



FY 2022 Storm Water Services

Capital Improvement Program Annual Report Highlights

Letter from the Director



*Don Ceccarelli,
Division Director*

In FY22, Mecklenburg County Storm Water Services (STW) completed the first year of our 15-year Capital Improvement Project (CIP) plan.

The investments will strategically reduce flood risk and improve the quality of our natural stream systems throughout Mecklenburg County. We have had tremendous support from the Storm Water Advisory Committee (SWAC), County leadership, elected officials, and other partners. The results in FY22 exceeded our goals even though STW operated in a challenging real estate and contracting environment.

The Flood Mitigation CIP primarily reduced flood risk in 2 ways; buyouts and private mitigation actions supported through our retroFIT grant program. Buyouts were very challenging in FY22 because of the real estate market. Soaring prices, lack of replacement property, and private buyers willing to pay above appraised value made the voluntary buyout program especially challenging. We expect these trends to continue in FY23 on top of higher interest rates which will make it difficult for some sellers to move into comparable homes. Many of the retroFIT grants completed in FY22 were for homes along the Catawba River that flooded in 2019.

The Water Quality CIP began construction of several stream restoration/enhancement projects in FY22. Our projects take 3-5 years to plan, design and permit for construction. In FY23, STW will focus heavily on identifying the next group of stream reaches to begin planning on and grants to provide supplemental funding.

Lastly, Storm Water Services is committed to a fair and equitable CIP. In FY23 we are working with the County Manager's office on reviewing our CIP through an equity lens. Staff are providing information to an outside consultant who will review our selection/prioritization process and implementation guidelines.

Don Ceccarelli

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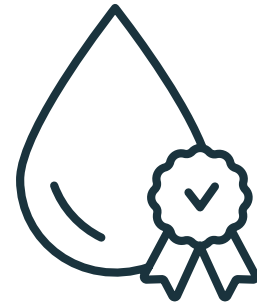
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Currently there are 15 active Water Quality (WQ) CIP projects in various stages of completion throughout the County, ranging from the early permitting stage to the warranty stage. Projects take approximately 3 to 5 years to plan, design and permit. Tasks include easements and land acquisition, contract bid, construction, and finally warranty. Easements and land acquisitions were the top challenges in FY22. Currently, STW staff is focusing on identifying the next group of stream reaches to begin planning and acquire possible grants to supplement funding.



4.7

STREAM MILES IMPROVED

Since 1997, **103.3 stream miles** have been improved.

LSC-POLK TO SC STATE LINE: 2.5 MILES

STEWART CREEK TRIBUTARY #2: 0.5 MILES

LONG CREEK AT TREYBURN: 1.7 MILES

Water Quality CIP SRRS monitoring data for FY22 shows five (5) out of six (6) WQ CIP projects currently meet the minimum 190 score for restored projects, indicating stable stream channels and habitat conditions. One site had beaver activity that negatively impacted the score. It's expected to increase in future monitoring years.

5/6

**STABLE STREAM CHANNELS
& HABITAT CONDITIONS**



Storm Water Services (STW) has been pursuing flood mitigation projects along Cullman Avenue for nearly 20 years. Historically, it has been the most flood prone commercial development area in Charlotte. Only a few flood prone buildings remain. In FY22, STW was able to acquire two additional buildings at 3144 and 3162 Cullman for approximately \$2.4M. Acquisition of 3110 Cullman is expected to occur early in FY23.



9,425

FLOOD MITIGATION RISK
POINTS MITIGATED (RARR)



ACQUISITIONS: **6 PROPERTIES** (6,317 PTS)



PROTECT EQUIPMENT: **2 PROPERTIES** (282 PTS)



ELEVATION: **1 PROPERTY** (73 PTS)



DEMOLITION/REBUILD: **3 PROPERTIES** (2,358 PTS)

4

HOMES
DEMOLISHED



2

ACRES OF OPEN
SPACE CREATED

Since 1988, **458 buildings** have been demolished to create **194 acres** of open space.



462

TREES PLANTED



\$1.192M

FY22 FLOOD INSURANCE
SAVINGS COUNTYWIDE



Demolition/rebuild

FY 2022 ACCOMPLISHMENTS

Flood Mitigation



Program Overview

The flood mitigation goal for FY22 was the reduction of 5,500 flood risk points. A total of 9,425 points were mitigated in FY22. The reductions are the result of action by STW and the private sector. STW reduces flood risk through the acquisition and demolition of flood prone structures and by providing funding to homeowners for the implementation of measures to reduce flood risk on their property. The private sector reduces the flood risk pool through the redevelopment of properties within the FEMA floodplain whereby older high-risk structures are replaced by new compliant structures and therefore lower risk. It is important to note that the private sector can also add to the flood risk pool by development of previously undeveloped lots within the floodplain. Even if these new structures are compliant, they still add a measure of overall flood risk to the community.

15 YEAR FLOOD MITIGATION GOAL

FY	CUMULATIVE RISK POINT REDUCTION GOAL	ANNUAL FUNDING ALLOCATION	FY	CUMULATIVE RISK POINT REDUCTION GOAL	ANNUAL FUNDING ALLOCATION
FY22	Goal 5,500 Actual 9,425	\$3,000,000	FY30	109,500	\$8,150,000
FY23	13,000	\$3,960,000	FY31	124,000	\$8,150,000
FY24	23,500	\$5,810,000	FY32	138,500	\$8,150,000
FY25	36,000	\$6,980,000	FY33	153,500	\$8,150,000
FY26	50,000	\$8,150,000	FY34	167,500	\$7,420,000
FY27	65,500	\$8,150,000	FY35	180,000	\$7,420,000
FY28	80,000	\$8,150,000	FY36	193,500	\$7,420,000
FY29	95,000	\$8,150,000			

