

North Carolina's Land and Water Yesterday, Today, and Forever

A Survey of North Carolina's Land and Water Funding

May 2018

Prepared under contract to
North Carolina Forever

Prepared by
Kyle Clark-Sutton, Julia
Hofmann, Sara VanLear, &
Michael Gallaher

RTI International
3040 E. Cornwallis Road
Research Triangle Park, NC
27709

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Acknowledgements

RTI International relied on both data and expert input from a variety of stakeholders in the land and water conservation community in North Carolina and around the country. We would like to thank those who supported this study by providing data and their expertise. For this study, RTI interviewed 35 individuals from a variety of backgrounds, including state legislators and policy experts, conservation experts from national organizations and the North Carolina conservation community, and state government officials.

About NC Forever

NC Forever is a consensus-based organization whose mission is to advocate for state funds and related policies needed to conserve and protect North Carolina's lands and waters for the purpose of making the state a better place to live, work, and do business for all.

NC Forever partners include businesses and nonprofit organizations in North Carolina that have come together to accomplish this mission. Partners are:

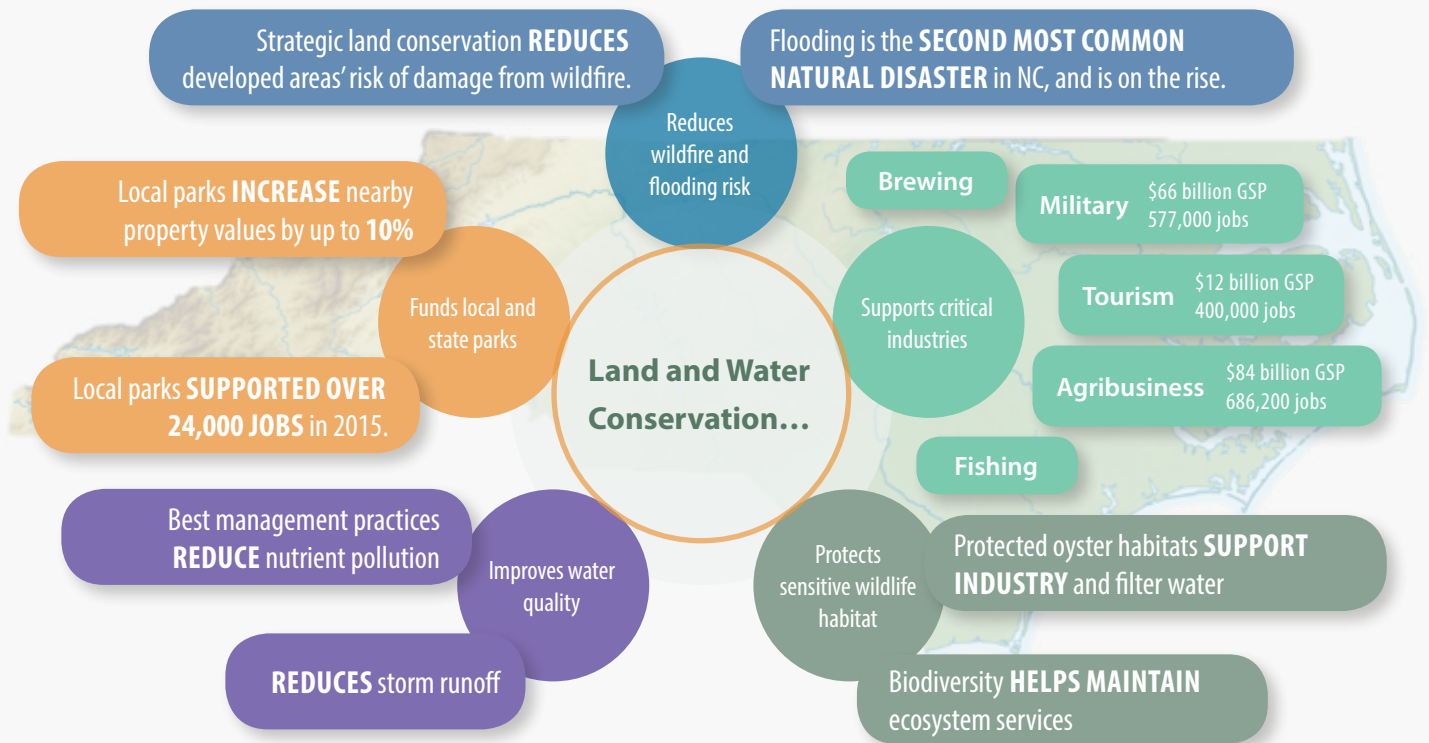
- Blue Cross Blue Shield of North Carolina
- Environmental Defense Fund
- Friends of State Parks
- NC Association of Soil and Water Conservation Districts
- Audubon North Carolina
- NC Coastal Federation
- NC Farm Bureau
- NC Forestry Association
- NC Recreation and Park Association
- Partners for Parks
- Martin Marietta
- Site Collaborative
- Smithfield Foods

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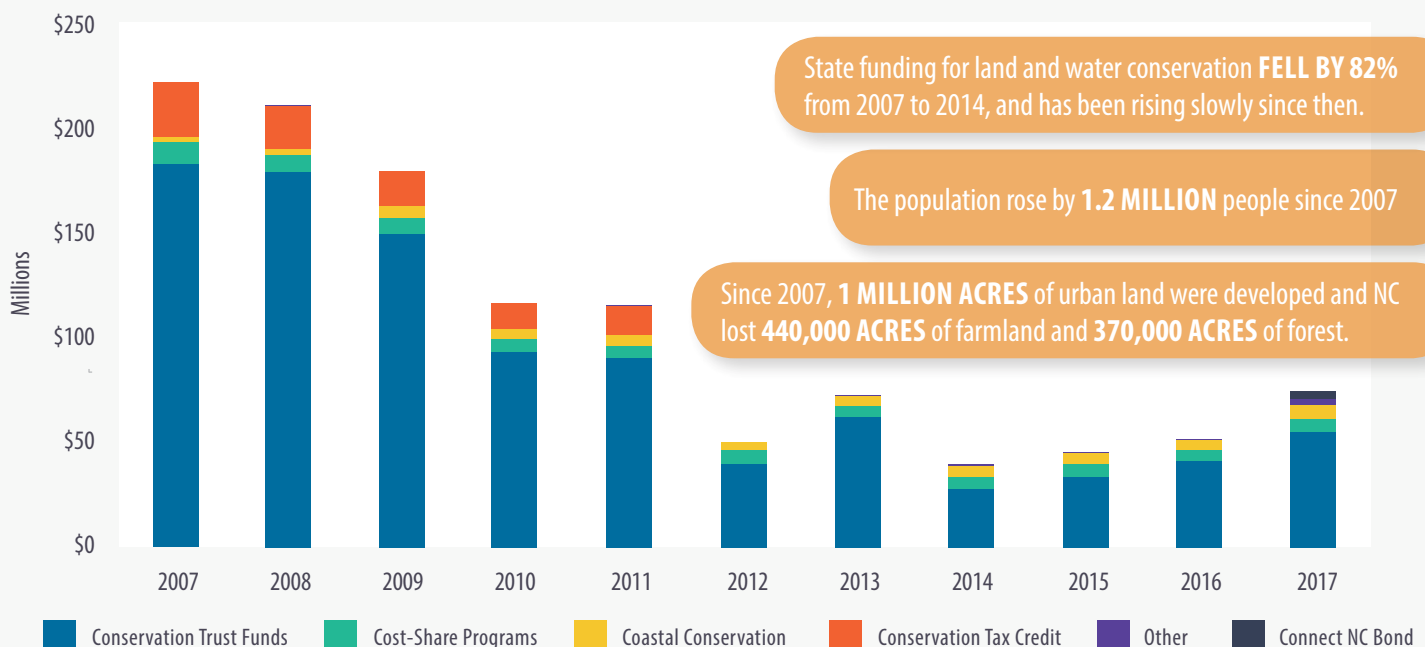
A Survey of North Carolina's Land and Water Funding



Land and water conservation play an important role in supporting a healthy environment, sustainable growth, and a vibrant North Carolina economy.



Land and water conservation funding has been rising gradually since 2014 after falling sharply for several years. However, funding is still insufficient given the land and water conservation needs of the state.



North Carolina has a strong land and water conservation infrastructure in place, and best practices from around the country can provide insight into effective strategies.

NORTH CAROLINA'S LAND AND WATER CONSERVATION INFRASTRUCTURE

Trust Funds. North Carolina's three trust funds provide transparent and objective criteria to help allocate funding. The trust funds support land conservation for water quality, parks and recreation, and farmland preservation. Since 2007, they have funded nearly \$1 billion in land and water conservation investments, but 72% of that funding came before 2012 as funding has fallen substantially since then.

Cost-Share Programs. Cost-share programs incentivize landowners to invest in improving water quality and supply through best management practices on their land. North Carolina cost-share programs have prevented nearly 10 million pounds of nitrogen and phosphorous from entering waterways and have protected over 1,000 miles of stream from erosion, sedimentation, and nutrient pollution.

Coastal conservation and restoration. A variety of programs are working to protect water quality and shorelines on the coast, which provide rich wildlife habitats and support numerous thriving industries, including tourism, commercial fishing, and shellfish.

TOOLS FOR STRENGTHENING LAND AND WATER CONSERVATION IN NORTH CAROLINA

Dedicated Revenues. Tax revenues that are statutorily dedicated to land and water conservation help ensure more consistent funding, which is critical for projects that require years of planning and complex multi-stakeholder agreements to succeed.

What is land and water conservation?

For this report, we consider state funding that supports the quality, health, diversity, and economic value of North Carolina's land and water resources, including:

- Land conservation
- Cost-share programs supporting water quality and supply through best management practices
- Farmland preservation and restoration
- Coastal habitat conservation and restoration
- Storm water and wastewater infrastructure

Tax Credits. North Carolina was the first state to implement a land conservation tax credit in 1983, but it was discontinued in 2013. Tax credits allow the state to secure a conservation easement or receive donated land at below market value. Virginia, South Carolina, and Georgia leverage tax credits to incentivize conservation.

Bridge Financing. Conservation groups frequently face a gap between when funding for land is available and when the land needs to be secured. Bridge financing programs offer low interest loans to help conservation groups bridge this gap, allowing them to secure more land when the market is right. State programs like the Georgia Environmental Finance Authority provide valuable support for land acquisition at very low cost to government.

About this report

NC Forever contracted with RTI International to conduct a survey of North Carolina's land and water conservation funding and the benefits of investing in land and water conservation.

This report examines North Carolina's land and water conservation funding over the last ten years (FY2007 to FY2017). Specifically, we collected data on voluntary state funding sources. Federal or local sources of funding and any funding that is allocated to fulfill a federal mandate are not quantified in this study.

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- Environmental Defense Fund
- Friends of State Parks
- NC Association of Soil and Water Conservation Districts
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- NC Farm Bureau
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1 Introduction

North Carolina is rich in land and water resources that serve as natural infrastructure supporting the economy and population of our state. Working forests, farms, clean water, open space, and a varied landscape of coastal, piedmont and mountain lands and waters support thriving industries from wood products and sweet potatoes to beer, tourism, and shellfish. State and local parks and greenways, public gamelands, mountain vistas and miles of shoreline also make North Carolina an attractive destination for visitors and new residents. Finally, this natural infrastructure provides critical ecological services to the people of North Carolina by cleaning our water and air, mitigating damage from natural disasters, and supporting healthy soil and wildlife habitats.

From 2007 to 2017, North Carolina added almost 1.2 million people to its population—the fourth largest increase in the country during this time period.¹ As the population increases, the pressure placed on finite land and water resources will also increase. Urban development is driving a rapid conversion of farm and forest land, and both urban and rural activity affect the quality of North Carolina's water.² Funding for land and water conservation can help mitigate some of the effects of human activity and population growth on our natural infrastructure by reducing agricultural runoff into waterways³, controlling urban pollution and reducing flooding through storm water infrastructure⁴, and protecting wildlife habitat through strategic land acquisition and other measures.⁵

RTI examined the past, present, and future possibilities of land and water conservation funding in North Carolina. In Sections 2 and 3, we discuss North Carolina's historical approach to land and water conservation and present an analysis of the state of funding today in the context of our

rapid growth trajectory and changing climate. We also present research that shows how land and water conservation funding supports the North Carolina economy.

For this report, RTI examined the past, present, and future possibilities of land and water conservation funding in North Carolina.

Section 4 presents high-level data about North Carolina's funding for natural resources and parks and recreation in the context of the rest of the country. In Sections 5 through 8, we examine key areas of opportunity for ensuring that land and water conservation funding is adequate to keep pace with growth and sustain North Carolina's land and water resources for the long term:

- Conservation trust funds
- Cost-share programs
- Coastal resources
- Storm water and wastewater infrastructure

1.1 WHAT IS LAND AND WATER CONSERVATION?

Frequently, conservation is thought of in terms of common land conservation practices, particularly land acquisition and easements for conservation purposes. For the purposes of this report, we address land conservation more broadly, considering other investments

1 U.S. Census Bureau. 2017. State Population Totals. Retrieved from <https://www.census.gov/programs-surveys/popest/data/tables.html>.

2 See Section 3.2

3 Lovell, S. T., & Sullivan, W. C. (2006). Environmental benefits of conservation buffers in the United States: evidence, promise, and open questions. *Agriculture, ecosystems & environment*, 112(4), 249-260.

4 Braden, J. B., & Johnston, D. M. (2004). Downstream economic benefits from storm-water management. *Journal of Water Resources Planning and Management*, 130(6), 498-505

5 Bennett, A. F. (1999). Linkages in the landscape: the role of corridors and connectivity in wildlife conservation (No. 1). *Lucn*.

and programs that support the quality, health, diversity, and economic value of North Carolina's land and water resources in addition to the more traditional conservation measures. These broader strategies include

- cost-share programs that incentivize best management practices on farmland and forestland to protect and enhance water quality,
- farmland preservation funding and programs,
- coastal habitat restoration and water quality funding, and
- storm water and wastewater infrastructure funding.

1.2 SCOPE OF ANALYSIS AND OUR APPROACH

This report examines North Carolina's land and water conservation funding over the last ten years (FY2007 to FY2017). Specifically, we collected data on voluntary state funding sources. Thus, although some state investments unlock federal matching dollars or act as a match to local investment, any federal or local sources of funding and

any funding that is allocated to fulfill a federal mandate are not quantified in this study. Additionally, we do not quantify funding allocated to satisfy federal or state regulations.

When deciding how to quantify land and water conservation funding, we consulted with state government officials to define specific programs and funding mechanisms that should be considered a part of the overall network of land and water conservation programs and capacity that the state has established. Figure 1 provides a specific list of programs considered part of that network of state land and water conservation funding in North Carolina.

The analysis in this report relies on extensive data collection on land and water conservation funding in North Carolina and other states, as well as interviews with 35 experts and stakeholders. The report appendices present data collected about neighboring states to add context to the report and provide a resource to others interested in how neighboring states approach land and water conservation.

Figure 1-1. Land and Water Conservation Funding in North Carolina

Conservation Trust Funds

- Clean Water Management Trust Fund
- Parks and Recreation Trust Fund
- Agricultural Development and Farmland Preservation Trust Fund
- Natural Heritage Trust Fund (discontinued in 2013)

Coastal Conservation

- Albemarle-Pamlico National Estuary Partnership (APNEP)
- Artificial Reef Program
- FerryMon
- North Carolina Coastal Reserve and National Estuarine Research Reserve Program
- Oyster Sanctuary Program
- Shellfish Rehabilitation Program

Tax Credits

- North Carolina Conservation Tax Credit (discontinued in 2013)

Cost Share Programs

- Agriculture Water Resource Assistance program
- Community Conservation Assistance Program
- Agricultural Cost Share Program
- Forest Development Program

Bonds

- Connect NC Bond (2016)

Other

- Natural Heritage Program
- North Carolina Science Museums Grant Program

2 North Carolina's Conservation Legacy

North Carolina has a rich legacy of land and water conservation that dates back more than 100 years to the establishment of the first state park at Mt. Mitchell. In the early 1970s, North Carolina enacted forward-thinking environmental laws, including the State Environmental Policy Act and the Coastal Area Management Act. More recently, in 1983, North Carolina led the way as the first state to implement a tax credit to incentivize putting private land into conservation through donation or an easement.⁶ Over its lifetime, the tax credit supported the protection of 262,000 acres of land.⁷ In addition, at its peak, the Clean Water Management Trust Fund (CWMTF) provided a robust \$100 million dollars a year to support the acquisition of lands of high conservation value to protect water quality in the state.⁸ While the CWMTF always relied on appropriations for its funding, funding for the Natural Heritage Trust Fund and Parks and Recreation Trust Fund was secured until 2013 by a steady flow of dedicated revenue from a portion of the deed stamp tax.

North Carolina is also consistently recognized as having one of the best state parks systems in the country. In 2009, 2011, and 2013, North Carolina's state parks system was a finalist for the National Recreation and Park Association's (NRPA) National Gold Medal Award.⁹ The Gold Medal Award recognizes parks systems for excellence in resource management, long-term planning, and innovative practices.

On the coast, North Carolina has been a leader in oyster habitat conservation in the Southeast, which provides water quality benefits and supports a growing aquaculture



Mount Mitchell State Park
(Photo credit: Tom Eamhardt)

North Carolina has a rich legacy of land and water conservation that dates back more than 100 years to the establishment of the first state park at Mt. Mitchell.

industry and promises to provide a new source of economic development for the region.

North Carolina has also innovated to advance conservation while leaving land in the hands of private land owners. The Agricultural Development and Farmland Preservation Trust Fund (ADFPTF) provides funding to secure easements on farmland to ensure that it is not converted to other uses.

In addition to recurring commitments to land and water conservation through the state budget, North Carolina has funded land and water conservation through bond measures, including the Connect NC bond, which was approved in 2016. The Connect NC bond provides \$75 million for state parks, over \$300 million to local governments for upgrading water infrastructure, and \$3 million for local parks.¹⁰

⁶ Conservation Resource Center. (2007). State Conservation Tax Credits: Impact and Analysis. Retrieved from <http://www.taxcreditexchange.com/documents/realfinalversion.pdf>.

⁷ North Carolina Department of Environment and Natural Resources. (2014). Conservation Tax Credit Program Annual Report. Retrieved from https://web.archive.org/web/20180225161952/http://portal.ncdenr.org/c/document_library/get_file?uuid=e1f24986-2cbd-4155-8031-24c925db1052&groupId=5118328

⁸ Data provided by the North Carolina Department of Natural and Cultural Resources

⁹ National Recreation and Parks Association. (2014). National Gold Medal Awards State Park Award Winners and Finalists. Retrieved from https://www.nrpa.org/uploadedFiles/nrpa.org/Membership/Awards/Gold_Medal/Gold%20Medal%20Winners%20-%20State%20Parks.pdf.

