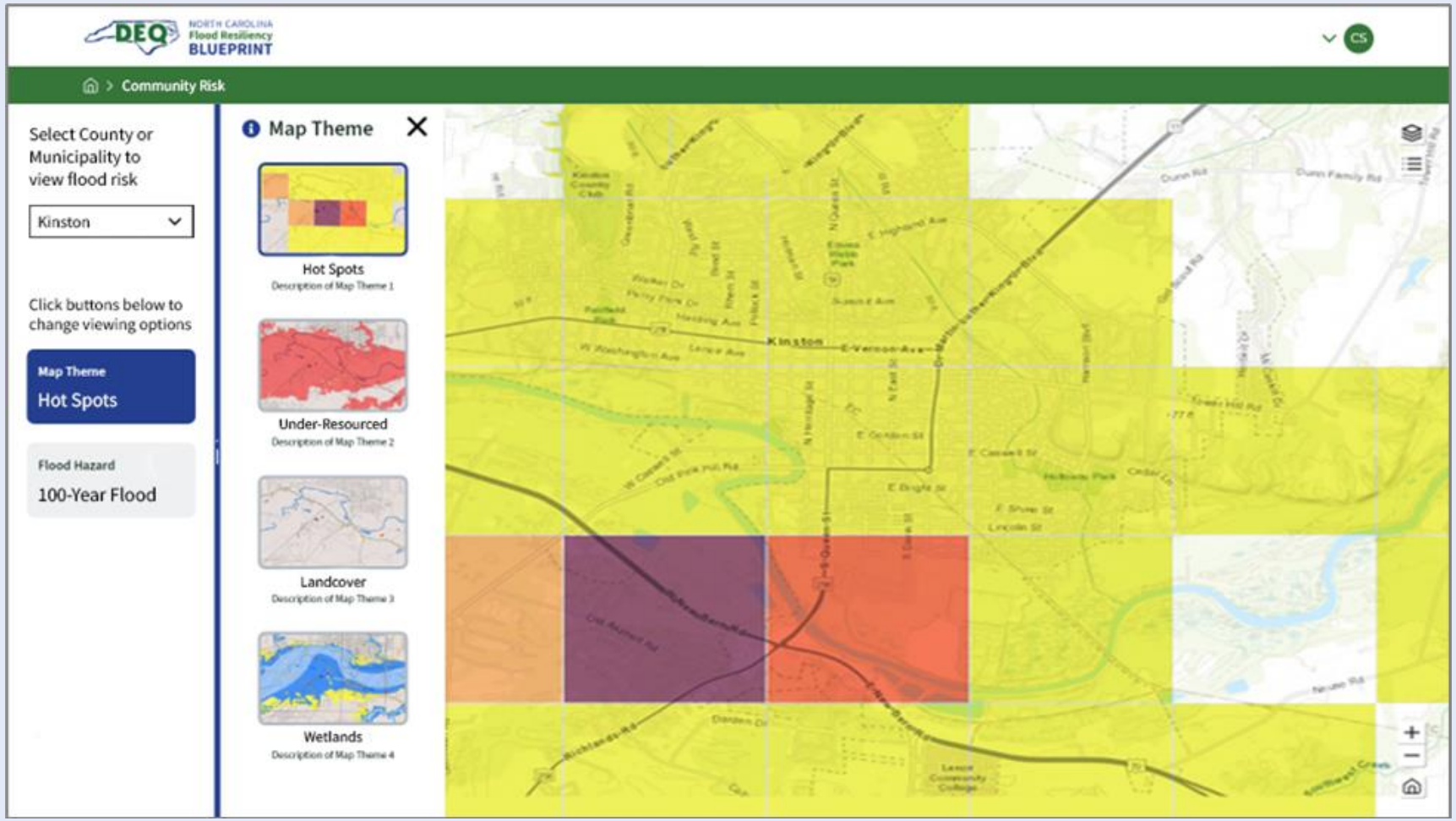
Community Flood Risk



- Helps community or community member better understand their flood risk.
- All users can view Community Flood Risk.
- User selects a county or municipality.

**All content and functionality will be subject to further refinement as part of Phase II*

Community Flood Risk



- Map zooms to selected area.
- Default Map Theme and Flood Hazard load.

A Map Theme is a curated set of layers that help users identify risk a specific topic

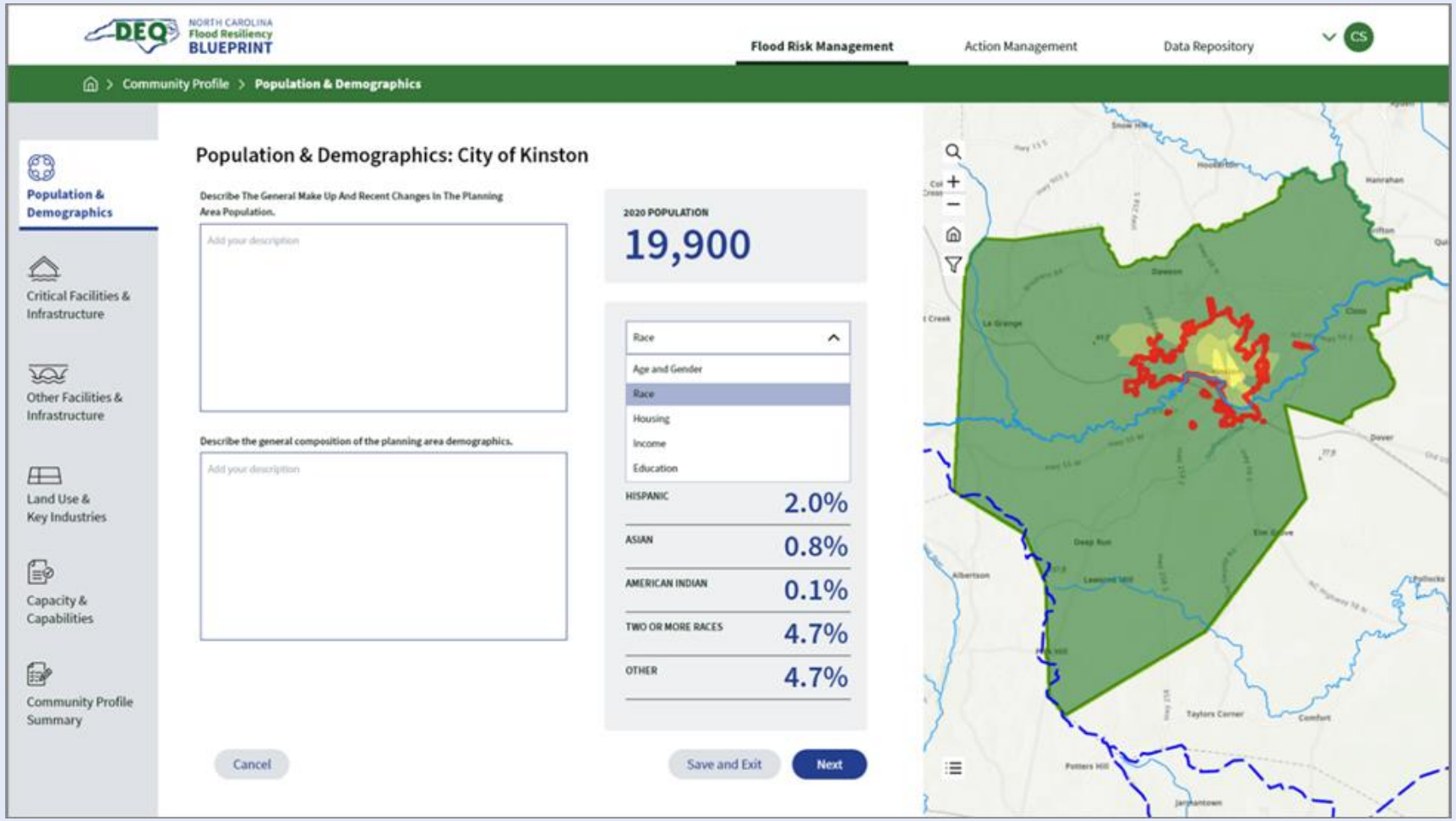
- Map Themes and Flood Hazards can be changed by clicking the button.

**All content and functionality will be subject to further refinement as part of Phase II*

INTRODUCTORY MODULE

Community Profile

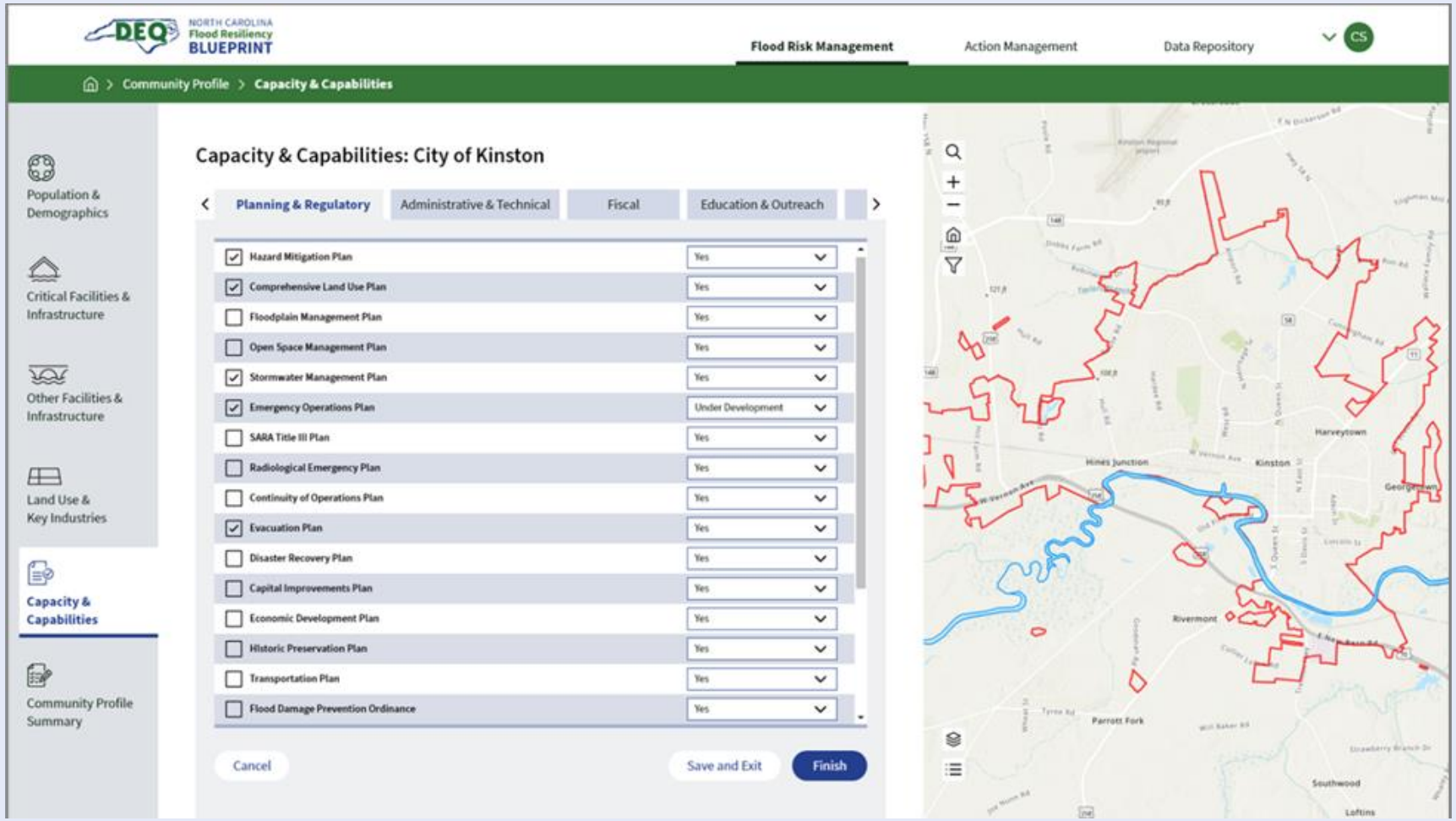
Community Profile: Demographics



- Community demographics auto-populate from existing data.
- Communities review, edit, and add key information about their community.

**All content and functionality will be subject to further refinement as part of Phase II*

Community Profile: Capacity & Capabilities



- Communities enter Capacity and Capabilities details.
- Used to help identify under-resourced communities, as well as other purposes.

