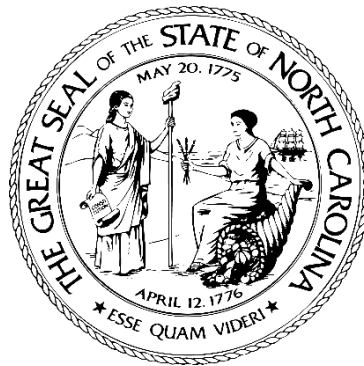




# Executive Order 80: 2022 Status Report

THE UNXDU 2022



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## I. Department of Environmental Quality

### A. Message from the Secretary / Chair of Interagency Climate Change Council

The Department of Environmental Quality and the Interagency Climate Change Council focused on implementing the initiatives of the plans created in response to [Executive Order 80](#), including the Clean Energy Plan, Climate Risk Assessment and Resilience Plan, Motor Fleet ZEV Plan and Clean Energy and Clean Transportation Workforce Assessment in 2021.

At the start of the year, the stakeholder processes developed under Clean Energy Plan Recommendations (A-1 and B-1) completed and delivered their reports. In October, Governor Roy Cooper signed HB 951, the state's bipartisan energy legislation. This legislation mandates a 70% reduction in power sector carbon emissions by 2030 and sets a goal of achieving net-zero carbon emissions by 2050, which is consistent with the goals in the state's Clean Energy Plan.

Cabinet agencies also made strides in reducing carbon emissions from the transportation sector in 2021, including the promotion of sales and adoption of medium- and heavy-duty Zero Emission Vehicles (ZEVs). Here at DEQ, we installed charging stations at locations throughout the state in preparation for more ZEVs in the state fleet.

The State Energy Office successfully partnered with North Carolina A&T University, Appalachian State University and East Carolina University to support approximately 40 students in clean energy workforce development. Efforts targeted high school, community college, and university students from underserved backgrounds to complete hands-on training and education in energy efficiency, solar and battery storage occupations. We are pleased to report that student interest in these programs have tripled for 2022.

The Department continued its focus on resiliency in the face of a changing climate:

- The Division of Coastal Management awarded \$705,000 to provide planning, technical assistance, and capacity building to 26 local governments through the Resilient Coastal Communities Program to help communities with vulnerability assessment and project identification.
- DEQ updated the 2021 Coastal Habitat Protection Plan Amendment with approval from the Environmental Management Commission, Coastal Resources Commission and Marine Fisheries Commission.
- The Dam Safety program completed hydrologic and hydraulic capacity study of over 249 dams in the Neuse and Lumber River Basins.
- Staff mapped energy resilience with a focus on a replicable framework for North Carolina and studied resiliency metrics and targets appropriate for North Carolina's grid infrastructure.
- The Division of Mitigation Services began work on North Carolina's first Flood Resiliency Blueprint, 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.

#### **Interagency Council Meetings**

The North Carolina Climate Change Interagency Council held three meetings in 2021. The February meeting included updates on transportation related initiatives as well as the results of the stakeholder processes for the Clean Energy Plan A-1 and B-1 recommendations. The May meeting focused on State

Building Energy Consumption and Agency Resilience Reports. In October, the Council learned more about the passage of the Energy Solutions for North Carolina Act and the state's efforts to increase fleet EVs.

For detailed agendas and video recordings of all Climate Change Interagency Council meetings, please visit: <https://deq.nc.gov/climate-council>.

As we look ahead, 2022 promises to be a busy year. The Carbon Plan mandated by HB951 is due to the North Carolina Utilities Commission by the end of the year. Executive Order 246: North Carolina's Transformation to a Clean, Equitable Economy builds on EO80, increasing the statewide goal to a 50% reduction in greenhouse gas emissions from 2005 levels by 2030 and achieving net-zero greenhouse gas emissions as soon as possible, no later than 2050. Cabinet agencies will be focusing on the transportation sector as EO 246 also calls for an increase in registered zero-emission vehicles (ZEVs) to at least 1,250,000 by 2030 and the [2022 Greenhouse Gas Inventory Update](#) points to transportation as the state's largest contributor to GHG emissions. Across state government, North Carolina remains committed to addressing the impacts of climate change and an equitable transition to clean energy for the benefit of our residents, our economy and our environment.

Secretary,

Elizabeth S. Biser

## B. DEQ Update on EO80 Climate Mitigation and Economic Development Activities

Table 1. Agency Actions Related to Climate Mitigation

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	<p><b>Tribal Coastal Resilience Connections (TCRC):</b></p> <ul style="list-style-type: none"> <li>The TCRC team continued its social media (#WaterStory) campaign launched 2020 on Indigenous People’s Day to share information about climate science, and resilience and adaptation planning. This platform provided a way to engage virtually about climate issues of concern to Tribal communities, collect stories about Indigenous connections to the land and waterways of the coastal plain in Virginia and North Carolina, and share resilience and adaptation work being conducted by Tribes.</li> <li>Team members conducted outreach about the project at around fifteen events, including presentations at the NC Indian Annual Unity Conference, NC American Indian Heritage Celebration, Carolinas Climate Resilience Conference (APNEP facilitated session), We Still Remain (Arizona State University), Clean Air NC Breathe Conference, Choose Clean Water Coalition, Chesapeake Bay Foundation, Earth Day Live, Climate Reality Project, Tribal Climate Resilience Camp, APNEP Leadership Council, Southeast Climate Adaptation Science Center Global Change seminar: “Stories of Culture and Adaptation,” and NC Coastal Resilience Community of Practice/</li> <li>Outreach included press releases and articles by NCSU:  <a href="#">NC State Student Brings Indigenous Knowledge to State Climate Policies</a></li> </ul>	APNEP, NCDOA NCCIA
	<p><b>Toolbox Development for Local Governments /Use of Natural and Nature Based Infrastructure:</b></p> <ul style="list-style-type: none"> <li>APNEP invited team members from the NOAA funded VIMS project discussed further below to share information about the Virginia based project and discuss the applicability of developing similar tools to promote the use of natural infrastructure to mitigate storm driven flooding. Presentations and discussion sessions were held with the NCCF/APNEP Living Shorelines Team, Coastal Resilience Community of Practice, Water Resources Improvement Team, NWL Coastal Habitats Team, and Outer Banks Community Rating System Users Group.</li> </ul>	APNEP

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>APNEP has contracted with Wetlands Watch to continue outreach in NC, conduct a needs assessment, and develop a template resilience toolbox/toolkit for local governments similar to one created by WW for the VA Coastal Zone Management Program.</p>	
	<p><b>Coastal Habitat Protection Plan:</b></p> <p>Numerous outreach events were held to inform the 2021 update to the CHPP and provide opportunity for public comment. Some of these discussions centered around the importance of protecting and restoring coastal habitat to build ecosystem and community resilience to climate change.</p> <p>APNEP and Division of Marine Fisheries staff participated in presentations and webinars hosted by Creation Justice Ministries, Pew Environment, NC Coastal Habitat Coalition, Audubon North Carolina, and contributed to/interviewed for articles in Coastal Review Online and NC Sea Grant Coastwatch.</p>	DMF, APNEP
	<p>The N.C. Air Awareness program participated in 85 education and outreach events in which staff shared information about EO80, climate change, and electric vehicles reaching over 1,620 people while encouraging specific actions to improve air quality and the environment. This effort included teaching 1,220 driver's education High School students about electric vehicles and encouraging positive behavior changes for new drivers which would also reduce harmful air pollution.</p>	Division of Air Quality / Planning / NC Air Awareness
	<p>The Division of Air Quality continued increasing its communication and reach to teachers through online workshops, including Energy curriculum and activities for k-12 students which will further share EO80 related information with NC citizens.</p>	Division of Air Quality / Planning / NC Air Awareness
	<p>In 2021, the Division of Energy, Mineral, and Land Resources (DEMLR), conducted one hybrid (In-Person/Virtual) Erosion and Sedimentation Control Design Workshop for design professionals, developers and contractors with a total of 150 participants. A wide range of experts presented on common E&amp;SC and Stormwater issues and about solutions based on innovative design and research. State and local program representatives provided updates on the latest regulatory changes and approaches to successful plan design and approval.</p>	Energy, Mineral, and Land Resources / Erosion & Sedimentation Control Program
	<p>In 2021, DEMLR staff conducted an annual workshop for the delegated local erosion and sediment control programs to train local government staff in erosion and sediment control</p>	Energy, Mineral, and Land Resources / Erosion

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>related issues. The 2021 Local Program Workshop was moved to a virtual format and was planned in coordination with the Water Resources Research Institute (WRRI). The workshop was held from April 19th – April 22nd. The 4-days of half-day webinars focused on regulatory updates, design reviews, inspection &amp; enforcement topics, and Erosion &amp; Sedimentation Control best practices. The sessions also incorporated breakout rooms, roundtable discussions, and Q&amp;A panels. The 4 sessions averaged 140 attendees each session (including local program representatives, presenters, and DEQ employees), and 47 of the 54 local programs participated in at least one session. An awards program was conducted at the annual workshop to recognize local governments that excel in erosion and sedimentation control efforts. Plaques were mailed to the two local program winners, Lincoln County and The Town of Apex.</p>	<p>&amp; Sedimentation Control Program</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>In addition to the NC E&amp;SC Design Webinars and the Local Program Workshop, DEMLR staff moderated/co-moderated, attended/exhibited and/or organized the following workshops/conferences/webinars:</p> <ul style="list-style-type: none"> <li>– Moderated the 1/20/21 <a href="#">DEQ WOW Stormwater Webinar</a>.</li> <li>– Organized, attended, and helped moderate the Lounge &amp; Learn with ACF Environmental sessions for DEMLR employees on 1/13/21 and 1/20/21.</li> <li>– Organized and co-hosted a <a href="#">Project WET</a> virtual workshop for educators with DEQ-DWR’s educator Lauren Daniel on 6/14/21 &amp; 6/15/21. Shared what resources DEQ has available for teachers and students.</li> <li>– Organized and co-hosted a Project WET Facilitators’ virtual workshop for educators with Lauren Daniel on 6/21/21 &amp; 6/22/21. Shared what resources DEQ has available for teachers and students.</li> <li>– Participated in the Wake Ed’s Summer STEM webinar for educators on 7/13/21 and shared water education resources DEQ has available for teachers.</li> <li>– Participated in SciREN Virtual Teachers Event on 9/23/21. Shared what resources DEMLR has available for teachers.</li> <li>– Co-hosted a Project WET virtual workshop for educators with Lauren Daniel on 10/25/21 &amp; 10/26/21. Shared what resources DEQ has available for teachers and students.</li> <li>– Starting in September and running through the beginning of December, co-hosted bi-weekly Water Education Coffee Talks with DWR’s water educator, Lauren Daniel, for formal and non-formal educators. The purpose of these coffee talks are to answer questions, showcase our education resources, facilitate networking, and discover/facilitate collaboration opportunities.</li> </ul>	<p>Energy, Mineral, and Land Resources / Erosion &amp; Sedimentation Control Program</p>



Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>Conducted education outreach (preK-12 &amp; College) at the following events/class visits:</p> <ul style="list-style-type: none"> <li>– Participated in River Bend’s Middle School’s virtual STEM Fair/Career Day. Presented to 4 sessions of students, a total of 7 teachers/classes with approximately 20 students per class participated over those 4 sessions 2/26/21.</li> <li>– Virtually visited one Pre-K class of ~8 students at Lincoln Heights Magnet Elementary School on 4/13/21 with Lauren Daniel (DWR educator) to discuss where we find water and looked for signs of erosion.</li> <li>– Virtually judged the <a href="#">NC Envirothon</a> on 4/16/21. Teams of high school students from across the state virtually participated in this competition. The five member teams were tested on their knowledge of natural resources in the following subject areas: Wildlife, Soils, Forestry, Aquatics, and Current Environmental Issues.</li> <li>– As a part of the <a href="#">NC SciFest’s SciMatch Program</a> virtually presented to the NC Cyber Academy’s Middle School Science Class on 4/26/21 and 5/3/21; there was approximately 30 6-8th graders in the class.</li> <li>– As part of the NC SciFest’s SciMatch Program virtually visited Fuquay Varina Middle School on 5/21/21 and presented to 4 8th grade classes over the course of the day, with approximately 34 students per class.</li> <li>– Presented on the Virtual DEQ Career Panel for the NC Governor’s Page Program on 9/30/21, 11 Pages attended the virtual panel.</li> <li>– Attended NC State’s ASABE (American Society of Agricultural and Biological Engineers) Fall Career Fair on 11/6/21 with 3 other DEQ-DEMLR employees.</li> <li>– Virtually visited the Natural Resources Class (~12 students) at JT Williams Secondary Montessori School on 11/12/21 with Chris Graybeal of DEQ-DEMLR's Mooresville Regional Office.</li> <li>– Virtually visited a 5<sup>th</sup> grade classroom of ~20 students at Dillard Drive Magnet Elementary on 11/18/21 and 11/19/21 to discuss where we find water in different ecosystems.</li> <li>– Follow-up in-person outdoor visit with the Dillard Drive Magnet Elementary 5<sup>th</sup> grade class on 11/21/21 to discuss how humans can impact the water in our ecosystems.</li> </ul>	<p>Energy, Mineral, and Land Resources / Erosion &amp; Sedimentation Control Program</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>The Dam Safety Program presented at the Southeast Regional Association of State Dam Safety Officials Conference and Workshop to Design Engineers, Contractors and other State Dam Safety Programs on the development of a Semi-Quantitative Risk Analysis process that North Carolina is designing to use for assessing risk in conjunction with the FEMA High Hazard Potential Dams program and assessing condition of dams as part of its routine inspection program.</p>	<p>Energy, Mineral, and Land Resources / Dam Safety Program</p>
	<p>The NC Stormwater Program has held monthly WOW Stormwater virtual seminars for industry, design, development, and government interests throughout 2021. Seminars have covered topics related to changes in law, general permit updates, and Best Management Practices to name just a few.</p>	<p>Energy, Mineral, and Land Resources / Stormwater Program</p>
	<p>The Stormwater Program has also presented its overall program to the members of APWA at its annual meeting in September of 2021. This covered education and outreach, website updates, NPDES Construction Program, Post-Construction Program, flooding guidance related to stormwater, Industrial Program, Financial Management and the MS4 Program (for local governments).</p>	<p>Energy, Mineral, and Land Resources / Stormwater Program</p>
	<p>The Environmental Stewardship Initiative (ESI) program promotes and supports businesses and organizations to implement environmental management systems (EMS) modeled after the ISO 14001 standard, which pushes organizations to incorporate sustainability and resiliency into their strategic business planning and core business functions. An EMS includes the development of goals to reduce energy, water and resource consumption, as well as to generate less waste. It also asks organizations to consider not only how they affect the environment but also how the environment can affect them, such as through climate change impacts. The ESI program offered a high-level overview training on the ISO 14001 EMS standard virtually twice during 2021. A total of 132 registered and the first set of sessions was recorded and posted online for additional educational opportunities. The program also offered five in-depth ISO 14001 training module classes in 2021 to fourteen registrants.</p> <p>Similar to ISO 14001, ISO 50001 is an international standard for establishing a management system specific to energy. The ESI program also offered a high-level overview of this standard virtually for 12 registrants. This training was recorded and posted online for additional educational opportunities.</p>	<p>Division of Environmental Assistance and Customer Service</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>The Environmental Stewardship Initiative (ESI) facilitates benchmarking/networking events hosted by members in which they share their progress on environmental goals, such as energy/water usage or waste generation reductions, and their associated management programs. We also partner with other organizations to provide educational opportunities on relevant topics that may be hosted at member sites as well. Historically, these events have been in-person educational opportunities. However, due to the COVID-19 pandemic the program transitioned to providing virtual content. In 2021 we provided the following webinar events in conjunction with our partners including the Land of Sky Regional Council, DEQ Waste Reduction Partners, and others:</p> <ul style="list-style-type: none"> <li>• Environmental Benchmarking Session with Sierra Nevada Brewing on their sustainability initiatives. (109 registrants)</li> <li>• Environmental Benchmarking Session with Smithfield Foods in Wilson on their pre-pandemic water usage reduction project. These reductions also led to reductions in energy and waste. (68 registered)</li> <li>• Energy efficiency webinar on Material Handling Technology (32 registered)</li> <li>• Energy efficiency webinar on DOE’s NREL Lithium-Ion Battery Recycling Prize (23 registered)</li> </ul> <p>We also provided content regarding energy conservation, water and waste reduction strategies during the virtual ESI Annual Conference in the Fall of 2021 that reached 110 registrants. Looking forward we will continue this EMS focus and hope to expand our membership base and service offerings. ISO 50001 is becoming more widely adopted, along with zero waste to landfill, resiliency, and circular economy strategies. We will continue to evolve our services in order for NC organizations to operate in a more efficient and optimized way enabling them to provide gainful employment, stable tax bases, robust communities and healthy ecosystem foundations.</p>	<p>Division of Environmental Assistance and Customer Service</p>
	<p>The Recycling and Materials Management Section (RMMS) promotes recycling and waste reduction across the state by providing technical assistance and grant funding to local governments and recycling businesses. In 2021, RMMS sought to emphasize the relationship between materials management and greenhouse gas emissions through use of EPA’s Waste Reduction Model, which quantifies greenhouse gas emissions reductions from recycling and composting as opposed to landfilling materials. RMMS included this framing of recycling and greenhouse gas emissions reductions and quantified emissions reductions</p>	<p>Division of Environmental Assistance and Customer Service</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>from North Carolina’s public recycling programs in a report to local governments and in conference presentations to the Carolina Recycling Association. Information about the circular economy and greenhouse gas emissions will soon be posted to DEACS’ website and will continue to be promoted across the state in presentations, publications, and other communications.</p>	
	<p>DEQ Public Affairs staff have discussed with a researcher on development of a video about the challenges climate change brings to fisheries management. Due to COVID-19 restrictions and staff shortages, the project has been delayed.</p>	<p>Division of Marine Fisheries/Communications</p>
<p>NC Clean Energy Plan Implementation</p>	<p>As part of the NC Clean Energy Plan, the Division of Air Quality developed revisions to the North Carolina Greenhouse Gas (GHG) Emissions Inventory Report during the latter half of 2021. The focus was on updating emissions for the largest sources of GHG emissions for which historical activity data have been published since the previous report was prepared.</p>	<p>Division of Air Quality / Planning / Attainment Planning</p>
	<p>As part of the federal Coronavirus Aid, Relief, and Economic Security (CARES) Act funding opportunity, the State Energy Office (SEO) received approximately \$4 million to support the Department of Health and Human Services’ (DHHS) Low Income Home Energy Assistance Program (LIHEAP) objectives. As such, the SEO worked with private, academic, and non-profit partners during federal fiscal year 2020-21 to create and manage programs aligning with the Clean Energy Plan (CEP) that benefited low-to-moderate income households. In addition, the projects targeted the following focus areas: (1) solar and community solar [i.e., clean energy]; (2) workforce development; (3) energy resilience; and (4) energy efficiency and weatherization.</p> <p><u>Environmental Benefits:</u> Collectively, the SEO’s energy projects were estimated to reduce North Carolina’s annual electricity sector emissions of carbon dioxide, sulfur dioxide, and oxides of nitrogen by 1,461 tons/year, 0.6 tons/year, and 0.9 tons/year, respectively.</p> <p><u>Economic Benefits:</u> Between October 1, 2020, through September 30, 2021, collective efforts supported approximately 350 positions across North Carolina in the following 2017 North American Industry Classification System sectors: (1) Utilities; (2) Construction; (3) Manufacturing; (4) Information; (5) Professional, Scientific and Technical Services; (6) Educational Services; and (7) Public Administration.</p>	<p>State Energy Office</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>The SEO and North Carolina Agricultural and Technical State University (NC A&amp;T) launched pilot efforts in Guilford, Wake, and Halifax counties to support approximately 30 students in clean energy workforce development. Efforts targeted high school, community college, and university students from underserved backgrounds to complete hands-on training and education in energy efficiency or solar occupations. Due to strong collaborative efforts between the SEO and partners, ApprenticeshipNC has fully-approved the following four apprenticeships as of January 2022: (1) <i>Apprenticeship for Solar Energy</i>; (2) <i>Apprenticeship for Energy Efficiency/HVAC</i>; (3) <i>Pre-Apprenticeship for Solar Energy</i>; and (4) <i>Pre-Apprenticeship for Energy Efficiency/HVAC</i>. This aligns with North Carolina’s Clean Energy Plan recommendation to create a statewide clean energy workforce development program with regionally-based learning opportunities.</p>	State Energy Office
	<p>Clean Energy Plan Recommendations A-1 and B-1 Stakeholder Process Leads to HB951.</p> <p>In October of 2021, the NC Legislature passed HB951 impacting the electricity sector. This legislation is significant in that it enables several key recommendations in the Clean Energy Plan including significant carbon reductions in the power sector by 2030 and net-zero by 2050; facilitating coal retirements through securitization; allowing the use of performance-based rate making; and decoupling of revenues from electricity use; and promoting the growth of solar power plants.</p>	State Energy Office
NC ZEV Plan Implementation	<p>Using Volkswagen Settlement funds, the Division of Air Quality (DAQ) awarded funding for electric school and transit buses in addition to light duty electric charging stations as summarized below.</p> <p><u>School Bus Program:</u> DAQ awarded funding for the purchase of six electric school buses for deployment in six counties in North Carolina. During the initial stakeholder consultation for developing North Carolina’s VW mitigation plan, 5% of the available funds for Phase 1 were allocated to school bus electrification. The NC Department of Public Instruction plans a pilot program with five of the six electric buses while the sixth bus was awarded to the Eastern Band of Cherokees.</p> <p><u>Transit Program:</u> DAQ awarded funding for the purchase of eleven electric transit buses. Funding was awarded for transit buses to several regional and local transportation authorities and one for a university electric shuttle bus.</p>	Division of Air Quality / Technical Services / Mobile Source Compliance

