

North Carolina Flood Resiliency Blueprint

South Carolina Association for Hazard Mitigation Conference

March 19, 2024

Hope Morgan, AECOM

Marc Recktenwald, NC Dept of Environmental Quality



Agenda NC Flood Resiliency Blueprint

- Background
- Legislative Intent
- Blueprint Team
- *What is Blueprint?*
- Multiphase Blueprint Process and Status Update
- Stakeholder and Community Engagement
- Decision Support Tool Design
- Questions

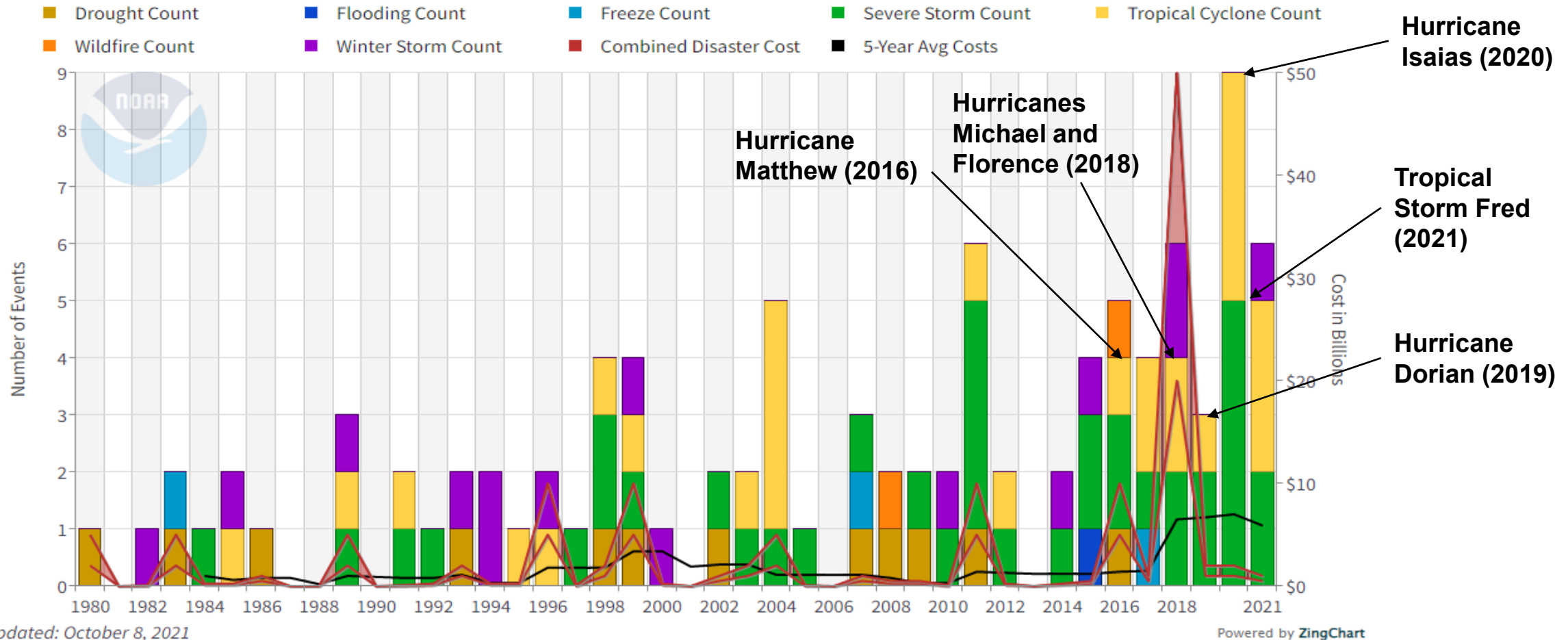


Background



Billion-Dollar Disaster Events

North Carolina Billion-Dollar Disaster Events 1980-2021 (CPI-Adjusted)