FY22 FLOOD MITIGATION COSTS AND FLOOD RISK REDUCED

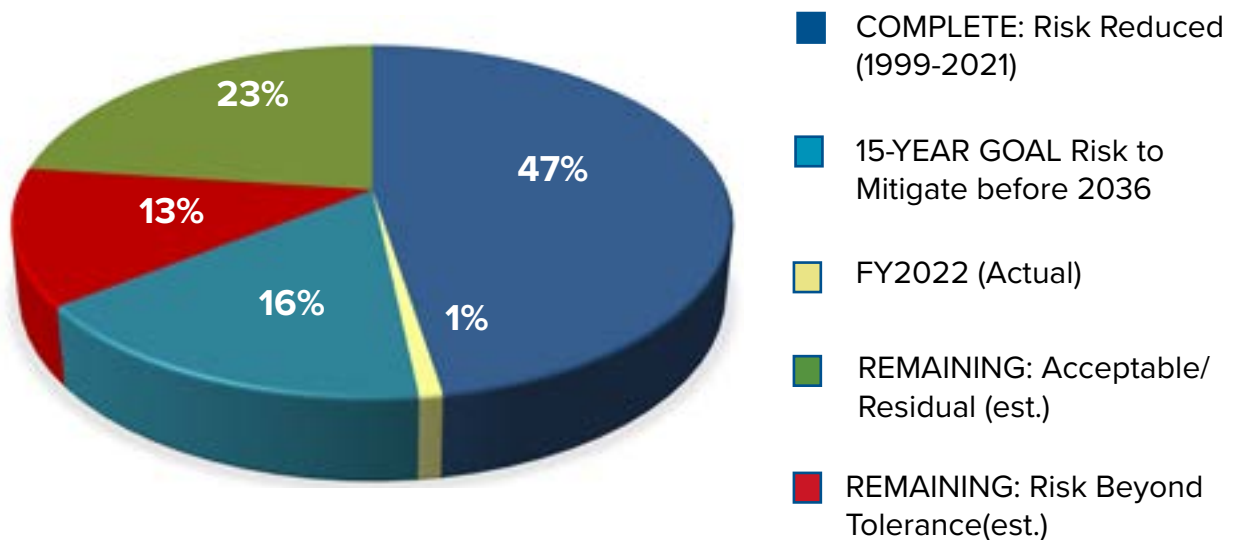
PROJECT NAME	COST TO THE UTILITY	TOTAL COST	PROJECT TYPE	FLOOD RISK POINTS REDUCED
1200 Riverside Drive	\$81,900	\$109,200	Elevation	73
1613 Lake Drive	\$32,387	\$43,535	Demo/rebuild	1,427
1727 Lake Drive	\$81,496	\$108,661	Demo/rebuild	744
1815 Lake Drive	\$9,800	\$2,450	Demolition	187
1230 E Woodlawn Road	\$277,500	\$277,500	Acquisition	517
3210 Brixton Court	\$7,463	\$16,794	Protect Equipment	108
1227 Barkley Road	\$12,075	\$16,100	Protect Equipment	174
4743 Emory Lane	\$382,000	\$382,000	Acquisition	221
3144 & 3162 Cullman Avenue	\$1,350,000	\$2,400,000	Acquisition	1,178
3144 & 3162 Cullman Avenue	\$1,050,000	\$2,400,000	Acquisition	1,179
5129 Dolphin Lane	\$168,000	\$168,000	Acquisition	1,840
5129 Lincrest Place	\$562,000	\$562,000	Acquisition	1,777
TOTAL				9,425



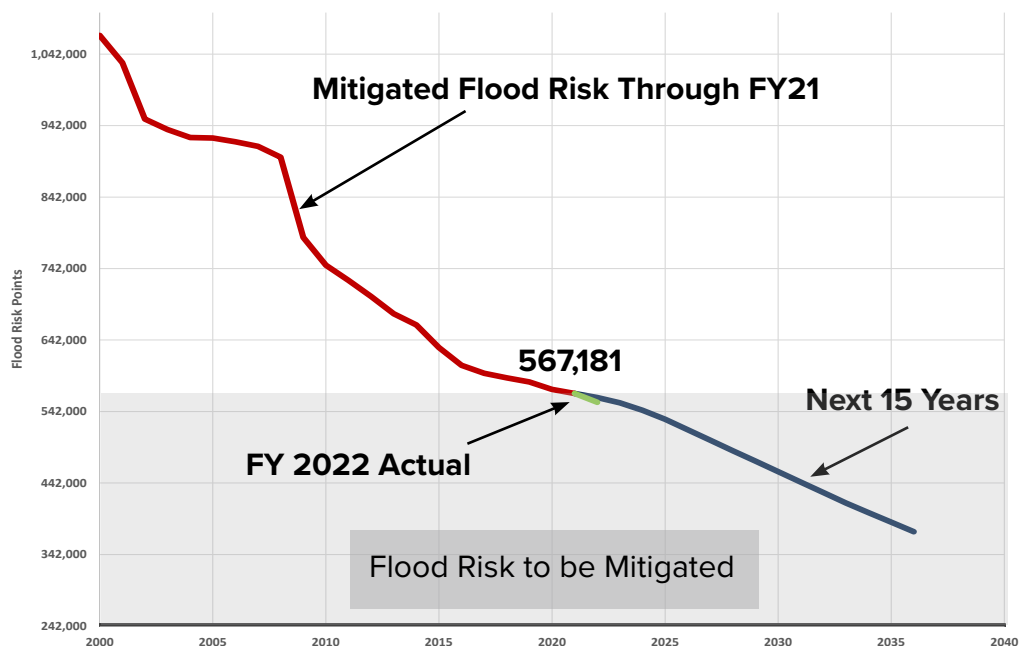
Detailed Reporting

The flood mitigation CIP is guided by the Flood Risk Assessment and Risk Reduction Plan (RARR Plan). The RARR Plan was presented by STW staff, endorsed by the Storm Water Advisory Committee (SWAC) and subsequently approved by the Mecklenburg Board of County Commissioners (BOCC) in 2012. The RARR Plan presents a scoring system used for identifying and prioritizing flood mitigation options on approximately 5000 structures in Mecklenburg County. The scoring system assigns flood risk points for various building features impacted by flooding. Examples include crawlspace flooding, living space flooding and flooding of mechanical equipment. More points are assigned as the frequency and severity of the impacts increase and higher points are indicative of higher flood risk. The RARR Plan also evaluates mitigation options for each flood prone structure in Mecklenburg County and determines their effectiveness and viability.

