

N.C. Department of Agriculture and Consumer Services

A more resilient agriculture and forest landscape contributes significantly to a more resilient North Carolina while also mitigating the effects of climate change. The North Carolina Department of Agriculture and Consumer Services (NCDA&CS) manages significant and diverse activities and programs across its 21 divisions which have a goal of creating a more resilient and economically viable future for North Carolina.

A farmer was once quoted as saying, “A dry year will scare you and a wet year will break you.” This statement is not only relative to weather patterns but also to the far-reaching impacts of weather on North Carolina’s environment, landscape and economy. Relative to the changing landscape and weather patterns of our state, inland flooding is recognized as a far-reaching concern by NCDA&CS.

Specific concerns for our communities and ecosystems attributed to inland flooding from likely increases in annual rainfall and impervious land surfaces correlated to land use changes include:

- Inland communities across the state are at risk from flooding due to extreme precipitation and outdated and/or undersized storm drainage infrastructure.
- Increased inland flooding caused by extreme precipitation events will further increase economic and agricultural losses after a flooding event.
- More frequent flooding will impact inland habitats, fisheries and the protective services that natural areas provide to local communities.
- Inland flooding will continue to damage archaeological and historic sites on floodplains across all three physiographic regions and within every river basin in the state.
- Increased or more frequent flooding events may negatively impact both the quantity and quality of our inland water supplies.

Recognizing these concerns, NCDA&CS continues to implement programs within the mission of the department to be proactive in associated mitigation practices that will benefit the residents of our state. Various divisions of the department are actively pursuing research and implementation of such practices along with opportunities to partner with other agencies and entities. Following are examples of current efforts of the department related to inland flooding:

- The Stream Debris Removal program works with 98 local sponsors to remove debris that is blocking stream flow and potentially contributing to flooding of adjacent and/or upstream cropland and communities. Since October 2019, local sponsors have completed over 792 miles of debris removal and stream repair. These same local sponsors are currently contracted to complete another 1,293 miles of debris removal and streambank restoration activities to further protect ag land, forest land and communities.

- Increasing on-farm water storage through the Agricultural Water Resources Assistance Program (AgWRAP) to assist agricultural producers and landowners in constructing and enhancing ponds and water collection. On-farm storage of water flattens the runoff hydrograph to reduce peak runoff, which lessens downstream flood potential. On-farm storage also increases water available for irrigation when needed. Since October 2019, the Department has assisted in the construction of 15 new ponds, restored storage capacity of 24 existing ponds, and repaired or reconstructed 10 ponds. The Department has agreements in place to install, repair or replace an additional 49 ponds.
- Upgrading existing irrigation systems to improve efficiency of irrigation methods, thereby reducing the demand on water resources for agricultural production. Since October 2019, NCDA&CS has assisted 8 agricultural producers in upgrading their existing irrigation systems with agreements in place to assist an additional 20 producers to implement conservation irrigation conversion.
- NCDA&CS oversees education and implementation of cover crop, conservation tillage and cropland conversion programs. These practices result in many climate resiliency benefits, including:
 - Improved water quality from increased nutrient scavenging and cycling leading to a reduction in sedimentation and agricultural chemical inputs.
 - Stormwater management leading to increased rainfall infiltration and decreased soil erosion and runoff.
 - Drought resilience from improved efficiency in soil moisture use and increased soil water holding capacity.
 - Increasing plant biomass and soil carbon storage leads to an improved means for carbon sequestration.
 - It is noted that since October 2019, through the Agriculture Cost Share Program (ACSP), the Department has assisted producers to implement these beneficial climate conservation practices on 20,592 acres of cropland. ACSP agreements are currently in place to assist producers with 22,912 additional acres.
- Implementation of adaptive practices for controlling excessive rainwater overflow, turbidity and settleable solids in our aquaculture industry has been accomplished through partnerships with N.C. Soil and Water Conservation Districts, NCDA&CS, N.C. Farm Bureau, N.C. State University and the N.C. Department of Environmental Quality - Division of Water Resources.
- Trees help to reduce erosion and anchor topsoil along with providing a canopy to more evenly disperse rainfall. Through the Forest Development Program (FDP) and Florence Restoration Fund (FRF) over 20 million tree seedlings have been planted on over 34,000 acres during FY19-20.

- Research Stations are hosting trials to evaluate and develop crops and tree species with improved tolerance to flooding. Additionally, the Cherry Research Station in Goldsboro has ongoing work to improve berms and drainage systems to serve as a test location for evaluating production practices in areas of high flood risk.
- Funding has been secured by the Plant Conservation Program (PCP) to address existing culvert and road wash-out concerns at coastal plain preserves. At present, operations are on hold as drier conditions are required before initiating earthwork activities.
- Preserving upstream farms in the Piedmont and Sandhills region of North Carolina is a phased project that aims to reduce the negative impacts of soil erosion and runoff in river basins. Conservation easements will be placed on around 4,900 acres of farms and forests in the Upper Cape Fear River Basin. The working lands that are preserved are actively managed by farmers, providing essential benefits such as erosion control, carbon sequestration, rainwater percolation, waterway buffer protection and permeable surfaces. For a fuller picture, more than 23,500 additional acres of farmland statewide are currently under contract for perpetual conservation easements, further limiting the area of impervious surfaces.

NCDA&CS continues to research, educate, and assist the residents of our state with implementation methods to minimize inland flooding. The Department continues to work with “upstream” neighboring states to identify means that we may work on together to decrease inland flooding as well as improve water quality. Impacts from inland flooding can be both economically devastating as well as damaging to our state’s landscape and environment. With the ongoing positive efforts facilitated by NCDA&CS, the department foresees a continuation of positive outcomes in minimizing inland flooding not only during wet periods, but also during drought conditions.