Despite this long legacy, as with most states in the country, funding for land and water conservation declined rapidly during and after the Great Recession in North Carolina. From 2007 to 2017, appropriated funds fell by 66% from \$220 million to \$74.4 million. At its lowest level in 2014, funding was down by 82% from 2007 levels.

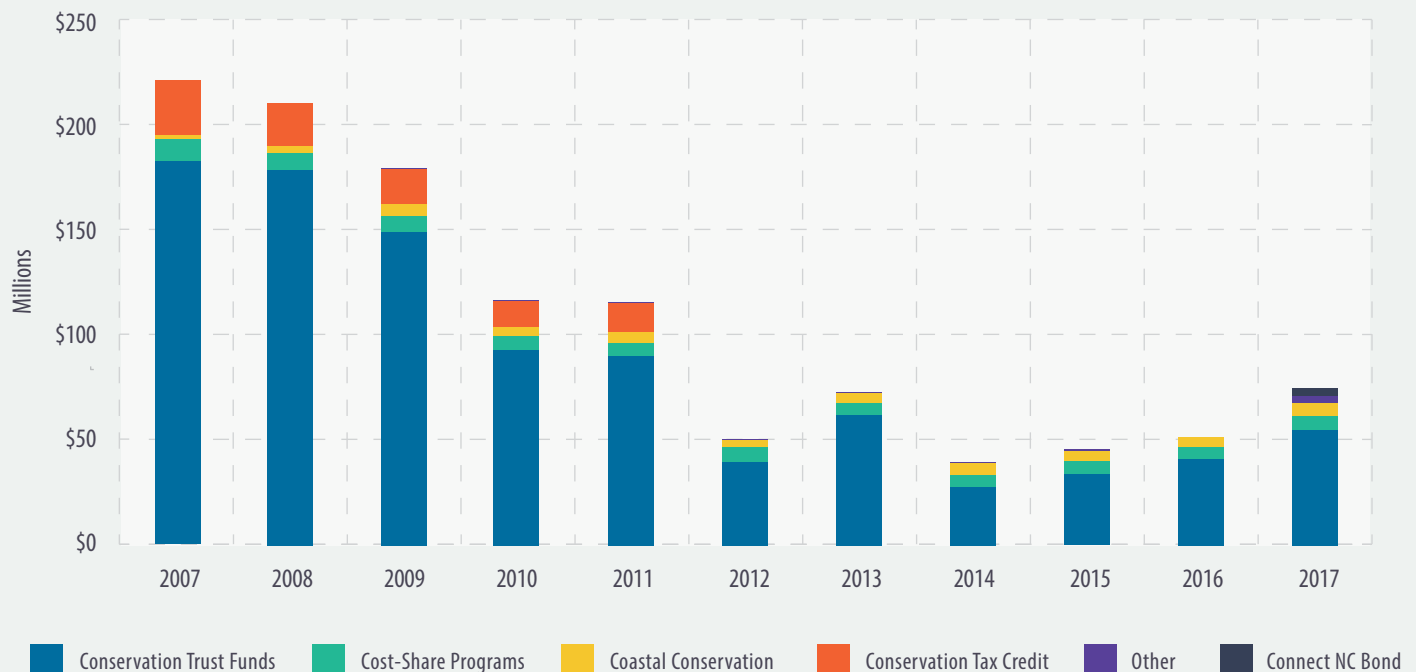
Figure 2-1 and Table 2-1 present funding levels for land and water conservation in North Carolina from 2007 to 2017 based on the list of programs included in Figure 1-1. Program-level funding information is detailed in Appendix A. All data was provided by the departments overseeing the programs included. Table 2-2 details the breakdown of allocated and spent funds for land and water conservation from the Connect NC Bond as of October 2017.¹¹

From 2007 to 2017, state funding for land and water conservation fell by 66%. At its lowest level in 2014, funding was down by 82% from 2007 levels.



(Photo credit: Allison Raber)

Figure 2-1. Funding for Land and Water Conservation in North Carolina (\$millions of dollars)



¹⁰ Connect NC Bonds Tracking System. (2017). Retrieved from <https://www.ncleg.net/documentsites/committees/bcci-6659/2017/Meetings/10-11-2017/Connect%20NC%20Bond%20Expenditures.pdf>.

¹¹ Ibid.

Table 2-1. Land and Water Conservation Funding (2007–2017, \$ millions, except per capita)

FUNDING TYPE	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Trust funds	\$181.2	\$177.8	\$148.4	\$92.6	\$89.9	\$39.6	\$61.7	\$27.5	\$33.6	\$41.0	\$54.7
Tax credit	\$25.7	\$20.0	\$16.5	\$12.0	\$13.5	\$0.0*	\$0.0*	\$0.0	\$0.0	\$0.0	\$0.0
Ag & forestry	\$10.5	\$8.1	\$7.6	\$6.2	\$5.8	\$6.7	\$5.6	\$6.0	\$6.2	\$5.3	\$6.3
Coastal	\$2.4	\$3.5	\$5.8	\$5.1	\$5.7	\$3.7	\$4.8	\$5.3	\$4.9	\$4.7	\$6.4
Bonds	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3.6
Other	\$0.0	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.8	\$0.8	\$0.5	\$3.3
Total	\$219.9	\$209.7	\$178.9	\$116.3	\$115.3	\$50.4	\$72.5	\$39.6	\$45.5	\$51.5	\$74.3
\$ Per Capita	\$24.12	\$22.53	\$18.93	\$12.15	\$11.94	\$5.17	\$7.36	\$3.98	\$4.53	\$5.07	\$6.89

* Data on conservation tax credits claimed are not available for 2012 and 2013.

i Numbers may not sum to total due to rounding

Table 2-2. Funding for Land and Water Conservation from Connect NC Bond (Expenditures as of October 2017, \$millions of dollars)

CATEGORY	ALLOCATED	SPENT
Local Parks	\$3.0	\$0
State Park Land Acquisitions	\$14.1	\$1.8
State Park Facilities Improvements	\$60.9	\$1.8
Water System Grants	\$100.0	\$0
Water System Loans	\$209.5	\$0
Total	\$387.5	\$3.6

3 The Case for Land and Water Conservation

During the last decade of declining funding for land and water conservation, the pressure on land and water resources has sustained or increased across several fronts. Furthermore, analysis of projected growth suggests that North Carolina will continue to experience increasing demand for land and water resources. This section lays out key factors driving the need for land and water conservation and presents research on the benefits of land and water conservation.

3.1 POPULATION GROWTH

Over the last decade, North Carolina has been one of the fastest growing states in the country, adding 1.2 million people since 2007. Growth is projected by the North Carolina Office of Budget and Management to continue at roughly the same pace for the next decade, reaching a total of 11.4 million in population by 2027 and 12.3 million by 2035. While projections indicate that growth will be most intense around existing urban areas (see Figure 3-1), population increases will also be distributed across the state with 49% of counties experiencing over 10% growth by 2035.¹²

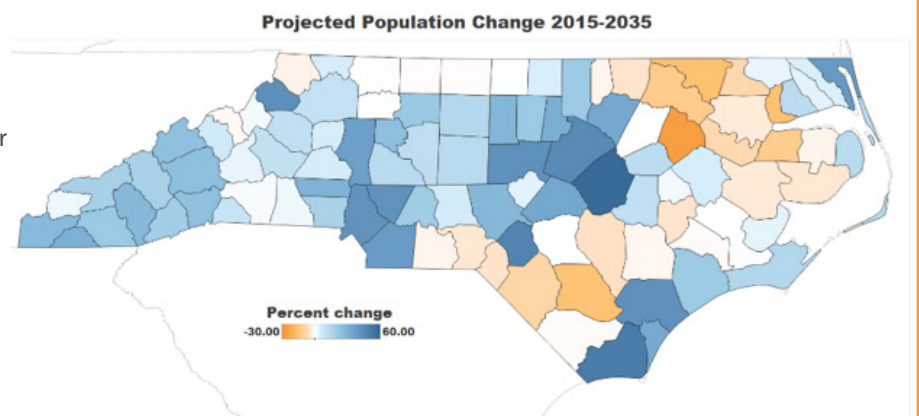
Increasing population drives demand for resources—land, water, energy, and food—while also increasing the output of both solid waste and wastewater, which also influence the health of the environment. Land and water conservation funding both helps to reduce the pressures of population growth on the state's land and water resources and provides services to North Carolinians by:

- protecting agricultural and forestland from urban development to preserve a vibrant food supply chain and rural economies;
- preserving lands critical to wildlife habitats and ecosystem connectivity across the state;
- setting aside lands for parks, which conserve land resources and provide outdoor recreation opportunities for residents, preserving the quality of life that drew many individuals and employers to the state and providing proven public health benefits; and
- preserving key waterways, wetlands, and lands that help control flooding and increase water quality through reductions in nutrient pollution, sedimentation, erosion, and other human sources of pollution.

Considering funding on a per capita basis provides insight into the effect of population growth on funding levels.

Figure 3-1. Population Growth Projections, 2015–2035

Between 2015 and 2035, North Carolina is projected to add yet another 2 million new residents, with the most intense growth concentrated around Asheville, Boone, Charlotte, the Triad, the Triangle, and Wilmington (NC OSBM, 2017).



¹² North Carolina OSBM. (2017). Standard Population Estimates, Vintage 2016 and Population Projections, Vintage 2017. Retrieved from <https://www.osbm.nc.gov/demog/county-projections>.

Between 2007 and 2017, per capita funding for land and water conservation fell from \$24.12 to \$6.89, a 71% decline (see Table 2-1). If funding remains the same through 2025 as the population increases, per capita funding would actually decline from \$6.89 per capita to \$6.32 per capita. By 2035, per capita funding would dip to \$5.74 per capita. As demand for resources increases, the effectiveness of an equal amount of funding is gradually eroded, suggesting that an increase in funding is needed to keep up with population growth. Inflation has a similar eroding effect—if funding remains unchanged, its purchasing power declines over time.

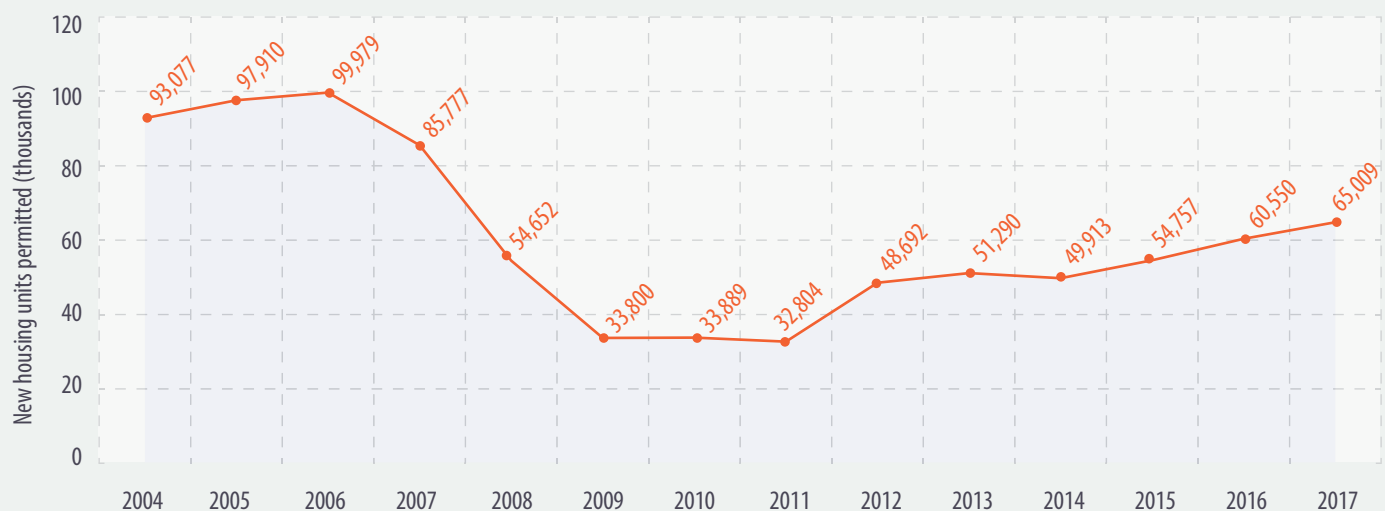
3.2 URBAN DEVELOPMENT AND LAND USE CHANGE

An inevitable result of population growth is land use change. As the population grows, demand for land increases as well, as evidenced by the rising property values in North Carolina, particularly around major urban areas.

The result of increased demand for urban (developed) land is a corresponding loss of non-urban land, including farm and forest land.¹³ Between 1982 and 2012, over 848,000 acres of farmland were converted to urban development. Additionally, during the same three decades, urban development resulted in the loss of nearly 1.6 million acres of forestland.¹⁴ The combined area of farm and forest land loss is roughly equal to the size of Mecklenburg, Gaston, Lincoln, Cabarrus, Catawba, and Iredell Counties combined.

Comprehensive data tracking land use changes from 2012 to the present are not yet available, but we can look at related data that suggest the story is similar to what we see up to 2012. While the pace of urban development slowed briefly during the recession, population growth continued, and new home construction has increased every year since 2011 with the exception of a small dip in 2014 (Figure 3-2).¹⁵ At a median lot size of 0.2 acres, single-family home construction alone consumed 9,300 acres in North Carolina in 2017.¹⁶

Figure 3-2. Building Permits Issued for New Housing, 2004-2017



¹³ In this section, we are using land use classifications to summarize land use change rather than considering any distinctions between urban areas and rural areas, or cities and small towns. Thus, any reference to “urban land” is a reference to land classified as developed, which can occur in both urban and rural communities.

¹⁴ USDA Natural Resources Conservation Service. (2015). 2012 National Resources Inventory Summary Report. Retrieved from https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcsprd396218.pdf.

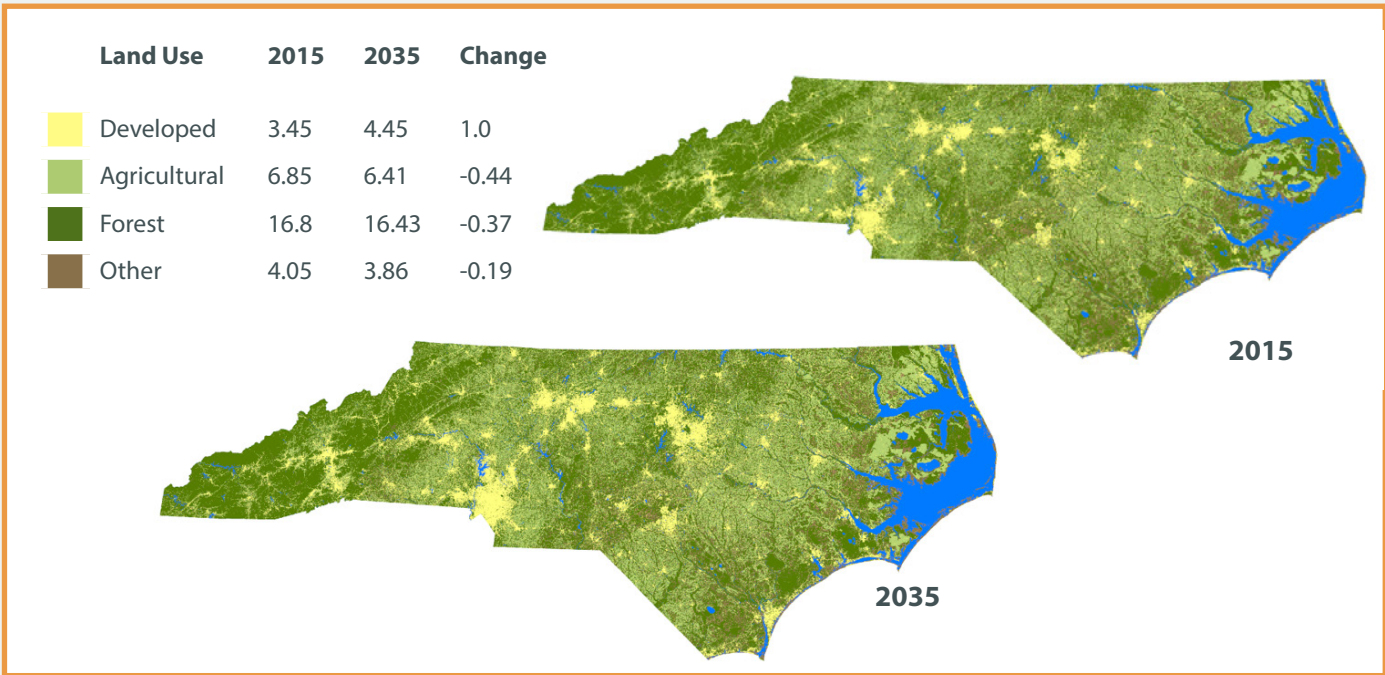
¹⁵ U.S. Census Bureau. (2018). Building Permits Survey: Permits by State. Retrieved from <https://www.census.gov/construction/bps/stateannual.html>.

¹⁶ U.S. Census Bureau. (2016). 2016 Characteristics of New Housing. Retrieved from <https://www.census.gov/construction/chars/pdf/c25ann2016.pdf>, p. 289.

Looking to the future, urban development is projected to continue on pace with population growth. While consumer preferences have shifted somewhat to prefer more dense, mixed-use development in urban areas, demand for new urban space is still strong. By 2035, urban growth modeling projects that roughly 1 million acres of land currently made up of forests, farms, and open space will be converted to urban development (see Figure 3-3).¹⁷

for the health and stability of the environment. Land use intensification promotes a small number of ecosystem services (or just one service) on the landscape, often to the detriment of other ecosystem services that the land naturally provides. Intensification could refer to urbanization, agriculture, forestry, or industrial activity. Intensification has been associated with a loss of biodiversity and increases the likelihood that the natural hydrology will be altered,

Figure 3-3. Projected Land Use Change, 2015–2035 (millions of acres)



Land use change in rural areas of the state also has implications for the environment. The conversion of wetlands for other uses compromises vital ecosystems that preserve biological diversity and provide valuable water quality and flood management services.

Additionally, land use intensification has implications

potentially degrading water quality services provided by the land.¹⁸ Land and water conservation investments can help minimize the effects of land use intensification through the installation of best management practices on intensely used land and through the protection of undeveloped land that is still providing a full suite of ecosystem services.

¹⁷ Land use projections estimated using the FUTURES model developed at the NCSU Center for Geospatial Analytics. Data provided by NCSU CGA and the Environmental Defense Fund
¹⁸ Allan, E., Manning, P., Alt, F., Binkenstein, J., Blaser, S., Blüthgen, N., ... & Kleinebecker, T. (2015). Land use intensification alters ecosystem multifunctionality via loss of biodiversity and changes to functional composition. *Ecology letters*, 18(8), 834-843.