FLOOD MITIGATION GOAL DRIVEN CIP



FLOOD RISK POINTS REMAINING





Terminology

Major system: Creek with a watershed or drainage area of 1 sq. mile or more. Creek is considered FEMA regulated.

Minor system: Creek, tributary, ravine, culvert, etc. that has a drainage area less than 1 sq. mile. Not FEMA regulated.

Risk Assessment Risk Reduction (RARR): The technical concept of the RARR Plan includes three components that are combined to rank and prioritize mitigation activities. These components are Flood Risk Property Score, Risk Reduction Recommendations and Mitigation Priority Scores.

Risk Score: The flood risk score of an individual property includes two main factors: 1. The likelihood of various floods occurring on that property. 2. The damage (financial impacts) that will follow in the event of flooding. There are nearly a dozen different components to analyzing a property's likelihood of flood and financial impact.

retroFIT: (Floodproofing • Improvements • Together) The retroFIT program offers financial and technical assistance to owners that undertake flood damage reduction measures for existing buildings in the regulated floodplain. retroFIT options include Structure Elevation, Equipment Elevation, Wet/Dry Floodproofing, Abandon Basement, and Demolition.

Repetitive Loss: Flood-related damages sustained by a structure on two separate occasions during any 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the Market Value of the structure before the damage occurred.

Losses Avoided: Monetary calculation of savings after mitigation efforts have been completed. For example, since the buyout of the Doral and Cavalier Apartments more than \$10 million in damages did not occur because the building were removed.

FEMA Hazard Mitigation Assistance Grant: FEMA's hazard mitigation assistance provides funding for eligible mitigation measures that reduce disaster losses.

Hazard Mitigation Grant Program (HMGP): A federal post-disaster program intended to reduce future disaster losses. HMGP funding is made to states after a presidentially declared disaster. The states in turn distribute the funds to local communities according to state priorities, subject to FEMA approval.

FEMA Cooperating Technical Partners (CTP) Program: Program directed at strengthening the effectiveness of the National Flood Insurance Program through partnerships with state and local entities. FEMA provides funding for local initiatives to develop hazard identification and risk assessment products that lead to increased public awareness.



Acquisition and Demolition

7 PROPERTIES ACQUIRED AT A COST OF \$2.5M · 6838 FLOOD RISK POINTS MITIGATED · 4.1 ACRES FLOODPLAIN RECLAIMED

Buying and removing buildings from the floodplain is one of the most cost-effective ways to reduce long-term flood damage and creates many other community benefits. Floodplain acquisitions provide community recreational and open space. Since 1998, STW has purchased over 450 homes and businesses and removed them from the floodplain.

Buyouts were very challenging in FY22 because of the real estate market. Soaring prices, lack of replacement property, and private buyers willing to pay above appraised value made the voluntary buyout program especially difficult. We expect these trends to continue in FY23 on top of higher interest rates which will make it hard for some sellers to move into comparable homes.

Many homes in the McDowell Farms floodplain now rank near the top of Storm Water Services priority list to reduce or eliminate flood risk. STW is in the process of purchasing 15 homes with grant money from The Hazard Mitigation Grant Program (HMGP). Phase 1 of the grant contract specifies up to \$4,150,486 for the acquisition of 15 structures. Phase 2 is expected as additional funding becomes available.



Cullman Avenue acquisition

FY22 DEMOLITIONS

ADDRESS	DATES	ACREAGE
5715 Wedgewood Drive	7/28/21 - 8/2/21	0.412 acres
5129 Dolphin Lane	2/8/22 - 2/15/22	0.347 acres
4743 Emory Lane	3/8/22 - 3/22/22	0.376 acres
3144 Cullman Avenue	5/13/22 - 6/16/22	0.879 acres



retroFIT

Demolition/rebuild



Equipment elevation

retroFIT (Floodproofing • Improvements • Together), is an element of Mecklenburg County’s flood mitigation efforts. The purpose of the retroFIT program is to offer financial and technical assistance to owners that undertake flood damage reduction measures for existing buildings in the regulated floodplain.

Financial grants are available to reimburse 75-95% of eligible expenses for qualified floodproofing projects. The program is intended to assist floodplain property owners who may not be currently served by other mitigation efforts (e.g. creek restoration/mitigation projects and buyout programs) and are at risk for future flood losses.

FY22 RETROFIT PROJECTS

PROJECT LOCATION	PROJECT TYPE	FLOOD RISK POINT REDUCTION
1200 Riverside Drive	Elevation	73
1727 Lake Drive	Demolition/rebuild	744
1815 Lake Drive	Demolition	187
3210 Brixton Court	Protect equipment	108
1227 Barkley Road	Protect equipment	174

FY22 HIGHLIGHTS

- retroFIT applications received: 34
- 5 retroFIT projects have been completed representing \$246,999 in grants. The total flood risk reduction points add up to 1,286 and all are approved by the Storm Water Advisory Council.
- The first publicly-funded home elevation project in Mecklenburg County was completed at 1200 Riverside Drive.
- There are several additional retroFIT projects in progress and are in various stages of completion and will be added to FY23 CIP Annual report.
- Two home elevations are expected to be completed on Riverside Drive on the Catawba River in



Private Mitigation

Flood vent

Storm Water Services is building a reporting tool to record when residents mitigate the flood threat to their property without STW retroFIT Grant money using, Storm Water fees or County grant money. Sometimes a property does not qualify for a retroFIT grant and the resident uses their own money to mitigate the property. Flood Risk Points on the property are reduced and this tool will record the change in score. The Private Mitigation tool is expected to be completed in FY23 and presented in the next CIP Annual Report.



Equipment elevation



Losses Avoided

Westfield Road with homes removed

In order to evaluate the cost-effectiveness of its mitigation program, STW uses a flood mitigation Losses Avoided Tool, which is used to determine the value of the flood losses and damage that would have occurred if the building were still impacted by a flood. The tool assesses the actual effectiveness of two types of mitigation implementations: property acquisition and structure elevation.

The Losses Avoided calculations are based on the following categories.

