

Hurricane Florence Recovery Recommendations

Governor Roy Cooper

Building Communities Stronger and Smarter
Based on Preliminary Damage and Needs Assessment

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Executive Summary

In September 2018, Hurricane Florence brought high winds, dangerous storm surge and record rainfall that caused historic flooding throughout North Carolina. At its peak, Hurricane Florence was a Category 4 storm as wide as the entire state with winds reaching 140 mph. The storm hovered over North Carolina for six days, inflicting even higher levels of rainfall, storm surge, and flooding than Hurricane Matthew only two years prior.

This deadly storm has left a lasting impact on families and neighborhoods across our state, resulting in 40 confirmed fatalities. Property damage and power outages were widespread, cutting power to over a million people and forcing tens of thousands of families to take refuge in emergency shelters. While the impacts of Hurricane Florence were felt across the state, those who live in the southeast bore the brunt of the storm. Forty-four counties have been designated by FEMA for federal disaster assistance.¹ An estimated 3.9 million people, almost 40% of North Carolinians, live in one of the designated counties.²

Preliminary impact estimates approach \$17 billion in damages across the state. This is over three times the \$4.8 billion physical and economic cost of Hurricane Matthew in 2016. While the storm affected nearly every aspect of life in Eastern North Carolina, three categories drive approximately 80% of the direct and indirect damage estimates: (1) Business, (2) Housing and (3) Agriculture:

- **Business:** The impact on businesses and non-profits in North Carolina has also been significant, currently estimated at \$5.7 billion. Over 3,800 private-sector business and nonprofit properties incurred water damage; more than 23,000 incurred wind damages. The ripple effect of this impact is immense. Hurricane related interruption results in lost revenue for the businesses and lost wages and ancillary benefits for employees, both of which can lead to substantial knock-on effects to local economies and businesses, exacerbating the impact.
- **Housing:** Current estimates show that approximately 1.2 households or 30% of North Carolina households have been affected by the storm resulting in a preliminary impact estimate of \$5.6 billion. While single and multi-family dwellings drive a significant portion of those costs, Affordable, Temporary, and Supporting Housing damages are also substantial and could continue to grow as the recovery continues.
- **Agriculture:** Florence has also had devastating effects on North Carolina's agriculture industry, causing large scale loss of crops and livestock with impact estimated at upwards of \$2.4 billion. Among other elements, this figure includes \$1.1 billion in crop, livestock and commodity losses and \$117.7 million in farm buildings, equipment, and infrastructure losses.

In terms of sources of funding, initial estimates indicate at least \$2.5 billion of potential federal aid (majority in CDBG-DR and FEMA funds). While private insurance coverage is difficult to estimate at this early stage, high-level estimates suggest \$4.6 billion in private coverage. That leaves a significant gap of \$8.8 billion which will need to be met by a combination of additional federal, private, and state aid.

¹ There are 44 counties FEMA designated by 10/26/2018 for Individual (31) or Public Assistance (44)

² NC OSBM, Certified Population Estimates, Vintage 2017.

Summary of Preliminary Damage and Needs Estimates

Preliminary Total Damage and Needs Assessment Costs (Millions)					
Category	Direct ¹	Indirect/ Induced ²	Subtotal	Resiliency Efforts	Total Impact
Business	\$3,780	\$1,900	\$5,680	\$20	\$5,700
Housing	\$5,339	\$0	\$5,339	\$291	\$5,630
Agriculture	\$1,332	\$1,023	\$2,355	\$75	\$2,430
Utilities, Water and Sewer	\$779	\$0	\$779	\$25	\$804
Natural Resources	\$410	\$0	\$410	\$145	\$554
Government Property and Revenue	\$333	\$69	\$402	\$5	\$407
Transportation	\$419	\$7	\$426	\$50	\$476
Education	\$275	\$28	\$303	\$0	\$303
Health and Human Services	\$192	\$40	\$233	\$0	\$233
Recovery Operations	\$194	\$0	\$194	\$0	\$194
Total Recovery Costs	\$13,053	\$3,067	\$16,120	\$611	\$16,731

1. *Direct effects* are the results of changes in spending and investment by businesses and organizations in a given region, including money spent to pay for salaries, supplies, raw materials, and operating expenses.
2. *Indirect effects* are the results of business-to-business transactions within a given region indirectly caused by the direct effects, such as changes in spending on business supplies or product components. *Induced effects* are the results of changes in personal income caused by direct and indirect effects. Businesses experiencing changes in revenue from the direct and indirect effects will subsequently alter payroll expenditures (e.g., by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will, in turn, change amounts spent at local businesses. The induced effect is a measure of the resulting change in purchases by households from businesses within a given region.

Summary of Preliminary Damage Estimates (cont.)

Preliminary Total Damage & Need Assessment costs (Millions)						
	Current Expected Funding Level		Appropriated			
Total Impact	Private	Federal	State	Unmet Impact	Additional Federal Request	Remaining Unmet Impact
\$16.7	\$4.6	\$2.5	\$0.8	\$8.8	\$5.0	\$3.8

Governor Cooper's Hurricane Florence State Recovery and Resiliency Plan	
Total Recommendation	Initial Down Payment
\$1.5 billion	\$750 million

Historical Comparison of Florence to other Storms

Measure	Florence	Matthew	Floyd
Total Damage	\$16.7 billion	\$4.8 billion	\$7.0-\$9.4 billion (inflation adjusted)
FEMA Individual Assistance applications	122,080 ¹	82,000	87,000
Inches of Rain	25-35	18-20	17-20
Storm Surge (ft.)	10	6	9
Fatalities	40	28	51
Strongest wind (mph)	90	80	100
Duration (days)	6	2	4

1. As of 10/12/2018



Business

Addresses physical damage and economic losses for non-agricultural businesses

1. Summary

The following is documentation of the methodology used to derive a preliminary estimate for non-agriculture business and non-profit losses due to Hurricane Florence.

Preliminary estimates used flood mapping to identify affected private, non-residential structures to estimate structural damages and to model the disruption to the economy. This analysis leverages North Carolina Emergency Management (NCEM) and Bureau of Economic Analysis (BEA) data. The preliminary estimate for total impact is \$5.7 billion—of this, \$3.8 billion is the direct impact and \$1.9 billion is the secondary impact (indirect and induced). Based on preliminary data, we expect \$746 million to be covered by federal and private sources of funding, resulting in an unmet non-agriculture business and non-profit impact of \$4.9 billion. There is an opportunity to close the unmet need gap by providing loans and grants to businesses and to increase resiliency by investing in economic development programs.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/Induced	Total impact	Federal	Private	State	Unmet Impact
Real estate and equipment	\$1,080.0	\$0.0	\$1,080.0	\$200.0	\$506.0	-	\$374.0
Economic loss	\$2,700.0	\$1,900.0	\$4,600.0	\$0.0	\$40.0	-	\$4,560.0
Subtotal	\$3,780.0	\$1,900.0	\$5,680.0	\$200.0	\$546.0	-	\$4,934.0
Resilience efforts	\$0.0	\$0.0	\$20.0	\$0.0	\$0.0	-	\$20.0
State Appropriations	-	-	-	-	-	\$5.0	-
Total	\$3,780.0	\$1,900.0	\$5,700.0	\$200.0	\$546.0	\$5.0	\$4,949.0

2. Scope

Losses in scope for the business and non-profit estimates include:

- Real estate and equipment damage, and
- Business-disruption effects.

The estimates of damages to structures do not include agricultural enterprises and hospitals/clinics – these estimates are included in other sections – but do include churches and temporary lodgings (e.g., hotels). The business disruption loss estimate covers the whole of the state’s economy, except for the farming and fishing industries (those losses are covered in the Agriculture section) and government (losses to government entities are covered in the Government Property and Revenue section).

3. Economic Overview

Most of the damage from Hurricane Florence was concentrated in the 31 counties that FEMA has designated to receive individual assistance (IA). These counties account for 23% of North Carolina GDP.³

Of the 57,000 establishments (i.e. business locations that include separate locations of a chain) in the 31 counties, 96% had fewer than 50 employees in 2016.⁴ There are another 196,000 “mom and pop” type businesses and side businesses that have no employees and had receipts of nearly \$8 million in 2016.⁵

The Retail Trade sector accounts for 17% of all establishments and total employment in the 31 counties. The Health Care & Social Assistance and Construction sectors each account for about 11% of establishments, and Accommodation & Food Services accounts for 10%. While the Manufacturing sector accounts for only 3% of establishments, it comprises 14% of total employment.⁶

The average unemployment rate in these 31 counties was 5.0% in 2017 compared to the state average of 4.6% (the rate for the region was 4.4% in August 2018, the most recent month available, versus the state rate of 3.9%).⁷ However, this area includes six counties that are in the bottom fifth in terms of the unemployment rate and four counties in the top fifth.

Employment statistics are slow to show the impact of weather events, and usually undergo significant annual revisions to appropriately account for the impact of storms. However, unemployment rates in the affected area will very likely increase temporarily. As of October 22, a total of 13,732 unemployment insurance claims have been filed as a direct result of the storm and \$1,333,089 has been paid on these claims. Individuals who have already received their maximum benefit through regular unemployment insurance (12 weeks) are also entitled to Disaster Unemployment Assistance (DUA) for up to 27 weeks. As of October 22, a total of 11,478 DUA claims have been filed and \$54,009 has been paid on these claims.

³ IHS 2016 Estimate of Gross County Product.

⁴ Census Bureau County Business Patterns.

⁵ Census Bureau Nonemployer Statistics.

⁶ Census Bureau County Business Patterns.

⁷ 2017 Unadjusted Local Area Unemployment Statistics, available at: <https://d4.nccommerce.com/LausSelection.aspx>.

4. Methodology

NCEM estimated that a total of 3,800 private-sector business and nonprofit properties incurred flood damage. Based on insurance claims reported to the NC Department of Insurance (DOI) as of October 19, 2018, OSBM estimates that approximately 23,000 business and nonprofit properties suffered damages from wind and other storm-related hazards. Based on the same DOI reports, OSBM also estimates that approximately 1,100 businesses and nonprofits experienced damages to vehicles and other tangible property. These impacts represent \$1.1 billion in total damage to structures, their contents, and other property.

The estimates include damages from coastal storm surge, flooding from rivers, and wind.

- *Storm surge:* NCEM used national models to create a GIS layer of the storm surge. NCEM compared the GIS layer against the elevation of the structures' first floor to determine the depth of flooding. Then, NCEM translated the flood depth into damage estimates by relying on Army Corps of Engineers (USACE) formulas and on estimated replacement values (based on property tax value) in NCEM's statewide database of buildings. The estimate for the number of buildings affected by the storm surge only includes primary structures; the replacement values include the building and its contents.
- *River flooding:* In a similar process as storm surge analysis, a GIS layer was constructed for riverine flooding. This layer combines model calculations of precipitation accumulation with actual river gage and high-water observations. The riverine flooding GIS layer allowed NCEM to estimate the flood depth sustained by structures, and damages were once again determined from NCEM's replacement values.
- *Total flood damages:* OSBM relied primarily on NCEM model-generated estimates for total structural damages caused by flooding. OSBM then adjusted the amount of damage to properties with flood insurance to account for the lower number and amount of National Flood Insurance Program (NFIP) and private flood insurance claims reported by DOI, assuming that 80% of expected NFIP and private flood insurance claims were filed by October 19, 2018
- *Wind damages:* OSBM based wind damages on the estimated non-residential share of preliminary insured losses – including real property, automobiles, and other property types – reported to DOI by private insurers as of October 19, 2018, as well as on trends in claims seen in past disasters. DOI data includes losses from the Coastal Property Insurance Pool (CPIP) and the Fair Access to Insurance Requirements plan (FAIR plan). One shortcoming of the preliminary insured losses reported to DOI is the possibility of double-counting between CPIP/FAIR losses and other insured losses. If subsequent DOI reports of insured losses indicate significant double-counting in their preliminary reports, total estimated wind damages will be lower than the current estimate.

Business Disruption: The total nonfarm business-disruption loss to North Carolina from Hurricane Florence is estimated at \$4.6 billion—inclusive of the direct and secondary (indirect and induced) effects. In terms of value-added (GDP), this amounts to \$2.3 billion, or about 0.4% of projected 2018 North Carolina annual GDP.

- All 100 counties were grouped into 5 categories of impact – critical, high, moderate, low, and minimal. Criteria for designation include: FEMA designation for individual and public disaster assistance and for transitional shelter assistance, flood-related damages to private property as a share of each county’s aggregate value for assessed real property, mandatory and voluntary evacuations, and school closures.
- Each category had its own set of assumptions regarding decreased economic output over time (see table in Assumptions below).
- The disruption assumptions were applied to the average daily non-farm, non-government employee compensation figures in each county to determine the total direct impact on compensation.
- Compensation losses were scaled to employment, GDP, and total industry output in an economic modeling platform to calculate the direct and secondary impacts on economic output and other economic indicators. Models were run separately for the higher-impact areas (counties in the critical and high impact categories) and lower-impact area (rest of the counties), including the impact of each area’s disruptions on the other area.
- Direct effects include lost production and sales to firms resulting from storm-related disruptions (e.g., business closures, reduced access by employees and customers, etc.) Secondary effects include changes to business-to-business purchases and household purchases that are affected by the disruptions and wage losses. The total business-disruption loss reported is total effect on business output, which is consistent with how business disruption was reported for Superstorm Sandy.
- This approach to estimating disruption does not include non-financial impacts to human wellbeing resulting from the hurricane, including but not limited to physical and emotional trauma and the value of time diverted from normal activities to preparing for, responding to, and recovering from the storm. The billions of dollars in physical damages to infrastructure, lost inventory, and reduced economic output account only for a portion of the total impact to the wellbeing of North Carolinians affected by the storm.

Analysis of each part of the scope leads to a total estimate of \$5.7 billion, which is in line with expectations as seen in Hurricane Floyd (\$1.0 billion in structural damages to non-agricultural businesses and \$4.0 billion in economic loss).

5. Assumptions

- *Business disruption:* Assumptions for disruptions by county impact category are below. These assumptions are based on evacuations, power outages, school and road closures, and share of damaged property. The business-disruption levels reflect estimates of business revenues permanently lost due to the storm.

Many businesses will compensate for reduced production and revenues during and immediately after the storm with higher production and sales (e.g., through overtime) after the initial disruption period has passed.

Business Disruption Assumptions										
Period Start (Incl.)	9/12	9/14	9/17	9/22	9/27	10/2	10/7	10/12		Disruption Factor (Days)
Period End (Excl.)	9/14	9/17	9/22	9/27	10/2	10/7	10/12	10/27		
Days	2	3	5	5	5	5	5	15		
Weekdays	2	1	5	3	3	4	4	11		
County Impact Categories	Share of Business Activity Permanently Disrupted									
Critical	30%	45%	25%	20%	15%	10%	5%	3%	6.03	
High	15%	30%	10%	5%	3%	2%	2%	1%	2.30	
Moderate	5%	10%	5%	2%	1%	0%	0%	0%	0.767	
Low	2%	3%	1%	0%	0%	0%	0%	0%	0.171	
Minimal	0.5%	1%	0.1%	0%	0%	0%	0%	0%	0.038	

Note: For disruption-factor calculations, daily GDP during weekdays assumed to be 1.3x average daily GDP and daily GDP on weekend days assumed to be 0.25x average daily GDP.

- **Construction cost:** The preliminary estimate for property damages conservatively assumes construction costs for flood damage would be 10% higher than the replacement values in the NCEM database. Experience from hurricanes Matthew, Katrina, Harvey, and Superstorm Sandy suggests construction costs were 8-20% higher in the aftermath of the event due to a shortage of available construction services or an increase in the cost of raw material or labor. In addition, Hurricane Florence construction costs are likely to be driven up by the impact of tariffs on the price of lumber, steel, aluminum, and other materials, which would further increase the \$1.1 billion preliminary estimate.
- **Wind damages:** OSBM first assumed that claims filed with DOI as of October 19, 2018 account for 80% of total Florence-related claims to be filed, based on trends in claims seen in other disasters. Additionally, to determine the size of the damage incurred from wind, OSBM assumed that insured losses represent only 80% of total wind-damage losses. This latter assumption uses conservative impact estimates based on the National Oceanic and Atmospheric Administration’s (NOAA’s) methodology for converting insured wind-damage losses to total wind-damage losses.⁸

⁸ Smith, A.B and R.W. Katz. 2013. “US Billion-dollar Weather and Climate Disasters: Data Sources, Trends, Accuracy and Biases. National Oceanic and Atmospheric Administration. <https://www.ncdc.noaa.gov/monitoring-content/billions/docs/smith-and-katz-2013.pdf>

6. Primary Data Sources

- NC Division of Emergency Management for flood-impact modeling
- U.S. Bureau of Economic Analysis for county-level employee compensation
- IMPLAN for estimates of county-level economic indicators, multipliers, and inter-industry linkages
- NC Department of Insurance for reported insured losses

7. Potential Sources of Funding for Unmet Impact

Federal:

- *Small Business Administration (SBA)* – The federal agency provides disaster loans for physical and economic losses to eligible small businesses. Based on SBA loans for Hurricane Matthew and Superstorm Sandy, SBA could cover about a fifth of the damages to business structures and their contents – preliminary estimate of around \$200.0 million. As of October 23, 2018 SBA approved close to \$20.0 million for more than 360 low-interest disaster loans. This includes about \$3.5 million for economic-injury disaster loans for small businesses.
- *Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR)* – HUD funding could be used for small business loans. The preliminary federal funding estimate in the table above does not include any potential funding from CDBG-DR funds. For Hurricane Matthew, the state allocated \$12.5 million of CDBG-DR funds for small business loans and assistance.
- *Economic Development Administration (EDA) Assistance Programs* – This federal agency within the Department of Commerce assists with the economic development aspects of long term disaster recovery, including creating jobs in areas of distress. Based on supplemental funding states have received following prior hurricanes, North Carolina may receive \$300.0 million in assistance from the EDA.

Private:

- *Private business disruption insurance* – Based on the most recent claims data reported to DOI, OSBM anticipates that private insurance should cover at least \$40 million in business disruption losses for businesses experiencing business closures resulting from physical property damage. As of October 19th, DOI had estimates for current business disruption claims of \$32 million (adjusted to account for likely deductibles and waiting periods). Based on historical timing of insurance claims following a disaster, the final amount of claims is likely to be at least 25% higher. DOI notes that due to current reporting limitations, there is likely a non-trivial amount of business disruption insurance that is currently grouped with commercial property insurance totals.

In the 2017 RIMS Business Interruption Survey of primarily large businesses, approximately 56% of businesses had comprehensive business disruption

insurance in the event of a natural catastrophe and 40% had partial coverage. Many businesses are likely to use insurance payments for business-interruption losses to at least partially compensate employees for lost wage and salary income.

Based on a 2007 survey of small businesses conducted by the National Association of Insurance Commissioners, we previously estimated that private insurance would cover up to 40% of direct business disruption losses. More likely, however, the actual amount of recouped losses will be far lower due to a common 72-hour waiting period after the event, limitations on types of losses that are insurable (i.e., disallowing claims based on loss of power or mandatory evacuations), caps on total income loss covered, and a lack of available financial data to prove loss of income.