3.3 NATURAL DISASTERS AND EXTREME WEATHER EVENTS

Land and water conservation also helps mitigate damages from natural disasters and extreme weather, particularly flooding and wildfires. Flooding is the second most common natural disaster in North Carolina (after thunderstorms and lightning) with an average of 48 floods per year in the state.¹⁹ Flooding is particularly common on the coast and in the coastal plain, where 25% of the land area is less than 5 feet above sea level and flooding is increasing in frequency. In the 1950s, for example, Wilmington averaged 1 flood day per year—from 2010 to 2015, Wilmington averaged 49 flood days. This trend has been observed to varying degrees all along the east coast, with some of the most dramatic increases occurring in North Carolina.²⁰

One of the forces driving increased coastal flooding is the observed rise in sea level, which is caused by increases in ocean temperature due to climate change. In Beaufort, NC, the sea level has risen by over six inches since 1960. In Wilmington, the sea level has risen by over 4.5 inches.²¹ Extreme weather, such as hurricanes and heavier rain events, combine with higher sea levels to create a more flood-prone coastal environment.

Land and water conservation funding mitigates risks of flooding by preserving and restoring wetlands, waterways, farmland, and forests that act as natural storm water management. Additionally, in heavily urbanized areas, upgraded storm water infrastructure is necessary to manage

water from heavy rain events where space is dominated by impervious surfaces.

With respect to wildfires, North Carolina ranked 4th in the frequency of wildfires compared with other states and 15th with respect to acreage burned in 2016.²² The most acute risk of loss of life and economic damage from wildfires is in the wildland–urban interface (WUI), which is defined as the transition zone between occupied and unoccupied land.²³

As urban development expands, so does the WUI, which is 13.7 million acres large and includes 66% of all housing in North Carolina—the largest WUI of any state in the country.²⁴ Homes and other structures within the WUI are at elevated risk of damage from wildfire, which carries both a human and economic cost. Figure 3-4 maps the WUI in North Carolina, which is split into two categories: intermix and interface. Intermix WUI (in red) are areas where housing and vegetation are interspersed. Interface WUI (in yellow) are areas where housing is in the vicinity of contiguous wildland vegetation.²⁵

From a practical perspective, a large WUI also stretches the thin resources of local, state, and federal officials charged with preventing and responding to wildfires, further elevating risk. Funding for land acquisition can help reduce wildfire risk by shaping development patterns to minimize and manage the wildland–urban interface in areas that are at a high risk from wildfires.²⁶

19 U.S. Department of Energy. (2015). State of North Carolina Energy Risk Profile. Retrieved from https://www.energy.gov/sites/prod/files/2015/05/f22/NC-Energy_Sector_Risk_Profile.pdf

20 NOAA [National Oceanic and Atmospheric Administration]. (2016). 2016 update to data originally published in: NOAA. (2014). Sea level rise and nuisance flood frequency changes around the United States. NOAA Technical Report NOS CO-OPS 073. Retrieved from http://tidesandcurrents.noaa.gov/publications/NOAA_Technical_Report_NOS_COOPS_073.pdf.

21 Ibid.

22 Insurance Information Institute. (2016). Wildfire Facts and Statistics. <https://www.iii.org/fact-statistic/facts-statistics-wildfires#Wildfires%20By%20State,%202016>.

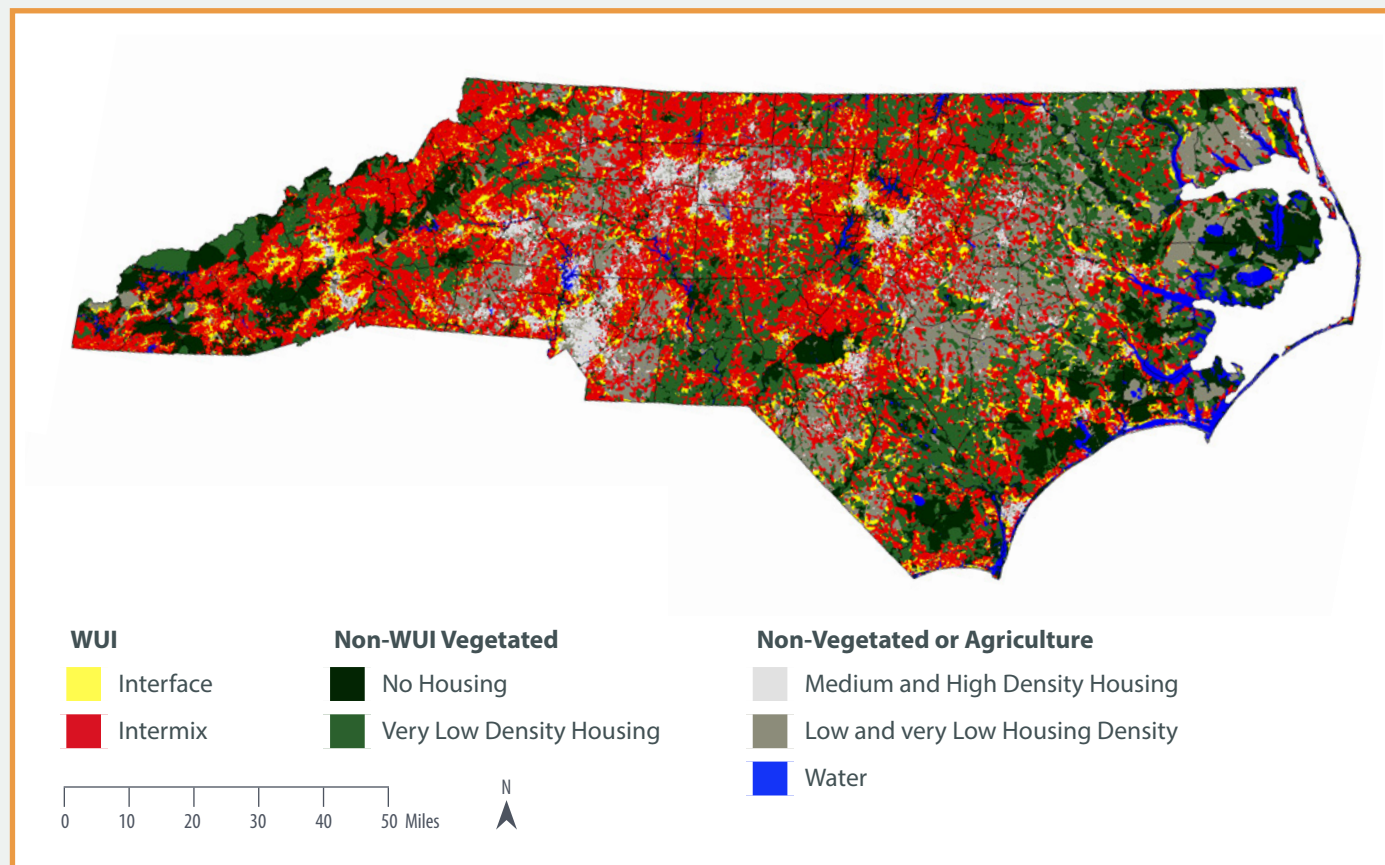
23 Radeloff, V. C., Hammer, R. B., Stewart, S. I., Fried, J. S., Holcomb, S. S., & McKeefry, J. F. (2005). The wildland–urban interface in the United States. *Ecological applications*, 15(3), 799–805. Retrieved from https://www.nrs.fs.fed.us/pubs/jrnl/2005/nc_2005_radeloff_001.pdf.

24 Radeloff, et al. (2005) Appendix A. Retrieved from <http://esapubs.org/archive/appl/A015/020/appendix-A.htm>.

25 SILVIS Lab, University of Wisconsin. The Wild Land Urban Interface. Retrieved from <http://silvis.forest.wisc.edu/maps/wui>.

26 Syphard, A., Butsic, V., Bar-Massada, A., Keeley, J., Tracey, J., & Fisher, R. (2016). Setting priorities for private land conservation in fire-prone landscapes: Are fire risk reduction and biodiversity conservation competing or compatible objectives? *Ecology and Society*, 21(3).

Figure 3-4. North Carolina's Wildland–Urban Interface



3.4 FARM AND FOREST PRESERVATION AND RESTORATION

Farmland preservation is another focus of land and water conservation funding in North Carolina. Farmland preservation is a priority in North Carolina for several reasons:

- North Carolina is steadily losing farmland, primarily to urban development (see Section 3.2). Once farmland is lost to development, it is unlikely to return to agricultural production.
- In-state farmland is important for ensuring a food supply chain.
- Agriculture and agribusiness is one of the most important industry clusters in the state, accounting for \$84 billion (17%) of the gross state product in North Carolina and supporting 16% of the state's jobs.²⁷ Agriculture is also compatible with military and military training (see Section 3.5), which is another key economic driver.
- Similar in some ways to other land that is not developed for urban use, farmland provides ecosystem services, including water regulation, soil retention, and pollination.²⁸

27 Walden, M. (2016). Agriculture and Agribusiness: North Carolina's Number One Industry. Retrieved from <https://ag-econ.ncsu.edu/wp-content/uploads/2017/05/NCState-WaldenAgBusinessReport-051017.pdf>.

28 Bergstrom, J. C., Dillman, B.L., Stoll, J.R. (1985). Public environmental amenity benefits of private land: the case of

Urban farmland is a particular area of concern. Besides being at a higher risk for development by simple proximity, several well-documented factors make urban farmland more susceptible to development, including regulation of farming activities, increased property taxation to fund services supporting population growth, and air pollution from increased automobile traffic or industrial activity. The result is that urban farmland becomes undervalued for agricultural use and overvalued for urban development, placing pressure on farmers to sell or convert land to urban uses.²⁹

In addition to the factors mentioned above, which drive costs up and productivity down for urban farmers, psychology plays a role as well. Research has shown that urban farmland becomes less productive over time because farmers make investment and planning decisions under the assumption that farmland will soon be consumed by urban development. This phenomenon, known as *impermanence syndrome*, becomes a self-fulfilling prophecy: because urban development seems imminent and inevitable, farmers are more likely to disinvest in their farm operations, forgoing expensive capital improvements or investments in production efficiency, labor, marketing, and other activities.³⁰ Farmers may also choose to plant less labor- and capital-intensive crops instead of more profitable crops, such as berries or orchards, which require more investment up front and a longer time horizon to see returns.

Land and water conservation funding is one of the tools available to the state for incentivizing the preservation of farmland, particularly when selling land for urban development is a lucrative prospect. As we discuss in Section 5, the Agricultural Development and Farmland Preservation Trust Fund provides funding for easement contracts to compensate farmers for agreeing to preserve their land for agricultural use.

Along the coast, sea level rise threatens farmland due to an increase in the frequency and extent of flooding, which can cause saltwater intrusion and render farmland unusable. In some cases, restoration of former wetlands that have been converted to farmland may be an important strategy for managing flooding risks along the coast.

3.5 ECONOMIC BENEFITS OF LAND AND WATER CONSERVATION

In addition to helping reduce the effects of population growth, urban expansion, land use intensification, natural disasters and extreme weather events, land and water conservation has a substantial positive economic impact on North Carolina. Below we describe some general areas of economic impact; throughout the report, where data availability allows, we detail specific estimates of the economic impact of land and water conservation funding in North Carolina.

Local Parks and Recreation

Investing in local parks and recreation facilities delivers economic benefits in several ways. First, parks have a positive impact on nearby property values. Parks that offer mostly passive recreation (e.g., walking paths, greenways, playgrounds, and picnic facilities) have been shown to boost nearby property values by up to 20%. Active recreation facilities (e.g., large park facilities with athletic fields that draw larger crowds) boost nearby property values by up to 10%.³¹

Second, active recreation facilities that have many athletic fields to host large tournaments draw people from outside of the local community and outside of the state, resulting in substantial economic benefits to the parks' facilities and local businesses such as hotels and restaurants. For example, the Rocky Mount Sports Complex draws people

29 Nelson, A. C. (1992). Preserving prime farmland in the face of urbanization: lessons from Oregon. *Journal of the American Planning Association*, 58(4), 467-488.

30 <http://sustainable-farming.rutgers.edu/impermanence-syndrome-urban-fringe-farming/>

31 Crompton, J. L. (2001). The impact of parks on property values: A review of the empirical evidence. *Journal of leisure research*, 33(1), 1-31.

from around the country for baseball tournaments, which put “heads in beds” throughout the year. The complex was funded in part from the North Carolina Parks and Recreation Trust Fund. Since 2007, the Sports Complex has attracted 585,000 people to the community and generated over \$65 million in economic impact.³²

In total, the National Recreation and Park Association estimates that North Carolina local parks and recreation generated over \$2.7 billion of economic impact in 2015 alone, supporting 24,303 jobs. Land and water conservation funding, mostly from the North Carolina Parks and Recreation Trust Fund and the Clean Water Management Trust Fund, supports local parks and recreation around the state.³³

Attracting New Business and Growing Existing Business

A healthy environment with clean air, clean water, open space, and recreational opportunities contributes to making a place attractive to new and existing businesses, for both quality-of-life and pragmatic reasons. In the case of the brewing industry, when large brewers like New Belgium and Sierra Nevada chose to relocate to the Asheville area, access to plentiful clean water and recreational opportunities for their employees was cited as a major factor in the decision to choose North Carolina.³⁴ Additionally, Amazon has listed recreational opportunities as a top priority in their search for their next headquarters.³⁵

Land and water conservation also supports the economic potential of industries already present in the state. For example, at the request of the N.C. General Assembly, a diverse stakeholder group is executing on a strategic plan

In 2015, North Carolina local parks and recreation supported over 24,000 jobs and generated \$2.7 billion in economic impact.

—National Recreation and Park Association

to grow the shellfish mariculture industry from \$2 million in landing today to \$33 million in 2030. This will result in an industry that has an economic impact of at least \$100 million for our coast. This industry can’t thrive without clean water and investments in environmental protection.

Retaining Military Bases

North Carolina is home to seven major military bases, making the military a major economic contributor to the state. In addition to the salaries paid to service members, which support the communities around bases, a number of other industries rely on military spending, and veterans separating from the military are a valuable source of skilled workers across a number of industries. In 2015, the military sector contributed \$66 billion to the gross state product and supported 577,000 jobs, roughly 10% of employment in the state.³⁶

Land and water conservation funding supports retaining military bases in North Carolina by providing funding for acquisition of military buffer land and conservation easements around bases. Military buffers set aside land in between bases and communities to help the military carry

32 Economic impact data provided by the parks and recreation department of Rocky Mount.

33 National Recreation and Parks Association. (2018). The Economic Impact of Local Parks. Retrieved from <https://www.nrpa.org/publications-research/research-papers/the-economic-impact-of-local-parks/>.

34 Bland, A. (2014). Big Breweries Move Into Small Beer Town—And Business Is Hopping, Retrieved from <https://www.npr.org/sections/thesalt/2014/05/28/316317087/big-breweries-move-into-small-beer-town-and-business-is-hopping>

35 Griswold, A. (2017). Everything Amazon wants for HQ2, the massive new headquarters it’s planning in North America. Retrieved from <https://qz.com/1071832/amazons-hq2-what-it-wants-for-its-massive-new-north-american-headquarters/>

36 Levy, J. (2015). The Economic Impact of the Military on North Carolina. Retrieved from <https://www.nccommerce.com/Portals/47/Publications/Industry%20Reports/2015-Economic-Impact-of-the-Military-on-North-Carolina.pdf>

out the required training and operations while minimizing its effect on neighbors.³⁷ Although federal funding does provide for land acquisition for military buffers, state funding provides valuable match funding to make more of these projects happen. In addition to land acquisition, this funding supports term contracts for easements, which protects land from development and helps keep farmland in production.

An expert interviewed for this study said that the availability of adequate land buffers for military operations is a significant consideration when the military is evaluating whether to keep a military base open. Since 1988, more than 350 military installations have been closed through the Base Realignment and Closure (BRAC) Act.

One existing forum for finding common ground between military needs and land and water conservation efforts is the Onslow Bight Conservation Forum (OBCF), which engages 12 agencies and organizations in aligning conservation efforts with compatible land uses.³⁸ Additionally, the Sentinel Lands Initiative was established in 2013 between the U.S. Department of Defense, Department of the Interior and the USDA to promote natural resource sustainability, land conservation, and farmland preservation around military bases.

Tourism

Tourism and North Carolina's land and water resources are deeply interconnected. Some of the biggest draws to North Carolina for tourists are the beach, rural sightseeing, fishing, state parks and recreation areas, wildlife viewing, hiking, and craft breweries.³⁹ Each of these activities relies on having plentiful recreation opportuni-

Tourism contributed \$12 billion to the state GDP in 2016 and supported over 400,000 jobs.

—Tourism Economics

ties, wildlife habitats, open space, and clean air and water. In 2016 alone, tourism contributed \$12 billion to the state gross domestic product, supported over 400,000 jobs, and generated \$3.5 billion in state and local taxes.⁴⁰

Through the development of parks, public gamelands, and recreational trail systems, land water conservation funding directly supports the amenities that drive tourism by protecting natural heritage sites, improving water quality, and ensuring public access to natural areas that might otherwise remain in private ownership.

4 How North Carolina Compares to Other States

Throughout this study, we present program-level funding data where data is available, but this section uses data from the State Government Finances (SGF) Survey conducted by the U.S. Census Bureau to provide high-level national context. The SGF Survey reports data annually on state government expenditures across 12 functional areas, including natural resources and parks and recreation. Data excludes federal payments to state governments and focuses on direct state expenditures.⁴¹

Figure 4-1 combines the natural resources and parks and recreation spending categories from the SGF Survey and presents the data in per capita terms.⁴² Figure 4-2 presents

37 U.S. Fish and Wildlife Service. (2005). Conservation Lands as Compatible Use Buffers. Retrieved from https://www.fws.gov/endangered/esa-library/pdf/Buffer_Lands_Fact_Sheet_dec05.pdf

38 Onslow Bight Conservation Forum. (2018). Retrieved from <https://www.longleafalliance.org/ncobcf>.

39 Economic Development Partnership of North Carolina. (2016). 2016 North Carolina Regional Travel Summary. Retrieved from <https://partners.visitnc.com/contents/sdownload/65549/file/2016-North-Carolina-Regional-Travel-Summary.pdf>.

40 Tourism Economics. (2016). The Economic Impact of Tourism in North Carolina. Retrieved from <https://partners.visitnc.com/files/files/tsa/2016-NC-TSA.pdf>.

41 U.S. Census Bureau. (2016). Annual Survey of State Government Finances: 2016 State Government Finances Methodology. Retrieved from <https://www.census.gov/programs-surveys/state/technical-documentation/methodology/annual-methodology/2016.html>.

42 Natural resources includes expenditures related to water resources, mineral resources, agriculture, and the regulation of industries related to natural resources or agriculture. It also includes conservation, promotion, and development activities related to natural resources and agriculture. Parks and recreation expenditures include the provision and support of publicly-owned parks and recreation facilities and lands. For more detail, see the SGF 2006 Classification Manual, available at http://www2.census.gov/govs/pubs/classification/2006_classification_manual.pdf.

the same data as Figure 4-1, but only for selected south-eastern states. Finally, Figure 4-3 shows North Carolina's spending for the same categories of state expenditures from 2007 through 2015.