Building loss

- Standard USACE building loss using Building Replacement Value (BRV)
- Crawl space losses, including mechanical equipment

Contents loss

- Standard USACE contents loss using a percentage of BRV
- Vehicle losses
- External property improvement losses

Displacement costs

Emergency response costs (i.e., police or fire crew dispatch, sheltering)



Flooding on Westfield Road before buyout/acquisitions

FY22 DATA

STORM DATE	LOSSES AVOIDED
8/12/2021	\$1,825
3/12/2022	\$1,138,377
3/31/2022	\$14,979
6/27/2022	\$1,317,635
FY22 TOTAL	\$2,472,816
SINCE 1998	\$32,846,361



Funding and Partnerships

FLOOD MITIGATION ASSISTANCE

Flood Mitigation Assistance (FMA) is a federal pre-disaster grant program that provides funds for planning and mitigation projects intended to reduce the risk of flood damage. Having flood insurance and demonstrating a benefit to cost ratio greater than one are prerequisites for eligibility. Projects that mitigate buildings with multiple prior claims are given priority in the nationally competitive ranking for awards.

Storm Water Services submitted one FMA grant application during federal 2021 fiscal year. The \$666,545 project would fund the acquisition and demolition of two residential structures on Briar Creek. The 2021 awards have not been announced as of preparation of this report.

HAZARD MITIGATION GRANT PROGRAM

The **Hazard Mitigation Grant Program (HMGP)** is a federal post-disaster program intended to reduce future disaster losses. HMGP funding is made to states after a presidentially declared disaster. The states in turn distribute the funds to local communities according to state priorities, subject to FEMA approval.

Storm Water Services has two current projects that have been awarded funding from the Hurricane Florence HMGP grant to North Carolina. The Kings Branch stream restoration and flood mitigation project is meant to improve water quality and reduce flood hazard along Kings Branch between Archdale Drive and Arrowood Road, (Phase 1 of the grant is \$380,000). The McDowell Farms flood mitigation project will acquire and demolish up to 15 homes on Sugar Creek. The grant contract specifies up to \$4,150,486 for the acquisition of 15 structures. STW may not spend all the money if all 15 are not purchased. A third project, to be funded from Hurricane Dorian disaster relief is under review. This project proposes to elevate four Hanson Drive residences in the Little Sugar Creek floodplain.

COOPERATING TECHNICAL PARTNERS

The FEMA **Cooperating Technical Partners (CTP)** program is directed at strengthening the effectiveness of the National Flood Insurance Program through partnerships with state and local entities. FEMA provides funding for local initiatives to develop hazard identification and risk assessment products that lead to increased public awareness.

Storm Water Services participates in the FEMA Letter of Map Revision partnership through the CTP program. In this partnership, requests to revise flood maps and data are processed in-house rather than by FEMA contractors. The partnership is funded by FEMA through an annual grant to Storm Water Services that may vary from \$20,000 to \$40,000 per year.



Operations and Maintenance

PROPERTIES MAINTAINED BY STORM WATER OPERATION

- 443 total properties
- Mecklenburg County Park and Rec maintains 97 properties
- Storm Water Operations maintains 346 properties

CONVERTING PROPERTIES TO PERMANENT USE

236 unprogrammed properties x 0.05=12 properties (FY22 goal)

Total properties 15

- Stopped mowing 7 properties (natural succession)
- Removed kudzu and reduced mowing on 2 properties
- Grant for landscaping on 1 Montford property
- Creek Releaf, volunteer tree planting on 4 properties on Merriman/Spruce
- Shannonhouse Community Garden 1 parcel
- Hidden Valley Pollinator beds 2 parcels

PROPERTIES USED FOR TRAINING BY CHARLOTTE FIRE & MECKLENBURG COUNTY SHERIFF'S DEPARTMENT

- 3: Cullman, Wedgewood, and Dolphin

PROPERTIES MOWED

- 297 properties
- Annual cost \$201,242.69

TREES PLANTED

462 total in FY22

- | | |
|--------------------|----------------------------|
| • 350 Creek Releaf | • 3 Hidden Valley |
| • 2 Norwood | • 6 Mounting Rock |
| • 2 Dunlavin | • 3 Chantilly |
| • 6 Dolphin | • 90 replants at Chantilly |

Charlotte Wildlife Stewards received a 2021 grant from North Carolina Native Plant Society to incorporate a vegetated littoral shelf and educational signage at the Chantilly Ecological Society wet pond. Approximately 6,000 square feet of littoral shelf was planted with native plants.



Pollinator garden



Planting at Hidden Valley Community



Charlotte Fire uses buyout building
on Cullman for training



McDowell Creek after restoration

FY 2022 ACCOMPLISHMENTS

Water Quality



Program Overview

The water quality goal for FY22 was the restoration of 2.2 miles of FEMA stream. A total of 4.7 miles were completed during FY22. Restoration of streams is accomplished through the re-shaping of the stream channel, removal of non-native vegetation and replacement with native species and the introduction of habitat into the stream channel itself.

The water quality CIP is guided by the Stream Restoration Ranking System (SRRS). The SRRS concept was presented by STW staff, endorsed by the SWAC in 2019. Similar to the RARR Plan, SRRS uses a point system to identify and prioritize stream reaches for restoration, enhancement or preservation. SRRS assigns points to various stream features, including geomorphology, biological habitat and riparian buffer. Increasing scores indicate better in-stream conditions.

