



North Carolina

Climate Risk Assessment and Resilience Plan

Impacts, Vulnerability, Risks, and Preliminary Actions

Appendix D: North Carolina Coastal Regional Workshops Report

June 2020

2019 North Carolina Coastal Regional Resilience Workshops

Summary Report

North Carolina Department of Environmental Quality

Division of Coastal Management

September 2019



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Background and Purpose

The N.C. Division of Coastal Management (DCM) and its many public, private, and non-profit partners have been pursuing and supporting coastal community resilience building efforts for many years. From the monitoring of long-term erosion rates to the disbursement of over \$275,000 in local Planning and Management Grants to support local vulnerability assessments and other studies, DCM continues to facilitate smart, science-based planning and management efforts. As coastal communities continue to manage and plan for increasing natural hazard risks (e.g., coastal erosion and flooding, extreme rainfall events, drought, wildfire, etc.) that can be exacerbated by climate change impacts (e.g., sea level rise, higher or lower rainfall rates, etc.), DCM has worked to better understand the challenges faced at both the local and regional level.

In late 2018, a combination of local government and active non-profit partners, including the Town of Nags Head and the North Carolina Coastal Federation (NCCF), approached DCM and proposed organizing a series of workshops for coastal stakeholders to convene and discuss problems and solutions to dealing with hazards and climate change risks. Concurrently, in October of 2018, Governor Roy Cooper signed Executive Order 80: North Carolina’s Commitment to Address Climate Change and Transition to a Clean Energy Economy. Along with several directives reduce statewide greenhouse gas emissions to 40% below 2005 levels by 2025, it also included Section 9 which states, in part:

- a. The Department of Environmental Quality (DEQ), with the support of cabinet agencies and informed by stakeholder engagement, shall prepare a North Carolina Climate Risk Assessment and Resiliency Plan for the Council and submit to the Governor by March 1, 2020.
- b. The Council shall support communities that are interested in assessing risks and vulnerabilities to natural and built infrastructure and in developing community-level adaptation and resiliency plans.

To support both the stakeholder engagement needs of Section 9 of Executive Order 80 and the needs expressed by DCM’s partners (who are stakeholders themselves), DCM and NCCF convened a coastal resilience working group to begin planning a total of three events. These included two regional workshops primarily for local governments, followed by a Coastal Resilience Summit that would attract all stakeholders of coastal North Carolina.

This report represents a summary of the feedback and discussion that occurred at the two Regional Resilience Workshops hosted on:

- May 2nd in Elizabeth City, NC
- May 14th in Wilmington, NC

Workshop	Total Participants
Northeast (5/2/19) Elizabeth City, NC	45
Southeast (5/14/19) Wilmington, NC	56



Figure 1. Governor Roy Cooper Signs Executive Order 80

Workshop Planning, Goals, and Design

Planning

DCM and the NC Coastal Federation invited a number of key public, private, and non-profit partners to help plan, design, and promote the two regional resilience workshops. Within the larger working group, three sub-committees were formed to help focus planning efforts. They included both Southeast and Northeast sub-committees as well as a group that supported the efforts of both regional workshops.

Working Group Meeting Schedule:

- (In-person) February 4th, 2019: Craven Community College, New Bern, NC
- (In-person) March 7th, 2019: New Bern/Craven County Public Library, New Bern, NC
- (Call/Webinar) March 27th, 2019: Conference call and webinar
- (In-person) April 11th, 2019: New Bern/Craven County Public Library, New Bern, NC
- (Call/webinar) April 25th, 2019: Conference call and webinar

Table 1. Workshop Working Group Members

Geographic Role	Name	Organization
Both	Tancred Miller	N.C. Division of Coastal Management
Both	Christian Kamrath	N.C. Division of Coastal Management
Both	Rachel Love-Adrick	N.C. Division of Coastal Management
Both	Whitney Jenkins	N.C. Coastal Reserve
Both	Jessica Whitehead	N.C. Sea Grant
Both	Todd Miller	N.C. Coastal Federation
Both	Ana Zivanovic-Nenadovic	N.C. Coastal Federation
Both	Adam Lovelady	UNC School of Government
Both	Randy Mundt	N.C. Emergency Management
Both	Sam Burdick	Eastern Carolina Council
Both	Bill Cary	Brooks Pierce Law
Northeast	Stacey Feken	Albemarle-Pamlico National Estuary Partnership
Northeast	Kevin Richards	Mid-East Commission
Northeast	Brian Boutin	The Nature Conservancy
Northeast	Lora Eddy	The Nature Conservancy
Northeast	Holly White	Town of Nags Head
Northeast	Charlan Owens	N.C. Division of Coastal Management
Southeast	Wes Macleod	Cape Fear Council of Governments
Southeast	Lindsey Hallock	Cape Fear Public Utilities Authority
Southeast	Mike Christenbury	N.C. Division of Coastal Management

Additional outreach support was provided by Joe Heard (Town of Duck), Kathleen Riley (NC Beach, Inlet, and Waterways Association), Jeremy Hardison (Town of Carolina Beach) Michael Flynn (NC Coastal Federation), and Joey Hester (N.C. Division of Soil and Water Conservation).