In 2015, the most recent year for which data are available, North Carolina spent \$69.70 per capita in state funding on natural resources and parks. The average across the United States was \$90.36 per capita. Considering these data in the

Figure 4-1. Natural Resources and Parks Spending in the United States, by State, 2015 (\$ per capita)

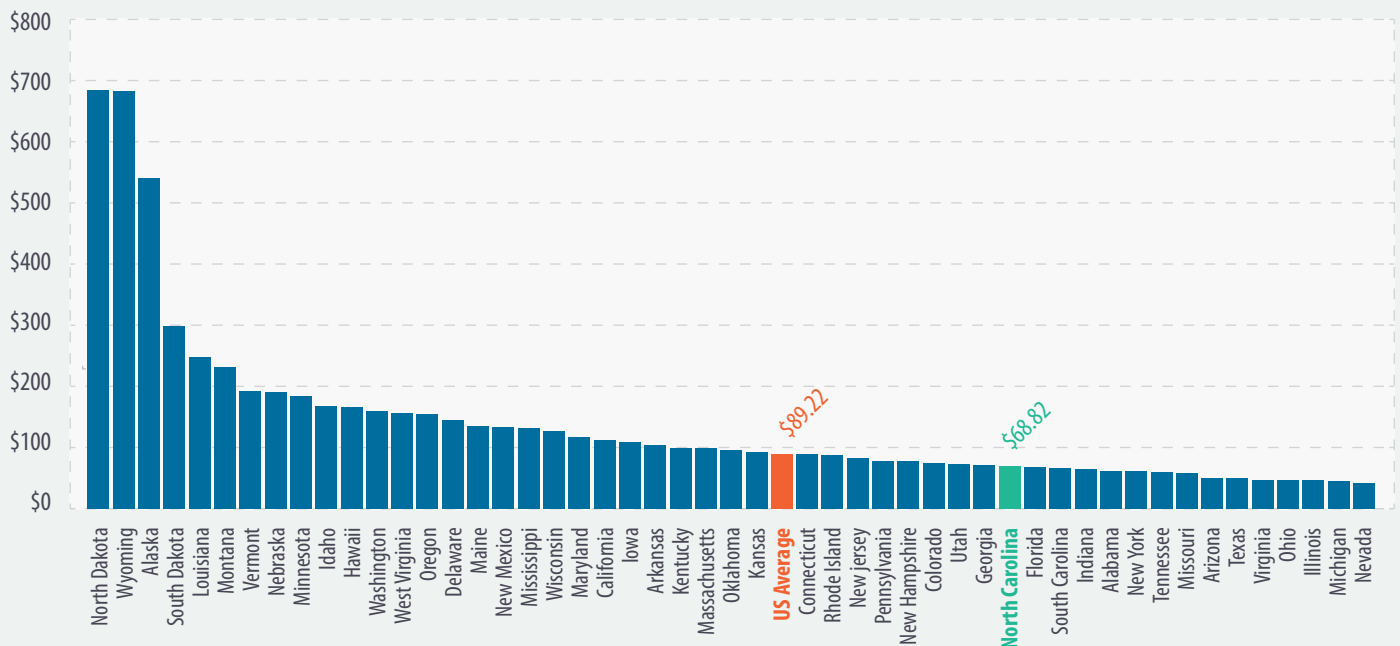


Figure 4-2. Natural Resources and Parks Spending in the Southeast, 2015 (\$ per capita)

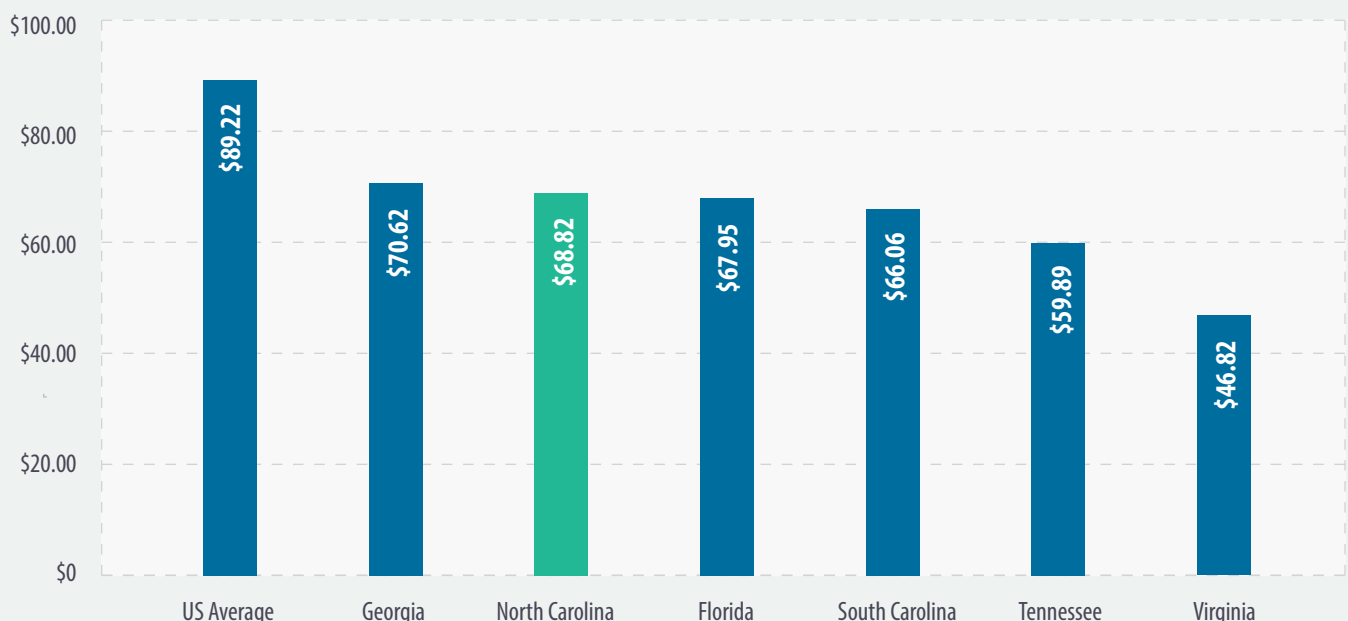
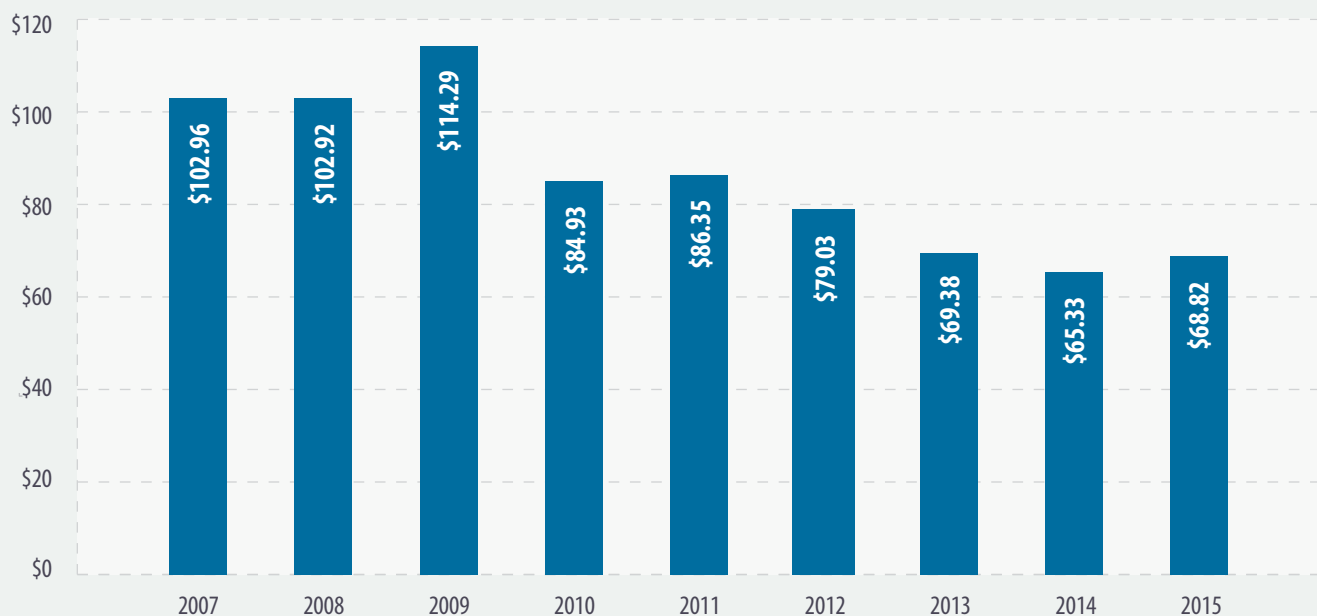


Figure 4-3. Natural Resources and Parks Spending in North Carolina, 2007-2015 (\$ per capita)



context of similarly dense and fast-growing states, North Carolina is lagging behind. North Carolina is the 11th fastest growing state by percentages since 2007 and ranks 15th in population density, yet it ranks 36th in natural resources and parks funding.

North Carolina's receipt of federal Farm Bill funding also lends insight into North Carolina's investment in land and water conservation. Farm Bill support is both a function of the effectiveness of the state delegation in lobbying for funding as well as the level of state investment in land and water conservation because state funds often serve as a source of match funds. In 2014, North Carolina ranked 50th (out of 51) in competitiveness for Farm Bill conservation dollars when accounting for the size of North Carolina's agriculture sector (\$8.2 billion). North Carolina received \$9.5 million in funding while Kansas (with an ag sector of \$9.5 billion) received \$100 million and Wisconsin (\$6.9 billion) received \$27 million in funding.⁴³

Every state is unique in its characteristics, needs, and resources, suggesting that an abundance of caution is required in drawing conclusions from such high-level comparisons. Additionally, the data presented here does not include all of the appropriate spending categories due to the way data is aggregated by the Census Bureau. Some state government expenditures such as water infrastructure funding are aggregated into other expenditure categories. Additionally, tax credits and bonds are not included here.

While this presents a high-level snapshot that lends some insight into state priorities, it is more useful to compare how similar states implement specific types of programs or pursue specific land and water conservation goals.

43 BenDor, T., et al. (2017). The economic impacts of ecological restoration: Ideas to guide better NC strategy. Presented at the 2017 North Carolina Sound Economic Development Summit. Available upon request.

INNOVATIVE APPROACHES: SUPPORTING FARMLAND PRESERVATION THROUGH FARMLINK PROGRAMS



Lincoln County, NC
(Photo credit: Noah Buscher)

In addition to financial incentives, another strategy to support farmland preservation is FarmLink programs. In many cases, farmland is passed down within a family, or it may be sold or leased to a neighbor when a farmer is ready to retire or move on. However, those opportunities are not always available. Additionally, individuals interested in entering farming may have trouble locating land to farm.

FarmLink programs help facilitate connections between farmers with land and farmers who are seeking land. At its simplest, a typical FarmLink program is similar to an online message board that allows farmers to find other farmers that match what they need. However, different FarmLink programs expand on this basic model by providing a number of other services and features.

How North Carolina Compares

FarmLink programs may be non-profit organizations or part of a state department of agriculture. In North Carolina, WNC FarmLink, which covers the western portion of the state, is the most well-established program. As of the writing of this report, WNC FarmLink is in the process

of merging databases and services with NC FarmLink to form a single organization serving the entire state.

NC FarmLink receives some funding from the Cooperative Extension Program in North Carolina and is in the process of expanding services. Their primary services are the online message boards and staff that assist farmers in finding the right matches for their needs. In Tennessee, the FarmLink program is modeled after WNC FarmLink and supported by the Tennessee Department of Agriculture and the Appalachian Resource Conservation and Development Council.

Virginia has the most well-established FarmLink program in the region. In addition to helping connect farmers through an online community and working directly with farmers, they also have developed a Farm Seeker Certification for farm seekers that can demonstrate experience and have a farm business plan in order to improve the quality and success of matches. Virginia FarmLink is fully funded by the Virginia Department of Agriculture and Consumer Services (VDACS).

In total, 24 states have FarmLink programs.

5 Conservation Trust Funds

Historically, North Carolina has relied on conservation trust funds to fund land acquisition and easement projects with a focus on water quality, natural heritage, habitat protection, farmland preservation, and parks funding. See Figure 5-1 for a brief description of each conservation trust fund in North Carolina.

A trust fund is a grant-making institution that is responsible for distributing money for a specific scope of projects, typically defined by legislation. Trust funds are funded through a variety of mechanisms, including endowments, dedicated revenue streams, and annual appropriations. Once money is allocated, trust funds are typically more insulated from shifts in budget priorities than programs within government departments, because they are established as semi-independent institutions and they can also carry over unspent funds and earn interest. Trust funds

Figure 5-1. North Carolina's Conservation Trust Funds

North Carolina has three conservation trust funds—the Clean Water Management Trust Fund (CWMTF), Agricultural Development and Farmland Preservation Trust Fund (ADFPTF), and Parks and Recreation Trust Fund (PARTF). The Natural Heritage Trust Fund (NHTF) was combined with the CWMTF in 2013.

Clean Water Management Trust Fund

The CWMTF was established in 1996 by the North Carolina General Assembly to address water pollution, improve water quality, and acquire lands for water quality purposes. This includes lands for riparian buffers to protect surface and drinking water resources and degraded land to be restored. The CWMTF also funds buffers around military bases by using state matching funds to leverage Department of Defense funding through the Readiness and Environmental Protection Initiative (DOD REPI). In 2013, the CWMTF absorbed the Natural Heritage Trust Fund, expanding the CWMTF's scope to include the acquisition of land with ecological diversity and cultural or historical value. CWMTF grant areas include land acquisition, stream restoration, and innovative storm water programs. Grants are awarded to government and nonprofit organizations.

Agricultural Development and Farmland Preservation Trust Fund

The ADFPTF was established in 2005. The ADFPTF supports agricultural, horticultural, and forest sustainability programs. These programs include conservation easements, sustainable agricultural business projects, and conservation agreements with the goal of preserving family farms. Similar to CWMTF, the ADFPTF also supports easement contracts for military buffers to leverage DOD REPI matching funds.

Parks and Recreation Trust Fund

PARTF was established in 1994 by the North Carolina General Assembly. It supports capital improvements for state parks and provides matching funds for local park projects. State park projects funded by the PARTF include building and renovating facilities and acquiring land to expand or develop new state parks or state natural areas. PARTF also is a primary source of funds for the Public Beach and Coastal Waterfront Access Program, which matches local government investments in improving pedestrian access to state beaches and waterways.

Natural Heritage Trust Fund

The NHTF was established in 1987 to provide grants to acquire land of natural, cultural, and historical importance. It also provided funding for inventories of natural areas by the North Carolina Natural Heritage Program. NHTF provided grants solely to state agencies, including the Department of Environmental Quality (DEQ), the Department of Agriculture and Consumer Services, the Department of Natural and Cultural Resources, and the Wildlife Resources Commission. In 2013, NHTF was discontinued, and the scope of the CWMTF was expanded to cover some of NHTF's previous focus areas.

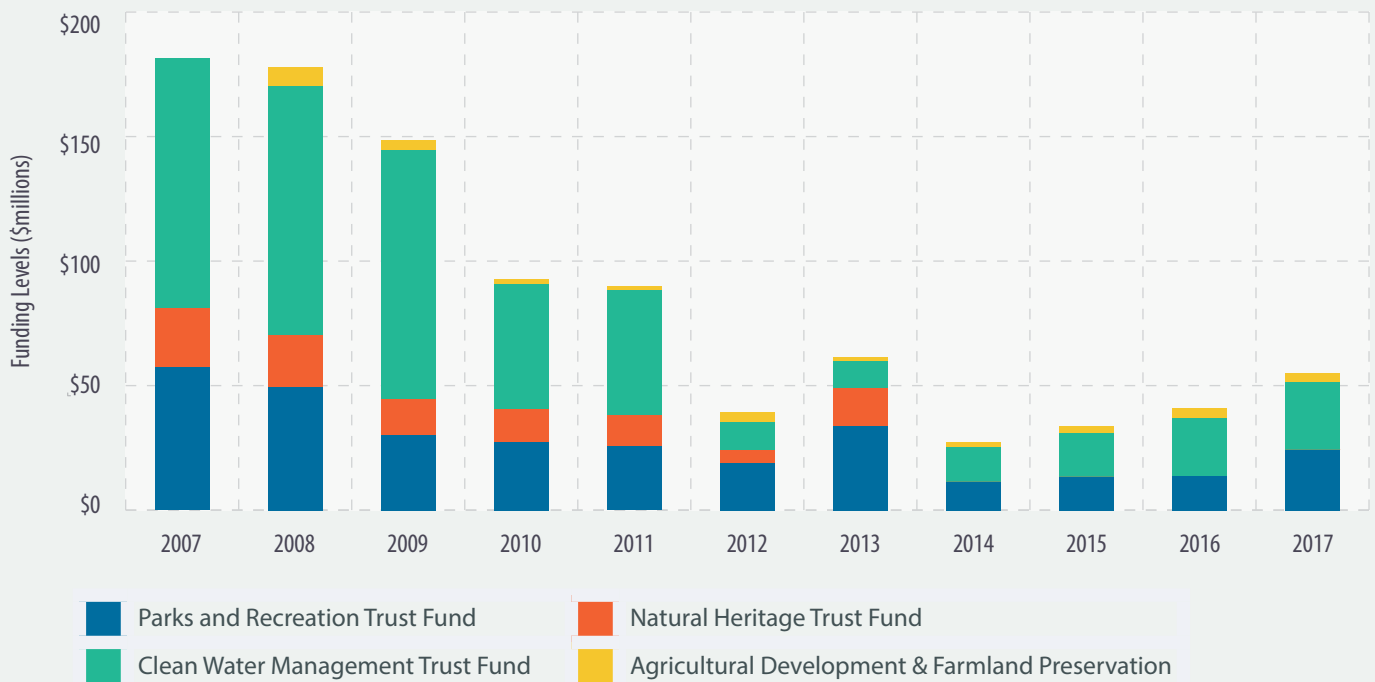
that are adequately capitalized and managed can, in some cases, become self-sustaining.

In North Carolina, all three trust funds employ executive branch staff for day-to-day operations, but funds are administered by advisory boards that use detailed scoring criteria to assess the merits of proposed projects. A key consideration for all the North Carolina trust funds is matching funds. CWMTF considers matching funds when prioritizing projects,⁴⁴ PARTF require at least 50% matching funds for grant applicants,⁴⁵ whereas ADFPTF requires matching funds ranging from 15% to 30% depending on a number of criteria for applicants that are land trust non-profits or local governments.⁴⁶

5.1 FUNDING LEVELS FOR NORTH CAROLINA CONSERVATION TRUST FUNDS

Figure 5-2 shows the levels of funding for conservation trust funds since FY2007. Since FY2007, overall funding allocated to conservation trust funds has declined by 70% from \$181 million to just under \$55 million. Funding declined steadily starting in FY2008 until FY2012. In FY2012- FY2013, funding jumped 56% from \$40 million to \$62 million, mostly due to increases in funding allocated to PARTF and NHTF. This time period corresponds with the beginning of the recovery in residential construction (see Figure 3-2), which would have driven more money to PARTF and NHTF through the deed stamp tax revenue stream.