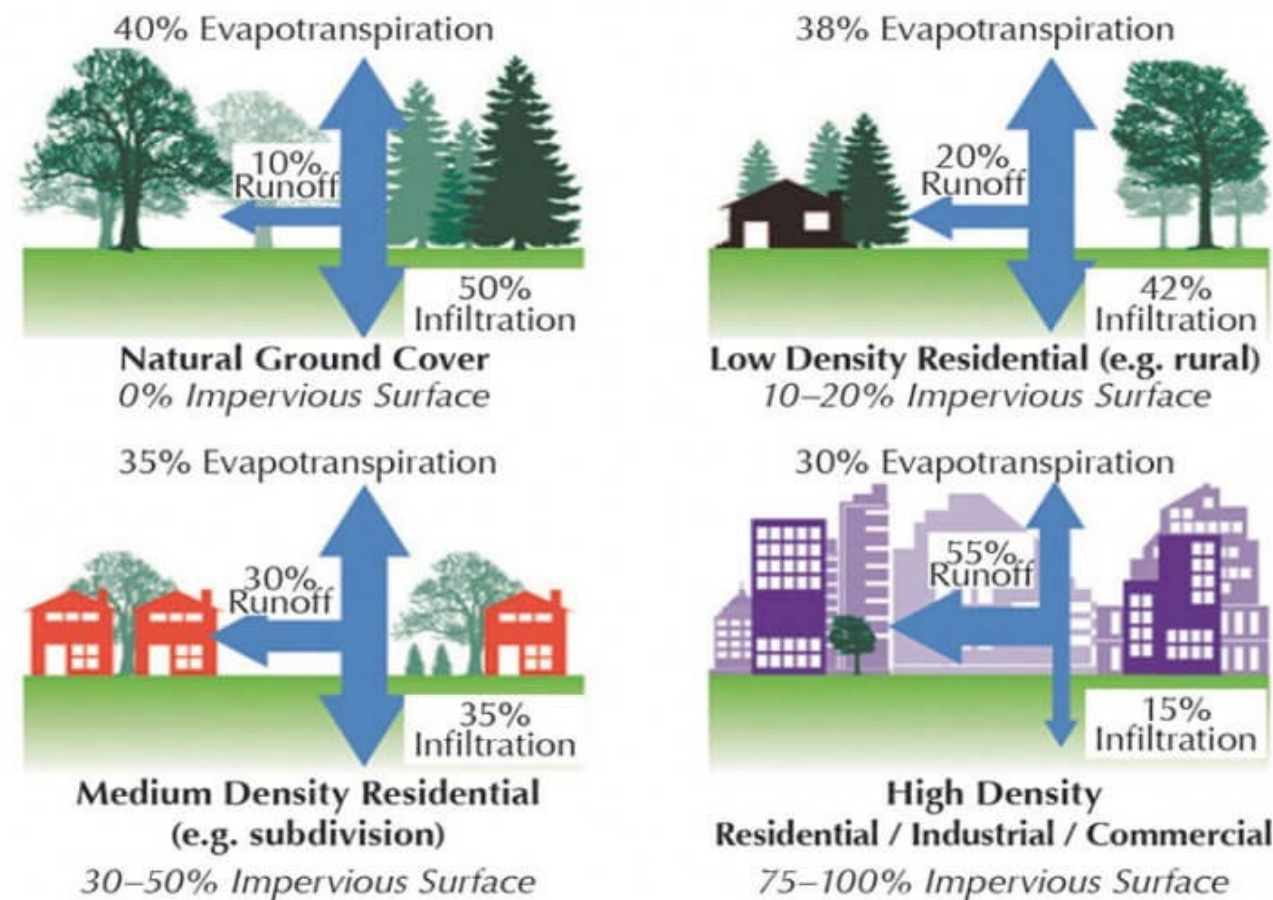


North Carolina population growth 1990-2035



Source: US Census Bureau, NCOSBM

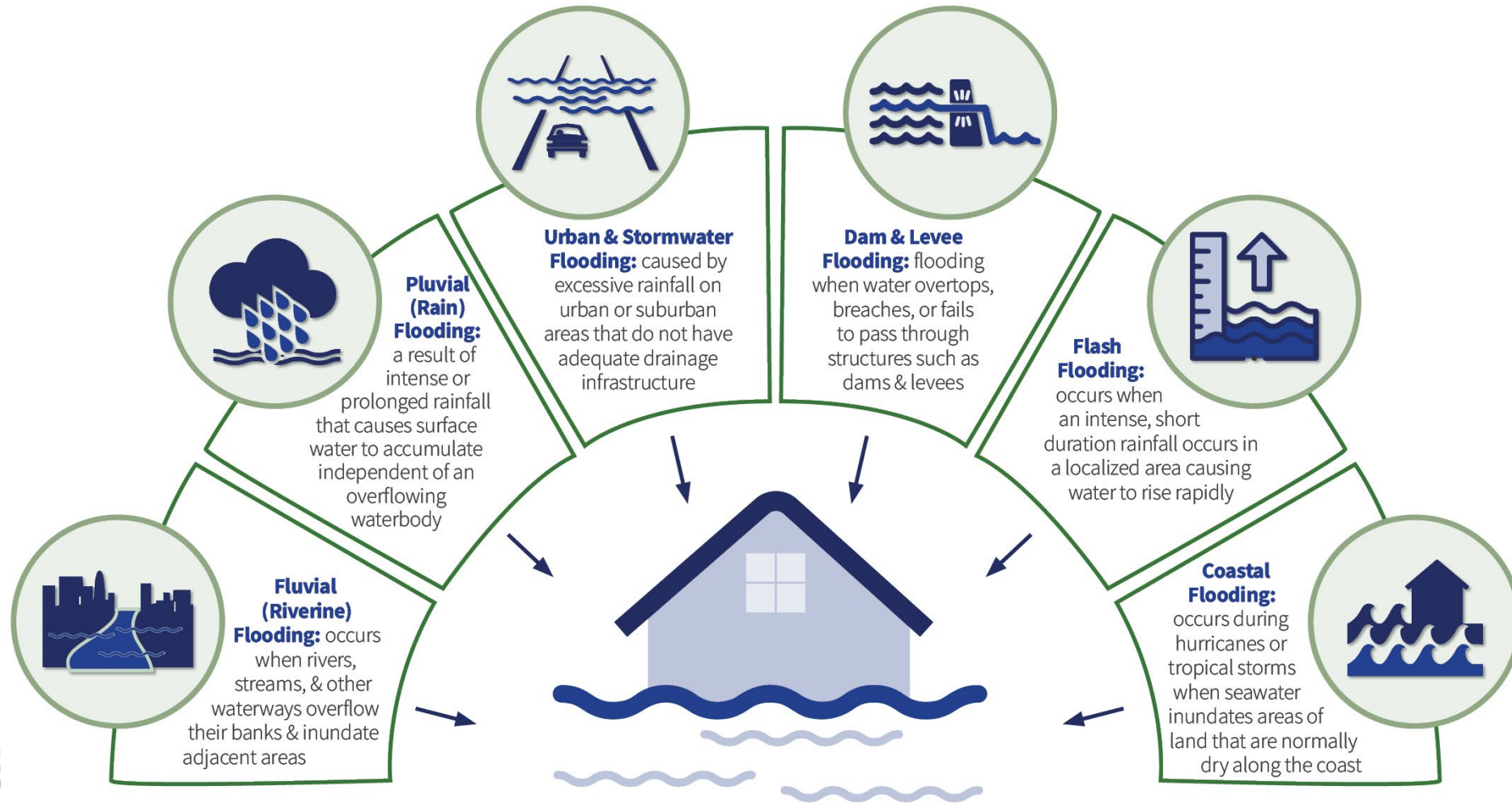
EFFECTS OF IMPERVIOUSNESS ON RUNOFF AND INFILTRATION



Source: The Watershed Institute

FLOOD HAZARD TYPES

There are many types and sources of flooding that create negative impacts to human safety, structures, infrastructure, and the environment. These sources of flooding may occur independently, but often occur concurrently with each other (compound flooding). Often, brick and mortar structures are a primary focus; however, impacts can include infrastructure, agricultural areas, natural resources, indirect economic impacts or anything else that could be negatively impacted by flooding. Different types of categorized flood hazards include:





Legislative Intent



S.L. 2021-180 Sec 5.9(c) Requirements (1 of 3)



- Contract with an organization to **develop a statewide Flood Resiliency Blueprint** for major watersheds impacted by flooding, including, among others, the Cape Fear River and the Neuse River Basins
- Shall form the **backbone of a State flood planning process** that **increases community resiliency to flooding**
- Should **reduce the cost and complexity for local government** in developing decision support tools and implementation of flood risk reduction projects
- Shall be a resource for **riverine and stream management** to reduce flooding
- Should support the establishment and furtherance of local government **stormwater** maintenance programs

S.L. 2021-180 Sec 5.9(c) Requirements (2 of 3)



- Shall **identify the major watersheds affected by flooding and direct these funds** toward the activities which are central to the creation of an actionable blueprint, namely
 - Flood risk assessment
 - Identification of data gaps
 - Recommendations to reduce flood risk for each target watershed
- Shall ensure the blueprint **incorporates**
 - Local knowledge
 - Community goals
 - Projections of future flood risk
 - Best available science and **hydrologic modeling to create a decision tool for flood mitigation investments and strategies from local watersheds up to whole river basins.**
- Lead to a prioritized set of projects and funding strategies that can be **implemented by state agencies, local governments, and regional resource managers.**

S.L. 2021-180 Sec 5.9(c) Requirements (3 of 3)



- DMS and the organization selected are encouraged to **examine examples from other states** such as the Louisiana Coastal Master Plan or the flood resiliency planning processes in South Carolina and Virginia.
- The organization shall send all necessary information to DMS on the implementation of the blueprint upon request by DMS.
- The organization shall submit an initial **draft of the blueprint** to DMS **no later than December 31, 2023**.
- **DMS shall report by July 1, 2022, and annually thereafter** to the Joint Legislative Commission on Governmental Operations and the Fiscal Research Division on the implementation of this subsection.

S.L. 2021-180 Sec 5.9(c) Requirements



“...A successful blueprint should ultimately lead to a prioritized set of projects and funding strategies that the State can implement.”



Blueprint Team



DEQ Core Blueprint Team



Shrikar Nunna

Director of Legislative Affairs
Department of Environmental Quality, Secretary's Office



Marc Recktenwald

Director
Department of Environmental Quality, Division of Mitigation Services

**NOW
HIRING**

Stuart (Stu) Brown

Flood Resiliency Blueprint Program Supervisor
Department of Environmental Quality, Division of Mitigation Services