- *FEMA National Flood Insurance Program (NFIP)* – Based on the most recent claims data reported to DOI and the commercial share of NFIP coverage among flood-affected structures modeled by NCEM, OSBM anticipates that NFIP will pay an estimated \$50 million for non-residential flood damages. DOI data as of October 19th shows that total NFIP claims are approximately \$385 million (adjusted to account for likely deductibles), of which OSBM estimates the non-residential share to be \$38 million. OSBM anticipates that the final amount will be at least 25% higher (\$50 million) based on historical trends. However, actual reimbursement may end up being lower if policyholders are not reimbursed up to the amount of their coverage, as has been the case in past disasters.
- *Private Flood Insurance* – OSBM anticipates that private flood insurance will cover approximately \$23 million in flood damage. As of October 19th, DOI reported total private flood insurance losses (residential and non-residential) equal to nearly \$31 million (adjusted to account for likely deductibles), and OSBM anticipates that this figure will increase by at least 25% to \$38 million. Based on other insurance filings with DOI, OSBM estimates that the non-residential market accounts for roughly 60% of the private flood insurance market in the state. OSBM used the estimated residential vs. non-residential market shares for private flood insurance to disaggregate the projected total private flood insurance claims into non-residential and residential estimates.
- *Private Insurance for Damages Caused by Winds and Other Hazards* – OSBM anticipates that private commercial property insurance will cover approximately \$433 million in damages to real property, automobiles, and other property. DOI's October 19th reports show insured losses of more than \$345 million (adjusted to account for likely deductibles) from wind and other hazards. OSBM anticipates that the final amount will be at least 25% higher based on historical trends. The total estimate for insured property likely includes some insured business disruption losses due to current reporting limitations.
- *Deductibles* – Note that all estimates of total insured losses include OSBM estimates of deductibles paid by policyholders to satisfy claims. Deductibles are not included in unmet need.

8. State Funding Recommendations for Unmet Impact

Rebuilding - \$30 million

Small Business Loans and Grants– \$20.0 million

Provides funds to the Department of Commerce to award to eligible small business lending institutions to expand access to credit for small businesses within Florence-affected areas. Funds may be used to provide loans and forgivable loans to businesses that could not obtain SBA loans or that need supplemental loans in addition to what SBA provides. Funds may also be used to provide emergency bridge loans to businesses to meet short-term needs until federal loans, insurance payouts, and other disaster relief funds are approved. Utilize best practices for disaster assistance loans, including:

- Implement appropriate program guidelines and internal controls to clearly define rules for determining loan amounts and circumstances for forgiving loans.
- Establish a process for considering exceptions to the guidelines and ensure any exceptions are thoroughly documented.
- Develop a uniform reporting template and reporting requirements for all participating entities to capture information on loans applications, approved loans, disbursements, and other metrics.
- Create an online system for applicants to track their application.
- Specify any restrictions or required uses of loan funds that have been repaid.
- Connect businesses with technical assistance providers, including business and financial planning, legal assistance, and other resources to address short-term needs and build stronger businesses for the future.

Assistance for Historically Underutilized Businesses – \$5.0 million

Provides funding to the Carolina Small Business Development Fund to provide low-rate loans and recovery assistance to historically underutilized businesses impacted by Hurricane Florence. Utilize the same best practices listed above.

Commercial Building Disaster Assistance – \$5.0 million

Funds the Department of Commerce to award grants to local governments that focus on repairing, mitigation upgrading, or demolishing non-residential structures damaged by Hurricane Florence.

Boost to Historic Preservation Tax Credit – \$1.0-2.0 million estimated revenue loss

Provides an additional 5% disaster zone bonus tax credit for qualified rehabilitation expenses in federally declared disaster areas for five years, changes the current five-year cycle for non-income-producing properties to a two-year cycle in federally declared disaster areas for five years, and repeals the sunset for the program.

Resiliency - \$20 million

OneNC Fund – \$5.0 million

Raises the cap on the Fund to attract high-impact economic development projects in the affected areas.

NC Main Street and Rural Planning Center – \$10.0 million

Offers economic development planning technical assistance services and grants to local governments of impacted communities. The grants will be used to implement business district revitalization projects.

Marketing North Carolina as a Business Destination and Tourism Advertising – \$5.0 million

Provides funds to be used for marketing the state as business destination and for advertising for tourism-related businesses and for highlighting regional assets in the affected areas.

9. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Small Business Loans – \$5.0 million

Provides funds to Golden LEAF to partner with nonprofits to administer loans to small businesses affected by Hurricane Florence.



Housing

Addresses physical damage to residential structures and cost of housing assistance

1. Summary

The preliminary need for housing assistance and recovery is estimated at \$5.6 billion. The total estimate includes \$5.0 billion in damages to residential structures, personal automobiles, and other personal property. This preliminary estimate will change as additional data from FEMA, NFIP, and insurers becomes available. Of the overall estimated need, OSBM expects \$4.2 billion to be covered by private and federal sources of funding and \$79.0 million has already been allocated by the State, resulting in an unmet housing impact of at least \$1.3 billion.

Preliminary Damage & Need Estimate (Millions)							
Category	Direct	Indirect/ Induced ¹	Total Impact	Expected Funding		Appropriated	Unmet Impact
				Federal ²	Private	State	
Residential	\$4,820.0	\$0.0	\$4,820.0	\$1,083.0	\$2,710.0	-	\$1,027.0
Auto & Other Personal Property	\$175.0	\$0.0	\$175.0	\$0.0	\$136.0	-	\$39.0
Transitional Shelter	\$2.2	\$0.0	\$2.2	\$1.6	\$0.0	-	\$0.6
Housing Assistance	\$236.2	\$0.0	\$236.2	\$236.2	\$0.0	-	\$0.0
Public Assistance	\$54.0	\$0.0	\$54.0	\$40.5	\$0.0	-	\$13.5
Other Needs Assistance	\$51.9	\$0.0	\$51.9	\$38.9	\$0.0	-	\$13.0
Subtotal	\$5,339.3	\$0.0	\$5,339.3	\$1,400.2	\$2,846.0	-	\$1,093.1
Resilience efforts	\$0.0	\$0.0	\$291.0	\$0.0	\$0.0	-	\$291.0
State appropriations	-	-	-	-	-	\$79.0	-
Total	\$5,339.3	\$0.0	\$5,630.3	\$1,400.2	\$2,846.0	\$79.0	\$1,305.1

1. Zero does not indicate that indirect and induced losses do not exist for these categories, only that estimates are not available.

2. FEMA Federal Share Projection (\$317 million) + CDBG-DR (\$1.1 billion) = \$1.4 billion + TBD Future Federal Funding

2. Scope

The scope for preliminary housing estimates includes:

- Residential housing: single-family, multi-family, rental residences, and supportive housing (includes subsidized affordable housing)

- Temporary housing, public assistance (STEP program for emergency repairs), and individual assistance payments

These estimates do not include losses from private, non-residential buildings or government buildings. These items are covered in other sections.

The table below provides additional detail on estimates by level and type of damage. This data also includes nursing homes and temporary lodging, which are reflected in the health and business sections, respectively.

SUMMARY OF NCEM ESTIMATED FLOOD DAMAGES TO RESIDENTIAL PROPERTIES							
DAMAGE		All Flood Hazards		Surge Flooding		Riverine Flooding	
		Estimated Damages (M)	Building Count	Estimated Damages (M)	Building Count	Estimated Damages (M)	Building Count
FLOOD DEPTH	LEVEL						
Substructure	Minor	\$142	37,391	\$52	8,900	\$91	28,491
0 - 2 ft	Minor	\$563	15,474	\$341	8,552	\$222	6,922
2 - 4 ft	Moderate	\$766	10,712	\$550	7,617	\$215	3,095
4 - 6 ft	Major	\$624	6,711	\$467	4,880	\$157	1,831
6+ ft	Destroyed	\$435	4,275	\$321	2,938	\$114	1,337
Total		\$2,530	74,563	\$1,730	32,887	\$799	41,676

Source: NC Division of Emergency Management; estimates include temporary lodging, nursing homes, and institutional dormitories, which are otherwise excluded from housing damage estimates.

3. Methodology

OSBM relied primarily on flood modeling performed by the Division of Emergency Management of the NC Department of Public Safety (NCEM) and reports of insurance claims from the NC Department of Insurance (DOI) to produce estimates of total storm-related structural damages and associated insurance coverage.

NCEM flood models indicate that approximately 74,400 residential structures incurred damage from water, with nearly 21,000 structures having National Flood Insurance Program (NFIP) policies sufficient to cover all damages and another nearly 1,800 structures with partial NFIP coverage. Based on insurer reports to the NC Department of Insurance (DOI) as of October 19, 2018, however, OSBM anticipates only approximately 12,000 residential NFIP claims resulting from Florence. Based on the same DOI insurance claims reports, OSBM estimates that wind and other non-flood insurable hazards damaged approximately 360,000 residential properties sustain and 34,000 personal automobiles.

These preliminary estimates represent \$5.0 billion in total damages, which includes a 10% inflation factor for flood damages to account for anticipated higher construction costs.

The estimates include damages from the coastal storm surge, flooding from rivers, and wind.

- *Storm surge:* To produce the storm surge damage estimates, NCEM used national models to create a GIS layer of the storm surge. In conjunction with the GIS layer, NCEM used data on the elevation of the structures' first floor to determine the depth of the flooding incurred by structures. Then, NCEM translated the flood depth into damage estimates by relying on Army Corps of Engineers' formulas and estimated replacement values for buildings and

contents in NCEM's statewide database of buildings. Replacement values include the value of equipment contained in the buildings. The estimate for the number of buildings affected by the storm surge only includes primary structure.

- *Flooding from rivers:* To produce the riverine estimates, NCEM employed NOAA National Severe Storms Laboratory data to determine the amount of flooding sustained from rivers and create a GIS layer of riverine flooding. To increase precision, the GIS layer combines model calculations of precipitation accumulation with actual river gage and high-water observations. The riverine flooding GIS layer allowed NCEM to estimate the flood depth sustained by structures, and in turn the flood depth informed the loss estimate for structures and their contents (including equipment). The estimate for the number of buildings affected by flooding from rivers only includes primary structures.
- *Total flood damages:* OSBM relied primarily on NCEM model-generated estimates for total structural damages caused by flooding. OSBM then adjusted the amount of damage to properties with flood insurance to account for the lower number and amount of NFIP and private flood insurance claims reported by DOI, assuming that 80% of expected NFIP and private flood insurance claims were filed by October 19, 2018
- *Wind damages:* Wind damages are based on the estimated residential share of insured losses reported to DOI by private insurers as of October 19, 2018, including the Coastal Property Insurance Pool (CPIP) and the Fair Access to Insurance Requirements plan (FAIR plan). Based on the National Oceanic and Atmospheric Administration's (NOAA's) methodology for converting insured wind-damage losses to total wind-damage losses, OSBM assumed that insured losses represent only 80% of total wind-damage losses. One shortcoming of the preliminary insured losses reported to DOI is the possibility of double-counting between CPIP/FAIR losses and other insured losses. If subsequent DOI reports of insured losses indicate significant double-counting in their preliminary reports, total estimated wind damages will be lower than the current estimate.
- *Personal Automobiles & Other Property:* Based on DOI reports, OSBM anticipates approximately 28,000 claims for insured personal automobile damage, resulting in an estimated \$100 million in insured losses. DOI also reports approximately \$36 million in insured losses to unspecified property types, which OSBM assumes is distributed between personal and commercial property in the same ratio as damages to residential and commercial real property. Consistent with NOAA's wind-damages methodology, OSBM assumes that insured losses represent 80% of total losses.
- *Adjustments to Insured Losses:* OSBM adjusted DOI data for insured losses by estimating deductibles not included in insurers' claims reports and by assuming additional claims equal to 25% of insured losses as of October 19,

2018, will be filed at a later date.

- *Other considerations:*
 - Based on 5-year ACS estimates of housing tenure by structure type (e.g., single-family dwellings, duplexes, etc.) for each of the 31 FEMA individual-assistance-eligible counties, OSBM estimates that owner-occupied and rental structures accounted for approximately 70% and 30%, respectively, of damaged residential structures.
 - Outside of the 31 FEMA individual-assistance-eligible counties, OSBM calculations based on NCEM flood modeling indicate that approximately \$56 million in flood damages to residential buildings occurred.
 - The supply of affordable housing in the Florence-affected region of the state was far below the needs of the local population even before the storm hit: the NC Housing Finance Agency estimated an affordable-housing shortfall of more than 200,000 homes. Florence exacerbated this shortfall.
 - Under- and uninsured single-family homes and manufactured homes account for nearly 70% of all residential structures with NCEM-modeled flood damage. Repairing and replacing these homes – most of which would qualify as affordable housing based on estimated replacement values – will cost an estimated \$1.3 billion (excluding estimated insurance coverage for under-insured homes).

4. Assumptions

- *Construction cost:* The preliminary estimate for property damages conservatively assumes construction costs will be 10% higher than the replacement values in the NCEM database. Experience from hurricanes Matthew, Katrina, Harvey, and Superstorm Sandy suggests construction costs were 8-20% higher in the aftermath of the event due to a shortage of available construction services or an increase in the cost of raw material or labor. In addition, Hurricane Florence construction costs are likely to be driven up by the impact of tariffs on the price of lumber, steel, aluminum, and other materials, which would increase further the preliminary estimate.
- *Building estimation:* The estimate for the number of buildings affected by storm surge and riverine flooding only includes primary structures. The estimate for wind damage also includes detached garages, sheds, and the like.

5. Primary Data Sources

- NC Division of Emergency Management for flood-impact modeling
- NC Department of Insurance for reported insured losses
- Census Bureau: American Community Survey 5-Year County Estimates
- FEMA

- HUD

6. Potential Sources of Funding for Unmet Impact

Federal:

- North Carolina expects to receive approximately \$276 million from FEMA for individual assistance, temporary shelter, and other assistance programs, resulting in a state match need of \$13.5 million.
- North Carolina expects to receive approximately \$124 million from FEMA for hazard mitigation, resulting in a state match need of \$41 million.
- Based on FEMA estimates as of October 5, 2018, the state is expected to receive \$554 million in Public Assistance funds from FEMA with a state match of \$185 million for a total of \$739 million. Based on allocations from Hurricane Matthew, we anticipate that approximately \$54 million of those funds will be for housing related items, resulting in a state match need of \$14 million.
- The US Congress has earmarked approximately \$1.2 billion to North Carolina in the form of HUD CDBG funding. We anticipate that a large portion of this (\$1.1 billion) will be utilized for housing program needs.
- The Small Business Administration has approved 4,715 low-interest loans to homeowners and renters, totaling nearly \$188 million as of October 20, 2018.
- Additional funds may also be available from USDA.

Private:

- *FEMA National Flood Insurance Program (NFIP)* – Based on the most recent claims data reported to DOI and the commercial share of NFIP coverage among flood-affected structures modeled by NCEM, OSBM anticipates that NFIP will pay an estimated \$440 million for non-residential flood damages. DOI data as of October 19th shows that total NFIP claims are approximately \$385 million (adjusted to account for likely deductibles), of which OSBM estimates the non-residential share to be nearly \$350 million. OSBM anticipates that the final amount will be at least 25% higher (\$440 million) based on historical trends. However, actual reimbursement may end up being lower if policyholders are not reimbursed up to the amount of their coverage, as has been the case in past disasters.
- *Private Flood Insurance* – OSBM anticipates that private flood insurance will cover approximately \$15 million in flood damage. As of October 19th, DOI reported total private flood insurance losses equal to nearly \$31 million (adjusted to account for likely deductibles), and OSBM anticipates that this figure will increase by at least 25% to \$38 million. Based on other insurance filings with DOI, OSBM estimates that the residential market accounts for

roughly 40% of the private flood insurance market in the state. OSBM used the estimated residential vs. non-residential market shares for private flood insurance to disaggregate the projected total private flood insurance claims into non-residential and residential estimates.

- *Private Insurance for Damages Caused by Winds and Other Hazards* – OSBM anticipates that private residential property insurance will cover approximately \$2.25 billion in damages to real property, \$100 million for personal automobiles, and \$36 million for other personal property. DOI’s October 19th reports show insured property losses of more than \$2.2 billion (adjusted to account for likely deductibles) from wind and other hazards. OSBM anticipates that the final amount will be at least 25% higher based on historical trends. DOI reports separate amounts for residential versus commercial claims for real property and automobiles, and OSBM assumed that coverage for other, unspecified property is distributed the same as for real property. The total estimate for insured property likely includes some insured business disruption losses due to current reporting limitations.
- *Deductibles* – Note that all estimates of total insured losses include OSBM estimates of deductibles paid by policyholders to satisfy claims. Deductibles are not included in unmet need.

7. State Funding Recommendation for Unmet impact

Rebuilding - \$243 million

FEMA State Match for Individual and Public Assistance – \$27.5 million

Funds state match for FEMA individual assistance programs to provide short to medium term housing and temporary emergency repairs to damaged homes. Assistance is also provided for other needs, such as: medical and dental assistance, child care, repair or replacement of clothing and household items, moving and storage, and other critical needs.

Rapid Rehousing Program (Back@Home NC) – \$12.0 million

Assists individuals and families still living in shelters or staying in unsafe or unstable arrangements due to Hurricane Florence quickly transition to safe and sustainable longer-term housing. Services include help finding housing, rent and utility assistance, move-in supplies, and, if needed, help accessing other stability supports like job training and placement and child care.

Transitions to Community Living Initiative (TCLI) Displacement Recovery – \$1.3 million

Provides funding to help to secure new placements and provide additional tenancy support services to TCLI participants who were displaced during Hurricane Florence.

Volunteer Organizations Active During Disasters (VOADs) – \$2.0 million

Provide support to volunteer organizations that provide multiple services to storm survivors.

Homeowner Repair and Rehabilitation Fund – \$176.0 million

Provide funding for programs that help homeowners and renters remain in their communities, for activities that are not eligible for federal reimbursement. Strategies to implement this include the following:

- *Homeowner reimbursements, repairs and rehabilitation funding.* For example, owners can be reimbursed for flood damaged appliances, emergency repairs, urgent and pressing needs or other documented costs that may not be covered by federal funding sources, because the volume of applicant demands exceed federal award amounts for North Carolina.
- *Forgivable loans or grants to SBA housing loan recipients.* For example, if an individual has received an SBA loan but has difficulty affording the payments, this program would provide funds to assist with the payments or loan interest buydown.
- *Extension of Rental/Mortgage Assistance* for displaced individuals who must pay current rental leases or mortgages while their damaged properties are repaired. For example, many funding sources that provide rental and mortgage assistance do so on a time-limited basis. If a qualified individual has received assistance but continues to have unmet needs after exhausting the time limit of the benefit, this program would provide funds to continue providing the much-needed rental or mortgage assistance.
- *Gap assistance payments.* For example, if an individual has qualified for a FEMA hazard mitigation grant to re-locate their house, and the FEMA award is less than an equivalent market priced home that is not in a floodplain, gap assistance payments can supplement these awards to make up the difference

Cash Flow Assistance to Distressed Local Government Agencies - \$24.0 million

Provides cash flow management assistance for small, rural, and distressed agencies. Hazard Mitigation Grant Program (HMGP) awards can greatly exceed small local government operating budgets and cash reserves. For example, the Town of Fair Bluff received an \$8.3 million FEMA grant to rebuild over 100 houses destroyed from Hurricane Matthew. However, the town's annual general fund operating budget is \$900,000. The town does not have the cash capacity to pay construction contractors first and wait for lengthy reimbursements on its FEMA grant without risking town payroll and other budget needs.