Figure 5-2. North Carolina Conservation Trust Fund Funding, 2007-2017



44 N.C. Department of Natural and Cultural Resources. CWMTF Acquisition Grant Evaluation Criteria. Retrieved from https://files.nc.gov/cwmf/Docs/acquisition_grant_evaluation_criteria.pdf.

45 N.C. Division of Parks & Recreation. (2017). Parks and Recreation Trust Fund. Retrieved from <https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund>.

46 N.C. General Assembly. (2005). HB 607. Retrieved from <https://www.ncga.state.nc.us/Sessions/2005/Bills/House/HTML/H607v6.html>

However, in FY2014, funding dropped 55% from FY2013 because of the elimination of NHTF and the loss of deed stamp tax revenue, which caused funding for PARTF to fall by 66% to its lowest level since 1995, its first year of funding. Also in FY2014 the North Carolina legislature also increased funding to CWMTF and ADFPTF by 29% and 17%, respectively. Since FY2014, funding has increased steadily for all three trust funds, though they are still 70% below FY2007 funding levels in aggregate.

5.2 PROS AND CONS OF CONSERVATION TRUST FUNDS

Interviews with experts and stakeholders conducted for this study show that trust funds are generally well regarded as a conservation tool, chiefly because they lend legitimacy and transparency to the project selection process by using a transparent scoring method based on objective criteria to distribute funds.

Dedicated revenue sources have also contributed to trust funds' effectiveness in North Carolina. Until 2013, both PARTF and NHTF received a portion of the revenues from the deed stamp tax. One expert commented that the use of this form of real estate transfer tax was particularly appropriate because it is a proxy for real estate activity, including new development. Because new development typically leads to increased demand for land and water resources, real estate activity and the need for land and water conservation funding are correlated.

In addition to the strengths cited by experts and stakeholders that we spoke with, they described ways in which North Carolina's conservation trust funds could be improved. First, starting in 2013, the conservation trust funds lost all sources of dedicated revenue with the exception of custom license plate sales for PARTF and CWMTF.⁴⁷ Relying solely on appropriations creates greater uncertainty from year to year. If the deed stamp tax rev-

enue stream were still in place, \$61 million would have been dedicated to conservation trust funds in 2017.⁴⁸

Second, funding for North Carolina trust funds has been inconsistent over the years, dropping by as much as 66% from year to year. For some years, this fluctuation was a function of the variation in revenues from the deed stamp tax for NHTF and PARTF. However, CWMTF and ADFPTF have always been funded through appropriations and have experienced similar patterns of inconsistent funding.

Consistent and predictable funding is critical for enabling efficient and effective conservation planning and investments.

Inconsistent funding is a major challenge for land and water conservation efforts for several reasons. First and foremost, land acquisitions and easements often take years to come to fruition. If funding is unpredictable, state agencies, local governments, and conservation groups are more hesitant to undertake large projects because they do not know whether they can count on funds being available when the time comes to purchase the land or easement.

Sometimes, land acquisition efforts move forward by acquiring a property piecemeal over many years; this approach works, but it can be hard to keep landowners engaged over a long time frame, changes in land values can add complications, and the project is more expensive in the long run because of the added labor and transaction costs inherent in executing many small acquisitions as opposed to one large one. Inconsistent and low funding limits organizations' abilities to leverage match funding from local and federal governments and private donors.

⁴⁷ License plate revenues that previously funded NHTF now are allocated to CWMTF.

⁴⁸ North Carolina Department of Revenue. (2016). Statistical Abstract 2016: Summary of State General Fund Revenue Collections. Retrieved from https://files.nc.gov/ncdor/documents/reports/table2_2016.xls.

BEST PRACTICE SPOTLIGHT: BRIDGE FINANCING FOR LAND CONSERVATION

In order to be flexible and responsive to opportunities, land conservation organizations often need to access *bridge financing* in order to secure conservation land while waiting on government funding to come available. Some large national conservation groups have sufficient scale and funding to internally finance acquisitions until grant money comes through and some make financing available to small land trusts as well. However, these sources are not sufficient to meet the need for bridge financing. Interviews with stakeholders in North Carolina have shown that land trusts often have to rely on large individual donors in order to finance acquisitions.

Some states, such as Georgia, have state-supported revolving loan funds to fill the need for bridge financing. The Georgia Environmental Finance Authority (GEFA) provides low-interest loans to conservation groups for land acquisition purposes. Funds can be used to finance purchases or as bridge financing. GEFA also provides financing for landowners to install water quality BMPs in order to be eligible for a conservation tax credit.

Because bridge financing is intended to be a short-term loan while waiting for government funding that has already been secured, this is a relatively low-cost, low-risk way for the state to better support land conservation and reduce uncertainty.

Other critiques of the trust funds from stakeholders related to the scope of eligible projects and the screening process. Although most individuals interviewed for this study agreed that the scoring criteria were clear, one stakeholder commented that the rationale driving the weighting of the criteria is opaque and would benefit from some more transparent justification or explanation.

Finally, multiple stakeholders noted that a common challenge that conservation landholders—both private land trusts and state government departments—face is finding funding for management of existing conserved land. When management funds are insufficient, the ecological value of conservation land can be eroded, and the recreational value for public access lands suffers as well. This becomes an even larger problem as more land is conserved and management funding does not keep pace.

5.3 HOW NORTH CAROLINA COMPARES TO OTHER STATES

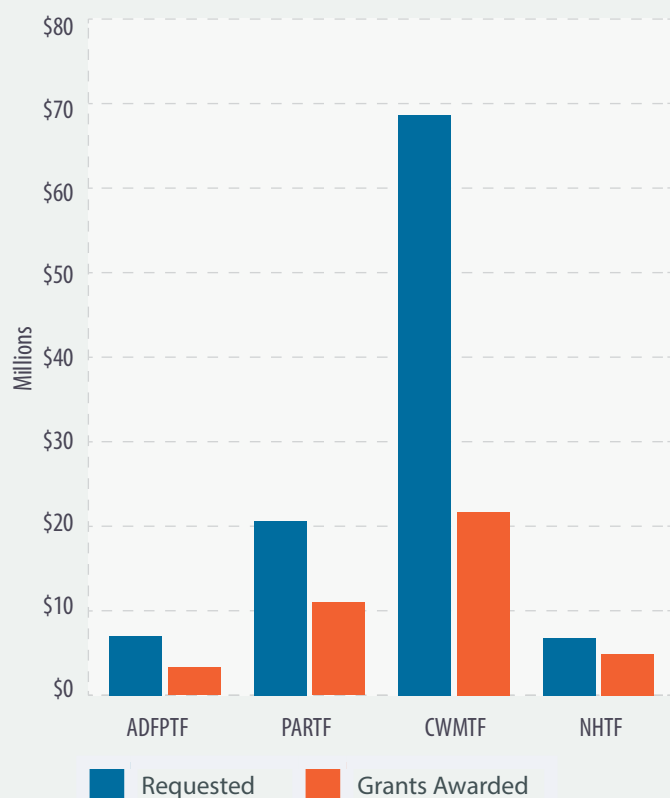
With the exception of Florida, North Carolina has, over the last ten years, invested more in land acquisition through trust funds than any other state in the southeast,

due in large part to the funding of the CWMTF, which was at \$100 million per year for several years up until 2010. The closest comparison within the southeast is Florida, where the Florida Forever Trust Fund historically saw funding reach as high as \$300 million a year. Florida Forever funds land acquisition for a broad variety of purposes, including water quality, farmland preservation, and parks and recreation. Since 2007, Florida Forever has spent over \$1.6 billion (\$76 per capita) on land acquisition and maintenance compared to \$589.2 million (\$60 per capita) in North Carolina over the same time period.

Looking more closely at farmland preservation funding, Florida has invested \$41.5 million (\$4.35 per acre of farmland) through its Rural and Family Lands Protection program compared to \$29.6 million (\$3.52 per acre of farmland) invested through the ADFPTF.

Similar to conservation trust funds in North Carolina, funding for Florida Forever declined sharply after the recession, even reaching zero funding in 2010 and 2012 and only receiving a total of \$30 million in funding over 2010-2014.

Figure 5-3. Funding Gap for North Carolina Conservation Trust Funds, 2013



5.4 DETERMINING THE APPROPRIATE LEVEL OF FUNDING FOR CONSERVATION TRUST FUNDS

Determining the appropriate level of funding for North Carolina's conservation trust funds is inherently subjective depending on the value placed on different conservation outcomes. However, there are some guideposts to use as a starting point.

The first guidepost we identified from speaking with experts and stakeholders is to consider the amount of funding applied for relative to how much was awarded. Figure 5-3 shows requested and awarded funding for the four trust funds in 2013, the last year before NHTF was

merged with CWMTF. Although CWMTF shows the most noticeable gap and the gaps vary widely over time, as seen in Figure 5-4, but requests consistently exceed amounts granted by at least 50% across all trust funds from 2007 through 2017.⁴⁹ NHTF had the smallest relative differences in funding across time, and CWMTF had the largest overall and the largest range.

The funding gap is a classic example of demand exceeding supply but using this measure as a guidepost should be undertaken conservatively. On the one hand, the amount that is available influenced property owners' decision about whether to apply. For example, CWMTF grant requests decreased over 40% in 2011 compared with 2009, following low funding levels in 2009 and 2010. The reduction in applications may be for a variety of reasons, including but not limited to the lower expected funding amounts and hence lower chances of success.⁵⁰ As discussed previously, lower expected available funding may also have affected applicants' ability to receive match funding.

A funding gap may also overestimate the actual need. These data do not account for funding applications that were denied because they were ineligible to receive funding. Nevertheless, the funding gap in conservation trust funds is a valuable benchmark for framing the magnitude of the need for land and water conservation funding.

Another guidepost experts recommended for measuring the need for funding for land and water conservation is to use data analysis tools like the North Carolina Natural Heritage Program's Conservation Planning Tool and the U.S. Environmental Protection Agency's (EPA's) AT-TAINs database, which tracks water quality assessments of surface waters. Such tools can help identify the most vulnerable waterways and landscapes in order to prioritize investments. Conservation organizations and land trusts in the state have also developed conservation plans that prioritize lands for protection.

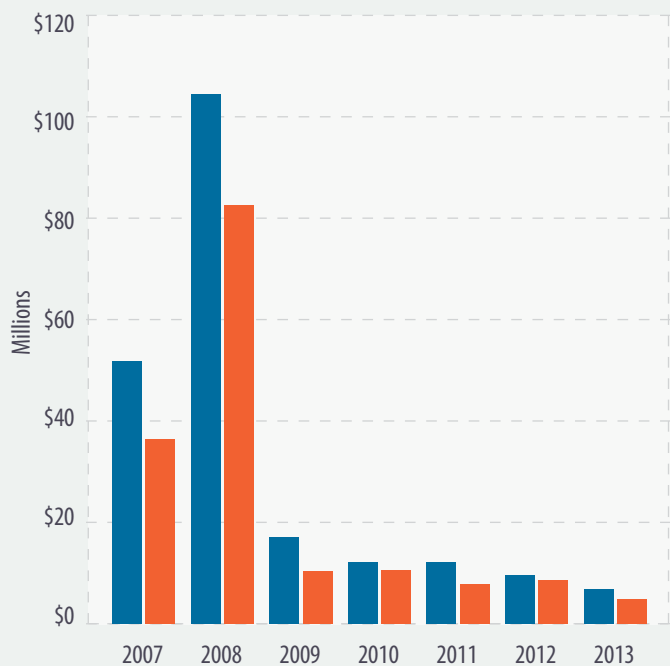
⁴⁹ 82% of the time, the funding gap exceeded 50% across the four trust funds.

⁵⁰ Land for Tomorrow. (2012). Securing North Carolina's Future: A Five-Year Plan for Investing in Our Land, Water and Quality of Life. Retrieved from <http://www.land4tomorrow.org/wp-content/uploads/2012/05/Land-For-Tomorrow-2012-Report-final-Web-rev.pdf>.

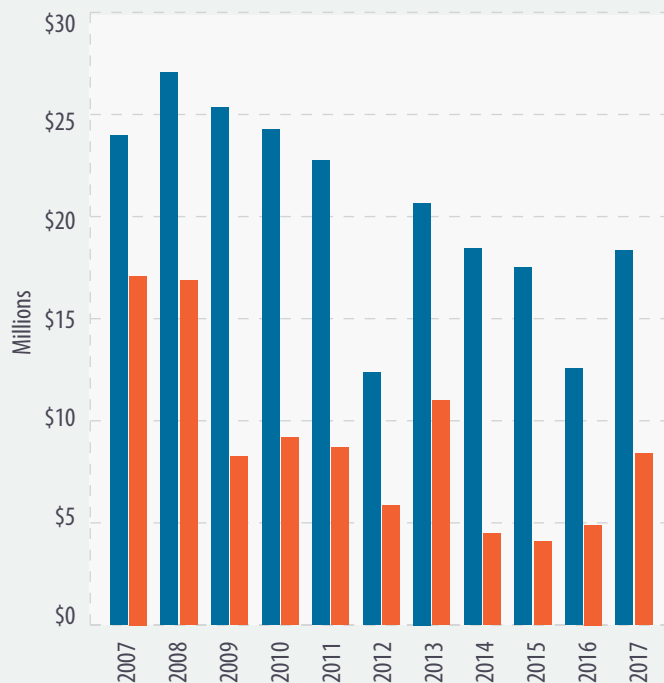
Figure 5-4. Comparing Funds Requested vs. Granted for North Carolina Conservation Trust Funds
(see Appendix A for Data Sources)

■ Requests ■ Grants Awarded

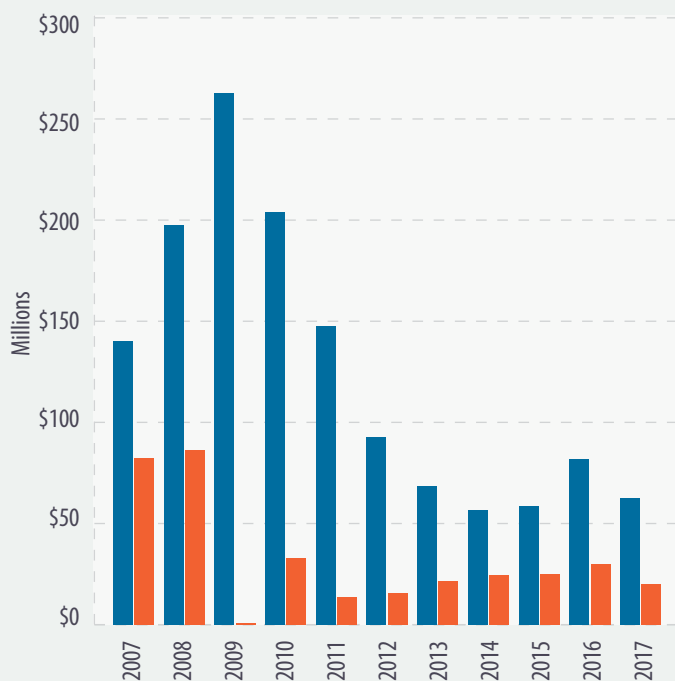
Natural Heritage Trust Fund



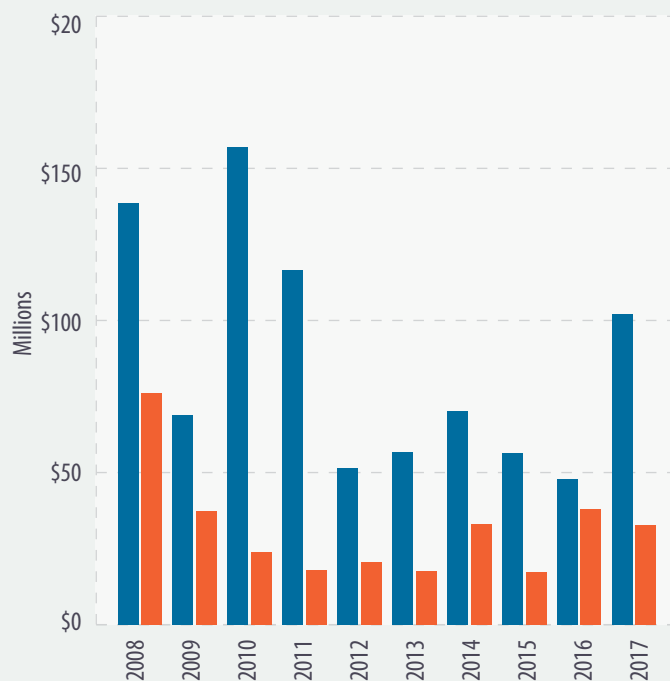
Parks and Recreation Trust Fund



Clean Water Management Trust Fund



Natural Heritage Trust Fund





Urban development projections, such as those used in Section 3.2, could also be a tool for measuring the need for funding and prioritizing projects for funding. By projecting where urban development may occur, planners and conservation groups can proactively identify waterways or parcels in need of protection. Such an analysis could be used to shape development in a way that minimizes the impact on ecosystem services provided by our land and water resources.

Regarding farmland preservation, geospatial analysis can be used effectively to identify tracts of farmland that may be at risk of being converted to urban development. Quantifying the amount of high-risk farmland and its potential market value may lend some insight into where funding should be set for ADFPTF. Such an analysis could also serve as an early warning of development that could fragment farming communities that currently have some cohesion, which would help prioritize where to fund farmland preservation projects within the state. While such an analysis has not yet been conducted for the whole state, the Conservation Trust of North Carolina developed a methodology to identify farmland protection priority areas in the Triangle region using geospatial data.⁵¹

In addition to determining the magnitude of funding needed, geospatial analysis and other tools can also help inform priorities for deploying the funding to yield the greatest benefit. Effective conservation planning and prioritization requires both a macro-level understanding

of the state's biggest challenges and flexibility to tailor land and water conservation efforts to local and regional needs.

Asheville and Boone provide an excellent example of two somewhat similar regions have very different needs. In Asheville, urban growth is putting pressure mostly on private agricultural land because much of the forest areas adjacent to Asheville are publicly owned and thus protected. In Boone, however, urban expansion is more acutely impacting forestland because much of it in the Boone region is privately owned. Thus, preserving forestland in Boone will have a greater impact than in Asheville.

5.5 KEY TAKEAWAYS: CONSERVATION TRUST FUNDS

- North Carolina has a strong institutional framework in the form of conservation trust funds to support land and water conservation funding.
- Conservation trust funds lend transparency to the funding process by distributing funds on a competitive basis using a detailed scoring methodology.
- At one time, the conservation trust funds were one of the best-funded portfolios of funds in the nation with \$181 million in 2007. Since then, funding has declined 70% to \$55 million in 2017.
- Because land and water conservation efforts often take years to pull together, predictability of how much funding will be available is critical.
- A conservation trust fund that has a minimum amount of guaranteed funding every year is able to reduce uncertainty related to how much funding will be available for potential projects and build capacity to plan for and take on the highest priority projects.
- The demand for funding from trust funds may be one guidepost for determining where funding should be set. The average percentage gap between how many funds were requested and how many were granted between 2007 and 2017 is 153%.