Six Time-limited Blueprint Project Managers

Blueprint Development Team Structure



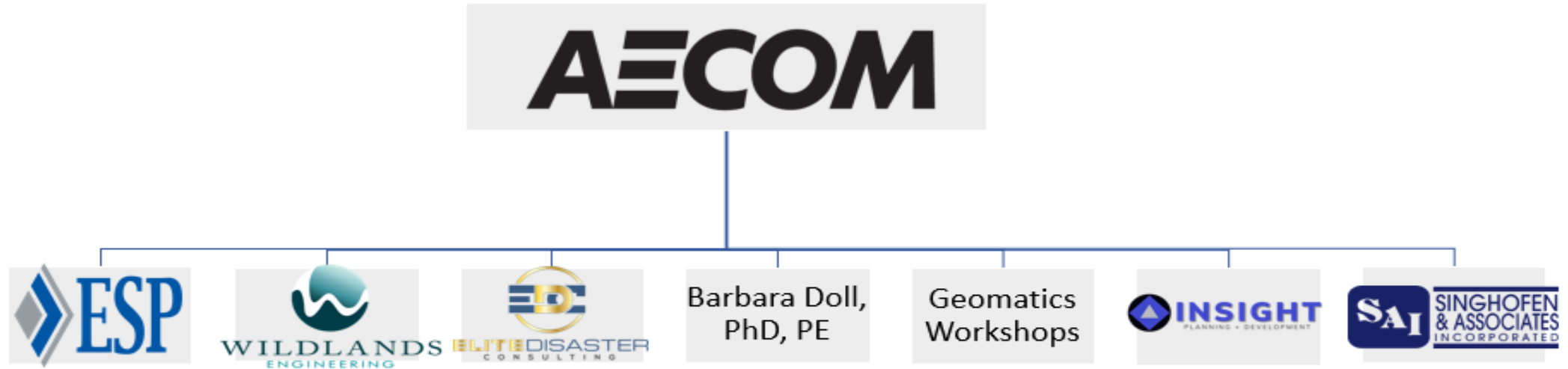
Leadership						
DEQ Executive Leadership		DEQ Core Advisory Group		Principal Advisory Group		
Work with the Core Advisory Group to decide on recommendations		Determine whether to implement recommendations provided by the TAGs, including technical requirements, policies, economics, environmental and human health, and project funding		Provide advisory input and feedback on the policy, process, engagement, modeling, tools, and support utilized		
Seven Technical Advisory Groups						
Government		Environmental		Social		Regional
Governance	Partnership/ Funding	Hazard Identification	Vulnerability/ Risk/ Impact	Resilience/ Mitigation/ Reduction	Tool Development/ Acceptance	Neuse Regional Advisory Council

Critical to providing advisory input and feedback

Blueprint Work Plan Partners



Phase I & II Vendor Team





What is Blueprint?