To address this fiscal challenge, it is recommended that the Office of State Budget and Management be provided with adequate funding and authority to enter into fiscal agent agreements with these agencies to ensure they have the cash flow and financial capacity to reimburse federal agencies for disaster response and recovery grant awards. The final federal reimbursements from this cash flow assistance program would be re-directed to future FEMA grants or support housing reconstruction, repairs and state mitigation efforts.

Resiliency - \$291 million

FEMA State Match for Hazard Mitigation – \$41.0 million

After a presidential declared disaster, FEMA hazard mitigation grants requests are reviewed and approved often in advance of federal CDBG-DR funding requests. These HMGP approvals support housing acquisitions, elevations and reconstruction activities to minimize and mitigate these homes from future risk of loss of life and property. HMGP federal grants are awarded to impacted Counties and municipalities who must hire contractors, execute repairs, and then seek reimbursements from FEMA for the federal share and the State for the state share.

It is estimated that NC would qualify for a minimum of \$164 million FEMA HMGP approvals, with 75% (or \$123 million) supported by FEMA federal grant funds that require a 25% (or \$41 million) state or local agency match.

State Acquisition and Relocation Fund (SARF) – \$180.0 million

Provides funding to SARF, which is currently authorized by statute and has a primary focus to buyout, acquire, and totally reconstruct homes outside from the 100-year floodplain. The types of things SARF can assist with include the following:

- Home acquisition and buyouts that minimize future flood damage
- Financial assistance in the form of interest buy down grants
- Gap assistance grants for associated loans
- Flood insurance assistance

Residential Construction Infrastructure Grants - \$20.0 million

Recommends funds for the Department of Commerce’s Rural Economic Development Division to provide grants to local and regional agencies for infrastructure required to support new residential structures in areas outside the 100-year floodplain or to repair or replace existing infrastructure. Funds may be used to cover water, sewer, sidewalks, storm drainage, and other similar projects.

Affordable Housing – \$50.0 million

Provides funds to the Housing Finance Agency (HFA) to create housing development incentives for high-quality, resilient, affordable housing options in the affected communities. Funds may also be used to repair damaged HFA properties, emergency, homeless, and domestic violence shelters.

8. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Disaster Housing Recovery Support – \$23.0 million

Allocates funds to the Department of Public Safety, Office of Recovery and Resiliency, for two programs. The Homeowner Repair and Rehabilitation Fund provides for homeowner reimbursements, repairs, and rehabilitation, forgivable loans or grants to help repay federal Small Business Administration loans, rental or mortgage

assistance, and relocation gap funding. The State Acquisition and Relocation Fund facilitates home acquisition and buyouts to move families out of floodplains, interest buy down grants, gap funding assistance, and flood insurance assistance.

Share of State Match - \$44.0 million

North Carolina has allocated \$115 million to the Hurricane Florence Disaster Relief Reserve and Fund for the required State match for various Federal funding programs. Based on the remaining match needs across categories, an estimated \$44.0 million is expected to be dedicated to Housing.

Housing Assistance - \$10.0 million

Allocates funds to the Housing Finance Agency (HFA) to assist with the development of affordable housing and to repair damaged single-family homes and existing properties within the HFA portfolio in impacted counties.

Volunteer Organizations Assisting with Disasters - \$2.0 million

Allocates funds to the Department of Public Safety, Division of Emergency Management, to provide financial assistance to volunteer non-profit organizations that provide shelters, housing repairs, and other emergency and disaster recovery services.



Agriculture

Addresses physical damage and business disruption for agricultural enterprises

1. Summary

The following is documentation of the methodology used to derive a preliminary estimate for agriculture losses due to Hurricane Florence.

The preliminary economic impact is estimated at \$2.4 billion. Of this amount, the direct needs and damages are estimated at \$1.3 billion with indirect/induced damages of \$1.0 billion. Federal, private, and state sources of funding are expected to cover \$248.3 million of these damages, resulting in an unmet agricultural impact of \$2.2 billion. The direct needs and damages estimate is comprised of \$1.1 billion due to crop and livestock losses, \$9.7 million due to cooperatives and growers' associations losses, \$20 million in emergency livestock disposal, \$117.7 million due to agricultural building, equipment, and infrastructure losses, \$13.5 million due to commercial fishing and aquaculture losses, \$49.4 million due to forestry, and \$57.5 million due to stream restoration and stream debris removal needs.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/Induced ¹	Total Impact	Federal	Private	State	Unmet Impact
Crops & Livestock	\$1,064.5	\$967.4	\$2,031.9	\$0.0	\$159.7	-	\$1,872.2
Cooperatives & Growers' Association	\$9.7	\$0.0	\$9.7	\$0.0	\$0.0	-	\$9.7
Emergency Livestock Disposal	\$20.0	\$0.0	\$20.0	\$15.0	\$0.0	-	\$5.0
Agricultural Buildings & Equipment	\$61.8	\$0.0	\$61.8	\$0.0	\$1.7	-	\$60.1
Agricultural Infrastructure	\$55.9	\$0.0	\$55.9	\$0.0	\$0.0	-	\$55.9
Commercial Fishing and Aquaculture	\$13.5	\$19.8	\$33.3	\$0.0	\$0.3	-	\$33.0
Forestry ²	\$49.4	\$35.5	\$84.9	\$0.0	\$0.0	-	\$84.9
Stream Restoration & Stream Debris Removal	\$57.5	\$0.0	\$57.5	\$0.0	\$0.0	-	\$57.5
Subtotal	\$1,332.3	\$1,022.7	\$2,355.0	\$15.0	\$161.7	-	\$2,178.3
Resilience efforts	\$0.0	\$0.0	\$75.0	\$0.0	\$0.0	-	\$75.0
State appropriations	-	-	-	-	-	\$71.6	-
Total	\$1,332.3	\$1,022.7	\$2,430.0	\$15.0	\$161.7	\$71.6	\$2,181.7

1. Zero does not indicate that indirect and induced losses do not exist for these categories, only that estimates are not available.

2. Forestry estimate is for privately-owned timber.

2. Scope

Scope for Agriculture estimates include:

- Crop and livestock losses
- Cooperative and growers' associations losses
- Emergency livestock disposal
- Agricultural buildings, equipment, and infrastructure
- Commercial fishing and aquaculture

- Forestry
- Stream restoration and stream debris removal

Items considered but no or limited estimate available: Commercial fishermen’s equipment and gear damage or potential federal cost-share assistance through the US Department of Agriculture (USDA) outside of its Emergency Conservation Program and Emergency Watershed Protection Program (EWP). Surveys in disaster-affected areas are needed to estimate what losses and costs are eligible for federal assistance through these types of programs.

3. Methodology

Crop and livestock losses:

Preliminary Estimates - Commodity Loss by Crop and Livestock Type (Millions)			
Commodity	Production Losses	Indirect/ Induced	Total Economic Impact
Soybeans	\$202.8	\$202.2	\$404.9
Corn	\$84.4	\$83.4	\$167.8
Cotton	\$135.0	\$124.3	\$259.3
Flue-Cured Tobacco	\$314.1	\$281.1	\$595.2
Hay	\$19.0	\$18.8	\$37.8
Peanuts	\$50.6	\$46.6	\$97.2
Sweet Potatoes	\$180.7	\$147.1	\$327.9
Vegetables	\$26.9	\$21.9	\$48.8
Green Industry	\$30.0	\$21.1	\$51.1
Pork	\$0.7	\$0.6	\$1.2
Poultry	\$20.1	\$20.3	\$40.4
Beef	\$0.2	\$0.1	\$0.3
Total	\$1,064.5	\$967.4	\$2,031.9

Crop loss estimates are based on the percentage of crops still in the field in the 35 most highly impacted counties. Calculations looked at a five-year average for crop production and the price of commodities. The estimates were developed with assessment information from DACS regional agronomists, North Carolina State University agents and specialists, the USDA’s Farm Service Agency, the USDA’s National Agricultural Statistics Service and commodity associations. Livestock mortality rates were derived by DACS Veterinary Division. Industry sources and commodity groups provided base value per head for livestock and swine. Indirect and induced impacts were calculated using 2015 IMPLAN Economic Modelling software. Indirect impacts measure the impact the direct loss has on other businesses, while induced impacts measure the impact the direct loss has on household spending.

Preliminary Estimates - Agriculture Loss by Type (Millions)			
Commodity	Production Losses	Indirect/Induced	Total Economic Impact
Crops & Livestock	\$1,064.5	\$967.4	\$2,031.9
Aquaculture	\$2.2	\$1.9	\$4.1
Forestry ¹	\$69.6	\$50.0	\$119.6
Total	\$1,136.3	\$1,019.3	\$2,155.6

1. Forestry estimate includes state, federal, and privately-owned timber.

Farmer-owned cooperative and growers' associations assessment losses:

The state expects losses to farmer-owned cooperatives and growers' associations. Cooperatives often purchase and store commodities to help stabilize commodity prices. Historically, the quality of commodities purchased and stored by cooperatives declines during storms due to flooding, power outages, and delays getting product to market. Such damages result in decreased revenue for the cooperative.

Growers' associations, which provide promotional and marketing of individual commodities, are typically funded by an assessment per harvested acre. Because flooding preventing harvest, revenue from assessments is expected to decline, leaving the associations unable to provide marketing and maintain demand.

The estimate of \$9.7 million in damages is based on the percentage of Cooperative and Association Assessment losses covered during Hurricane Floyd relative to total Floyd crop losses applied to Hurricane Florence crop losses. During Hurricane Floyd, crop and livestock losses exceeded \$551 million. \$5 million was requested to cover these losses; that percentage, 0.907%, applied to Hurricane Florence crop and livestock losses of \$1.1 billion results in the \$9.7 million estimate. A survey of farmer-owned cooperatives and growers' associations would be needed to provide a more accurate estimate of the damages sustained by the entities.

Emergency livestock disposal

This estimate of \$20 million is based on the contractor's estimate of the cost to provide animal disposal. Disposal requires carbon material for composting, transportation costs to provide the carbon material as well as to dispose of wet litter, carcasses, and other waste at landfills for livestock operations that sustained mortality losses due to the storm.

Agricultural buildings and equipment

The following is documentation of the methodology used to estimate agricultural property loss. These preliminary estimates represent \$61.8 million in total damage to the structures and their contents, including equipment, due to Hurricane Florence. Preliminary estimates are based on historical production and prices as well as experience from previous storm events, leveraging data reported by farm operators and other industry participants.

DEM estimated that a total of 1,300 agricultural structures, including farm buildings and commercial fishing buildings (dealers and processors), incurred water damage; more than 4,100 incurred wind damages.

The estimates include damages from the coastal storm surge, flooding from rivers, and wind.

- *Storm surge:* DEM used national models to create a GIS layer of the storm surge. DEM compared the GIS layer against the elevation of the structures' first floor to determine the depth of flooding. Then, DEM translated the flood depth

into damage estimates by relying on Army Corps of Engineers (USACE) formulas and estimated replacement values in DEM's statewide database of buildings. The estimate for the number of buildings affected by the storm surge only includes primary structures; the replacement values include the building and its contents.

- *River flooding:* In a similar process as storm surge analysis, a GIS layer was constructed for riverine flooding. This layer combines model calculations of precipitation accumulation with actual river gage and high-water observations. The riverine flooding GIS layer allowed DEM to estimate the flood depth sustained by structures, and damages were once again determined from DEM's replacement values.
- *Wind:* DEM used information on Hurricane Florence wind speeds from the National Weather Service. The agency used DEM Risk Management tools to model the wind speed effect on structures and to derive a wind damage estimate. Structures for wind damage include minor buildings as well, such as detached garages and sheds.
- *Insurance levels:* DEM's statewide building database includes data on NFIP insurance coverage for each building. OSBM relied on this data to estimate the share of flood-affected buildings that were un- and under-insured and the aggregate insurance gap between estimated damages and NFIP coverage.

Agricultural infrastructure

Emergency Conservation Program (ECP) – The USDA/Farm Service Agency, through its Emergency Conservation Program (ECP), pays affected farmers 75% of the eligible costs of repairing damaged farm fields, fences, as well as many conservation practices and structures. The ECP provides emergency funding and technical assistance “to farmers and ranchers to rehabilitate farmland damaged by natural disasters and to implement emergency water conservation measures in periods of severe drought.” Funding varies from year to year, but most funding is authorized in supplemental appropriations rather than annual appropriations. Funding is normally available until expended.

This preliminary need estimate of \$46.7 million is based on damages from Hurricane Matthew and then adjusted for the severity of Hurricane Florence. After Hurricane Matthew and in other prior storm events, the federal ECP program paid approximately 75% of eligible costs, the state has paid 18%, and farmers have paid 7%. For Hurricane Matthew, DACS received \$6.6 million to make direct payments to farmers participating in ECP. DACS is still making these payments, since state payments go out after the federal ECP payments are made as to not reduce the amount the farmer will receive from the federal ECP. There may be additional need and/or federal funding for similar types of damages, but an estimate is not available at this time.

- *Non-field farm road repair* – \$1 million is the preliminary estimate of funds needed for non-field farm road repair. It would be for repair or stabilization of existing access roads used for agricultural operations, including roads to existing crop fields, pastures and barns. Farm roads off secondary roads that

have been almost or completely washed away are not eligible for ECP funds.

- *Agricultural pond repair* – \$5 million is the preliminary estimate of funds needed for repair and retrofits of existing agricultural pond systems. Potential benefits include water supply, erosion control, flood control, and sediment and nutrient reductions from farm fields. This estimated need is based on farmer requests for assistance from Hurricane Matthew and then adjusted for the greater severity of damage for Hurricane Florence.
- *Best management practice repair and renovation* – \$2 million is the preliminary estimate for best management practice repair and renovation. There is a need for repair of conservation structures such as waterways, terraces, diversion, and other potential damages. There is additional need for repair and renovation of conservation structures that do not qualify for assistance through USDA's Farm Service Agency.
- *Hay loss* – Hay was washed away, inundated by floodwaters, or fall cutting was unable to be made, making it detrimental to winter feeding. The need estimate of \$3 million was made based on DACS's conversations with the NC Cattleman's Association, the NC Horse Council, the extension service, and regional agronomists.
- *Pasture renovation and emergency waste management* – Pastureland needs to be repaired to accept land application of liquid manure. Lagoons that have excess water need to either apply this waste to their fields or pay for hose drag systems or pump-and-haul to otherwise non-available application fields for lagoon management. DACS estimates these costs at \$3 million based on the number of damaged, inundated, and near-full lagoons.
- *Swine lagoon repair* – Self-reported data from swine lagoon operators indicate that six lagoons have had structural damage, 33 have reported discharges, eight are inundated, and 47 are full or nearly full. These estimates of lagoons with structural damage are likely to increase after DEQ completes physical inspections. Based on DEQ and engineering firm professional judgements about the likely number of lagoons needing repairs and repair costs per day, lagoon and storm water diversion repair costs could range from \$45,000 to \$440,000 depending upon the severity of damage. For the purposes of this estimate we assume the cost will fall in the middle of that range at approximately \$200,000.

Commercial fishing

- *Commercial harvest losses* – At this time, many dealers, harvesters, and processors are unreachable, so the duration and extent of the commercial fishing industry's business disruption and harvest reductions are unknown. A preliminary estimate of the order of magnitude of revenue losses for commercial fishery harvesters was based on fishing landings from the past five

years and the prices paid to fishermen for those landings during the month of September. The 2013-2017 average ex-vessel value of commercial fishery harvests for the month of September is approximately \$10 million. These estimates include only direct production losses to harvesters. Vessel and gear damage and loss of product in storage at dealers are not included. These preliminary estimates are derived from the Department of Environmental Quality, Division of Marine Fisheries (DMF) trip ticket program and dealer surveys. Data needed for more precise estimates of harvest losses will not be available for several months.

- The additional downstream impact that the direct harvest losses has on other businesses, such as dealers and processors, and household spending, is \$17.9 million. Together, the preliminary total economic impact is \$27.9 million. DMF estimated the indirect and induced impacts using the 2016 IMPLAN model, customized to better reflect the North Carolina industry participants.
- Anecdotal reports suggest that some vessels and dealers are now operational, while others are still out of operation. Some fishermen removed their gear days before the storm.
- Anecdotal reports suggest that, in general, business disruption was more severe and long lasting in southern regions compared to northern regions but there is significant impact variation within regions.
- Species respond differently to storm events, complicating estimates of short term revenue loss and recuperation. Some species, like shrimp, may migrate to waters with preferable conditions. Fish behavior may change, and some species may experience mortality, while other species are minimally affected. Over the long term, the impact of hurricanes on nursery habitat, recruitment, and fish stocks is uncertain, but both positive and negative impacts on landings could persist for months or years.
- *Aquaculture product loss* – Preliminary aquaculture losses, estimated at \$2.2 million, are based on the percentage of unharvested product in the most highly affected counties. Calculations looked at a five-year average for production and the price of commodities. The estimates were developed with assessment information from DACS regional agronomists, North Carolina State University agents and specialists, the USDA's Farm Service Agency, the USDA's National Agricultural Statistics Service, and commodity associations. North Carolina Sea Grant reached similar estimates from a preliminary survey of clam and oyster aquaculture participants. Low salinity levels will likely cause mortality and product loss. Damage assessments are ongoing and loss estimates are expected to increase. Preliminary indirect and induced impacts, estimated at \$1.9 million, were calculated using 2015 IMPLAN economic modelling software. Indirect impacts measure the impact the direct loss has on other businesses. Similarly, induced impacts measure the impact the direct loss has on household spending. The preliminary total direct, indirect, and induced economic impact of aquaculture product loss is \$4.1 million.

- *Shellfish aquaculture gear and equipment damage* – To date, North Carolina Sea Grant has surveyed a limited number of clam and oyster aquaculture participants to derive a preliminary estimate of damaged or destroyed gear, docks, raceways, pumps, tanks, building infrastructure, poles, and signs. Sea Grant estimates the damages at \$1.3 million. Damage assessments are ongoing and loss estimates are expected to increase.
- *Equipment and vessel damage to harvesters* - An estimate is not available at this time. A survey of harvesters would be needed to determine these losses.

Forestry

An aerial survey was conducted to estimate damage to timber caused by wind from Hurricane Florence. Approximately 1.25 million acres of timberland were impacted—mostly scattered and light damage with the most damage found in four counties (Carteret, Craven, Jones, and Onslow). The estimated amount of timber damaged includes 1,354,202 tons of pulpwood and 391,164 thousand board feet of sawtimber. At current stumpage values, this amounts to approximately \$69.6 million dollars. Of the \$1.25 million affected acres, approximately 71% is privately owned, 6% is state-owned, and 23% is federally owned. The estimated impact to the NC forestry industry of \$49.4 million includes only privately-owned timber. The estimated \$4.2 million in damage to state-owned timber is accounted for under the state-owned property damage estimate. Federally-owned timber damage is excluded. Indirect and induced impacts were calculated using 2015 IMPLAN Economic Modelling software. Indirect impacts measure the impact the direct loss has on other businesses. Similarly, induced impacts measure the impact the direct loss has on household spending.

Stream restoration and stream debris removal

The complex network of streams, canals and ditches that make up the drainage network in eastern NC are critical to protect the people, property and economy of the region. In many locations this drainage network has been significantly affected by vegetative storm debris, stream bank erosion, and sediment deposition. The preliminary stream debris damage estimate of \$57.5 million is based on DACS's estimates of damage eligible to be covered by the USDA Natural Resources Conservation Service (NRCS)'s Emergency Watershed Protection Program (EWP) from Hurricane Matthew and then adjusted for the greater severity of damage for Hurricane Florence.