⁵¹ Conservation Trust of North Carolina. (2017). Triangle Farms for Food: Strategy + Action Plan. Retrieved from <https://www.ctnc.org/protect/triangle-farms-for-food-strategy/>.

BEST PRACTICE SPOTLIGHT: TAX CREDITS AS A CONSERVATION TOOL

Tax incentives are a common tool that governments use to incentivize a variety of behaviors. The primary way tax incentives are applied in land and water conservation is through a land preservation tax credit, which offers the property owner an income tax credit in exchange for putting land into a conservation easement or donating it to a land trust. While the federal government has offered a tax deduction for the donation of a conservation easement or fee title for 40 years, North Carolina was the first state to offer a tax credit for the donation of easements and land in 1983.

Tax credits as a conservation tool have two key benefits:

Tax credits increase the donation of land. A 2007 analysis from the Conservation Resource Center, *State Conservation Tax Credits: Impact and Analysis*, shows that enactment of a conservation tax credit in Virginia in 2000 resulted in a near quadrupling of acres donated to the Virginia Outdoors Foundation.

Tax credits are a low-cost conservation strategy. Tax credits allow states to incentivize voluntary conservation at a relatively low cost while also delivering a financial benefit to the landowner. From 2003 to 2011, the North Carolina Conservation Tax Credit incentivized donations of conservation land with an estimated market value of over \$1 billion in exchange for \$122.5 million in claimed tax credits.

In many cases, land owners to whom the tax credit may be appealing are cash poor but land rich. In other words, they do not have large annual incomes, and the value of the tax credit may exceed their tax burden. To maximize attractiveness (and therefore effectiveness), conservation tax credit programs should have three features:

1. **Long carry-over periods.** To help landowners for whom the tax credit exceeds their taxable income, legislation should allow donors to reduce their tax burden over several years.
2. **Refundable.** Legislation can also opt to make a tax credit refundable, meaning that the government will pay the land donor a tax refund for any excess credit above their tax burden.
3. **Transferable.** In states with transferable tax credits, credit recipients can sell their tax credit to a third party; this is attractive to a landowner who wishes to maximize the immediate value of the credit rather than carrying a credit forward over many years. Purchasers of tax credits can then reduce their own tax burden. Typically, tax credits are sold for between 70 and 82% of their value.

How North Carolina Compares to Other States

The North Carolina Conservation Tax Credit Program was discontinued in 2013. Sixteen other states offer tax credits for conservation easements or land donations, including Virginia, South Carolina, and Georgia.

6 Conservation on Private Lands: Cost-Share Programs

Beyond land acquisition and permanent easements, North Carolina uses other tools to incentivize private landowners to engage in land and water conservation without selling their property or locking it into a permanent restricted use. This section considers programs that provide cost-share and easement rental payments to incentivize the implementation of best management practices (BMPs) on lands to improve water quality. With the exception of the Community Conservation Assistance Program, these programs target farm- and forestland owners.

Agricultural Cost-Share Program

The Agricultural Cost-Share Program (ACSP) provides financial and technical assistance to farmers to implement BMPs targeted at improving water quality. ACSP supports over 60 BMPs covering agrichemical pollution prevention; erosion, sediment and nutrient management; stream protection; and animal waste management. ACSP is administered through local soil and water conservation districts, working directly with farmers to write a customized conservation plan and identify BMPs that are most appropriate for the farm. Farmers can receive reimbursement for up to 75% of the cost of BMPs.⁵²

Community Conservation Assistance Program

The Community Conservation Assistance Program (CCAP) provides financial and technical assistance to nonagricultural and nonfarm landowners to implement BMPs on their property. The focus of CCAP is on helping landowners mitigate the effects of storm water runoff, particularly in developed areas where storm water is harder to manage because of the presence of impervious surfaces

like roads or parking lots. BMPs in urban areas divert storm water runoff away from impervious surfaces, which can minimize flooding and prevent storm water from picking up pollutants (e.g., oil from a leaking vehicle) and depositing them in the watershed. Similar to ACSP, CCAP applicants can receive reimbursement for up to 75% of the cost of BMPs.⁵³

Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) is a federally administered program in partnership with states to address water quality, soil erosion, and wildlife habitat concerns in 9 of North Carolina's 17 river basins. CREP provides cost-share payments and rental payments in easement contracts ranging from 10 to 30 years for practices such as tree planting, filter strips, riparian buffers, wetland restoration, and bottomland timber establishment. While ACSP focuses on the implementation of BMPs without necessarily taking farmland out of production, practices eligible for funding under CREP necessitate land being taken out of production to protect areas around the streams and rivers under protection. For this reason, CREP offers rental payments in addition to cost-share payments. Forest landowners are also eligible for CREP funding in addition to farm landowners.⁵⁴

Agriculture Water Resource Assistance Program

The Agriculture Water Resource Assistance Program (AgWRAP), rather than targeting water quality, focuses on cost-share and technical assistance to help farmland owners increase the security and quantity of their water supply through the construction of water storage and implementation of technology and BMPs that increase water efficiency such as irrigation system conversions and water collection and reuse systems. Approved applicants are eligible for 75% cost-share reimbursement for practices and BMPs.⁵⁵

52 NCDA&CS. (2017). Cost Share Programs: Agriculture Cost Share Program. Retrieved from <http://www.ncagr.gov/SWC/costshareprograms/ACSP/index.html>.

53 NCDA&CS. (2017). Cost Share Programs: Community Conservation Assistance Program. Retrieved from <http://www.ncagr.gov/SWC/costshareprograms/CCAP/index.html>.

54 NC Forest Service. (2017). Cost Share Programs: Conservation Reserve Enhancement Program. Retrieved from http://ncforestservice.gov/Managing_your_forest/crep.htm.

Forest Development Program

The Forest Development Program (FDP) is a cost-share program administered by the North Carolina Forest Service that focuses on reforestation, afforestation, and forest stand improvement. Cost-share rates average around 40%, but vary by district and practice, and a forest management plan is required to receive funding. Private landowners can receive up to 100 acres of cost-share annually.⁵⁶

Until 2010, the FDP received funding from appropriations as well as assessments on the forest products industry. Starting in 2010, however, FDP became solely funded by industry assessment payments, which reduced its funding by approximately 25%.

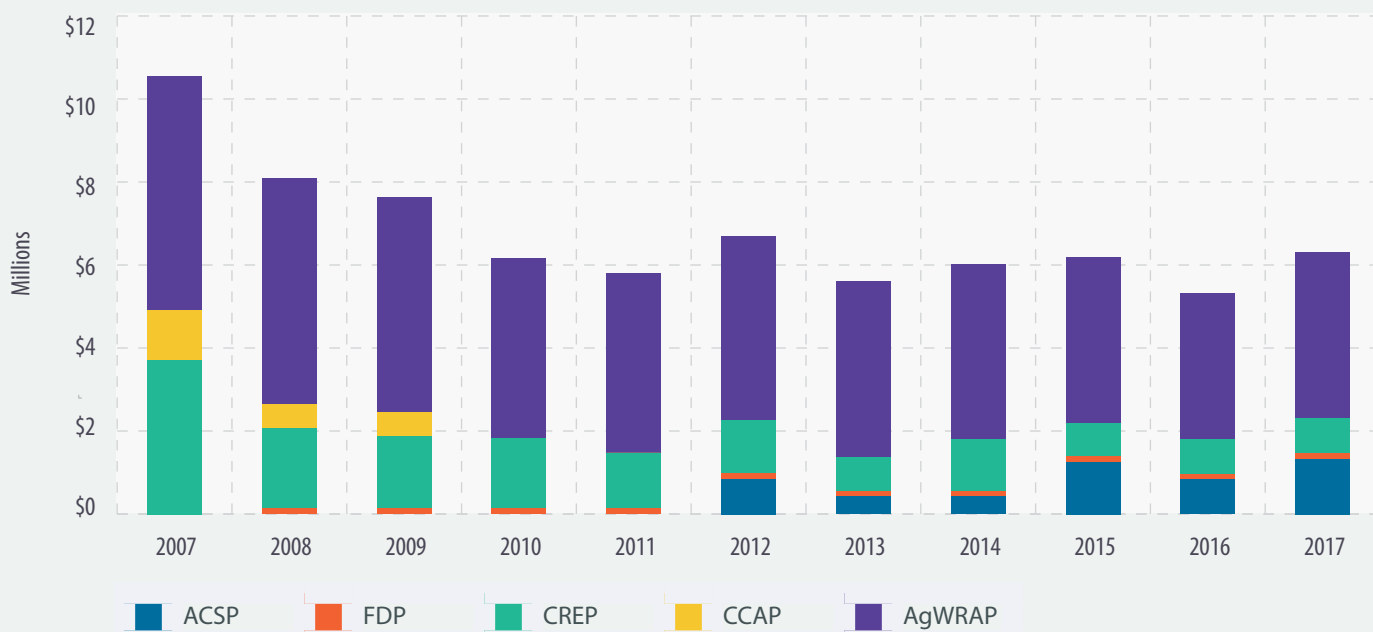
Stakeholder interviews for this study described FDP as primarily targeting small landowners who are not operating forests as a primary profession. This is in part because 100 acres of cost-share is small relative to the holdings of

large forest landowners and because larger operations in the timber industry may not need such assistance. Thus, FDP acts as a draw for small landowners to keep their land in managed forests rather than convert it to some other use or opt to not actively manage their forestland. An FDP survey showed that half of responding landowners' acreage would not have been planted if FDP funding were not available.

6.1 FUNDING FOR COST-SHARE PROGRAMS

Funding for cost-share and BMP programs range from \$6 million to just over \$10 million (see Figure 6-1). Since 2007, funding has dropped by 40%, primarily driven by declines in CREP (34%), ACSP (9%), and the elimination of funding for FDP. CCAP funding has remained flat over the last 10 years at a relatively low average of \$139,000. Taking into account inflation, population growth, and expanded urban development, real funding for CCAP has

Figure 6-1. Funding for Cost-Share Programs, 2007-2017



55 NCDA&CS. (2017). Cost Share Programs: Agricultural Water Resource Assistance Program. Retrieved from <http://www.ncagr.gov/SWC/costshareprograms/AgWRAP/index.html>.

56 NC Forest Service. (n.d.). Forest Development Program Executive Summary. Retrieved from http://ncforestservice.gov/Managing_your_forest/pdf/NCFSFDPExecutiveSummary.pdf.

fallen relative to potential demand for water quality BMPs on nonfarm- and forestland. Funding for AgWRAP, since its inception in 2012, has increased 56%.

Note that CREP funding in Figure 6-1 reflects state appropriations only; the CREP program has in the past also received funds from the Clean Water Management Trust Fund, but the last time was in 2006 when it received \$2.6 million.

6.2 BENEFITS OF COST-SHARE PROGRAMS

As a mechanism for accomplishing land and water conservation goals, cost-share programs that target the implementation of BMPs have several benefits. First, programs are voluntary, creating incentives for landowners to implement best management practices where mandatory regulations may be politically infeasible or difficult to enforce. Second, similar to conservation trust funds, cost-share programs unlock other money that otherwise would not get spent on land and water conservation. The cost-share programs considered in this report leverage land owner funding for 25% to 60% of the implementation costs and 100% of the maintenance costs. CREP has the additional feature of using both federal and state funds, leveraging \$2.01 of federal funds for every dollar of state money invested.⁵⁷

The cost-share programs focused on water quality—ACSP, CREP, CCAP—yield benefits of reduced nutrient and pollution runoff by diverting storm water from running over ground straight into surface water bodies. Specific benefits include reduced nitrogen and phosphorous runoff as well as reduced sedimentation. Excess nitrogen and phosphorous can cause algal blooms which deprive wildlife of oxygen in the water and degrade can drinking water quality; sedimentation leads to turbid waterways, which also degrades streambed habitats.

Cost share programs leverage investment from landowners to achieve land and water conservation goals on private lands.

Since 2007, ACSP and CCAP combined have treated over 585,000 acres of land, and CREP has protected and estimated 1,085 miles of stream. Between all three programs, over 7.4 million pounds of nitrogen and 2.1 million pounds of phosphorous have been saved or removed, preventing them from entering the waterways.

For AgWRAP, which focuses on helping farmers ensure a stable water supply and implement water efficiency measures, the program has successfully increased water supply to farms that received funding by over 1.3 billion gallons. The program has also funded irrigation system retrofits or installations covering 8,917 acres.

See Appendix C for detailed tables of the benefits of ACSP, CREP, CCAP, and AgWRAP, provided by the North Carolina Department of Agriculture and Consumer Services.

The FDP also has well-documented benefits. In 2016, FDP helped plant or improve 46,127 acres of timberland.⁵⁸ Over the life of the program (started in 1978), FDP has supported 1,200,000 acres of forestland. Using data from the 2009 Legislative Review of the FDP, we estimate that the cost to the state of replanting or improving forestland is \$11.79 per acre on average. Each acre that is managed using FDP-approved practices, however, increases in capitalized value from \$331.32 per acre to \$701.54 per acre. Thus, every dollar of state investment returns an estimated benefit of \$370.22.⁵⁹ This estimated benefit is likely a lower bound as well because increased forest management activity

⁵⁷ Data on CREP leveraging of federal funding received from N.C. Department of Agriculture and Consumer Services

⁵⁸ NC Forest Service. (2016). Forest Development Program Budget Summary, 2016-2017. Retrieved from http://ncforestservice.gov/Managing_your_forest/pdf/FDP_budget_summary_16_17.pdf.

also yields direct and indirect economic benefits through increased demand for professional forestry services. Additionally, FDP also cost shares prescribed burning, which lowers the wildfire risk in managed forests.

6.3 HOW NORTH CAROLINA COMPARES

With respect to North Carolina's CCAP program, we found no similar programs in the Southeast to compare. CREP funding exists in 28 out of 50 states, but only North Carolina and Virginia operate CREP programs in the Southeast.⁶⁰ North Carolina has historically funded CREP at a significantly higher level than Virginia with average annual funding between 2007 and 2017 of \$54.38 per 1,000 acres of farm- and forestland in North Carolina, while Virginia's average CREP funding was \$25.51 per 1,000 acres over the same time period.⁶¹

Other agriculture cost-share programs are more common than CREP in the Southeast than CREP. Virginia has historically invested more in agriculture cost-share programs than North Carolina for a similar farmland footprint. Virginia's funding averaged \$2,483 per 1,000 acres of farmland over 2007 to 2017, while North Carolina funded ACSP at an average of \$531 per 1,000 acres of farmland.⁶² Tennessee funding for agriculture cost-share programs was an average of \$243.34 per 1,000 acres of farmland based on data available for 2007 to 2014.⁶³ In addition to cost-share funding, Virginia offers tax credits for landowners to offset the expense of implementing BMPs which amounted to over \$7 million between 2010 and 2017.⁶⁴

Florida also operates a variety of cost-share programs targeting water quality and water supply BMPs in agriculture, but data were not available for the entire state for this report. In Florida, a large portion of land and water conservation funding is administered through Florida's water management districts, which vary in the types of programs they offer and the levels of public data availability. One cost-share program that matches the types of projects funded by the ACSP, CREP, and AgWRAP programs for farmland is the Southwest Florida Water Management District's (SWFWMD) Facilitating Agricultural Resource Management Systems (FARMS) Program.⁶⁵

FARMS has been funded at \$7,000,000 per year since at least 2013.⁶⁶ North Carolina's AgWRAP, ACSP, and CREP funding have averaged \$6.8 million per year since 2007 but cover a much larger area. SWFWMD covers roughly 10,000 square miles of land area, most of which is urban, whereas North Carolina's total agricultural land area is roughly 13,000 square miles. While comparison with Florida should be considered carefully for the reasons laid out in Section 4, their investment in water quality and water supply protection is generally higher than North Carolina's.

6.4 DETERMINING THE APPROPRIATE LEVEL OF FUNDING

Similar to conservation trust funds, we consider the gap between the amount requested and the amount granted under ACSP, CCAP, and AgWRAP as a guidepost for the

59 NC Forest Service. (2009). Continuation Review Legislative Report on the Forest Development Program. Retrieved from http://ncforestservice.gov/Managing_your_forest/pdf/FDP_Review.pdf.

60 USDA Farm Service Agency. (2017). Conservation Reserve Enhancement Program. Retrieved from <https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index>.

61 Data retrieved from Virginia's Department of Conservation and Recreation Soil and Water Conservation Database Query. Retrieved from http://dswcapps.dcr.virginia.gov/htdocs/progs/BMP_query.aspx.

62 Ibid.

63 Agricultural Resources Conservation Fund 2015 Biennial Report. Retrieved from <https://www.tn.gov/content/dam/tn/agriculture/documents/landwaterstewardship/AgFarArcfrga.pdf>.

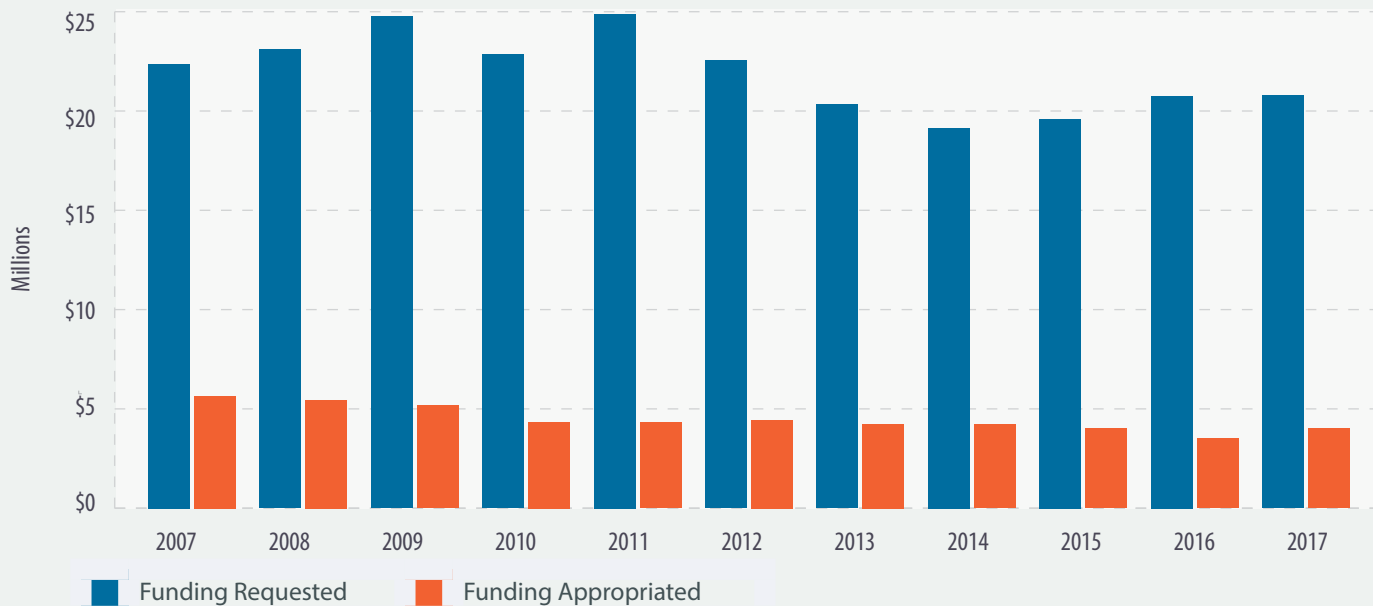
64 Virginia Department of Taxation. Annual Reports, 2010-2017. Retrieved from <https://www.tax.virginia.gov/annual-reports>.

