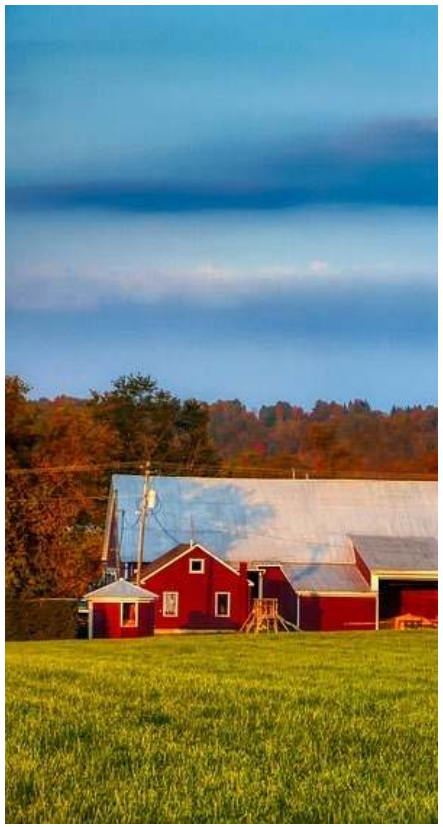
NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Planning for the Near & Distant Future: *Resilience & Adaptation* for Water and Wastewater Infrastructure



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Topic Overview

- Why Is It Important?
- What Does Resilient Infrastructure Mean?
- NHDES Vulnerability Assessment Initiative

Key Takeaways

1. Appreciate & Support Your Local Utilities
2. General Understanding of Resilient Infrastructure

Setting the Stage – Why is This Topic Important?