Workshop Goals and Design

The goals of the workshops were to bring together local government staff, elected officials, and other local leaders to explore a number of topics.

Workshop Goals:

- 1) learn how communities and the science community are measuring and managing changes that may be exacerbated by climate change;
- 2) understand and validate the impacts and risks of natural hazards, both short- and long-term;
- 3) discuss potential strategies that could be implemented at the local level; and
- 4) generate recommendations for resiliency planning that could be implemented at the state level

Workshop Design

To achieve these goals, the working group developed a full day of presentations and facilitated discussion activities that provided multiple forms of engagement for the audience:

- **Presentations and Question & Answer**

To help set the stage for the afternoon series of facilitated discussions, participants heard from local government representatives, state officials, and climate science and adaptation experts on the basics of resilience planning. PowerPoint presentations touched on topics including:

- Executive Order 80 Overview, Live Polling, and Recipe for Resilience
- Managing and Measuring Change: Part 1 – Community Perspectives
- Managing and Measuring Change: Part 2 – Latest Climate and Coastal Science

- **3-Part Facilitated Discussion – Small Groups**

Participants were asked to organized into their pre-assigned small groups based on their professional role (e.g., community development planners, emergency managers, elected officials, etc.). An experienced facilitator then led the group through the following questions to solicit feedback:

- 1) *Given your direct experience, how do natural hazards and long-term stressors affect different sectors of the community?*
 - Participants were provided with examples of both natural hazards and long-term stressors as well as the typical community sectors. They were asked to consider the information from earlier presentations and record their initial thoughts on sticky notes before sharing and discussing with the facilitator and rest of the small group. One member of the group then shared the highlights from the group which was recorded on a flip chart.
- 2) *Which strategies (found on posters) should be explored or used first for addressing climate hazard impacts and long-term stressors?*
 - Participants were given 20 minutes to review the four resiliency strategy posters displayed in the room before their small group was led by the facilitator to each poster. Facilitators then recorded answers on sticky notes and flip charts.
- 3) *How Should the State better support communities? (e.g., funding, regulation and policy changes, technical assistance, training/resources, other)*
 - Participants were asked to consider their pressing issues, the previously discussed strategies and describe ways the state or other organizations may be able to support resiliency and adaptation efforts at the local level.

See Appendix A for full workshop agendas.

Managing and Measuring Change: Parts 1 and 2

Each regional workshop featured several presentations from local government or other organizations describing their recent efforts to build community resilience to hazards and climate change.

Presentations included:

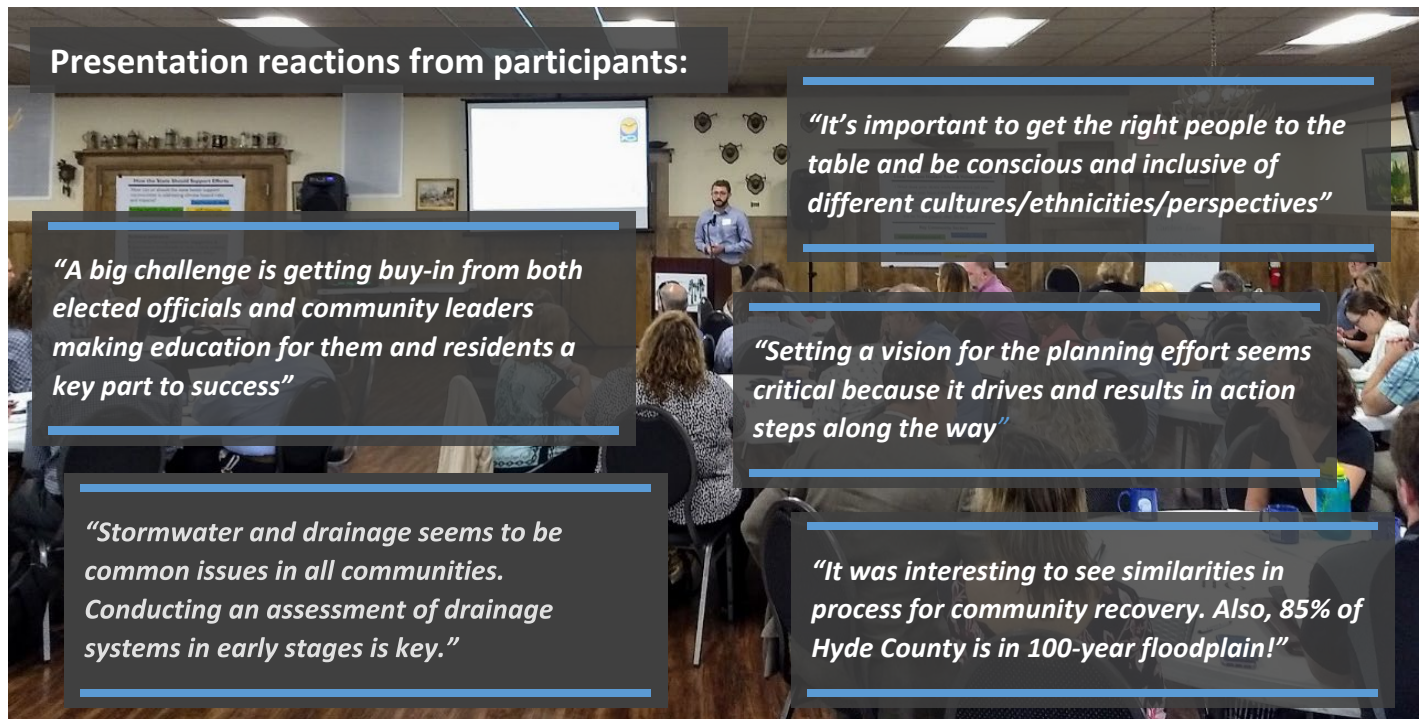
Northeast Workshop (May 2nd) – Elizabeth City, NC