EWP does not require a disaster declaration by federal or state officials for program assistance to begin, but ultimately partial funding must be provided by the General Assembly. If authorized, federal EWP assistance could cover 75% of eligible costs. For past storm events, the state traditionally has covered 18% of the total cost while eligible sponsors have paid 7%. Funding for EWP varies from year to year, but most funding is authorized in supplemental appropriations by Congress rather than annual appropriations. Funding is normally available until expended.

There may be additional need and/or federal funding for similar types of damages as is covered by EWP, but an estimate is not available at this time.

4. Assumptions

- After Hurricane Floyd in September 1999, approximately 15% of crop, livestock, and aquaculture losses were covered by insurance. These estimates assume the same percentage of Hurricane Florence losses will be covered.
- DACS assumes that 75% of the cost of the emergency livestock disposal will be covered by federal assistance through FEMA.
- The preliminary estimate for agricultural building and equipment damages conservatively assumes construction costs would be 10% higher than the replacement values in the NCEM database. Experience from hurricanes Matthew, Katrina, Harvey, and Superstorm Sandy suggests construction costs were 8-20% higher in the aftermath of the event due to a shortage of available construction services or an increase in the cost of raw material or labor. In addition, Hurricane Florence construction costs are likely to be driven up by the impact of tariffs on the price of lumber, steel, aluminum, and other materials, which would increase further the preliminary estimate for building and equipment damages.
- Commercial catch losses assume that landings and the value of those landings are similar to 2013-2017 averages for the month of September. The preliminary loss estimate of \$10 million represents the entire value of the landings from that month. The duration and intensity of business disruption and lost landings is unknown at this time; trip ticket data will not be available for several months, and many industry participants are still unreachable.
- Timber damage is assumed to be proportional according to ownership. Total damage is estimated at \$69.6 million. Of the 1.3 million affected acres, approximately 71% is privately owned, 6% is state-owned, and 23% is federally owned.

5. Data Sources

- Department of Agriculture and Consumer Services (DACS)
- Department of Environmental Quality (DEQ)
- Division of Emergency Management (DEM)
- Department of Environmental Quality, Division of Marine Fisheries (DMF)

6. Potential Sources of Funding for Unmet Impact

After Hurricane Floyd in September 1999, federal assistance reimbursed approximately two-thirds of crop and livestock losses. These funds are typically appropriated ad-hoc by Congress through federal disaster-related legislation.

In 2017, the Wildfires and Hurricane Indemnity Program (WHIP) made up to \$2.36 billion available for disaster payments to agricultural producers to offset losses from eligible hurricanes and wildfires. WHIP covered losses caused by a 2017 hurricane for both insured and uninsured producers in counties that received a qualifying Presidential Emergency Disaster Declaration or Secretarial Disaster Declaration. Eligibility for the 2017 Wildfires and Hurricanes Indemnity Program would need to be extended to 2018 disasters for the funding to become available to farmers affected by Florence. If this extension occurs, it is estimated that North Carolina may receive \$500.0 million from this program.

USDA's Block Grants for Agricultural Disasters program can direct funding to states for a specific aspect of agricultural recovery following a natural disaster. After Hurricane Harvey, Florida received a block grant of \$340.0 million for its citrus industry. It is estimated that North Carolina may receive \$450.0 million from this program to assist the agricultural industry's recovery.

FEMA provides funding for emergency livestock disposal and flood damage to structures. The state anticipates 100% FEMA reimbursement for livestock disposal, estimated at \$20.0 million. FEMA's National Flood Insurance Program covers water damage to structures, but most agricultural structures are uninsured for flooding.

USDA offers a variety of programs to address agricultural and natural resource losses including, but not limited to the following:

- Emergency Conservation Program (ECP)
- Emergency Forest Restoration Program (EFRP)
- Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP)
- Emergency Watershed Protection Program (EWP)
- Environmental Quality Incentives Program (EQIP)
- Livestock Indemnity Program (LIP)
- Tree Assistance Program (TAP)
- 2017 Wildfires and Hurricanes Indemnity Program

Funding for the Emergency Conservation Program (ECP) and the Emergency Watershed Protection Program (EWP) varies year to year, but most funding is authorized in supplemental appropriations rather than annual appropriations. Funding is normally available until expended. EWP does not need a declared disaster designation for program assistance to begin; however, partial funding must be provided by the state legislature. If appropriations are made for 2018 disasters, it is estimated that North Carolina may receive \$160.0 million in funding from the Emergency Conservation Program and \$115.0 million from the Emergency Watershed Protection Program.

Funding for the Livestock Indemnity Program (LIP) and the Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP) is permanently authorized and funded. These programs receive "such sums as necessary" via the Commodity Credit Corporation.

Financial assistance has been provided to the fishing industry when it is affected by a commercial fishery failure if certain resource and economic damage thresholds are met. The Governor must request a fishery failure determination from the US Secretary of Commerce. Funds may be distributed to states, dependent upon Congressional appropriations, through the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and the Interjurisdictional Fisheries Act (IFA).

7. State Funding Recommendations for Unmet Impact

Rebuilding - \$235 million

NC Farmer Recovery Reinvestment Program – \$200.0 million

Funds economic incentives program in the Department of Agriculture and Consumer Services for NC farmers to retain the state's number one industry and job developer for the remainder of this year and next. Program grants may include, but are not limited to, assistance with uninsurable/underinsured crops as well as livestock, poultry, and aquaculture losses. Funds may also be used for hay relief, pasture renovation/lagoon management, agricultural pond repair, non-field farm road repair, and best management practice repair/renovation.

State Supplement to Federal Matching Funds – \$20.0 million

Provides state supplemental matching funds to Department of Agriculture and Consumer Services needed to match estimated USDA Farm Service Agency, USDA Natural Resources Conservation Service, or other federal agency cost share payments. Eligible federal programs include, but are not limited to, the Emergency Conservation Program and the Emergency Watershed Protection Program. Additional supplemental matching funds may be necessary once final federal allocations are made.

Commercial Fishing Assistance – \$12.0 million

Provides funding to the Division of Marine Fisheries in the Department of Environmental Quality for grants to commercial fishermen to compensate for equipment losses and income losses from harvest reductions.

Forest Development Fund – \$2.5 million

Assists private woodland owners in establishing timber stands in counties that sustained forest loss from wind or flood damage through additional funding to the Forest Development Fund administered by Department of Agriculture and Consumer Services.

Resiliency - \$75 million

NC Farmer Resiliency Fund – \$75.0 million

Provides grant funds to the Department of Agriculture and Consumer Services to expand the voluntary buyout program for swine operations and the voluntary lagoon conversion program. Buyout program eligibility will be expanded to include operations in the 500-year floodplain. Funds may be used to relocate operations

outside of the floodplain. Grants may be awarded to farmers and third-parties to convert from open lagoons to environmentally superior technologies.

8. Funding Provided in S.L. 2018-134 and S.L. 2018-136

FEMA/US Department of Agriculture Match - \$20.0 million

Allocates funds to the Department of Agriculture and Consumer Services to provide the State match for federal farmer assistance programs.

Commercial Fishing Assistance - \$1.6 million

Allocates funds to the Department of Environmental Quality, Division of Marine Fisheries, to compensate commercial fishermen and shellfish harvesters for equipment and income losses from harvest reductions.

Agricultural Recovery - \$50.0 million

Allocates funds to the Department of Agriculture and Consumer Services to assist farmers with recovery activities such as hay relief, pasture renovation, non-field farm repair, best management practices renovations, reforestation efforts, and to provide federal matches as needed.



Utilities, Water, Sewer

Addresses the physical damage to energy and water infrastructure

1. Summary

The following is documentation of the methodology used to estimate water, sewer, storm water, and utilities costs due to Hurricane Florence.

Preliminary estimates for water and sewer are based on a local government survey issued by the Office of State Budget and Management. Total water and sewer estimated need is \$88 million, \$42 million of which we expect to be covered from federal and private funds, resulting in an unmet need of \$46 million. These estimates will be refined as more detailed assessments are done.

Preliminary estimates for utilities are based on information provided by the North Carolina Electrical Cooperatives Association, Public Works Commission of Fayetteville, Greenville Utilities Commission, and Duke Progress Energy. The Electrical Cooperatives are designated as nonprofits and can receive FEMA reimbursement for storm related damages. The Association has already compiled early damage estimates on behalf of its members working with the Federal FEMA coordinator and Emergency Management. Duke Progress Energy is a for-profit corporation with the expectation that damages will be covered through available reserves, insurance, and potentially rate adjustments. Duke Progress Energy also operates the Piedmont Natural Gas Company which provides gas service to the hardest hit region of North Carolina. Duke Progress has provided the State with preliminary cost estimates for both electrical and gas restoration in North Carolina. Total electrical and gas need is estimated at \$691 million, \$680.0 million of which we expect to be covered by Federal and Private sources of funding, resulting in an unmet electrical and gas utility need of \$11.0 million. The \$11.0 million represents the FEMA state match for the North Carolina Electrical Cooperatives and governmental operated utilities affected by the storm. For water and sewer, estimates are based on survey data gathered from local governments and data obtained from the Department of Environmental Quality.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/Induced	Total Impact	Federal	Private	State	Unmet Impact
Water, Sewer, storm water*	\$88.0	\$0.0	\$88.0	\$39.0	\$3.0	-	\$46.0
Gas, Electric	\$691.0	\$0.0	\$691.0	\$30.0	\$650.0	-	\$11.0
Local Fee Revenue loss*	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-	\$0.0
Subtotal	\$779.0	\$0.0	\$779.0	\$69.0	\$653.0	-	\$57.0
Resiliency efforts	\$0.0	\$0.0	\$25.0	\$0.0	\$0.0	-	\$25.0
State appropriations	-	-	-	-	-	\$15.9	-
Total	\$779.0	\$0.0	\$804.0	\$69.0	\$653.0	\$15.9	\$66.1

1. The state will conduct a local government survey to estimate lost local fee revenue from local municipalities and counties.

2. Scope

Scope for utilities estimates include:

- Public Water, Sewer, Storm water
- Gas, Electric
- Revenue loss (TBD from local survey)

3. Methodology

Water and Sewer: The estimate provided for water and sewer are based on survey data gathered by the Office of State Budget and Management. OSBM obtained a listing of at least 233 water systems located in the 44 counties currently receiving federal assistance. Of the 233 only 46 responded with damage estimates. OSBM calculated an average damage amount per client served using additional data provided by the North Carolina Department of Environmental Quality. This average per client was then applied to the populations served by all 233 water systems to determine an initial damage assessment. As local systems complete their damage assessments for FEMA reimbursement, inspection data will become available for actual damage to water and sewer systems. Once damages have been assessed, estimates provided in this section will be refined.

Electrical and Gas: Information was collected from Emergency Management, the NC Electrical Cooperatives, Public Works Commission of Fayetteville, Greenville Utilities Commission, and Duke Progress Energy. The utilities stated their methodology is based on past storm damage and some early actual estimates for personnel, right-of-way clearance, equipment, powerlines, and pole replacements.

4. Assumptions

The needs estimates from the Department of Environmental Quality are preliminary for water and sewer. These estimates will evolve as detailed inspections occur. The State will cover the FEMA match funds, as with past storms, for the Electrical Cooperatives and some governmentally owned electric, water, and sewer repairs that file reimbursement through the State. Since Duke Progress Energy is a for-profit corporation, the company will not be eligible for direct state or federal assistance through existing programs but may request storm related rate adjustment through the State's Utility Commission.

5. Primary data sources

- Division of Emergency Management (DEM)
- Duke Progress Energy
- North Carolina Electrical Cooperatives Association
- Fayetteville Public Works Commission and Greenville Utilities
- Department of Environmental Quality (DEQ)

6. Potential sources of funding for Unmet Impact

Federal:

- FEMA has provided early estimates of federal utility reimbursement based on past storms and has shared that information with the Division of Emergency Management and the Office of State Budget and Management. FEMA estimates federal assistance for utilities at \$69 million and a state share of \$23 million.

Private:

- \$650 million for Duke Progress Energy made up of reserves, insurance claims where applicable, and possible future rate adjustments will make up the difference.
- The state is estimating \$3 million in insurance claims related to local water and sewer facilities.

7. State Funding Recommendations for Unmet Impact

Rebuilding - \$48 million

FEMA Match – State Share - \$23.0 million

Provides funding for the state share of FEMA funding for public assistance. Public assistance projects could potentially include repair of electrical power grids, water and sewer systems operated by governmental and non-profit utilities.

Golden L.E.A.F. - \$25.0 million

Provides funding for grants to local governments and to 501(c) (3) nonprofit corporations for assistance and relief from Hurricane Florence. The nonprofit would provide infrastructure grants that will help restore water and sewer systems and repair storm drainage systems.

Resiliency - \$25 million

Wastewater and Drinking Water Grants - \$25.0 million

Provides supplemental grant funds to two existing programs for State Wastewater and State Drinking Water. Both programs cover infrastructure needs such as resolving failed systems, rehabilitation and replacement, expanding, consolidation of regional systems. State wastewater grants can also be used for stream, wetland, and stream buffers. State drinking water grants can be used to aid the merger of failing public water systems, resolve documented low pressure in an existing system, the treatment of contaminated water, and support connections between systems or cover a public need.

Clean Water Management Trust Fund (CWMTF): Please see the Natural Resources section funding recommendations under Resiliency for recommendations on activities related to resiliency and storm water.

9. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Share of State Match - \$15.9 million

North Carolina has allocated \$115 million to the Hurricane Florence Disaster Relief Fund for the required State match for various Federal funding programs. Based on the remaining match needs across categories, an estimated \$15.9 million is expected to be dedicated to utilities and water infrastructure.

Golden LEAF Local Government Infrastructure Fund

Allocates \$20 million to Golden LEAF for local government infrastructure and equipment repair and replacement. Infrastructure includes facilities, vehicles, equipment, and utilities (water, sewer, and storm water). This funding is accounted for in the Government section of this document.



Natural Resources

Addresses the restoration of landscapes, dams/dikes/levees, and waste clean-up

1. Summary

The following is the documentation of the methodology used to estimate natural resource damage and needs due to Hurricane Florence.

Preliminary estimates are based on early reports from affected entities and costs associated with similar damages during prior storms. Inspections and damage assessments are ongoing. Total impact is estimated at be at least \$554.4 million. \$119.6 million is expected to be covered by Federal, Private, and State sources of funding, resulting in a potential unmet natural resource need of \$434.8 million.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/Induced ¹	Total Impact	Federal	Private	State	Unmet Impact
Hazardous waste/ Waste management	\$3.0	\$0.0	\$3.0	\$0.0	\$0.0	-	\$3.0
Dredging ²	\$89.8	\$0.0	\$89.8	\$0.0	\$0.0	-	\$89.8
Beach renourishment ²	\$287.9	\$0.0	\$287.9	\$0.0	\$0.0	-	\$287.9
Dams, dikes, & levees	\$29.2	\$0.0	\$29.2	\$0.0	\$29.2	-	\$0.0
FEMA Public Assistance	\$0.0	\$0.0	\$0.0	\$66.5	\$0.0	-	\$0.0
Subtotal	\$409.9	\$0.0	\$409.9	\$66.5	\$29.2	-	\$314.2
Resiliency - Lumberton	\$0.0	\$0.0	\$14.0	\$0.0	\$0.0	-	\$14.0
Resiliency - Other	\$0.0	\$0.0	\$130.5	\$0.0	\$0.0	-	\$130.5
State appropriations ³	-	-	-	-	-	\$23.9	
Total	\$409.9	\$0.0	\$554.4	\$66.5	\$29.2	\$23.9	\$434.8

1. Zero does not indicate that indirect and induced losses do not exist for these categories, only that estimates are not available.

2. Dredging and beach renourishment figures may qualify for federal funds.

3. 11% of this state funding is already allocated to this category; 89% represents a share of federal match money that has not been specified to any specific category

2. Scope

Structures in scope for natural resources estimates include:

- Hazardous waste/ Waste management
- Dredging/ Beach renourishment
- Dams, dikes, and levees

This report does not include comprehensive estimates of damages and needs related to:

- Water quality damage and testing
- Flood abatement and water quality protection measures

These needs will be evaluated in the coming months when/if further data becomes available.

3. Methodology

Hazardous waste/Waste management

- *Underground Storage Tanks (USTs):* Flood waters can cause USTs to shift, float to the ground surface or fill with water. DEQ's Division of Waste Management has not had an opportunity to verify and categorize the 78 reported UST incidents resulting from Hurricane Florence. Average costs of soil and groundwater remediation vary by incident size, scope, and location. DEQ has estimated preliminary damages of \$3.0 million based on average site costs of Hurricane Matthew UST incidents by type applied to the number of Hurricane Florence incidents reported to date.
- *Landfills:* DEQ is aware of three landfills damaged during the storm. Currently, the extent of damages to these landfills – or damages to other landfills – is unknown.
- *Hazardous Waste:* DEQ has contacted all hazardous waste sites and no releases were reported. DEQ is not aware of any damages or needs associated with hazardous waste sites due to Hurricane Florence.

Dredging/ Beach renourishment

- Dredging and beach renourishment damages and needs are \$89.8 million and \$287.9 million respectively. These estimates are based on a DEQ request to local partners in hurricane-impacted counties for dredging and beach nourishment needs due to Hurricane Florence. This survey information has not been verified and represents a preliminary estimate of damages. Some projects may also be on the current Six Year Water Resources Development plan and may already be receiving, or planned to, receive federal, state, and local funds. Engineers will need to survey and assess beach shorelines and channels for damage to understand the impacts of the hurricane – a process

that can take months. In addition, some channels that were due to be dredged were cleared by the hurricane, while others were shoaled in; this may have an off-setting effect on damages and needs.

Dams, dikes, and levees

- Ensuring the structural integrity of dams and dikes is critical to reducing the risk of life and property loss and surface and groundwater contamination that could result from dam breaches and failures. DEQ provided a preliminary estimate of \$29.2 million for damages to 19 dams. Included in this total are dam breaches at Boiling Spring Lakes and Sutton Lake, which represent an estimated \$20 million in damages. This is not a complete estimate of damages incurred, as costs due to dam and dike damages is expected to increase as DEQ continues to receive updated damage reports.
- After hurricane Matthew, the City of Lumberton identified a need for floodgates and channel drainage improvements to their levee to protect residents from repeated flooding risks. The project has not been initiated and the city experienced additional flooding in Hurricane Florence.

Items considered but limited/ incomplete information available: these needs will continue to be evaluated in the coming months when/if further data becomes available.

Water quality damage and testing

At present, estimates of water quality-related damages are unavailable. As DEQ's Recreational Water Quality Program noted in their September 11 news release: "Floodwaters and stormwater runoff can contain pollutants such as waste from septic systems, sewer line breaks, wildlife, petroleum products and other chemicals." These pollutants can affect the water quality of public water supply and private wells, as well as of rivers and the ocean.