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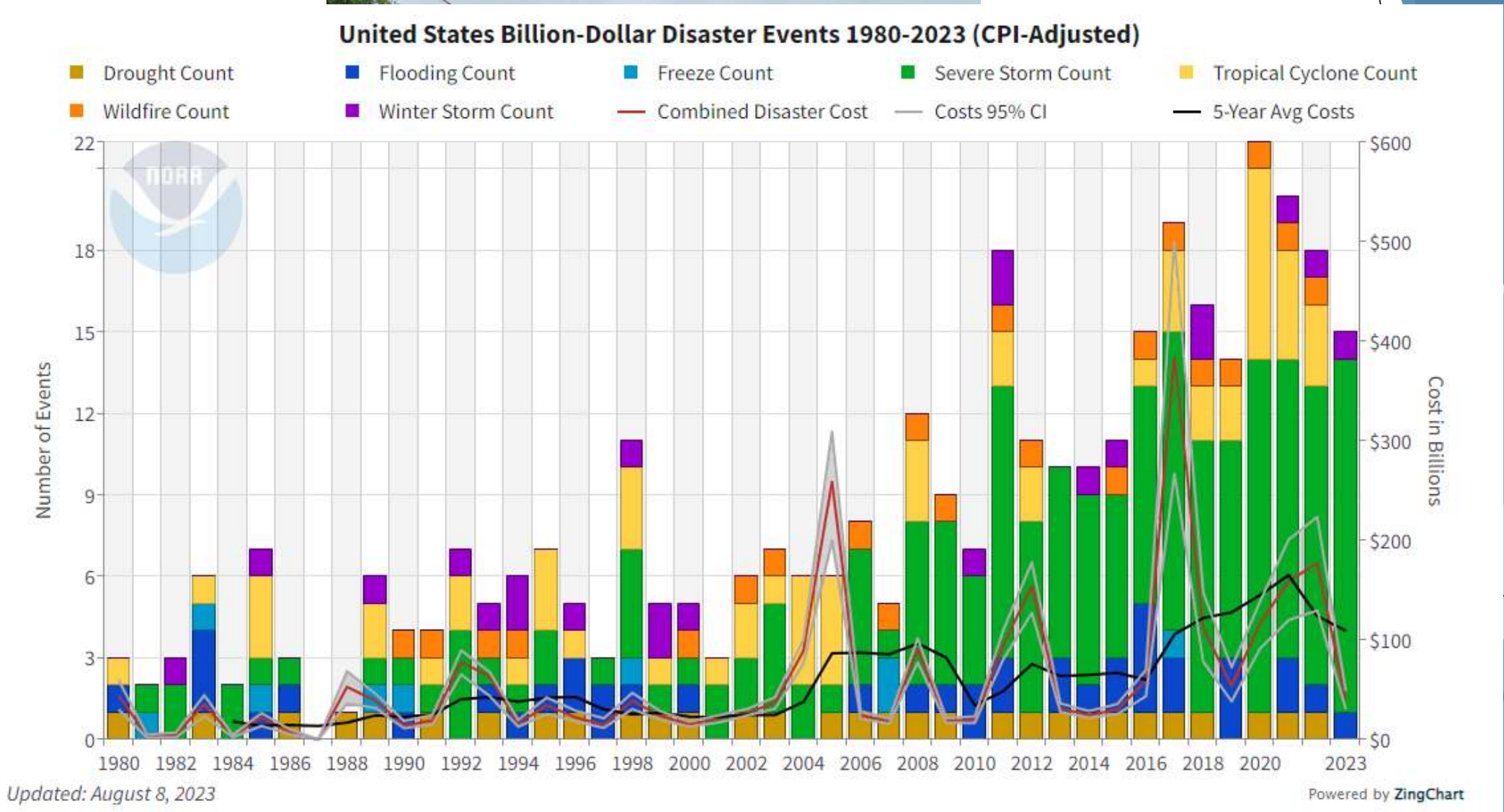
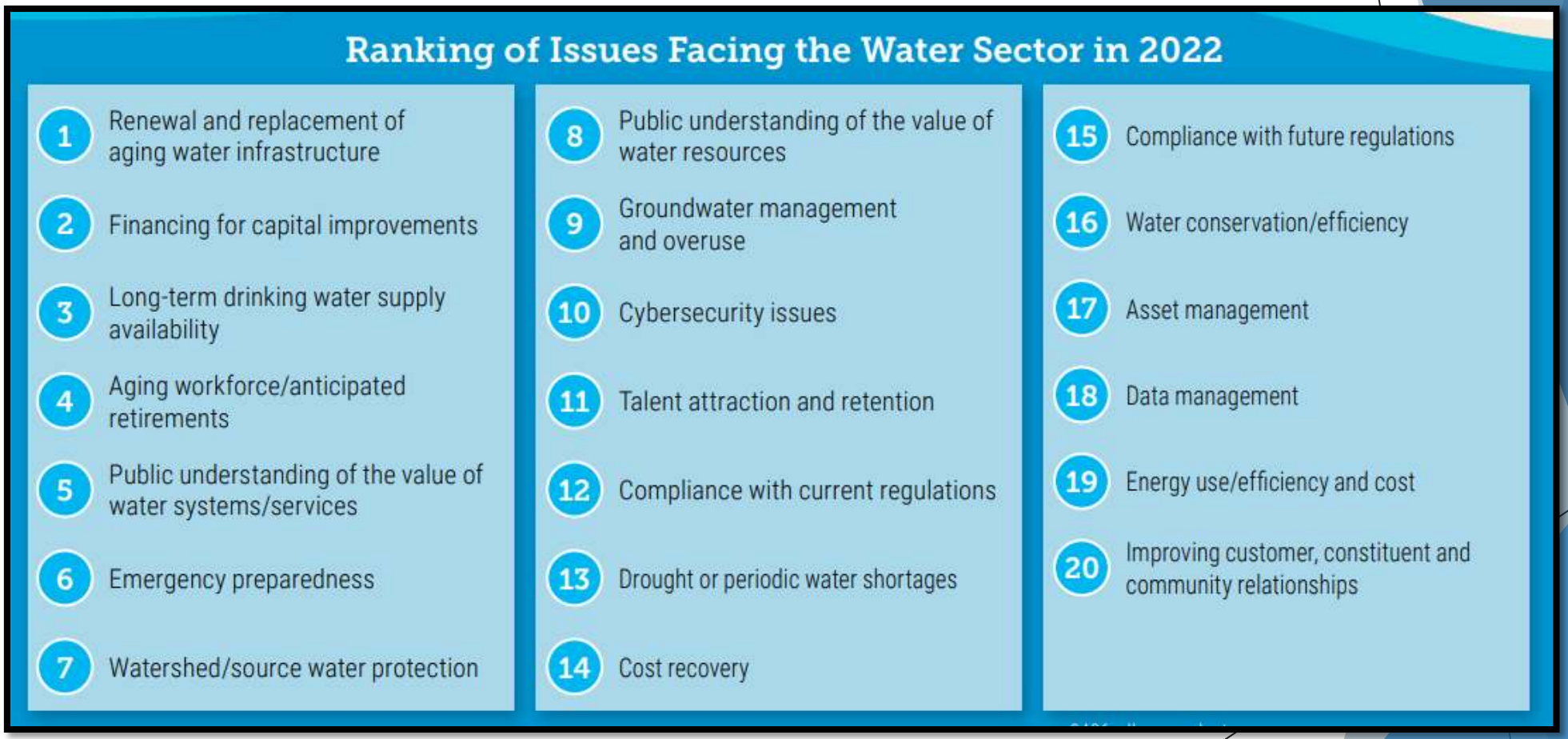
- Water & Wastewater are Essential Services
- Needed for survival
  - Historically:
    - Settlements founded near water
  - Today:
    - Communities with reliable resources endured
    - Infrastructure = foundation of community
      - In-home service standard
      - Cornerstone of business/development