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p><u>DC Fast Program:</u> DAQ award funding for the purchase and installation of 27 light duty DC Fast electric vehicle charging stations along priority corridors across the state. The charging kilowatt (kW) capacity of the selected projects range from a low of 50kW to a high of 200kW, most of the projects selected are of 62kW capacity. Once the projects are completed a total of 39 charging ports that will be added to the state EV fast charging network.</p> <p><u>Level 2 Charging Program:</u> DAQ awarded funding for the purchase and installation of 77 light duty Level 2 electric vehicle charging stations across the state including publicly accessible, workplace, and multi-unit dwelling charging stations. The charging kilowatt (kW) capacity of the selected projects range from a low of 6.6kW to a high of 14.4kW, most of the projects selected are of 7.2kW capacity. Once projects are completed a total of 269 charging ports will be added to the state EV level 2 charging network.</p> <p>Using FY2020 EPA Diesel Emission Reduction Act (DERA) program funds using the DERA Option from the Volkswagen Settlement eligible mitigation actions, DAQ awarded funding for two electric refuse trucks and one electric transit bus.</p>	
	<p>The Division of Air Quality is part of an Interagency Taskforce working towards promoting sales and adoption of medium- and heavy-duty Zero Emission Vehicles (MHD ZEV) in NC. DAQ is the lead agency for the Department of Environmental Quality for this effort. The work is being coordinated through the Governor’s office and includes collaboration with NC DOT, NC DOA, and Commerce. This work is an outgrowth of a MOU signed by NC with several other states and directs those sales of MHD vehicles switch to electric by 2050. The overarching goals of this effort will reduce GHG emissions from MHD vehicles in the state.</p>	<p>Division of Air Quality / Planning /Allied Programs and Attainment Planning   Technical Services / Mobile Source Compliance</p>
	<p>The State Energy Program funded approximately \$104,000 for two electric vehicle charging infrastructure projects in Warren and Scotland counties. Collectively, the DC fast charging stations will provide access to 62.5 kilowatts of capacity for motorists in these Tier 1 counties. This closely aligns with North Carolina’s Clean Energy Plan recommendation to accelerate statewide electrification of the transportation sector.</p>	<p>State Energy Office – State Energy Program</p>
<p>NC Motor Fleet ZEV Plan Implementation</p>	<p>The State Energy Program supported the adoption of electric transportation and charging infrastructure by participating in the Southeast Regional Electric Vehicle Information Exchange. This collaborative effort between multiple Southeastern states identifies opportunities to promote electric transportation, build resiliency into power supply delivery,</p>	<p>State Energy Office – State Energy Program</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	and implement infrastructure solutions that provide equitable access for all communities. As part of the initiative, the State Energy Program assisted with the following for North Carolina in 2021: (1) coordinated stakeholder meetings with public and private organizations to further reinforce the adoption of electric transportation; (2) provided technical support for developing a guidance document of best practices to support electric transportation; (3) funded projects that accelerate the adoption of electric vehicles; and (4) contributed information for an interactive online planning map that shows alternative fuel corridors and existing charging infrastructure across the Southeast.	
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	Implementation of a DEQ Internal EV Charging Network that includes eight chargers at the Morehead City Campus and six at the Reedy Creek Lab Campus. We are working with our landlords through lease renewals and amendments to install chargers at leased sites, including two at the Winston-Salem Regional Office, four at the Asheville Regional Office, and a number to be determined and the Wilmington Regional Office.	Financial Services Division/DEQ Facilities Services Section
	Financial Services is actively managing the fleet vehicle inventory to downsize overall and to exchange gasoline powered vehicles to hybrid or electric at every opportunity when feasible to meet the operational needs of the divisions.	Financial Services Division/DEQ Facilities Services Section
	A total of eight electric vehicle charging stations are planning to be installed at the division’s headquarters office in Morehead City. The first pre-bid meeting for installation is scheduled for 1/7/2022 with the bid opening date of 1/18/2022. Project anticipated to begin in February 2022.	Division of Marine Fisheries/Administrative and Maintenance Services Section
	The State Energy Program allocated approximately \$75,000 to install eight electric vehicle charging stations at the Department of Environmental Quality’s Morehead City campus. This action assisted with reducing the number of conventionally fueled state-owned vehicles to support the electrification of North Carolina’s cabinet agency motor fleet.	State Energy Office – State Energy Program
	The division headquarters building, hangar, warehouse, net shed as well as the South River facility have been converted to LED lighting. The division also drafted the “DMF HQ Campus Resilience Plan” that includes recommendations to incorporate alternative energy sources (i.e., solar panels) when resources are available.	Division of Marine Fisheries/Administrative and Maintenance Services Section

Category	Summary of Initiative / Accomplishments	Division/Program Office
Agency Building Utility Consumption Reduction (EO80 Section 8)	<p>The Utility Savings Initiative (USI) is leading the effort to encourage State-owned buildings collectively to reduce energy consumption per square foot by at least 40% of fiscal year (FY) 2002-2003 levels by 2025. In addition, the Utility Savings Initiative encourages and assists, upon request, the UNC System, K-12 schools, and local governments in reducing energy consumption. The USI program annually updates the Comprehensive Energy, Water, and Utility Use Conservation Program and provides strategies that assist State-owned buildings in reducing energy consumption to meet the 40% goal.</p> <p>Through coordination with the Office of State Budget and Management, \$30 million dollars in funding was set aside for energy efficiency projects in FY2021-22. These funds are in support Agency Building Utility Consumption Reduction (EO80 Section 8) of EO80 and will be allocated to agencies that need funding for upgrades to meet the 40% goal by 2025.</p>	State Energy Office – Utility Savings Initiative
	<p>The USI program provides preliminary audits, project evaluations, and implements strategy assistance to meet the EO80 goals. The program also reviews utility bills for clients in all sectors and encourages participants to engage in current programs to reduce energy consumption. A core component of the USI program provides relevant energy efficiency training to local and State government facility managers. This training includes items such as creating an Agency Utility Management Plan, analyses of utility bills, and various building systems and programs to increase energy efficiency.</p>	State Energy Office – Utility Savings Initiative
	<p>The USI program strongly encourages all energy managers to conduct regularly scheduled meetings with colleagues to share best practices and opportunities for energy savings. The USI program facilitates this by scheduling monthly teleconference meetings with cabinet agency energy managers. Various subject-matter experts from the public and private sectors are invited to discuss tested approaches that may assist in meeting EO80 goals. These meetings provide the necessary tools and training foundation to improve energy efficiency, to promote sustainability, to increase resiliency, and to reduce operating costs within current State budgetary constraints. For example, due to this initiative, several cabinet agencies pursued utility management software in 2021 that will assist with maximizing resources and identifying key areas to prioritize for energy efficiency improvements.</p>	State Energy Office – Utility Savings Initiative
	<p>The USI program provided guidance for the Department of Natural and Cultural Resources (DNCR) and Department of Public Safety (DPS) to pursue Guaranteed Energy Savings Contracts (GESCs) to finance energy efficiency upgrades that will assist with meeting the EO80 40% reduction goal by 2025. For example, DNCR is targeting significant improvements at three aquariums, five museums, and the North Carolina Zoo. In addition,</p>	State Energy Office – Utility Savings Initiative



Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>DPS is focusing on energy efficiency upgrades at six correctional facilities that each contain over one thousand inmate cells. Collectively, these projects are expected to achieve a guaranteed savings of over \$3 million per year.</p>	
	<p>The Facilities Services Section has made great strides in improving building utility consumption to maximize efficiency in several DEQ locations. With \$1.5M in repair and renovation funding from OSBM, the 31-year-old HVAC equipment and controls were replaced at the Reedy Creek Lab Campus, reducing usage annually by 219,000 kwh and 10,000 therms, for an annual savings of \$26,000. Further, building analytics were installed and implemented to track, measure and keep the buildings systems in peak maximum efficiency, achieving real time identification and tracking of major HVAC issues and providing remote support capability that reduces the number of on-site services calls needed and minimizes downtime at the labs. The team also performed retro-commissions of the lab buildings' HVAC systems, as well as the Green Square HVAC system, to ensure proper air flow, system efficiency, and that these systems operate as designed.</p> <p>To further achieve energy reduction at the labs, the team is scheduled to perform building envelope sealing on all three lab campus buildings. A goal with this project is to attain the Department of Energy Building Envelope Campaign Award.</p> <p>Another major HVAC replacement occurred at the DMF Morehead City Campus this year. The replacement of this old equipment and campus main chiller with highly efficient units is estimated to save \$10,000 annually.</p>	<p>Financial Services Division/DEQ Facilities Services Section</p>
	<p>Conversion of lighting to LED at DEQ locations has been and remains a high priority. In addition to DMF's LED lighting replacement, a 5000-square-foot warehouse, including offices that DEMLR uses has been converted.</p>	<p>Financial Services Division/DEQ Facilities Services Section</p>
	<p>As infrastructure needs and funding dictates, the Division of Air Quality is endeavoring to purchase modern, more energy efficient ambient monitoring shelters capable of withstanding winds more than 140 mph. These shelters should reduce energy consumption and consequently reduce the CO2 (greenhouse gas) emitted by electric generating facilities as well. One of these shelters that was purchased in early 2020, was put into service during the fall of 2021.</p>	<p>Division of Air Quality / Ambient Monitoring</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>Reduction of Methane-Producing Organic Waste Disposal and Increase of Carbon Sequestration through the Application of Finished Compost:</p> <p>DEACS works with stakeholders including private businesses, local governments and higher education institutions to reduce the amount of food waste and organics entering North Carolina landfills by encouraging less generation of waste in the first place, donation of edible food, and composting of inedible food scraps. These efforts help reduce the amount of methane generation and facilitate increased carbon sequestration through the application of finished compost.</p> <p>DEACS enhances the state’s growing organic waste recycling economy by connecting producers and consumers of compost products, helping businesses and local governments grow their recycling capacity, and demonstrating why NC is the ideal place to establish new green enterprises.</p> <p>DEACS Waste Reduction Partner program, working in a funding partnership with the State Energy Office, provides no-cost energy efficiency assessments to any business or institution requesting assistance. Last year, the program provided energy assessments to 37 organizations helping to reduce energy use by 23,619 MMBtu, cut CO2e emissions by 1,570 metric tons which had net annual cost savings to these businesses of \$230,000.</p>	<p>Division of Environmental Assistance and Customer Service</p>
	<p>The State Energy Program allocated approximately 75,000 to provide LED lighting upgrades for the Department of Environmental Quality’s Morehead City campus. Collectively, the projected energy savings are expected to be over \$9,000 per year.</p>	<p>State Energy Office – State Energy Program</p>
	<p>North Carolina has been a participant in the United States Department of Energy’s (DOE) Better Building Challenge (BBC) since 2012. The BBC is an initiative to improve the energy efficiency of all manmade buildings. North Carolina was one of the first states to enroll all state-owned buildings into this challenge. In 2018, North Carolina achieved the original goal of a 20% energy reduction from the challenge’s 2008-09 baseline. Later, in 2021, that goal was extended to a 30% reduction by 2028. USI’s preliminary estimates indicate that the state is currently at a 22% reduction relative to the BBC baseline and is on track to meet the revised goal.</p>	<p>State Energy Office – Utility Savings Initiative</p>

## C. Update on DEQ Climate Resilience Activities

- a. **Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019**  
*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
EO80 Risk and Resiliency Plan Implementation	APNEP staff continue to participate in state agency led activities stemming from implementation of the N.C. Climate Risk and Resiliency Plan (2020), including the Natural and Working Lands Stakeholder Team, Coastal Habitats and Pocosin Wetlands Subcommittees, and the Coastal Resilience Community of Practice. APNEP’s involvement in these efforts have led to identification of regional gaps and needs and integrating resilience activities with existing programs and initiatives, including working closely with N.C. Division of Marine Fisheries staff to develop actions that complement the goals and objectives of both APNEP’s CCMP and N.C. Coastal Habitat Protection Plan, developing tools for local governments to incentivize the use of natural infrastructure to build resilience to storm driven flooding, and incorporating resilience as an overarching theme for our MOU with Virginia. In addition, the Tribal Coastal Resilience Project stemmed from APNEP participation on various workgroups and committees and identifying gaps in participation in resilience planning from underserved and under-represented communities. Staff continue to explore options to assist with implementation of the actions recommended in the Risk and Resiliency Plan and will be integrating recommendations into updates to the APNEP Comprehensive Conservation and Management Plan (CCMP) in 2022.	NCDEQ, NCORR
APNEP Air Resources Monitoring & Assessment Team (AR-MAT)	The APNEP Air Resources Monitoring & Assessment Team (AR-MAT) continue to work toward producing their monitoring and assessment deliverables. Two ad-hoc working groups (chemical deposition and climate) have been convening between meetings to address tasks within their respective topic areas. The chemical deposition group has proposed “ammonia deposition” as their initial featured parameter for an APNEP Air Resources monitoring plan. An ammonia deposition (based on modeling) and monitoring station location map, presented at the meeting, revealed that all operational stations are located along the outer APNEP boundary and none located within the region’s interior or coastal	APNEP, facilitated by a team lead from EPA

Initiative Title	Description	Division/Lead Program Office
	<p>areas. This suggests the need for an additional station(s) to detect whether a deposition gradient exist in non-monitored areas. The chemical deposition group also has plans to finalize a draft metric (assessment) report for total nitrogen deposition during spring 2022. The climate group has proposed “annual and seasonal series of daily precipitation maxima” as the initial climate parameter featured in a metric report and presented some preliminary analysis at the meeting. They envision that this precipitation parameter will be reported at two scales: region/basin-wide and individual basins or sub-basins. At this time is likely that the insights of data gaps gained in this assessment will lead to this parameter also being featured as the initial climate parameter in the Air Resources monitoring plan. The team is facilitated by US EPA and includes members from NC Air Quality, State Climate office, APNEP, NCSU, CASC, NOAA NWS, EPA.</p>	
<p>North Carolina - Virginia Memorandum of Understanding (2020)</p>	<p>APNEP facilitated a Memorandum of Understanding (MOU) between six environmental and natural resources agencies from N.C. and Virginia. The MOU, released in September 2020, builds upon the MOU signed in 2017 and re-affirms the agencies’ commitment to foster interstate collaboration within the shared waterways of the Albemarle-Pamlico region. The MOU required a report on coordination, data-sharing, and assessment of interstate initiatives by March 2021, which was circulated to the agency designees summer 2021. The designees agreed upon climate resilience as an overarching theme for MOU implementation, with an initial focus on working together in the Chowan River Basin. A final recommendation regarding interstate joint-management strategies will be delivered to the signatories by Spring 2022.</p>	<p>APNEP; NCDEQ, NCWRC, NCDACS, NCDCCR</p>
<p>Water Level Monitoring Stations</p>	<p>APNEP funded placement of additional N.C. Flood Inundation Mapping and Alert Network (FIMAN) remote monitoring stations in Newport, Carteret County and Slocum Creek near Havelock, Craven County, through the N.C. Division of Emergency Management. Data from gauges located within the Albemarle-Pamlico watershed increases real-time knowledge of flood conditions in the region, as well as contributing to knowledge that can be used to address future water management actions in the watershed. <a href="#">Learn more.</a></p>	<p>APNEP, NC DPS</p>
<p>EO80 Natural and Working Lands</p>	<p>APNEP staff continue to participate in the Natural and Working Lands Stakeholder Team and Coastal Habitats and Pocosin Wetlands Subcommittees. Staff worked closely with DMF</p>	<p>NCDEQ Energy, DMF, NCDCCR</p>

Initiative Title	Description	Division/Lead Program Office
	<p>staff to develop actions that complement the goals and objectives of both the CCMP and Coastal Habitat Protection Plan (CHPP). Staff continue to explore options to assist with implementation of the NWL plan and through integration with APNEP and partner initiatives. Also see more information below on the SOW developed by APNEP for the VIMS NNBF/Wetlands Watch project to assist in implementing actions identified by the NWL Coastal Habitats Team and recommendations in the Climate Risk and Resilience Plan (development of resilience toolbox).</p>	
<p>Resilience Clearinghouse Steering Committee</p>	<p>APNEP is participating in a group convened to consolidate various efforts around the state to compile information related to resilience, reduce redundancies, promote information, stemming from recommendations in both the NWL plan and Climate Risk and Resilience Plan to develop resilience toolboxes (including interstate toolboxes for shared waterways).</p> <p>APNEP developed a scope of work to assist in implementing toolbox recommendations in both plans as part of the VIMS NOAA Natural and Nature Based Features project for coastal local governments, in addition to coordinating with the various resilience groups mentioned here and other committees including the DEQ led interagency Watershed Restoration Implementation Team. The needs assessment and template resilience tools database being built through APNEP's contract with Wetlands Watch as part of the NNBF project is of interest to the team.</p>	<p>DEQ / DMF / NCORR</p>
<p>Assessment of Climate Change Impacts to APNEP CCMP Implementation</p>	<p>During fall 2019, APNEP staff conducted a climate change vulnerability assessment to determine the risks from relevant climate stressors to implementation of APNEP's Comprehensive Conservation and Management Plan (CCMP) actions. Identifying risks associated with climate change and managing them to reduce their impacts is essential for implementation of the CCMP actions. The CCMP was developed with the potential impacts of a changing climate in mind, thus the reassessment was a way to confirm and update APNEP's perception of risks to implementation of the CCMP actions. APNEP initiated updates to the CCMP in 2021 and will continue to incorporate consideration of climate impacts when assessing actions needed to identify, protect, and restore the significant resources of the Albemarle-Pamlico region.</p>	<p>APNEP</p>

Initiative Title	Description	Division/Lead Program Office
2021 Amendment to the NC Coastal Habitat Protection Plan (CHPP)	<p>The Department’s Coastal Habitat Protection Plan was amended in 2021 and adopted by the three regulatory commissions with coastal jurisdiction. Throughout the amendment, EO80 and climate change impacts were considered. This quote from chapter 3 highlights much of the thought process involved in the amendment. “Impacts from climate change including SLR will affect all coastal habitats and species throughout NC. Therefore, actions should be taken to make them more resilient to these disturbances and ensure coastal habitats and their valuable ecosystem services continue to persist. Changes to environmental variables, such as increased water temperatures due to warmer air temperatures and salinity due to increased freshwater runoff or breached inlets from hurricanes, will impact the distribution, range, and abundance of coastal habitats and the species that use them for nursery, forage, spawning, and refuge. Impacts can be minimized, and coastal resilience can be increased by conserving, protecting, and restoring coastal habitats that provide valuable ecosystem services and using natural and nature-based infrastructure wherever possible.”</p>	APNEP, DCM, DEMLR, DMF, DMS, DWR,
Submerged Aquatic Vegetation (SAV) Team	<p>Resilience strategies listed in Chapter 5F (p. 5F-19) (Ecosystems) of the Climate Risk Assessment and Resilience Plan for Submerged Aquatic Vegetation (SAV) include mapping and monitoring, water quality improvement and protection, and protection from physical disturbance. APNEP’s SAV Team continued to lead efforts to map and monitor SAV, which significantly contribute to the recommendations in the Resilience Plan. A summary of efforts conducted in 2021 is highlighted below; more details and information can be found in APNEP’s annual workplan and report to EPA:</p> <p><a href="https://apnep.nc.gov/resources/publications-and-reports/governance-guiding-documents">https://apnep.nc.gov/resources/publications-and-reports/governance-guiding-documents</a></p> <ul style="list-style-type: none"> <li>• <b>SAV Integrated Monitoring Plan:</b> With the input of APNEP’s Science and Technical Advisory Committee (STAC), APNEP staff developed a proof-of-concept Integrated Monitoring Plan whose initial scope focused on coastal submerged aquatic vegetation (SAV) and estuarine water quality factors that impact coastal SAV. The plan was accepted by the Leadership Council on March 11, 2021.</li> <li>• <b>SAV Metric Report:</b> APNEP published a report showing a net loss in the extent of high-salinity submerged aquatic vegetation (SAV) habitat in North Carolina’s sounds between 2006-2008 and 2013. While the data also confirm that the state possesses the largest acreage of seagrass along the east coast of the United States, around 100,000 acres, the overall extent of seagrass meadows in the Albemarle-</li> </ul>	APNEP, DMF, multiple agencies and stakeholders

Initiative Title	Description	Division/Lead Program Office
	<p>Pamlico estuary decreased by 5,686 acres or 5.6% despite the availability of suitable habitat for expansion of the resource. Seagrass is declining worldwide; North Carolina is experiencing annual rates of seagrass loss at or below the global average. <a href="#">Learn more.</a></p> <ul style="list-style-type: none"> <li> <p><b>SAV Map Data Collection:</b> During 2020-2021 APNEP coordinated with the N.C. Department of Transportation and other partners on the APNEP SAV Team to gather SAV data via aerial imagery and boat-based surveys. In addition to this information supporting the creation of an updated map of high-salinity SAV (seagrass) for the Albemarle-Pamlico Estuarine System, this effort in 2021 marked the initial implementation of APNEP’s monitoring plan by focusing on several indicator metrics reflecting the condition of the region’s coastal SAV resource. <a href="#">Learn more.</a></p> </li> <li> <p><b>SAV Economic Valuation:</b> APNEP also provided funding for an interdisciplinary team of researchers at NC State University and Duke University to research and publish a report that estimated the market and nonmarket economic losses from declines in submerged aquatic vegetation in the Albemarle-Pamlico estuary. Focusing on the losses to commercial and recreational fisheries, residential property values, and carbon sequestration, the team conservatively estimates aggregate losses of \$1,290 per acre over the next decade. The report can be found here: <a href="https://apnep.nc.gov/documents/files/publications/2021-economic-valuation-sav-albemarle-pamlico-estuary">https://apnep.nc.gov/documents/files/publications/2021-economic-valuation-sav-albemarle-pamlico-estuary</a></p> </li> <li> <p><b>Research Study to Support Chlorophyll-<i>a</i> Standards for SAV Protection:</b> To set SAV protection and restoration goals for the Albemarle-Pamlico Estuarine System and make the connection to needed nutrient and sediment load reductions, quantitative linkages between chlorophyll-<i>a</i> concentrations and SAV light requirements are needed. Under APNEP contract, UNC Institute of Marine Sciences staff has developed scientifically -defensible chlorophyll-<i>a</i> and turbidity threshold concentrations that when considered together are protective of SAV in high-salinity zones. This information will help guide the decisions made through the NC Nutrient Criteria Development Plan and the NC Coastal Habitat Protection Plan.</p> </li> </ul>	

Initiative Title	Description	Division/Lead Program Office
	<p><b>SAV Greenhouse Gas Inventory:</b> Select members of the SAV team and APNEP Science and Technical Advisory Committee (STAC) participated in a workgroup led by NWL Coastal Habitat workgroup member Paul Cough (APNEP Leadership Council member): Greenhouse Gas Inventories for Coastal Habitats: Submerged Aquatic Vegetation and Subaerial Wetlands. This project is reported on in more detail by the NWL Coastal Habitats Committee.</p>	
<p>Prioritizing Coastal Habitats and Carbon Resilience</p>	<p>APNEP participated on a United States Climate Alliance (USCA) project led by Duke University. The USCA grant was awarded in 2019 and is a multi-state effort that builds on North Carolina’s Executive EO80 Natural and Working Lands Initiative (see above). The project involved spatial analysis to map and prioritize coastal habitats that store carbon, enhance natural and human community resilience to coastal hazards, and support a variety of species. It is designed to support Atlantic Coast states that are engaged in resilience planning and working to incorporate blue carbon into their climate mitigation plans.</p> <p>The project included funds for a pilot project within a six-state region, and APNEP led development of a proposal, in coordination with VIMS, Old Dominion University (ODU), The Nature Conservancy, Chowan University, and Audubon, for an interstate pilot project with partners in Virginia and North Carolina. This project resulted in a GIS-based modeling tool tailored to the that can be utilized by the Currituck Sound Coalition to assist in future planning reflect local community restoration priorities and goals. <a href="#">Learn more.</a></p>	<p>Duke</p>
<p>CAMA Oceanfront Setbacks</p>	<p>The Division of Coastal Management worked with the Coastal Resources Commission to update the rules for siting oceanfront development. The setback rules now reference the long-term annual average erosion rates contained in DCM’s 2019 report.</p>	<p>DCM/Policy &amp; Planning</p>
<p>Estuarine Shoreline Strategy Update</p>	<p>The Division’s Estuarine Shoreline Workgroup finalized an update to its estuarine shoreline strategy for 2022 through 2026. Through implementation of this strategy, the Division will continue to better understand and manage estuarine shorelines through an integrated approach of planning, permitting, education, and research. This includes promoting the use of living shorelines for shoreline stabilization, understanding shoreline change through mapping, and exploring implementation of resilience strategies including thin-layer deposition and protection of marsh migration pathways.</p>	<p>DCM</p>