- Community Perspectives:
 - **Town of Edenton:** Elizabeth Bryant, Planning Director
 - **Town of Nags Head:** Holly White, Principal Planner
 - **Hyde County:** Daniel Brinn, Flood Control Coordinator
- Latest Climate and Coastal Science:
 - **Dr. Reide Corbett,** East Carolina University and Coastal Studies Institute
 - **Dr. Jared Bowden,** SE Climate Science Adaptation Center and N.C. State University

Southeast Workshop (May 14th) – Wilmington, NC

- Community Perspectives:
 - **Town of Swansboro:** Andrea Correll, Town Planner
 - **Cape Fear Public Utility Authority:** Gary McSmith, Assistant Director of Engineering
 - **Town of Carolina Beach:** Jeremy Hardison, Planning and Zoning Director
- Latest Climate and Coastal Science:
 - **Dr. Lawrence Cahoon,** University of North Carolina Wilmington
 - **Dr. Jared Bowden,** SE Climate Science Adaptation Center and N.C. State University

Reactions from Workshop Participants:



1) Local Climate Hazard Risks and Vulnerabilities

The first session of small group facilitated discussions aimed to better understand and validate existing knowledge of natural hazard and climate stressor impacts felt at the community level. Workshop participants were provided with examples of natural hazards and long-term stressors and then were asked about their observations and experiences about impacts to various community sectors: A) natural environment, B) vulnerable populations and systems, C) infrastructure and built environment, and D) economic drivers.

Question asked at both workshops:
<p>What does your direct work experience tell you about how natural hazards and long-term stressors affect different sectors of your community?</p> <ul style="list-style-type: none"> • <i>Are there regular day-to-day decisions, activities, or investments happening now that will be 'in the ground' after 30-50 years</i>
Note: Each asterisk (“*”) represents the number of participants who expressed the same point.

Coast-wide Takeaways:

- Many long-term management challenges (stormwater drainage/impervious surface, flooding, water quality, affordable housing, septic system function, population/workforce loss, degrading habitat quality, etc.) have been exacerbated by recent historic and extreme weather events (Hurricanes Matthew and Florence, and Tropical Storm Michael).
- Two emerging and universal issues in coastal communities involve: 1) educating both year-round and transient tourist populations about actual flood risks and need for flood insurance; and 2) moving communities towards more integrated water management (e.g. stormwater, wastewater, drinking water, agriculture, etc.) at the local and watershed scale.
- Socially vulnerable populations (e.g. elderly, disabled, low-income, communities of color, non-English speaking) suffer the greatest economic and public health-related impacts from both disasters and long-term stressors and are less able to adapt to changes on their own.