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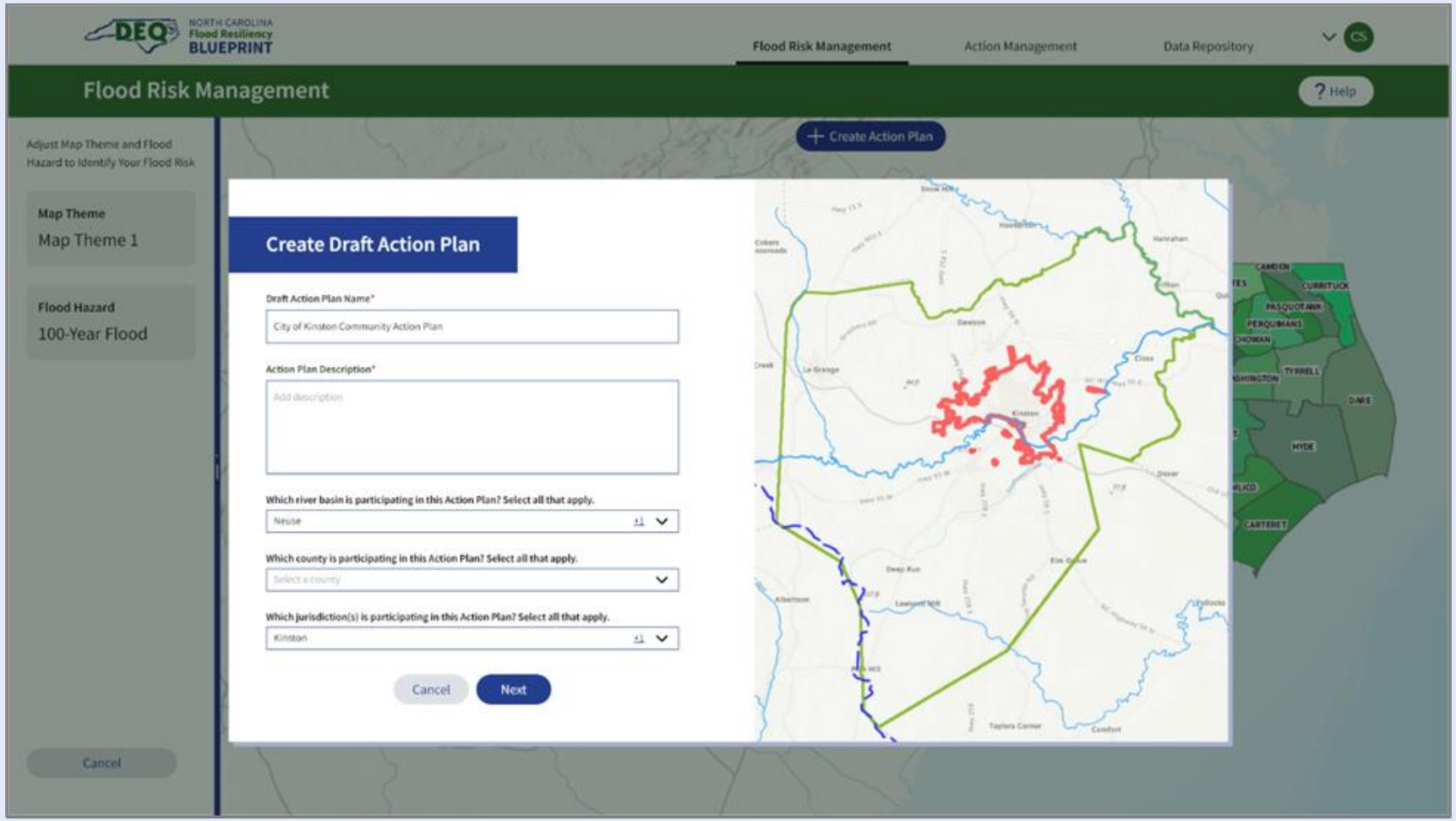
Flood Resiliency Blueprint Tool

Flood Risk Management Module

FLOOD RISK MANAGEMENT MODULE

Create Draft Action Plan

Create Draft Action Plan



- Communities enter the plan details for a new Draft Action Plan including:
  - Draft Plan Name
  - Description
  - Basin, County, and Jurisdiction(s)

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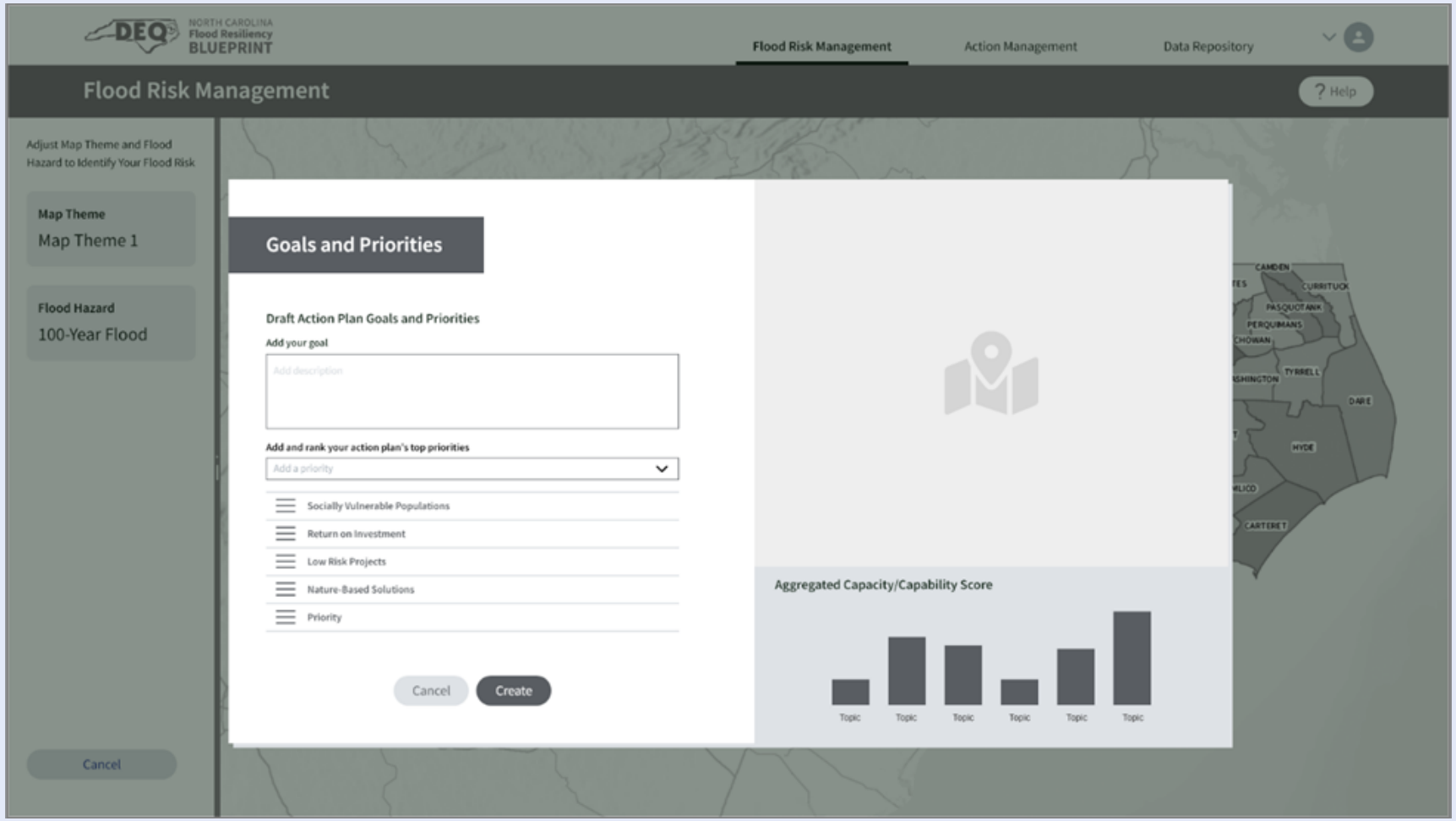
Create Draft Action Plan: Goals and Priorities



- Submitters enter detailed goals for their plan.
- Submitters add and rank their plan priorities.

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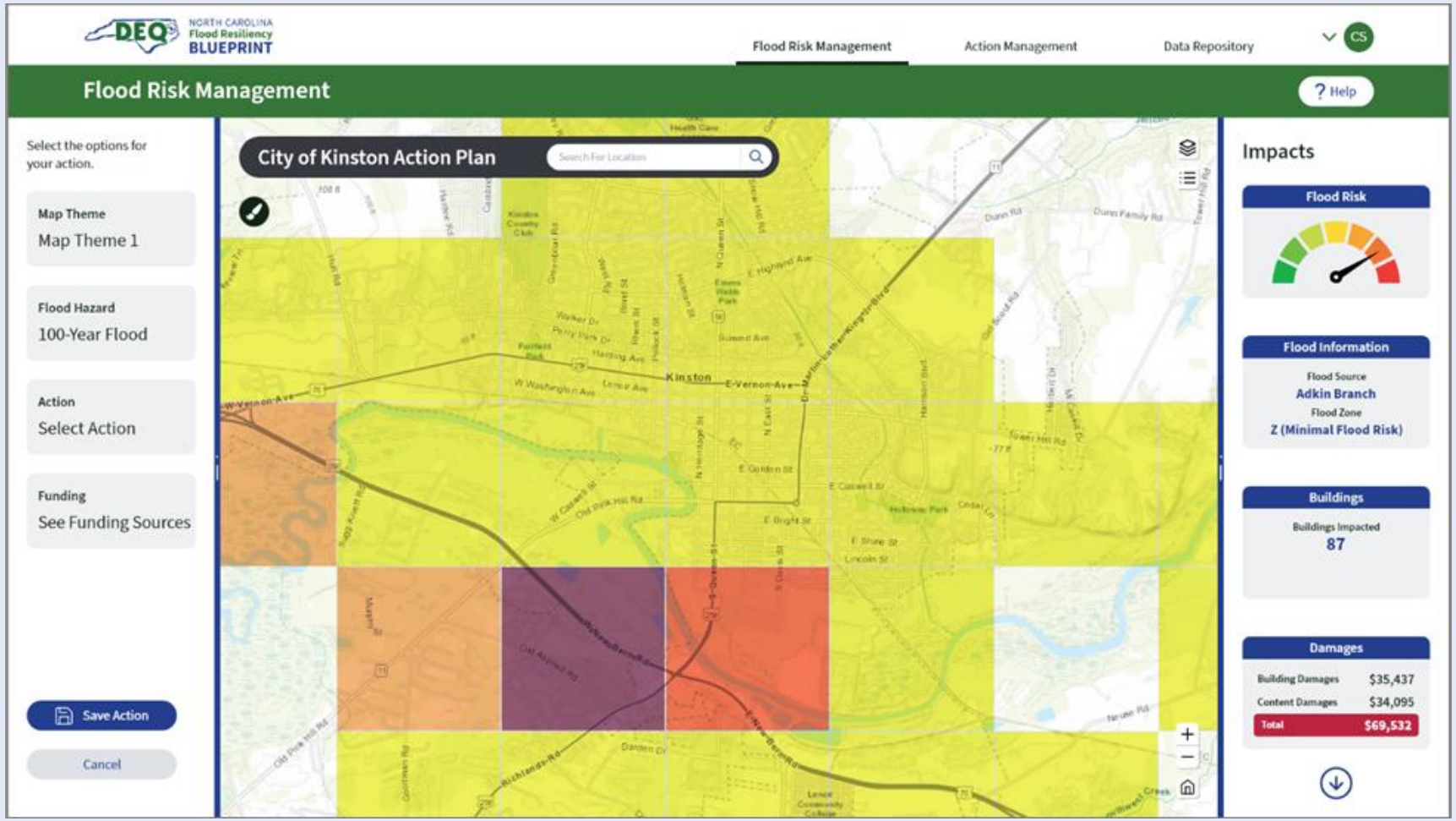
FLOOD RISK MANAGEMENT MODULE

Identify Flood Risk Areas

Identify Flood Risk Areas



- Submitters identify flood risk areas by viewing various Map Themes and Flood Hazards, and assessing Impacts.
- Impacts are shown on the right.
- Map Themes and Flood Hazards can be changed by clicking the button.