15 YEAR WATER QUALITY CIP

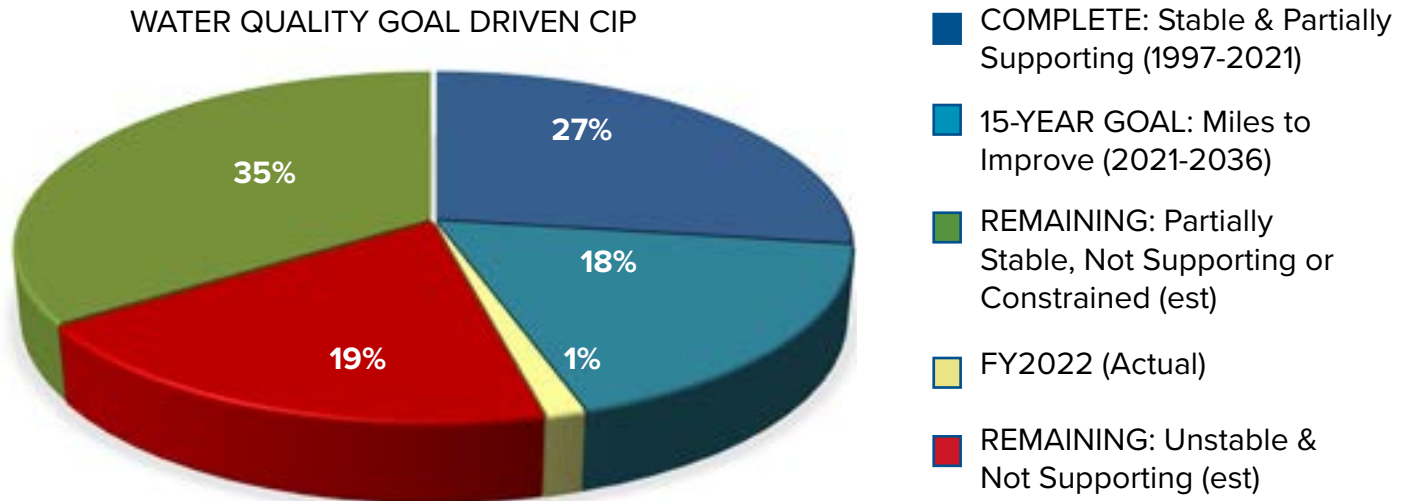
	CUMULATIVE STREAM MILES RESTORED	ANNUAL FUNDING ALLOCATION
FY22	Goal 2.2 Actual 4.7	\$5,200,000
FY23	5.0	\$6,840,000
FY24	8.4	\$8,040,000
FY25	12.6	\$10,070,000
FY26	17.6	\$12,100,000
FY27	22.6	\$12,100,000
FY28	27.7	\$12,100,000
FY29	32.7	\$12,100,000
FY30	37.8	\$12,100,000
FY31	42.8	\$12,100,000
FY32	47.9	\$12,100,000
FY33	52.9	\$12,100,000
FY34	58.2	\$12,830,000
FY35	63.6	\$12,830,000
FY36	68.9	\$12,830,000

STREAM MILES IMPROVED ABOVE GOAL (SRRS)

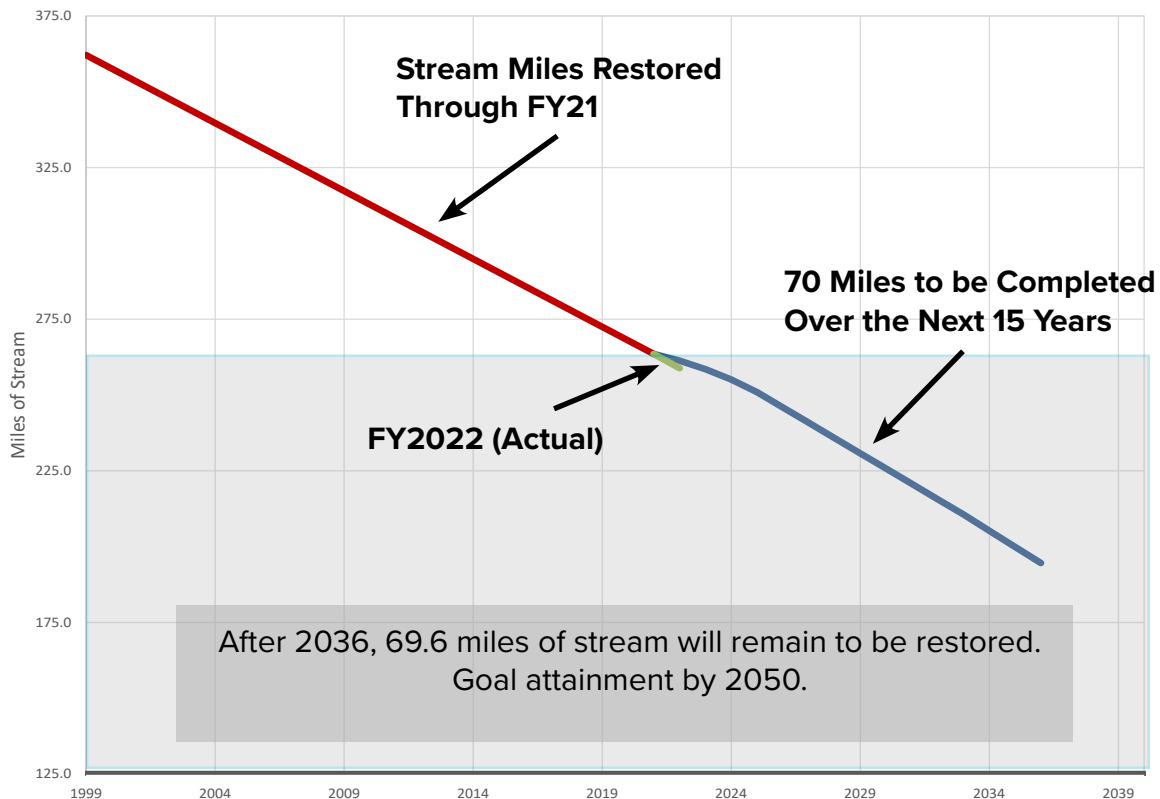
LOCATION	DATE	MILEAGE
LSC-Polk to SC State Line	July 2021	2.50 miles
Stewart Creek Tributary #2	February 2022	0.50 miles
Long Creek at Treyburn	May 2022	1.72 miles
		4.7 miles

Note: Green shading indicates actual data.

Program Overview



MILES OF STREAM RESTORATION AND 15 YEAR GOAL





Terminology

SRRS score (Stream Restoration Ranking System): SRRS is a data evaluation/collection process to quantify a stream's existing conditions and improvements after restoration activities.

PROJECT PHASES

Planning: Survey crews document the existing creek, drainage system and surrounding areas. The project team uses this information, along with other data and resident reported drainage concerns to evaluate the existing system.

Design: The project team develops detailed design plans for proposed water quality and drainage system improvements. Additionally, any required federal or state permits are secured.