Initiative Title	Description	Division/Lead Program Office
Research and Monitoring	The Division of Coastal Management conducted applied research on techniques to enhance resiliency at Coastal Reserve sites and in coastal N.C. such as thin layer deposition and living shorelines, and continued monitoring environmental conditions, species, and habitats at Coastal Reserve sites to better understand change. The Reserve's NOAA Margaret A. Davidson Fellow is researching the impacts of sea level rise on wintering populations of vulnerable saltmarsh sparrows to inform future habitat and species management strategies. Staff, in partnership with UNCW, compiled five decades of data to assess the impacts of increasing sea surface temperature on a seagrass at its southern range limit. Importantly, the research highlighted the importance of good water quality and clarity, as well as seagrass species diversity on the resilience and persistence of seagrass meadows.	DCM/Coastal Reserve
Education and Training	The Division of Coastal Management's Coastal Training Program delivered resilience-related trainings to coastal decision-makers on nature-based solutions to reduce coastal hazards, barrier island development, and low impact development basics for water quality protection. This includes three living shorelines trainings: a living shoreline pilot training for marine construction professionals was offered in spring 2021 reaching 35 participants in partnership with NC Sea Grant and NC Coastal Federation, and two virtual real estate professional trainings were offered in September 2021 reaching 161 participants.	DCM/Coastal Reserve
Rachel Carson Reserve Habitat Resilience Plan	The Division of Coastal Management is developing a habitat resilience plan for its Rachel Carson Reserve that identifies and prioritizes areas for resilience projects based on known vulnerabilities and hazards, and engineers two shovel-ready projects. The plan is funded by the National Fish & Wildlife Foundation with match from the NC General Assembly. The project team and local partners conducted risk and vulnerability assessments, identified priority areas for shovel-ready projects, and identified other management actions (e.g., research, education, and stewardship activities) to be conducted as part of the resilience plan.	DCM/Coastal Reserve
Acquisition	The Division of Coastal Management acquired 25 acres to protect coastal wetland and beach habitats in perpetuity at its Masonboro Island Reserve. The parcel was donated by the Broussard/Stich family with funding for closing costs provided by the former NC Clean Water Management Trust Fund.	DCM/Coastal Reserve

Initiative Title	Description	Division/Lead Program Office
Hydrology and Hydraulics Study for Dam Overtopping in the Neuse and Lumber River Basins	Study of the hydrology and hydraulic capacity of large and very large dams identified in the Neuse, Lumber and Cape Fear River Basins. The DEMLR Dam Safety Program developed and completed hydrology and hydraulic models to determine storm sizes (the amount of rain) that would cause ~261 dams in the Neuse and Lumber River Basins to overtop. The program likewise began an identical study for the Cape Fear basin to study over 300 dams. This part of the study should be completed in July of 2022. Dam overtopping is a sign of inadequate spillway capacity but more importantly is a characteristic of dams in stress which could lead to failure of the dam and possibly cause life safety and flooding impacts. The information gained in this study will allow State and Local governments to set priorities on responses to dams given limited personnel resources as well as monitor the need for dam modifications in the future. This information will also be placed into use with DamWatch software used in partnership with NCEM to further enhance state and local capabilities. The published reports of the Neuse and Lumber project population in the study from <b>SL 2016-124 4.1 (9)</b> have been provided to DEQ, DPS/EM and to Local Emergency Management and Planning.	Energy, Mineral, and Land Resources/Dam Safety Program
Dam Breach Modeling	The DEMLR Dam Safety Program continues to perform Dam Breach Models as needed of High and Intermediate Hazard dams in North Carolina to confirm hazard classifications but more importantly to determine the hazard impacts if dam failure were to occur. These breach models are used by NCDEQ, NCDPS and Local Emergency Management to identify property and infrastructure subject to impact, residences that could be impacted as well as to develop access and evacuation routes. This information will also be shared with NCDOT as state-maintained roads and highways are subject to flooding and damage impacts from dam failure.	Energy, Mineral, and Land Resources/Dam Safety Program
High Hazard Dam Rehabilitation Grant (HHPD)	The DEMLR Dam Safety Program has administered a FEMA Grant for the rehabilitation of High Hazard Dams. There were three local government sub-grantees this year that shared in the receipt of \$169,000 used to develop plans to determine dam risk and repair needs to address deficiencies to ensure improved infrastructure and reduce risk and increase resilience within their communities.	Energy, Mineral, and Land Resources/Dam Safety Program

Initiative Title	Description	Division/Lead Program Office
Risk-Informed Prioritization of North Carolina High Hazard Dams	The DEMLR Dam Safety Program recently completed a study and assessment of 56 dams to develop risk-informed Prioritization of the High Hazard Dams in North Carolina. This pilot study of five dams will help us to develop a screening level risk assessment protocol for all High Hazard Dams. These assessments will allow our program, other State agencies including NCEM & NCDOT, local governments and dam owners to set priorities for these dams and the areas in breach inundation zones in setting repair/maintenance/resilience plans and identifying resource needs for risk, resilience and emergency response. This study will also qualify North Carolina and its dams for future FEMA grants such as the HHPD grant previously described.	Energy, Mineral, and Land Resources/Dam Safety Program
Semi-Quantitative Risk Analysis	The DEMLR Dam Safety Program is currently developing a process for semi-quantitative risk analysis to be used on a state level and may possibly be evaluated for use on a national level with other states for assessing risk of dams in order to prioritize or more appropriately rank them for evaluation of need of repair and possible federal funding for that purpose. This process is also being developed more importantly to update training and inspection practices that will provide for more long-term consistency of inspection and regulation of all dams in North Carolina. This process will allow for determining an updated condition assessment of the dams following a complete inspection.	Energy, Mineral, and Land Resources/Dam Safety Program
Environmental Preservation Recovery Support Function Group 7	DEQ has led and hosted monthly meetings of this RSF7 group with NCORR and other State and Federal agency members which include the North Carolina Wildlife Resources Commission, NC Department of Agriculture and Consumer Services, NC Department of Health and Human Services, NC Cooperative Extension, NC Emergency Management, NC Department of Natural and Cultural Resources, USDA, local government representation by NC association of County Commissioners & NC League of Municipalities, and non-governmental interest groups including The Conservation Network, Mountain True, SELC, NC Foundation for Soil and Water Conservation, Coastal Federation, and NC Land Trust Federation among others. This group provided recommendations to NCEM/NCORR and received resilience funding support for needs identified in the North Carolina Climate Risk Assessment and Resilience Plan. Those recommendations include funding for updating NOAA's Atlas 14, Development of pilot projects to use climate scenarios to establish future rainfall statistics, Updating the Probable Maximum Precipitation (PMP) Model for NC, Development of Middle Neuse	DEQ/DEMLR

Initiative Title	Description	Division/Lead Program Office
	Basin Flood Capacity Planning Project, DCM’s Resilient Coastal Communities Program among others and a NC Low Flow Study for DWR to take over quantifying responsibilities of stream low flow statistics in NC.	
Landslide Mapping and Modeling	<p>The landslide mapping program is funded by appropriations in SL 2018-5 5.6(b)(2) a. and most recently with permanent funding for 4 FTEs for the State Landslide Program. The program is implemented now by one Geologist Supervisor and 4 permanent Geologist staff positions in the Geological Survey Section’s (GSS) Asheville Regional Office. Additional support for the program has been through contracts for landslide mapping (Appalachian Landslide Consultants, PLLC); and, for geospatial data support and technology transfer (UNC-Asheville National Environmental Modeling and Analysis Center). The GSS maintains a landslide geodatabase, and these data are accessible in public web map viewer developed through the UNCA-NEMAC contract. The landslide program collects landslide data and conducts landslide modeling on a county-wide basis to identify areas vulnerable to landslides, especially those triggered by excessive rainfall events. Field mapping of landslides in Polk County is complete and released, Rutherford County is complete but undergoing QA/QC of 1,607 landslides and 603 deposits prior to release. Field mapping of landslides in Transylvania County is underway. Preliminary landslide susceptibility modelling is complete for 22 western NC counties. The GSS responds to requests for technical assistance on landslides from emergency managers, local government agencies, the private sector, and the public. Since the program was fully staffed in June 2019, the GSS has responded to 100+ landslides in 13 counties throughout western NC. The GSS has implemented Unmanned Aerial Systems (UAS) technology for routine use in landslide mapping and analysis. Collaborative research with U.S. Geological Survey, UNC-Institute for the Environment, and the USDA-Forest Service is underway on landslides related to drought-induced wildfires. The GSS operates 9 landside-rainfall monitoring sites in cooperation with the U.S. Geological Survey and the USDA-Forest Service.</p>	DEMLR/Geological Survey Section

Initiative Title	Description	Division/Lead Program Office
Coastal Habitat Protection Plan (CHPP) Resilience Strategies	The division completed the 2021 CHPP Amendment which was approved by the three regulatory commissions at their business meetings in November 2021 and included resilience strategies with priority issues including: 1) Environmental Rule Compliance to Protect Habitat; 2) Habitat Monitoring to Assess Status and Regulatory Effectiveness; 3) Submerged Aquatic Vegetation Protection and Restoration, with Focus on Water Quality Improvements; 4) Wetland Protection and Enhancement, with Focus on Nature-Based Methods; and 5) Reducing Inflow and Infiltration associated with Wastewater Infrastructure to Improve Coastal Water Quality. A chapter on Climate Change and Coastal Resilience is included in the CHPP Amendment. This chapter references the Climate Science Report, the Risk Assessment and Resilience Plan 2020, and the Natural and Working Lands Action Plan including the recommendations from the reports.	Division of Marine Fisheries/Habitat and Enhancement Section
Coastal Habitat Restoration	Continued oyster restorations at Cedar Island Oyster Sanctuary (6.3 acres built with approximately 18,500 tons of material) to help offset habitat loss and water quality degradation expected from climate change, increase ecosystem and community resilience, and improve water quality.	Division of Marine Fisheries/Habitat and Enhancement Section
Wastewater	The division has pursued staff training (delayed due to COVID travel restrictions) to allow for improved assessment of the potential impacts of wastewater treatment plant failures on surrounding shellfish harvesting and recreational swimming areas. Staff have also been working to develop protocols for integrating the division's drone fleet into these pollution source assessments to provide improved data collection and more effective visual representation of impacts for public education purposes.	Division of Marine Fisheries/Shellfish Sanitation and Recreational Water Quality Section
Stormwater	Continued to enhance the division's ability to address potential public health impacts of increased stormwater runoff through research and development of updated shellfish growing area management plans. Staff have also worked with local municipalities to help develop town- and city-wide stormwater management plans that effectively balance public health considerations alongside concerns about safety and property damage due to flooding.	Division of Marine Fisheries/Shellfish Sanitation and Recreational Water Quality Section
Shellfish Aquaculture Storm Management Plan	The division partnered with NC Sea Grant to host a session at the 2021 NC Aquaculture Development Conference on March 20, 2021 which included a panel discussion titled	Division of Marine Fisheries/Habitat

Initiative Title	Description	Division/Lead Program Office
	<p>“Shellfish Aquaculture Gear Management and Storm Preparedness”. The division also partnered with NC Sea Grant and the NOAA Office of Response and Restoration’s Disaster Preparedness Program to develop a Shellfish Aquaculture Storm Management Plan for shellfish growers throughout North Carolina and held a virtual workshop on April 8, 2021, with over 60 individuals in attendance.</p>	and Enhancement Section
Fisheries Management	<p>The division continues to address climate change impacts as fishery management opportunities allow through the development fishery management strategies that are flexible and support easier entry and exit into new fisheries and out of those that are declining, to prevent overfishing. The division continues to support interstate and federal cooperative management, stock assessments, and fishery management plan guidelines by incorporating climate change in vision statements and/or strategic plans and fishery management plans.</p>	Division of Marine Fisheries/Fisheries Management Section
Division Headquarters Campus Resilience Plan	<p>The division drafted the “DMF HQ Campus Resilience Plan” that includes recommendations to enhance community and ecosystem resilience through building a living shoreline, rain gardens, and other Nature-Based Solutions to help mitigate impacts of storms, floods, and other natural hazards to state property/infrastructure and the surrounding environment. Initial phases of the Plan were approved through the Office of State Construction and the division is in the process of applying for state and federal funding to complete the project.</p>	Division of Marine Fisheries
Mapping Energy Resilience in New Hanover County with a Focus on a Replicable Framework	<p>The SEO partnered with New Hanover County, UNC Asheville, and FernLeaf Interactive to conduct a pilot project that assesses community vulnerabilities and potential impacts from extreme flooding, heat events, and storm-related disruptions to energy assets. Specifically, this project focused on identifying disproportionate impacts to households with low-to-moderate incomes, communities of color, and other overburdened or under-resourced groups in North Carolina’s coastal communities. These efforts provided the foundation for a replicable resilience framework that identifies areas that may experience disproportionate impacts from extreme weather events and should be prioritized for energy resilience solutions.</p>	State Energy Office

Initiative Title	Description	Division/Lead Program Office
Planning an Affordable, Resilient, and Sustainable Grid	The SEO continued its partnership with UNC Charlotte’s Energy Production and Infrastructure Center and North Carolina State University’s Clean Energy Technology Center on this competitive project from the U.S. Department of Energy seeking to develop an affordable, resilient, and sustainable Grid Roadmap to inform key energy planning processes. Ultimately, development of new social and cultural metrics would assist state officials, utility providers, and other stakeholders with evaluating modern resiliency options. In 2021, the project conducted its final stakeholder meetings where SEO staff facilitated discussions with approximately 48 stakeholders on community engagement needs and methods for valuing greater resilience.	State Energy Office – State Energy Program
Solar Energy Technologies Office Community Microgrids	The SEO provided matching funds and personnel support to project steering and community engagement for “ <i>Resilient Community Microgrids with Dynamic Reconfiguration to Serve Critical Loads in the Aftermath of Severe Events.</i> ” UNC Charlotte’s Energy Production and Infrastructure Center led the project team, which included Duke Energy, NC Electric Membership Corporation, the National Renewable Energy Laboratory, Southern Methodist University, Clemson University, NC Clean Energy Technology Center, and NCDEQ. The project goal was to design and test an advanced microgrid solution using a variety of utility-owned and behind-the-meter distributed energy resources that reduces customer outage time and enhances resiliency of the grid.	State Energy Office
Carolina Alternative Fuel Infrastructure Planning for Storm Resilience	The State Energy Office is a project partner along with multiple private, academic, governmental, and utility stakeholders on a competitively funded project by the United States Department of Energy to analyze storm-induced disruptions to alternative fuel infrastructure. During 2021, the project team inventoried the incidence of storm-induced disruptions for petroleum, alternative fuel, and utility infrastructure in the Carolinas. In addition, partners conducted surveys with stakeholders to assist with developing the initial draft of the “ <i>Carolina Alternative Fuel Infrastructure for Storm Resilience Plan</i> ”. This plan will provide the roadmap to reduce the impacts of disruptions to key infrastructure, transportation operations, utility restoration, and other recovery initiatives.	State Energy Office – State Energy Program

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
Building Capacity for Climate Resilience in Albemarle-Pamlico Region Tribal Communities	<p>APNEP partnered with the North Carolina Commission of Indian Affairs (NCCIA), NC State University, and Virginia Coastal Policy Center to work with tribal communities in the Albemarle-Pamlico region to develop a strategy for incorporating resilience into tribal planning and community engagement processes. The Tribal Coastal Resilience Team has been successful in generating research on tribal engagement in climate and resilience planning efforts throughout the U.S., launching a social media campaign, conducting outreach at conferences and events, and creating partnerships and building the groundwork for a sustainable program.</p> <ul style="list-style-type: none"> <li>• A final report, which will document engagement, partnership building, and lessons learned during the first phase, include the results of the Tribal coastal adaptation plans analysis conducted by NCSU, and recommendations for the project’s second phase, is being finalized by the team.</li> <li>• It is anticipated that Phase II will utilize funds from APNEP to narrow the scope and focus on engagement with Tribal communities in the shared waterways of the APNEP region between Virginia and North Carolina (also supporting implementation of APNEP’s MOU), building upon a Climate Risk Analysis conducted by the Climate Service for the NCCIA in Phase I with the Nottoway Indian Tribe of Virginia and Meherrin Indian Nation, and utilizing a geospatial mapping platform to collect water stories and present climate threats and vulnerabilities identified by Tribal communities in this region.</li> </ul>	APNEP, DOA NC Commission of Indian Affairs, NCSU, VCPC
Low-Income Energy Assistance Programs	<p>In FY2021, the N.C. Weatherization Assistance Program (NCWAP) dispersed more than \$19 million in federal grants, allowing more than 1,250 homes to be weatherized and more than 800 Heating, Ventilation and Air Conditioning (HVAC) units in homes to be repaired or replaced throughout the state. The program helps low-income residents save energy and reduce their utility bills. NCWAP CARES ACT grant funding provided an additional 69 HVAC units to low-income households.</p>	State Energy Office – Weatherization Assistance Program



Initiative Title	Description	Division/Lead Program Office
Community Solar for Low Income Households	In combination with federal NCWAP and CARES Act grant funding, the SEO awarded \$211,400 to provide community solar resources for qualified low-income residents. The funding allowed 94 households to participate in the community solar programs of electric utilities for a 10-year period.	State Energy Office – Weatherization Assistance Program
Justice, Equity, Diversity and Inclusion (JEDI) Resources	The Office of Environmental Education and Public Affairs has incorporated environmental justice, equity, diversity and inclusion (JEDI) into its environmental education certification program and resources for educators. The office has created a website for providing JEDI resources to educators which includes professional development opportunities, stories about people working in the field and tools, resources and research. The office will include climate related JEDI topics on this site and highlights similar efforts by other agencies and organizations on social media. <a href="https://www.eenorthcarolina.org/resources/justice-equity-diversity-and-inclusion">https://www.eenorthcarolina.org/resources/justice-equity-diversity-and-inclusion</a> . The office has added a search feature to its online database of resources so that educators can quickly access JEDI resources. The office’s popular Lunchtime Discovery Series that is streamed live in partnership with the N.C. Museum of Natural Sciences features speakers on JEDI topics. The office will continue to focus on increasing access of diverse communities to natural areas and environmental education programs.	Office of Environmental Education and Public Affairs

**c. Actions taken or planned to take to assist communities served**

**Table 4. Agency Actions Related to Community Assistance**

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
Coastal Resilience Community of Practice	APNEP participates in the Coastal Resilience Community of Practice led by the NC Division of Coastal Management. The workgroup consists of diverse coastal stakeholders, including agency representatives, local governments, and non-profit organizations who have agreed to focus on how ecosystem resiliency can help build local community resilience. APNEP staff assist with meeting logistics and developing meeting content, inviting partners to present and share information, and are working with a subgroup to update and include resilience measures in the WRC Green Growth Toolbox.	N.C. Division of Coastal Management, N.C. Coastal Reserve, APNEP, NCWRC
Using Natural and Nature-Based Features to Build Resilience to Storm-Driven Flooding	<p>APNEP continued to participate on a Virginia Institute of Marine Sciences (VIMS)-led team on a NOAA-funded Coastal Resilience project which began in 2017. The project team developed a spatial analysis tool for Virginia local governments to identify opportunities and criteria for using Natural and Nature Based Features (NNBFs) that increase resilience to storm driven flooding. The project is designed to incentivize the use by NNBFs by identifying co-benefits of different coastal habitat types by highlighting their ability to generate credits for local governments in water quality and hazard mitigation (FEMA CRS) programs. APNEP is working with the project team and other partners to evaluate the tool’s applicability in N.C. coastal localities as a possible extension of the guidance to areas beyond coastal Virginia.</p> <p>APNEP developed a scope of work to assess N.C. locality needs, build a template tool comparison database, and develop outreach materials and resources that N.C. local government staff can use to compare tools and the types of NNBFs that can meet their needs. These outreach materials will promote the use of natural infrastructure to build community and ecosystem resilience, and also complement outreach being conducted for the CHPP and by the Living Shorelines Committee. APNEP has developed a contract with Wetlands Watch to complete this remaining phase of the project which will be completed in 2022.</p>	{non-agency led} APNEP, VIMS, Wetlands, Watch, VCPC

Initiative Title	Description	Division/Lead Program Office
Scuppernong Regional Water Management Study	<p>APNEP has partnered with NC State Parks, NC Soil and Water Conservation, US Fish and Wildlife Service, and Washington and Tyrell Counties on a hydrologic study of the northern Albemarle-Pamlico peninsula. Washington County was awarded a planning grant from the Water Resources Development Fund to conduct the study. APNEP is assisting with convening technical partners and stakeholders, grant application preparation, and securing partners and match for the project. APNEP will continue working with these local governments, who have requested assistance from the state with technical and grant administrative capacity to address flooding and resilience planning, to conduct a hydrologic study of the headwaters of the Scuppernong River, Lake Phelps, and the surrounding land.</p> <p>The outcomes from the study will be utilized to build a more comprehensive approach to regional water management in order to create a water budget for the northern Albemarle-Pamlico peninsula, which has been experiencing cycles of flooding and drought in an area that is highly vulnerable to sea level rise. APNEP is participating in NCORR's RISE program and also anticipates this type of project will be of interest to the group which is working on developing local and regional approaches to building climate resilience.</p>	APNEP, DWR, DPR, SWCD, USFWS
Resilient Coastal Communities Program (RCCP)	<p>The Division of Coastal Management funded 10 organizations for a total of \$705,000, to provide planning, technical assistance, and capacity building to 26 local governments (8 counties, 18 municipalities), through the Resilient Coastal Communities Program. Planning, technical assistance, and engagement are conducted as called for in the RCCP Planning Handbook, and includes standards for vulnerability assessment, critical asset mapping, community engagement, and the incorporation of nature-based features in project identification.</p> <p>The program is funded by the NC General Assembly and the National Fish &amp; Wildlife Foundation. DCM is continuing to implement the RCCP in partnership with the NC Office of Recovery &amp; Resiliency, NC Sea Grant, and The Nature Conservancy.</p>	DCM/Policy & Planning
Hydrology and Hydraulics Study for Dam Overtopping in the Neuse and Lumber River Basins	Study of the hydrology and hydraulic capacity of large and very large dams identified in the Neuse and Lumber River Basins. The information gained in this study will allow State and Local governments to set priorities on responses to dams given limited personnel resources as well as monitor the need for dam modifications in the future. DEMLR Dam Safety is in the process of completing study of 326 dams in the Cape Fear River Basin	Energy, Mineral, and Land Resources/Dam Safety Program

Initiative Title	Description	Division/Lead Program Office
	under <b>SL 2019-224 2.1(3)</b> to supplement the already completed 261 dams in the Neuse and Lumber River Basins.	
Dam Breach Modeling	The DEMLR Dam Safety Program has performed over 300 Dam Breach Models of High and Intermediate Hazard dams in North Carolina to confirm hazard classifications but more importantly to determine the hazard impacts if dam failure were to occur. These breach models are used by NCDEQ, NCDPS and Local Emergency Management to identify property and infrastructure subject to impact, residences that could be impacted as well as to develop access and evacuation routes. This information will also be shared with NCDOT as state maintained roads and highways are subject to flooding and damage impacts from dam failure.	Energy, Mineral, and Land Resources/Dam Safety Program
High Hazard Dam Rehabilitation Grant (HHPD)	The DEMLR Dam Safety Program has administered a FEMA Grant for the rehabilitation of High Hazard Dams. There were four local government sub-grantees this year that shared in the receipt of \$664,000 used to develop plans to determine dam risk and repair needs to address deficiencies to ensure improved infrastructure and reduce risk and increase resilience within their communities. The DEMLR has also just been awarded \$670,000 to continue these efforts in the coming year including the development of a Semi-Quantitative Risk Analysis Process of High Hazard Dams.	Energy, Mineral, and Land Resources/Dam Safety Program
Reduce Methane-Producing Organic Waste Disposal and Increase Carbon Sequestration through the Application of Finished Compost	<p>According to the EPA, 17 percent of U.S. methane emissions (a greenhouse gas with a global warming potential 84 times more potent than carbon dioxide over a 20-year period) came from organic waste decomposing in landfills in 2019. DEACS works with stakeholders including private businesses, local governments and higher education institutions to reduce the amount of food waste and organics entering North Carolina landfills by encouraging less generation of waste in the first place, donation of edible food, and composting of inedible food scraps. These efforts help reduce the amount of methane generation and facilitate increased carbon sequestration through the application of finished compost.</p> <p>DEACS enhances the state’s growing organic waste recycling economy by connecting producers and consumers of compost products, helping businesses and local governments grow their recycling capacity, and demonstrating why NC is the ideal place to establish new green enterprises.</p>	Division of Environmental Assistance and Customer Service