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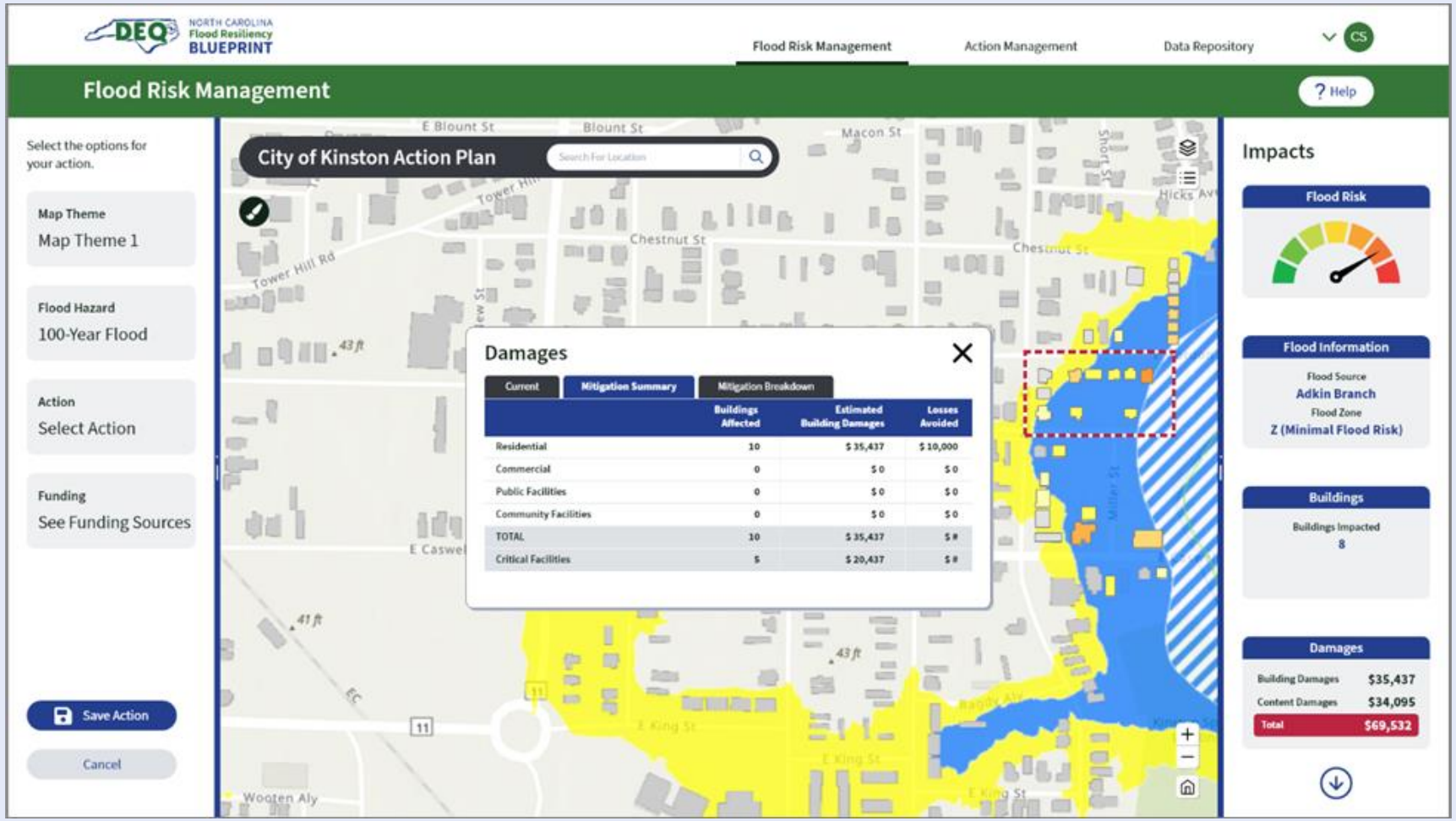
FLOOD RISK MANAGEMENT MODULE

View Impacts

View Impacts



- Impacts are shown in the dashboard on right.
- Impacts shown vary based on selections.
- Each pane can be clicked to show detailed impact and analysis in a window.

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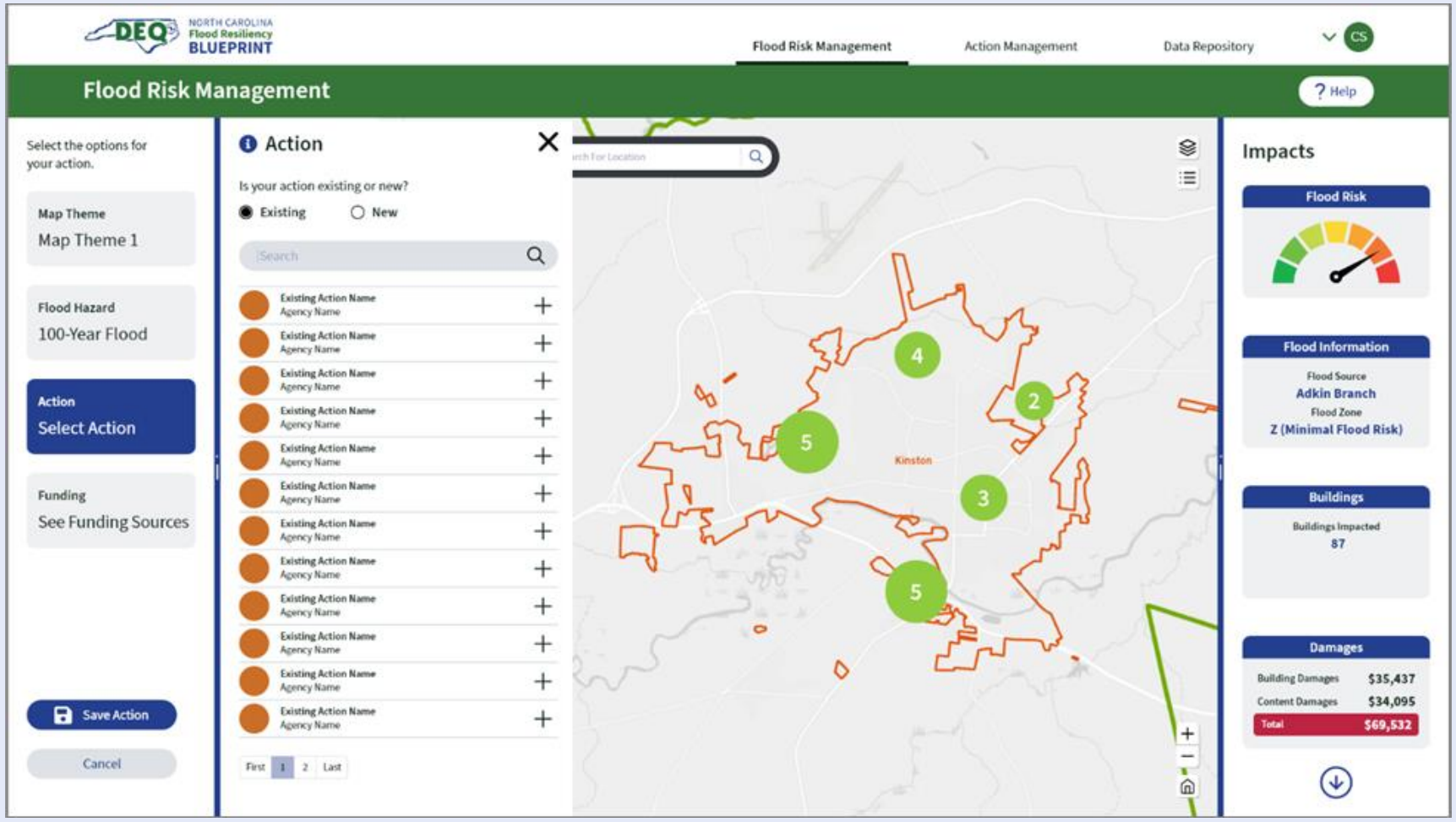
FLOOD RISK MANAGEMENT MODULE

Add Existing Resiliency Actions

Add Existing Resiliency Actions



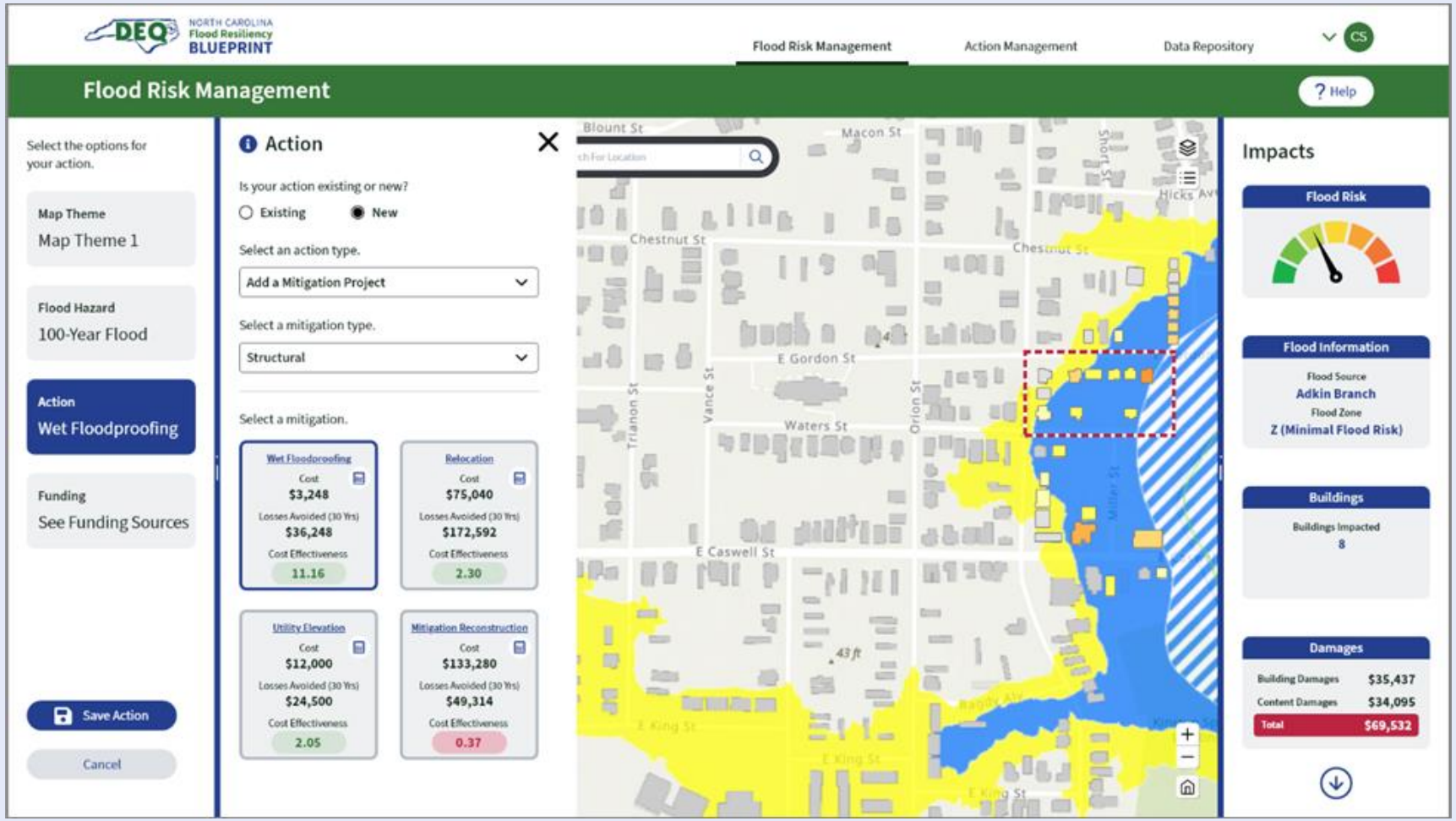
- Submitters can view existing action details in a window.
- Submitters select existing actions to add to their plan.
- Impacts shown are based on the selected action.

**All content and functionality will be subject to further refinement as part of Phase II*

FLOOD RISK MANAGEMENT MODULE

Define New Resiliency Actions

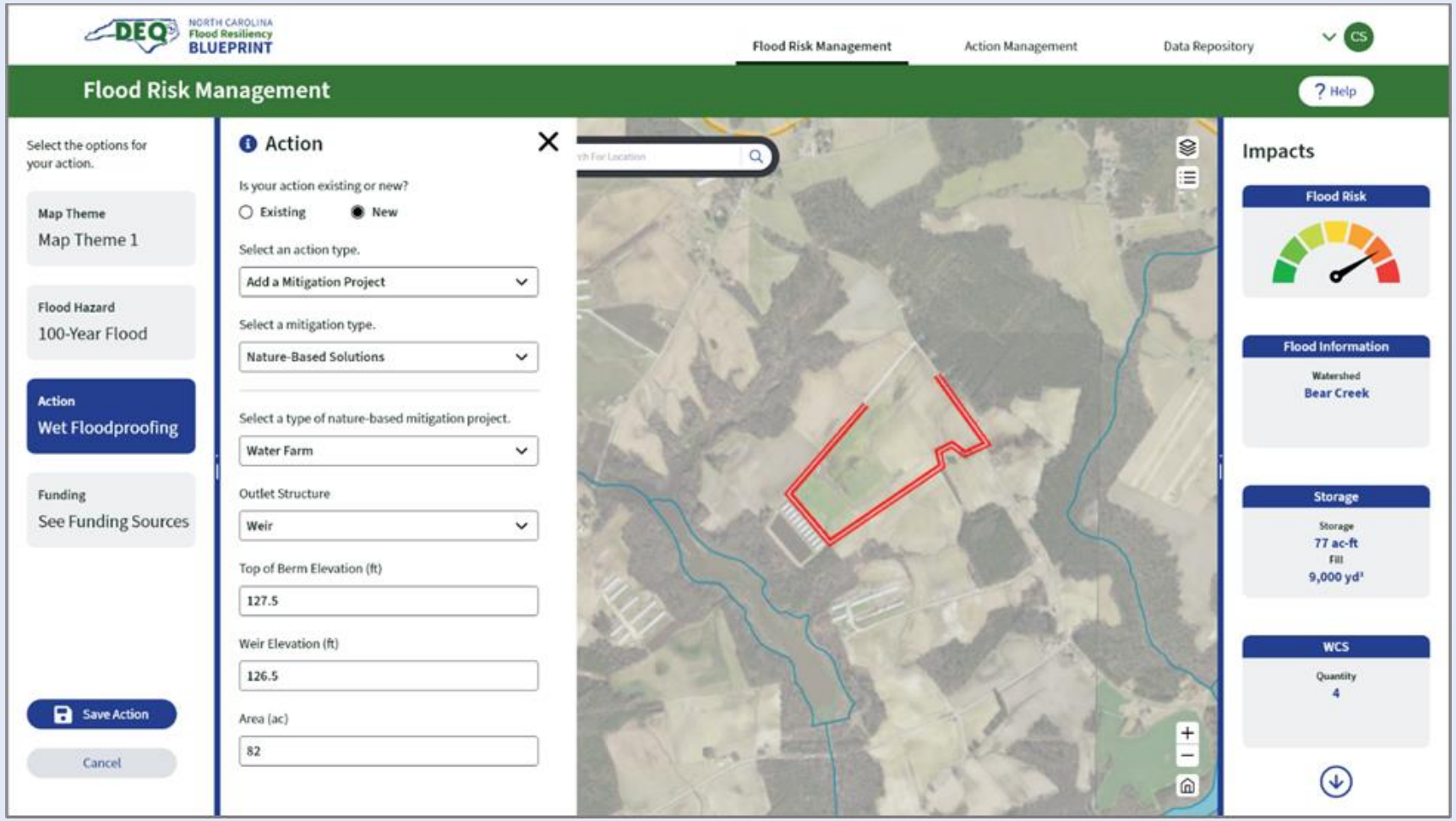
Define New Resiliency Actions: Structural



- Submitters choose a resiliency action type.
- Submitters select from a list of flood risk reduction resiliency options.
- Impacts shown are based on the selected action.