- *Public water supply* - DEQ's Dashboard of Hurricane Florence-related incidents, last updated October 2, identified seven systems with use restriction advisories. At that time, use restrictions ranged from limited boil advisories to a complete system closure, affecting approximately 21,270 people. The needs associated with repairing physical damage to water treatment facilities are captured in the Utilities section of this report.
- *Private wells* - Wells are a primary source of drinking water for many residents in impacted counties. DHHS has requested \$60,000 for private well-water testing. However, tests have not yet been completed on private wells to assess contamination and necessary remediation. FEMA is expected to cover 75% of testing costs.
- *River and ocean water quality* - River and ocean quality have been impaired due to Hurricane Florence. Poor water quality in rivers and the ocean can create hazards for recreational and commercial use, result in fish kills and algae blooms, and degrade wetlands and wildlife habitat. Water quality damages associated with recreational and commercial activities are captured in the Business section of this report; damages associated with fish kills and wetland and habitat degradation cannot be quantified at this time.

Substantial fish kills occurred throughout the rivers of the coastal plain due to reduced dissolved oxygen levels resulting from Hurricane Florence. In some areas, fish kills are ongoing. Wildlife Resources Commission staff continue to assess the extent of the low dissolved oxygen conditions and fish kills.

Research conducted by the agency following previous hurricane-induced fish kills shows that river species richness and abundances can recover within about 3 years, but size and age structures (especially for sportfish species) recover in 5-6 years. These fish kills will alter angler practices and impact angling success; however, it is unknown if that will reduce angling effort and license sales during the recovery period. Waterbodies impacted include:

- Black River from Garland to the Cape Fear River
- Cape Fear River from Tar Heel to Southport
- Cashie River from Windsor to the mouth at Albemarle Sound
- Chowan River upstream of Winton
- Contentnea Creek downstream of Hookerton
- Greenfield Lake in Wilmington
- Lake Mattamuskeet outfall canals
- Lumber River from Lumberton into South Carolina
- Neuse River from Goldsboro to Fort Barnwell
- North River
- Northeast Cape Fear River from Kenansville to Wilmington
- Pasquotank River
- Pungo River upstream of Belhaven
- Roanoke River downstream of Highway 45 to the mouth at Albemarle Sound
- South River from Garland to the Black River
- Sutton Lake near Wilmington
- Trent River from Pleasant Hill downstream to the mouth at New Bern
- Waccamaw River from the headwaters into South Carolina
- White Oak River from the headwaters to Stella

Flood abatement and water quality protection measures

- *Stormwater control measures* - Stormwater control measures slow down and filter the flow of polluted runoff from impervious surfaces after storm events. Examples include bioretention cells, infiltration systems, permeable pavement, sand filters, and green roofs. Data on damages to existing stormwater control measures is unavailable at this time. Additional stormwater management planning and installation of stormwater control measures is needed to reduce downstream flooding, protect water quality, and protect receiving streams from physical damage. Several of the local resiliency plans developed post-Hurricane Matthew identify stormwater management as a priority.
- *Conservation measures for water management* - Conservation measures such as restoring and protecting wetlands, streams, and riparian buffers and

protecting natural shorelines provide natural flood protection and reduce erosion. In addition to their storm damage mitigation benefits, healthy wetlands, streams, and shorelines perform important water quality protection and groundwater recharge functions, provide wildlife and fishery habitats, and support both recreational and commercial uses.

An estimate of damage to these natural areas due to Hurricane Florence cannot be determined at this time. The geographic extent of the damages will not be known until on-ground assessments or new LIDAR data are available. Additional protection and restoration efforts would improve the state's resilience in future storm events.

4. Assumptions

- Due to lack of verified damage assessments for most of the natural resource areas, most of these estimates rely on unverified incident counts, incomplete information on the extent of the damages, and average repair or remediation costs from prior hurricane incidents. Specific assumptions not outlined in the methodology descriptions are explained below.
- Dredging and beach renourishment projects are assumed to require a specific request for funding from the Federal government. Historically, the federal government may require a match of up to 25% of project costs from non-federal partners. The non-federal match may be up to up to 35% for beach renourishment projects. Federal projects that are not already designated as a federal project (not currently receiving federal funding) could potentially be eligible for FEMA Public Assistance funds. Federal projects that are designated as a federal project could be funded through supplemental appropriations through the US Army Corp of Engineers.
- There is no federal funding for the reconstruction of privately owned dams.

5. Primary data sources

- Department of Environmental Quality (DEQ)
- Department of Health and Human Services (DHHS)
- Division of Emergency Management (DEM)

6. Potential Source of Funding for Unmet Impact

Federal

- Dredging and Beach Nourishment: Typically, some federal funding for disaster response is made available to cover total project costs for dredging and, potentially, beach nourishment. FEMA Public Assistance funds may also be available for projects, as well as funding from the US Army Corps of Engineers described below. It remains to be seen what this level of funding will be, although it is typically 50% for beach renourishment and 75% for dredging projects.

- The US Department of Commerce can provide assistance for coastal resource restoration (such as habitat improvement and oyster reef repair), research, and data collection when a fishery failure has occurred. The Governor must request a fishery failure determination from the US Secretary of Commerce. Funding is dependent upon the Secretary's determination and Congressional appropriations.
- FEMA Public Assistance funds may be available for natural resource-related needs. OSBM estimates \$66.5 million in federal FEMA funds may be allocated to North Carolina with a state matching requirement of \$22.2 million for a total of \$88.7 million.
- FEMA Hazard Mitigation funds may be available for natural resource-related needs. OSBM estimates \$30.9 million in federal FEMA funds may be allocated to North Carolina with a state matching requirement of \$10.3 million for a total of \$41.2 million. These funds are not currently included in the federal funding estimate, as on-the-ground Hazard Mitigation estimates are yet to be completed.
- DEQ expects FEMA funding, through US EPA Region 4, for conducting assessment and field responses to actual or threatened hazardous material releases and oil discharges in counties impacted by Hurricane Florence. These funds would require a 25% state match.
- The U.S. Army Corps of Engineers (USACE) supports states by assessing, funding, and constructing various types of public engineering projects to mitigate and prevent flood damage. Many of their projects are applicable to the natural resources damage suffered from Hurricane Florence, including:
 - Coastal Storm Damage Reduction and Shore Protection: Beach erosion and dredging projects. North Carolina may receive \$380.0 in USACE funding for projects to restore its coastline.
 - Emergency Stream Bank and Shore Protection: Constructs stream bank protection works to protect highways, bridges, and non-profit public services. Based on damage caused by river and stream flooding during Hurricane Florence, North Carolina may receive \$100.0 in USACE funding for these projects.
 - Flood Risk Management: Funds studies and construction projects to reduce risks from coastal floods and storms. North Carolina may receive \$100.0 in USACE funding for projects to increase coastal resilience to flooding.

Private

- Private funding from dam owners, often utilities, HOAs, or individual land owners, will be required for dam repair.

7. State funding recommendations for Unmet Impact

Rebuilding - \$27 million

Dredging/ Beach Nourishment Needs Assessment – \$5.0 million

Provides funds to survey beaches and channels for hurricane-related damage and to assess disposal areas for dredged material to prepare for any future emergency and supplemental federal funding.

FEMA Match Funds – \$22.2 million

Provides the state match for FEMA public assistance funds for natural resource-related public assistance. Based on FEMA estimates as of October 5, 2018, the state is expected to receive a total of \$739 million in Public Assistance funds. Using FEMA allocations from Hurricane Matthew, \$89 million of those funds will be for natural resources projects. The expected state match need is \$22.2 million. Additionally, the State Lab of Public Health anticipates distributing 2,500 well-water testing kits to local health departments in impacted areas; each test costs \$36 to test. DHHS assumes two-thirds of tests will be returned for a total cost of \$60,000. FEMA is expected to cover 75% of total costs.

Resiliency - \$145 million

Clean Water Management Trust Fund (CWMTF) – \$25.0 million

Provides funds to help finance conservation and restoration projects in Hurricane Florence-impacted counties that specifically address flood abatement and surface water quality protection and improvement.

Oyster Sanctuaries & Marine Debris Clean-up – \$3.0 million

Provides funds to DEQ to support rebuilding and repopulating of oyster reefs and marine debris clean up. According to initial assessments, the oyster population is expected to suffer a substantial die-off due to storm-induced water quality issues and increased salinity. Funds may be used to build new and repair and maintain oyster sanctuaries to help restore damaged fisheries, improve water quality, clean-up marine debris, and protect the coastline.

Dam Repair Cost-Share Fund – \$5.0 million

Provides \$5 million to establish a cost-share program for the repair of dams that pose a substantial threat to the health, safety, and welfare of downstream residents and businesses. Funds may be used when dam owners do not have the immediate resources needed to protect downstream life and property.

Mapping and Modeling – \$87.5 million

Provides funds to DEM for the following studies, mapping projects, and flood mitigation studies for design permitting, and planning specifications. Preliminary estimates of construction of the flood mitigation projects, for all three river basins, would be approximately \$105 million; this estimate will be refined by the studies. Federal funding may be available to offset the cost of these projects.

Request	Description	Total Cost (\$M)
Mapping and Modeling		
Statewide Gage, Inundation Mapping and Risk Assessment	To acquire and install additional water gauges and extend flood inundation modeling and risk assessments for inclusion in the Flood Inundation Mapping and Alert Network (FIMAN) application.	\$8.3
Acquisition and Generation of High Resolution Topography and Built Environment	To generate additional LiDAR data for: real-time structural flood damage calculations, road and bridge inundation and routing, water and power infrastructure damage assessments, extended flood hazard identification, and dam breach monitoring and alert.	\$32.3
Real-Time Road Inundation Modeling, Mapping and Routing	To expand the FIMAN application to include real-time road inundation modeling, mapping and routing. In a flooding event, the state will be able to determine whether a road or bridge was closed, and time efficient routing and re-routing as flood conditions change.	\$6.0
High and Intermediate Dam Inundation, Monitoring and Alert	To install surface elevation gages at all 1,510 high and intermediate hazard dams and enable breach monitoring and alert systems.	\$4.8
Total Mapping & Modeling Costs		\$51.4
Flood Mitigation Design Specifications		
Tar River Basin Flood Mitigation Reservoirs - Feasibility Study and Design Build	To fund feasibility studies and design build planning for three proposed flood loss mitigation reservoirs in the Tar River Basin: Stony Creek Dry Reservoir; Swift Creek Dry Reservoir; and Little Fishing Creek Dry Reservoir.	\$20.7
Neuse River Basin Flood Mitigation Reservoirs - Feasibility Study and Design Build	To fund feasibility studies and design build planning for three proposed flood loss mitigation reservoirs and levee in the Neuse River Basin: Bakers Mill Dry Reservoir; Beulah Town Wet Reservoir; and Seven Springs Levee.	\$15.0
Lumber River Basin-Fair Bluff Levee - Feasibility Study and Design Build	To fund feasibility studies and design build planning for the proposed levee in the Lumber River Basin at Fair Bluff.	\$0.6
Total Flood Mitigation Design Costs		\$36.3
Total		\$87.5

FEMA Hazard Mitigation Matching Funds – \$10.3 million

Provides the state match for FEMA hazard mitigation funds to be used for natural resource-related projects. Based on FEMA estimates as of October 5, 2018, the state is expected to receive a total of \$155 million in Hazard Mitigation funds. Using FEMA allocations from Hurricane Matthew, \$30.9 million of those funds will be available for natural resources projects. The expected state match need is \$10.3 million.

Lumberton VFW Road Underpass – \$14.0 million

Provides initial funding to the City of Lumberton for the VFW Road underpass to support floodgates and channel drainage improvements to protect residents from repeated flooding risks.

8. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Coastal Beach and Dredging Needs Assessment - \$2.0 million

Allocates funds to the Department of Environmental Quality, Division of Water Resources, to conduct a survey of beaches and channels for hurricane related damage and to assess disposal areas for dredged material.

Marine Debris Cleanup - \$400,000

Allocates funds to the Department of Environmental Quality, Division of Marine Fisheries, to support the North Carolina Coastal Federation's marine debris cleanup program.

Share of State Match - \$21.5 million

North Carolina has allocated \$115 million to the Hurricane Florence Disaster Relief Reserve and Fund for the required State match for various Federal funding programs. Based on the remaining match needs across categories, an estimated \$21.5 million is expected to be dedicated to Natural Resources.



Government Property and Revenue

Addresses the damage to government properties, and lost tax/fee revenue

1. Summary

The following is documentation of the methodology used to estimate state and local government property and revenue loss due to Hurricane Florence.

Preliminary estimates for total direct and indirect impact is estimated to be \$406.7 million, \$317.8 million of which we expect to be covered by federal, private and state sources. After \$66.2 million allocation from the state of North Carolina, total unmet impact amounts to \$88.9 million. This unmet impact includes a potential unmet government property and revenue need of \$61.9 million. OSBM currently estimates a State tax revenue loss of \$25.0 million and a local tax revenue loss of \$10.0 million. State agency revenue loss is estimated to be \$26.9 million.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/Induced	Total Impact	Federal	Private	State	Unmet Impact
Local Gov. Buildings*	\$143.5	\$0.0	\$143.5	\$49.5	\$77.5	-	\$16.5
State Gov. Buildings	\$180.4	\$0.0	\$180.4	\$37.5	\$71.3	-	\$71.6
State attractions	\$4.5	\$0.0	\$4.5	\$0.0	\$0.8	-	\$3.7
State Tax Revenue Loss	\$0.0	\$25.0	\$25.0	\$0.0	\$15.0	-	\$10.0
State Fee Revenue Loss	\$0.0	\$17.5	\$17.5	\$0.0	\$0.0	-	\$17.5
State Lottery Revenue Loss	\$0.0	\$9.4	\$9.4	\$0.0	\$0.0	-	\$9.4
Local Tax Revenue Loss	\$0.0	\$10.0	\$10.0	\$0.0	\$0.0	-	\$10.0
Local Fee Revenue Loss ¹	-	-	-	-	-	-	-
Subtotal	\$328.4	\$61.9	\$390.3	\$87.0	\$164.6	-	\$138.7
Timber	\$4.2	\$7.2	\$11.4	\$0.0	\$0.0	-	\$11.4
Resiliency efforts	\$0.0	\$0.0	\$5.0	\$0.0	\$0.0	-	\$5.0
State appropriations	-	-	-	-	-	\$66.2	-
Total	\$332.6	\$69.1	\$406.7	\$87.0	\$164.6	\$66.2	\$88.9

1. See Methodology Section

2. Scope

Structures in scope for the preliminary State and local government property estimates include:

- Local government facilities: excluding public utilities, Community Colleges, and public K-12 educational facilities.
- State government buildings for State Agencies and the University of North Carolina
- State attractions for the Department of Natural and Cultural Resources
- State tax revenue loss: \$ 25 million (one year)
- State fee revenue loss: \$ 17.5 million (one year)
- State Lottery lost sales: \$9.4 million (one year)
- Local tax revenue loss: \$ 10 million tax per year (fees unknown)
- Timber losses on State property (Department of Agriculture and Consumer Services)

Incomplete Agency Responses: All Agencies and Universities are continuing to evaluate properties for damages and for the extent of the damage.

3. Methodology

Local Government Buildings - NC Emergency Management flood mapping data was used to estimate the damage to local government property. Local Education Agencies (schools), public universities, and State agencies that reported damage are excluded from the data. The modeling methodology is presented below:

- To produce the storm surge damage estimates, NCEM used national models to create a GIS layer of the storm surge. In conjunction with the GIS layer, NCEM used data on the elevation of the structures' first floor to determine the depth of the flooding incurred by structures. Then, NCEM translated the flood depth into damage estimates by relying on Army Corps of Engineers' formulas and estimated replacement values for buildings and contents in NCEM's statewide database of buildings. Replacement values include the value of equipment contained in the buildings. The estimate for the number of buildings affected by the storm surge only includes primary structures.
- To produce the riverine estimates, NCEM employed NOAA National Severe Storms Laboratory data to determine the amount of flooding sustained from rivers and create a GIS layer of riverine flooding. To increase precision, the GIS layer combines model calculations of precipitation accumulation with actual river gage and high-water observations. The riverine flooding GIS layer allowed NCEM to estimate the flood depth sustained by structures, and in turn the flood depth informed the loss estimate for structures and their

contents (including equipment). The estimate for the number of buildings affected by flooding from rivers only includes primary structures.

Construction cost - The preliminary estimate for property damages conservatively assumes construction costs would be 10% higher than the replacement values in the NCEM database. Experience from hurricanes Matthew, Katrina, Harvey, and Superstorm Sandy suggests construction costs were 8-20% higher in the aftermath of the event due to a shortage of available construction services or an increase in the cost of raw material or labor. In addition, Hurricane Florence construction costs are likely to be driven up by the impact of tariffs on the price of lumber, steel, aluminum, and other materials, which would increase further the preliminary cost estimate.

Local Government Survey: OSBM surveyed local governments as to building damage and revenue loss as a result of Hurricane Florence. Considering the response rate was 20.7%, and responses had significant variance, we do not believe that survey data provides more accurate data than the modeled data. Respondents to the OSBM survey identified \$16.9 million in damage to local parks and recreation facilities – a separate survey by the Department of Natural and Cultural Resources found respondents reporting \$11.3 million in damages.

State Government Buildings - OSBM surveyed all state government and University of North Carolina agencies and campuses for expected damage and cost to repair. This analysis revealed that state facilities may be significantly under insured for building and content value and may not be insured for related damage. The Department of Insurance provided an analysis of expected coverage for all state agencies and universities based on insured building value, coverage, and estimated damage. State agencies, universities, and the Department of Insurance are continuing to evaluate facilities for damages, cost to repair, and potential insurance coverage.

State and Local Revenue Losses - State tax revenue losses are based on an estimated reduction in personal and business income resulting from storm-related disruptions. (See Business & Nonprofit section for detailed methodology on business disruptions.) Local tax revenue losses are based on the estimated loss in private real estate and tangible property from flooding and the effective property tax rates in storm-affected counties.

State Fee Losses - The lost state fee revenues were compiled from a survey of state agencies and universities.

State Lottery Revenue Loss - The NC Education Lottery analyzed lost sales from daily games during a 14-day hurricane period and then applied the percentage decline to recent sales activity.

Timber Losses - Timber losses were modeled by the Department of Agriculture and Consumer Services and OSBM.

Federal Government Property – OSBM contacted the Governmental Services Agency and the National Guard for information regarding damage to federal property. The departments preferred to respond to damage requests through separate appropriations requests to the U.S. Congress – if any were required.

Timber losses, modeled by the Department of Agriculture and Consumer Services, may be \$16.0 million on federal property.

4. Assumptions:

- Local government property is insured at the same level as State government property (approximately 54% of replacement value).
- Government property presented in the table is all identified “government” property by the NC Emergency Management data. Education facilities and utilities were excluded. The damages reported by State agencies were also excluded. It is possible that federal property is reported within this section. Federal military property was excluded.
- State tax revenue impacts assume that individual and corporate income losses account for nearly all lost General Fund revenues. Private insurance payments to businesses with adequate business-interruption losses will compensate for an estimated one-third to one-half of income losses. Based on analysis of sales tax data before, during, and after Hurricane Matthew, sales tax revenues are expected to rebound quickly after an initial decline.
- Local property tax revenue impacts assume that private property owners whose property suffered major damage or was destroyed will be unable to pay their FY 2018-19 property taxes. The impact range assumes that some property owners with minor-to-moderate property damage will pay less in property taxes relative to the pre-Florence value of their properties. Rebuilding efforts in storm-affected counties should largely restore the local tax base within 3-4 years. Local sales tax revenues will rebound quickly after an initial period of losses.
- Timber losses were modeled from the Department of Agriculture and Consumer Services and IMPLAN (OSBM)

5. Primary data sources

- All State Agencies and Universities
- Division of Emergency Management (property damage)
- NCDOR (tax data)
- BEA and IMPLAN (local economic data and multipliers)

6. Potential Sources of Funding for Unmet Impact

The primary source of funding for event specific losses is expected to be private insurance held by governments and private businesses. A potential \$209.9 million may be available for state and local property damages from private insurance, based on preliminary estimates. An additional \$15.0 million may be available in the form of tax revenue from business interruption insurance for business related entities. It is assumed that the federal government will also provide a significant amount of funding in the form of Federal Emergency Management Agency – Public Assistance.