Initiative Title	Description	Division/Lead Program Office
Reduce the Burden on the State's Disposal Resources and Increase Recycling and Sustainable Material Management	<p>Increased frequency and intensity of storm events will result in increased storm debris that will place a burden on the state's disposal resources and will require appropriate management options, including recycling, composting, and other waste reduction strategies. Communities and other entities with strong, robust waste reduction and recycling programs will be less dependent upon disposal options and more resilient to the impacts of climate change and significant storm events.</p> <p>The promotion and support of recycling and sustainable materials management in NC has been ongoing since the start of the state's recycling assistance program in 1989. However, DEACS has begun to emphasize the importance of waste reduction, recycling, and composting to reduce greenhouse gas emissions. In most cases, manufacturing products from recycled material uses less energy than manufacturing products from raw materials. Through recovering raw materials through recycling, communities and businesses reduce energy consumption and greenhouse gas production. DEACS encourages the expansion and implementation of waste reduction and diversion programs through outreach, technical assistance, and awarding \$1.1 million annually in grant funding to local governments and industries.</p>	Division of Environmental Assistance and Customer Service
Energy Efficiency Assessments for Communities	DEACS' Waste Reduction Partners program provides direct energy efficiency and renewable energy technical assistance to businesses, farms, community facilities, water and wastewater systems, and manufacturers. For example, WRP engineers worked with poultry processors to develop preliminary feasibility studies of renewable natural gas projection anaerobic digestion lagoons and net zero greenhouse gas emissions plans.	Division of Environmental Assistance and Customer Service
Harmful Algal Blooms (HAB)	Implemented sentinel site monitoring, collection, and processing for harmful algae species in shellfish growing waters throughout the coast. Continued to enhance division monitoring capacity through equipment acquisition, staff training, and more formalized collaboration with other state and federal entities with responsibilities in this field. Began development of standard protocol and contingency plans for HAB response to integrate not only Shellfish Sanitation and Recreational Water Quality staff, but also the division drone fleet to allow for more rapid response to reported issues.	Division of Marine Fisheries/Shellfish Sanitation and Recreational Water Quality Section
Northern Lab	Continued to pursue acquisition of a facility to house the northern regional Shellfish Sanitation and Recreational Water Quality lab. State Properties Office is prepared to sign	Division of Marine Fisheries/Shellfish

Initiative Title	Description	Division/Lead Program Office
	the lease with a projected opening in Spring/Summer 2022. Acquisition of lab space will help to increase the division's ability to respond to water quality issues that may impact the suitability of shellfish for harvest, particularly following storm impacts.	Sanitation and Recreational Water Quality Section
Coastal Habitat Protection Plan (CHPP) Outreach Plan	The division drafted the CHPP Outreach Plan with strategies for increased public understanding of NC's important coastal habitats, community engagement, and habitat protection and restoration benefits including enhancing ecosystem and community resilience. This includes the formation of a private public partnership for further community engagement.	Division of Marine Fisheries/Habitat and Enhancement Section
Upgrade and Save Program for Energy Star Manufactured Homes	The State Energy Program and East Carolina University partnered to provide rebates that assist with the sale and installation of high-efficiency heat pumps in newly sited ENERGY STAR-certified manufactured homes. Efforts served low-to-moderate income communities east of the I-95 corridor and typically provide an annual energy savings of \$630 for each manufactured home. During FY2020-21, 435 manufactured homeowners obtained high-efficiency heat pumps in rural North Carolina ( <i>approximately 75% were sited in Tier 1 and Tier 2 counties</i> ).	State Energy Office – State Energy Program

## **II. Department of Health and Human Services**

### **A. Summary Message Regarding EO80 Implementation**

Due to pervasive systemic injustices, historically marginalized populations too often live in environments that jeopardize their health and well-being. For decades, the same policies and pollutants that we now recognize as causing climate change have been wreaking havoc on communities of color, resulting in higher rates of asthma, heart disease, cancer, and other preventable diseases. At the Department of Health and Human Services, we have continued to use our mission and position to raise the alarm on the disparate health impacts of climate change; provide healthcare, resources, and support to those most affected; and create lasting systemic change.

Nowhere in recent memory has the impact of these inequities been more evident and more urgent than in the current and ongoing pandemic. Historically marginalized populations have been disproportionately impacted by COVID-19, no doubt made worse by the higher prevalence of diseases that increase the risk of serious illness from the virus. With this data in hand, DHHS has led its COVID-19 response with an intentional focus on historically marginalized populations, thereby addressing both the health impacts of environmental injustice and building a stronger framework for engaging with historically marginalized communities beyond the pandemic. We continue to build trust by engaging local leaders to guide our policies and practices, investing in partners on the ground, using culturally and linguistically appropriate strategies, and working tirelessly to ensure contractors and other trusted partners look like the communities served.

The Department's primary responsibility continues to be responding to the COVID pandemic.

## B. Update on E080 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	Awarded \$2.5 million Building Resilience Against Climate Effects (BRACE) grant from CDC to continue climate and health adaptation work in the state through 2026.	Division of Public Health (DPH)/Occupational and Environmental Epidemiology Branch (OEEB)
	Continued Building Resilience Against Climate Effects (BRACE) adaptation projects in heat-health alert systems, heat-health surveillance, and wildfire elementary education in the Sandhills and expanded work to incorporate impacts from flooding and climate injustice.	DPH/OEEB
	Completed a pilot of an Environmental Health data dashboard, based on the framework for CDC’s Environmental Public Health Tracking Network. The dashboard includes environmental exposure and health outcome data including, chemical releases, private well water, childhood lead poisoning, and carbon monoxide poisonings. It incorporates critical climate change indicators including flooding, air quality and population demographics important to climate justice, such as race and socioeconomic status. Upon completion, this tool will be publicly accessible for communities to explore the numerous relationships among environment, communities, and health. Expected to launch in Summer 2022.	DPH/OEEB
	Provided interview on heat-health and NC farmworkers for NC News Service radio series on climate change.	DPH/OEEB
	Presented on the impact of climate on health to the: <ol style="list-style-type: none"> <li>1. NC BREATHE Conference</li> <li>2. SR AHEC</li> <li>3. National Adaptation Forum</li> <li>4. Southeast Climate Adaptation Science Center</li> </ol>	DPH/OEEB
	The Division of Health Benefits (DHB) continued to expand reimbursement for clinical services delivered via telehealth, potentially reducing transportation burdens on patients accessing health care.	DHHS/DHB



Category	Summary of Initiative / Accomplishments	Division/Program Office
NC Clean Energy Plan Implementation	Teleworking has continued to be part of the pandemic response, and this dramatically reduces earth warming air pollution. Building energy costs and vehicle miles traveled for commute continue to be dramatically reduced.	DHHS
	Expanded the use of electronic signing via Adobe and DocuSign leading to significant paper reduction.	DHHS
	Transitioning from paper documents to electronic documents, including the management and award of solicitations (e.g., RFA, RFP, RFI, RFQ, IFB), has significantly reduced paper use and the need for brick-and-mortar storage capacity.	DHHS
NC ZEV Plan Implementation	The DHHS is implementing the ZEV initiative through a two (2) pronged approach:	DHHS/Property & Construction
	1. Vehicular asset needs are reviewed in a timely manner to address departmental needs with the goal of utilizing a ZEV or hybrid vehicle unless the particular situation determines another vehicle type is absolutely required	DHHS/Property & Construction
	2. The DHHS is approaching property acquisitions and maintenance with the goal of making all DHHS properties EV (ZEV) capable with the inclusion of EV (ZEV) infrastructure. This is inclusive of working with the NC DOA to incorporate EV (ZEV) infrastructure language into lease acquisition documents.	DHHS/Property & Construction
NC Motor Fleet ZEV Plan Implementation	DHHS works diligently with the NC DOA MFM to fully vet all vehicular asset situations whether for a new or replacement vehicle. All new or replacement vehicular asset deployments are evaluated for potential EV (ZEV) utilization. Vehicle utilization, in order to provide direct client services, are the final arbiter of the make and model requested and deployed, but always in the most economical yet environmentally sustainable manner, be it EV or hybrid	DHHS/Property & Construction
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	DHHS has undertaken supportive measures at DHHS allocations (state owned properties and leased properties) to augment electrical services to support EV (ZEV) vehicles in service and to handle additional EV (ZEV) units as they come online with DHHS.	DHHS/Property & Construction

Category	Summary of Initiative / Accomplishments	Division/Program Office
Agency Building Utility Consumption Reduction (EO80 Section 8)	<p>DHHS Facility Managers have been instructed to take several initiatives on their campuses to reduce energy and water usage when these opportunities are available. These initiatives include the following:</p> <ol style="list-style-type: none"> <li>1. Consolidating building occupants in buildings with a high square foot per person so that buildings may be closed off and HVAC system temperatures set back or turned off completely.</li> <li>2. Recommissioning existing HVAC control systems to optimize energy savings. Verification of proper outdoor air set points on HVAC systems.</li> <li>3. Survey each campus for energy savings opportunities. Identify system leaks and repair them.</li> <li>4. Replace existing lighting (incandescent or fluorescent) with LED lighting.</li> <li>5. Install lighting occupancy sensors in appropriate areas/rooms.</li> <li>6. Implement temperature setbacks for non-occupied time periods for non-patient areas. Provide proper deadband between heating and cooling setpoints in all occupancies.</li> <li>7. Prohibit personal space heaters and mini refrigerators.</li> <li>8. Repair and caulk leaks in windows and doors. Add building insulation where needed or where it does not exist.</li> </ol> <p>Several projects have been completed or are in construction which help in the reduction of energy usage. These projects include the following:</p> <ol style="list-style-type: none"> <li>1. At the majority of DHHS facilities, existing incandescent and fluorescent lighting fixtures have been replaced with LED fixtures.</li> <li>2. Broughton Hospital: Replacement of the domestic water heaters with semi-instantaneous water heaters.</li> <li>3. J. Iverson Riddle Developmental Center: Replaced aging domestic water heater at the Mulberry Building with more efficient water heater.</li> <li>4. J. Iverson Riddle Developmental Center: Reduced aging domestic water and sewer piping which has reduced water leakage.</li> <li>5. J. Iverson Riddle Developmental Center: Replaced an aging air-cooled chiller at the Birch Cottage serving three buildings with a more efficient chiller.</li> <li>6. J. Iverson Riddle Developmental Center: Replaced the roof on the Maple Building including additional roof insulation.</li> <li>7. John Umstead Campus: Replace the aging HVAC system including leaking steam piping in Building 27A with a new HVAC system.</li> </ol>	DHHS/Property & Construction

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>8. Julian F. Keith ADATC: Upgraded Dorms 1 &amp; 2 with new windows, new plumbing piping and fixtures new HVAC system upgraded electrical system including new LED lighting.</p> <p>9. Julian F. Keith ADATC: Replaced aging condensing unit at the Activities/Gym Building.</p> <p>10. O’Berry NMTC: Upgraded the HVAC system serving the Administration Building and Human Resources Building.</p> <p>11. O’Berry NMTC: Replaced windows at ELC-2.</p>	
Other Conversation and Efficiency Initiatives	<p>DHHS has contracted with Capturis, a utilities management consultant in order to document utility usage and costs. With this information, DHHS can more easily detect abnormalities in energy and water use and take measures to identify the sources of abnormal energy and water use and make adjustments or repairs as needed.</p> <p>In order to reduce overall energy consumption, DHHS is in the process of consolidating partially used buildings so that some buildings can be closed off and utilities usage for these buildings reduced significantly.</p>	DHHS/Property & Construction

## C. Update on Department Climate Resilience Activities

### a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2020

*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Climate Risk Assessment & Resilience Plan	<p>Developed a resilience framework for public health and human services in partnership with the Department of Environmental Quality, Division of Air Quality (NCDAQ), DHHS. From February 2019 through March 2020, NCDEQ and NCDHHS participated in 12 statewide resilience planning meetings and 7 regional workshops. As a result, DHHS developed multiple recommendations including:</p> <ol style="list-style-type: none"> <li>1. Address existing toxic exposures in low-income communities and communities of color</li> <li>2. Provide information on minimizing effects of moisture and mold</li> <li>3. Incentivize housing integration &amp; reduce substandard housing and increase access to cooling</li> <li>4. Increase social and behavioral health support in vulnerable communities</li> <li>5. Expand tracking of epidemiological health impacts of climate change in NC</li> <li>6. Increased investment in Back@Home disaster recovery rapid rehousing initiative</li> <li>7. Offer adequate social services support to North Carolinians navigating government processes during disaster recover</li> </ol>	DHHS

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
Climate Justice and Equity	Continued conversations and work to build resilience in the context of addressing existing toxic exposures, such as hazardous waste in water or homes, in low-income communities and communities of color. Provided content to and shared EO 246 on environmental justice. Identified environmental justice leadership within DHHS.	DHHS
Equity in Response to COVID-19	<p>DHHS continues to serve as the lead agency for the COVID-19 pandemic and uses a data driven approach to address the inequitable impacts we see from COVID-19. Closing these disparity gaps is important to mitigating the impacts of climate change on our most vulnerable communities.</p> <p>DHHS continues to provide increased social and behavioral supports across communities during COVID-19 response. Provided unprecedented health guidance to protect a wide array of North Carolinians in the pandemic,</p> <p>DHHS created a COVID workgroup during 2020, and this work has continued into 2022. This workgroup focuses on HMPs and includes internal DHHS staff and contractors and external partners from community groups, advocacy organizations, health care providers and academic institutions.</p> <p>DHHS hired a Chief Health Equity Officer, the new Interagency Leadership Team representative, and pledged to support health equity by using and sharing high-level data about race, ethnicity, language, and gender to inform best practices to promote health equity, reporting race and ethnicity data for all COVID-19 vaccinations, and establishing accountability mechanisms to strategically address health disparities.</p> <p>DHHS’s Office of Procurement, Contracts and Grants has reached out to virtually educate the vendor community in efforts to expand the Department’s reach given the unique needs of the pandemic and its work to ensure vendors reflect the communities served:</p> <ol style="list-style-type: none"> <li>1. A virtual educational session on understanding contracting with the State of NC; and</li> </ol>	DHHS

Initiative Title	Description	Division/Lead Program Office
	<ol style="list-style-type: none"> <li>2. Virtual preproposal conferences to walk through the competitive solicitation document and offer attendees an opportunity to ask questions; and</li> <li>3. Begin drafting debriefing procedures and an implementation strategy to allow unsuccessful vendors to understand why its proposal was not selected for award.</li> </ol>	

**c. Actions taken or planned to take to assist communities served**

**Table 4. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
Seeking additional support	<p>Continue to educate on benefits of additional support for DHHS programs below. Additional funding for infectious disease tracking has been obtained for COVID-19.</p> <ol style="list-style-type: none"> <li>1. Building Resilience Against Climate Effects program</li> <li>2. Back@Home program</li> <li>3. Mold and moisture education</li> <li>4. Infectious disease tracking</li> </ol>	DHHS
Climate and health adaptation	Continued adaptation projects in heat-related illness surveillance, heat-health alert systems, and wildland fire elementary education	DHHS/DPH/OEEB
Disaster Response Efforts	The DHHS has continued to respond to disasters facing the State, addresses their impact and provides staff in a variety of public services. DHHS has continued its lead agency role with primary responsibility for the COVID-19 pandemic.	DHHS

### **III. Department of Public Safety**

#### **A. Message from the Secretary**

The Department of Public Safety continues to prioritize all facets of Governor Cooper’s Executive Order 80 that are related to our mission, and to expand our vision to achieve new success in delivering on the Order’s promise. The divisions of this agency work to reduce their carbon footprint by producing energy and water savings in facilities, reducing dependence on internal combustion vehicles, managing the natural resources in our possession, and promoting resiliency in communities across the State.

#### **Energy and Water Savings – Prison Facilities**

Our Utility Consumption Reduction plan includes converting all our interior and exterior lighting to LED via our “LED in ‘23!” campaign. We are on track to complete this task by the end of fiscal year 2023-2024. The Division of Prisons’ largest utility spend is for water and sewer. Water management systems for use in correctional facility settings can reduce water waste and abuse by over 50%. To this end we are pursuing a performance contract for six of our largest correctional facilities with a focus on these systems as well as LED lighting. Funding has always been a challenge for energy and water efficiency projects, but OSBM’s decision to set aside \$30 million of the Repair and Renovation budget for projects to meet this goal will help tremendously. We are aggressively seeking our share of those funds to make our vision of energy efficiency a reality.

With more technical and engineering staff we will be able to take our vision to the next level. We intend to take our part in the efforts in EO 246 to develop a clean energy-focused workforce.

#### **Fleet Electrification**

Electrification of the Public Safety fleet is challenging given our mission. The ZEVs currently available through State Term Contract are not feasible for law enforcement purposes because there are no commercially available cages for transporting individuals under arrest, and our employees’ safety is a paramount concern for us. We are meeting regularly with Divisions of Motor Fleet Management and Purchase and Contract in the Department of Administration to expand the offerings on the State Term Contract.

Motor Fleet Management identified approximately 175 assigned vehicles in our fleet that could be replaced with a ZEV based on utilization, but due to the nature of our work, often transporting offenders, we were not able to place those ZEVs. However, in offering a hybrid alternative, we successfully replaced over 300 gas-powered vehicles with Toyota Camry hybrids cutting our carbon emissions for those vehicles by half.

#### **Managing Natural Resources**

The Department owns approximately 36,000 acres in North Carolina. Through the work of the Governor’s Climate Council, our agency has learned about ways that land can be used to absorb carbon, making as much of a contribution to reducing greenhouse gases in our atmosphere as electric vehicles. We have worked closely with the Natural Heritage Program in the Department of Natural and Cultural Resources to create a strategy to leverage our property to maximize carbon sequestration. We have dedicated over 40 acres of swampland in Robeson County as a natural heritage preserve that will absorb carbon and protect species of wildlife unique to the Lumber River. We are engaged in ongoing efforts to

work with specialists in forest management to ensure maximum advantage from our acres of deciduous forest. Our learning and commitment will only expand as we continue to interact with our partners in the Departments of Environmental Quality and Natural and Cultural Resources.

### **Office of Recovery and Resiliency**

DPS also contains the NC Office of Recovery and Resiliency (NCORR), which has primary responsibility for ensuring that federal disaster recovery dollars, specifically Community Development Block Grant – Disaster Recovery (CDBG-DR) and CDBG – Mitigation (CDBG-MIT) funds from the U.S. Department of Housing and Urban Development, are invested in ways that make our communities less vulnerable and more prepared to bounce back from future disasters. NCORR’s Resilience Team staffs the State Disaster Recovery Task Force (SDRTF), the Interagency Resilience Team, and the newly created Stream Management and Flood Reduction Interagency Working Group. As part of that work, NCORR is leading various subcommittees of the SDRTF through developing recommendations for how to administer CDBG-DR and CDBG-MIT planning funds to support state-wide climate resilience,

The Resilience Team, in partnership with NC Rural Center and various councils of government, launched a program under the NC Resilient Communities umbrella—Regions Innovating for Strong Economies and Environment (RISE) Program this year, working with nine regions in the eastern half of the state to complete climate vulnerability assessments and identify priority projects to reduce risk and increase resilience to hurricanes, flooding, and other extreme weather events. The Resilience Team is also developing a guide for building community resilience, and continues to advise all branches of state government, including the Governor’s Office, on climate adaptation and resilience.

In addition to supporting local governments, NCORR's programs serve residents, helping communities rebuild in a safe, equitable manner. NCORR's housing recovery programs are especially designed to serve low- and moderate-income households. The agency has committed to funding more than 1,000 new affordable housing units in regions of the state hit by Hurricanes Matthew and Florence. In addition, NCORR has a partnership with the North Carolina Housing Finance Agency to construct affordable housing outside the floodplain in several counties.



## B. Update on EO80 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	<ul style="list-style-type: none"> <li>• Transition 25% of Prison’s fleet convertible vehicles to zero emission vehicles by 2025. Out of 1600 vehicles, 1000 could be substituted. This amount to approximately 250 vehicles we will need to convert to EV.</li> <li>• By 2022, increase Prison owned Level 2 and DC Fast charging infrastructure to 25% of Prison owned Facilities to include Regional Offices and Regional Maintenance yard.</li> <li>• Deploy ZEV Security Patrol vehicles at no less than (5) facilities by the end of 2022.</li> <li>• Deploy EV Transit passenger vans and maintenance vans when available.</li> <li>• Advocate for greater diversity of available electric vehicles on state contract.</li> </ul>	NCDPS Adult Corrections
Agency Building Utility Consumption Reduction (EO80 Section 8)	FY 2017-2018 to FY 2020-2021: <ul style="list-style-type: none"> <li>• Exterior Lighting:               <ul style="list-style-type: none"> <li>• Replaced ~62% of all our exterior lights. Exterior lighting at correctional facilities have a significant impact on our energy costs and usage and can be over 10% of our overall site energy costs</li> <li>• Invested over \$2.9M (\$2.6M Opt-out funds, \$.3M in department funds) in wholesale replacement of outdoor lighting, impacting 48 DOP correctional facilities resulting in an annual reduction of 28,600 MMBTUs and annual savings of over \$640k</li> </ul> </li> <li>• Interior Lighting:               <ul style="list-style-type: none"> <li>• Invested over \$280K of Opt-out and department funds towards interior lighting resulting in wholesale lighting replacements at five facilities resulting in an annual reduction of 8,220 MMBTUs and annual savings of over \$195k</li> </ul> </li> </ul>	NCDPS and Adult Corrections (Prisons and Central Engineering)

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<ul style="list-style-type: none"> <li>• Water Leaks <ul style="list-style-type: none"> <li>• Repaired water leaks resulting in ~45,500 kgals per year and ~\$735k in yearly savings</li> </ul> </li> </ul> <p>FY 2021-2022:</p> <ul style="list-style-type: none"> <li>• Investing over \$400k for additional exterior LED lighting retrofits.</li> <li>• Investing over \$125k for additional interior LED lighting retrofits</li> <li>• Investing over \$250k in building management system (BMS upfits)</li> <li>• RFP for performance contracting for our six Thousand Cell Correctional facilities with a focus on water management systems and LED lighting retrofits/replacements</li> <li>• Monthly facilities management roundtables to discuss Performance Driven Maintenance topics.</li> </ul>	
Other Conversation and Efficiency Initiatives	<ul style="list-style-type: none"> <li>• In the process of hiring a water manager to oversee our water management and leak program.</li> <li>• In the process of hiring a building management systems manager</li> <li>• North Carolina Clean Energy and Technology Center has partnered with NCDPS to complete a comprehensive solar assessment of all possible sites.</li> <li>• Primary for is to obtain meaningful GHG reduction at an acceptable payback (Simple payback, SIR, ROI) to assist with meeting Executive 80 requirements-40% by 2025 compared with 2005 levels and bring solar to Adult Corrections.</li> </ul>	NCDPS and Adult Corrections (Prisons and Central Engineering)

**C. Update on Department Climate Resilience Activities**

**a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2020** *(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
Interagency Resilience Team	NCORR regularly convenes the Interagency Resilience Team, pursuant to Chapter 7 of the 2020 North Carolina Climate Risk Assessment and Resilience Plan, to facilitate interagency communication on building resilience internally and statewide.	NC Office of Recovery and Resiliency
Agency Resilience Strategy Reports	NCORR guides State agencies as they submit their annual Agency Resilience Strategy reports, which are called for in the 2020 Climate Risk Assessment and Resilience Plan (2020 Plan). The reports outline agencies’ current and planned actions to increase resilience and describes progress on implementing strategies identified in the 2020 Plan.	NC Office of Recovery and Resiliency
Stream Management and Flooding Reduction Working Group	NCORR is in the process of establishing an intergovernmental working group composed of representatives from DEQ and other relevant state agencies, local governments, and other stakeholders to identify legislative, economic, jurisdictional, and other challenges related to stream management and flooding reduction. NCORR will report biannually to the Joint Legislative Commission on Governmental Operations and the Fiscal Research Division regarding the findings and recommendations of the working group. These actions fulfill § 143B-1041 of the 2021 Appropriations Act.	NC Office of Recovery and Resiliency