**All content and functionality will be subject to further refinement as part of Phase II*

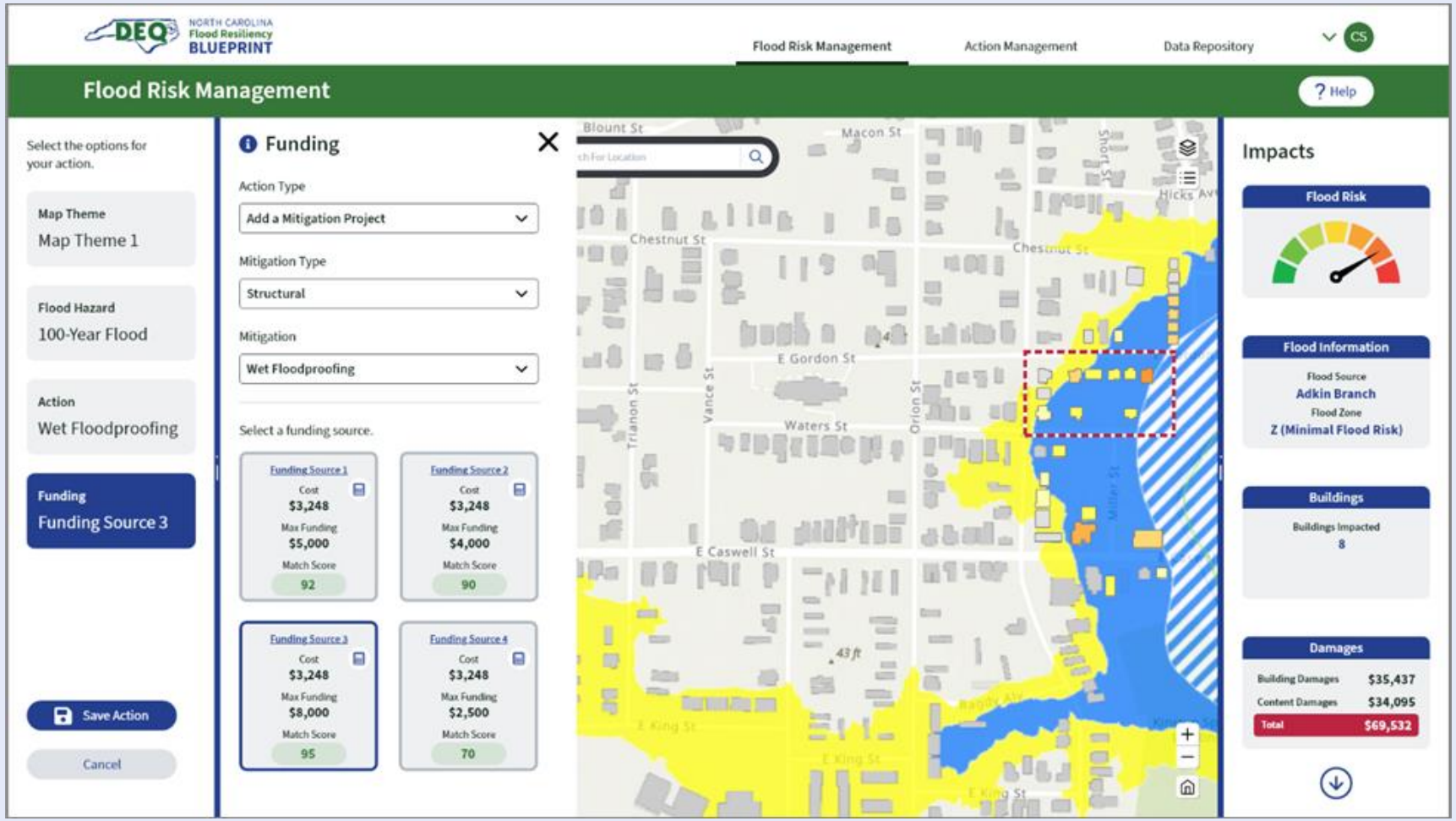
Define New Resiliency Actions: Nature-Based



- Submitters select from a list of nature-based resiliency options.
- Nature-based solutions are being developed as part of Phase II

**All content and functionality will be subject to further refinement as part of Phase II*

Define New Resiliency Actions: Funding



- Submitters review the mitigation action considering the potential funding source that has been identified.
- Submitters can view further details on each potential funding source and then select the preferred funding option to be pursued.

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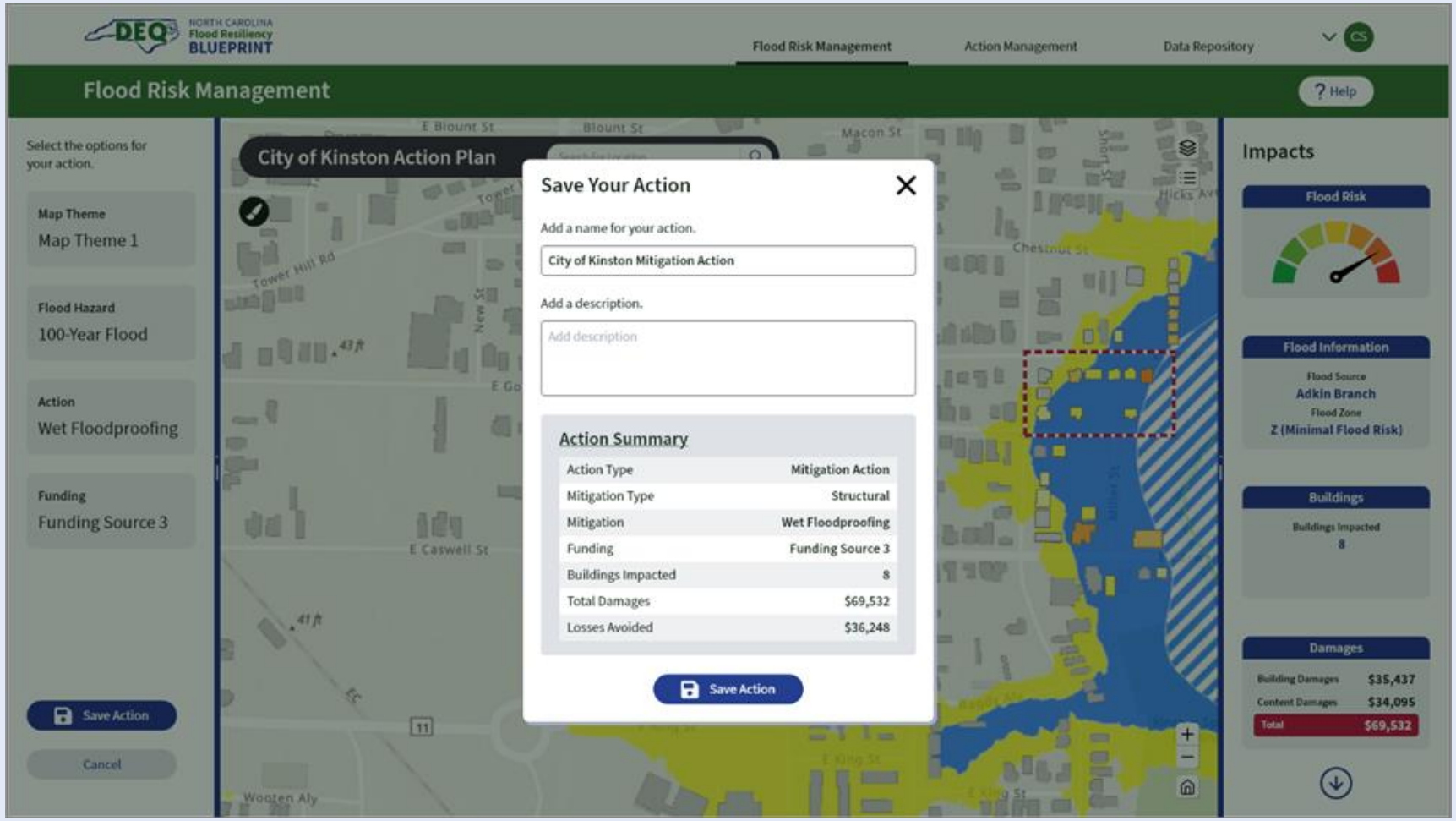
FLOOD RISK MANAGEMENT MODULE

Save New Resiliency Action

Save New Resiliency Action



- A summary of the resiliency action is shown in a window.
- Submitters provide a name and description for the new action.
- Submitters save the new action to their plan.

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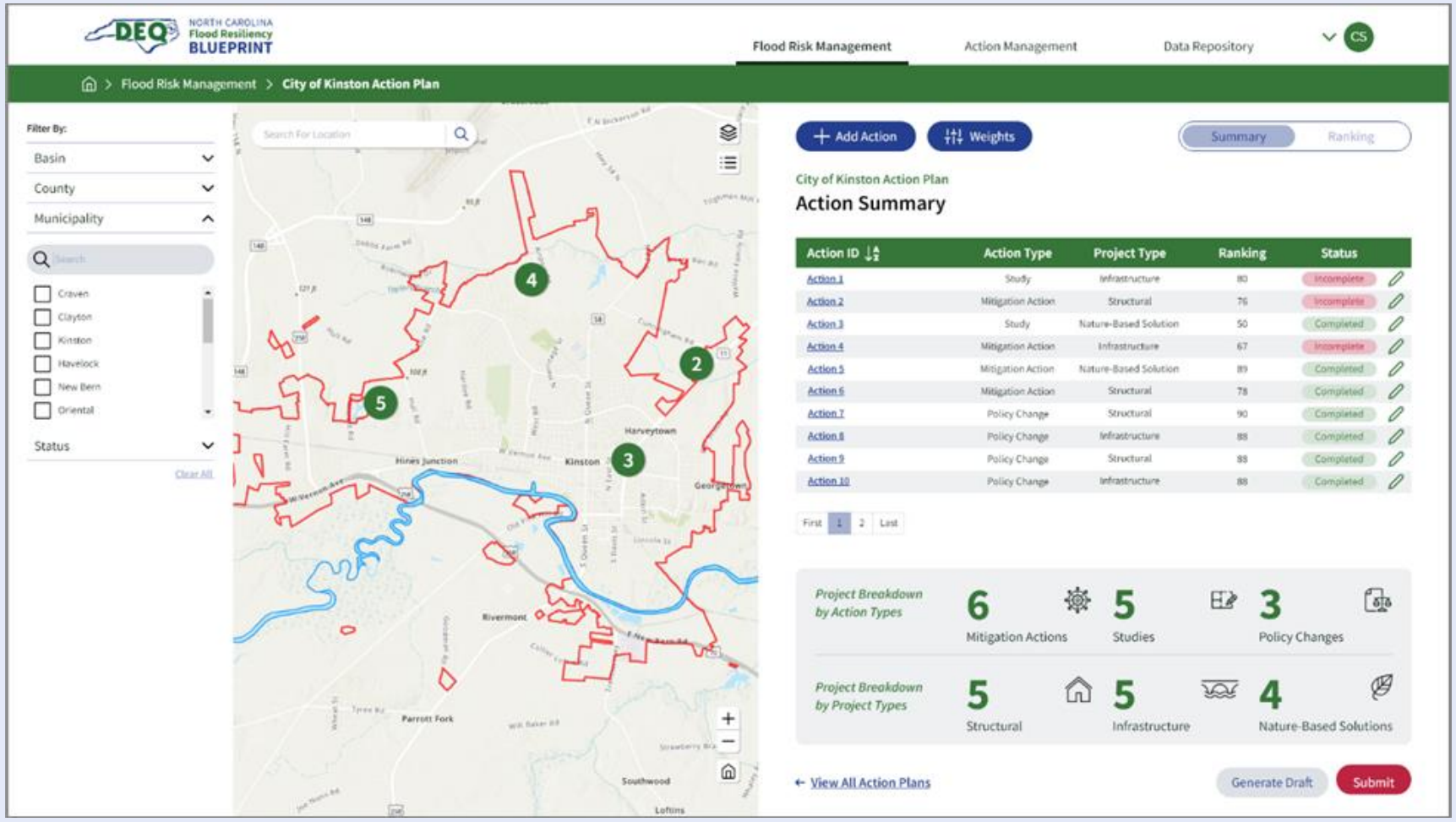
FLOOD RISK MANAGEMENT MODULE