This funding is assumed be the next largest portion of funds for local government property damage. The Department of Defense may also provide funding for damaged National Guard facilities should FEMA-Public Assistance funding not be available. In addition, it is estimated the Department of the Interior's Historic Preservation Fund Grant Program may provide \$20.0 million to support repair and restoration of historic preservation sites damaged by the Florence. The final source of funds is a direct state appropriation for unmet needs.

7. State funding Recommendation for Unmet Impact

Rebuilding - \$82 million

FEMA Match – State Share - \$22.0 million

Provides funding for the state share of FEMA funding for public assistance. Public assistance projects could potentially include funds to University of North Carolina Campuses, State government agencies, and local government facilities impacted by the hurricane.

Emergency Repairs and Renovations Reserve - \$25.0 million

Provides funding to be distributed as needed to hurricane impacted facilities for items not covered by insurance or FEMA Public Assistance.

Golden L.E.A.F. Local Government Infrastructure Fund - \$25.0 million

Provides grant funding to local governments to repair and rebuild governmental facilities, such as emergency management services facilities, administrative facilities, courts, and libraries.

Parks and Recreation Trust Fund - \$10.0 million

Provides grants to hurricane impacted local governments to repair and rebuild local park facilities.

Resiliency - \$5 million

All Risk Coverage and Flood Coverage - \$5.0 million

Requires all State Agencies and Universities to carry all risk coverage and require flood coverage for those that are in the flood plain or have experienced a flood. The Department of Insurance shall allocate premium funding by highest risk, in the event that recommended funding is insufficient

State Risk Management – \$TBD

Requires the Department of Insurance, in conjunction with state agencies and the University of North Carolina system to undertake a risk analysis and building value analysis to look at under coverage for risk type and dollar value. For example, a

replacement for Dobo Hall at UNC-Wilmington is estimated at \$59 million; the insured value was only \$32 million.

8. Funding provided in S.L. 2018-134 and S.L. 2018-136:

Capital Recovery Funds – University of North Carolina - \$30.0 Million

Appropriates funds to the University of North Carolina Board of Governors to distribute to the University of North Carolina – Pembroke, University of North Carolina Wilmington, and Fayetteville State University for repair and renovation of damaged facilities.

Golden LEAF Local Government Infrastructure Fund - \$20.0 Million

Appropriates funds to Golden LEAF for local government infrastructure and equipment repair and replacement. Infrastructure includes facilities, vehicles, equipment, and utilities (water, sewer, and storm water).

Share of State Match - \$15.3 million

North Carolina has allocated \$115 million to the Hurricane Florence Disaster Relief Reserve and Fund for the required State match for various Federal funding programs. Based on the remaining match needs across categories, an estimated \$15.3 million is expected to be dedicated to Government property and revenue.

Volunteer Fire Department Assistance – Department of Insurance - \$0.9 million

Appropriates funds to the Department of Insurance for volunteer fire department losses not covered by insurance or federal assistance programs.



Transportation

Addresses the physical damage and state revenue implications of the transportation infrastructure

1. Summary

The following is documentation of the methodology used to estimate transportation needs due to Hurricane Florence.

Preliminary estimates are based on a combination of windshield (initial) estimates, detailed site inspections, and historical data from prior similar events. The preliminary total impact is estimated at \$476.1 million with an unmet impact of \$120 million after expected federal and private funding is account for.

The total Department of Transportation highway and bridge system need is estimated at \$260 million, \$195 million of which we expect to be covered by Federal sources of funding, resulting in an unmet highway and bridge system need of \$65 million. The Department will assess the status of their funds and realign them to cover the unmet needs of this event. Public transportation needs are estimated at \$1.7M, all of which is estimated to be covered by FEMA and FTA.⁹ Rail system damage of \$1.1 million is reimbursed at a 50% rate by users, resulting in an unmet rail need of \$550,000. Damages related to Ports is estimated to be \$54 million, \$8.3 million is covered by private insurance. Nine Aviation systems are reporting damages with four of them reporting direct damage estimates of \$4 million and \$260,000 of indirect damages. The remaining five systems' damages are to be determined. Aviation facilities are submitted by other government entities directly to their reimbursement sources resulting in no direct effects to DOT. Damages for non-system (local) roads have also been estimated to be \$54.6million, \$40.9 million of which we expect to be covered by Federal sources of funding, resulting in an unmet local transportation need of \$13.7 million. Damages for private roads have been estimated to be \$43.6 million. The state has appropriated \$65.0 million towards transportation, resulting in \$160.6 million of unmet impact.

⁹ During and post event, transit system needs are fully reimbursed by FEMA and FTA funds. Pre-event evacuation costs for transit systems are currently unknown; however, these are eligible for 75% reimbursement from FEMA, and the remaining unmet need must be covered by counties.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/ Induced	Total Impact	Federal	Private	State	Unmet Impact
State bridges & roads	\$260.0	\$0.0	\$260.0	\$195.0	\$0.0	-	\$65.0
Public transportation	\$1.7	\$0.0	\$1.7	\$1.7	\$0.0	-	\$0.0
Rail & rolling stock	\$1.1	\$0.0	\$1.1	\$0.0	\$0.6	-	\$0.5
Ports	\$54.0	\$0.0	\$54.0	\$0.0	\$8.3	-	\$45.7
Aviation	\$4.0	\$0.3	\$4.3	\$0.0	\$4.0	-	\$0.3
State revenue impact	\$0.0	\$6.8	\$6.8	\$0.0	\$0.0	-	\$6.8
State Subtotal	\$320.8	\$7.1	\$327.9	\$196.7	\$12.9	-	\$118.3
Non-system (local) roads	\$54.6	\$0.0	\$54.6	\$40.9	\$0.0	-	\$13.7
Private Roads	\$43.6	\$0.0	\$43.6	\$0.0	\$0.0	-	\$43.6
Subtotal	\$419.0	\$7.1	\$426.1	\$237.6	\$12.9	-	\$175.6
Resiliency efforts	\$0.0	\$0.0	\$50.0	\$0.0	\$0.0	-	\$50.0
State appropriations	-	-	-	-	-	\$65.0	-
Total	\$419.0	\$7.1	\$476.1	\$237.6	\$12.9	\$65.0	\$160.6

2. Scope

Structures in scope for transportation estimates include:

- Bridges, tunnels, and roads, including sidewalks
- Public transit, including bus systems
- Rail and rolling stock
- Ports and airports
- Non-system (local) roads
- Private roads

3. Methodology

Estimates were developed by the NC Department of Transportation based on initial assessments of damage, including information obtained from contractors deployed for emergency response and repair. Cost estimates are based on estimated quantities, historic unit costs, and engineering judgments. Non-system (local) road (source data from the 2017 Powell Bill) and Private road (source data from the NCDOT 2016 legislative report) costs were extrapolated using state system proportions of estimated road damages and cost estimates in affected counties. Surveys were conducted of local governments to assess their transportation needs and those results support the methodology used in these estimates.

Item	Location	Cost
Major NC state highways	Statewide	\$260,000,000
DMV	Declared Emergency Counties	\$72,776
Public transportation	Declared Emergency Counties	\$1,700,000
Rails	Declared Emergency Counties	\$1,100,000
Non-system (local) roads	Declared Emergency Counties	\$56,948,026
Private roads	Declared Emergency Counties	\$43,646,230
Aviation (direct costs only)	Declared Emergency Counties	\$3,990,000
Ports	Wilmington/Morehead City	\$54,000,000

4. Assumptions

- Non-system (local) and private road estimates were calculated based on prorated DOT-reported damages by county.

5. Primary Data Sources

- DOT
- Moody’s Credit Outlook (October 2018)
- 2017 Powell Bill
- NCDOT Legislative Report: Non-System Road Survey, June 30, 2016

6. Potential Sources of Funding for Unmet Impact

The Department of Transportation estimates reimbursements from FHWA/FEMA for the highway system and public transportation totaling \$196.4 million. Public transportation has also received a grant of \$340,000 from the Federal Transit Authority (FTA). In addition, North Carolina may receive \$200.0 million in funding from USDOT's Infrastructure for Rebuilding America program (INFRA), which provides discretionary funding for projects that address critical issues with highways and bridges.

Airports, ports, and public transportation use a combination of federal grants and private insurance to return their systems to pre-Florence conditions. Ports will receive an estimated reimbursement primarily from private insurance of \$8.3 million. Aviation will be covered by private insurance in the amount of \$4.0 million. The rail system is required by state law to receive 50% of their damage estimate as reimbursement from the Short Line Railroad. Their current reimbursement estimate is \$550,000.

7. State Funding Recommendation for Unmet Impact

Rebuilding - \$79 million

State Match for Federal Funds - \$65.0 million (Highway Fund)

Utilizes the existing cash balance of the Highway Fund to provide the required state match of \$65 million. This match will draw down \$195 million in federal funding.

Match for Local Government Assistance – \$14.0 million (General Fund)

Provides grants to local governments for repair of non-system (local) road damage and other similar projects.

Resiliency - \$50 million

Building Smarter and Stronger Resilient Roads - \$50.0 million (General Fund)

Provides funds to help leverage federal grants for designing roads, bridges, pipes, and other transportation structures to better mitigate the effects of extreme weather events. This mitigation should minimize transportation system and local property damages in future events. Initial potential projects include upgrades of eastern sections of I-40, southern sections of I-95, US 70 (future I-42), and US 421.

8. State Funding Provided in S.L. 2018-134 and S.L. 2018-136

State Match for Federal Transportation Assistance - \$65.0 million

Allocates funds to the Department of Transportation for the required 25% state match for FEMA/FHWA funds to conduct repairs and debris removal for the transportation infrastructure.



Education

Addresses the repair cost and revenue implications of damage to educational facilities (excludes UNC system)

1. Summary

The following is documentation of the methodology used to estimate education impacts due to Hurricane Florence.

Over 1,000 public k-12 schools, 36 community colleges, and five UNC institutions are located within the 44 FEMA-designated disaster counties in North Carolina affected by Hurricane Florence.¹⁰ Based on preliminary reporting, substantial damage was sustained to structures across these educational sectors, leading to delays at many institutions in resuming operations. Seven school districts were closed for 20 school days or more, and, excluding charter schools, 60 public schools across three school districts remain closed as of October 22, 2018. The preliminary economic impact across the education sector is estimated at \$302.7 million. This estimate will change as additional survey data on infrastructure becomes available later this fall. Of the overall estimated impact, we expect \$265.4 million to be covered by Federal, Private, and State sources of funding, resulting in an unmet education impact of \$37.3 million.

Preliminary Damage & Need Estimate (Millions)							
Category	Direct	Indirect/ Induced	Total Impact	Expected Funding		Appropriated	Unmet Impact
				Federal	Private	State	
Public K-12 Schools – Operational	\$2.0	\$14.2	\$16.2	\$0.0	\$2.0	-	\$14.2
Public K-12 Schools – Capital	\$267.0	\$0.0	\$267.0	\$26.3	\$144.2	-	\$96.5
Community Colleges - Operational	\$0.5	\$8.7	\$9.2	\$1.1	\$0.3	-	\$7.8
Community Colleges – Capital	\$4.9	\$0.0	\$4.9	\$0.0	\$2.7	-	\$2.2
UNC System	\$0.3	\$5.1	\$5.4	\$0.8	\$0.0	-	\$4.6
Subtotal	\$274.7	\$28.0	\$302.7	\$28.2	\$149.2	-	\$125.3
Resiliency efforts	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-	\$0.0

¹⁰ Forty-four counties are eligible to apply for FEMA’s Public Assistance program.

State appropriations	-	-	-	-	-	\$88.0	-
Total	\$274.7	\$28.0	\$302.7	\$28.2	\$149.2	\$88.0	\$37.3

*S.L. 2018-135, the School Calendar & Pay/Hurricane Florence signed into law on October 3, 2018, provided \$6.5 million to offset the loss of revenue to pay school nutrition employees.

2. Scope

Structures in scope for education estimates include:

- Public universities (damage to university facilities is not included here; it is included with state buildings data in the Infrastructure section)
- Public K-12 schools and Charter schools
- Community colleges, including lost revenue and facilities (locally-owned)
- Private schools and universities

For reference, the number of educational institutions by sector operating in the 44 affected counties is included in the following table. Numbers of potentially affected students for UNC and independent colleges and universities includes students from the FEMA-designated counties who may be enrolled at institutions across the state.

Type of School	Number of Institutions in FEMA Counties	Number of Students from FEMA Counties
K-12 Schools (46 Local Education Agencies)	1001	577,516
Charter Schools	51	25,590
Community Colleges	36	155,970
UNC Institutions	5	54,441
Independent Colleges & Universities	5	9,433

3. Methodology

K-12 Public Schools

- *Damage to Facilities and Equipment* – Damage to public school facilities and equipment was estimated by generating an average cost per impacted school using preliminary damage assessments reported by 13 Local Education Agencies (LEAs) in FEMA-designated counties. This average cost per school was then multiplied by the number of schools in the most affected FEMA-designated counties that had yet to report damages. Based on this modeling, our preliminary estimate of damages to public school facilities and equipment is \$267 million. These estimates are subject to revision as damage assessments and insurance filings proceed. The Department of Public Instruction (DPI) is

currently conducting a statewide survey of all LEAs and Charter schools regarding damage to facilities and equipment and storm clean-up costs. This survey, combined with claims data received by the North Carolina Public School Insurance Fund, will be used to produce more complete estimates of facility damage in coming weeks. Insurance and FEMA's Public Assistance Program will cover many of the costs, but the state and local share of funding will be significant.

- The NC Public School Insurance Fund insures 85 LEAs, including 42 of the 52 LEAs located in FEMA-Public Assistance-eligible-designated counties. Only 17 LEAs have submitted claims to the Public School Insurance Fund to date, totaling \$35.7 million.
- Thirteen LEAs have reported damage estimates of \$177 million, including damages of \$125.0 million in Onslow County alone. Of that amount, Onslow estimates they need \$51.0 million to re-open the school system.
- *School Nutrition Programs* – Impacted schools suffered losses of food and equipment used to provide meals under the School Nutrition programs. Eight LEAs reported initial assessments of losses in excess of \$2.0 million as of October 5. This figure is expected to rise as program officials assess the damage.
- *The North Carolina Education Lottery (NCEL)* - NCEL compared lost sales from daily games during a 14-day window surrounding Hurricane Florence with the average activity from comparable 14-day windows from the previous two months to assess the initial impact of the storm. NCEL estimates a net loss in revenue to education of \$2.1 million resulting from the storm; however, there are sufficient funds in the Lottery Reserve to offset this revenue loss for FY 2018-19. Total estimated loss of lottery revenue of \$9.0 million is included in the Government section, so it is not included in the education section.
- *Estimated Lost Revenue* - Lost revenue from school meals not served and reimbursed by the federal government under the school nutrition programs is estimated at \$14.2 million as of October 5, 2018. The Department of Public Instruction likely experienced additional lost revenue and this number will rise as data becomes available.

Community College System

- *Estimated Lost Tuition Revenue* - The NC Community College System Office developed an estimate of potential lost tuition revenue based on the severity of hurricane damage in disaster-declared counties. The System used the length of college closures post-storm as a proxy for impact, dividing affected colleges into 3 categories based on when courses resumed. Colleges with the longest closures were weighted more heavily in a formula that utilized an estimated effect on enrollment multiplied by an estimated amount of lost tuition revenue per full-time equivalent student. This formula resulted in an estimated loss of

\$8.7 million in tuition receipts.

- *Damage to Facilities and Equipment* - The NC Community College System Office surveyed campuses regarding damage to facilities and equipment and storm clean-up costs. As of October 10, 2018, all colleges that sustained damage had provided estimates of costs for repair and replacement of damaged facilities and equipment. Preliminary damage estimates total \$5.4 million (\$4.9 million to facilities and \$0.5 million to equipment), with 21 of 58 colleges across the state reporting damage. Seven colleges in disaster-declared counties account for approximately 80% of the estimated monetary loss. These estimates are subject to revision as damage assessments and insurance filings proceed.

UNC System

- *Estimated Lost Revenue* - OSBM surveyed UNC constituent institutions regarding lost fee revenue due to storm-related disruption. Six institutions, including three of the five located in disaster-declared counties, reported an estimated loss of \$5.1 million in various revenues. Of that, \$3.3 million was at UNC-Wilmington. The estimated lost revenues primarily consisted of fees deposited in institutional trust funds, including health care, housing, dining, and receipts related to canceled events.
- *Estimated Storm Prep Costs* - 11 universities reported storm preparation costs of approximately \$0.3 million.
- *Damage to Facilities and Storm Clean-Up* - Damage to UNC facilities and storm clean-up costs are reported separately in the state buildings and infrastructure data.

NC Independent Colleges and Universities

- *Estimated Lost Revenue* - No estimate of potential lost revenue has been obtained from private colleges. The NC Independent Colleges and Universities association has made a general request for financial aid assistance for students hailing from disaster-declared counties to both aid their continued enrollment and mitigate operational losses at private institutions.
- *Damage to Facilities and Storm Clean-Up* - No data has been collected regarding damage to private college facilities. Known damage was sustained to at least three institutions, but no damage estimates could be obtained.

4. Assumptions

- School property is insured at the same level as State government property (approximately 54% of replacement value).

5. Primary data sources

- Division of Emergency Management
- Department of Public Instruction
- North Carolina Education Lottery
- NC Community College System Office
- UNC System Office
- Individual UNC and Community College system institutions
- State Education Assistance Authority
- NC Independent Colleges and Universities association
- Southeast Education Alliance

6. Potential Sources of Funding for Unmet Impact

Federal:

- *Federal Emergency Management Agency* – Based on FEMA estimates as of October 5, 2018, the state is expected to receive \$554.0 million in Public Assistance funds from FEMA with a state match of \$185.0 million for a total of \$739.0 million. Based on allocations from Hurricane Matthew, we anticipate that \$35.1 million of those funds will be for education projects, resulting in a state match need of \$8.8 million to match the \$26.3 million of federal funds.
- *Department of Education* – in 2018 US Congress appropriated \$2.5 billion to the US Department of Education for the Immediate Aid to Restart School Operations (RESTART) and Emergency Impact Aid for Displaced Students programs in response to Hurricanes Harvey, Irma, and Maria and 2017 California wildfires. Texas received a total of \$263.0 million from these programs to assist with Hurricane Harvey recovery. If supplemental appropriations are made in response to 2018 disasters, it is estimated that North Carolina may receive \$60.0 million from the Temporary Emergency Aid for Displaced Students program and \$40.0 million from the RESTART program.
- *Department of Education – Federal Supplemental Education Opportunity Grants (FSEOG)*. Approximately \$2.0 million of unused FSEOG funds have been reallocated to date to NC public and private post-secondary education institutions in disaster-declared counties to assist students with financial need. To date, \$1.1M have been allocated to community colleges and \$0.8M to universities.
- *Federal Communications Commission (FCC) – Emergency E-rate*. The FCC provided funding following Hurricane Harvey to assist schools in Directly and Indirectly Impacted areas restore services and replace damaged equipment and to help schools which incurred additional costs due to serving displaced students. This federal funding option needs to be pursued further.