A) Impacts to the Natural Environment	
Northeast	Southeast
<ul style="list-style-type: none"> • *Salt-water intrusion (affects water supply and species distribution, ecosystems & services) • Prolonged flooding and runoff leads to harmful algal blooms and septic issues • Shifts in debris and marsh health • Length of time for forest recovery • Storms removing beach nourishment 	<ul style="list-style-type: none"> • *Degraded ecosystems (e.g., wetlands) affecting recreational/shellfish water quality • *Shoreline/riverine erosion • *Trees down from storm events reducing flood retention and wind protection benefits; difficulty meeting requirements for Tree City Certification • Water quality degraded from pollution runoff • Shoaling leads to cutoff access to water-based businesses • Drainage ditches inadequate • Sensitive species lost first

B) Impacts to Vulnerable Populations and Social Systems

<i>Northeast</i>	<i>Southeast</i>
<ul style="list-style-type: none"> • ***Communicating risks to non-permanent residents on oceanfront, or for new owners who come post-storm • Disaster can boost community morale & political will, bringing people together to invest in public safety • Socially vulnerable (low income, elderly, non-English speaking) are impacted the most and for the longest • Needing cell phone directories to keep communication during events • MOAs in place for fuel provisions to utilities and public buildings • Buyouts in rural areas – can't afford loss of tax base; opting for elevations instead • Corresponding pressure on receiving Counties from population shift from housing loss – both short and long term • Hard to know needs and move people during evacuation 	<ul style="list-style-type: none"> • **Physical and psychological impacts to first responders and other town staff may be 'under the radar' • *Newcomers buy properties post-storm without understanding risks • *New and exacerbated mental health issues caused by traumatic event • *Family displacement/population loss over long periods of time • Poor/low income groups hit hardest by disasters - less able to clean up, develop safe living space, and navigate disaster recovery programs • *Low-paying service jobs affected by disaster when businesses close • *Elderly populations and others on a fixed income may not be fully prepared for hurricane or able to incur extra expenses • Harder to conserve water during drought • Some businesses not fully prepared for hurricane's impact to tourism • Public health effects of mold • Complexity of recovery assistance framework more challenging to navigate for socially vulnerable (less education, non-English speaking) • Insurance issues • Increased cost of compliance issues • Property rights conflict with hazard vulnerability • Personal losses (contents or other not covered by insurance) • Evacuation of university students a challenge

C) Impacts to Infrastructure and the Built Environment

<i>Northeast</i>	<i>Southeast</i>
<ul style="list-style-type: none"> ● Wastewater System Concerns <ul style="list-style-type: none"> ○ Septic Sewer Systems <ul style="list-style-type: none"> ▪ Elevated groundwater table threatens viability ▪ Health departments are requiring the elevation of drainage fields using large quantities of fill contributing to flooding on adjacent properties ● Centralized Sewer Systems <ul style="list-style-type: none"> ○ Saltwater intrusion entering manhole covers during storm events that can negatively affect the treatment process. Inundation from heavy precipitation events/storm surge is also a concern for treatment plants located in in low lying areas or within close proximity to the coast. ● Stormwater Management <ul style="list-style-type: none"> ○ Participants acknowledged that the level of vulnerability is dependent on the hazard— differentiating between heavy precipitation (+ antecedent conditions/*high groundwater levels), *wind-driven flooding, and storm surge. ○ Participants discussed that public perception between increased frequency and severity of flooding varies. Some think it has to do with increased development, others associate more extreme precipitation events, and others view sea level rise as cause, while others recognize the interactions between the drivers. ○ Camden County is seeking to conduct a study to re-open outfalls on U.S. 158 with the intent to coordinate highway widening in conjunction with flood mitigation efforts. ○ Stormwater re-designs are needed to decrease reliance on outfalls ● Transportation Systems <ul style="list-style-type: none"> ○ *Flooded roads and inaccessible communities/neighborhoods, or left destroyed ○ Jug Handle bridge/Mid-Currituck Bridge as elevated 	<ul style="list-style-type: none"> ● ****Increased development and impervious surfaces reduce natural flood retention (e.g., floodplain and trees) and increase runoff ● **Major stormwater issues became more visible to all – caused by higher water table ● ***Destroyed infrastructure leads to disruptions ● ***Loss of affordable housing (particularly renters) ● **Capital Improvement Plans budget not designed to have system destroyed (bridge/road washouts) instead of slowly degrading ● *Emergency access to some areas can be cut off or limited during storm ● *Closing of schools ● Sand in wastewater systems ● Failing septic systems ● Fishing piers damaged in storms ● Derelict boats and debris clean up ● Building code for wind leaves structures vulnerable to extremes ● Older homes on waterfront built to old elevation standards ● Cost to rebuild to code post-storm ● Shelters not adequate ● NGO and faith-based recovery groups not always implementing hazard mitigation practices (e.g., structure elevation, FORTIFIED roof, etc.) ● Repetitively damaged infrastructure might be abandoned ● Transportation infrastructure – inadequate design standard for flooding; not proactive ● Even newer infrastructure (four-year old water treatment plant) overwhelmed ● Retrofitting more challenging/expensive for rural communities

D) Impacts to the Economy

Northeast

- *Participants discussed the economic impacts flooding has on revenue collection since property tax values decrease in areas where property is inaccessible for extended periods of time or is considered a repetitive loss property.
- *Participants also highlighted the impact storms have on tourism-based economies, specifically a decrease in occupancy tax collected following an evacuation order and subsequent storm recovery.
- Lost agriculture income leads to increased prices for consumers