Action Plan Summary

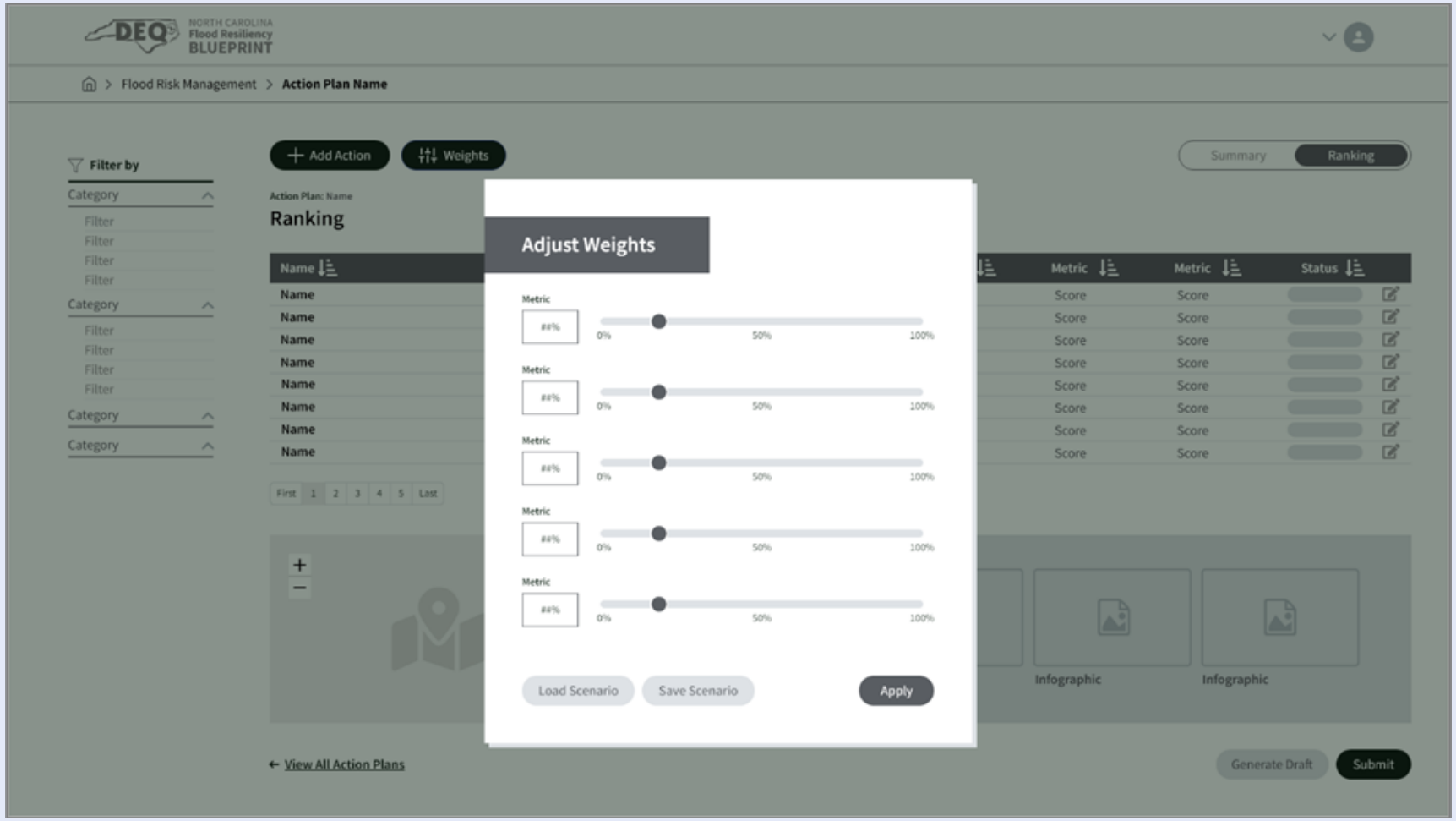
Action Plan Summary



- Submitters view a summary of actions in their plan.
- A detailed ranking view is available to view detailed metrics.

All content and functionality will be subject to further refinement as part of Phase II

Action Plan Summary: Adjust Weights



- Submitters can adjust weighting of select metrics based to meet their specific goals.
- Weighting settings can be saved as a scenario.

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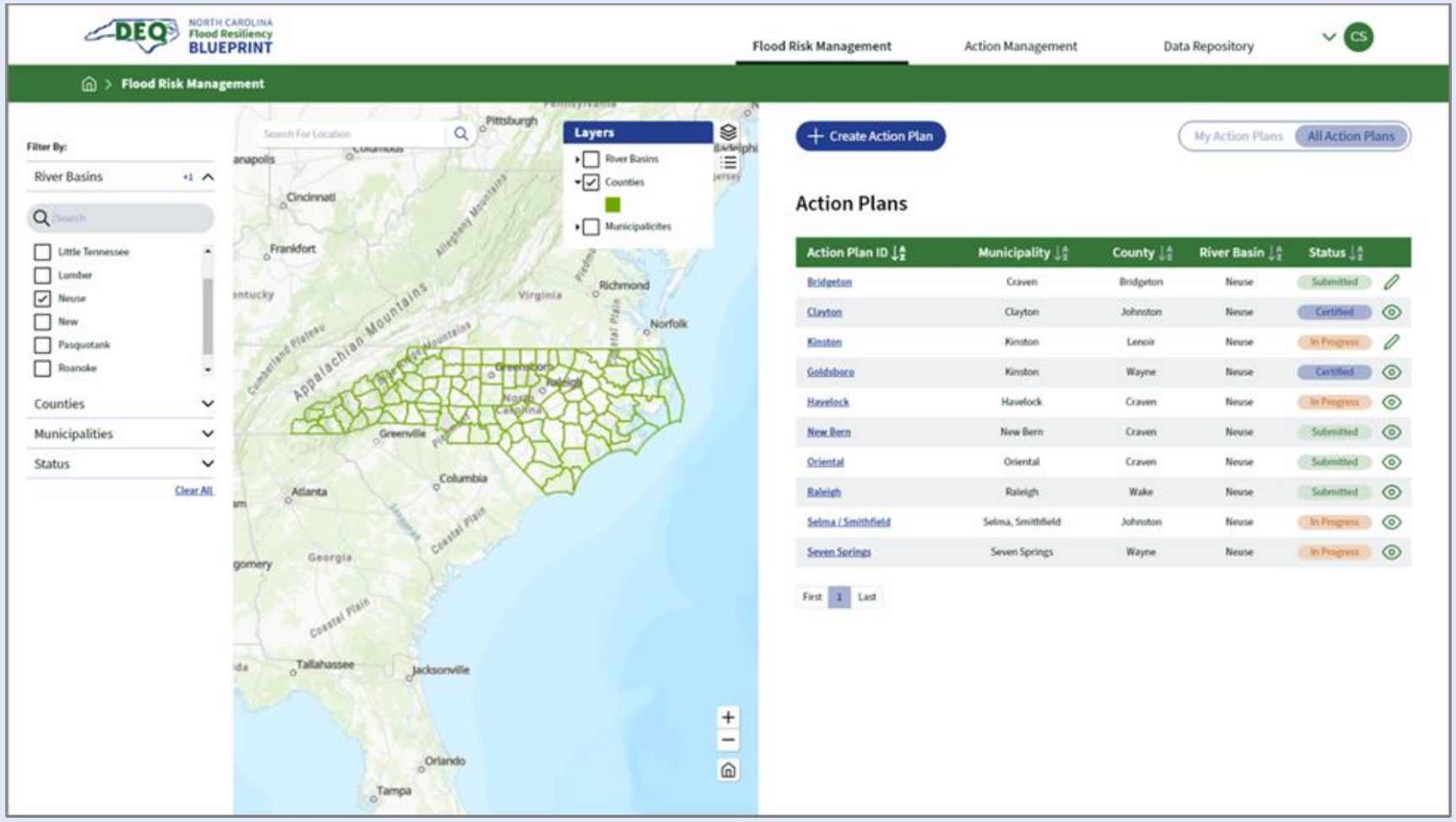
FLOOD RISK MANAGEMENT MODULE

View All Action Plans

View All Action Plans



- Users can see a list of all Action Plans.
- List can set to show all plans or just the user's plans.
- Plans can be filtered.

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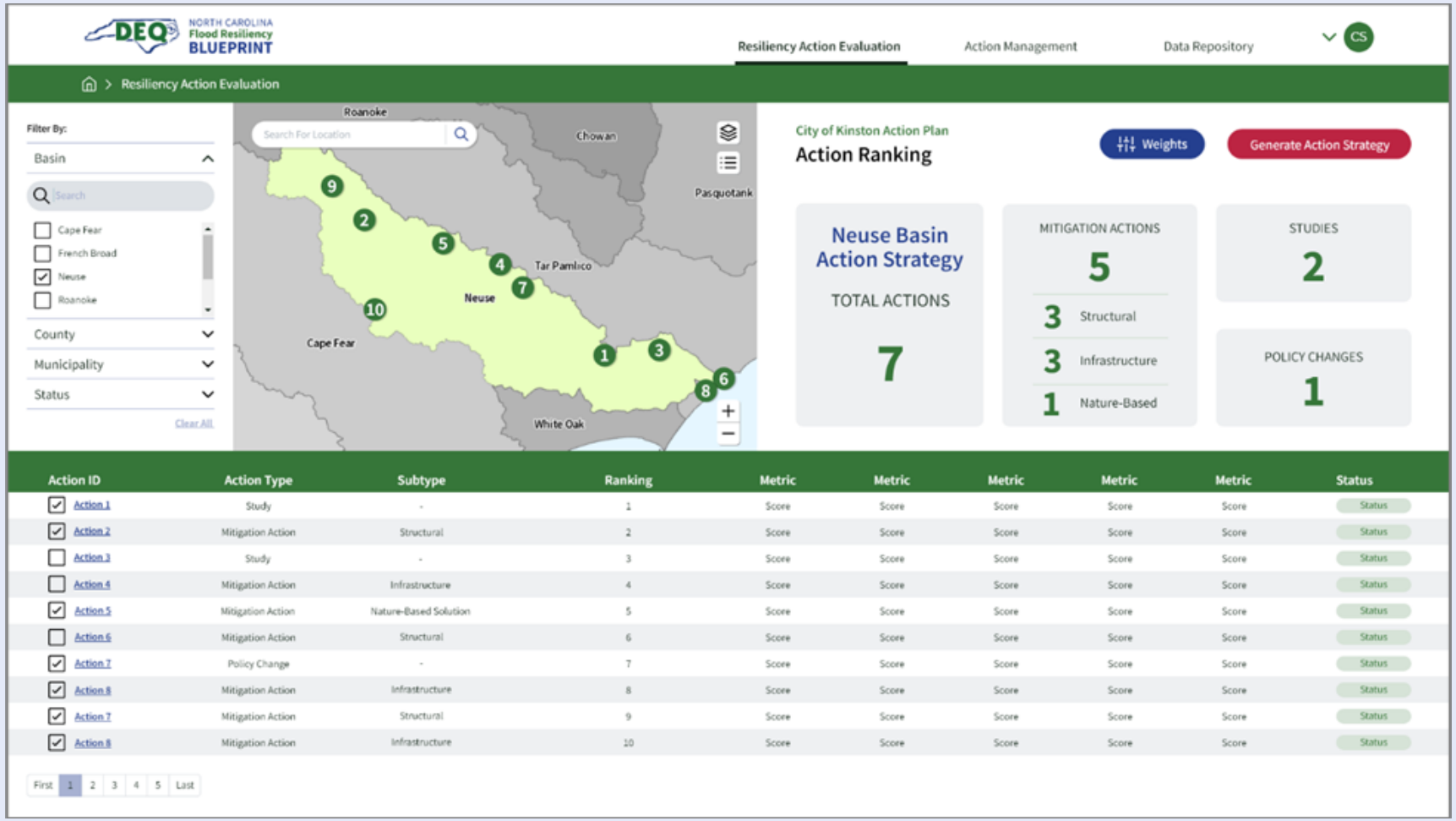
Flood Resiliency Blueprint Tool