Private:

- *FEMA National Flood Insurance Program* – Water damages would be covered based on the structures that have coverage through NFIP; estimates are still pending.
- *Private insurance* – A potential \$144.2 million may be available for property damages to K-12 schools from private insurance, based on preliminary modeling. However, estimates are still pending that will show the total amount

across educational sectors that could potentially be covered by private insurance companies for covered damages.

Other:

- *Local Governments* – Additional funds may be provided by counties and municipalities; however, estimates are still pending. Capital facilities for K-12 public schools and community colleges are largely owned and maintained by local governments.

7. State Funding Recommendations for Unmet Impact

Rebuilding - \$74 million

State Match for FEMA Public Assistance Funds - \$9.0 million

Provides funding for the state share of FEMA funding for public assistance. Allocations are estimated based on proportions from Hurricane Matthew. Public assistance projects for educational operations and facilities could potentially include emergency protective measures and debris removal, infrastructure and equipment repair and replacement, cost-effective hazard mitigation to protect the facilities from future damage, and temporary facilities.

Flexible Emergency Funding for Public School Capital –\$25.0 million

Allocates \$25.0 million from the Education Lottery Fund to provide emergency funding for schools to address damages to facilities caused by Hurricane Florence and allow them to reopen. Seven LEAs remain closed as of October 8.

Flexible Emergency Funding for Public School Operations –\$25.0 million

Provides \$25.0 million in flexible funding for LEAs to address operational needs related to the storm, including transportation, mental health needs, and the North Carolina Virtual Public School (NCVPS).

- *Transportation* - LEAs receive funding for school bus fuel through DPI's Transportation Allotment, which provides a block grant to each district to provide to- and from-school transportation for students in grades K-12. Longer bus routes caused by storm damage, displaced students, and federal McKinney-Vento Homeless Education Assistance Act requirements may increase fuel costs for impacted districts. OSBM estimates that additional funds of up to \$2.0 million may be necessary.
- *Students in Crisis Grants* – Provide crisis services and/or training to help students develop healthy responses to trauma and stress in the most heavily impacted disaster-declared areas through the existing Students in Crisis grant program. Analyses of mental health service demand following Hurricane Matthew conducted by Trillium Health Services showed a

dramatic increase in demand for services for children, especially children age 13 and under. Extrapolating this data, Trillium predicts a 50-60% surge in demand for children 13 and under and overall increase in demand of 35-45% for children 18 and under lasting up to eight months. The estimated cost to increase the number of school counselors on a contract basis in the 18 LEAs which missed more than nine days of school to the recommended national ratio of 1:250 students is \$12.0 million.

- *Average Daily Membership (ADM)* - The storm disrupted DPI's student accounting process, which adjusts funding to LEAs and Charter schools based on the first two months' ADM. A hold harmless for FY 2018-19 only for LEAs and charter schools located in the most heavily impacted disaster-declared counties would provide needed stability for affected schools.
- *North Carolina Virtual Public School (NCVPS)* - The state-funded North Carolina Virtual Public School offers on-line courses for middle and high school students. For students in impacted areas anticipated to be out of school for 20 days or more, enrollment in NCVPS courses may help fill in the educational gap. Extending enrollment deadlines for NCVPS course and reducing or waiving payments for students in disaster-declared areas would allow more students to take advantage of this option.

Stay-in-School Student Assistance – \$10.0 million

Assists students from disaster-declared counties who may have trouble maintaining enrollment due to disruptions to family income, ability to pay, and other negative storm-related impacts. Funds will assist affected students with paying for tuition, fees, and emergency expenses that impact a student's ability to remain enrolled. Each system will have flexibility to develop program guidelines and assess need for applicants. Eligible recipients must be NC residents and either have a FEMA-designated county as their primary residence or be attending an eligible post-secondary education institution in a FEMA-designated county. Funds will be allocated as follows, with funding administered by community colleges and by the State Education Assistance Authority for UNC and independent colleges:

- \$6.0 million: NC Community College System
- \$3.5 million: UNC System
- \$0.5 million: NC Independent Colleges and Universities

Community College Tuition Receipts – \$5.0 million

Offsets an anticipated receipts shortfall at affected community colleges due to enrollment declines caused by Hurricane Florence. Tuition receipts are pooled at the system level, thus a shortfall in receipts will have impacts across all colleges. An anticipated shortfall of approximately \$8.7 million is projected based on enrollment declines experienced following Hurricane Matthew.

10. Funding Provided in S.L. 2018-134 and S.L. 2018-136

School Nutrition Employee Compensation - \$6.5 million

Allocates funds to the Department of Public Instruction for the compensation of school nutrition employees in counties impacted by Hurricane Florence whose compensation would otherwise have been provided by school meal receipts as part of the National School Lunch Program or School Breakfast Program.

Capital Recovery Funds – Public School Facilities - \$60.0 million

Allocates funds to the Department of Public Instruction for repair and renovation of facilities damaged by Hurricane Florence for local school administrative units, lab schools, and the Innovative School District.

Capital Recovery Funds – NC Community College System - \$5.0 million

Allocates fund to the North Carolina Community College System Office for repair and renovation of local community college facilities damaged by Hurricane Florence.

Budget Stabilization Funds for the NC Community College System - \$8.5 million

Allocates funds to the North Carolina Community College System Office to offset an anticipated receipts shortfall at affected community colleges due to enrollment declines caused by Hurricane Florence.

Emergency Grants for Affected Postsecondary Students (NCCCS) - \$5.0 million

Allocates funds to the North Carolina Community College System Office (NCCCS) to assist students from disaster-declared counties with paying for tuition, fees, and emergency expenses that impact a student’s ability to remain enrolled.

Emergency Grants for Affected Postsecondary Students (UNC) - \$2.0 million

Allocates funds to the University of North Carolina (UNC) to assist students from disaster-declared counties with paying for tuition, fees, and emergency expenses that impact a student’s ability to remain enrolled.

Emergency Grants for Affected Postsecondary Students (NCICU) - \$1.0 million

Allocates funds to the State Educational Assistance Authority for North Carolina Independent Colleges and Universities (NCICU) to assist students from disaster-declared counties with paying for tuition, fees, and emergency expenses that impact a student’s ability to remain enrolled.



Health and Human Services

Encompasses the financial impact of damage to healthcare facilities, as well as cost to address additional public health needs caused by Hurricane Florence.

1. Summary

The following is documentation of the methodology used to estimate health and human services needs due to Hurricane Florence.

Preliminary estimates are based on information provided to us by the North Carolina Department of Health and Human Services (DHHS) and external health and human services stakeholders. Total impact is estimated at \$232.5 million, at least \$161.3 million of which we expect to be covered by federal, private, and state sources of funding, resulting in an unmet health and human services impact of \$71.2 million.

In summary, the total impact estimate is comprised of \$90.6 million due to hospitals and nursing homes, \$8.5 million due to public health, \$29.0 million due to social services, and \$104.4 million due to other health needs.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/ Induced	Total Impact	Federal	Private	State	Unmet Impact
Health Care Facilities*	\$50.5	\$40.1	\$90.6	\$0.0	\$72.5	-	\$18.1
Public Health	\$8.5	\$0.0	\$8.5	\$5.6	\$0.0	-	\$2.9
Social Services	\$29.0	\$0.0	\$29.0	\$18.4	\$0.0	-	\$10.6
Health Needs	\$104.4	\$0.0	\$104.4	\$52.8	\$0.0	-	\$51.6
Subtotal	\$192.4	\$40.1	\$232.5	\$76.8	\$72.5	-	\$83.2
Resiliency efforts	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-	\$0.0
State appropriations	-	-	-	-	-	\$12.0	-
Total	\$192.4	\$40.1	\$232.5	\$76.8	\$72.5	\$12.0	\$71.2

**Note: Figure only includes estimates to private hospitals and nursing homes. Does not include health care safety net sites in impacted counties (rural health centers, free and charitable clinics, small rural hospitals, critical access hospitals, and school-based health centers).*

2. Scope

Structures in scope for health and human services estimates include:

- Private hospitals and nursing homes
- Public health (including vector surveillance & mold mitigation)
- Social services (including foster care & emergency nutrition assistance)
- Health needs (including assistive technology, mental health & substance use disorder services, I/DD services)

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3. Demographics

The majority of damage from Hurricane Florence was to an especially vulnerable part of North Carolina. Many of the Eastern and Southern counties impacted by the storm had not yet recovered from the severe damage of Hurricane Mathew in 2016.

More than a quarter of the state’s population lives in the 31 counties the Federal Emergency Management Agency (FEMA) declared eligible for individual assistance, and many of those people lack the capacity to respond to such a devastating event. Approximately one in five residents in the region live in poverty, and 30% live below 150% of the poverty line. More than 30% of the state’s Medicaid population, and one quarter of its Children’s Health Insurance Program (CHIP) recipients, live in the area. Under normal circumstances, these residents often rely on a combination of government-subsidized health and human services for food, medical care and housing assistance. In the wake of the hurricane, they’ve turned to emergency assistance programs such as the Disaster Supplemental Nutrition Assistance Program (D-SNAP), and temporary housing shelters until they can return to their homes.

Estimates were calculated as specifically as possible based on historical data and the demographics of affected counties. OSBM continues to work with NC hospitals and the North Carolina Hospital Association (NCHA) to verify damage estimates. Pre-K and child care facilities were also impacted by the hurricane; however, the extent of the damage is not yet known. The limited availability of current data makes it difficult to quantify the effects of trauma experienced by individuals and families impacted by the storm. In addition, the nature of DHHS services will require a comprehensive and thoughtful long-range approach in responding to this disaster.

Demographics Snapshot of Disaster-Impacted Counties	
Medicaid	<ul style="list-style-type: none"> • 764,000 people enrolled in Medicaid • 35,000 children enrolled in CHIP
Uninsured	<ul style="list-style-type: none"> • 13% under age of 65 uninsured (311,000) • 44% of uninsured fall below 138% of poverty line
Disabled	<ul style="list-style-type: none"> • 18% over the age of 18 (397,000)
Public Assistance	<ul style="list-style-type: none"> • 16% of households receive FNS benefits (188,000)
Elderly	<ul style="list-style-type: none"> • 16% over age of 65 (484,000) • 27% of households have at least one person over the age of 65 (270,000)

4. Methodology

Private Hospitals & Nursing Homes

Damage at hospitals was estimated by benchmarking the physical damage and economic loss of North Carolina's hospital system against the observed financial costs of Hurricane Sandy. Damage estimates were pulled from three New York Hospitals in Sandy's path (Bellevue, Coney Island, Long Beach Medical Center). Using this information, an average cost of damage per bed was estimated. This figure was then multiplied by the total number of beds in North Carolina hospitals located in the Hurricane Florence federal disaster zone.

Finally, two adjustments were made. First, the damage at North Carolina Hospitals was scaled down according to the hospital damage severity classifications established after Hurricane Sandy. Second, the facility damage cost was adjusted down 56%, which is based on comparing the average construction cost per square foot in North Carolina vs. New York City (see Assumptions section for more detail). Based on this modeling, we estimate eastern North Carolina hospitals will face \$42.7 million in facility costs and \$30.8 million in economic loss.

The facility and economic costs of nursing homes were modeled using the same methodology. Damage assessments from ten New York nursing homes were used to identify a facility and economic cost benchmark per bed. This benchmark was then applied to the 99 nursing homes located in disaster-declared North Carolina counties, using the same adjustment criteria. Based on this modeling, we estimate eastern North Carolina nursing homes will face \$7.8 million in facility costs and \$9.2 million in economic costs.

Public Health

- *Mosquito Abatement* - Based on the population and acreage of the disaster-impacted counties, the state has committed \$7.5 million in assistance to counties to address increases in mosquito population and size, caused by flooding, which pose an immediate public health risk to their communities.
- *Funding for Mold Remediation* - HHS requested an estimated \$1M, which includes 6 new FTEs, to bolster counties' response to mold calls from impacted residents, as well as to assist with home clean up and mold remediation strategies. Mold growth due to flooding is a long-term issue and costs will be incurred for as long as two years. Given that current North Carolina Emergency Management (NCEM) models indicate 73,000 homes were impacted by flooding, this is a conservative needs estimate averaging to only \$13.69 per impacted home.

Adult Social Services

DHHS expects an increase in the number of Adult Protective Services and Guardianship cases. The department estimated the cost of temporary staff to support each local agency's response to the increase.

The Home and Community Care Block Grant (HCCBG) provides a mix of services that counties administer to meet the needs of older adults. DHHS began providing extra supports, such as home-delivered meals, before the storm began and expects these services to be needed for as long as six months.

Child Services

A new child welfare services program would provide assistance to foster care families, foster children, and families with an open child protective services (CPS) case. DHHS estimated the number of children and families to be served by applying the percentage of households seeking individual assistance from FEMA to the number of foster care families, the number of foster care children, and the number of families with an CPS case in the impacted counties. The assistance provided would range for \$150-\$1000 per child/household. Federal IV-E funding may be able to cover 25% of these costs associated with foster care families.

Following Hurricane Sandy, New Jersey allotted \$237,000 to hire former CPS workers to help cover increasing reports in 10 different counties. With three times as many affected counties, an estimated \$800,000 would be needed to implement this program in North Carolina, which also includes an adjustment for inflation.

While the total number of damaged and/or closed NC Pre-K classrooms is not yet known, we do know that many Pre-K classrooms experienced some sort of damage from Hurricane Florence. Therefore, \$1.0 million in assistance was requested from the state for a grant program to help them quickly return to operation.

Food and Nutrition Assistance

- *D-SNAP* - DHHS reviewed county data for D-SNAP from Hurricane Matthew and extrapolated from it based on the increased severity of Hurricane Florence. DHHS also used feedback from county Departments of Social Services (DSS) operations to assist in arriving at a total estimate \$10.2 million. State and local governments must provide 50% of these costs. The State has already authorized overtime for DSS staff to respond to increased demand.
- *School Nutrition Services* – All students in disaster-declared areas are eligible to participate in free federal school breakfast and lunch program through the end of October. The Department of Public Instruction (DPI) estimated the number of additional students eligible to receive free meals in the impacted school districts, charter schools, and federal schools, and the maximum potential federal payment per meal per day. The projected cost for all eligible students to receive both breakfast and lunch from September 17 through October 31, 2018 ranges from \$6.0 million to \$13.1 million, depending on uptake rate.

Health Needs

- *Emergency Prescription Assistance Program (EPAP)* - Eligible, uninsured residents can receive a free 30-day supply of their medications. Based on the population of uninsured in the impacted counties, anticipated take-up rate modeled after New York/New Jersey following Hurricane Sandy, and

factoring increased cost of claim growth, the impact to North Carolina if the EPAP program is activated for a full year could be up to \$1.0 million.

- *Durable Medical Equipment (DME) and Assistive Technology (AT) Replacement* - Based on the disabled population of the impacted counties, the costs of providing short-term DME/AT solutions for evacuees displaced by the storm, and repairing/replacing damaged or destroyed DME/AT during Hurricane Florence. Additionally, staff in impacted counties will be needed to assist with the anticipated demands of expeditiously addressing accessibility and safety needs, increase stability, and replace equipment and devices in order to restore client's ability to function independently.
- *Intellectual and/or Developmentally Disabled Displacement Recovery* - The estimated impact to individuals with Intellectual and/or Developmental Disabilities (I/DD) who may need an institutional level of care, but currently have a living situation in the community due to supports provided by existing I/DD service providers and LME/MCOs was modeled after the disabled population in the impacted counties.
- *Mental Health Services* - Mental health and substance use disorder services costs experienced by New Jersey's Department of Health and Human Services following Hurricane Sandy indicated an additional need of \$8.1 million for increased clinical behavioral health services, as well as a mental health public awareness campaign targeted at individuals impacted by Sandy. Following Sandy, there were 16,024 crisis counseling contacts, of which 1,424 required referrals for longer-term professional mental health treatment and an additional 262 received referrals for professional behavioral or medical treatment for substance abuse problems.
 - Within 30 days post-Florence, increased costs for mental health services in the LME/MCO catchment areas with impacted counties will include: responding to trauma; community outreach, screening and training; school screenings and training; and patient transportation for appointments with mental health providers.
 - Mental health services costs for Medicaid beneficiaries are likely to surge starting roughly 2-3 months following the disaster, with the surge lasting up to 8 months. Trillium experienced increased mental health services for Medicaid beneficiaries totaling \$10.2 million in additional costs following Hurricane Matthew in 2016.
 - Approximately 3,200-3,750 uninsured adults will need outpatient therapy, medication management, intensive in-home services, community support team services, assertive community treatment team services, and/or substance abuse intensive outpatient services.

This impact estimate reflects the anticipated cost of services that will be needed in impacted areas. It does not attempt to quantify the effects of trauma experienced by individuals and families impacted by the storm. Peer-reviewed literature detailing the mental health impacts of Hurricanes Katrina and Rita indicate that an evidence-based mental health response to storm trauma is feasible, but

requires targeted resources, increased provider capacity, and advanced planning. The study indicated that full implementation would cost \$1,133 per capita. Put into the North Carolina context, such an approach would cost more than \$12.5 billion and yield 94.8% to 96.1% recovery within 30 months; however, it would exceed available provider capacity. Partial implementation would lower costs and recovery proportionately.

5. Assumptions

- 56% repair cost adjustment: based on comparing average construction cost per square foot in New York City against average cost in Wilmington, North Carolina (e.g. what would cost \$1 in New York City would be \$0.56 in Wilmington). This comparison was made using data from the RSMMeans Location Factors.
- Extrapolating hospital costs across all hospitals utilizes the same methodology as that of Hurricane Sandy. Hospitals were placed in one of 3 impact categories: 1) no physical damage, but surge in patients (hence costs) from evacuated facilities 2) Temporary damage, significant surge in patients, and 3) facility closed due to damage and evacuated. The analysis extrapolated damage estimates from category 3 hospitals to estimate damage in facilities in categories 1 and 2. Our analysis categorizes all hospitals in disaster areas as a “Category 1.5.” To this end, we applied a 95% reduction in the damage per bed figures observed in Hurricane Sandy.
- We assume all hospitals and nursing homes have comprehensive private insurance coverage that will compensate them for 80% of their facility costs.
- Assumes CPS and foster care families and children will apply for assistance at the same rate as households in the impacted areas applied for FEMA Individual Assistance.
- Assumes an annual 2% inflation in child welfare social worker costs.
- EPAP methodology assumes that North Carolina has a 2% take up rate, or double the impact experienced in New Jersey following superstorm Sandy, as well as a higher cost of claims, grown by the Consumer Price Index for Medical Inflation to an average claim cost of \$130.