- Emergency Events – Key indicator of resilience & return to normalcy
- Bottomline: No water/wastewater = no community

Why it needs attention: Events



Why It Needs Attention: Balancing Requirements, Focusing Funding & Resources



AWWA 2022 State of the Water Industry

What Does it Mean to Be Resilient?

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DEFINITIONS

Resilience

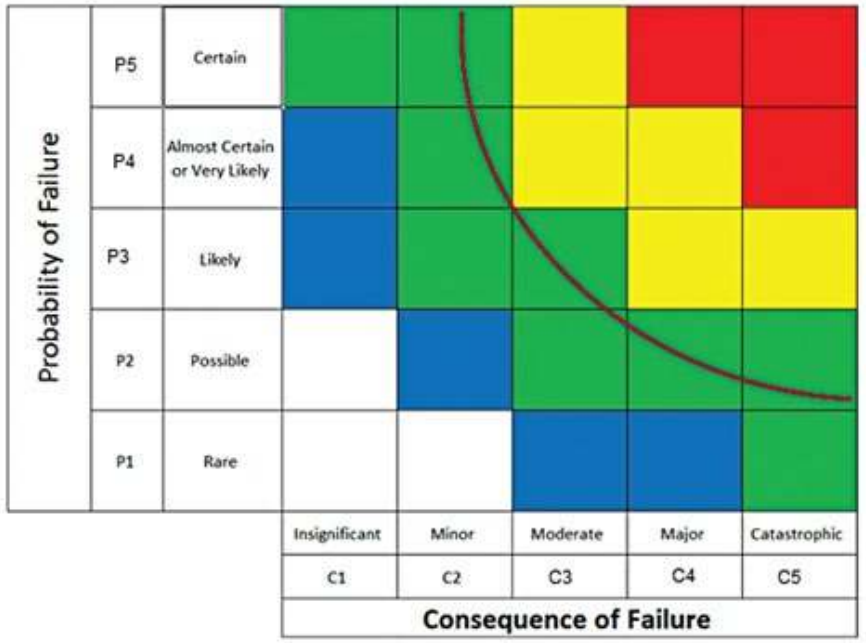
- How a component or system bounces back to normal following a disruption

