Climate Change Resilience: North Carolina’s Story

Dr. Amanda Martin
Chief Resilience Officer
NC Office of Recovery & Resiliency
Welcome!
Tropical Storm Fred
The Science

**Virtually Certain**
Sea Level will continue to rise

**Very Likely**
Summer Heat Index Values will increase

**Likely**
Annual Total precipitation will increase

Source: Kunkel et al. (2020) *North Carolina Climate Science Report*
The Science

**Likely**
Hurricane intensity will increase

**Likely**
Severe droughts will become more intense

**Likely**
Increase in precipitation will lead to an increase in inland flooding

Source: Kunkel et al. (2020) *North Carolina Climate Science Report*
The Science

A. Climate Change Projections in North Carolina

Virtually Certain: Sea Level will continue to rise
Very Likely: Summer Heat Index Values will increase
Likely: Annual Total precipitation will increase
Likely: Hurricane intensity will increase
Likely: Severe droughts will become more intense
Likely: Increase in precipitation will lead to an increase in inland flooding

Source: Kunkel et al. (2020) North Carolina Climate Science Report
The Science

A. Climate Change Projections in North Carolina

1. Virtually Certain: Sea level will continue to rise
2. Very Likely: Summer heat index values will increase
3. Likely: Annual total precipitation will increase
4. Likely: Hurricane intensity will increase
5. Likely: Severe droughts will become more intense
6. Likely: Increase in precipitation will lead to an increase in inland flooding

Virtually Certain = 99–100% probability of outcome
Very Likely = 90–100% probability of outcome
Likely = 66–100% probability of outcome
About as Likely as Not = 33–66% probability of outcome
Unlikely = 0–33% probability of outcome
Very Unlikely = 0–10% probability of outcome
Exceptionally Unlikely = 0–1% probability of outcome

B. Non-Climate Stressors facing North Carolina

- Population Growth
- Aging Infrastructure
- Socioeconomic disparity
- Physical Attacks, Cyber Security, and other manmade disasters
- Rural-Urban Divide
- Public Health Threats/Pandemics

Source: Kunkel et al. (2020) North Carolina Climate Science Report
What’s At Stake

Wildfire
Saltwater intrusion
Flash and riverine flooding
Cumulative public health burden
Loss of housing stock; business and job loss
Water quality and ecological impact
What’s At Stake
Resilience: Two Models
Resilience: The Swinging Door Model

How much time does it take to get back to a baseline after a shock or stress?

… is that baseline the best we can be?

Is the baseline good enough for the future?
Swiss Cheese Model

“Why Swiss cheese may be the key to keeping you safe from COVID-19”

- Multiple layers of defense
- No single layer provides 100 percent protection against harm
- Residual possibility of harm

University of Iowa Hospital & Clinics website: https://uihc.org/health-topics/why-swiss-cheese-may-be-key-keeping-you-safe-covid-19
Land Use

How do we live with water?
A place for development and a place for water.
First, do no harm: Not making flooding problems any worse

Future Land Use
- Traditional Town Center (TTC)
- Suburban Town Center (STC)
- Coastal Traditional Neighborhood (CTN)
- Low Density / Suburban Neighborhood (LDSN)
- Rural / Agricultural (RA)
- Light Industrial / Employment (LIE)
- Conservation Priority Area (CPA)
- Gateway Corridor (GC)
Infrastructure

Photo (center + left): Jess Whitehead

Photo: Baxter Miller/RI$$ING
Nature Based Solutions

Natural features provide protection
Community Capacity

Local government

![Local government image]

Neighborhood cohesion

![Neighborhood cohesion image]
Social and Economic Connectedness

- Government capacity
- Local schools and parents
- Faith communities
- Chambers of commerce
- Health providers and champions
- Business owners
- Local media
- Nonprofits
- Senior centers
- Workforce development
- Leadership and representation!!
Emergency Preparedness

- Emergency management operations
- Multi-lingual emergency communication
- Household emergency kit
- Evacuation preparation, especially for elders, people with disabilities
- Know your flood risk: flood.nc.gov
- Purchase flood insurance (even renters)
What’s Happening in North Carolina?

UPDATING DATA

- Rainfall frequencies (Atlas 14)
- Future rainfall statistics
- Probable maximum precipitation
- Climate projections

Intensity-Duration-Frequency Analysis Tool
What’s Happening in North Carolina?

RETROFITTING TO BETTER STANDARDS

Protecting N.C. 24 between Swansboro and Cedar Point by building large-scale living shorelines

Restoration efforts along the corridor will improve water quality in the White Oak River
What’s Happening in North Carolina?

HEAT HEALTH EMERGENCY PREPAREDNESS

Heat-health alert systems in Bladen, Robeson, and Scotland Counties tailored toward populations most vulnerable

High heat included in Durham Community Health Assessment; urban heat island effect mapping
What’s Happening in North Carolina?

COMMUNITY RESILIENCE PLANNING

Local and regional leadership and action provide groundwork for bringing in implementation money

Two state programs provide technical assistance for local government and regions interested in resilience planning
What’s Happening in North Carolina?

TELL US MORE!
Resilience Recap

1. There is a lot at stake in North Carolina

2. Make today’s decisions in consideration of their *generational* impact

3. Learn from past mistakes (swinging door) and build many layers of resilience (swiss cheese)