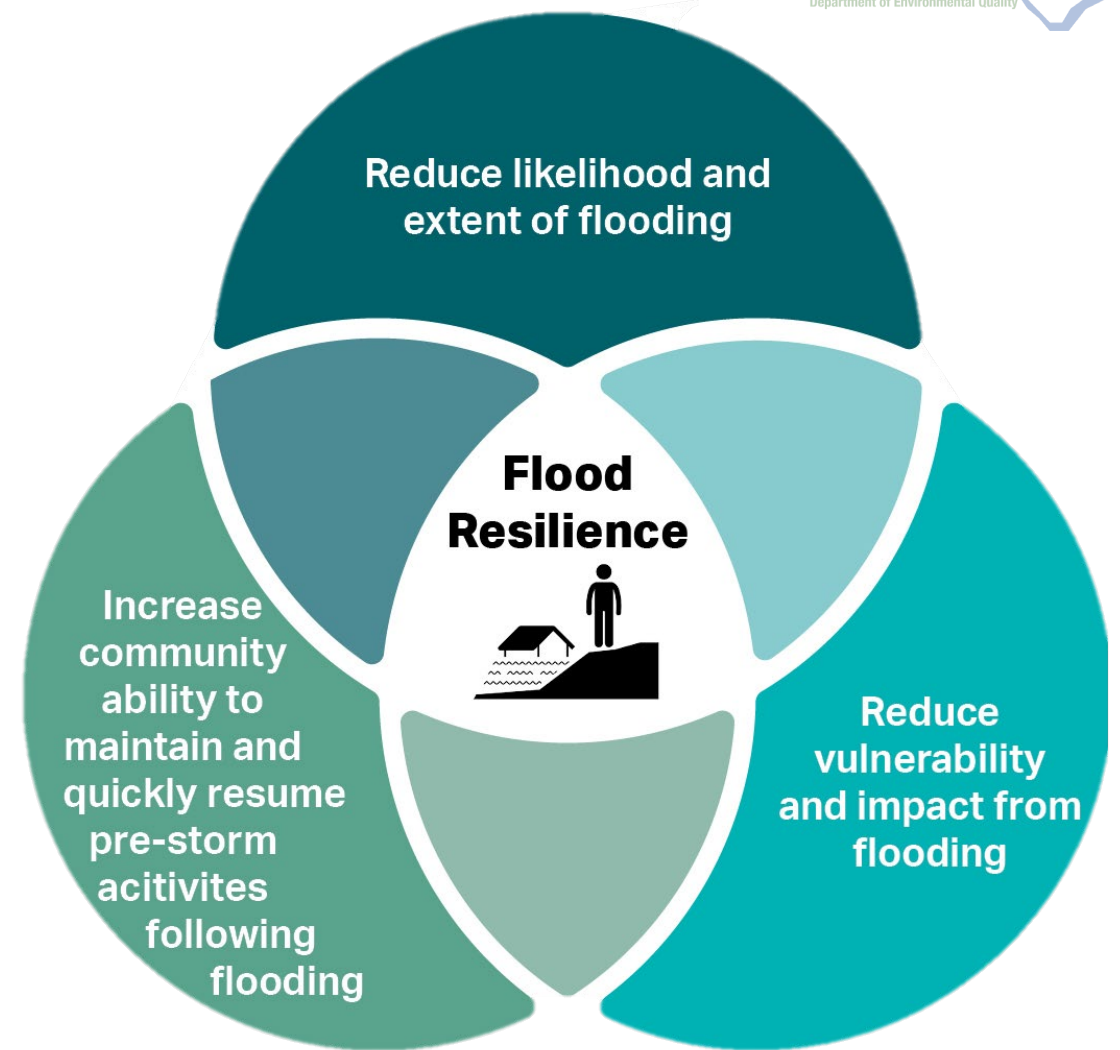
Purpose and Goals

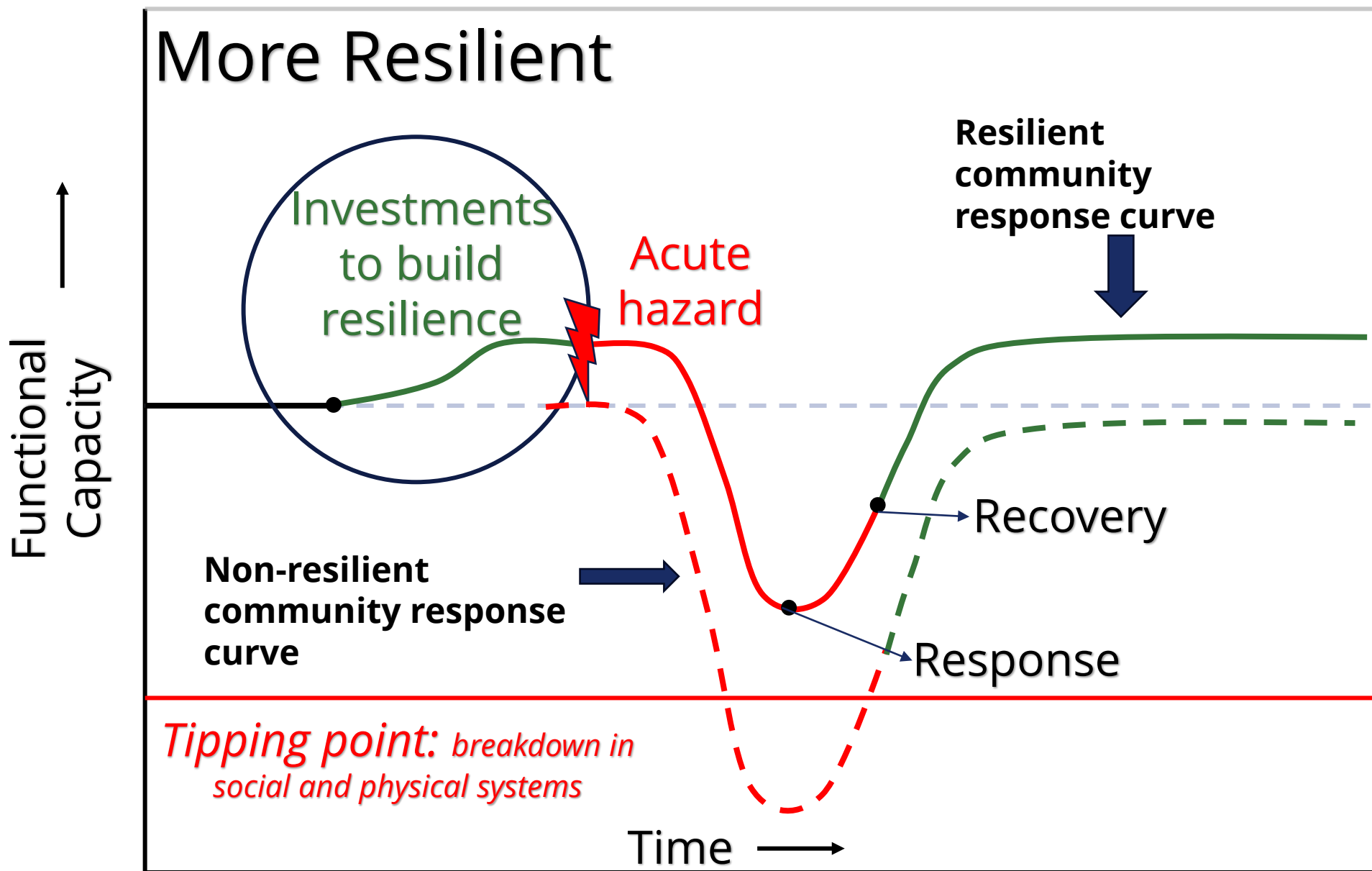


Blueprint – Core Outcomes

The three core high level goals that all actions are evaluated against:

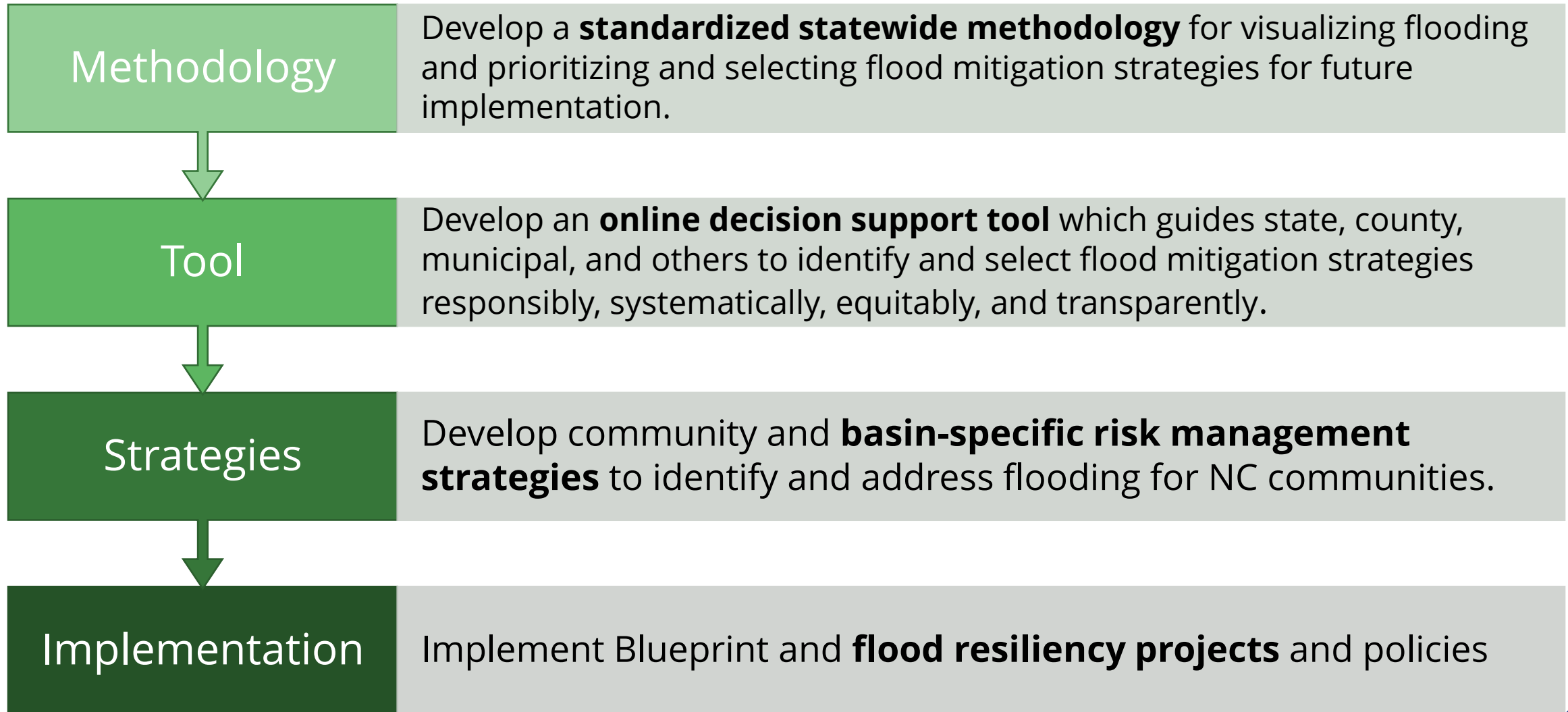
1. Reduce likelihood and extent of flooding
2. Reduce vulnerability and impact
3. Increase community ability to recover





- Investment in resilience, leads to better outcomes before, during and after natural disasters.
- What is a community's "Capacity" to recover from flood hazards?

Blueprint Components



Blueprint Program - Multiphase Process



- **Phase I (2022 - 2023)**
 - Research and evaluation
 - Gap analysis
 - Recommendations and decisions (Programmatic, Policy, Tools, Approaches, Needs)
 - Implementation roadmap and manual
 - Blueprint Workflow
 - Neuse River Basin Action Strategy (Pilot)
 - Draft Blueprint **by December 31, 2023**
 - **Version I of Blueprint document is complete**
 - **20 of 29 documents are currently available on the website**
- **Phase II (2023 - 2024)**
 - Develop online decision support tool (Blueprint Tool)
 - Refine Blueprint and Neuse Action Strategy (including additional modeling)
 - Begin implementation
- **Phase III (2024 - 2025)**
 - Develop Action Strategies for five prioritized areas
 - Refine of Decision Support Tool
 - Continue Blueprint implementation
 - Implement \$96 million worth of resiliency projects in prioritized areas
- **Phase IV (2025 +)**
 - Statewide Expansion of Strategies/Decision Support Tool (pending additional funding)
 - Ongoing implementation and refinement of the Blueprint Program

Phase I

Phase I:

Develop Draft
Blueprint and
Draft Neuse
Basin Flood
Resiliency
Action Strategy

Task 1:

Stakeholder Outreach/ Facilitation.

Literature review,
Data collection
inventory, Review
of existing
statewide
planning efforts,
Review of
governance
schemes from
select peer states

Task 2:

Gap Analysis.

Statewide data
inventory
Gap analysis
of data,
Modeling,
Resources
necessary to
develop the
Blueprint and
Action
Strategies

Task 3: Recommendations /Decision Framework.

Develop
recommendations to
support the Draft
Blueprint and Action
Strategies.