- "The term "resilient" refers to the ability of such infrastructure systems to absorb disturbance and still retain their basic function and structural capacity"

Main Goals

- **Increased Functional Capacity**
- **Risk Management/Tolerance**

Figure 1: Project Approach – Risk Mapping and Decision Making



Catastrophic	Immediate action to prevent impact to LOS, Safety, and environment
Extreme	Gearing up for immediate action
High	Monitoring Regime, response plan in place
Moderate	Management responsibility specified
Low	Manage using routine procedures

Risk = PoF x CoF

Source: GHD

How do you get there?

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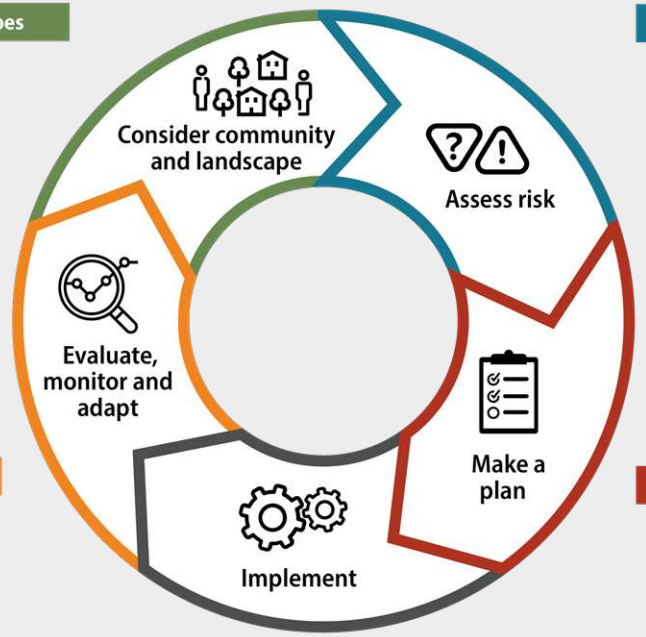
Consider community and landscapes

Focus on:
- Characterization, Location, Systems
- Timeframes
- Partnerships and Teams

Consider:
- Diverse, Interdisciplinary, Inclusive
- Multi-Sector



Assess risk

Compile and understand:
- Data, Tools, Models, Knowledge
- Exposure and Sensitivity, Adaptive Capacity and Potential Impacts

Consider:
- Past, Present, Future, Geographical, Economic, Human/Social, Critical Infrastructure, Built and Natural Environment
- Multi-Hazard

Make a plan

Action:
- Prioritize Vulnerabilities
- Identify, Evaluate, and Prioritize Strategies

Consider:
- Scales/Scalable, Risk-Based Planning, Robust, Redundant, Resourceful, Feasible, Compatible, Cost-Effective, Equitable, Objective
- Chronic / Acute Hazards