Resiliency Action Evaluation Module

RESILIENCY ACTION EVALUATION MODULE

Actions Summary and Ranking

Actions Summary and Ranking

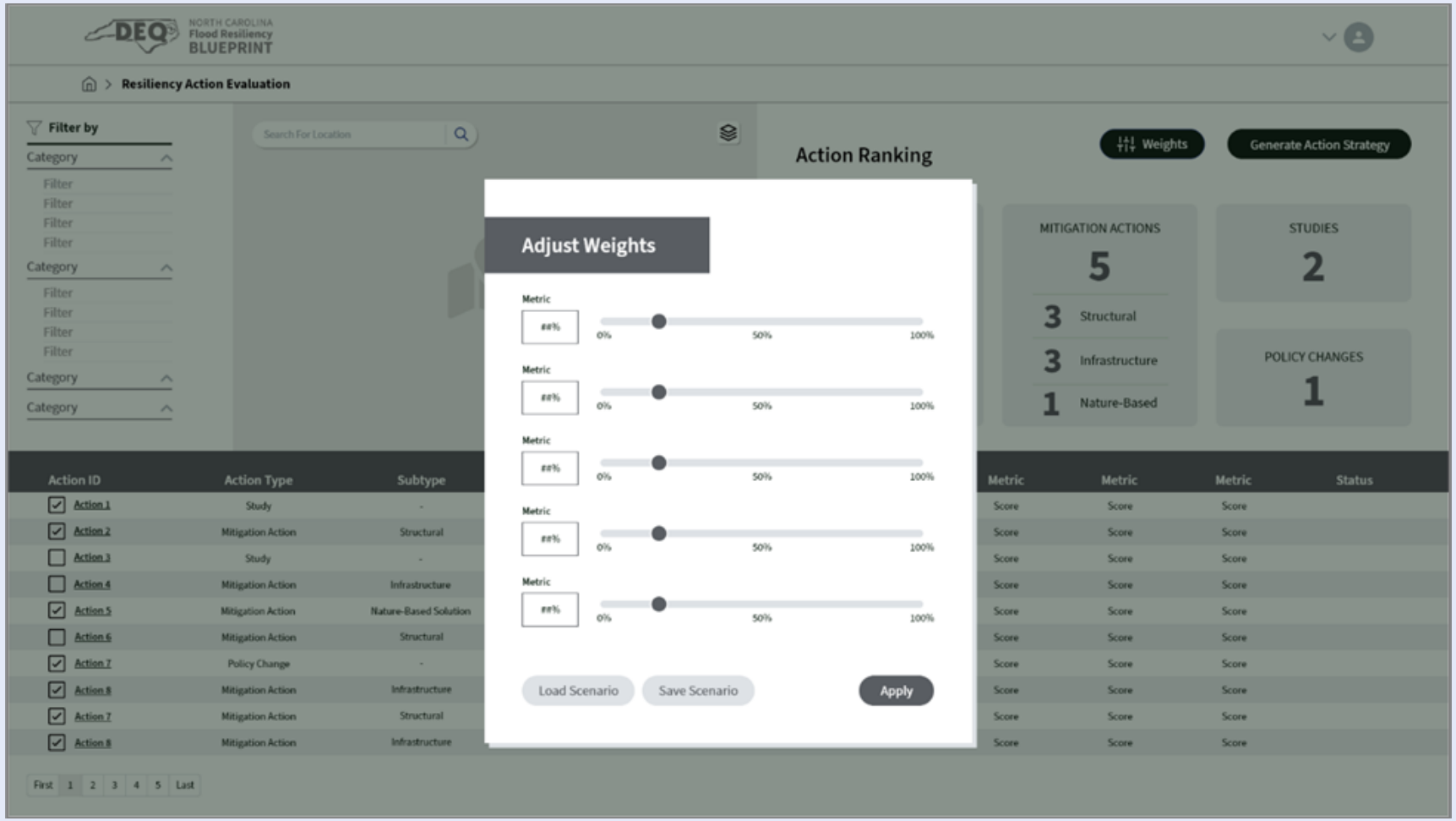


NCDEQ Program Analysts will:

- Evaluate and compare resiliency actions.
- Check to approve and include an action in the River Basin Action Strategy.
- Generate a draft report.
- Save for use in the Basin Action Strategy.

**All content and functionality will be subject to further refinement as part of Phase II*

Actions Summary and Ranking: Adjust Weights



- NCDEQ can adjust weighting of select metrics based to meet the goals of the Basin Action Strategy.
- Weighting settings can be saved as a scenario.

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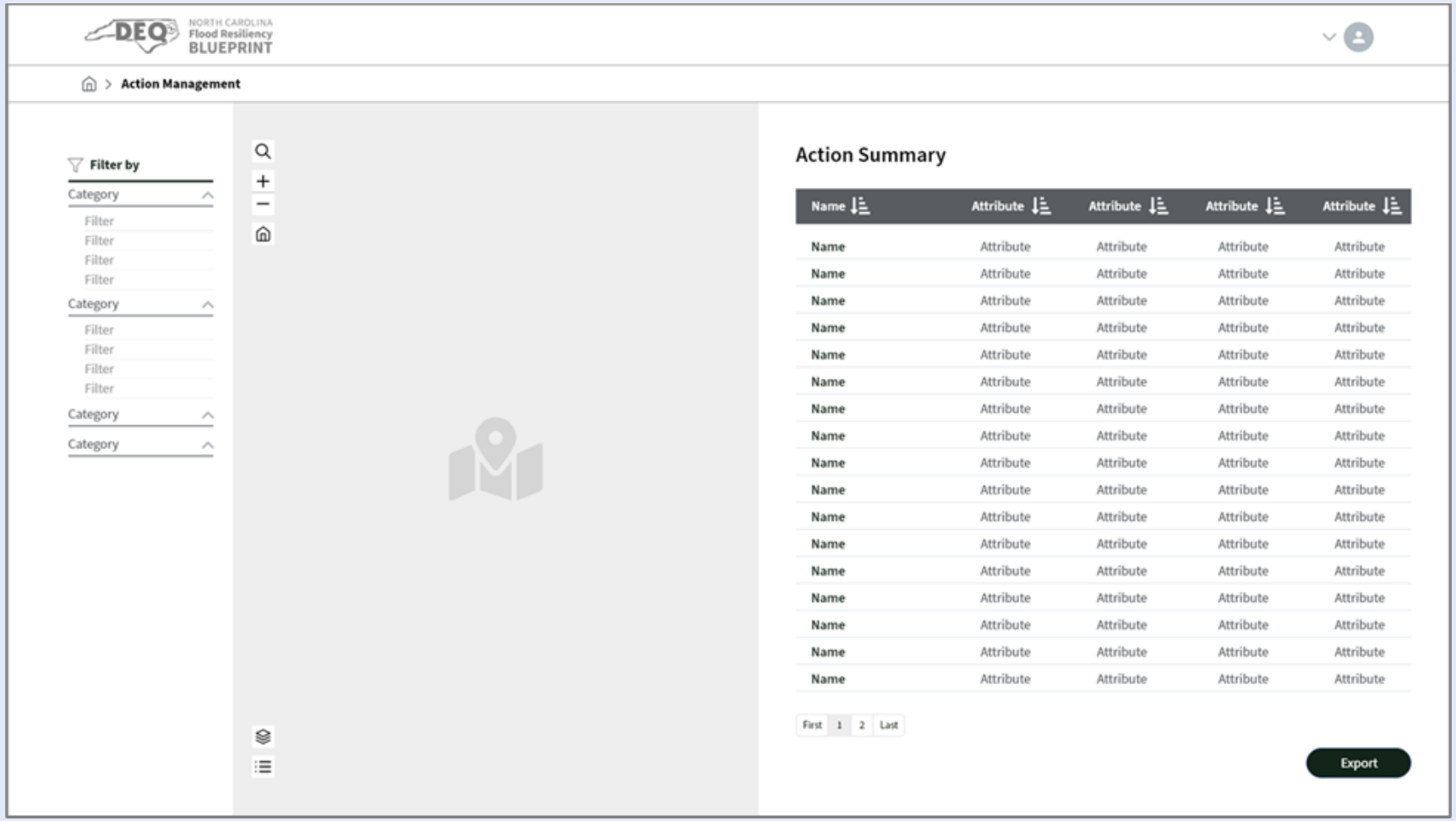
Flood Resiliency Blueprint Tool

Action Management Module

ACTION MANAGEMENT MODULE

Actions Overview

Actions Overview



- Users will see a list of all Actions.
- Users can filter actions by criteria such as geographical area, jurisdiction, mitigation type.
- Users select an action to open the Action Management Dashboard.

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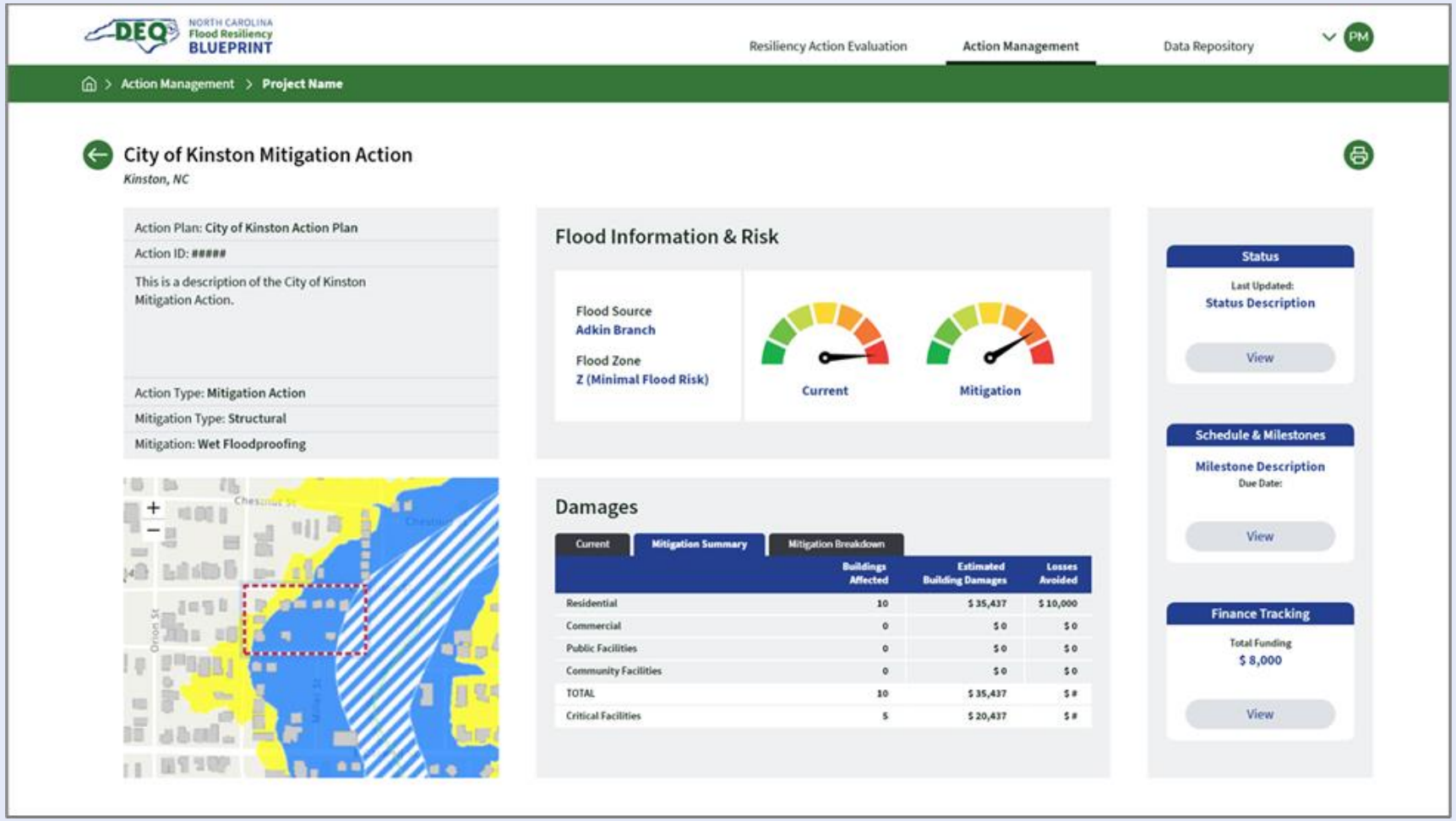
ACTION MANAGEMENT MODULE

Action Management Dashboard

Actions Management Dashboard



- Users view information about an action in the dashboard.
- Metrics are shown are determined by factors including action type and available data.
- Users click on the individual panels to show more details.