Easement Acquisition: The project team works with property owners to acquire temporary or permanent easements. Easements allow Storm Water Services to access private property during construction and/or to provide future maintenance.

Bid: A competitive bidding process is held to select a qualified contractor to construct the project. By state law, the lowest responsive, responsible bidder is selected.

Construction: Residents, business owners and other stakeholders in the project area are notified when construction is expected to begin and end. Once construction is underway, the main point of contact is Storm Water Services' project manager.

Warranty: All materials and workmanship are guaranteed by the contractor for one year after the project is accepted. Storm Water Services' project managers conduct inspections during the warranty period. Upon notification, the contractor will return to the site to make repairs at no additional cost.



Toby & Mallard Creek Restoration Project at UNCC

1.9 MILES OF STREAM RESTORED · STORM WATER PARTNERSHIP WITH UNCC, CHARLOTTE WATER AND NC LAND & WATER

PROBLEM & SOLUTION

The stream restoration project includes approximately 7,900 linear feet of Toby Creek from W.T. Harris Boulevard to the confluence with Mallard Creek and approximately 1,800 linear feet of Mallard Creek from North Tryon Street to E. Mallard Creek Church Road. The stream restoration project was designed to stabilize eroding stream banks, and restore the floodplain to its natural state. The pre-construction SRRS score was **116** with a pre-construction design score of **241**, well above the goal of **230**.

CHALLENGES & OUTCOME

Working in tandem with Charlotte Water in a busy university environment was a challenge. Charlotte Water was installing a sewer line along Toby Creek while Storm Water was working on restoration in the creek. Pre-construction coordination allowed Charlotte Water to work upstream while Storm Water Stream restoration construction worked downstream.

ADDITIONAL NOTES

Stream restoration was highly visible with Mecklenburg County's Mallard Creek greenway running alongside the creek. Impacts to users of the greenway were minimized through communication and coordination. The primary concerns were centered around tree loss and reduction in shade for greenway users. Vegetation including live stakes and trees have been planted in some areas and will continue to be planted as weather conditions dictate. The UNCC Geography Department is using the restoration project as a learning opportunity for some environmental classes.





Historic Stewart Creek Phase II

1.2 MILES OF STREAM ENHANCED · SECOND PHASE OF A MORE THAN 3-MILE
ENHANCEMENT PROJECT ALONG STEWART CREEK

PROBLEM & SOLUTION

The stream enhancement project includes approximately 6,350 linear feet of Stewart Creek from States Street to Wilkinson Boulevard. The project objective is to repair eroded stream banks, improve water quality, improve wildlife and aquatic habitat, and reduce the amount of sediment in the water. A Charlotte Water sanitary sewer line runs along the creek and has been the source of discharges in the past. The pre-construction SRRS score was **161** with a pre-construction design score increased to **211**.

CHALLENGES & OUTCOME

A major challenge with this project is its location in a highly urbanized area of Mecklenburg County and a portion of the project is adjacent to a Mecklenburg County Greenway. Area residents were very concerned about a temporary closure of the greenway and the removal of large trees providing shade at Sevierville Park. These concerns were addressed through community outreach including letters, postcards and targeted video explaining the benefits of the project. For safety purposes a small section of the greenway was temporarily closed during construction for several weeks minimizing the impact to residents.

ADDITIONAL NOTES

Storm Water Services will continue to enhance a total of more than three miles of stream in this highly urbanized area of Mecklenburg County. Mecklenburg County Park and Rec Department is planning on extending the greenway from Freedom Drive downstream to Wilkinson Boulevard.



Early growth along Stewart Creek



Matting placed along stream bank

Little Sugar Creek-Polk Historic Site to South Carolina State Line

PROJECT GOAL

Grade the eroding stream banks & prevent future bank failures especially along vulnerable structures; Manage the grading and grading costs, and coordinate construction efforts with Mecklenburg County Park & Rec to provide beautification and protection for the Cross-Charlotte Trail and stream. **Projected SRRS score is 202.**

PROJECT OVERVIEW

STW is working with Mecklenburg County Asset and Facilities Management and Mecklenburg County Park and Rec to restore the stream. JD Goodrum, Inc was awarded the construction contract. The project will be completed in December 2023.

FUNDING NOTES

Cost: \$1.7 million per mile

Total funding: \$4,179,784.74 Mecklenburg County STW CIP.

<https://bit.ly/LittleSugarCreekPolktoStateline>



Historic Stewart Creek Stream Enhancement Project – Phase II

PROJECT GOAL

Grade and stabilize eroding stream banks and install stream structures to improve in-stream habitat; this will provide a new county-owned park and connect to existing greenways, improving water quality for the county, beautification and recreational enhancements, and improving habitat for native species. **Projected SRRS score is 224.**

PROJECT OVERVIEW

STW was awarded funding from the North Carolina Water and Land Fund (NCWLF) for construction. Blythe Development Company was awarded the construction contract. Project completed September 2021.

FUNDING NOTES

Cost: \$2.4 million per mile

Total funding: \$3,750,861.80 NCWLF & STW.

<https://bit.ly/StewartCreekPhaseII>





Historic Stewart Creek Enhancement Project Phase III

PROJECT GOAL

The objective of the project is to repair eroding stream banks, improve water quality, improve wildlife and aquatic habitat, and reduce the amount of sediment in the water. **Projected SRRS score is 224.**

PROJECT OVERVIEW

STW will construct an enhancement project on Stewart Creek from I-85 to La Salle St. in the third and final stage of the more than 3 miles project. The project is expected to begin in the fall of 2022 and be completed in 2023.

FUNDING NOTES

Cost: \$4.0 million per mile

Total funding: \$3,938,021 Mecklenburg County STW CIP 100%.

<https://bit.ly/StewartCreekPhaseIII>



Stewart Creek Tributary 2 Stream Enhancement Project

PROJECT GOAL

Water quality and ecological objectives associated with this project include improving stream stability, reducing sediment loading, improving in-stream habitat, and establishing a native riparian corridor. **Projected SRRS score is 226.**

PROJECT OVERVIEW

The Stewart Creek Tributary 2 Greenway and Stream Enhancement Project will improve creek banks to reduce erosion. This project is in partnership with Mecklenburg County Park & Rec Department that will extend the Stewart Creek Greenway by one mile.