Implement

Action:
- Funding and Finance Opportunities
- Projects, Policies, and Procedures

Consider:
- Long/Short-Term Actions
- Hazard Mitigation Linked With Adaptation

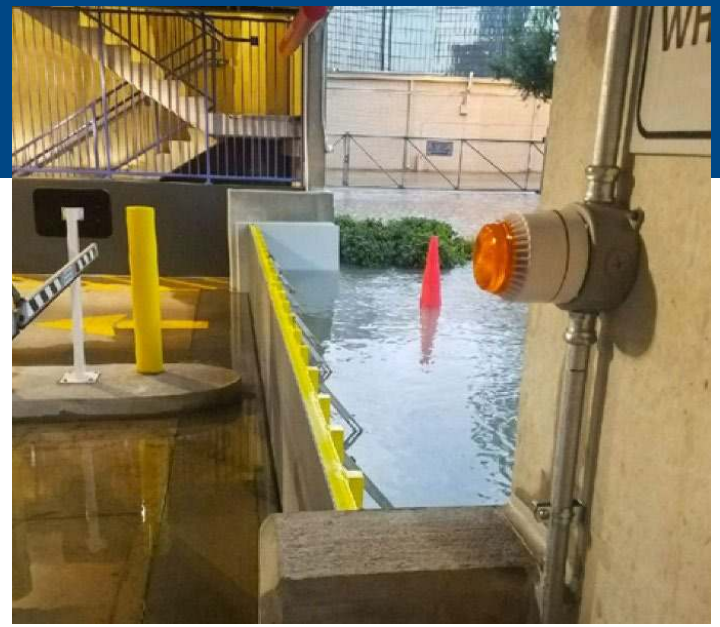
Evaluate, monitor and adapt

Action:
- Resilience Indicators
- Decision-Making Criteria

Consider:
- Metrics and Evaluation

https://extension.umaine.edu/climatesolutions/resilience-building-cycle

Implementation Measures



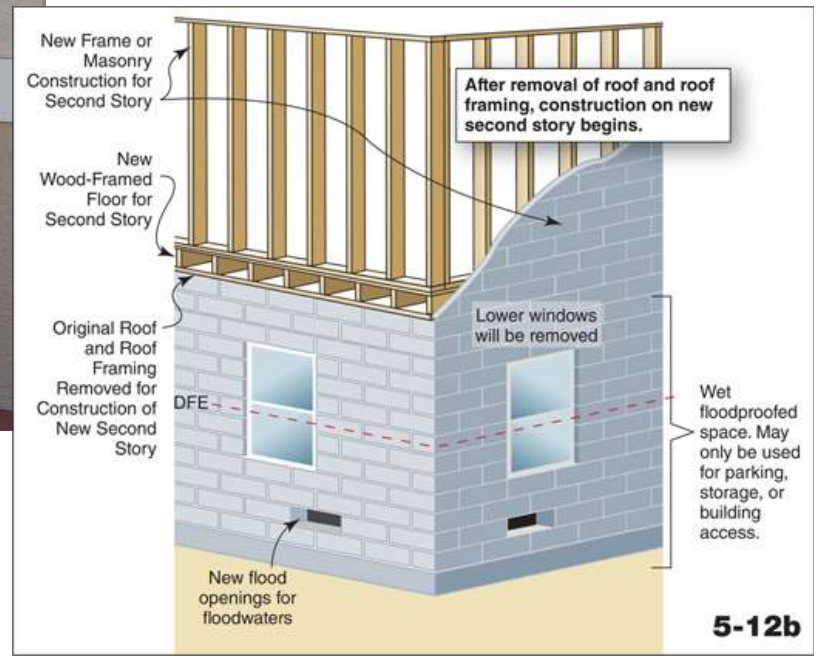
Unfortunately, it typically takes an emergency event to spark significant change

Now is the Time to Consider Resilience & Adaptation Measures

- Excluding needed scope today can cost more tomorrow
- Emergency repairs typically cost around 6 times more

Recommended Approach

- Combining Scope
  - Account for specific resilience needs in “normal” projects
  - Allows for potential capital stacking



Example Areas to Target

Addressing System Redundancies

- Eliminate Critical Single Points of Failure
- Bolstering Facilities

Horizontal System Rehabilitation or Replacement

- Restrained Joints, Anchoring, Seamless pipe such as fused HDPE
- Addressing I&I

Flood Proofing/Mitigation

- Stormwater Management

Elevating Systems Due to Flooding

- From Previous Occurrences
- Future Projected Flood Analysis
- New/Changing Flood Elevation Requirements

Future Capacity Needs

- Water Resources - Alternative/Backup Water Supply

Process Studies in Response to Hazards (Drought, Extreme Heat, Ice Storms, etc)