Task 4:

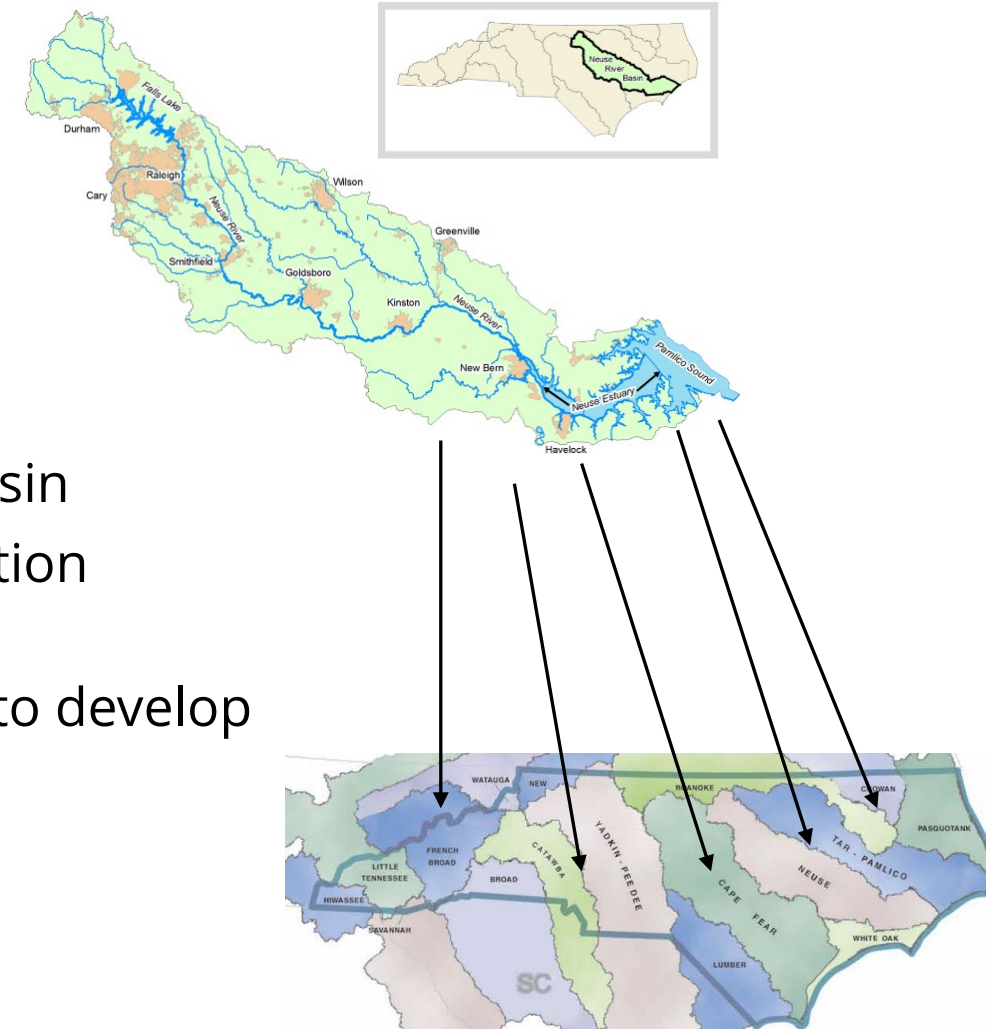
Develop a Draft Blueprint and Pilot Action Strategy.

Includes
developing the
requirements
needed for an
online decision
support tool.

Decisions Now & Strategic Future

River Basin Action Strategies (RBAS)

- Considering NC basins have different
 - flood exposure,
 - data and modeling needs,
 - capacity and/or values;
 - unique stakeholders and governments for each basin
- Develop preliminary RBAS to identify best flood mitigation strategies based on initial data and engagement
- Identify and prioritize basin data and modeling needs to develop final river basin action strategy
- Fill in gaps and analyze results
- Complete Action Strategy



Blueprint Workflow



Draft Blueprint Program

- **“Connective tissue” for resilience efforts**
- Recognize, support, leverage, and advance resilience efforts at the **basin scale**
- Identify and fill data gaps
- Close capacity gaps
- Implement resiliency actions

Proposed, Interim Approach to Approving Critical Decisions

- Need for decisions in a timely manner for continued progress, implementation
- NCDEQ is decision authority, in the interim
- Blueprint Principal Advisory Group

Draft Blueprint Workflow is Dynamic

- **General guide**, not stringent
- **Engagement of communities, stakeholders, etc. is critical**
- Collaborate with key partners
- “Manual” on the specific steps is under development
- Basin Advisory Groups

Blueprint Action Strategy Workflow

- Gather, generate and update data

Step 1. Actionable Data, Modeling, Analysis



- Formal kickoff with communities and stakeholders

Step 2. Initiate Community Engagement and Discovery



- Start using the Flood Resiliency Blueprint Tool

Step 3. Flood Risk Planning and Analysis



- Refine action data

Step 4. Action Review, Creation, and Adjustment



- Review, sort, and rank actions

Step 5. Action Analysis and Ranking



- Create Basin Action Strategy

Step 6. Flood Resiliency Blueprint Basin Action Strategy



- Increase resilience at the basin scale

Step 7. Action Implementation



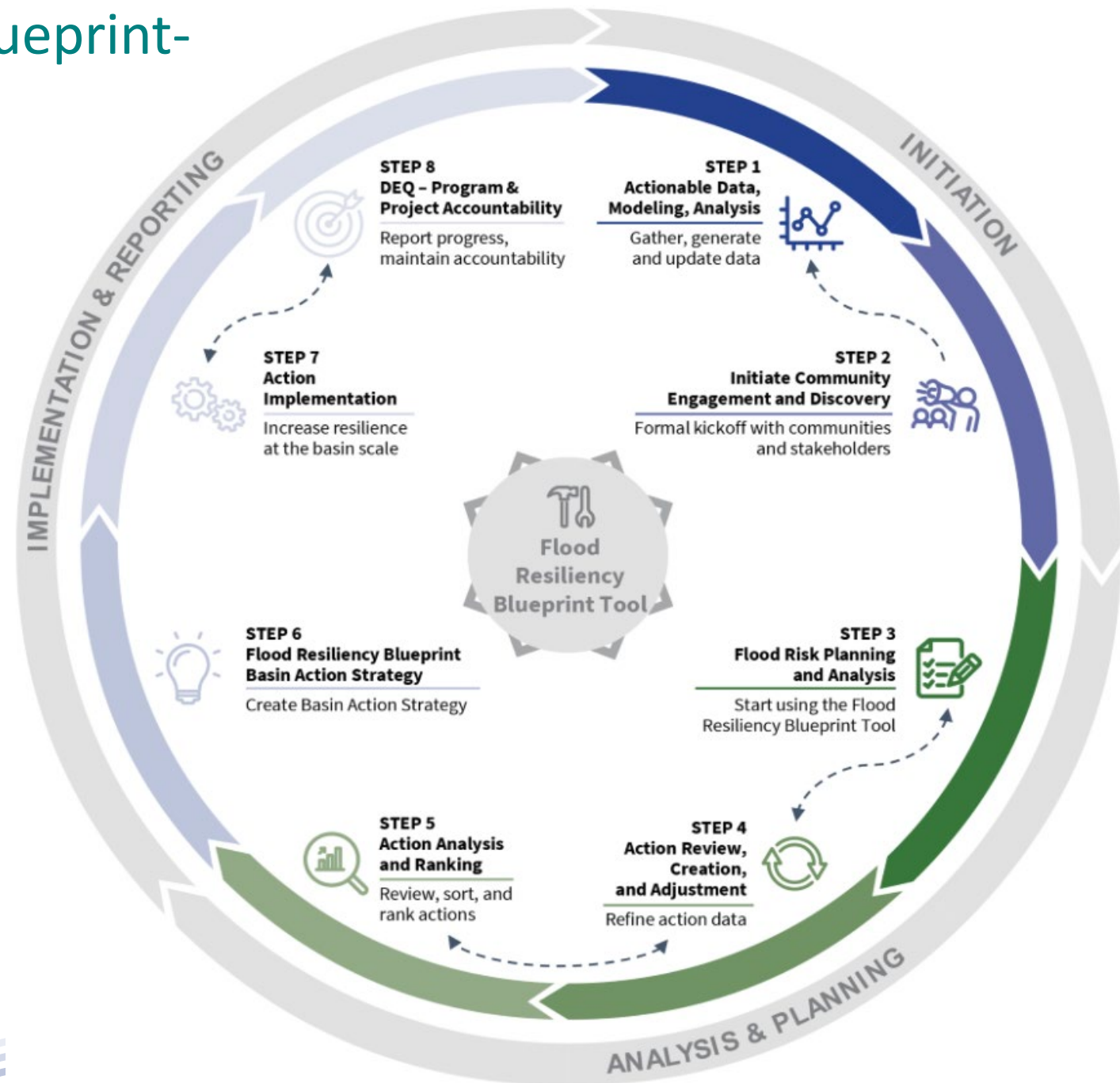
- Report progress, maintain accountability