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
Affordable Housing Planning Initiative	NCORR has partnered with the University of North Carolina’s Development Finance Initiative to help identify locations across the sixteen counties most impacted and distressed by Hurricane Matthew and Florence impacts. The study will inform NCORR’s affordable housing strategy as it seeks to locate housing that addresses the critical affordable housing need and creates housing that suites the character of the impacted area and ensures sustainable, resilient affordable housing stock.	NC Office of Recovery and Resiliency
Infrastructure Recovery Program	NCORR works with local municipalities impacted by Hurricane Matthew to restore damaged critical infrastructure. These projects include flood gates, drainage repairs, access roads, water tanks, generators, and various other improvements identified by the city or county as a critical need. The program also includes significant site development on a 53-acre site in Princeville, NC, to help establish long-term resilience and community viability.	NC Office of Recovery and Resiliency
Multi-Family Rental Housing	In 2021, NCORR committed to funding more than 1,000 new affordable housing units in regions of the state hit by Hurricanes Matthew and Florence. Approximately \$53.5 million of the state’s HUD Community Development Block Grant–Disaster Recovery funds are being used in partnership with the N.C. Housing Finance Agency, public housing authorities in the cities of Lumberton and Wilson, and Cumberland County government to increase safe, affordable housing opportunities for low-to-moderate income households. The agency has committed to building additional units in Fayetteville, Goldsboro, Brunswick County, Columbus County, Craven County, Edgecombe County, and Onslow County.	NC Office of Recovery and Resiliency
Public Housing Restoration Fund	Through this fund, NCORR repairs and replaces affordable housing that was impacted by Hurricane Matthew and Hurricane Florence. The intent of this program is to provide recovery funding to storm-impacted public housing authorities to relocate public housing units out of harm’s way.	NC Office of Recovery and Resiliency

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
ReBuild NC – Homeowner Recovery Program	NCORR administers the ReBuild NC Homeowner Recovery Program, North Carolina's long-term disaster recovery program, to repair and elevate storm-damaged homes. This effort primarily serves low- and moderate-income homeowners.	NC Office of Recovery and Resiliency

**c. Actions taken or planned to take to assist communities served**

**Table 4. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
NC Resilient Communities Planning Guide	The guide will empower local and regional leaders, including government officials as well as business, nonprofit, and community leaders, to understand their climate vulnerabilities and develop shared priorities for action. This project is also part of RISE, within the North Carolina Resilient Communities program.	NC Office of Recovery and Resiliency
Online Resilience Resource Center	NCORR, in partnership with DEQ and several environmental nonprofits, is developing an online climate resilience clearinghouse for local governments and community leaders. The tool is called for in Chapters 4, 6, and 7 of the 2020 North Carolina Climate Risk Assessment and Resilience Plan (2020 Plan) and in the North Carolina Natural and Working Lands Action Plan.	NC Office of Recovery and Resiliency
ReBuild NC – Transition to Modular Homes from Manufactured Homes	NCORR transitioned its home replacement program from providing manufactured housing to providing modular housing. Modular housing is more durable and resilient to climate hazards; solid foundations also increase the durability of the housing units.	NC Office of Recovery and Resiliency
ReBuild NC – Strategic Buyout Program	NCORR administers the ReBuild NC Strategic Buyout Program, which is a voluntary program that purchases properties that are at-risk for flooding, turning them into deed-restricted greenspace. The Strategic Buyout Program engages closely with local governments and communities to identify contiguous areas that are good fits for the program, and the program offers generous financial incentives to encourage applicants to move to places that are less at-risk for flooding.	NC Office of Recovery and Resiliency
RISE Regional Resilience Portfolio Program	In partnership with NC Rural Center, NCORR launched the Regions Innovating for Strong Economies and Environment (RISE) Regional Resilience Portfolio Program to address the need for local capacity building around long-term disaster recovery and resilience planning and implementation. With input from local stakeholders, the program will produce climate vulnerability assessments and priority resilience project portfolios in nine	NC Office of Recovery and Resiliency

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
	regions across the eastern half of the state. RISE is part of the North Carolina Resilience Communities program, run in partnership with DEQ.	

## IV. Department of Revenue

### A. Message from the Secretary

The Department of Revenue (DOR) administers the tax laws and collects taxes due in an impartial, consistent, secure, and efficient manner to fund public services benefitting the people of North Carolina. As a cabinet agency, the Department is fully committed to supporting Executive Order 80 and working with other agencies to meet the established goals:

- Reduce statewide greenhouse gas emissions to 40% below 2005 levels
- Increase the number of registered, zero-emission vehicles to at least 80,000
- Reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels

The agency has focused on several areas in support of Executive Order 80 to include promoting electronic filing, replacing older equipment, analyzing officespace requirements, analyzing long term vehicle leases and identifying opportunities for increased teleworking.

In March 2020, an estimated 5% of the agency was part-time or full time teleworking. As a result of COVID19, the agency had to quickly take action to move employees to teleworking while maintaining agency operations and service levels. To date, approximately 90% of employees are teleworking. At this point the agency plans to continue offering teleworking to employees due to the positive impact on the environment as well as providing an added benefit for the employee.



## B. Update on EO80 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	<p>Electronic Filing Marketing Plan. Updated and implemented the marketing plan in support of increasing electronic filing for business taxes. For tax year 2020, electronic filing data as of July 30, 2021:</p> <p>Corporate Tax 77% - 2% increase</p> <p>Partnership 87% - 5% increase</p> <p>Added electronic filing option for Estates and Trust income taxes for tax year 2020. Approximately 60% adoption rate in the first year.</p> <p>Expanded ability to file NC-3s and W2s electronically by partnering with two software providers to create a Server to Server solution that allows filers to submit the forms directly through their software product. 23,733 NC-3s and 232,364 W2s were filed using the service. This contributed to a <b>15% increase in NC-3s filed electronically</b>. Note: W2s filed did not increase due to a lower volume of W2s issued for TY 2020 due to the pandemic.</p>	Tax Schedule Implementation and Digital Communications
NC ZEV Plan Implementation	Transition to Hybrid Vehicles. Switched the majority of long term rental vehicles to hybrid vehicles prior to COVID19. Currently, long term rentals are still suspended based on limited travel.	Financial Services
Agency Building Utility Consumption Reduction (EO80 Section 8)	New Revenue Building managed by the Department of Administration. Data included as part of DOA agency information.	Business Operations

<p>Other Conversation and Efficiency Initiatives</p>	<p>Remote Office Space Analysis.</p> <ol style="list-style-type: none"> <li>1. Reducing Charlotte office footprint by over 60% in February 2022.</li> <li>2. Planning to reduce Wilmington office footprint in 2022.</li> </ol> <p>Equipment Replacement/Removal</p> <ol style="list-style-type: none"> <li>1. Actively working to replace outdated CRAC Units in our Scanner Room at the Revenue Headquarters Building.</li> <li>2. Working to remove server racks from our Headquarters Data Center.</li> </ol> <p>Telework: Approximately 90% of employees are continuing to telework.</p>	<p>Business Services</p>
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**C. Update on Department Climate Resilience Activities**

**a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019**

*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Telework Program	Continuing teleworking program and updated recruitment practices to reflect employee location flexibility depending on job duties. A remote workforce improves agency resiliency.	Secretary’s Office

**b. Actions taken or planned to take to assist communities served**

**Table 3. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
Taxpayer Assistance Remote Services	Continuing to follow the process for taxpayers to request appointments online. Upon receipt of the request, taxpayers are contacted and assistance is provided virtually in over 90% of cases eliminating the need to physically visit a DOR service center. This process supports continued services during weather events which in the past would have been limited in impacted areas.	Taxpayer Assistance and Collections

## V. Department of Information Technology

### A. Message from the Secretary

This report details changes made by the North Carolina Department of Information Technology (NCDIT) in response to Governor Cooper's Executive EO-80 (EO80) on October 29, 2018, calling for integration of climate adaptation and resilience planning into NCDIT's policies, programs, and operations. NCDIT has fully engaged its staff to evaluate internal, as well as external, information technology programs in developing a resilience strategy that supports state agencies and communities in North Carolina.

NCDIT continues to evaluate information technology software and hardware solutions to reduce energy consumption, and to implement newer monitoring of energy consumption tools within our data centers. The department is presently investing funds to improve resiliency through current and long-term climate changes. NCDIT's two state data centers are the largest energy users in our agency, and we continue to invest in staff and technology to reduce any risk associated with climate change. We also want to ensure our ability to support other state agencies with their individual resiliency programs.

1. Our organization continues its focus on reducing global climate change by eliminating reliance on paper reports and increasing employee awareness of our role in supporting climate change impacts.
  - a. NCDIT has successfully reduced paper processing by promoting electronic distribution to state agencies. The agency closed its internal printing services, outsourcing printing services only when necessary. After meeting with agencies about their individual paper reporting requirements, NCDIT continues to minimize paper production to those agencies.
  - b. NCDIT has reduced internal environmental impacts by improving energy efficiency in our data centers and Raleigh headquarter buildings. We have accomplished this by implementing additional monitoring tools. NCDIT recently received results from the Eastern Data Center (EDC) power replacement project, allowing the agency to use the best systems to monitor, sustain, and improve power distribution.
  - c. Our organization continues to focus on identifying and procuring the most energy-efficient IT equipment and evaluate working relationships with current and future vendors to see if there are opportunities to reduce our environmental impact. The goal is to purchase from vendors that recycle products sold to state government agencies.

- d. Our team continues to analyze its use of long-term lease and motor fleet vehicles to see if there are opportunities to improve energy efficiency by using electric vehicles. State funding was provided to build NCDIT's first EV (electric vehicle) station at the Western Data Center (WDC) in Forest City, N.C.
- e. NCDIT continues to focus on employee-centric programs that increase environmental awareness and opportunities for remote work.

## B. Update on E080 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	Developing plans and ideas for workplace signage and staff awareness training for FY 22/23.	Human Resources
	<ul style="list-style-type: none"> <li>• NCDIT continues to evaluate energy use at both data centers. We report that information to the N.C. Department of Environmental Quality (NCDEQ) for assistance in developing opportunities to reduce energy costs, while reducing our overall impact on North Carolina’s climate. Our organization is improving its ability to manage power and other energy-related resources, by enhancing our monitoring/managing capabilities for reporting and analyzing energy use. The goal is to reduce our carbon footprint. This behavior will continue each year.</li> <li>•</li> </ul>	Facilities/Data Center Services
	<ul style="list-style-type: none"> <li>• The WDC has plans to install the infrastructure needed to power two EV charging stations by June 30, 2022, with procurement of chargers thereafter. This will encourage EV use and support future agency EV’s. Planning is underway at the EDC to determine what is needed to install EV chargers there. Based on funding availability, EV Charging stations will be added to Raleigh facility.</li> <li>• Replace current gasoline-powered vehicles with EV’s as leases expire and when feasible.</li> </ul>	Facilities
NC Clean Energy Plan Implementation	Currently 62% of NCDIT’s workforce have a full-time remote work agreement and 28% have a part-time remote work agreement. This helps reduce power, water, and fuel consumption for employees and the agency. It also improves resiliency during adverse weather events.	Human Resources
	<ul style="list-style-type: none"> <li>• The WDC has plans to install the infrastructure needed to power two EV charging stations by June 30, 2022, with procurement of chargers thereafter. This will encourage EV use and support future agency EV’s. Planning is underway at the EDC</li> </ul>	Facilities

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>to determine what is needed to install EV chargers there. Based on funding availability, EV Charging stations will be added to Raleigh facility.</p> <ul style="list-style-type: none"> <li>• Replace current gasoline-powered vehicles with EV's as leases expire and when feasible.</li> </ul>	
	<ul style="list-style-type: none"> <li>• NCDIT Hosting Services continue assisting agencies in developing electronic sharing of information and reporting capabilities.</li> <li>• NCDIT has a long-term strategy to convert the state-owned data centers to third party cloud solutions (i.e., Azure, AWS, Google Cloud, etc.). This will significantly reduce the state's energy consumption required to operate numerous servers.</li> <li>• NCDIT continues investing in energy monitoring capable power distribution bars within the server racks.</li> <li>• Increase data center server virtualization, increasing energy efficiency, while reducing hosts servers, reducing energy utilization.</li> <li>• Updated data center design with improved properly deployed airflow management</li> <li>• Data storage systems replacement include all flash storage drives. Power utilization of these type of systems occurs when there is access to efficient data storage.</li> <li>• Installed approximately 300 remaining T8 Fluorescent tubes at the WDC. This will complete the replacement of nearly 1750 T8's with LED's.</li> <li>• Adding equipment scheduling to the Building Management system to reduce consumption in the off hours.</li> <li>• Replacing parking lot lighting at the WDC with LED's as current lamps fail.</li> </ul>	<p>Hosting Services/Data Center Services/Facilities</p>

Category	Summary of Initiative / Accomplishments	Division/Program Office
	NCDIT will conduct a space utilization assessment to determine how much its real estate footprint can shrink under a long-term remote work policies for employees.	
	<ul style="list-style-type: none"> <li>Planned Electrical upgrades at the EDC and UPS replacement at the WDC.</li> </ul>	

### C. Update on Department Climate Resilience Activities

#### a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019

*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Data Center Resilience	<ul style="list-style-type: none"> <li>All the critical building systems, UPS, Generators, HVAC, Building Management and Fire suppression are maintained both in-house and under contracted maintenance. This ensures everything is working efficiently and potential issues are addressed before becoming an unexpected outage.</li> <li>The Data Centers have onsite fuel storage for the generators and backup batteries for the UPS systems. Batteries for the EDC/WDC have been replaced within the last 3-4 years and have a 10-year life.</li> <li>Under NC Contract 405B, diesel fuel is delivered as needed within a maximum of two days.</li> <li>The WDC has 35,000 gallons of water storage for the cooling towers in the event of an issue with water supply from the Town of Forest City. The Forest City Fire dept can also deliver water in an emergency.</li> </ul> <p>NCDIT has a long-term strategy to convert the state-owned data storage to third-party cloud solutions (i.e., Azure, AWS, Google Cloud...) and this will significantly improve resiliency.</p>	Facilities/Data Center Services



Initiative Title	Description	Division/Lead Program Office
Future Measures, Data Centers	<ul style="list-style-type: none"> <li>• A study of the EDC Electrical System upgrade has been completed and is waiting on funding to implement.</li> <li>• Plans to replace the aging and obsolete WDC UPS Systems with more efficient units is waiting on funding.</li> </ul> <p>The WDC third chiller project (adding a third chiller to increase redundancy) is waiting on funding.</p>	Facilities/Data Center Services

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
	<p>NCDIT is working to build digital equity across North Carolina so that every community and household has access to a high-speed internet connection, can afford the cost of service, and has the devices and skills necessary to participate in the digital economy. Closing the digital divide will benefit every walk of life – education access, employment opportunities, health care services, and fuller access to government and other essential services. NCDIT is using its infrastructure investments to further support equitable hiring and contracting practices among its partner providers. Additionally, updated broadband infrastructure can provide better data to assess energy use and efficiency, support precision farming and labor opportunity, and build continuity and resiliency in the face of climate change and extreme weather events.</p>	Division of Broadband and Digital Equity

**c. Actions taken or planned to address Climate Justice and Equity**

Table 4. Agency Actions Related to Community Assistance

Initiative Title	Description	Division/Lead Program Office
	<ul style="list-style-type: none"> <li>NCDIT is working with internet service providers, electric membership cooperatives that provide broadband and local municipalities to close the digital divide in North Carolina. Through a variety of grants programs, including GREAT, CAB, pole replacement and others, the agency will be spending more than \$970 million in state and federal American Rescue Plan funds to build out high-speed internet access in unserved and underserved areas of the state.</li> </ul>	Division of Broadband and Digital Equity

## **VI. Department of Commerce**

### **A. Message from the Secretary**

The NC Department of Commerce's mission is to improve the economic well-being and quality of life for all North Carolinians, which is dependent upon the creation of good jobs, the availability of a highly skilled workforce, and the implementation of policies that support a business-friendly environment and the well-being of residents and communities. Securing economic and workforce opportunities in clean energy is a critical part of this mission.

The very premise of Executive Order 80, and the goals outlined in the order to transition to a clean energy economy, are aligned with the Department's new and ongoing initiatives to educate stakeholders about climate mitigation strategies, promote resilience, advance climate justice, and provide community assistance. The Department will continue and expand these activities in subsequent years.

## B. Update on E080 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	<p>Rural Planning has started Phase 2 of the Community Economic Recovery and Resiliency Initiative. Phase 1 had 11 communities across the state participate. Phase 2 has 16 communities participating in Phase 2. CERRI focusses on business resiliency in the face of a pandemic, fire, flood, hurricane, sudden death of owner, and other disasters.</p>	<p>NC Commerce Rural Economic Development Division Rural Planning</p>
	<p>OSTI staff made more than one dozen presentations focused on offshore wind and its potential as a high-growth manufacturing sector and source of clean energy for North Carolina. Several attendees, from organizations such as local economic develop agencies, industry representatives, and state workforce officials, benefitted from the presentations.</p> <p>OSTI represented North Carolina and was a featured speaker at the Business Network for Offshore Wind’s International Partnering Conference (IPF) in Richmond, Virginia in August. More than 1,000 people attended the conference.</p>	<p>Office of Science Technology &amp; Innovation</p>
	<p>The Office of Science, Technology &amp; Innovation launched a new communications platform, reaching nearly 500 policy makers and government officials. The new platform delivers quarterly email messages to highlight meetings, current messaging, and advocacy for programmatic efforts of the Board of Science, Technology and Innovation.</p>	<p>Office of Science Technology &amp; Innovation</p>
	<p>In March 2021, Arrival, the global company creating electric vehicles ("EVs") using its game-changing technologies, announced that it will be building its second US Microfactory in Charlotte. This Microfactory will produce electric delivery vans and is expected to bring more than 250 new jobs to Mecklenburg County. The Microfactory is expected to begin production by Q3 2022. In December 2021, Arrival announced it will establish a high voltage battery module assembly plant, adding 150 new jobs and investing \$11.5 million in its new facility off Yorkmont Road.</p> <p>In June 2021, the Rural Infrastructure Authority awarded a \$500,000 grant to Rowan County to support the renovation of a building in Salisbury that is occupied by Agility Fuel</p>	

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>Solutions, LLC, a manufacturer of compressed natural gas fuel systems for trucking and transit vehicles. The company plans to add 113,000 square feet to the existing property, while creating 75 jobs and investing \$28,562,493 in this project.</p> <p>In July 2021, Smart Wires Inc., a global power technology company working to advance the delivery of affordable, clean electricity around the world, selected Durham as the site for its global headquarters, creating 250 jobs and investing \$21.5 million over five years. The Economic Investment Committee awarded a \$2.8 million Job Development Investment Grant to the project which is estimated to grow the state's economy by \$3.07 billion and the state will see net direct revenue from the project in excess of \$106 million.</p> <p>In December 2021, Toyota announced plans to build its first North American battery manufacturing plant for a new generation of vehicles in North Carolina, creating at least 1,750 jobs. Toyota will invest \$1.29 billion at the Greensboro-Randolph Megasite, strengthening North Carolina's position as a leader in the nation's growing, clean energy economy. Toyota's project in North Carolina will be led by a new venture between Toyota and Toyota Tsusho Corporation, the trading arm of the Toyota Group. The new venture company will be known as Toyota Battery Manufacturing, North Carolina (TBMNC), based in Randolph County.</p> <p>Governor Cooper's July 9, 2021, Executive Order 218, Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind, directed Commerce to establish the North Carolina Taskforce for Offshore Wind and Economic Resource Strategies (NCTOWERS) and designate a clean energy economic development coordinate. The Department has since established NCTOWERS and plans to host the first meeting of the task force in February 2022.</p> <p>The Department created a new position, the Assistant Secretary of Clean Energy Economic Development, to elevate the importance of clean energy economic and workforce development as described in EO218.</p> <p>Assisted the Governor's Office in inviting businesses to participate in the Clean Transportation Roundtable Discussion -- an opportunity for businesses to share their perspective and priorities for transportation electrification as well as to learn about opportunities and challenges in electrification from colleagues of diverse backgrounds. The</p>	Economic Development/ Secretary's Office

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>roundtable included public and private stakeholders within the transportation sector, such as state officials, automakers, fleet owners, and technology providers.</p> <p>Clean energy workforce development:</p> <ul style="list-style-type: none"> <li>-NCWorks / Turning Point WDB is partnering with The Center for Energy Education to sponsor solar training classes focused on installation, roofing, racking and OSHA 10 training. Also conducting job fairs and outreach for Strata Solar.</li> <li>-NCWorks / Northeastern WDB is collaborating with the Hampton Roads WDB (Virginia) on a grant that will include maritime industry &amp; off-shore wind manufacturing.</li> <li>-NCWorks / Lumber River WDB is collaborating with Hard Hats on talent acquisition focused on assemblers and installers for solar farms throughout Scotland, Hoke, Robeson and Richmond Counties.</li> <li>-NCWorks / Charlotte Works WDB is working toward greater collaboration with Duke Energy to use NCWorks for talent acquisition focused on the Duke Renewable Control Center (RCC) which monitors wind and solar plants across the nation.</li> <li>- NCWorks / Mountain Area WDB is collaborating with Solfarm which focuses on residential and commercial solar, along with EV charging stations, on talent acquisitions. Other partners include A-B Tech Cimmunity College and Apprenticeship NC.</li> <li>- NCWorks / Piedmont-Triad WDB partnering with NC A&amp;T for a clean energy grant focused on Rockingham and Forsyth Counties.</li> </ul> <p>Participated in the NC Pathways Analysis Interagency working group responsible for developing the RFP used to hire the consultants that will analyze NC climate strategies and actions to date, model 50% reduction by 2030 and net zero emissions by 2050 and analyze all sectors. Commerce provided feedback on the types of modeling and stakeholder engagement that should be included in the Pathways Analysis.</p>	<p>The Division of Workforce Solutions (DWS)</p> <p>Economic Development/Secretary's Office</p>
NC ZEV Plan Implementation	Participated as a member of the North Carolina team in Multi-State Medium- and Heavy-Duty Zero Emissions Vehicle (ZEV) Task Force working to develop an action plan to accelerate the transition to zero emissions vans and trucks.	Economic Development/Secretary's Office

Category	Summary of Initiative / Accomplishments	Division/Program Office
NC Motor Fleet ZEV Plan Implementation	The Department of Commerce supported the Motor Fleet ZEV Plan in 2021 by replacing two vehicles with ZEVs or hybrid vehicles. One ZEV was purchased by DWS and one 2022 Camry Hybrid was purchased by Commerce proper.	Secretary's Office/DWS
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	The Department of Commerce provided recommendations and advice to the Department of Environmental Quality on the strategies to invest funding from the Phase 2 VW Mitigation Plan.	Economic Development/Secretary's Office
Agency Building Utility Consumption Reduction (EO80 Section 8)	MERV 13 HVAC air filters are installed at the downtown Commerce location. By using these filters it is a cost savings of \$0.01 to \$0.02 per square foot, totaling approximately \$3000 to \$6000 per month in savings.	HR/Safety
Other Conservation and Efficiency Initiatives	The Commerce occupied spaces in the Education Building have timers on the lights to conserve energy. The lights are turned off automatically for most of the evening (10:30pm-6:00am) and are turned off on state holidays. The lights on the exterior of the building are also on timers to conserve energy. The exterior lights do not turn on until 6 or 7pm depending on the time of year and cut off at 7AM each day.	HR/Safety

**C. Update on Department Climate Resilience Activities**

**a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019**

*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
CERRI	Hosted “How to Avoid Negative Impacts of Natural Disasters” series with LeverageNC for communities across the state – Be Prepared Before Disaster Strikes, Making Historic Buildings More Resilient, and Planning for Recovery: CERRI <a href="https://www.leveragenc.org/webinar-archives">https://www.leveragenc.org/webinar-archives</a>	Rural Economic Development Division NC Commerce Main Street/Rural Planning
Disaster Recovery Task Force	NC’s Disaster Recovery Framework, a comprehensive document which offers direction to the State Disaster Recovery Task Force, describes the role of State agencies and their partners in assisting with recovery efforts and is designed to address the complex and unique nature of disasters. The Department of Commerce is the lead agency for the Workforce and Business Recovery Support Function and convenes partners quarterly to discuss ways to collaborate to assist small business recovery throughout the state.	Business Resiliency (Disaster Recovery Task Force working group)



**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
Corporate Citizenship	The Department of Commerce hired a strategy coordinator to identify opportunities to further integrate corporate citizenship and economic development. The strategy coordinator will map the economic development process and identify entry points during the recruitment process to share information about policies that are of importance to the state, including climate justice and equity.	Secretary’s Office
Biomass Education	The Department met with environmental justice stakeholders that were concerned about the air pollution created by some North Carolina businesses. The Department shared relevant statutes and processes with the environmental justice group and advised them on county level decision makers that may have influence on if/when certain types of businesses are provided local incentives.	Secretary’s Office/ Economic Development/
Bias and Equity Workshop	NCCJ 3 part workshop series on bias and equity inclusion for all of REDD June-August 2021 <a href="https://www.nccjtriad.org/">https://www.nccjtriad.org/</a>	NC Commerce Rural Economic Development Division
Chief DEI Officer Appointed	Commerce named a Chief Diversity, Equity, and Inclusion (DEI) Officer to lead the agency’s work to view everything through an equity lens to dismantle barriers and expand quality and business opportunities for all North Carolinians. The officer ensures that equity is a key factor in decision making as it relates to Commerce’s priorities of job creation, workforce development, and post pandemic recovery.	Office of DEI
Andrea Harris Task Force Partnership	Commerce is collaborating with Dr. Jim Johnson and Jeanne Milliken Bonds of the Kenean-Flager Business School, UNC Chapel Hill to address critical issues such as environmentally sick schools, childcare deserts, and affordable housing.	Office of DEI
First in Equity	Commerce provided a letter of support for the Durham Global Equity Project (Hytai Reborn) – an initiative led by Dr. Henry McCoy to create an equity innovation hub in	Office of DEI

Initiative Title	Description	Division/Lead Program Office
	Durham. Dr. McKoy's vision of the state being "First in Equity" aligns with Commerce's priorities and ways to further partner are underway.	