65 Southwest Florida Water Management District. Facilitating Agricultural Resource Management Systems: About the Program. Retrieved from <http://www.swfwmd.state.fl.us/agriculture/farms/>.

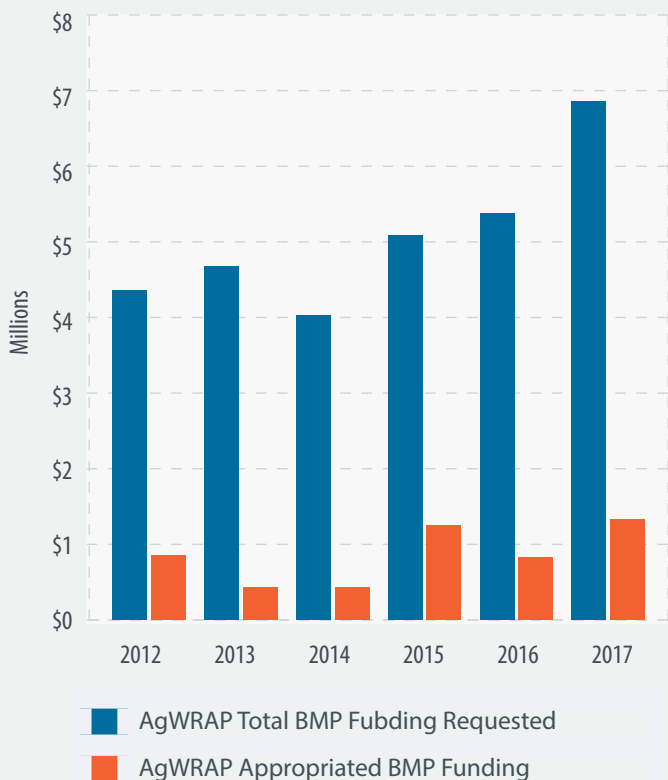
66 Funding data retrieved from budget documents available at <http://www.swfwmd.state.fl.us/business/budget/>.

Figure 6-2. Comparing Funds Requested vs. Granted for North Carolina Cost-Share Funding (excluding CREP)

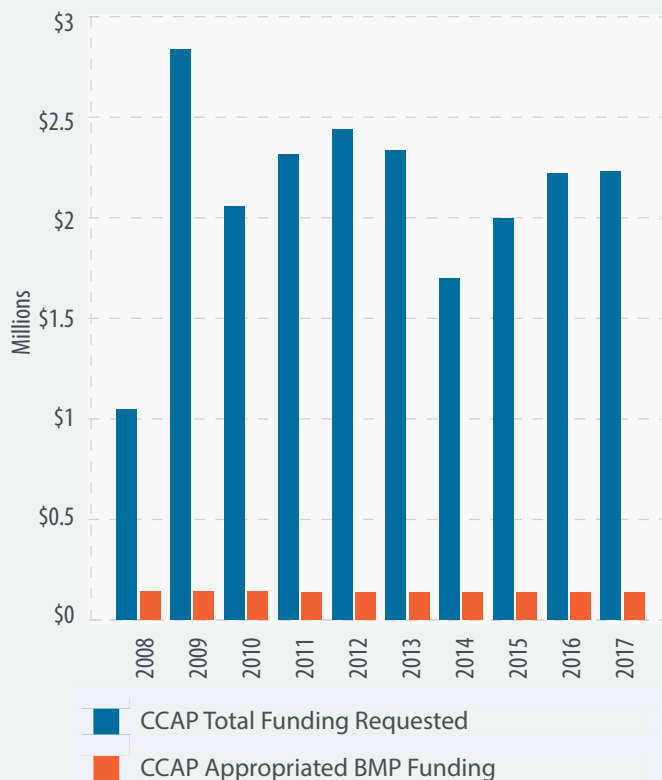
ACSP Requested and Appropriated Funding



AgWRAP Requested and Appropriated Funding



CCAP Requested and Appropriated Funding



potential need for funding. Figure 6-2 presents this data graphically. While all three programs consistently exhibit large gaps between funds requested and funds allocated, ACSP had the largest dollar gap, in part because it is the primary funding mechanism for water quality BMPs in North Carolina and helps the agriculture sector meet requirements for the Neuse, Tar-Pamlico, and Falls Lake watersheds. Data on funds applied for from CREP is not available.

Another guidepost noted by interview participants that should be considered when setting funding levels is the amount of farmland adjacent to impaired waterways that does not have BMPs installed. Using geospatial analysis to identify these tracts could help focus conservation spending and outreach efforts to where the need is the greatest. One measure of nutrient pollution is oxygen depletion, which happens when excess nutrients in the water cause algal blooms and other organic growth, consuming excessive amounts of oxygen in the water. Currently, 219 miles of rivers and streams in North Carolina are considered impaired because of oxygen depletion; this extends to lakes such as Jordan Lake in the Triangle region. Another indicator of impairment is turbidity, which is driven chiefly by sedimentation; currently 146.2 miles of North Carolina waterways are impaired because of excess turbidity.⁶⁷

With respect to the FDP, a legislative report from 2009 shows that the program reaches approximately 1,500 forestland owners a year out of 469,000 small forestland owners, suggesting that a much larger population of forestland owners would likely benefit from FDP funding each year. Also in 2009, FDP estimated that its budget fell short of demand for reforestation assistance by \$2,200,000. The need for more funding is also supported by the fact that the FDP has a waiting list for funding. In 2016, FDP reported an unfunded waiting list of 689 projects totaling \$3,185,700 in cost-share funding, which led them to suspend new applications for the following year.

6.5 KEY TAKEAWAYS: COST-SHARE PROGRAMS

- Cost-share programs are another strong tool for incentivizing voluntary implementation of management practices that achieve land and water conservation priorities on private land, whether it is agricultural, forest, or urban land. The cost-share programs in this report cover from 40% to 75% of the cost of installing BMPs.
- Funding for cost-share programs overall has declined by 40% since 2007; state appropriations were discontinued altogether for the FDP after 2009, which targets forestland preservation by working with mostly small landowners that would likely convert their forestland to some other use (or allow the forest to grow unmanaged) in the absence of this funding.
- The demand for funding is significantly higher than the funds available, suggesting a need for increased funding. For example, the Agricultural Cost-Share Program regularly receives in excess of \$20 million in requests for funding but has not exceeded \$5 million in allocated funding since 2009.
- Compared with neighboring states, North Carolina leads in funding for the CREP, but its Agricultural Cost-Share Program is lagging behind similar programs in Virginia and Florida.
- Cost-share programs yield substantial benefits to the environment and the economy. Water quality cost-share programs have funded BMPs on 585,000 acres and 1,085 miles of stream to mitigate runoff of nutrients to the water supply. The FDP meaningfully increases property values and profitability of the forest stock on lands managed through the program.

67 USEPA. (2014). North Carolina Water Quality Assessment Report. Retrieved from https://ofmpub.epa.gov/waters10/attains_state.control?p_state=NC#wqs.

7 Coastal Waters Conservation

The coast of North Carolina is home to a diverse, interconnected set of ecosystems, including the second largest estuary in the country, which supports vibrant fish and wildlife habitat and has intrinsic, commercial, and recreational value. As with other parts of the state, the health of the economy and the health of the environment are intertwined. Industries that rely on a healthy coastal environment include tourism, commercial and recreational fishing, and aquaculture.⁶⁸ Proactive stewardship of land and water resources will be important to grow these sectors and make them sustainable over the long term.

7.1 OYSTERS: THE ENVIRONMENTAL AND ECONOMIC OPPORTUNITY

Oysters are a key tool for protecting and improving coastal water quality; they also are central to the story of economic opportunity on the coast. Since the beginning of the 20th century, oyster populations in North Carolina have declined by 90% due to multiple factors, including loss of habitat, pollution and overharvesting. The remaining 10% are increasingly vulnerable to disease, habitat fragmentation, and toxic algae.⁶⁹ The renewed interest in oysters is due in part to the recognition that oysters provide important ecological services and also represent a major economic opportunity for North Carolina.

First, oysters are a major source of natural water filtration services. A single oyster can filter up to 50 gallons of water a day, helping to mitigate the effects of increased pollution from storm water runoff. Additionally, oyster habitats tend to attract other species of wildlife, including clams, finfish, crabs, and other small marine species. Finally, oyster habitats protect and stabilize shorelines.⁷⁰

The economic opportunity for oysters is found in the thriving and expanding aquaculture industry. Demand for oysters, particularly in restaurants, has been on an upward trend for years, but North Carolina has not historically been a strong participant.⁷¹ In 2013, the East Coast states sold \$154 million worth of shellfish, but North Carolina only claimed 0.4% of the market. In contrast, Virginia claimed 34% of the East Coast production, or \$52 million.⁷² Virginia's success is credited to its policies for incentivizing cultured oyster farming.

A 2016 study from APNEP and RTI International estimates that every \$1.00 of investment in oyster habitat enhancement yields \$4.00 of benefits for North Carolina.⁷³ As Section 7.2 illustrates, North Carolina is now making significant investments in restoring oyster habitat for both the environment and the economy.

7.2 STATE LAND AND WATER CONSERVATION FUNDING FOR COASTAL NORTH CAROLINA

North Carolina's investments in coastal land and water conservation are focused on protecting and enhancing water quality in the watershed and estuaries of the coastal region. Additionally, other funding focuses on protecting habitat for native fish and plant species; restoring reefs; and restoring and protecting shellfish habitat. The following programs were included in our assessment of coastal land and water conservation funding.

Albemarle-Pamlico National Estuary Partnership (APNEP)

APNEP is a partnership between the NC DEQ and the US EPA to identify, restore, and protect the significant resources of the Albemarle-Pamlico estuarine system. APNEP seeks to balance thriving human communities and sustainable ecosystems, funding a variety of initiatives

68 https://ncseagrant.ncsu.edu/ncseagrant_docs/products/2010s/NC_Ocean_Economy_White_Paper.pdf

69 North Carolina Coastal Federation. (2002). State of the coast report. Retrieved from <http://www.nccoast.org/uploads/documents/socreports/2002SOC.pdf>.

70 North Carolina Coastal Federation. (2002). State of the coast report. Retrieved from <http://www.nccoast.org/uploads/documents/socreports/2002SOC.pdf>.

71 <https://www.seafoodsource.com/news/supply-trade/oysters-remain-king-as-growers-race-to-meet-consumer-demand>

72 <http://www.ncaquaculture.org/documents/Rheault-keynote.pdf>

73 https://www.nccoast.org/wp-content/uploads/2014/12/RTI-APNEP_04-02-final.pdf

within the estuary.⁷⁴ North Carolina provides half of the funding for APNEP; EPA provides the other half.

N.C. Coastal Reserve (NCCR) and National Estuarine Research Reserve (NCNERR)

The NCCR and NCNERR is a network of 10 protected areas along the coast that conserve 42,000 acres of sensitive estuarine ecosystem. The protected lands represent all the unique types of estuarine ecosystems present in the state and help protect water quality; provide wildlife habitat; and support compatible research, education, and recreational opportunities.⁷⁵ Similar to APNEP, funding for NCCR and NCNERR is split between state appropriations and federal funds.

Artificial Reef Program (ARP)

The ARP maintains 42 ocean and 22 estuarine artificial reefs, 15 of which are designated oyster sanctuaries.⁷⁶ Artificial reefs provide critical spawning and feeding habitat for wildlife, helping to sustain healthy populations of native species and enhance the water quality of the estuaries.⁷⁷ Many of the species that are targeted for support by ARP are of importance to both commercial and recreational fishing in the region. ARP is funded by state appropriations, the US Fish and Wildlife Service, fishing license revenues, and private donations.

FerryMon

FerryMon is a collaboration between the North Carolina Department of Transportation's ferry fleet and the marine research laboratories of the University of North Carolina-Chapel Hill (UNC) to monitor water quality in the Albemarle-Pamlico Sound. Data collected by automated systems installed on ferries are made available for research purposes and are an important input to determining the

most effective strategies for maintaining the health of the Pamlico Sound's ecosystems. Funding is provided by a variety of sources, including state appropriations, the Coastal Recreational Fishing License Program, APNEP, and UNC.⁷⁸

Oyster Sanctuary Program

The Oyster Sanctuary Program is the foundational program that supports the reinvigoration of the oyster population on North Carolina's coast. The program has a goal of creating 500 acres of sanctuaries in Pamlico Sound. Currently the state has 10 oyster sanctuaries with about 250 acres developed, and has a goal of adding the remaining acreage by 2030. This will require an annual investment of about \$3 million each year. To date, the state and its nonprofit partners have been able to leverage state funding with federal grants—however, it is falling short of the goal of investing \$3 million in sanctuary construction every year. Harvesting of oysters is prohibited in oyster sanctuaries in order to preserve a healthy brood stock. Each oyster releases millions of eggs every year that result in expanding oyster populations adjacent to the sanctuaries. By protecting the brood stock, the sanctuaries can enhance the wider availability of oysters in areas that are open to commercial and recreational use.⁷⁹

Shellfish Rehabilitation Program

The Shellfish Rehabilitation Program supports the restoration of oyster habitat by actively building additional habitat through the placement of cultch (rock that oysters and other shellfish can attach to) in areas where oysters would naturally thrive. This program is complementary to the Oyster Sanctuary Program because it provides ready-made habitat for the oyster eggs that are being produced by the brood stocks in sanctuaries.

74 NC Department of Environmental Quality. About APNEP. Retrieved from <http://portal.ncdenr.org/web/apnep/about>.

75 NC Department of Environmental Quality. N.C. Coastal Reserve and National Estuarine Research Reserve. Retrieved from <http://portal.ncdenr.org/web/crp/publications1>.

76 NC Department of Environmental Quality. Artificial Reefs Program. Retrieved from <http://portal.ncdenr.org/web/mf/artificial-reefs-program>.

77 NC Department of Environmental Quality. Artificial Reefs Program: About Our Reefs. Retrieved from <http://portal.ncdenr.org/web/mf/about-nc-reefs>.

78 FerryMon. (2017). Retrieved from <http://www.unc.edu/ims/paerllab/research/ferrymon/images/index.html>.

79 NC Department of Environmental Quality. (2017). North Carolina's Oyster Sanctuary Program. Retrieved from <http://portal.ncdenr.org/web/mf/nc-oyster-sanctuary-program>.

Across all programs, funding for coastal land and water conservation amounted to \$6.4 million in 2017, a 163% increase in funding over 2007 (Figure 7-1). Our research and interviews with stakeholders indicate that the increase in funding over the last 10 years can be credited in part to the popular support for investment in coastal resources and in part to the recognition of oysters as an important tool for water quality improvement as well as an economic opportunity.

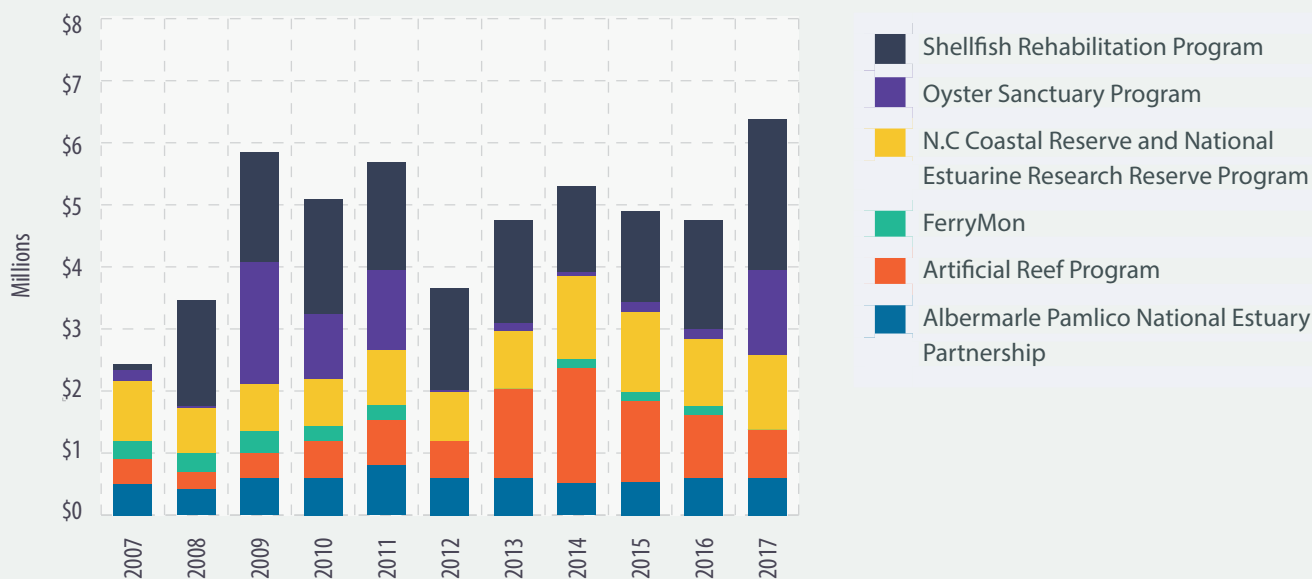
Despite increases in funding, interviews with stakeholders suggested that North Carolina is still falling short of funding needed to adequately protect coastal resources. Experts interviewed for this study commented that the pace of oyster habitat restoration is falling behind the goals set by the North Carolina Oyster Blueprint.⁸⁰ Additionally, experts commented that storm water runoff into the estuaries remains a significant source of water quality degradation. Section 8 discusses the need for storm water and wastewater infrastructure more broadly.

Coastal conservation and restoration provides protection for natural places and marine habitats that draw tourism and support a number of industries, including commercial fishing and a growing shellfish mariculture industry.

7.3 THE BENEFITS OF COASTAL RESTORATION

In 2015, RTI published a study called Coastal Restoration and Community Economic Development in North Carolina. This study demonstrated that the activity of coastal restoration yields meaningful economic benefits. RTI studied \$8 million worth of investments in coastal restoration and showed that these investments supported 116 jobs, generated nearly \$14 million in revenue to coastal businesses, and drove \$4 million in additional income to coastal households. These benefits only cover the economic benefits of funding the restoration projects. The out-

Figure 7-1. Coastal Land and Water Conservation Funding, 2007-2017



⁸⁰ The North Carolina Oyster Blueprint (available at <https://ncoysters.org/>) is an oyster restoration and protection plan that lays out a cohesive strategy for restoring oyster habitats in North Carolina waters for both the environmental and economic benefits. The steering committee for the Blueprint is made up of government, non-profit, academic, and private sector stakeholders.