Step 8. NCDEQ - Program & Project Accountability



North Carolina Flood Resiliency Blueprint- Differentiators

- **Future Conditions Modeling**
- **Detail Profiles** (*hazard, community, actions, funding*)
- **Quantifiable Metrics**
- **Impacts** (*population, environment, structures, infrastructure, economy*)
- **Mitigation / Resilience Action Exploration**
- **ROI / Added Value**
- **Prioritization of Actions – Ranking**
- **Matching Sources of Funding**





NC Online Flood Resiliency Blueprint Decision Support Tool (Blueprint Tool)

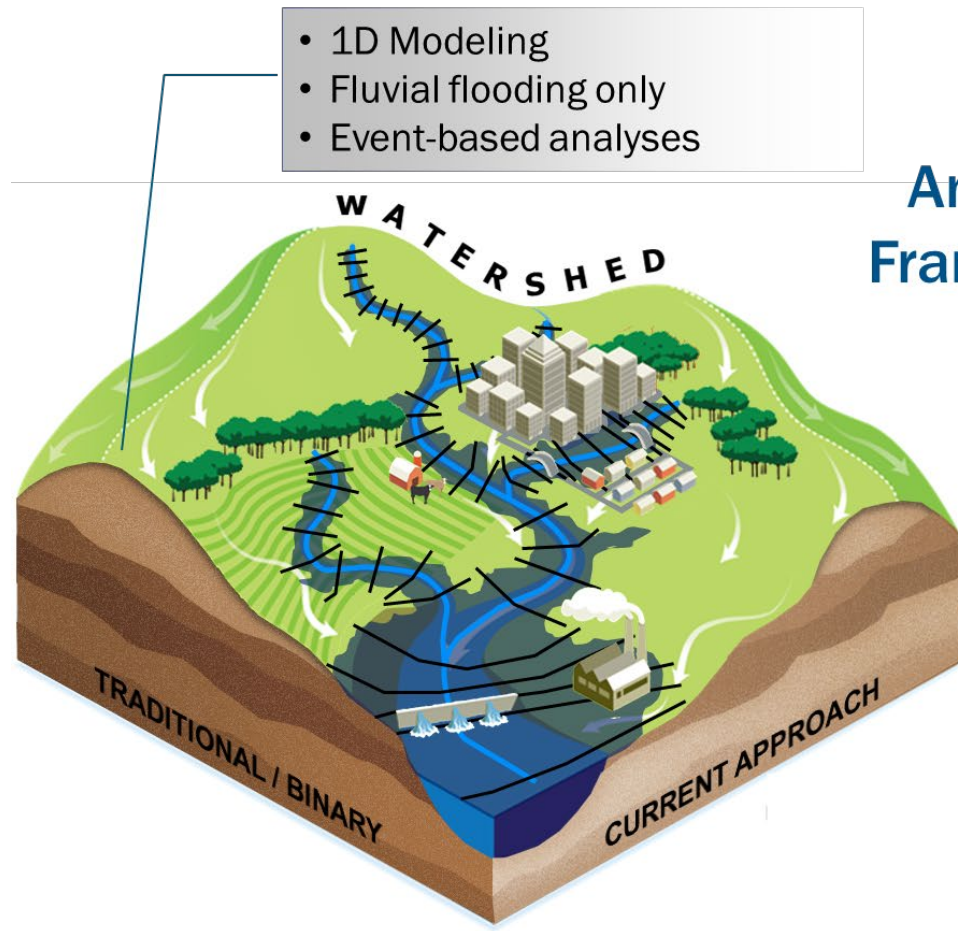


Blueprint Tool

- Expands on existing tools with new data and methodologies
- Integrates forecasted changes
- Allows for integration of future data and logic generated through multiple sources
- Is scalable (catchment to statewide)
- **Is dynamic** and improves as data and methodologies improve

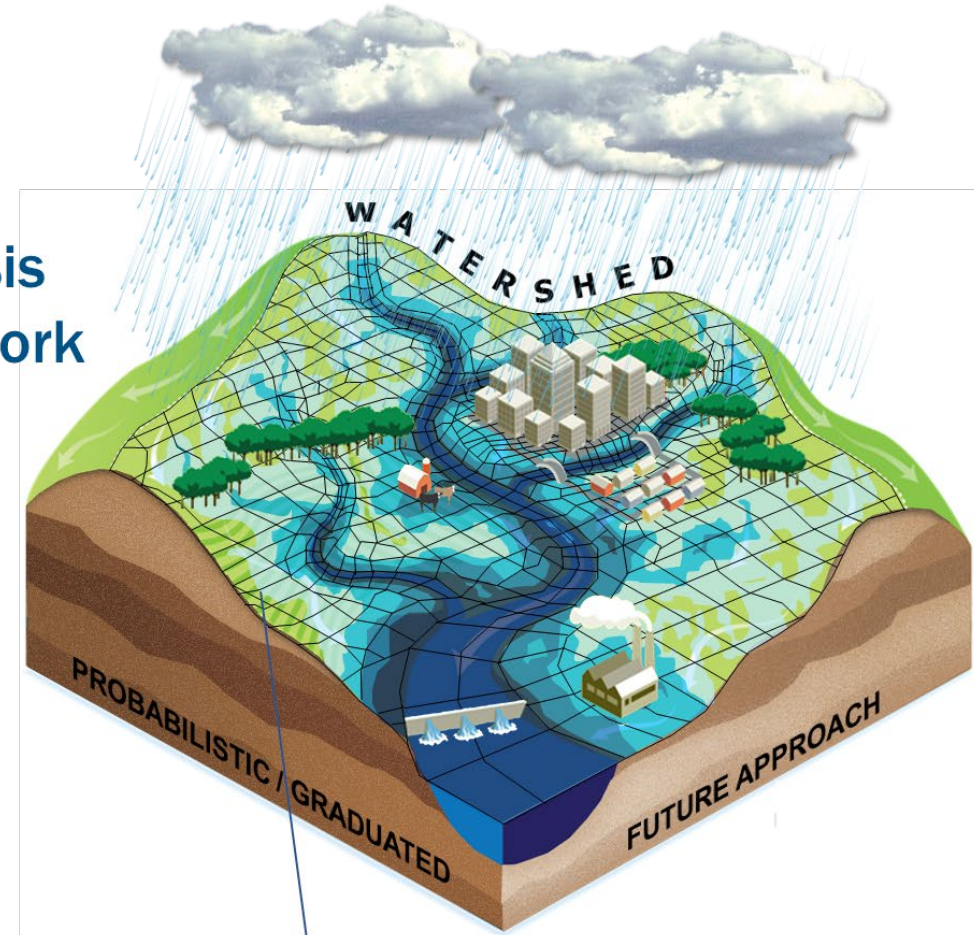


H&H Modeling Considerations



Inland/Riverine Flooding Examples

Analysis Framework



Initial Blueprint Tool

The Decision Support Tool will assist with:

- Multi-level, multi-variant mitigation planning
- Prioritization, including factors such as:
 - Social vulnerability
 - Local desire/tolerance
 - Nature-based solutions
 - Traditional mitigation solutions
 - Benefit-Cost Ratio
- Mitigation project management

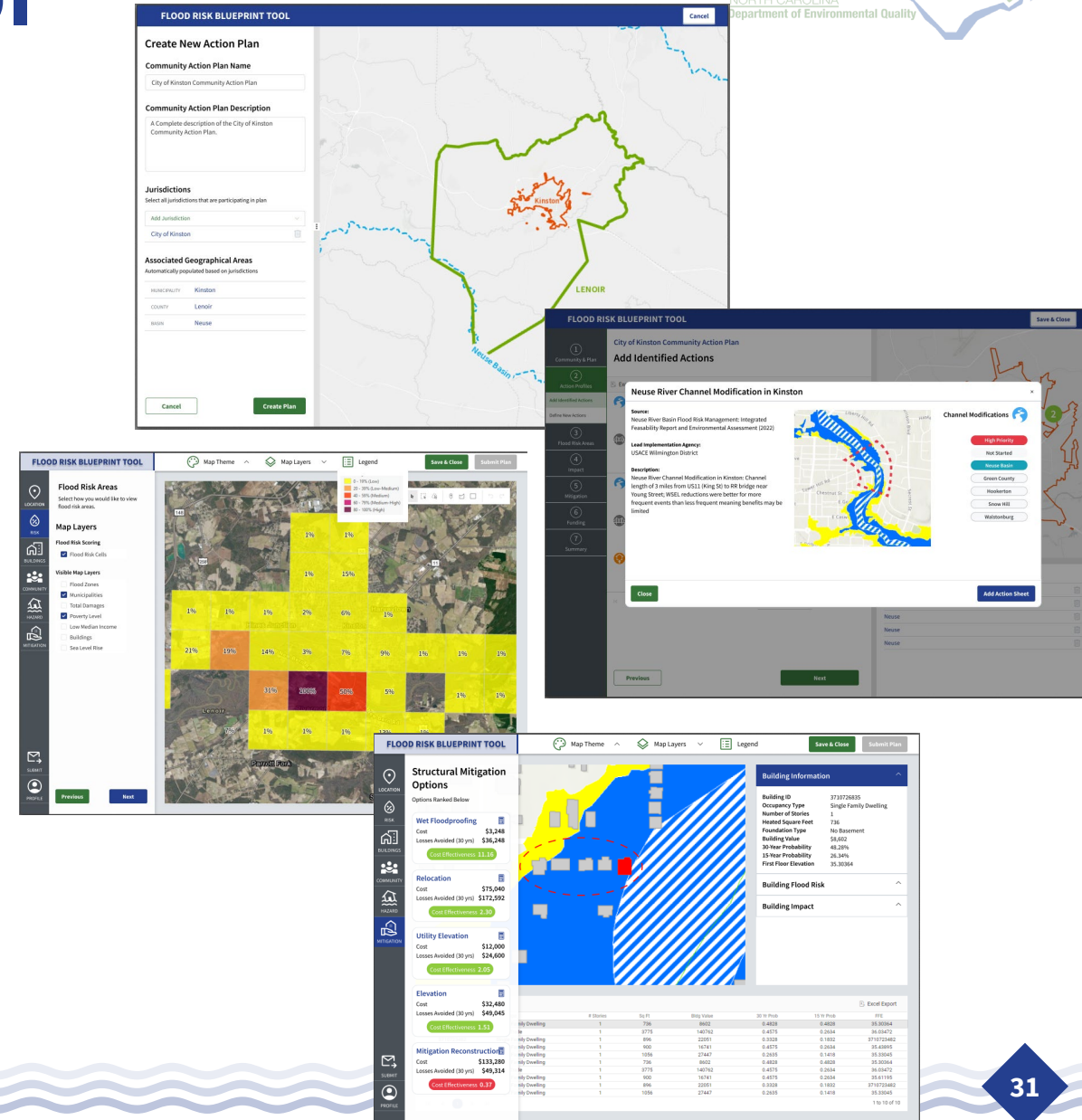
Progress on the Decision Support Tool has begun with:

- User roles and workflows, Storyboards, and Wireframes are in review

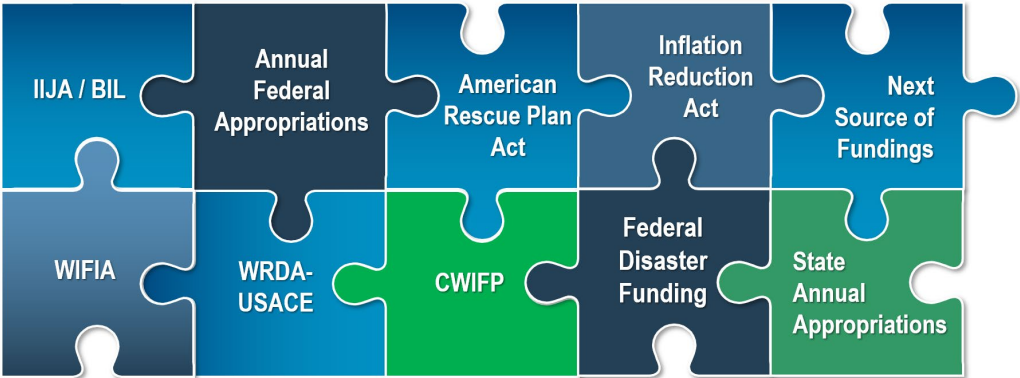


Potential examples of Tool

- Visualization of risk
- Showing how to create plans
- An understanding of projects/actions
- Understanding data availability and sources
- Mitigation actions and their **ranking**
- Track program accountability
- **Funding sources link to project type**

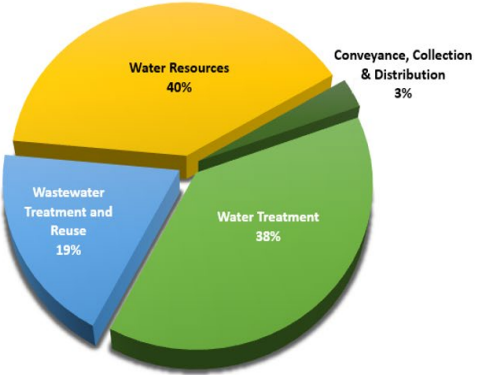


Blueprint – Strategic Funding ID and Matching



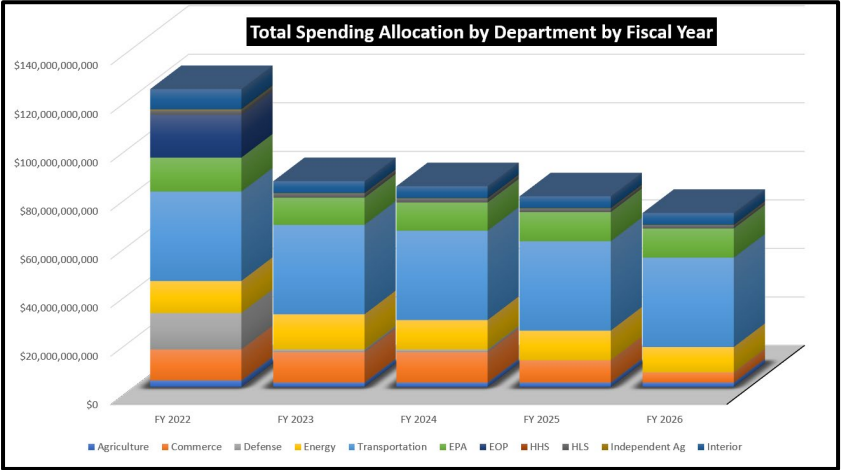
Annual Federal Appropriations and Authorization Acts
Infrastructure Investment and Jobs Act / BIL
Inflation Reduction Act
Water Resources Development Act (Biennial Authorization)
Energy and Water Development
Interior-Environment
Homeland Security
Agriculture, Rural Development, Food and Drug Administration, and Related Agencies
Commerce-Justice-Science
Farm System Reform Act of 2023