**c. Actions taken or planned to take to assist communities served**

**Table 4. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
	REDD representation in Healthy Environments Collaborative Hosted “How to Avoid Negative Impacts of Natural Disasters” series with LeverageNC for communities across the state – Be Prepared Before Disaster Strikes, Making Historic Buildings More Resilient, and Planning for Recovery: CERRI <a href="https://www.leveragenc.org/webinar-archives">https://www.leveragenc.org/webinar-archives</a>	REDD Main Street/Rural Planning
		REDD ARC
Rapid Response		DES
Andrea Harris Task Force Representative		Office of DEI
Partner w/ Dr. Johnson		
		NC Works Commission

## VII. Department of Transportation

### A. Message from the Secretary

The N.C. Department of Transportation kicked off 2021 by helping the state's residents remain resilient against the on-going disruption of COVID 19. In partnership with the Department of Health and Human Services, NCDOT helped provide public transportation to over 10,000 North Carolinians to vaccine appointments.

NCDOT's 2021 Resilience Strategy Report outlined the department's strategies to address the resilience of the state's transportation network. Many resilience related programs were already underway, but a concerted effort was made to collaborate and share information, to combine overlapping efforts, and to leverage existing data to achieve common goals. A year later tremendous progress has been made with a new department-wide policy in place under which all NCDOT is directed to make not only the state's transportation infrastructure, but all business practices more resilient to disruption.

The 2021 hurricane season marked another above-average tropical season for the Atlantic Ocean. There were twenty-one named systems, seven of which became hurricanes. But North Carolina did not see a land-falling hurricane in 2021. In fact, no tropical storm system made direct landfall along our coast. Yet weather related destruction and disruption, including loss of life, still played a significant role. Three tropical systems – Claudette, Elsa, and Fred – made their way across the state bringing gusty winds, heavy rainfall, and isolated tornadoes. Tropical depression Fred dropped over a foot of rain in August across areas of western North Carolina that had recently received several inches of rain. Significant flooding occurred, washing out multiple bridges and closing dozens of roads, largely in Haywood, Transylvania, Henderson, Yancey, and Buncombe counties. Six people lost their lives and millions of dollars damage occurred with some communities still trying to fully recover. NCDOT crews were able to open almost all the 100 plus roads that were closed within a week. Crews from central and eastern North Carolina helped crews in the west restore connectivity by refilling washouts, reconnecting bridges and stabilizing shoulders along damaged roads.

Light-duty Zero Emission Vehicles (ZEV - all electric and plug-in hybrid) registrations in North Carolina increased 191% from October 2019 to December 2021, representing 37,035 light-duty ZEVs on the road as of December 2021. With an increasing number of light duty ZEV models becoming available to consumers in the North Carolina market, the number of registered ZEVs in the state is projected to continue past the EO80 goal of 80,000 by 2025, and toward the ambitious new EO246 goal of 1,250,000 by 2030.

NCDOT finished out the year again in cabinet agency partnership, this time with the Department of Commerce, welcoming Toyota as they announced plans to build their first North American electric vehicle battery plant in North Carolina. The plant represents a \$1.29B investment in the state and will create 1700 new jobs. It also ensures that North Carolina is involved in the manufacture of the next generation of clean energy vehicles.

## B. Update on EO80 Climate Mitigation and Economic Development Activities

Table 1. Agency Actions Related to Climate Mitigation

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	NCDOT's <a href="#">Making Transportation Resilient</a> webpage went live providing information about the department's program to provide a transportation network that is more resilient to weather related disruptions.	Communications
NC ZEV Plan Implementation	Monthly ZEV registration data (by county) posted on NCDOT website for public use. These data will help inform investment and placement of charging infrastructure.	Highways/ Communications and Public Outreach
	Partnered with NC Clean Energy Technology Center to develop a guidance document on charging infrastructure and management. Guidance will be available on NCDOT website.	Communications
	Coordinated with partners (Clean Energy Technology Center, Clean Cities, Plug-in-NC, and others) on eight ride and drive events in 2021.	Highways/Transportation Planning
	Supported the <a href="#">2021 Sustainable Fleet Technology Conference</a> , hosted by NC Clean Energy Technology Center, to share fleet industry trends and strategies.	Highways/Transportation Planning
	Ten additional Alternative Fuel Corridors were approved in FWHA's nomination Round 5.	Highways/Transportation Planning
	<a href="#">NC First report</a> published in January 2021, offering options for addressing the disparity between transportation-related taxes paid by different vehicle types. The Transit Authority is looking at mileage-based solutions and will pilot a Mileage-Based User Fee (MBUF) solution in 2022.	Highways/Strategic Initiatives
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	Electric buses are continuing to emerge in North Carolina. As of 2021, nine transit systems spanning cities, organizations and universities across the state have added or will soon add the technology to their fleets. This transition from diesel to electric for medium- and heavy-duty vehicles comes with impactful environmental and health benefits as well as long-term savings.	Multi-Modal/Public Transportation

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>In November 2021 the Integrated Mobility Division (IMD) kicked off a project to develop transit fleet transition plans for two transit agencies – Hoke County and AppalCART in Boone. This project is funded through the Federal Transit Administration (FTA) Helping Obtain Prosperity for Everyone (HOPE) grant program.</p> <p>In December 2021 IMD also initiated the development of a statewide transit vehicle fleet transition plan, as required by FTA, to apply for certain discretionary grant opportunities starting in 2022.</p>	
Agency Building Utility Consumption Reduction (EO80 Section 8)	<p>NCDOT and NCSPA occupy 2,382 buildings totaling 9,376,737 gross square feet. FY-21 utility costs for those buildings totaled \$10,474,108, and energy consumption per square foot is 25% less than during the 2002/03 baseline year. At the conclusion of fiscal year 2021, energy savings programs have resulted in a total energy cost avoidance of \$31,027,742 and a water cost avoidance of \$13,892,840 - totaling \$44,920,582 over the last 17 years. By the end of FY 21, cost savings measures have reduced energy and water usage per square foot in NCDOT facilities by 31% and 20% respectively as measured from the baseline fiscal year of 2002-03.</p>	Highways/Facilities Management
Other Conversation and Efficiency Initiatives	<p>An NCDOT led committee completed a <a href="#">Vehicle Miles Traveled (VMT) Reduction Study</a> documenting trends and factors that influence VMT in North Carolina. The study also analyzed and modeled packages of VMT reduction strategies. The report will be used by an interdisciplinary VMT reduction task force consisting of NCDOT, MPO, RPO, local government, and NGO personnel. The task force will produce a VMT reduction tool kit detailing strategies available to various levels of government and potential funding sources to help with implementation.</p>	Highways/Transportation Planning & Technical Services
	<p>Research project 2022-01 is underway to investigate the feasibility of vessel electrification which would result in less dependency on diesel and would reduce GHG emissions.</p>	Ferry

## C. Update on Department Climate Resilience Activities

### a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019 (Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Resilience Program	Through the formation of a Core Management Team, a multi-disciplinary Program Management Team, and an Executive Leadership Team, department-wide goals and strategies were shared and aligned. Department of Transportation Resilience Policy was established. Internal SharePoint page developed with a “Resilience Registry” summarizing completed and ongoing work.	Highways/Multiple
Vulnerability Assessments of STC	A Statewide roadway inundation analysis modeling flood levels across roadways for the 10-, 25-, 50-, 100- and 500-year recurrence flood levels (where data were available) was completed. Results are provided through a GIS-based Roadway Inundation Tool available upon request. A similar analysis was conducted for the Statewide Rail STC’s and some secondary lines.	Highways and Rail
	Two pilot vulnerability studies to assess Strategic Transportation Corridor (STC) vulnerabilities to extreme weather were initiated. One study will use a modeling tool called CitySimulator to analyze US 74 from Mecklenburg County to the Port of Wilmington in New Hanover County. The second study will use the Federal Highway Administration’s (FHWA) Vulnerability Assessment Scoring Tool (VAST) to analyze the section of US 70 that runs from Wake County to its eastern terminus in Carteret County. Results of the studies will be available in the Spring and Summer of 2022 respectively. Comparison of the two methods will inform future studies.	Highways/Transportation Planning & Hydraulics
Geo-FRIT	Research project 2022-18 is underway to develop a web-based Geospatial Analytics Tool for quantifying Freight Risk In Transportation (Geo-FRIT). The tool will help identify vulnerabilities in the freight network and develop resilient solutions.	Rail/Freight and Logistics

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
Ports Resilience and Planning	A new fully automated terminal gate became active at the Port of Wilmington. New generators were installed at the Port of Morehead. An off-site Eastern Data Center data back-up system was initiated for all Port data systems. Redundant links were created through SD-WAN (a Mesh Network) to all operating locations and the off-site backup Eastern Data Center. The Port of Wilmington Data Center underwent resiliency upgrades with new HVAC and backup power with auto-transfer switch along with 2 <sup>nd</sup> Head End back-up location at the Port.	Ports
FIMAN-T	Work continues in coordination with N.C. Emergency Management on the installation of seventy-one new gauge locations for the <u>Flood Inundation Mapping and Alert Network</u> . Sixty-five of those locations are on NCDOT structures. Thirty more locations are planned for gauge installation in late 2022. This will greatly increase the area over which FIMAN-T provides real-time and predictive flood information for roadways and bridges.	Highways/Hydraulics
BridgeWatch	Approximately fifteen thousand NCDOT structures can now be monitored by the BridgeWatch program – a web based real-time structure monitoring system that alerts NCDOT personnel in advance when floodwaters threaten bridges.	Highways/Hydraulics

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
Vulnerability Assessments of STC	Specific consideration of equitable access to transportation during extreme weather disruptions is being investigated in the two pilot vulnerability studies described above.	Highways/Transportation Planning & Hydraulics



c. Actions taken or planned to take to assist communities served

**Table 4. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
Equity Plan	<p>NCDOT created new reference guidance to describe and provide methods of advertisement for transportation study public meetings including more options for virtual public engagement. These, in addition to standard options for in-person engagement further the department’s equity goal of access to and participation in public engagement opportunities by providing more flexibility and options.</p> <p>The guidance provides information that can be used during transportation studies to help extend outreach to residents, including traditionally underserved populations. The public engagement strategies will help project engineers and planners engage in equitable public communication at various stages of transportation studies. The guidance is intended to be flexible and is not a “one size fits all” approach. It is not intended to be a “standard procedure” or a “how to” document, but rather a framework to help engineers and planners to wholistically engage all members of the public throughout the transportation planning process.</p>	Highways/Transportation Planning & Technical Services (PICSVIZ Group)
USDOT RAISE Grant	NCDOT helped the City of High Point secure a Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant. The grant provided almost \$20M to the \$28M project which includes complete streets and other bicycle and pedestrian infrastructure to improve access and mobility for low-income, historically marginalized communities in High Point.	Multi-Modal/Public Transportation
NC MOVES 2050	In February 2021, the NC Moves 2050 Plan was adopted by the N.C. Board of Transportation and submitted to the Federal Highway Administration. The plan is focused on creating a more responsive, diverse, and inclusive transportation system for keeping people and freight moving safely and efficiently.	Highways/Transportation Planning
DBE Outreach Events	In 2021, NCDOT held a series of Disadvantaged Business Enterprise (DBE) outreach events. The events covered topics such as the diversity of contracts NCDOT has	Highways/Chief Engineers Office & Office of Civil Rights

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
	available for bid, how NCDOT advertises, and information on how to get prequalified. Hundreds of people attended representing over a hundred different DBE firms.	

## VIII. Department of Natural and Cultural Resources

### A. Message from the Secretary

I'm pleased to submit this annual report of the progress made in 2021 by the NC Department of Natural and Cultural Resources (DNCR) toward the goals of Executive Order 80.

As stewards of some of the state's most outstanding natural and cultural resources, the divisions in our department are viewed by state and federal agencies, local governments, and non-governmental organizations as essential partners in the development of strategies for climate change mitigation and resilience. Our divisions have adopted best practices to reduce their own greenhouse gas footprints, while leveraging resources, public facilities, and expertise to educate the public about both the challenges presented by climate change and ways our state can adapt for a more resilient future.

In the pages that follow, you'll find examples of significant progress toward cutting our department's greenhouse gas emissions, such as the conversion of full-sized gas-powered vehicles at the NC Zoo to fully electric, small-scale utility vehicles. Our state museums, parks, zoo, aquariums, and historic sites are now integrating climate change into their educational programs in ways that are experiential and far-reaching in scope. In addition to these site-specific programs, work is also underway to create physical and virtual climate educational materials to be used at all our sites. And DNCR is partnering with other agencies and institutions to broaden the message about climate change, including a new series called "A State of Change" that began airing this year on PBS-NC.

While climate change mitigation and education are central to our strategy for meeting EO 80's goals, adapting for a more resilient future is also a major priority. Divisions such as the NC Natural Heritage Program and NC Aquariums are integrating threats from climate change and measures of ecological resilience into their surveys and reports on plants and animals. On the cultural side, the State Historic Preservation Office and the Office of State Archaeology are leading by identifying cultural resources that are vulnerable to coastal storm damage and sea level rise. Other divisions and sites are demonstrating how to adapt in the face of such threats, including the USS North Carolina Battleship's "Living with Water" flood mitigation and resiliency project, and the Division of Archives & Records' efforts to train public records custodians in flood-prone communities on "essential records protection."

Finally, a major fire at one of our state parks in November highlighted the value of our department's ongoing resiliency strategies. The fire that burned 1100 acres at Pilot Mountain State Park was a harbinger of what our state can expect in the future as our climate warms and communities experience more frequent and potentially devastating wildfires. While the Pilot Mountain fire was significant, observers noted that the permanent damage to the forested areas was limited due to NC State Parks' recent practice of prescribed burning. Periodic controlled burns at Pilot Mountain over the past decade had greatly reduced the amount of fuel on the forest floor (which can typically accumulate in the form of downed trees and limbs), fuel that otherwise would have led to a more intense and devastating fire.

The experience at Pilot Mountain was a reminder of the importance of everything we are doing at DNCR as part of Executive Order 80 – that through public education and our own strategic best practices in stewarding North Carolina's natural and cultural resources, we are one of the state's leading agencies in promoting a more resilient future.

D. Reid Wilson Secretary

North Carolina Department of Natural and Cultural Resources

## B. Update on EO80 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	Revamped Investigation Station at Rocky Coast to focus more on climate change using explanatory metaphors and community level solutions.	NC Zoo
	Created two AmeriCorps positions focused on improving representativeness and meeting the needs of under-resourced communities. The goal is to provide more effective environmental education for these communities while also better meeting their needs.	NC Zoo
	<p>Public programs include several topics related to climate change (e.g. ocean acidification, temperature change and reptile impacts, wind and solar energy, geothermal program, climate clues and renewable energy challenge) and its impacts on ecosystems and ocean life.</p> <p>Staff training on NNOCCI (National Network for Ocean and Climate Change Interpretation) to more effectively cover this topic.</p> <p>Incorporated conservation messaging in signage including specific actions people can take to mitigate their use of fossil fuels and plastics.</p>	NC Aquariums
	Created Arts and Science minicourses for teachers as professional development including emphasis on how the design of the Museum’s Art Park is geared toward sustainability.	NC Museum of Art
	Implemented climate education into public events (e.g. BugFest, Science Cafes, etc.) and recycling in public and staff-only areas utilizing graphics provided by DNCR.	NC Museum of Natural Sciences
	Increased conservation communication to Museum members by incorporating a new “Conservation Corner” section into membership e-newsletters.	NC Museum of Natural Sciences

Category	Summary of Initiative / Accomplishments	Division/Program Office
	Managed an external program, Teen Science Ambassadors, to increase science literacy among middle school and high school students.	NC Museum of Natural Sciences
	Improved signage to increase composting and recycling in public and staff-only areas utilizing graphics provided by DNCR.	NC Museum of Natural Sciences
	Launched a series of Sustainability Lunches in the Triangle region modeled after the successful Charlotte area Sustainability Lunch Bunches. These quarterly programs attract corporate, NGO, and government organizations.	NC Museum of Natural Sciences
	Launched Love Nature: The Biophilia Podcast, hosted by Dr. Eric Dorfman (NCMNS Director and CEO) and Dr. Dan Dombrowski (NCMNS Chief Veterinarian) to “understand and navigate a changing world, and to allow us to live better, and more responsibly, on the planet.”	NC Museum of Natural Sciences
	Lunchtime Discovery Series Webinar with presentation and public question and answer session: The Other Side of Environmental Injustice: Parks and Greenspace Inequity in Marginalized Communities, NC Museum of Natural Sciences Via YouTube ( <a href="https://youtu.be/hnqh_2R8eX4">https://youtu.be/hnqh_2R8eX4</a> ).	NC Museum of Natural Sciences
	Created new, interactive conservation-focused signage at the NCMNS Whiteville branch with support from an Institute of Museum and Library Services (IMLS) grant.	NC Museum of Natural Sciences
	Research and Collections staff published several papers with research focused on climate-change related topics.	NC Museum of Natural Sciences
	Working on a new environmental education center at the Prairie Ridge facility in Wake County – a potential of embedding the initiative in a future facing story of science engagement, which will influence many aspects of that site and the Museum’s story overall.	NC Museum of Natural Sciences

Category	Summary of Initiative / Accomplishments	Division/Program Office																														
	DNCR is collaborating with PBS-NC by sponsorship of “A State of Change” a series on climate change in NC, to be aired on TV and internet in 2022.	DNCR-wide																														
	<p>Presented training on the identification and protection of essential government records, a key mitigation strategy for government offices to ensure continuity of operations during an emergency. This training was based on FEMA-approved curriculum (Intergovernmental Protection for Essential Records), originally developed by the Council of State Archivists in 2011.</p> <p>Government Records Section of the Division held 9 essential records and disaster preparedness workshops for 385 participants. Below is a chart with dates and if they were for a local government, state government, or combined audience.</p> <table border="1" data-bbox="478 743 1234 1252"> <thead> <tr> <th data-bbox="478 743 730 776">Date</th> <th data-bbox="730 743 982 776">Attendance</th> <th data-bbox="982 743 1234 776">State/Local/Mixed</th> </tr> </thead> <tbody> <tr> <td data-bbox="478 797 730 829">2/12/21</td> <td data-bbox="730 797 982 829">22</td> <td data-bbox="982 797 1234 829">Mixed</td> </tr> <tr> <td data-bbox="478 850 730 883">3/25/21-3/26/21</td> <td data-bbox="730 850 982 883">54</td> <td data-bbox="982 850 1234 883">Local</td> </tr> <tr> <td data-bbox="478 904 730 937">3/25/21-3/26/21</td> <td data-bbox="730 904 982 937">50</td> <td data-bbox="982 904 1234 937">Local</td> </tr> <tr> <td data-bbox="478 958 730 990">3/29/21-3/31/21</td> <td data-bbox="730 958 982 990">43</td> <td data-bbox="982 958 1234 990">State</td> </tr> <tr> <td data-bbox="478 1011 730 1044">3/30/21-4/1/21</td> <td data-bbox="730 1011 982 1044">32</td> <td data-bbox="982 1011 1234 1044">State</td> </tr> <tr> <td data-bbox="478 1065 730 1097">6/8/21-6/9/21</td> <td data-bbox="730 1065 982 1097">65</td> <td data-bbox="982 1065 1234 1097">Local</td> </tr> <tr> <td data-bbox="478 1118 730 1151">6/8/21-6/9/21</td> <td data-bbox="730 1118 982 1151">48</td> <td data-bbox="982 1118 1234 1151">Local</td> </tr> <tr> <td data-bbox="478 1172 730 1205">6/10/21-6/11/21</td> <td data-bbox="730 1172 982 1205">38</td> <td data-bbox="982 1172 1234 1205">State</td> </tr> <tr> <td data-bbox="478 1226 730 1258">6/10/21-6/11/21</td> <td data-bbox="730 1226 982 1258">33</td> <td data-bbox="982 1226 1234 1258">State</td> </tr> </tbody> </table>	Date	Attendance	State/Local/Mixed	2/12/21	22	Mixed	3/25/21-3/26/21	54	Local	3/25/21-3/26/21	50	Local	3/29/21-3/31/21	43	State	3/30/21-4/1/21	32	State	6/8/21-6/9/21	65	Local	6/8/21-6/9/21	48	Local	6/10/21-6/11/21	38	State	6/10/21-6/11/21	33	State	Division of Archives and Records
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	Cultural Resources Emergency Support Team (CREST): the team held their annual summit on August 24, 2021. 25 members attended. On September 15 the CREST	Division of Archives and Records																														