Southeast

- ***Workforce displacement
- **Population loss leads to permanent tax base loss & reduced revenue for utility rates leading to increasing rates
- **Growth and tourism reduced post-disaster (piers destroyed/damaged)
- *Failing or struggling farms (livestock and agriculture) knocked out by disaster
- Drought affects community aesthetics and community mood
- Shoaling leads to disrupted access to water-based businesses
- Business closures impact service jobs
- Beach tourism hampered by poor water quality/health risks, public access damaged (occupancy tax revenue down 20% in one town since Florence)
- Inland riverine flooding of commercial areas/downtowns
- Gas, fuel, and energy disrupted
- Room for new development may be limited; lack of safe areas
- Funding streams get backlogged during recovery



2) Potential Strategies

The second facilitated discussion conducted in small groups served two purposes. First, it exposed participants to a range of potential structural and non-structural strategies along with examples for building community resilience. Second, the discussion asked participants to consider each of the four different categories of strategies and identify which are already being used to explicitly incorporate or address climate change or resiliency issues. Participants at the Southeast Workshop were also asked about which strategy may be most useful or feasible to pursue first.

Question asked at Northeast Workshop:	Question asked at Southeast Workshop:
What types of plans, projects, programs, or activities are you already doing to reduce future climate/hazard risks? Also, think about things not related to ongoing disaster recovery (e.g., blue sky activities).	Which of the strategies on each of the four posters do you think should be explored first for addressing current & future climate change impacts?

Coast-wide takeaways:

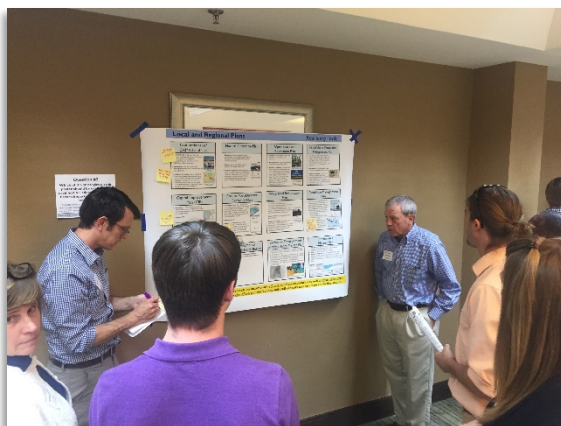
- There are many existing plans that, in theory, help find ways to reduce risk to natural hazards, but most do not explicitly acknowledge or account for climate change projections.
- It's a challenge, especially for smaller communities, to integrate plans and ordinances more thoroughly when there are not any incentives, or to find resources (staff capacity, time and funding) and expertise to take future projections and model impacts at the local level (e.g., building by building and neighborhood by neighborhood)

*Strategies listed toward the top of each sub-section were marked as most commonly used or useful.

Strategy	Comments and Examples
<i>Local and Regional Plans</i>	
Comprehensive or CAMA Land Use Plan	Seems to have little impact or 'teeth', gets amended frequently
Hazard Mitigation Plan	Completed as a requirement; but where is intersection with future climate risk?
Capital Improvements Plan	Opportunity to protect long-term investments; can contain asset management policy to collect data on infrastructure impacts to show trends from climate change; include succession planning for staff turnover to capture institutional knowledge of hazard risk
Stormwater Master Plan	Most communities address through ordinances
Floodplain Management Plan	Most communities address through ordinances
Pre- or Post-Disaster Recovery Plan	Not adopted by communities – challenging as rules can change from year to year. One preparedness measure used included pre-permitting temporary housing before disaster.
Open Space and Recreation Plan	Few communities have one adopted
Watershed Restoration Plan	Few have adopted