FUNDING NOTES

Cost: \$1.8 million per mile

Total funding: \$596,242.90 Mecklenburg County STW CIP 100%.

<https://bit.ly/StewartCreekTributary2>



West Branch Rocky River Phase I – Tributary

PROJECT GOAL

The goal was to stabilize the tributary and main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation during all seasons of mother nature's storm events for decades to come. **Projected SRRS score is 228.**

PROJECT OVERVIEW

Storm Water Services partnered with the Town of Davidson, Mecklenburg County Park & Rec Department along with local landowners. This is the first phase of a three phase project along the West Branch Rocky River and the tributary. The added length of the tributary will extend to the limits of the FEMA Floodplain.

FUNDING NOTES

Cost: \$1.13 million per mile

Total funding: \$1,922,269 North Carolina Soil & Water \$39,952

STW \$1,882,317.

<https://bit.ly/RockyRiverWestBranchPhase1>



West Branch Rocky River Phase II

PROJECT GOAL

The goal will be to stabilize the tributary and main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation. The project will extend from the confluence of the tributary to Gray Road (approx. 5,000 ft.). **Projected SRRS score is 224.**

PROJECT OVERVIEW

As of 7/2022 the project is in the design. The project has been delayed by the input of stakeholders on the project design. The total project, all three phases, will restore over 19,000 linear feet of stream in the Rocky River Watershed in the Town of Davidson.

FUNDING NOTES

Cost: \$3.2 million per mile

STW Total funding: \$3,200,000

<https://bit.ly/RockyRiverWestBranchPhase2>





Long Creek Phase I, I-77 to Dixon Branch

PROJECT GOAL

The goal of this project is to stabilize eroded stream banks, restore the floodplain to its natural state and function, change the stream path to a more natural design, improve habitat for aquatic life, and enhance water quality. **Projected SRRS score is 230.**

PROJECT OVERVIEW

Charlotte-Mecklenburg Storm Water Services and Mecklenburg County Park and Rec are restoring the stream and constructing a greenway trail along Long Creek and Dixon Branch. A grant received from the NCWTF will partially fund the construction of this project.

FUNDING NOTES

Cost: \$2.5 million per mile

Total funding: \$3,501,434.96 NCWTF \$400,000 STW \$3,101,434.96.

<https://bit.ly/LongCreekPhase1I77toDixonBranch>



Long Creek Phase II Treyburn to I-485

PROJECT GOAL

The goal of this project is to stabilize eroded stream banks, restore the floodplain to its natural state and function, change the stream path to a more natural design, improve habitat for aquatic life, and enhance water quality. **Projected SRRS score is 221.**

PROJECT OVERVIEW

Mecklenburg County Storm Water Services and Mecklenburg County Park and Rec will add new greenway and stream improvement. NCLWF provided grant funding for the County Storm Water Services portion of the project only.

FUNDING NOTES

Cost: \$2.8 million per mile

Total funding: \$4,842,891 NCWLF \$400,000 & STW \$4,442,891.

<https://bit.ly/LongCreekPhase2TreyburnDrive>



West Branch Rocky River Phase III

PROJECT GOAL

The restoration of Phase III was be put on hold waiting for consensus from the public and Mecklenburg County Park and Rec input. The schedule for the current phase of the project has been moved back to permitting and design. The goal will be to stabilize the main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation. The existing SRRS score is **110**.

PROJECT OVERVIEW

The location of the project is along the Mecklenburg County greenway running through Fisher Farms in the Town of Davidson. Because of the project's proximity to a very popular and heavily used greenway, local public feedback has been significant and has questioned the importance of the restoration. A new design is in progress.

FUNDING NOTES

Cost: \$4.3 million per mile

Estimated total funding is approximately \$2,500,000

<https://bit.ly/RockyRiverWestBranchPhase3>



Toby and Mallard Creek at UNCC

PROJECT GOAL

The stream restoration was designed to stabilize eroding stream banks, restore the floodplain to its natural state and function, improve habitat for aquatic life, improve stream buffer with species diversity and additional plants, and enhance water quality. **Projected SRRS score is 241.**

PROJECT OVERVIEW

STW worked in partnership with Charlotte Water in a busy university environment was challenging. Charlotte Water was replacing a sanitary sewage line along Toby Creek while Storm Water was working on restoration in the creek. UNC-Charlotte was a significant partner as the majority of the stream restoration was through campus.

FUNDING NOTES

Cost: \$3.2 million per mile

Total funding: \$6,501,230 NCWLF \$ 400,000 & STW \$6,101,230.

<https://bit.ly/MallardCreekTobyCreekatUNCC>





Upper Torrence Tributary 1

PROJECT GOAL

Water quality and ecological objectives associated with this project include improving stream stability, reducing sediment loading, improving in-stream habitat, reconnecting the stream to a floodplain, and establishing a native riparian corridor. **Projected SRRS score is 244.**

PROJECT OVERVIEW

An interlocal agreement was approved between the Town of Huntersville and Mecklenburg County for funding the design and construction of the Upper Torrence Tributary stream restoration project. The Town and County constructed approximately 6,133 ft. of stream restoration along Torrence Tributary #1. The County portion of the project was 1,566 ft. of the major system.

FUNDING NOTES

Cost: \$1.6 million per mile
Total funding \$476,919.99

<https://bit.ly/UpperTorrenceCreekTributary1>



Kings Branch

PROJECT GOAL

The project has dual goals of reducing flood risk and improving water quality within the project area. The project will stabilize eroded stream banks, restore the floodplain to its natural state and function, improve habitat for aquatic life, and enhance water quality. **Projected SRRS score is 213.**

PROJECT OVERVIEW

FEMA Grant funding has been approved. The proposed project will reduce base flood elevations by as much as 4.6 ft. at the Lexington Green Apartments.

FUNDING NOTES

Cost: \$4.0 million per mile
Total funding: \$4,600,865 NC Hazard Mitigation Grant \$3,054,000 & STW \$1,546,865.