Water BL Markets	Opportunities	Total Allocation
Water Treatment	7	\$35,086,349,500
Wastewater Treatment and Reuse	12	\$17,349,810,000
Water Resources	97	\$36,756,881,660
Conveyance, Collection & Distribution	9	\$2,732,530,000

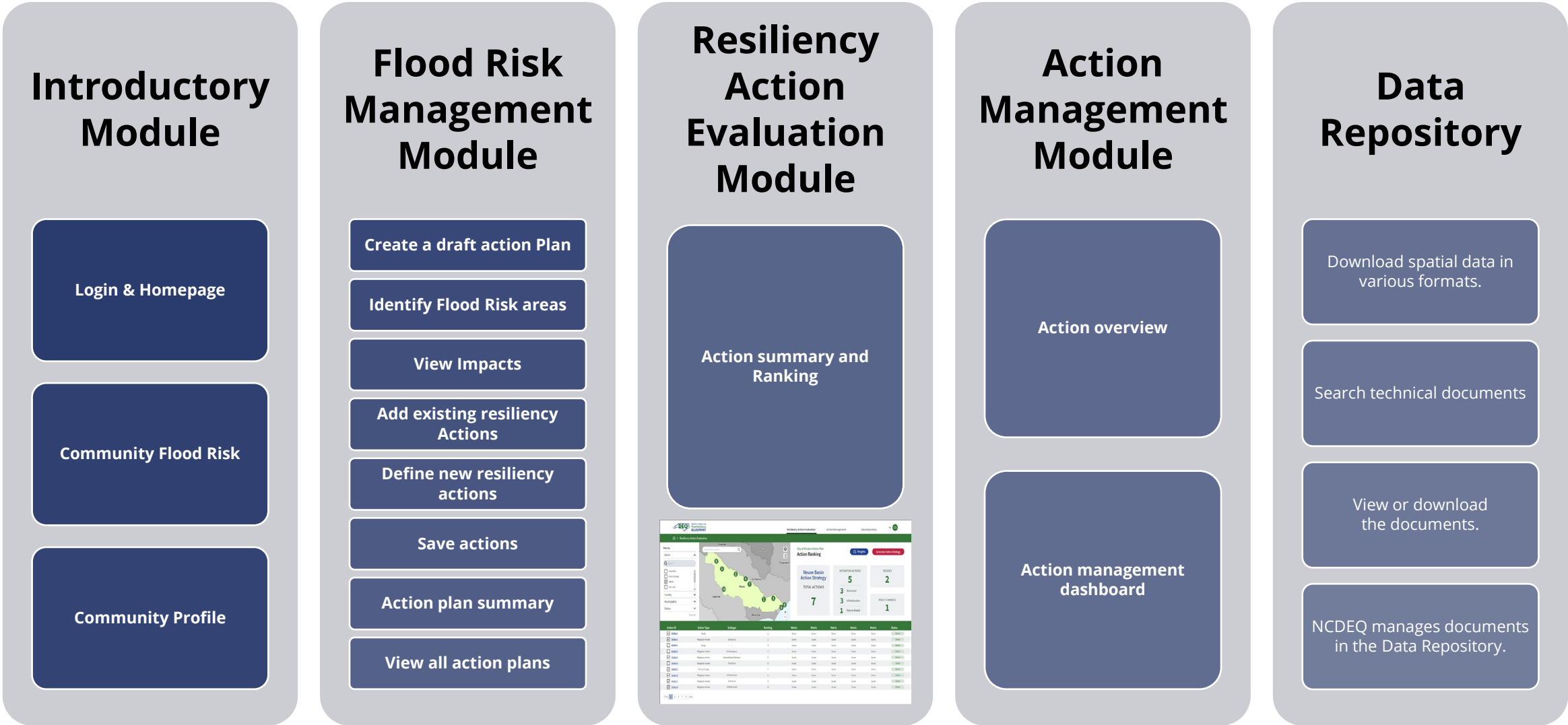


WR Sub-Markets	No. of Opportunities	Total Allocation	Federal	Non-Federal
Ecosystem Restoration	8	\$1.6 B	\$1.3 B	\$242 M
Ports and Harbors	3	\$2.7 B	\$500 M	\$2.2 B
Dams & Levees	28	\$12.6 B	\$9.8 B	\$2.8 B
Flood Risk Management	21	\$12.4 B	\$7.45 B	\$4.9 B
Rivers and Waterways	2	\$3.5 B	\$3.5 B	\$0
Watershed Management	35	\$3.9 B	\$3.6 B	\$272 M

Departments	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Agriculture	\$2,681,124,790	\$1,815,102,415	\$1,815,102,415	\$1,815,102,415	\$1,815,102,415
Commerce	\$12,726,927,667	\$12,554,984,000	\$12,554,983,000	\$9,174,427,667	\$4,201,677,667
Defense	\$15,009,000,000	\$1,050,000,000	\$1,000,000,000	\$0	\$0
Energy	\$13,222,130,000	\$14,493,580,000	\$12,158,292,500	\$12,182,870,625	\$10,410,267,656
Transportation	\$36,815,600,000	\$36,815,600,000	\$36,815,600,000	\$36,815,600,000	\$36,815,600,000
EPA	\$13,995,800,000	\$11,220,800,000	\$11,622,800,000	\$12,022,800,000	\$12,022,800,000
EOP	\$17,639,658,000	\$650,000	\$650,000	\$650,000	\$400,000
HHS	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000
HLS	\$1,882,100,000	\$1,618,100,000	\$1,518,100,000	\$1,318,100,000	\$1,218,100,000
Independent Ag	\$350,000,000	\$200,000,000	\$200,000,000	\$200,000,000	\$200,000,000
Interior	\$8,346,123,000	\$4,969,458,340	\$4,969,458,340	\$4,969,458,340	\$4,969,458,340
Total	\$122,669,263,457	\$84,739,074,755	\$82,655,786,255	\$78,499,809,047	\$71,654,206,078



Application Modules



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



NC Flood Resiliency Blueprint Status of process



Website

- The Flood Resiliency Blueprint Website is available.
- <https://ncfloodblueprint.com/>

North Carolina Flood Resiliency Blueprint

The North Carolina Department of Environmental Quality is developing the first North Carolina Flood Resiliency Blueprint. The Blueprint is a statewide watershed planning effort to establish a framework and tools to assist local communities in decision-making related to reducing flood risk and increasing resilience.

Working with interagency partners and stakeholders, DEQ's Division of Mitigation Services plans a comprehensive approach to identify problems, address barriers, and prioritize solutions.

UPDATES

Wednesday, May 3, 2023
Second Meeting of the Technical Advisory Groups

Wednesday, March 22, 2023
NC Flood Resiliency Blueprint Principal Advisory Group Kickoff

Wednesday, March 15, 2023
NC Flood Resiliency Blueprint Technical Advisory Group Kickoff

UPCOMING EVENTS

Jun 30 Fri 10:00 AM to 5:00 PM
Neuse Basin Advisory Group Meeting 3
Raleigh

Show Full Calendar

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