Outreach/Engagement Plan	Useful to tie other plans cohesively; suggested activity from workshop participant
Economic Development or Waterfront Master Plan	Economic development plan usually done at regional level
<i>Infrastructure and Nature-based Solutions</i>	
Flood Damage Prevention Ordinance – Freeboard	Most communities have at least a 1-foot freeboard requirement (some with 3-5 feet freeboard) in the Special Flood Hazard Area, but they may not be effective as new Flood Insurance Rate Maps downgrade the flood risk in many areas that are known to flood. To address the issue, Dare County is working to adopt a local elevation standard.
Elevate critical components of utility assets above Base Flood Elevation	Highly effective; the cheapest way to wet flood proof assets and other components (HVAC, electrical panels, etc.)
FORTIFIED standard for roof building	Important measure, but possibly underutilized
Green infrastructure and low-impact development	Best strategy for getting multiple benefits
Dune Management	Done by many communities to supplement beach nourishment
Elevating roads	Not as common
Marsh sills as living shorelines	Greater potential now with streamlined General Permit
Coastal and wetland restoration	
Building redundancy for critical assets (e.g., emergency generators)	
Riparian buffers, habitat conservation	
<i>Education, Awareness, and Incentive Programs</i>	
Digitizing community knowledge of plans and flood risk	
Citizen and new homebuyer education about hazard risk and flood insurance	Includes explaining 100-year flood term and hurricane categories. Good examples of outreach campaigns: OBXfloodmaps.com; National Weather Service Expos
Participate in and advance in the FEMA Community Rating System (CRS)	
Staff training	
Wide, deep, and inclusive public engagement	Suggested activity from workshop participant
Agriculture cost-share programs to restore floodplains and manage nutrients/runoff	Suggested activity from workshop participant
Septic Health Programs or Initiatives	Successful program in the Town of Nags Head (revolving, no interest loans for 7 years)
Interagency communication	Suggested activity from workshop participant
Community college programs for resiliency building and training for career evolution	Suggested activity from workshop participant

Incentives for not rebuilding in same hazardous areas	See example of new approach – Resilience Enterprise Zones
Use of automated systems	Suggested activity from workshop participant
Community Emergency Response Teams (CERTs)	
<i>Local Policy and Regulations</i>	
Flood Damage Prevention Ordinance	Effective because it can affect everyone
Unified Development Ordinance/Land Use Regulations/Zoning	Reviewed routinely to address hazard risk (adjusting freeboard, enact conservation overlay, etc.)
Stormwater Fee	Works in some places, but causes stress in others; consider drainage ordinance or stormwater development criteria pre- or post-development to reduce impacts on adjacent areas and potentially over-burden system. Could consider similar strategy for funding public beneficial use (through conservation or park development) Examples: Elizabeth City assesses fee based on impervious coverage; Camden County assesses a fee to clear drainage ditches
Landscaping and tree ordinance	Concern about a bill to reduce local control on tree removal regulation – Town of Nags Head is incentivizing tree preservation by providing Built Upon Area (BUA) credit. Not originally thought of as a resilience-building strategy.
Dune and beach protection	Needs to go hand-in-hand with development ordinances; DCM/CAMA should strengthen existing rules
Conservation overlay zones	
Cluster development	Originally thought as just good planning practice, but now see resilience benefits of avoiding hazardous areas
Conservation easements and buyouts to restore/enhance floodplain function	
CAMA 7H guidelines	Suggested activity from workshop participant
Green infrastructure implementation	Need new mechanisms to ensure it's really green in rapidly developing rural areas
Other	Need to connect and integrate planning for stormwater, wastewater, and drinking water management



3) How the State Could Support Local Resilience Efforts

Following discussion about locally-experienced impacts from natural hazards and long-term stressors as well as the range of potential strategies to reduce risk and build resilience, workshop participants then explored various avenues for how state government can and should support communities. This discussion was broken into six key categories of support which translate into recommendations to include in the State Climate Risk Assessment and Resiliency Plan.

Question asked at both Workshops:

How can or should the state better support communities in addressing climate hazard risks and impacts? Categories of support include:

- A. *Data and Research*
- B. *Technical Assistance*
- C. *Staff Resources and Connections*
- D. *Regulation and Policy Changes*
- E. *Funding*
- F. *Education, Training, and Outreach*

*The first three bullet points under each section represent topics or ideas that were reiterated by multiple participants.



A. Data and Research

Overall, workshop participants didn't necessarily think there was a lack of data available to support climate resilience work, but more importantly, relevant data and research may not be accessible to local government staff or is not clear in its direct application at the local government decision-making level. Participants suggested additional issue areas that could benefit from further research and data.

- Communities need increased monitoring infrastructure and access to real-time data at a localized scale on a number of variables that signal possible hazard risk including: weather stations and water level gauges (surface and groundwater)
- Many participants were unaware of or had not analyzed high-resolution datasets created and maintained by North Carolina Division of Emergency Management or Department of Transportation (e.g., building footprints and first-floor elevations, flood modeling data, roads, ditches, and outfalls).
 - Improvements are needed on interagency coordination – consider the NC OneMap portal.
- There is a need for understanding what the climate change trends and projections at a state and regional level through a database (including relevant journal articles not blocked by pay walls)
- Existing tools and assessments should be updated and expanded with consideration of future climate conditions and application at community scale including:
 - Intensity-Duration-Frequency [IDF] curves
 - Coastal Region Evaluation of Wetland Significance (CREWS) wetlands
 - Submerged aquatic vegetation
 - NCEM Flood Inundation Mapping Alert Network to include risk and monitoring for dams, fire, and other hazards
 - Social vulnerability index data at smaller scale than census tracts
 - Basin-wide land use analysis and impervious surface cover changes

- Need clearer understanding of what data requests are expected after a disaster as well as support needed for pre- and post-storm surveys of oceanfront and estuarine coast
- Workshops and trainings should focus on gathering and using various data for climate resilience planning and highlight ‘cheat sheet’ of expected return on investment/benefit-cost analyses for various measures, including which provide positive social outcomes beyond economic.