Category	Summary of Initiative / Accomplishments	Division/Program Office
	team manager presented a webinar, “Establishing and Maintaining Emergency Supply Caches,” for the Foundation for Advancement in Conservation (national audience). FAIC maintains the recording on their website.	
Motor Fleet ZEV Plan Implementation	<p>Agency Fleet ZEV/Electric Infrastructure: Work with Motor Fleet to plan ZEV &amp; hybrid replacements whenever possible.</p> <p>The Zoo has ordered 20 fully electric vehicles to considerably expand our existing electric fleet. These vehicles are all small utility vehicles and golf carts that will in some cases replace full-sized gas-powered vehicles.</p>	DNCR-wide, NC Zoo,
Agency Fleet ZEV Plan Implementation	Strategic Plan Milestone: DNCR will lead by example to increase state employees’ familiarity with Zero Emissions Vehicles (ZEV), prioritizing ZEVs and hybrids in the purchase or lease of new vehicles and shall use ZEVs for agency business travel when feasible.	DNCR-wide
	<p>Acquired two Chevy Bolts, full electric vehicles through DOA’s Motorfleet Division. Used for daily patrols by Park Rangers and for off-park programming by the Zoo’s Conservation, Education and Science Section.</p> <p>Added additional Zero Emission Vehicles to our fleet of off-road, small utility vehicles. Two new golf carts will be used for day-long ranger patrols and as an ambulance on constant standby, able to respond to emergencies anywhere on the property.</p>	NC Zoo and NC State Parks and Recreation

Category	Summary of Initiative / Accomplishments	Division/Program Office
	<p>Conservation Education and Science Section purchased two electric-assist tricycles. These vehicles are smaller than golf carts and ZEV capable for use inside the park. In addition to their service moving educators around inside the facility, we hope to be able to demonstrate how lithium-powered electric vehicles may be employed to fulfill any number of service roles inside the Zoo.</p> <p>Installed electric vehicle charging stations at NC Zoo (2) and State Parks: Crowders Mountain, Lake James, Lake Norman, Raven Rock, and Pilot Mountain State Parks. Plans for additional vehicle chargers at two parks.</p>	
	<p>Continue to modernize the Craft Services vehicle fleet and equipment with more fuel efficient and less polluting utility vans and vehicles.</p>	State Historic Sites
<p>Agency Building Utility Consumption Reduction (EO80 Section 8)</p>	<p>Strategic Plan Objective: Incorporate best practices for state government building energy efficiency to reduce energy consumption (Objective 5.1, DNCR Strategic Plan 2021-2023)</p> <p>Milestones: Improve tracking energy use to reduce energy consumption (Implementing Capturis through DNCR Budget Office – Capturis provides utility bill payment administration, utility consumption reporting, cost tracking as well as other utility information solutions).</p> <p>Partner with Capital Projects to integrate energy efficiency measures and reduce energy consumption for facility construction and upgrades.</p>	DNCR-Wide
	<p>Completed a transition to the highest Seasonal Energy Efficiency Ratio rated HVAC and the maximum LED lights that we can afford. All HVAC has been replaced and upgraded and about 80% of ship lighting replaced with LED.</p>	Battleship NC
	<p>FY2020-2021 goal to reduce energy consumption by 3% and reduce water use by 2%.</p>	NC Aquariums



Category	Summary of Initiative / Accomplishments	Division/Program Office
	Jennette's Pier will save energy through repairing solar panel installation and improving energy efficiency of a life support system. The Pier also installed energy efficient hand dryers, performed an EO80 energy efficiency audit, plans to replace thirty CFL light fixtures with LED fixtures, and replaced metal halide entrance sign light fixtures with solar rechargeable LED fixtures.	
	Working to replace fluorescent lights in the Government & Heritage Library stacks with motion-detection LED fixtures and add UV protection to all windows in the Government & Heritage Library reading room. Recommend all staff turn off computers in the evening to reduce energy use.	State Library
	Upgraded all lighting to LED systems. Installing more efficient HVAC systems. Utilizing geothermal HVAC systems when applicable during major renovations. Encouraging individual sites to adjust thermostat controls to cooler heating season temperatures and warmer cooling season temperatures where such changes will not affect artifact preservation.	State Historic Sites
	"Guaranteed energy savings contract" for the evaluation, recommendation, or implementation of energy conservation measures, including the design and installation of equipment or the repair or replacement of existing equipment or meters, in which all payments, except obligations on termination of the contract before its expiration, are to be made over time, and in which energy savings are guaranteed to exceed costs. A contract will be in place in early 2022 for this work at multiple facilities across the Department.	NC Capital Projects
	Pilot testing the use of a Zoo-built heat exchanger to provide supplemental heat for one of our greenhouses. Heat generated by composting organic material will be used to generate heat which the unit will capture and circulate into the greenhouse. If this test is effective, we will expand it to the Zoo's other greenhouses to reduce our propane consumption.	NC Zoo

Category	Summary of Initiative / Accomplishments	Division/Program Office
	The Zoo's 2020-2021 energy consumption for heating and cooling of state-owned buildings is 149,332 BTUs per square foot, a 30% reduction from 2002-2003 levels. We are pursuing additional savings through the installation of new HVAC systems, improvements to life support systems, use of alternative heating methods, and replacement of fluorescent tubes with LED bulbs.	NC Zoo
Other Conversation and Efficiency Initiatives	Working to reduce the amount of plastic used for events by 50% and implementing a plan to reduce the amount of paper used for administrative functions by 25%. Purchasing smaller amounts of supplies to eliminate future waste as supply needs change. Collaborate with DNCR and the NC Public Library Directors Association to more formally recognize and support the role that libraries play in disaster preparedness and recovery efforts.	State Library
	Eliminated all plastic bottles in park vending machines. Installing water bottle refill stations in place of standard water fountains. Started a sustainability team to bring together different sections from the Zoo and focus on non-organic waste, organic waste, carbon footprint, and surface & environmental water.	NC Zoo
	The Zoo has embarked on a new program to recycle disposable latex and nitrile gloves. Working with our Partner Terracycle, drop off points for gloves have been established around the Zoo. In the first few months of the program we have diverted over 160 lbs of gloves from landfill waste.	NC Zoo
	We have purchased a high-volume compost screener which will allow us to further improve the Zoo's extensive compost program. The screener will allow the production of hundreds of tons of high-quality compost annually from our two-acres compost facility.	NC Zoo
	Installed water fountains with the capacity to refill personal water bottles to help eliminate single use plastic bottles. Encouraging sites to utilize sustainably sourced materials for structural renovations and exhibit builds.	State Historic Sites

Category	Summary of Initiative / Accomplishments	Division/Program Office
	Renewed contract with CompostNow to compost at public-facing cafes and internal break rooms. Aiming to make future public events zero-waste. Writing an institution-wide environmental policy to reflect our values and goals related to conservation and climate change. Seeking certification from DEQ's NC Green Travel Initiative.	NC Museum of natural Sciences

### C. Update on Department Climate Resilience Activities

a. **Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019** (*Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy*)

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Climate Change Evaluation	Evaluate the impact of climate change and integrate climate change mitigation, adaptation, education, and resiliency practices into DNCR programs and operations – See Goal 5 of DNCR Strategic Plan 2021-2023.	DNCR-wide
Objective 5.2, DNCR Strategic Plan 2021-2023	<p>Milestone 5.2.1 Renovate and expand the North Carolina Aquarium at Fort Fisher</p> <p>Milestone 5.2.2 Floodplain and wetland acquisition and restoration</p> <p>Milestone 5.2.4 Complete repairs at State Parks related to storm damage</p> <p>Milestone 5.2.5 Complete repairs at Museum of Natural Sciences Whiteville</p> <p>Milestone 5.2.6 Develop on-demand training for public records custodians, cultural heritage practitioners, and the public around disaster preparedness and recovery for public records and documentary heritage of the state.</p> <p>Milestone 5.2.7 Protect historic structures and artifacts</p> <p>Milestone 5.2.8 Complete the relocation of Underwater Archaeology artifacts</p> <p>Milestone 5.2.9-10 Conduct environmental reviews and provide assistance to constituents for disaster recovery, response, and mitigation for future events</p>	DNCR-wide

Initiative Title	Description	Division/Lead Program Office
	<p>Milestone 5.2.11 NC Museum of Art: Complete bridge, culvert, path repairs and replacement and stream restoration</p> <p>Milestone 5.2.12 Evaluate off site storage solutions for collections at risk from the triple threats of flooding, heavy precipitation, and sea level rise climate risks</p> <p>Milestone 5.2.13 Introduce and promote land management practices to restore long-term resilience and mitigate climate change, such as prescribed fire, hydrologic restoration, reforestation, and natural riparian vegetation.</p> <p>Milestone 5.2.14 Consider climate-related hazards when developing master plans for natural areas, parks, and nature preserves.</p>	
Natural Heritage Inventory	<p>Working to update the NHP Lists of Rare Plant and Animal Species of North Carolina. These reports, which are updated every two years, provide a list of all the species that are listed as Endangered, Threatened, or of Special Concern as well as all species that are not formally protected but are imperiled enough to warrant tracking and monitoring to prevent extirpation. In 2022, the Natural Heritage Program will coordinate with partners in the NC Wildlife Resources Commission and NC Plant Conservation Program to review the plant and animal species listed as Significantly Rare and determine if any species are considered stable enough to be down-listed to Watch List; they will also review the Watch Lists to determine if any species have declined enough to be up-listed to Significantly Rare.</p> <p>In 2021, with funding from US Fish and Wildlife Service, the Natural Heritage Program conducted rangewide status surveys of 4 species under consideration for federal listing (Wireleaf Dropseed, Georgia Indigo-Bush, Thinwalled Quillwort, and Venus Flytrap Cutworm Moth). As part of these inventories, threats from climate change and overall ecological resilience were reported.</p>	Division of Land and Water Stewardship/Natural Heritage Program

Initiative Title	Description	Division/Lead Program Office
	In 2022, the Natural Heritage Program will launch a rangewide status survey of Carolina Hemlock, assessing threats from all sources including climate change.	
Climate Risk Assessment and Resilience Plan – Ecosystems Chapter	Field Biologists monitor rare species as they conduct biological inventories of lands under consideration for protection as state nature preserves. Special attention is paid to species and habitats that are most vulnerable to a changing climate and natural disasters such as hurricanes, floods, and landslides.	Division of Land and Water Stewardship/Natural Heritage Program
Recovery Support Functions of the State Disaster Recovery Task Force	NC Natural Heritage Program and NC Land and Water Fund staff participate in the Environmental Recovery Support Function of the State Disaster Recovery Task Force, as does the State Historic Preservation Office in the Cultural Resources Recovery Support Function, contributing map data and recommendations for the upcoming Disaster Recovery Framework update.	Division of Land and Water Stewardship and State Historic Preservation Office (HPO)
United States Army Corps Of Engineers (USACE) South Atlantic Coastal Study At-Risk Cultural Resources Analysis	Consulting with USACE to identify cultural resources (historic and archaeological sites, historic districts, and other historic resources) vulnerable to coastal storm damage and sea level rise. This analysis is part of a multi-state effort throughout the southeastern United States and Caribbean. GIS and archaeological and architectural survey data along with staff expertise are all proving crucial to informing this effort. Many of the places identified are federal and state historic assets open to the public.	State Historic Preservation Office (HPO) and Office of State Archaeology (OSA)
NC Shorescape Archaeological Survey	In FY2022-2023, OSA will undertake a North Carolina Shorescape Survey to identify and document archeological resources associated with coastal communities that are most at risk of being damaged by storm events. Focus is on identifying and documenting sites within 200 ft (60 meters) of the shoreline.	Office of State Archaeology (OSA)

Initiative Title	Description	Division/Lead Program Office
Libraries in Disaster Preparedness	Collaborate with DNCR and the NC Public Library Directors Association to more formally recognize and support the role that libraries play in disaster preparedness and recovery efforts.	State Library
Wildlife Monitoring	<p>Identifying potential impacts of climate change on plants and animals. Over time, scientists will be able to correlate data with changes in weather patterns and sea levels.</p> <p>We are monitoring the following species and animal groups:</p> <ul style="list-style-type: none"> <li>• Sand tiger sharks</li> <li>• Sea turtles (all species)</li> <li>• Crystal skipper butterfly</li> <li>• Gopher frogs – two populations at Pine Knoll Shores</li> <li>• Least tern colony at Pine Knoll Shores</li> <li>• Stranded marine mammals (all species) along the northern NC coastline</li> <li>• Lionfish on offshore shipwrecks</li> </ul>	NC Aquariums
Teddy Roosevelt Natural Area Biodiversity Surveys	NC Aquariums has conducted two biodiversity surveys in the Teddy Roosevelt Natural Area, 40 years apart. This good data for long-term monitoring that could be tied to climate change.	NC Aquariums
Prescribed Fire as Method to Increase Ecosystem Resilience	Active prescribed fire program to maintain natural communities in an ecologically healthy condition. A healthy habitat is one better suited to adapting to whatever climatic condition it faces. The Division has performed 70 separate prescribed fires on 15 of its properties in the past year totaling 5,708 acres.	NC State Parks and Recreation
Land Restoration and Management	Actively restoring lands and waters that have been damaged from past land activities. Actions on lands include conversion of pine plantations and abandoned agricultural fields	NC State Parks and Recreation

Initiative Title	Description	Division/Lead Program Office
	to a more natural condition. Streams and wetlands are being restored by re-creating natural channels and removing artificial structures such as dams and culverts.	
Climate Risk Assessment and Resilience Plan	Field Biologists monitor rare species as they conduct biological inventories of lands under consideration for protection as state nature preserves. Special attention is paid to species and habitats that are most vulnerable to a changing climate and natural disasters such as hurricanes, floods, and landslides.	Division of Land and Water Stewardship/Natural Heritage Program
Natural and Working Lands Action Plan	Collaborated with researchers at Duke University Nicholas Institute for Environmental Policy Solutions to analyze and summarize the resilience and carbon benefits of lands purchased and restored with funding from the NC Land and Water Fund since the Fund's inception as the Clean Water Management Trust Fund in 1996. The NHP and Duke also recently completed a similar study of NC Department of Public Safety lands.	Division of Land and Water Stewardship/Natural Heritage Program/Land and Water Fund
Statewide Historic Preservation Plan Update	Preliminary planning for the 2023 10-year update cycle of the state will be initiated in FY2022-2023. The update will include specific measures to be taken toward strengthening disaster mitigation and resiliency for historic resources throughout the state.	State Historic Preservation Office (HPO)
Environmental Stewardship	Environmental Steward/EMS Certification – a continued DEQ “Environmental Steward,” and maintenance of Environmental Management System certification	NC Zoo
Resiliency Projects for State-Owned Historic Sites' Properties	<p>Several state-owned historic properties have received federal and/or state funding to address Hurricane Florence / Michael damage and provide greater resiliency and projects underway:</p> <ol style="list-style-type: none"> <li>1. Battleship <i>USS North Carolina</i>. Address resiliency for the storm-damaged mast superstructure using newly developed marine coatings that are more resistant to wind-driven rain and resultant scouring and corrosion of the steel.</li> </ol>	Division Of State Historic Sites , Battleship North Carolina Memorial, Tryon Palace, Division Of Historical Resources / State



Initiative Title	Description	Division/Lead Program Office
	<ol style="list-style-type: none"> <li>2. Galen Stone Hall @ Charlotte Hawkins Brown State Historic Site. Design and construction of building and foundation drainage systems to prevent basement flooding that the building experienced during Hurricane Florence.</li> <li>3. Douglas Complex @ Tryon Palace. Address damaged flooring and brick sheathing, mold eradication, and water runoff control.</li> <li>4. Harper House @ Bentonville Battlefield State Historic Site. Installation of a state funded emergency generator to maintain power to the HVAC system during severe wind-driven rainstorm events will avoid future problems like the week-long period post- Hurricane Florence where the building could not be adequately dried out and developed mold and plaster issues.</li> </ol>	<p>Historic Preservation Office (HPO) And Office Of State Archaeology</p>
<p>Brunswick Town/Fort Anderson (BFTA) Wave Attenuator Project</p>	<p>Continued installation of wave attenuators in the Cape Fear River to protect more of the sensitive, in situ Colonial-era archaeological resources and Civil War earthworks present along the shoreline from wave action and hurricane storm surge.</p> <ol style="list-style-type: none"> <li>a. of the approximately 5,000 feet of shoreline in need of protection, two phases of wave attenuators have been installed for a total of 460 feet, with an additional two phases (1,775 more feet of protection) to be completed by December 2021.</li> <li>b. The excellent performance of previously installed sections during Hurricane Florence in protecting those segments of shoreline was in stark contrast to the loss of and damage to the largely non-protected stretches at Brunswick Town, which has been the subject of study through monitoring by the Coastal and Estuarine Studies Lab of the University of North Carolina-Wilmington.</li> <li>c. A new phase will be under construction in FY 2022-2023, funded with federal historic preservation fund hurricane grant monies.</li> </ol> <p>The agency believes this system is a demonstration project nationally for protection of vulnerable shorelines, particularly in the context of threatened cultural resources.</p>	<p>Division of State Historic Sites &amp; Division of Historical Resources/State Historic Preservation Office (HPO) and Office of State Archaeology</p>

**b. Actions taken or planned to address Climate Justice and Equity**

**Table 3. Agency Actions Related to Climate Justice and Equity**

Initiative Title	Description	Division/Lead Program Office
Objective 5.3, DNCR Strategic Plan 2021-2023	<p>Evaluate the impacts of climate change on DNCR programs and operations to ensure meaningful engagement with communities (Objective 5.3, DNCR Strategic Plan 2021-2023)</p> <p>Milestone 5.3.1 Increase outreach efforts in impacted communities. Implement a coordinated, strategic approach to increase communication and interaction, with an emphasis on vulnerable and historically marginalized communities.</p> <p>Milestone 5.3.2 Publish clear percentages of newly established jobs or contracts that should go to vulnerable communities and for which historically marginalized businesses receive priority bidding.</p> <p>Milestone 5.3.3 Increase outreach efforts for hiring in communities where work will be completed. Continue to partner with the DOA Office of Historically Underutilized Businesses, NC Institute of Minority Economic Development, and other entities to increase outreach efforts of bidding and contracting opportunities for underserved communities.</p> <p>Milestone 5.3.4 Leverage disaster recovery funds and other sources of capital to promote equitable job creation and inclusive business development in communities most vulnerable to climate change.</p> <p>Milestone 5.3.5 Develop a statewide science trail of venues to offer unique science experiences with the natural world for visitors and citizens.</p>	DNCR-wide

Initiative Title	Description	Division/Lead Program Office
	<p>Milestone 5.3.6 Environmental Justice and Inclusion – Promote Environmental Justice and Inclusion through collaboration with DNCR environmental, conservation, and preservation programs to ensure appropriate and fair uses of natural resources.</p> <p>Milestone 5.3.7 Promote equal access for communities of all backgrounds to parks, trails, greenways and other open spaces, and make recommendations through DNCR divisions to improve outcomes.</p>	
Public lands/open space investment	Plan to work with DEQ & the Andrea Harris Social, Economic, Environmental, and Health Equity Task Force to incorporate park and trail investment in underserved communities into the State’s environmental justice work.	State Parks/Land and Water Stewardship

**c. Actions taken or planned to take to assist communities served**

**Table 4. Agency Actions Related to Community Assistance**

Initiative Title	Description	Division/Lead Program Office
Objective 5.4, DNCR Strategic Plan 2021-2023	<p>Foster resiliency through local and statewide planning efforts, education, and grant opportunities to constituents (Objective 5.4, DNCR Strategic Plan 2021-2023)</p> <p>Milestone 5.4.1 Complete the statewide historic resilience project through cooperative agreement between the Historic Preservation Office and the UNC School of Government by September 2023</p> <p>Milestone 5.4.2 Broaden constituent outreach and education for resiliency measures, such as restoration workshops on how to floodproof or dry out buildings, CREST-led disaster planning training, and Register of Deeds training, to aid in better statewide preparation for flooding events.</p> <p>Milestone 5.4.3 Bring resiliency-oriented grant projects (constituent and internal) to completion through the State Historic Preservation Office hurricane grant program for Hurricanes Florence and Michael recovery.</p> <p>Milestone 5.4.4 Provide greater services such as resiliency-oriented technical assistance to locally- owned cultural resources.</p> <p>Milestone 5.4.5 Increase funding for the Parks and Recreation Trust Fund and NC Land and Water Fund.</p> <p>Milestone 5.4.6 Incorporate climate change and resilience information into DNCR educational materials, campaigns, and social media feeds.</p>	DNCR-wide
2021 Grant Cycle Projects – NC LWF	Lands conserved and restored with funding from the NC Land and Water Fund (formerly Clean Water Management Trust Fund) preserve resilient landscapes, provide flood abatement for nearby communities by helping store and slow the flow of water during storm events, protect natural streambank vegetation to stabilize shorelines, and provide habitat for rare species. In total, over 51,000 acres	Division of Land and Water Stewardship/NC LWF

Initiative Title	Description	Division/Lead Program Office
	will be protected, including over 33 miles of waterways, as a result of the 2021 grant awards. This includes Game Lands, State Parks, Historic Sites, and local parks, and 71 Endangered, Threatened, and Special Concern species.	
Grant Writing Support	Technical assistance is provided to local governments applying for PARTF grants through a contract with Recreation Resources Service (RRS) at NC State University	NC State Parks and Recreation
Constituent Consultations and Training Videos	<p>The Restoration Branch of the State Historic Preservation Office (HPO) provides technical advice for restorations, rehabilitations, and building maintenance to owners of historic buildings at no cost or obligation.</p> <p><b>Professional Development and Training.</b> The Branch has sought professional development opportunities regarding building adaptations for greater resiliency, including attendance at the national biennial <i>Keeping History Above Water</i> conferences and National Park Service training for historically sensitive building elevations where flooding is an issue. Several staff members have successfully completed floodplain management training with North Carolina Emergency Management.</p> <p><b>Constituent training videos.</b> The Branch continues to produce and release constituent videos available on YouTube, including review of federal disaster recovery assistance available for property owners in historic districts; how to use GIS mapping and data to prepare for and respond to natural disasters; case studies of building elevations for better resiliency; and how to dry out a flooded historic building. To date, we have quantified several thousand YouTube views of the videos, and released a new series in summer 2021 after an inaugural 2020 series.</p> <p><b>Constituent consultations.</b> The Branch provides expedited and on-site assistance to historic property owners following natural disasters and fires and conducts consultations regarding damaged historic buildings and best practices for repair and recovery.</p>	Division of Historical Resources/State Historic Preservation Office (HPO)

Initiative Title	Description	Division/Lead Program Office
Hurricanes Florence and Michael Constituent Subgrant Program for Historic Preservation Recovery	<p>In December 2019, the National Park Service (NPS) awarded the North Carolina State Historic Preservation Office (HPO) approximately \$17 million in federal grant funding to provide recovery assistance to historic resources damaged by Hurricanes Florence and/or Michael that are listed in or eligible for listing in the National Register of Historic Places.</p> <p>The award allowed the HPO to make available up to \$9.25 million in grants for historic resources located in the 61 eligible counties in North Carolina designated by FEMA for disaster assistance.</p> <p>In September 2020 following a successful subgrant solicitation period, the HPO submitted 22 constituent subgrant proposals to the National Park Service for funding approval totaling \$9.25 million in cumulative assistance. These projects include three planning projects, and nineteen brick and mortar projects, and were approved by NPS in 2021. Subgrant work is currently underway with individual recipients from FY2021 through FY2023.</p>	Division of Historical Resources/State Historic Preservation Office (HPO)
Historic Resilience Planning Project for Local Governments	In collaboration with the NC Impact Initiative at the UNC School of Government and NC State University, working to better link local disaster planning to historic resource resiliency planning, and create and provide training for state agency personnel, local governments, and non-profit historic sites in best practices for disaster preparedness and response.	Division of Historical Resources/State Historic Preservation Office (HPO)
Cultural Resources Emergency Support Team (CREST) – Post-	DNCR staff have worked on multiple fronts to address storm recovery and climate resilience in two historically marginalized communities with frequent flooding—Princeville and Pembroke.	Division of Historical Resources, State Historic

Initiative Title	Description	Division/Lead Program Office
storm Constituent Consultations	<p>Princeville: Consulted with town leaders to preserve buildings and artifacts associated with the historic Princeville School and the Matthewson House. Although, after careful consideration, the c.1870 Matthewson House was demolished in 2020, HPO and OAH staff continue to consult with town leaders to plan storage for the salvaged architectural elements and to assist with plans for a future Princeville Museum.</p> <p>Pembroke: Consultations have led to recommendations for federal resiliency funding to address structural needs at The Indian Education Program Museum in the historic Pembroke High School, and a federally funded historic preservation project, currently underway, for this historic building. In addition, CREST directed federal funds earmarked for Hurricane Florence recovery to upgrade storage supplies for the museum’s cultural heritage collection.</p>	Preservation Office (HPO), Office of Archives and History (OAH)
NC Coastal Cemetery Survey (post-Hurricanes Florence and Michael)	Undertaking a North Carolina Coastal Cemetery Survey to identify, document, and assess the condition of historical cemeteries on state lands in the nine coastal counties (Dare, Hyde, Beaufort, Pamlico, Carteret, Onslow, Pender, New Hanover, and Brunswick) likely to have been impacted by storm damage. Particular attention to recording cemeteries traditionally associated with African American communities, which are underrepresented in state records.	Office of State Archaeology (OSA)
Historic Architectural Surveys (post-Hurricanes Florence and Michael)	Identified multiple counties that received FEMA disaster declarations from hurricanes Florence and Michael currently lacking historic architectural survey information. Undertaking these needed surveys in Cumberland, Hoke, McDowell, Montgomery, Person, Polk, and Vance counties, and Mount Pleasant in Cabarrus County in FY 2021-FY2023.	State Historic Preservation Office (HPO)
Battleship Resilience Demonstration Project	The Battleship’s Living with Water flood mitigation and resiliency project will: 1) install an intertidal living shoreline at an actively eroding section of the berth, 2) create an estuarine wetland and tidal creek in a portion of the parking lot most subject to chronic flooding, 3) elevate the remaining parking area above the	Battleship <i>USS North Carolina</i>

Initiative Title	Description	Division/Lead Program Office
	measured tide flood level, and 4) deliver public education messages on building climate change resiliency in response to coastal conditions. Living with Water, a \$4M engineered solution to rising sea levels, is supported by \$2.3M in state and federal grants and a \$700K contribution in Battleship revenues.	
CREST Assistances for Tropical Storm Fred in Town of Canton	Tropical Storm Fred flooded the Town of Canton on August 18. Floodwaters filled the basement level of the town-operated museum. Its director requested CREST assistance and team members provided consultations remotely and onsite assessments and artifact relocation assistance in late August and early September.	Division of Archives and Records
Records Analyst Position	The department's goal of adding a records analyst based in the eastern portion of the state to focus on supporting counties and municipalities that have faced recent flooding during severe weather events was funded in the 2021-2022 budget. The position description has been written the planning has started for the position. It will be based in New Bern and primarily responsible for local government records consultations, training on essential records protection, and the coordination of back-up imaging of archival records in the eastern portion of the state.	Division of Archives and Records



## **IX. Department of Administration**

### **A. Message from the Secretary**

The North Carolina Department of Administration (DOA) is committed to addressing climate change and transitioning to a clean energy economy by developing sustainable practices and implementing progressive measures. As an agency, we prioritized the directives of Executive Order 80 to encourage and institutionalize energy efficiency in the workplace and our operations. Working collaboratively and independently, several DOA agencies embodied the passion of the Governor's priorities in creating a cleaner North Carolina.

