Coastal Resiliency & Adaptation in the Water & Wastewater Industry

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Cape Fear Public Utility Authority

- Largest provider of water and wastewater services in New Hanover County.
- Serves approximately 200,000 individuals and businesses, including New Hanover Regional Medical Center and the University of North Carolina Wilmington.
- Source waters: Cape Fear River, Castle Hayne and Peedee Aquifers
- Maintains over 2,000 miles of water and wastewater pipes and approximately 150 pump stations.

What Will the Future Bring?

- Coastal Communities should expect:
  - More frequent extreme weather events
  - More intense precipitation events
  - Sea-level rise and saltwater intrusion
  - Nuisance flooding
  - Temperature increases

- Challenge: How do we prepare for an uncertain future when capital investment planning for water and wastewater infrastructure requires looking 30-50 years down the road?

Impacts on Water and Wastewater Systems

- Source water quality and quantity may deteriorate.
- Water infrastructure may be at risk from sea-level rise and more frequent flooding events.
- Temperature increases may affect working conditions for staff.
- Impacts from multiple extreme weather events may deplete financial resources and impact rate affordability.

Changes in Water Quantity & Quality

- Increasing temperatures → algal blooms and evaporation
- More precipitation events → upstream runoff and nutrient loading
- Sea-level rise→ salt water intrusion into aquifers

Water Infrastructure at Risk

- Pump stations tend to be located in lowest areas of town→ may be affected by sea-level rise.
- Flooding and more intense precipitation events→ sanitary sewer overflows.
- More extreme weather events→ loss of power→ water treatment is very energy intensive.

Temperature Increases & Staff Safety

- Aging infrastructure requires frequent maintenance and repair work
  - Approximately 590 miles of water and sewer piping that is 40+ years old
- Emergency breaks and SSOs can happen at any time.
- During the hottest days of the year, staff can be at risk for dehydration and heat injury.

Financial Challenges

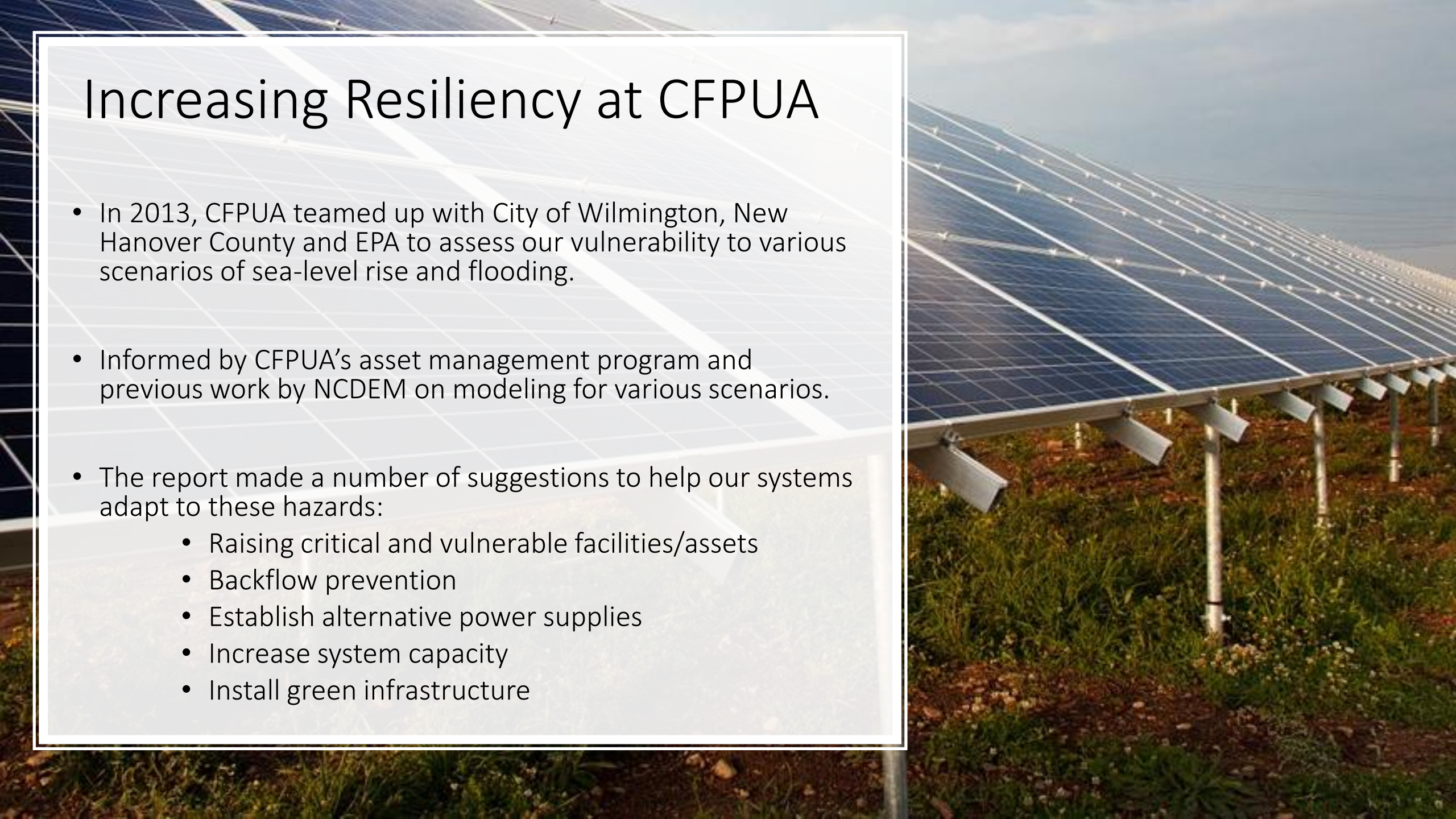
- Resiliency may mean:
  - Financial planning for redundant infrastructure
  - Investment in alternative energy supplies
  - Investment in more treatment technology
  - Reserves for multiple extreme weather events
- Utilities with diminishing customers bases or increasing costs of living may struggle with rate affordability as they balance resiliency work and the investments needed to keep the system running today.

Increasing Resiliency at CFPUA

- In 2013, CFPUA teamed up with City of Wilmington, New Hanover County and EPA to assess our vulnerability to various scenarios of sea-level rise and flooding.

- Informed by CFPUA's asset management program and previous work by NCDEM on modeling for various scenarios.

- The report made a number of suggestions to help our systems adapt to these hazards:
    - Raising critical and vulnerable facilities/assets
    - Backflow prevention
    - Establish alternative power supplies
    - Increase system capacity
    - Install green infrastructure



CFPUA Progress on Adaptation Strategies

- Asset management program
- Introduced strategic interconnects and redundancies
- Successful backflow program
- Performing elevation study with new drone program

The American Water Infrastructure Act (AWIA)

Passed in 2018, the AWIA requires water utilities to assess natural disaster vulnerability.

With this assessment, CFPUA will also evaluate climate change vulnerability.

CFPUA's Journey Toward Resiliency Continues…

- Water reuse and source water diversification
- Formation of an Energy Team to understand organizational energy usage and work toward energy use reductions
- Upstream partnerships
- Drought planning

Questions?

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