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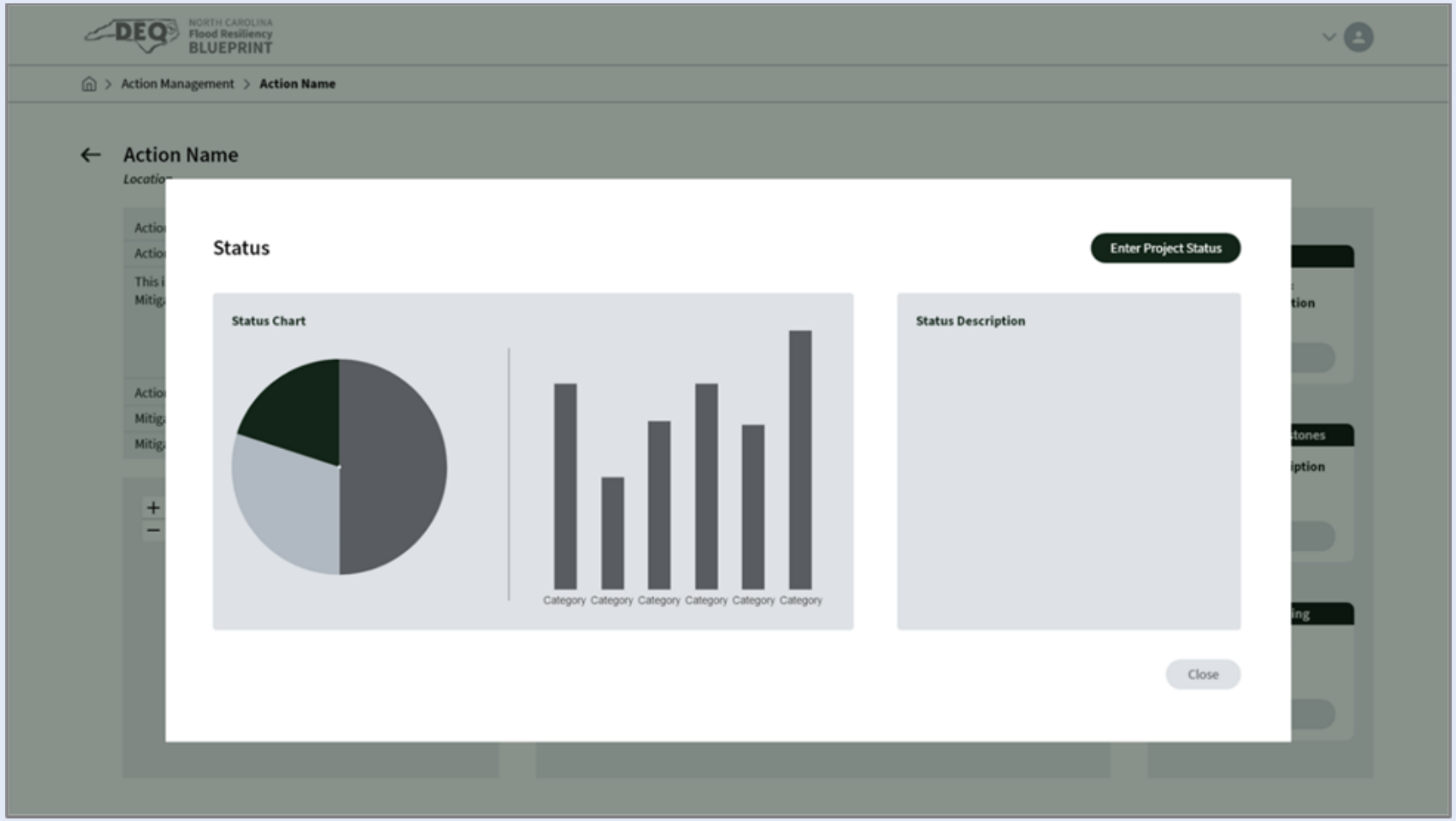
Actions Management Dashboard: Status Details



- Users view status details in a window.
- Submitters click on the **Enter Status Update** button to enter their latest status update

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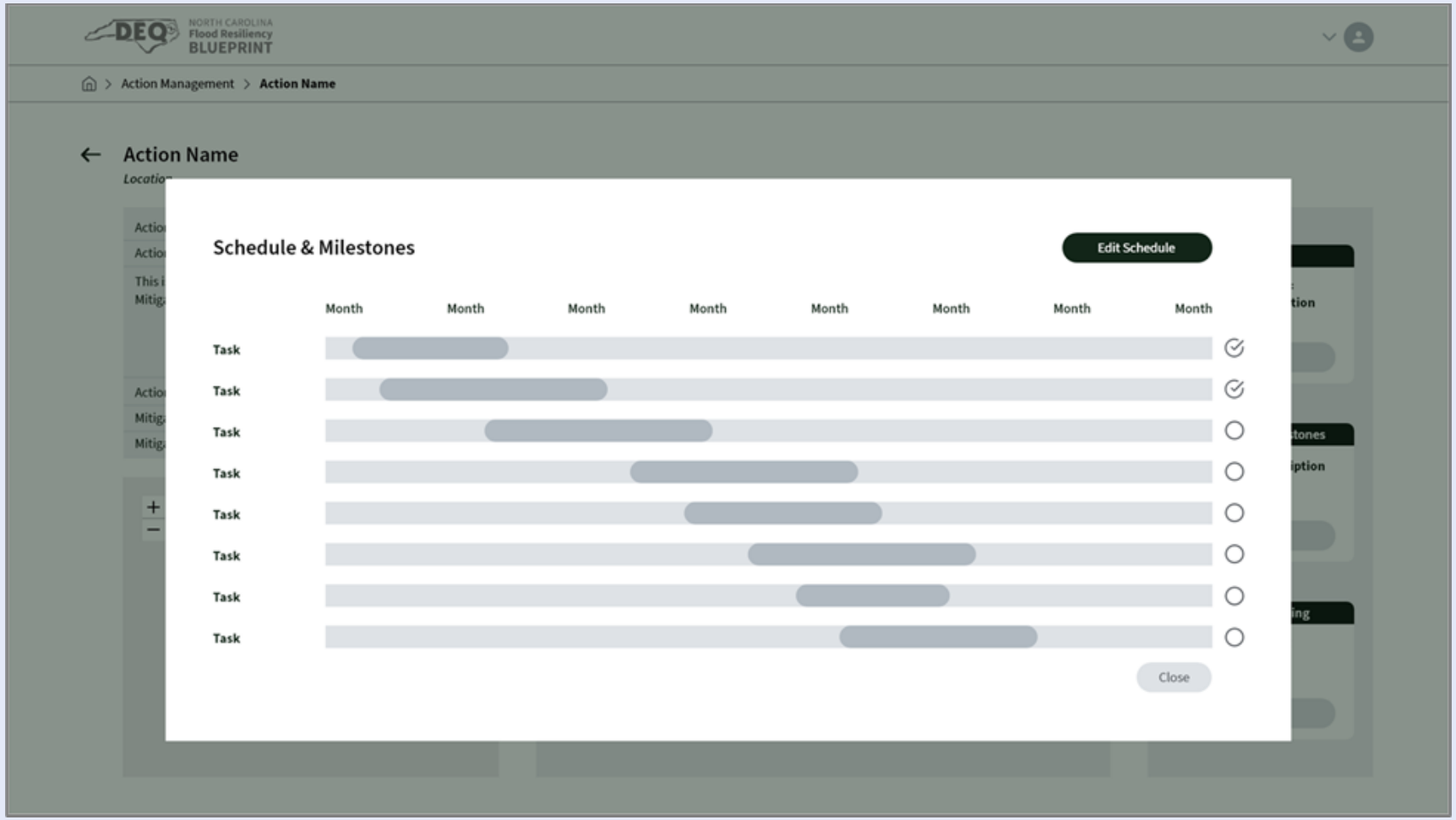
Actions Management Dashboard: Schedule & Milestones Details



- Users view schedule and milestone details in a window.
- NCDEQ click on the **Edit Schedule** button to make updates to the schedule and to sign off on milestones.

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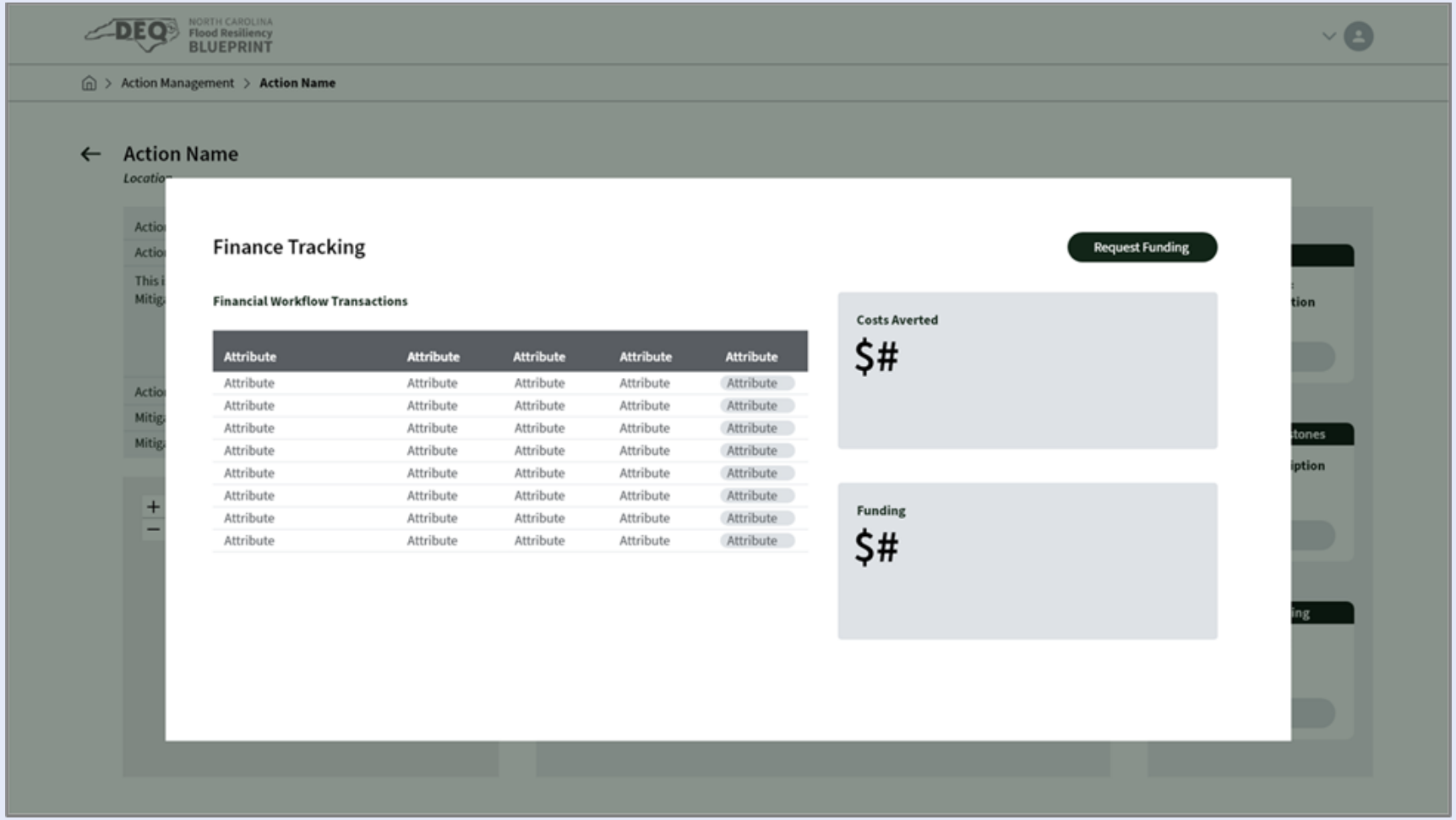
Actions Management Dashboard: Finance Tracking Details



- Users view detailed financial information associated with the action in a window.
- Submitters click the **Request Funding** button to request that NCDEQ release funds.