Significant Initiatives include:

- The ongoing steam trap maintenance program started in 2019 has saved \$36,896 in utility costs.
- The State Construction Office and Facilities Management Division continually collaborate with state agencies to bring attention and awareness to energy-saving measures.
- The Division of Motor Fleet Management implemented a new vehicle acquisition process to reduce the cost of vehicle purchases while focusing on increasing the use of zero to low emissions vehicles.
- The fiscal year (FY) 2021-2022 MFM replacement list identified 143 vehicles eligible for ZEV replacement in the next fiscal year and 330 vehicles as eligible for hybrid replacement in the next fiscal year. The annual replacement list is supplied to each agency, encouraging their adoption of ZEVs for agency operations.

The directives of EO80 are a priority for the entire department. Notwithstanding the hurdles caused by the ongoing pandemic, the lead divisions within DOA are making significant headway on EO80 implementation.

The Department of Administration is excited to continue the work of a cleaner NC, and I am honored to collaborate with brilliant minds on a brighter, more energy-efficient future for the people of our state.

Secretary,

Pamela Cashwell

## B. Update on EO80 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education Outreach	The SCO and FMD offices communicate energy savings opportunities internally and between agencies through collaborations such as DEQ’s Energy Managers meetings, DPS’s LED in ’23, and Maintenance Driven Commission round table.	State Construction Office (SCO) Facilities Management Division (FMD)
NC Motor Fleet ZEV Plan Implementation	NCDOA provided the North Carolina Motor Fleet Zero-Emission Vehicle (ZEV) Plan implementation to update DEQ Oct/Nov 2021. The report included steps taken by DOA to increase zero to low emissions vehicles in state agency fleets.	FMD
	The October 2021 Motor Fleet ZEV Plan highlights significant headway in converting the NC Motor to Zero-Emission vehicles in the coming years. The National Renewable Energy Laboratory and Sawatch Labs report, outlined in more detail below, identified 3,049 state vehicles that may be suitable for replacement with a ZEV at the end of their life cycles, potentially saving the state \$14 million in total cost of ownership over the life of those vehicles. Using this data, several DOA divisions are partnering to identify the best locations to implement charging infrastructure across the state for motor fleet vehicles. DOA continues to search for creative solutions to the limited number of ZEV offerings, supply chain shortages, the upgrading of parking infrastructure, and the acquisition of charging stations.	Motor Fleet Management (MFM) State Parking State Property SCO
	MFM has ordered six small electric cargo vans to replace six of the MSC minivans to deliver mail for agencies in the Raleigh area. To provide mail longer distances throughout the state, MFM is looking for hybrid minivans to replace the other 18. MFM currently has an option available, but the van is not available until further notice due to a shortage in vehicle production. Once we receive the first six electric vans, our fleet will be 23% compliant with executive order EO80, and as soon as the hybrid vans are available, we will be 81% compliant.	Mail Service Center (MSC)
Agency Fleet Zero Emission Vehicle / Electric	Agency Fleet Zero Emission Vehicle/Electric Infrastructure issues will be addressed by the Motor Fleet Management Office, in partnership with the North Carolina Department of Transportation.	FMD SCO

Category	Summary of Initiative / Accomplishments	Division/Program Office
Infrastructure (EO80 Section 7)	<p>FMD has requested EV charging stations for the facility management parking lot.</p> <p>SCO collaborated with FMD, Parking Services, and other DOA representatives to propose an R&amp;R project to add ZEV infrastructure to a few downtown parking areas.</p>	
Agency Building Utility Consumption Reduction (EO80 Section 8)	<p>Data management: FMD implemented Capturis for utility data tracking; consistent data tracking facilitates energy usage analysis and strategic energy efficiency planning.</p> <p>Energy efficiency - steam: The ongoing steam trap maintenance program that began in 2019 has saved \$36,896 in utility costs so far and mitigated an estimated steam loss of 8,940,000 lbs./year, saving an estimated 1,609,000 lbs. of CO2/year.</p> <p>Energy Efficiency – EUI: Combined EUI decreased from 109,273 in FY 19-20 to 100,475 in FY 20-21.</p>	FMD

## C. Update on Department Climate Resilience Activities

### a. Hazards Identification, Vulnerability Assessments, and/or Resilience Actions Taken Since October 15, 2019

*(Chapter 5 of the Climate Risk Assessment and Resilience Plan & Element 2 of the North Carolina Resilience Strategy)*

**Table 2. Agency Actions Related to Resilience**

Initiative Title	Description	Division/Lead Program Office
Chiller Plant Resilience	<p>Facilities Management Division (FMD) provides chilled water to many State-owned buildings in the downtown Raleigh complex. Chilled water from DOA’s two chilled water plants is piped through numerous air handling units in the downtown complex buildings to cool the buildings in spring, summer and fall seasons.</p> <p>Ongoing maintenance of the chilled water infrastructure, principally cooling towers, piping, and primary and secondary chilled water pumps is required to maintain the resilience of the chilled water system.</p> <p>FMD is replacing one failed chiller at Chiller Plant 2 and rebuilding the second chiller. Both chillers will receive an internal epoxy coating to protect the equipment.</p>	FMD
Boiler Plant Resilience	<p>The 2021 fund for Boiler Plant modifications is scheduled to provide the addition of a “summer boiler” in the existing HEQ plant to allow the service of the main boiler plant during the summer season. Ultimately this modification will allow better and safer maintenance activities and fewer steam outages.</p>	FMD

**b. Actions taken or planned to take to assist communities served**

**Table 3. Agency Actions Related to Community Assistance**

<b>Initiative Title</b>	<b>Description</b>	<b>Division/Lead Program Office</b>
Increase Energy Efficiency	Essentially all DOA allocated buildings are in the State Government Complex in Raleigh. The Department of Administration assists building occupants by providing reliable heating, cooling, electricity, and water utilities to that community.	FMD

## **X. Department of Military and Veterans' Affairs**

### **A. Message from the Secretary**

The Department continues to be focused on providing advocacy for veterans' and their families as they apply for and receive benefits they have earned, supporting the transition of retiring military members and their families to a civilian life to be lived in North Carolina, and supporting the unique socioeconomical environment that exists between active-duty military installations in North Carolina and the surrounding communities to these installations. Implementation of EO80 initiatives is part of the above advocacy. My staff is committed to support the implementation of EO80 initiatives at all DMVA facilities around the state.

Walter E. Gaskin  
Secretary

## B. Update on E080 Climate Mitigation and Economic Development Activities

**Table 1. Agency Actions Related to Climate Mitigation**

Category	Summary of Initiative / Accomplishments	Division/Program Office
Education / Outreach	The Department currently operates four skilled nursing facilities. A 5 <sup>th</sup> facility is scheduled to open in Spring, 2022. We are upgrading the HVAC systems in these facilities for a more energy efficient footprint. We are completing roof repairs and replacements on these facilities to provide a more energy efficient solution. We continually evaluate each facility to determine any other initiative that could improve energy efficiency.	State Veterans' Homes / Division of Veterans' Affairs
	The Department currently operates four State Veterans Cemeteries. Each facility is continually evaluated to determine any other initiative that could improve energy efficiency.	State Veterans' Cemeteries / Division of Veterans' Affairs
	The Department has in excess of 25 vehicles through Motor Fleet Management and/or private purchase. Each vehicle is evaluated for possible trade in for a more energy efficient replacement as they reach their likely life-cycle replacement date.	Department of Military and Veterans' Affairs
	The Department liaisons with all the active-duty military installations in North Carolina to determine any energy efficiencies these installations are developing, how North Carolina as a state can support this, and what effects are passed on to the surrounding communities	Division of Military Affairs
NC Clean Energy Plan Implementation	The Department will consider various Clean Energy Plan initiatives in the design of a new skilled nursing facility projected in Wake County. At a minimum, incorporation of solar power and a "Green Roof" system are under considerations, and any other initiatives that can be considered will be included.	State Veterans' Homes / Division of Veterans' Affairs
	The Department will evaluate options to provide Clean Energy Upgrades to the existing skilled nursing facilities in Buncombe, Cumberland, Rowan, and Lenoir counties.	State Veterans' Homes / Division of Veterans' Affairs
	The Department will evaluate options to provide Clean Energy Upgrades to the existing cemeteries in Buncombe, Cumberland, Wayne, and Onslow counties.	State Veterans' Cemeteries / Division of Veterans' Affairs

Category	Summary of Initiative / Accomplishments	Division/Program Office
NC ZEV Plan Implementation	The Department will request conversion to electric vehicles for any vehicle identified for trade in by NC Motor Fleet Management	Department of Military and Veterans' Affairs
	The Department will request assigned parking spaces for any assigned electric vehicles that facilitate access to a vehicle charging station, upon incorporating electric vehicles into the Department Motor Fleet	Department of Military and Veterans' Affairs
NC Motor Fleet ZEV Plan Implementation	The Department will comply with the NC Motor Fleet ZEV Implementation Plan	Department of Military and Veterans' Affairs
Workforce Assessment Implementation	The Department has not completed a workforce assessment	Department of Military and Veterans' Affairs
Agency Fleet Zero Emission Vehicle / Electric Infrastructure (EO80 Section 7)	The Department does not currently have any electric vehicles assigned. We are prepared to accept electric vehicles as replacement for directed trade in by Motor Fleet Management. However, due to the location of our facility, we will need new parking places assigned for our vehicles that are accessible to charging stations, or we will need a charging station installed in parking lot 37.	Department of Military and Veterans' Affairs
Agency Building Utility Consumption Reduction (EO80 Section 8)	The Department does not have a copy of the report on the Seaboard Building's possible utility consumption reduction actions. The Department is evaluating opportunities to create a utility consumption reduction at the existing skilled nursing facilities, and at the State Veterans' Cemeteries	Department of Military and Veterans' Affairs



## **XI. Department of Agriculture & Consumer Services**

The North Carolina Department of Agriculture & Consumer Services (NCDA&CS) is pleased to provide this update to the 2021 EO80 Status Report. We look forward to working with other agencies in dealing with resiliency and climate change issues.

Farmland preservation is one of the, if not the highest, priority for the department. The Farmland Preservation Division works with counties and nonprofits to record conservation easements on privately-owned farms and forests throughout North Carolina. These agricultural conservation easements restrict the residential, commercial, and industrial development of land to maintain its agricultural and forestry production capability. Agricultural conservation easements are key components in the department's climate resilient strategy because working lands are actively managed by farmers, providing essential benefits such as erosion control, carbon sequestration, rainwater percolation, waterway buffer protection, and permeable surfaces.

In 2021, the Agricultural Development and Farmland Preservation (ADFP) Trust Fund conserved 6,743 acres of working farms and forests across North Carolina. This is the most conservation easement acres recorded in one calendar year since the establishment of the program in 2005. In October 2021, the first partnership conservation easement between the Department of the Navy and the North Carolina Department of Agriculture and Consumer Services was recorded. This conservation easement met several objectives for compatible use, most notably military readiness for Marine Corps Installations East and the continued production of agriculture and timber products.

The Research Stations Division (RSD) feel the effects of climate change intimately. Just like a private farmer, RSD deals with weather extremes that impact planting, growing seasons, harvesting, crop yields, quality, etc. Learning to mitigate the adverse effects of weather extremes comes in the form of Precision Agriculture. With the use of satellite guidance technology, RSD can make precise applications of fertilizer and chemical, reducing the number of trips across a field in a tractor. This technology enables the reduction of inputs because there is less overlap. Precise GPS guided application translates into optimum yields with less input costs, potential runoff, and gallons of fuel.

The NC Forest Service has been dedicated to the protection, conservation, and stewardship of North Carolina's forests for over a century. It offers a wide variety of forest management programs and services that help landowners become more knowledgeable about their woods as well as their options. NC Forest Service Foresters and Rangers work one-on-one with landowners to prepare woodland plans tailored to the landowner's unique management goals and the features of the property. In 2021, 4,662 Woodland Management Plans were prepared, providing landowners with sound forest management recommendations on 227,964 acres. Through the Forest Development Program, Florence Restoration Fund, and other forestry costshare programs, the NC Forest Service allocated \$5.8 million in funding and over 62,000 acres of forest tree planting on private lands were completed. Agency staff continued to work with forest stakeholders to ensure the protection of the State's water resources, with 7,128

water quality inspections occurring statewide. The NC Forest Service partnered with the NC Urban Forest Council and North Carolina State University Extension to provide education and technical assistance to homeowners and municipalities in storm preparedness, response, and recovery. Three municipal training webinars drew 173 attendees, and two homeowner webinars drew 333 attendees. A new series of publications focusing on urban forest resiliency has also been released and should be a helpful guide for communities and homeowners.

For the NC Forest Service, calendar year 2021 will go down as an above normal occurrence year for North Carolina with 4,970 wildfires. Even though occurrence levels were up, the acres burned was below the 10-year average at 14,896 acres. This was the direct result of aggressive initial attack on wildfires and thorough suppression of wildfires. Occurrence levels were up as a result of two periods of drought, one in late spring and the other in late fall. Two burns bans (one statewide) were put in place in 2021 to mitigate ignition sources during these drought periods.

One of the most effective tools to mitigate wildfire risk is to conduct prescribed fires that remove excessive fuels and maintain healthy ecosystems. Prescribed fire is also an important habitat management tool at many of the Plant Conservation Preserves, used for the benefit of endangered and threatened plant species. However, at a time when more prescribed burns are needed for habitat restoration and to mitigate increasing wildfire risks, fewer burns are possible in part due to challenging weather patterns with wet winters moving quickly into dry and droughty springs. These weather patterns have effectively shortened the traditional prescribed burning season on both ends and are negatively impacting wildfire mitigation efforts across North Carolina. Despite these challenges it was a good year for prescribed burning with 894 projects completed for 93,691 acres. The Grindstone Fire on Pilot Mountain was a great example of the benefits of prescribed burning. Fuel loading in the area was lower due to previous burning and fire breaks were already in place. This made suppression of the wildfire timelier and more cost effective. Even though it was categorized as a wildfire, the impacts on the landscape are minimal and more in line with the results normally seen on a prescribed burn.

The Plant Conservation Program continues to view flood damage at the Plant Conservation Preserves and risk of wildfire as its two biggest climate change hazards throughout the state. In 2021, floods from heavy rain events continued to cause new damage on Plant Conservation Preserves. New in 2021, the Plant Conservation Program partnered with the Division of Water Resources (DEQ) at a Plant Conservation Preserve in Sampson County to install monitoring wells to measure ground water salinity as part of a state-wide program to track saltwater intrusion related to climate change. This information will help inform management of this preserve as well as provide important data for a state-wide analysis.

The Division of Soil and Water Conservation through its Stream Debris Removal program works with 103 local sponsors to remove debris that is blocking stream flow and potentially contributing to flooding of adjacent and/or upstream cropland and communities. In 2021, local sponsors have completed nearly 632 miles of debris removal and stream repair. These same local sponsors are currently contracted to complete another 1,190 miles of debris removal and streambank restoration activities to further protect farm land, forest land and communities.

The newly authorized Streamflow Rehabilitation Assistance Program will accelerate work to restore streamflow and drainage across the state.

A continuing goal is increasing on-farm water storage through the Agricultural Water Resources Assistance Program (AgWRAP) to assist agricultural producers and landowners in constructing and enhancing ponds and water collection. On-farm storage of water flattens the runoff hydrograph to reduce peak runoff, which lessens downstream flood potential. On-farm storage also increases water available for irrigation when needed. In 2021, the Division assisted in the construction of 21 new ponds, restored storage capacity of 5 existing ponds, and repaired or reconstructed 10 ponds. The Division has agreements in place to install, repair or replace an additional 114 ponds.

In 2021 the Division assisted 12 agricultural producers in upgrading their existing irrigation systems with agreements in place to assist an additional 17 producers to implement conservation irrigation conversion. Upgrading existing irrigation systems improves the efficiency of irrigation methods, thereby reducing the demand on water resources for agricultural production.

The Division oversees education and implementation of cover crop, conservation tillage and cropland conversion programs. These practices result in many climate resiliency benefits, including:

- Improved water quality from increased nutrient scavenging and cycling leading to a reduction in sedimentation and agricultural chemical inputs.
- Stormwater management leading to increased rainfall infiltration and decreased soil erosion and runoff.
- Drought resilience from improved efficiency in soil moisture use and increased soil water holding capacity.
- Increasing plant biomass and soil carbon storage leads to an improved means for carbon sequestration.

It is noted that in 2021, through the Agriculture Cost Share Program (ACSP), the Division has assisted producers to implement these beneficial climate conservation practices on 17,574 acres of cropland. ACSP agreements are currently in place to assist producers with 22,836 additional acres.

The Department is sponsoring several Biofuels Research Initiatives (BRI) funded through the Research Stations Division. Below is a summary of each.

- Two projects were entitled the *Pellets for Pullets* and *Pellets for Plants*. Their purpose was to show that wood pellets from wood waste can become a convenient, affordable, clean-burning, and climate-friendly source of heat for farmers in WNC. This project was particularly important because it strengthened regional economies while demonstrating that convenient and affordable wood pellet fuel can displace non-renewable alternatives while supporting the State of North Carolina goal to be carbon neutral by 2050.
- The BRI funded project entitled "*American sycamore: Sustainable bioenergy-improved soil health*" addresses the issue of climate change by researching the potential to store

atmospheric carbon in agricultural soils, offset fossil fuel emissions, and improve landscape scale energy balance, all while benefitting the economies of rural communities. The hypothesis is that by growing American sycamore in short-rotation coppice (SRC) systems on North Carolina farms in rotation with conventional crops such as corn and soybeans, carbon will be removed from the atmosphere by tree photosynthesis and transferred to the soil in leaf and root litter, and coarse woody debris from root systems. Applied statewide, this system has potential to remove vast quantities of carbon from the atmosphere while improving agricultural soil health.

- Through the BRI project, entitled “*Miscanthus Biochar Potential as a Poultry Litter Amendment*”, the researchers started [1] collecting greenhouse gas (GHG) emission potential for broiler house litter, and [2] developing designer biochar derived from miscanthus to reduce ammonia (NH<sub>3</sub>) as well as GHG emissions. The findings of this project will provide better quality data on GHG emissions from poultry sector, evaluate performance of plant-based product to offset these emissions and increase carbon sequestration potential through litter-biochar land application, and create a value-added application for herbaceous biomass to reduce risk associated with its wider cultivation for biofuel/bioenergy production.
- Perennial grasses such as *Miscanthus*, *Tripidium* and *Saccharum*, all belonging to the sugarcane complex have been recognized for their potential as bioenergy crops. As a bioenergy source, these high biomass grasses have been shown to have low greenhouse gas outputs. In addition, these grasses can sequester carbon, have low inputs and can grow in marginal areas and have been touted as having potential to mitigate greenhouse gas emissions and climate change. The Bioenergy Research Initiative has supported research and breeding within this complex to maximize yields and adaptability to North Carolina. In recent efforts research has focused on adaptability of energycanes to North Carolina. Closely related to sugarcanes, energycanes accessions are showing high yields in some areas of North Carolina. The diversity of bioenergy feedstocks will allow for optimizing crops to suitable areas and maximizing outputs with reduced climate impacts.
- Projects for the development of Populous (hybrid poplar) for veneer and fiber in Western North Carolina are climate-mitigation or alternative climate wood crops for high value wood products in WNC. Warming trends for WNC, particularly at night, and negative feedback loops for increased pest, disease, and pathogen expansion from lower elevations pose threats to valued woody crops in WNC. Hybrid poplars for veneer offer potential alternative crops that are more resilient to warming trends for mid-century mountain climates.
- A BRI project with the on-going objective to extend growing seasons for farmers in rural Appalachia utilizing controlled-environment agriculture powered by renewable energy while producing useful by-products for improving soil quality (biochar and anaerobic digester effluent). All of these measures help mitigate climate change. More local

agriculture decreases GHGs by reducing emissions associated with transportation of food to market. Controlled-environment agriculture (greenhouses) powered by renewable energy reduces the amount of fossil fuels used for heating. Solar thermal heating and waste heat from biochar production is used to help heat the greenhouse, and to facilitate root-zone heating for starting beds. Biochar itself helps sequester carbon in the soil and anaerobic digesters help capture methane and combust it to CO<sub>2</sub>, a less potent GHG. The digester effluent when combined with biochar creates a soil amendment that helps build soil quality by increasing soil organic matter and nutrient and water retention, thereby increasing local food production.

Lastly, the Steve Troxler Agricultural Sciences Center opened in 2021. Two electric vehicle charging stations were included in the construction along with the infrastructure to add two more stations should demand dictate the expansion. The initial two stations are operational and available to employees and the public.