<https://bit.ly/KingsBranchArchdaleToArrowood>



Funding and Partnerships

NORTH CAROLINA LAND AND WATER FUND

(NCLWF), formerly known as the Clean Water Management Trust Fund, has conserved well over one-half million acres and protected or restored 3,000 miles of streams and rivers.

Toby Creek NCLWF	\$400,000	Awarded 2018
Long Creek Phase 1	\$400,000	Contract executed 2018
Long Creek Phase 2	\$400,000	Contract executed June 2020
Long Creek Phase 3	\$400,000	Contract executed Sept 2021
Long Creek total	\$1,200,000	2018-2021
Stewart Creek	\$425,000	Contract executed 2018



Stewart Creek Phase 2

SUBMITTED FOR GRANT CYCLE FEB 2022 FY22

Irwin Creek	\$700,000
Reedy Creek	\$750,000



Construction along Stewart Creek in 2018

NORTH CAROLINA SOIL AND WATER FUND

The NCS&W Fund improves water quality, sustains ecological diversity, and protects historic sites and military installations by funding projects to acquire lands, restore the habitat for fish, wildlife, and other species, and enhance the filtering of stormwater runoff to reduce pollutants from entering water supplies.

West Branch Rocky River Phase I Trib.	\$39,952
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FEMA HAZARD MITIGATION GRANT PROGRAM

FEMA HMGP provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans and rebuild in a way that reduces, or mitigates, future disaster losses in their communities.

Kings Branch	\$380,000	Dec 2020
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Pre-construction along Irwin Creek



Maintenance

Maintenance is critical to the success of the CIP Program. Annual inspections are performed to identify maintenance issues, which are then reported to Operations. Channel stability repairs and invasive species management are completed by Storm Water Operations staff.

Inspection

At the end of a Water Quality CIP project's warranty period, post-construction inspections are conducted annually (minimum of 20 years). Visual inspections evaluate/document conditions of in-stream structures, streambank/buffer vegetation, Stormwater Control Measures (SCMs) and any easement encroachments. Inspection findings are digitally saved in the Environmental Data Management System (EDMS) and reported to designated staff (e.g., Project Manager, Storm Water Operations) for any corrective action(s).

Monitoring

To ensure long-term project success, each WQ CIP project has a 20-year monitoring plan, including a post-construction SRRS Field Score assessments. Assessments are intended to monitor channel stability and habitat improvements over time. The Construction SRRS Field Score (Monitor Year or MY1) is the benchmark SRRS Field Score for long term success.

The following post-construction SRRS Field Score assessments (Table below) were performed during FY22.



Stream walk monitoring through completed project



Stream walk monitoring through completed project

Post-construction SRRS scores for completed projects

PROJECT LOCATION	PRE-CONSTRUCTION SRRS FIELD SCORE	DESIGN SRRS FIELD SCORE	CONSTRUCTION SRRS FIELD SCORE (MY1)	MY2 SRRS FIELD SCORE
Briar Creek (Briar Chantilly)	174	223	215	206
Edwards Branch (Briar Chantilly)	179	260	217	206
Torrence Creek (The Parks)	111	244	272	176*
Briar Creek (Mint Museum)	173	201	216	216
LSC (Archdale to 485)	134	196	193	202
Stevens Creek	169	258	279**	

*Low SRRS score during MY2 field scoring due to damage from beavers.

**SRRS score exceeds the 230 project goal and is the highest score recorded to date.



FY 2023

Looking Ahead

Future Flood Mitigation

Implementation of the McDowell Farms neighborhood Hazard Mitigation Grant Program (HMGP) funding is a top priority for acquisition efforts. The grant was awarded in FY22, however increases in real estate values since the 2018 disaster declaration have complicated implementation. Staff continues to work with North Carolina Emergency Management to identify options to ensure property owners are offered fair market value while retaining the HMGP funding. The RARR plan has identified several properties in upper Briar Creek watershed and in Mint Hill as recommended for acquisition (FY21 CIP Report, Appendix D). In FY22 staff will explore eligibility of these properties for funding under traditional federal flood mitigation grants. One of the biggest challenges with buyout program is local housing sales are at premium prices. Staff will continue to explore all opportunities for partnerships, opportunistic acquisitions and buyouts. Some of the possibilities may include additional acquisitions in previously mitigated areas, such as Madison Park and Sherwood Forest. Furthermore, flood events in FY23 that result in mitigation opportunities could be pursued. Ongoing retroFIT projects will continue to be pursued in FY23 along with updates to the policy manual. Overall, a cumulative 13,000 risk points are targeted for mitigation by the end of FY23.

Mounting Rock Road



Sky views of McDowell Farms





Stevens Creek Tributary

Future Water Quality

The goal of the WQ-CIP during FY23 will be the restoration of a cumulative 5.0 miles of stream restoration. Additionally, STW will increase SRRS field assessments from 10 to 20 stream reaches per year. Efforts will focus on beginning design on 2-3 projects and bid construction contracts for 3-4 projects. Staff will review additional SRRS field scores to potentially initiate the feasibility phase for new projects in FY24 and beyond. SRRS field assessments will continue at a rate of approximately 20 reaches per year. Selection of SRRS reaches for field assessment is based upon SRRS desktop scores, grant opportunities, partnership opportunities, service requests and property considerations.

J-hook stream feature in Steven's Creek



Stream restoration information sign





Torrence Creek after a heavy rain event

CIP Emergency Day Rainy Fund

To plan for future disasters, CMSWS completed a failure funding analysis of CIP program. The analysis was based upon a series of Monte Carlo simulations that evaluated both the likelihood of the failure of a previously constructed stream restoration project as well as a significant flood event resulting in the activation of a 'Quick-Buy' funding approach. For the water quality CIP, each of the previously constructed stream projects was evaluated for potential failure through projections of failure rates over time. The 'Quick-Buy' program was evaluated using the value of building stock likely to be impacted during specific flood events (2, 5, 10, 25, 50, 100 and 500-year events). From the analysis, an emergency funding allocation of \$5.0 million was recommended for both the water quality and flood mitigation CIP. CMSWS will evaluate the emergency funding allocation on an annual basis and modify as necessary.

Flooding along the Catawba River, June 2019