B. Technical Assistance

Workshop participants were presented with some specific types of technical assistance (e.g., community planning/stakeholder engagement, benefit-cost analyses, project site assessment and preliminary design, final design and permitting, monitoring, evaluation, and maintenance). Communities expressed that going beyond day to day responsibilities and functions to incorporate climate and resilience is a great challenge especially for smaller, rural communities with limited staff and resources. Local staff need clear and succinct guidance on these topics and ideally an individual or person they can call when they need assistance or have specific questions.

- After a disaster, local staff need specific help and guidance on: navigating all state and federal programs and timelines; contracting post-disaster, including emergency procedures for bidding process to help avoid small communities being taken advantage of by vendors; creating a phone help line for engineering and architectural services; using recovery funds for community development; working with bond rating levels; and benefit-cost analysis that is region specific (coastal vs inland communities)
 - Suggest moving county staff to areas post-event to help municipalities further, and consider pairing communities to gather lessons and provide support (e.g. a smaller joint field office)
- Support for navigating and getting points through the FEMA Community Rating System including developing floodplain management plans, and guidance on state administered floodplain regulations, stormwater management best practices and funding opportunities. May require more state staff and funding for travel to reach eastern North Carolina communities.
- Support and resources funneled to the regional level (Councils of Government) for higher capacity planning, engagement, and training to go to local partners
- Facilitators and experts to guide staff through DCM Resilience Evaluation and Needs Assessment or similar process
- Remove state subdivision exemption
- Empower local advocacy groups through partnerships

C. Staff Resources & Connections:

Outside of funding and technical assistance, workshop participants expressed the need for other types of support related to staffing and making connections to existing programs.

- Additional state-agency staff support on the ground during short- and long-term disaster recovery activities including: expedited grant process for FEMA Hazard Mitigation Grant Program; connecting to and communicating with the correct FEMA representative; state should have designated rainy day funds for quick release to assist displaced populations; greater direct access to NCEM needed for municipalities; form and deploy a retired professionals’ corps to help communities navigate programs/process (FEMA, USACE, etc.)
- State portal for relevant agency staff contact information on various resiliency issues (phone tree with back up contacts), including trained facilitators and stormwater experts
- Putting authority/responsibility at lower levels such as signature authority or job approval authority to expedite

- Provide website/clearinghouse/workshops for local communities on best practices for resilience and adaptation; support with trainings and assistance brought to a regional level that covers all parts of the coast. This would provide more equitable support for lower resourced communities especially relevant post-event with fatigue of public safety and local representatives
- State portal for contact information in all communities (phone tree with back up contact)
- Get state counterpart to FEMA rep that networks with other federal agencies – locate in offices closer to affected communities (field or satellite office)
- Floodplain administration and Geographic Information Systems (GIS) software
- Create capacity at community colleges to provide technical assistance to advocacy/other groups

D. Regulation and Policy Changes

As the challenges and solutions for climate change and resilience continually change, the existing state-level regulations and policies may or may not be allowing or incentivizing positive actions at the local government level. Since many local government powers are specifically enabled and controlled by state statutes, workshop participants offered feedback as to where revisions or larger changes in state regulation and policy could be made to support implementation of strategies described earlier.

Barriers

- Legislation that removes local authority to use resiliency tools like tree protection ordinances, ability to regulate size/lot/number of bedrooms, ability to adopt higher standards for buildings
- Need ability to adopt local building codes without having to go to the NC Licensing Board for approval
- Need ability to request prestaging and logistics before a storm on our own – not just the ability to request during a storm
- Flaw with rebuilding to pre-storm condition, addressing repetitive loss properties
 - Guidance and program on deal with re-sale of areas, hazard disclosure, and educating prospective buyers
- Subsidies incentivize activity in high risk areas – needs to be assessed and reduced
- Existing conflict between historic preservation and costs for hazard mitigation measures
- Cleaning streams and creeks – clarify when local and county governments can and should do this, and how funding can be used to implement it
- Challenge to obtaining funding to enact higher design standards (e.g., U.S. Department of Agriculture funds for water lines)
- Local inability to go above and beyond regulations on public health and safety
- Mandates or requirements that do not come with adequate funding or guidance to implement
- Review how precipitation is used for CAFO permitting – annual average divided by 365 for a daily precipitation rate is not reflective of climatology
- Watershed management done using geographic boundaries instead of basin boundaries
- Wetland regulations are not consistent between state & federal rules