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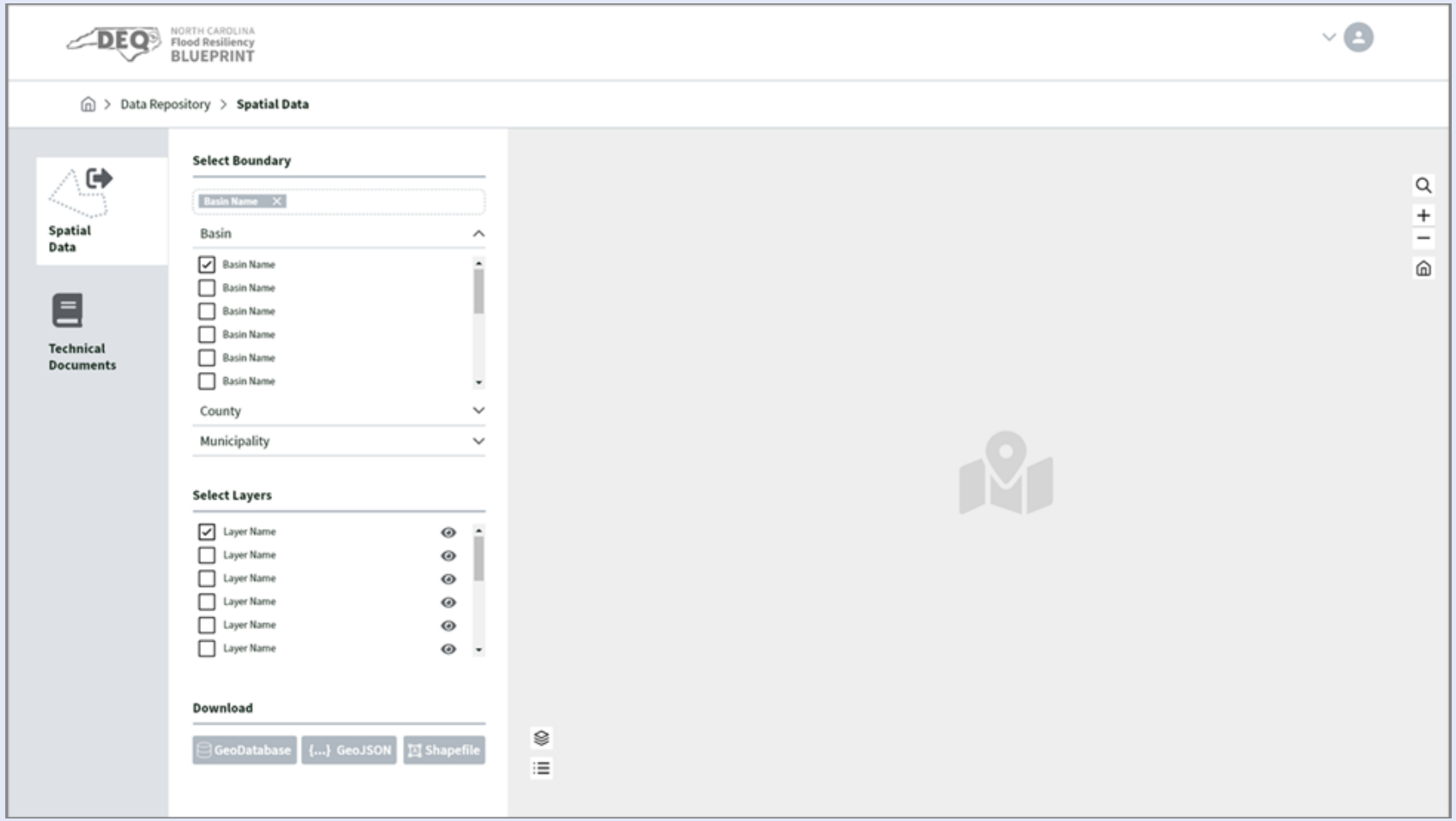
Flood Resiliency Blueprint Tool

Data Repository

Spatial Data



- Users search spatial data associated with the Flood Resiliency Blueprint.
- Users download spatial data in various formats.
- NCDEQ maintains spatial data in the Data Repository.

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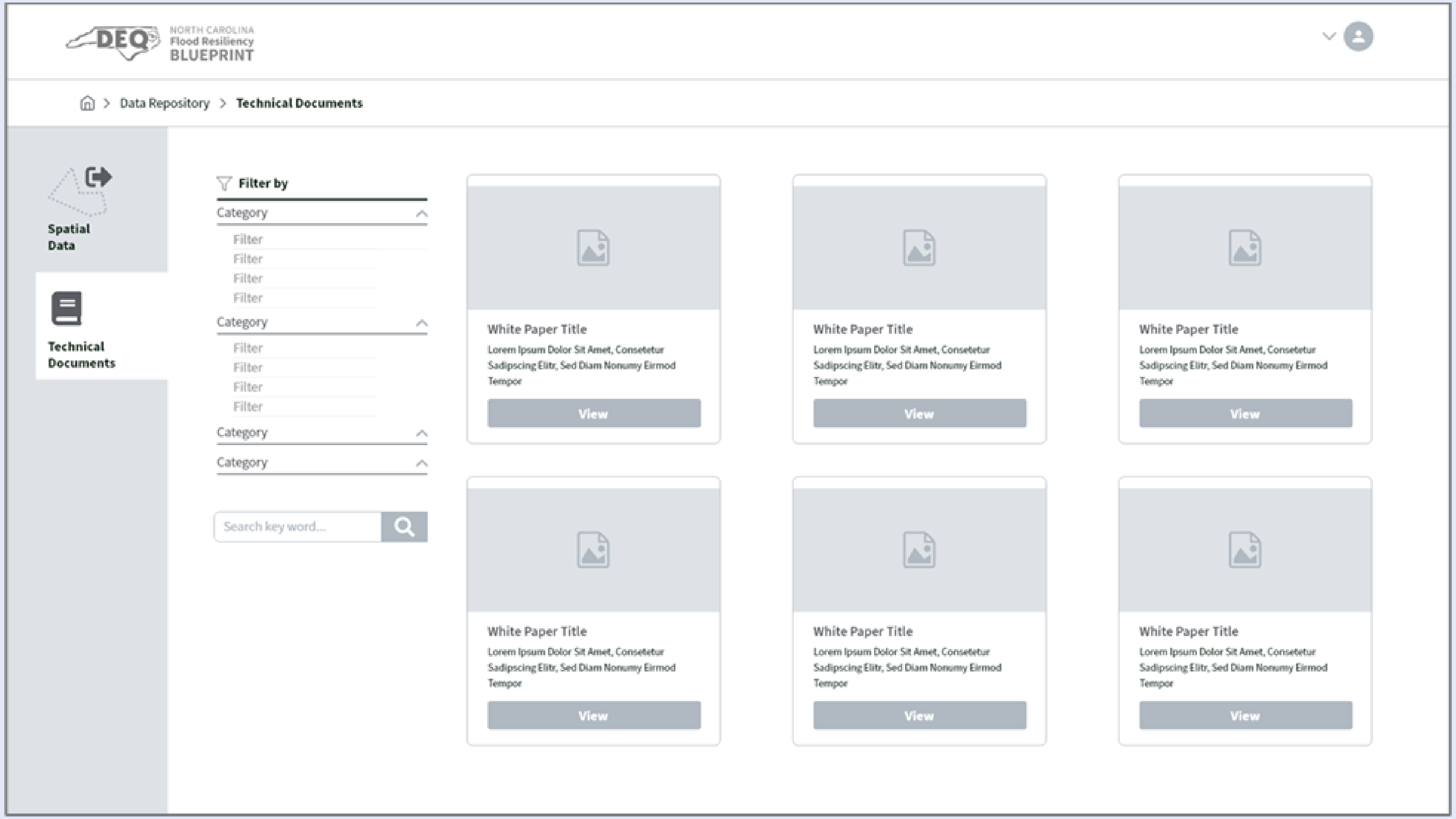
Technical Documents



- Users search technical documents associated with the Flood Resiliency Blueprint.
- Users view or download the documents.
- NCDEQ manages documents in the Data Repository.

**All content and functionality will be subject to further refinement as part of Phase II*

Tools Questions

Preliminary Draft Neuse Action Strategy

Nathan Slaughter

Discussion Overview

Review the Preliminary Neuse River Basin Flood Resiliency Action Strategy (25 minutes)

- **Preliminary** Version
- NCDEQ Selection of the Neuse
- Pre-Identified Action Strategies
- Previously Identified "Priorities"
- Recommendation Categories
- Recommendations
- Next Steps
- Questions/Comments

Preliminary Version

This is the first iteration of the Preliminary Neuse River Basin Flood Resiliency Blueprint. Information obtained from the following sources will refine the Action Strategy:

1. **YOU!** TAG and PAG member feedback and comment on the document
2. Additional Modeling (2 Tier Approach)
    - Additional modeling will result in additional vulnerability and risk assessment. New actions will be proposed to address newly identified vulnerability/risk.
3. Neuse Stakeholder Workshops (Early 2024)

Selection of the Neuse

NCDEQ selected the Neuse River Basin as the pilot basin for a variety of reasons including:

1. Flood Risk and Vulnerability
   - Recent Catastrophic Events
   - Substantial Population Increase
   - Changing Conditions
2. High Capability
   - Robust Data from Prior Studies
   - Robust Existing Stakeholder Efforts
   - Adaptive Capacity
   - Significant Natural Resources

Pre-Identified Action Strategies

The Action Strategy heavily relies on pre-identified action strategies from prior plans/studies for the following reasons. This strongly aligns with Blueprint's goal is to ***acknowledge, support, and leverage existing efforts.*** The following plans are included in the Action Strategy:

- Neuse River Basin Flood Analysis and Mitigation Strategies Study
- Flood Abatement Assessment for the Neuse River Basin
- Improving North Carolina's Resilience to Coastal Riverine Flooding
- Natural Infrastructure Flood Mitigation Program
- Supporting EJ in Connect Coastal Communities Through a Regional Approach to Collaborative Community Science
- Hurricane Matthew Resilient Redevelopment Plans (HMRRP)
- Regional Hazard Mitigation Plans (RHMP)
- NCORR RISE-Regional Resilience Portfolios (RRP)
- Resilient Coastal Communities Program (RCCP)
- Financial Risk of Flood Events in Eastern North Carolina
- Triangle J COG Water Resources Program

Previously Identified "Priorities"

Over 1,000 existing projects were inventoried for consideration and inclusion in the Action Strategy. The following aspects were considered to help refine projects most applicable to the basin:

- Project is relevant to Blueprint and the program's goals
- Project received a "high priority" ranking within the respective plan
- Plans/studies that did not indicate project's priority ranking were still inventoried and considered for inclusion
- Many of these plans/studies were Neuse-specific
- Projects determined to have a larger scale or basin-wide impact were included in the first iteration of the Action Strategy

NOTE: Local actions were reviewed, contributed to, and align with the overarching recommendations. They have been inventoried and will be included in future iterations of the Action Strategy based on stakeholder feedback.

Recommendation Categories

1. Policy

6 Overarching Recommendations

64 Pre-Identified Projects Proposed

2. Projects

10 Overarching Recommendations

70 Pre-Identified Projects Proposed

3. Modeling

13 Overarching Recommendations

All NEW Recommendations Proposed

Recommendations

Category	Recommendation
Policy	1. Highlight Localized Projects in Under-Resourced Communities
	2. Encourage Implementation and Enforcement of Land Use Policies and Regulations
	3. Encourage Local Participation in the NFIP
	4. Facilitate Collaboration Between Different Levels of Government, Community Orgs., and Private Sector
	5. Develop New and Update Existing Planning Documents
	6. Invest in Continued Research to Support Increased Flood Resilience

Recommendations

Category	Recommendation
Projects	1. Invest in Resilient Infrastructure to Mitigate Flood Impacts
	2. Design and Create Public Spaces that can Double as Flood Resilience Areas
	3. Continue Elevation, Acquisition, and Relocation of Structures in Flood-Prone Areas
	4. Perform Resource Studies and Analysis Using Innovative Technologies to Identify Risk
	5. Implement a Systematic and Regular Monitoring Program to Clear Streams

Recommendations

Category	Recommendation
Projects	6. Support the Implementation of Nature-Based Solutions
	7. Implement Appropriate “Hardening” Techniques for Critical Infrastructure and Facilities
	8. Enhance and Expand Early Warning Systems
	9. Conduct Capacity Building Programs and Training Sessions for Local Government, EM Responders, and Community Members
	10. Develop a Comprehensive Inventory of All Actions Previously Identified to Heighten Flood Resilience

Recommendations

Category	Recommendation
Modeling	1. Utilize 2D Modeling Methods
	2. Leverage Available HEC-RAS Model Geometry
	3. Complete and Update the Available Advisory 2D Modeling from NCFMP
	4. Use 2D HEC-RAS Models to Evaluate Basin-Wide Effects of Implementing Potential Mitigation Strategies
	5. Leverage RAS Mapper Terrain Modifications to Efficiently Model Mitigation Alternatives
	6. Use RAS Mapper Within HEC-RAS for Initial Floodplain Mapping Generation and Development of Raster Products
	7. Use Spatial-Varied Precipitation Data Within HEC-RAS to Calibrate Rain-on-Grid Models to Known Events

Recommendations

Category	Recommendation
Modeling	8. Leverage Stakeholder Relationships with USACE, USGS, and University of North Carolina Renaissance Computing Institute
	9. Use ADCIRC Coastal Modeling Results (or similar) as Boundary Conditions for Upland Riverine 2D Models
	10. Leverage Stakeholder Relationships with USGS for Groundwater Modeling Using MODFLOW (or similar)
	11. Maintain Consistency with the Wide Range of Storm Frequencies Currently Being Modeled in NCEM Advisory 2D Modeling Effort
	12. Implement the Freeboard Approach Recommended by FEMA Through FFRMS
	13. Explore or Pilot One HUC-10 Basin to Include Probabilistic Modeling to Determine Flood Hazard Areas

Flood Resiliency Blueprint Program – Key Components and Workflow

Current Status

Nuanced due timing/running concurrently with other components of Blueprint

Step 6: Create Basin Action Strategy

Steps 1-5: Will be revisited in 2024 for future refinements of the Action Strategy

TENTATIVE TIMELINE SUBJECT TO CHANGE

What's Next?

Dec. 2023

TAG/PAG feedback reviewed and incorporated into the first iteration of the Action Strategy

2024

First Quarter 2024 - Host Neuse Stakeholder Workshops to (1) Ensure the community still wants/needs the listed project(s), (2) Develop new projects, and (3) Start getting a sense of prioritization

2024

Most of 2024 – Conduct additional modeling (2d) to better understand vulnerability and risk in the basin

Late 2024

Return to stakeholders as part of the process to share findings/develop new actions that reflect additionally modeling completed

Questions

Nathan Slaughter

Congratulations

- Milestones for accomplishments for the year.
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Next Steps

Next Steps