- Wastewater Treatment Processes

Extreme Heat

- Personnel & Operational Conditions

Backup Power Generation

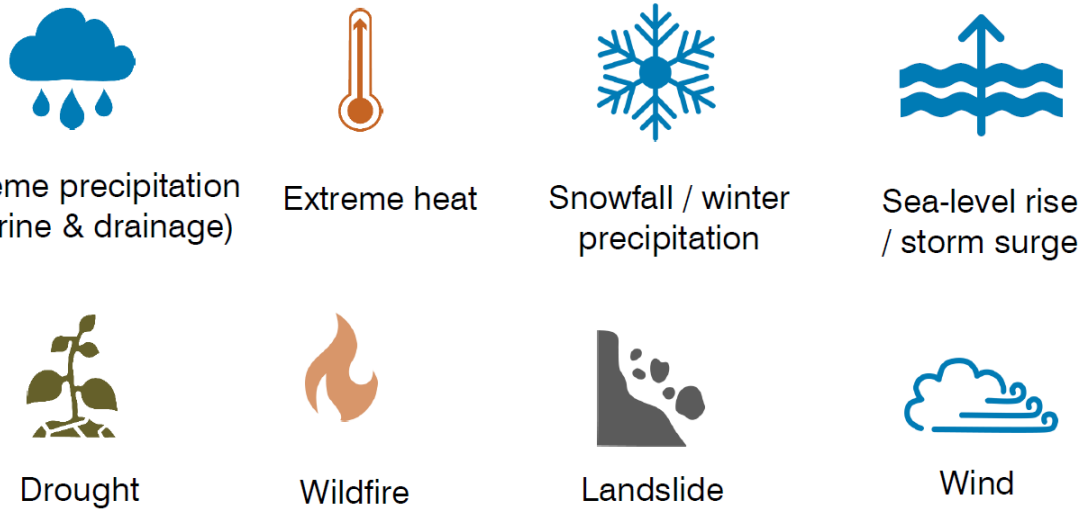
What Does This All Mean for You?

- Get to know your local water & wastewater systems
  - Spread your knowledge
- Support your local utility
- Advocate for infrastructure projects & funding

NHDES Vulnerability Assessment Initiative

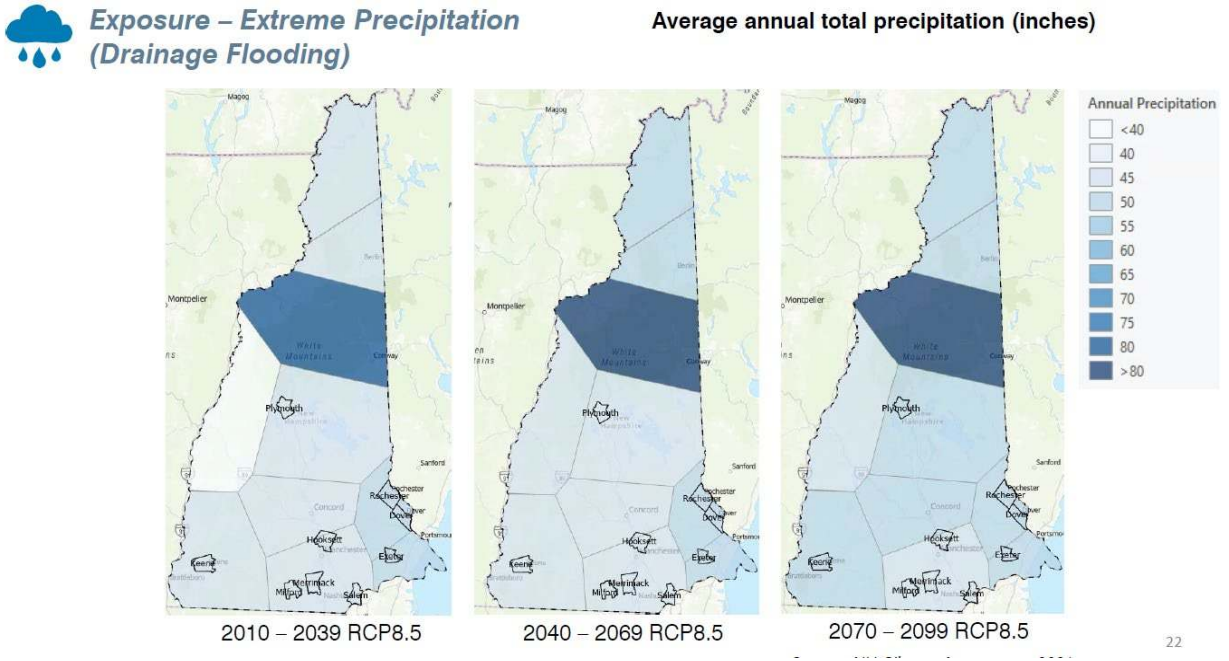
Climate Change Vulnerability Assessment (CCVA)