6. Primary Data Sources

- Department of Emergency Management (DEM)
- Department of Health and Human Services (DHHS)
- LME/MCO Executive Staff
- Hospital Executive Staff

7. Potential Sources of Funding for Unmet Impact

Federal:

- HHS offers assistance in the following areas:

- 67.3% of Medicaid eligible costs in FY 2018-19 (\$40.4 million) - this blended rate will change in the new state fiscal year.
- 75% of the EPAP costs (\$3.0 million)
- 25% of the costs associated with child welfare (\$0.2 million)
- HHS also manages the Social Services Block Grant (SSBG) program, which provides social services including health care for vulnerable children, adults, and families. In addition to the block grant's normal annual funding, there is a precedent for supplemental funding following disasters. Based on supplemental funding levels after Hurricane Sandy, North Carolina may receive approximately \$200.0 million in SSBG funds for unmet health and human services needs.
- USDA covers 50% of the costs associated with D-SNAP (\$5.1 million). In addition, USDA provides 100% of the funding for the school nutrition program (\$13.1 million).
- FEMA will reimburse the State up to 75% of the costs associated with certain health care services (\$9.4 million) and mosquito abatement (\$5.6 million).

Private:

- For private hospitals and nursing homes, \$76 million would come from those entities' insurance companies.

8. State Funding Recommendation for Unmet Impact

Rebuilding – \$69 million

Health Care Safety Net - \$5.0 million

Provides funds to the NC Department of Health and Human Services, Division of Central Administration to administer grants to hospitals, nursing homes, and health care safety net sites (rural health centers, free and charitable clinics, small rural hospitals, critical access hospitals, and school-based health centers) in the 31 affected counties.

Mosquito Abatement - \$2.0 million

Provides funding to local agencies to conduct integrated mosquito management. This state funding will be used to leverage federal funding and provide a total of \$7.5 million to impacted counties.

Mold Remediation - \$1.0 million

Bolsters counties' response to mold calls from impacted residents, as well as to assist with home clean up and mold remediation strategies. Mold growth due to flooding is a long-term issue and costs will be incurred for up to two years.

Child Welfare Services - \$2.0 million

Reimburses counties for financial assistance provided to foster children and foster care families, as well as families with open CPS cases, who have been impacted by Hurricane Florence. This assistance would be used to provide stability in the home by restoring losses to personal property.

NC Pre-K Repairs - \$1.0 million

Establishes a grant program where Pre-K providers can apply for assistance for immediate repairs that would aid these programs in remaining open or returning quickly to operations.

D-SNAP Match Funding - \$5.0 million

Provides food to families and individuals that meet certain eligibility requirements, including suffering a loss due to Hurricane Florence, and who are not currently receiving Food and Nutrition Services (FNS) benefits. This state appropriation leverages federal funding for a total of \$10.2 million in food benefits.

Durable Medical Equipment & Assistive Technology - \$1.0 million

Provides funding for staff qualified to assist individuals with replacing lost devices and requalifying individuals needing DME and/or AT in order to live independently and remain integrated in the community.

Individuals with Intellectual/Development Disabilities Displacement Recovery - \$0.5 million

Increases funding for the I/DD population to ensure that individuals remain integrated in the community and to assist I/DD providers to regain capacity to serve I/DD population in impacted counties.

Adult Protective Services - \$2.0 million

Provides assistance to counties for temporary staff support to respond to an expected increase in guardianship and APS cases following the disaster.

Area Agencies on Aging (AAA) - \$0.2 million

Provides home-delivered meals, transportation, and damage repairs to low-income elderly residents in impacted areas.

Child Welfare Social Workers - \$1.0 million

Provides a flexible pool of temporary or contract social workers to work with counties in the short term as they experience a surge in child welfare reports. Research indicates that reports of domestic violence, child abuse, and neglect increase following a disaster.

Emergency Prescription Assistance Program - \$1.0 million

Activates the EPAP program, allowing enrolled pharmacies to process claims for prescription medications, medical supplies, vaccinations and some medical equipment for uninsured residents of a disaster area.

Mental Health Services for the Uninsured - \$27.0 million

Provides funding to support emergency mental health needs as well as provide ongoing mental health support to the uninsured population impacted by Hurricane Florence.

Mental Health Services for Medicaid Beneficiaries - \$20.0 million

Provides supplemental funds to address the emergency and ongoing behavioral health needs of Medicaid beneficiaries for up to eight months post disaster declaration.

Substance Use Treatment Programs - \$1.0 million

Provides funding for supplies, take-home medication, overtime, building damage repair, and other costs of treatment to 25 opioid treatment programs to assist individuals with opioid addiction while recovering from Hurricane Florence.

9. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Behavioral Health Service - \$5.0 million

Allocates funds to the Department of Health and Human Services, Division of Mental Health, Substance Abuse and Developmental Disabilities, to increase single stream payments in response to the increased demand for behavioral services by the uninsured in the counties designated as a federally declared disaster area.

Unaffiliated Community Hospital Support - \$0.5 million

Allocates funds to the Department of Health and Human Services, Division of Central Management and Support, Office of Rural Health, to provide funds to the North Carolina Hospital Foundation to assist unaffiliated community hospitals affected by Hurricane Florence in offsetting increases in nursing and staffing expenses. Priority consideration for the funds will be given to unaffiliated community hospitals serving rural areas.

Mosquito Abatement - \$2.0 million

Allocates funds to the Department of Health and Human Services, Division of Public Health, for local health departments to support mosquito abatement and other integrated mosquito management activities. Estimated total requirements for this purpose are \$7.6 million.

Disaster Supplemental Nutrition Assistance Program (D-SNAP) - \$3.5 million

Allocates funds to the Department of Health and Human Services, Division of Social Services, to provide funding to assist counties in matching federal funds for the administrative expenses incurred by local departments of social services in operating

D-SNAP, a program to provide food assistance to low-income households with food loss or damages caused by Hurricane Florence.

Emergency Prescription Assistance Program (EPAP) - \$1.0 million

Allocates funds to the Department of Health and Human Services, Division of Central Management and Support, to activate EPAP, providing prescription medications, medical supplies, vaccinations and certain medical equipment for eligible uninsured residents within the disaster area. Estimated total requirements for this purpose are \$4.0 million.



Recovery Operations

Addresses the costs of establishing an office to implement recovery efforts

1. Summary

The following is documentation of the methodology used to estimate needs in Recovery Operations due to Hurricane Florence. Preliminary estimates are based on staffing costs for robust and efficient recovery office and leveraging Local Government Commission data on cities that are financially struggling. Total impact is estimated at \$194.2 million, \$165.8 million of which we expect to be covered by federal and state sources of funding, resulting in an unmet impact of \$28.4 million for recovery operations.

Preliminary Damage & Need Estimate (Millions)							
				Expected Funding		Appropriated	
Category	Direct	Indirect/ Induced	Total Impact	Federal	Private	State	Unmet Impact
State Government Support for Recovery & Resiliency	\$67.0	\$0.0	\$67.0	\$57.0	\$0.0	-	\$10.0
Local Government Assistance	\$20.0	\$0.0	\$20.0	\$0.0	\$0.0	-	\$20.0
State Match - FEMA Immediate Recovery Operations	\$107.2	\$0.0	\$107.2	\$80.4	\$0.0	-	\$26.8
Subtotal	\$194.2	\$0.0	\$194.2	\$137.4	\$0.0	-	\$56.8
Resiliency efforts	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-	\$0.0
State appropriations	-	-	-	-	-	\$28.3	-
Total	\$194.2	\$0.0	\$194.2	\$137.4	\$0.0	\$28.3	\$28.5

2. Scope

Items in scope for recovery operation estimates include:

- State government needs to manage an effective recovery
- Funding assistance to local governments

3. Background & Methodology

Effective State Government Support for Storm Recovery and Resiliency

State agencies need personnel and operating support to assist with an effective recovery and rebuilding. North Carolina's Division of Emergency Management (DEM) is working to fulfill the basic responsibilities of a state recovery office. With large scale recovery efforts, it is often best practice to set up a distinct recovery office entity with its own dedicated staff to oversee and drive recovery. Without this dedicated entity, it will be challenging for North Carolina to efficiently execute the needed multi-year recovery and resilience projects. Other state agencies will also need additional support to effectively assist in North Carolina's rebuilding and resiliency efforts.

Office of Recovery and Resiliency

Initial cost estimates for the Office of Recovery and Resiliency are based on best practices observed from recovery offices set up following Hurricanes Sandy and Harvey as well as South Carolina's successful Disaster Recovery Office. While New York's recovery office had over 100 employees and South Carolina's has 35 employees, North Carolina's office can be run in a more streamlined manner because it benefits from existing capacity within DEM. The office director will shape the specific organizational design of the office. To complete the full scope of recovery projects, the Office will need to be operational for approximately 5 years.

Local Government Assistance

Local governments are a critical partner in the state's efforts to rebuild after a disaster. Ensuring they have the capacity to implement programs and effectively utilize state and federal recovery funds is vital for a successful recovery and an efficient distribution of funds. Two programs to support and increase local governments recovery capacity are described below; another local government support program is included in the Housing section of this report.

Rebuilding and Capacity Grants

The Office of Recovery and Resiliency will develop and administer a grant program for financially-distressed local governments to assist with recovery capacity. The grants would cover the salaries, benefits, and operating costs for two positions as well as the purchase of 1 vehicle per community for three years.

Emergency Financial Assistance

The Local Government Commission (LGC) identified 36 municipalities in disaster-declared areas that may face difficulties maintaining normal operations in the event of a disaster. These municipalities, the majority of which have very small populations, were already facing financial difficulties in FY 2016-17 when there was no nationally declared disaster. It is currently unknown how many additional municipalities in hurricane impacted areas may face financial hardship. OSBM estimates that three months annual operating revenue for the identified municipalities is approximately \$30.0 million.

4. Assumptions

- Funding for the Office of Recovery and Resiliency will be needed for five years.
- Funding for State agency operational support for rebuilding and resiliency will be needed for three years.
- Funding for rebuilding and capacity grants to local governments will be needed for three years.
- Employee benefits are based on FY 2018-19 rates: 7.65% of pay for FICA, 18.86% of pay for retirement contributions, and \$6,104/FTE for health insurance.
- Annual operating costs per employee are \$23,808, and include average per employee expenditures on office supplies, technology, professional development, travel, and rental cost.
- Municipalities whose 2017 operating budget data was unavailable were assumed to have a municipal budget amount equal to the average of the municipalities for which data is available
- Local government fund balance was not considered in this analysis, as the governments may have already used some fund balance to meet operating requirements. Also, negatively weighting the availability of local fund balance may act as a disincentive to maintain adequate fund balance in future events.

5. Primary data sources

- Local Government Commission (LGC)
- Division of Emergency Management (DEM)
- Department of Environmental Quality (DEQ)
- Department of Insurance (DOI)
- Department of Administration (DOA)
- Office of State Human Resources (OSHR)

6. Potential Sources of Funding for Unmet Impact

North Carolina is expected to receive over \$1.1 billion in CDBG-DR funds. HUD allows 5% of these funds, equivalent to \$57 million, to be used to administer recovery programs. These funds will be used to support state government recovery needs and local government recovery.

7. State funding recommendations for Unmet Impact

Rebuilding - \$57 million

State Government Support for Recovery and Resiliency – \$10.0 million

Office of Recovery and Resiliency

Establishes an Office of Recovery and Resiliency. Preliminary assessment indicates the Office budget will be approximately \$35.0 million in order to operate for five years. This includes \$20.0 million for a staff of 30-35 time-limited positions providing general disaster recovery coordination and public information; citizen outreach and application case management; audit, finance, compliance, and reporting on disaster recovery funds; and program and construction management services. These positions will supplement the 40 existing positions within DEM already dedicated to recovery operations. The Office will also utilize up to \$15.0 million over the 5-year life of the Office to acquire contractual services from private sector firms specializing in housing, construction, and project management services.

Support Agency Disaster Recovery and Resiliency Efforts

Recommends funds for enhanced state agency operational capacity related to disaster recovery rebuilding and resiliency efforts over the next three years. As agencies continue to determine what programs and initiatives will comprise their disaster response, additional capacity needs may arise.

Division of Emergency Management Needs

Provides \$2.5 million to DEM address critical operational support to Division of Emergency Management's Logistics section in order to build capacity and increase the efficiency and effectiveness of future emergency response. This funding will support the salaries, benefits and operational needs for 10.0 time-limited positions which will include positions such as emergency response warehouse personnel, emergency services coordinators and emergency supply transportation staff.

Provides \$10.0 million to DEM fund immediate public safety and response capacity building which would include equipment and infrastructure needs to improve future emergency response. Items that could fall into this category include search and rescue equipment, generators, and information technology improvements.

Department of Environmental Quality Needs

Provides \$13.0 million to DEQ to address critical operational support and staffing needs for DEQ programs responding to disaster recovery and resiliency efforts. DEQ may establish up to 20.0 time-limited positions to support rebuilding and resiliency with these funds. Rebuilding activities include but are not limited to waste management, water quality monitoring and permitting, and dam safety. Funds for rebuilding may be used for operational needs, such as travel and testing as well as equipment necessary to assess, rebuild, and monitor storm-related damages. DEQ divisions also supporting resiliency activities helping the state and local governments prepare for and mitigate future storm-related impacts. Sample resiliency needs include obtaining storm-response training and equipment, conducting studies related to storm resiliency, and assisting local governments and other customers (such as water quality permits) in preparing for storm events.

Department of Insurance (DOI) Statewide Code Inspectors

Provides a \$5.5 million for DOI to hire 15.0 time-limited all trade code inspectors who can be deployed to Florence-impacted counties to augment and expand county and municipal city code inspection offices that perform compliance inspections associated with repairs and reconstruction of flood damaged homes. These code inspectors would have statewide jurisdiction and authority to ensure construction activity complies with building code standards. These additional staff are critical to ensuring the rebuilding process can occur without delay. Most of the local governments impacted by Hurricane Florence do not have the staff needed to review and inspect the volume of major home repairs and reconstruction activities expected to result from Hurricane Florence rebuilding.

Department of Administration (DOA) Needs

Provides \$950,000 to DOA to hire 3 time-limited positions. The Office of State Human Resource (OSHR) would hire 2.0 positions to assist agency HR offices in recruitment of positions and to fast-track the review and approval of all hurricane - related HR requests. The Division of Purchase and Contracts would hire 1.0 position to expedite the review and approval of state contracts related to disaster recovery.

Local Government Assistance – \$20.0 million

Rebuilding and Capacity Grants – \$10.0 Million

Provides \$10 million in state appropriation for grants-in-aid to financially distressed local governments to support two-person teams rebuilding and capacity teams. The Office of Recovery and Resiliency will engage impacted communities, assess internal capacity to manage large scale repair and reconstruction activities, and award grants of up to \$1 million to selected distressed communities. Grants would be awarded in a fair and open process and provide adequate funding for an experienced housing construction manager, civil engineer, land-use planners, and experienced program managers to assist the distressed communities for three years. These grants must accommodate each community's specific needs related to rebuilding and recovery. Some communities may need a construction manager while another needs a land-use planner. The grant program will provide the flexibility to allow the recipient to partner with another appropriate governmental entity, such as a county government or regional Council of Government, if the distressed local community does not have the capacity to supervise the 2-person disaster recovery team.

Emergency Financial Assistance Grants – \$10.0 million

Recommends the state establish a one-time emergency fund for local governments in disaster-affected areas that need immediate cash flow assistance. The Office of Recovery and Resiliency in consultation with the LGC will manage these funds, which shall be distributed to local government for the following, in priority order:

- To meet local government debt service obligations;
- To meet payroll obligations for local governments; and/or
- To meet vendor payments where non-payment would result in negative financial outcome.

State Match - FEMA Immediate Recovery Operations – \$27.0 million

Provides the state match for FEMA public assistance funds to be used for immediate disaster response activities. Based on FEMA estimates as of October 5, 2018, the state is expected to receive a total of \$739 million in Public Assistance funds. Using FEMA allocations from Hurricane Matthew, \$107.2 million of those funds will be immediate response such as rescues, debris removal, etc., resulting in \$26.8 million in state funds needed to match the \$80.4 million from FEMA.

8. Funding Provided in S.L. 2018-134 and S.L. 2018-136

Local Government Assistance - \$8.0 million

Allocated funds to the Department of Public Safety, Office of Recovery and Resilience, to assist financially-distressed local governments with staff support and provide one-time emergency funds for local governments in disaster areas that need immediate cash flow assistance.

Office of Recovery and Resiliency - \$2.0 million

Allocates funds to the Department of Public Safety to establish and operate an Office of Recovery and Resiliency to provide general disaster recovery coordination and public information; citizen outreach and application case management; audit, finance, compliance, and reporting on disaster recovery funds; and program and construction management services.

Share of State Match - \$18.3 million

North Carolina has allocated \$115 million to the Hurricane Florence Disaster Relief Reserve and Fund for the required State match for various Federal funding programs. Based on the remaining match needs across categories, an estimated \$18.3 million is expected to be dedicated to Recovery Operations.

Glossary

AAA – Area Agencies on Aging

ACS – American Community Survey

ADM – Average Daily Membership

AT – Assistive Technology

BEA – US Bureau of Economic Analysis

CDBG - Community Development Block Grant

CDBG-DR – Community Development Block Grant Disaster Recovery

CHIP - Children’s Health Insurance Program

CPS - Child Protective Services

CWMTF - Clean Water Management Trust Fund

D-SNAP - Disaster Supplemental Nutrition Assistance Program

DACS – Department of Agriculture and Consumer Services

DEM – Division of Emergency Management

DEQ – Department of Environmental Quality

DHHS – Department of Health and Human Services

DME - Durable Medical Equipment

DMF - Division of Marine Fisheries

DOA – Department of Administration

DOI – Department of Insurance

DOT – Department of Transportation

DPI – Department of Public Instruction

DSS - Departments of Social Services

ECP - Emergency Conservation Program

EFRP - Emergency Forest Restoration Program

ELAP - Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program

EPAP - Emergency Prescription Assistance Program

EQIP - Environmental Quality Incentives Program

EWP - Emergency Watershed Protection

FCC – Federal Communications Commission
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
FICA - Federal Insurance Contributions Act
FIMAN - Flood Inundation Mapping and Alert Network
FNS - Food and Nutrition Services
FSEOG - Federal Supplemental Education Opportunity Grants
FTA – Federal Transit Administration
FY – Fiscal Year
GDP – Gross Domestic Product
GIS – Geographic Information System
HCCBG - Home and Community Care Block Grant
HFA – Housing Finance Agency
HMGP - Hazard Mitigation Grant Program
HOA – Homeowner Association
HUD – Housing and Urban Development
I/DD – Intellectual and/or Developmental Disabilities
IFA - Interjurisdictional Fisheries Act
LEAs – Local Education Agencies
LGC – Local Government Commission
LIDAR – Light Detection and Ranging
LIP - Livestock Indemnity Program
LME/MCOs - Local Management Entity / Managed Care Organization
MSFCMA - Magnuson-Stevens Fishery Conservation and Management Act
NCDOR – North Carolina Department of Revenue
NCEL – North Carolina Education Lottery
NCEM – North Carolina Emergency Management
NCHA - North Carolina Hospital Association
NCVPS - North Carolina Virtual Public School

NFIP – National Insurance Flood Program
NOAA – National Oceanic and Atmospheric Administration
NRCS - Natural Resources Conservation Service
OSBM – Office of State Budget and Management
OSHR – Office of State Human Resources
SARF - State Acquisition and Relocation Fund
SBA – Small Business Administration
STEP - Sheltering and Temporary Essential Power
TAP - Tree Assistance Program
TCLI - Transitions to Community Living
UNC – University of North Carolina
US EPA – US Environmental Protection Agency
USACE – US Army Corps of Engineers
USDA – US Department of Agriculture
USTs – Underground Storage Tanks
VOADs - Volunteer Organizations Active During Disasters
WHIP - Wildfires and Hurricane Indemnity Program