Needed support and other considerations

- Evaluate nature-based solutions for effectiveness and make them easier to permit
- North Carolina needs a ‘Resiliency Czar’ not housed within a single agency, but with greater authority to effect change across all agencies

- State leadership is helpful because it creates justification for communities to bring up specific topics that may be difficult to introduce otherwise
- Policy guidance on how distinguish or connect disaster recovery to long-term resilience
- Policies to incentivize towns to implement or test innovative resiliency measures through streamlined permitting, taxes and money donations
- Increase freeboard
- Small towns and Tier 1 Counties need more resources for planning and policy
- Engage with health departments and NC Department of Health and Human Services on septic permitting and sea level rise
- Sea level rise needs to be included in state stormwater permits, floodplain maps (shown as future flood risk), coastal and estuarine setbacks, and riparian buffers
- To help ease DCM staff burdens, give local governments guidance on technical guidelines for permits and model ordinances so the process runs smoother overall with less back and forth
- Broader state requirements/guidance so local authority is not lost for stormwater regulations; quantity and quality rules are inconsistent between jurisdictions; more support for enforcement; state oversight of stormwater permits
- Provide guidance and incentivize investment in renewable energy and decentralized solar
- Look at CRS to further integrate state building code, or development of regional standard with state support
- Advertising for contractors – need reimbursement for grant agreements and ways to compensate for there being a limited number of contractors in rural areas (seeing funding expire before a contractor can be booked because there aren't enough to go around)
- Develop resiliency criteria for scoring system to prioritize transportation and other large capital projects and state grant programs
- *Ways to hold local governments accountable for vulnerable population needs
- County vs road vs subdivision approval

E. Education, Training, and Outreach

Very few communities have extra resources to send local staff, elected officials and residents and others to specialized trainings on climate change impacts and resiliency planning. There are still gaps in basic education about future hazard risks and the impacts of climate change on coastal North Carolina. The state can work with established, trusted partners and seek additional support to help institutionalize knowledge about resiliency issues and solutions with particular attention given to smaller, under-resourced communities. Workshop participants took the opportunity to suggest what types of programs would be most useful at the local level.

- Training for local/regional staff on why and how of resilience planning (plus train the trainer)
 - Informational templates to pass through on resilience topics; outreach via social media
- One-stop-shop for resiliency resources – such as NC One Map or UNC School of Government (SOG)
- Education and training for elected officials – possibly through UNC SOG
- Talk with other states, military organizations and international partners about successful approaches (e.g., Virginia, Dutch Dialogues)
- Webinars and forums focused on regional climate science and communicating about impacts
- Resiliency e-mail listserv and network for practitioners (integrate with UNC SOG listservs)
- More floodplain management trainings

- Reference sheets about available funding resources for different types of projects
- Develop a K-12 education program on climate and community resiliency
- Ensure accessible meetings/workshops (language barriers, childcare, transportation), going to stakeholders to meet them where they're at
- Establish resilience partnerships and incentives for being a partner
- More accurate disclosures about flood/hazard/climate change risks

F. Funding

Whether investments are more proactive (occurring before disasters) or reactive (funded by federal and state recovery dollars), there seems to be a lack of funds to support broader resiliency planning and implementation. The state has existing program and processes that could be supported at a higher level of funding or involve a higher level of scrutiny in prioritizing and assessing projects for their feasibility. Workshop participants identified several additional needs for funding in terms of the amount, nature of delivery, etc.

- Reduce delays/streamline process during disaster recovery
 - State funds Hazard Mitigation Grant Program and other recovery programs prior to federal fund appropriation
- More resilience planning assistance for smaller/rural communities - partner with colleges and state (Identify community assets, collect relevant data, build model)
- Funds to implement projects identified in resiliency and other plans
- Revolving loan up front to invest in hazard mitigation and resiliency projects including infrastructure, natural systems, and social programs)
- Account for high hazard areas (including sea level rise) with state funding decisions (e.g., Highways not prone to hazards)
- Resilience criteria for Clean Water/Drinking Water State Revolving Loan programs
- Increase resources to cover non-federal match for grants especially in smaller communities
- CAMA Land Use plan development
- Small Business Administration loans – infrastructure for local governments
- State Legislature revisit reinstatement of local powers to raise funds through intangible fees, right to annex, privilege license fee
- Community college for training in structure elevation
- Try to tie resilience to economic development for NOAA funds (under Dept. of Commerce)
- Home and business buyout program for relocation within same jurisdiction, outside of hazardous areas
- Increase funding within NC Division of Soil and Water Conservation Community Conservation Assistance Program (CCAP)
- Plan for relinquishment of funds to high hazard areas
- Local shelters that can serve as long-term recovery resource centers
- GIS software upgrades and training
- New approaches to finance affordable housing
- Rural broadband infrastructure and access



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