- NHDES managed project
- Contracted to Weston & Sampson
- Tentative completion date – 12/2024
- Includes 9 communities (Keene, Hooksett, Salem, Milford, Plymouth, Dover, Exeter, Merrimack, Rochester)
- Formal assessment of DW/WW Infrastructure
  - Potential natural hazards
  - Analyzed through year 2100
- Final product will include
  - Individualized reports for each community
  - Summary report & state story map for NHDES



CCVA Current Progress

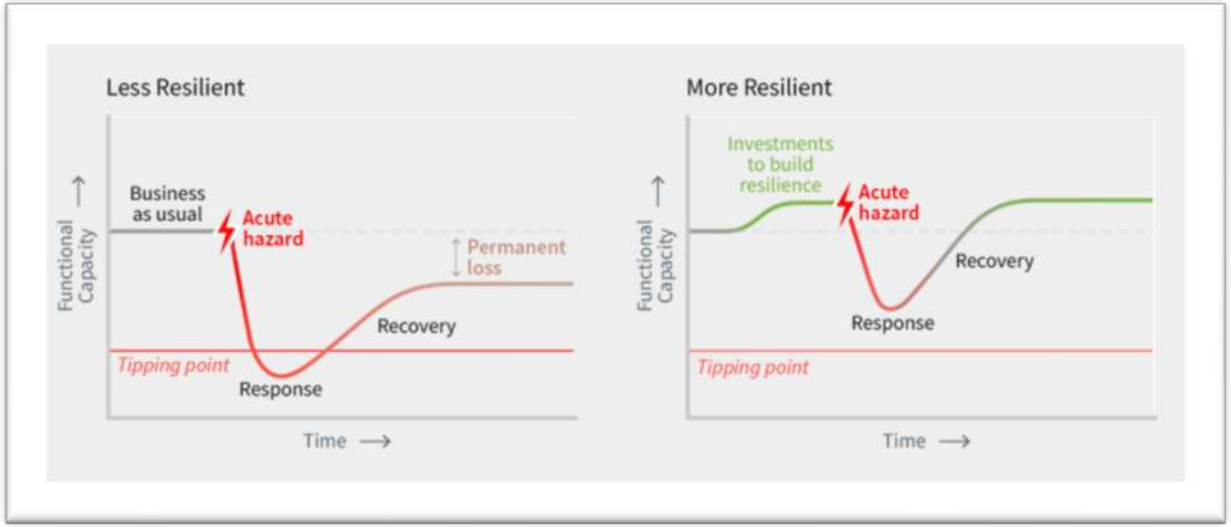
- Completed Site Surveys
  - 4/9 Communities
  - Interviews, site assessments, etc
- Pulling info from various sources (NHDES, USGS, UNH Climate Assessment, previously completed studies, etc.)
- Piloting analysis framework



Key Takeaways

1. Appreciate & Support Your Local Utilities
   - Water & WW infrastructure is essential to communities & businesses
   - Recognize utilizes face a lot of complex and expensive issues
   - Support local utilities with knowledge and advocating resources

2. General Understanding of Resilient Infrastructure
   - Increasing Functional Capacity
   - Risk Management/Tolerance
   - Integrating specific design into other projects



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Questions?

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