⁸¹ RTI International. Coastal Restoration and Community Economic Development in North Carolina. Retrieved from http://www.nccoast.org/wp-content/uploads/2015/03/Final_NCCF_1-19-15.pdf.



comes of the projects—restored coastline and expanded oyster habitats—also yield substantial benefits for quality of life in coastal North Carolina, for the environment, and for the economy.

7.4 HOW NORTH CAROLINA COMPARES TO OTHER STATES IN THE SOUTHEAST

North Carolina invests more state funds in coastal conservation programs than most other states in the southeast, which rely primarily on funding from the federal government to achieve coastal conservation priorities. Some exceptions to this arise when one considers the role of storm water and wastewater infrastructure in mitigating water quality issues in coastal waters. For example, Virginia invests significant resources through its Water Quality Improvement Fund that target nutrient pollution in the Chesapeake Bay. Section 8 provides an overview of this topic.

7.5 KEY TAKEAWAYS: COASTAL WATERS CONSERVATION

- North Carolina's coastal environment and wildlife habitats are particularly sensitive to water quality degradation; the region is downstream of a major watershed which includes large population centers like the Triangle, making them reliant on strong state-level policies to protect water quality
- The coastal region also supports major industries in North Carolina, including tourism, commercial and recreational fishing, and aquaculture. For example, a diverse group of stakeholders, in response to a mandate from the N.C. General Assembly, is executing a strategic plan to grow the shellfish mariculture industry to \$100 million in landings by 2030.
- Oyster habitat protection and restoration is a conservation investment that yields significant environmental and economic benefits, but habitat restoration efforts are running behind goals set by the Oyster Blueprint to establish at least 500 acres of oyster sanctuaries by 2020.
- Since 2007, North Carolina has increased funding for coastal conservation by 163%, but this funding level remains small at \$6.4 million relative to the need. For example, an estimated \$2 million per year in additional funding would be needed to achieve oyster sanctuary goals according to one stakeholder interviewed for this study.
- Storm water and wastewater infrastructure anywhere within the watershed that feeds into the ocean are areas of concern and significant underinvestment with respect to protecting coastal water quality.

8 Storm Water and Wastewater Infrastructure

As discussed in Section 1.1, we define an expanded idea of land and water conservation for this report to consider other types of investments that help manage the pressures of a growing population on North Carolina's natural infrastructure.

In this section, we consider storm water and wastewater infrastructure, which are critical tools for preventing flooding, managing large volumes of storm water, and controlling the flow of waste from developed areas into North Carolina waters. Storm water runoff can degrade water quality by concentrating pollutants from urban and agricultural land and depositing them in waterways.

Note that, with respect to storm water, this section primarily addresses large-scale storm water management systems, mostly targeted at urban storm water management. However, there are also more decentralized approaches to storm water management that leverage innovative design of landscapes and riparian areas to mitigate storm water runoff. Such approaches mimic naturally occurring landscape features that excel at managing storm water. These include rain gardens, pervious pavement that allows water to infiltrate, riparian buffers, bioretention areas, and urban wetlands.⁸²

While decentralized storm water management by itself is insufficient in large urban areas, it is a critical tool for minimizing the need for centralized storm water systems and relieving some burden from systems that are aging or in disrepair. Additionally, in rural areas, decentralized storm water management may be more accessible

Storm water management is most challenging in developed areas and can degrade water quality by concentrating urban and agricultural pollutants in the waterways and increasing erosion and sedimentation.

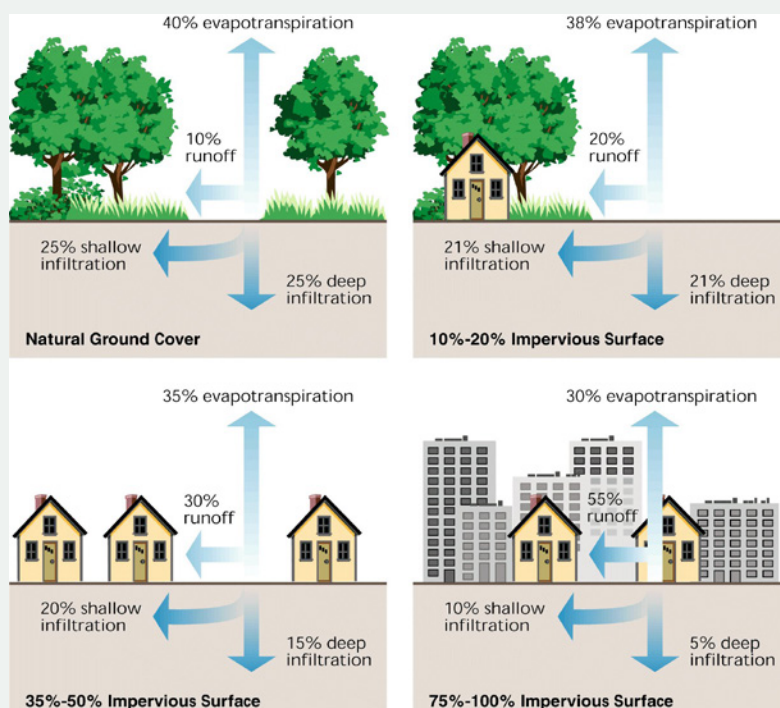
to cash-strapped towns and counties that still need to improve storm water management.

Many decentralized approaches to storm water management are supported under cost-share programs, which are detailed in Section 6 of this report.

8.1 STORM WATER AND WASTEWATER ENVIRONMENTAL IMPACTS

Ecosystems that are undeveloped by humans use natural infrastructure to manage storm water. Excess water from a rain event is removed through a combination of runoff, evapotranspiration, and infiltration. Urban development,

Figure 8-1. Relationship between Impervious Cover and Surface Runoff⁸³



⁸² NCDA&CS administers the Community Conservation Assistance Program, which provides cost-share for all of these storm water best management practices. See <http://www.ncagr.gov/SWC/costshareprograms/CCAP/index.html> for more information.

⁸³ Federal Interagency Stream Restoration Working Group. (1998). In *Stream Corridor Restoration: Principles, Processes, and Practices*. Retrieved from <https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/manage/restoration/?cid=stelprdb1043244>.

however, limits this natural management infrastructure, primarily because impervious surfaces such as roads and buildings prevent water from being naturally absorbed into the ground through infiltration, resulting in increased runoff. Figure 8-1 illustrates this concept at different levels of urban development.

Storm water runoff requires proactive management through manmade infrastructure such as storm drains, curbs, pipes, and detention ponds. Storm water that runs over a large area before being allowed to infiltrate into the ground or being collected by a storm water management system may require treatment because it collects pollutants from roads (e.g., motor oil) and nutrients from landscaping and farms, which negatively affect water quality. Additionally, poorly managed storm water can overwhelm creeks and streams, damaging property and leading to erosion and sedimentation.

Wastewater infrastructure is equally essential. While natural systems are effective at cleaning contaminants from water, humans generate waste on a scale that would overwhelm the natural infrastructure's capacity. Wastewater includes sewage, but also any water that is used in industrial processes and contains chemicals that could be harmful to the environment. The chief goal of wastewater infrastructure is to remove as many solids from water as possible before water is returned to the environment. Solids will decay over time, consuming oxygen in the water that plant and animal populations need to survive.⁸⁴

8.2 THE NEED FOR STORM WATER AND WASTEWATER INFRASTRUCTURE IN NORTH CAROLINA

Both storm water and wastewater infrastructure in North Carolina are in serious need of expansion and upgrade. The need for storm water infrastructure is directly related to the expansion of impervious surfaces in urban areas, and storm water management capacity does not necessari-

ly expand at the same pace as urban development. Outside of urban areas, runoff from land used for agriculture and livestock can introduce animal waste and nutrient pollution to the water supply. One expert interviewed for this study also commented that most water pollution on the coast comes from overland runoff rather than waste, underscoring the need to proactively address storm water management.

It is common for local and regional governments to assess storm water fees to maintain existing storm water infrastructure, but two-thirds of North Carolinians live in an area that does not have dedicated storm water funding.⁸⁵ Furthermore, this funding is typically not sufficient to finance large capital projects when major upgrades or new infrastructure is required. The result is that storm water infrastructure in North Carolina has fallen behind the pace of development.

With respect to wastewater, a survey conducted by EPA estimates that North Carolina has \$5.29 billion worth of documented wastewater infrastructure needs over the next 20 years. Particularly in smaller communities, wastewater systems are old and undersized relative to the rate of population growth. Aging infrastructure can lead to contamination of groundwater from pipe leaks and intrusion of roots and sediment into the pipe system, which can cause clogs and inhibit the capacity of the wastewater treatment infrastructure.

Similar to storm water infrastructure, it is common for municipalities to assess wastewater fees to maintain existing systems, but those revenues are rarely adequate to undertake large capital projects required to expand or retrofit infrastructure. In 2006, the North Carolina Rural Economic Development Center estimated that if all short-term wastewater infrastructure needs were used to set wastewater fees, the average customer's bill would grow by \$50 to \$75 a month, depending on the wastewater system.⁸⁶

84 U.S. Geological Survey. (2016). What is wastewater, and why treat it? Retrieved from <https://water.usgs.gov/edu/wuww.html>.

85 American Society of Civil Engineers. (2013). North Carolina Infrastructure Report Card. Retrieved from <https://www.infrastructurereportcard.org/wp-content/uploads/2016/10/2013-Report-Card-for-North-Carolina-Infrastructure-Lo-Res.pdf>.

86 North Carolina Rural Economic Development Center. (2006). Water 2030 Initiative.

8.3 FUNDING FOR STORM WATER AND WASTEWATER INFRASTRUCTURE IN NORTH CAROLINA

In addition to the local fees mentioned previously, storm water infrastructure funding is limited. The largest source is the Clean Water State Revolving Fund (SRF), a low-interest loan program that is capitalized each year with 80% federal and 20% state funds. Clean Water SRF loans can finance up to \$30 million projects and cover both storm water and wastewater projects.⁸⁷

The CWMTF also provides funding for innovative storm water projects, but given the broad scope of the fund's mission and declining funding in recent years (see Section 5.1), its ability to address storm water infrastructure needs is limited. Additionally, the requirement for storm water projects to be "innovative" means that funding is not available for more conventional, proven storm water management techniques, which are widely needed across the state.

Wastewater infrastructure projects have more options. The State Wastewater Reserve Program provides loans and limited grants for wastewater collection and treatment works, not to exceed \$3 million over 3 years.⁸⁸ The following are other state agencies that manage funding for wastewater infrastructure:

- NC DEQ, Division of Water Quality Infrastructure Finance Section
- NC DEQ, Public Water Supply Section
- NC Department of Commerce, Division of Community Assistance
- NC Department of Commerce, Commerce Finance Center
- NC Rural Economic Development Center
- CWMTF

The most recent state investment in wastewater infrastructure is the Connect NC Bond, which provides \$100 million in grants for small and medium-sized towns and \$209.5 million in low-interest loans to improve water and sewer systems. Half of this money is available for wastewater infrastructure grants and loans.

Across both wastewater and storm water, most government funding is federal, and the amount available is still insufficient to meet current and future needs. In fact, the most common source of financing for water infrastructure projects in North Carolina is private financing. More recent data are not available, but from 1995 to 2005, private financing, mostly through bonds, accounted for 70% of all investment in public wastewater infrastructure.

8.4 HOW NORTH CAROLINA COMPARES TO OTHER STATES IN THE SOUTHEAST

Most states in the Southeast approach these problems in a similar way and are similarly underfunded. One example that is worth observing, however, is Virginia's Water Quality Improvement Fund (WQIF). The WQIF is a permanent, non-reverting fund that provides grant funding to reduce nutrient pollution. Currently, funding is focused on grants for wastewater infrastructure in the Chesapeake Bay watershed. Since 2007, Virginia has invested \$743.2 million through WQIF.

8.5 KEY TAKEAWAYS: STORM WATER AND WASTEWATER INFRASTRUCTURE

- Storm water and wastewater infrastructure are essential areas of investment for protecting land and water resources as urban development increases the amount of impermeable surface in the state and increases the amount of waste and potential environmental contaminants that are released into North Carolina waters.

⁸⁷ NC Department of Environmental Quality. (2017). Clean Water State Revolving Loan Fund. Retrieved from <http://portal.ncdenr.org/web/wi/cwsrf>.

⁸⁸ NC Department of Environmental Quality. (2017). State Wastewater and Drinking Water Reserve Programs. Retrieved from <http://portal.ncdenr.org/web/wi/state-programs>.

- A 2013 report estimates that North Carolina will have \$5.29 billion in wastewater infrastructure needs over the next 20 years.
- Two-thirds of the state's population lives in communities without dedicated revenue for storm water infrastructure.
- Where municipalities collect storm water and wastewater fees, revenues are insufficient to undertake the major infrastructure renewal projects required to keep up with increased demand on the systems.
- The majority of projects for wastewater and storm water infrastructure are financed through private debt financing, but 60% of local governments in North Carolina cannot qualify for most private infrastructure lending programs because they have poor bond ratings.
- State-level funding for infrastructure projects is small relative to the need.
- Virginia provides one example to look to in its WQIF, which has invested \$743.2 million in wastewater infrastructure since 2007 to reduce nutrient pollution.

9 Conclusion

A healthy environment, healthy economy, and healthy population are deeply interconnected—one cannot exist over the long term without the others. North Carolina is rich in diverse land and water resources, from forests and farmland to the second largest estuary in the country. These resources are natural amenities, drawing people to visit and settle permanently, and they are also natural infrastructure, underpinning many sectors of the North Carolina economy, including forestry, agriculture, tourism, brewing, and fishing.

Over the past ten years, state funding for land and water conservation in North Carolina has declined by 70% in the midst of continued population growth. Over the next ten years, the population will continue to grow at the same

pace. Without additional investments in land and water conservation now, North Carolina may permanently sacrifice some of the natural infrastructure needed for long-term sustainability. Additionally, the state will miss out on economic opportunities that require investment in land and water conservation, including agriculture, forestry, tourism, national defense and aquaculture.

Addressing land and water conservation needs to support sustainable growth requires a portfolio approach that addresses distinct trends outlined in this report:

- the rate of agriculture and forestland loss
- intensification of land use
- an underequipped storm water and wastewater management infrastructure
- rapid urban development
- degraded coastal water quality and wildlife populations

A proactive, portfolio approach should be informed by rigorous research to identify the most vulnerable parts of the state and support a land and water conservation strategy with scientific evidence and a clear understanding of the benefits of such investments. By making adequate investments now, the state is making a down-payment on the long-term sustainability of North Carolina's lands and waters, supporting a healthy population and strong economy into the future.

Appendix A: North Carolina Land and Water Conservation Detailed Funding

Table A-1. Program-level Land and Water Conservation Funding

PROGRAM NAME	PROGRAM TYPE	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2007-2017 % CHANGE
Agriculture Water Resource Assistance program (AgWRAP)	Cost Share	-	-	-	-	-	\$0.9	\$0.4	\$0.4	\$1.3	\$0.8	\$1.3	56%
Community Assistance Conservation Program (CCAP)	Cost Share	-	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	-5%
Conservation Reserve Enhancement Program (CREP)	Cost Share	\$3.7	\$1.9	\$1.7	\$1.7	\$1.3	\$1.3	\$0.8	\$1.2	\$0.8	\$0.8	\$0.8	-77%
Forest Development Program (FDP)	Cost Share	\$1.2	\$0.6	\$0.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-100%
NC Agricultural Cost Share Program (ACSP)	Cost Share	\$5.6	\$5.4	\$5.2	\$4.3	\$4.3	\$4.4	\$4.2	\$4.2	\$4.0	\$3.5	\$4.0	-29%
Albemarle Pamlico National Estuary Partnership (APNEP)	Coastal	\$0.5	\$0.4	\$0.6	\$0.6	\$0.8	\$0.6	\$0.6	\$0.5	\$0.5	\$0.6	\$0.6	19%
Artificial Reef Program (ARP)	Coastal	\$0.4	\$0.3	\$0.4	\$0.6	\$0.7	\$0.6	\$1.4	\$1.9	\$1.3	\$1.0	\$0.8	98%
FerryMon	Coastal	\$0.3	\$0.3	\$0.4	\$0.3	\$0.3	\$0.0	\$0.0	\$0.1	\$0.1	\$0.1	\$0.0	-100%
N.C. Coastal Reserve and National Estuarine Research Reserve Program (NCCR/NCNERR)	Coastal	\$1.0	\$0.7	\$0.7	\$0.8	\$0.9	\$0.8	\$0.9	\$1.3	\$1.3	\$1.1	\$1.2	25%
Oyster Sanctuary Program	Coastal	\$0.2	\$0.0	\$2.0	\$1.0	\$1.3	\$0.0	\$0.1	\$0.1	\$0.1	\$0.2	\$1.4	650%
Shellfish Rehabilitation Program	Coastal	\$0.1	\$1.7	\$1.8	\$1.9	\$1.7	\$1.7	\$1.7	\$1.4	\$1.5	\$1.7	\$2.4	2876%
Natural Heritage Program	Other	-	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.8	\$0.8	\$0.5	\$0.8	98%
North Carolina Science Museums Grant Program	Other	-	-	-	-	-	-	-	-	-	-	\$2.5	-
Conservation Tax Credit	Tax Credit	\$25.7	\$20.0	\$16.5	\$12.0	\$13.5	N/A	N/A	\$0.0	\$0.0	\$0.0	\$0.0	-100%
ADFPTF Grants	Trust Fund	\$0.0	\$7.6	\$3.9	\$2.0	\$1.8	\$4.4	\$1.9	\$2.3	\$2.8	\$3.9	\$3.3	-57%
Clean Water Management Trust Fund	Trust Fund	\$100.0	\$100.0	\$100.0	\$50.0	\$50.0	\$11.3	\$10.8	\$13.9	\$17.4	\$23.4	\$27.2	-73%

Table A-1. Program-level Land and Water Conservation Funding (Continued from Previous Page)

PROGRAM NAME	PROGRAM TYPE	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2007-2017 % CHANGE
Natural Heritage Trust Fund	Trust Fund	\$24.0	\$20.8	\$14.3	\$13.1	\$12.5	\$5.0	\$15.1	\$0.0	\$0.0	\$0.0	\$0.0	-100%
Parks and Recreation Trust Fund	Trust Fund	\$57.3	\$49.4	\$30.2	\$27.5	\$25.6	\$19.0	\$33.9	\$11.4	\$13.5	\$13.7	\$24.3	-58%
Totals													
Conservation Trust Funds		\$181.2	\$177.8	\$148.4	\$92.6	\$89.9	\$39.6	\$61.7	\$27.5	\$33.6	\$41.0	\$54.7	-70%
Conservation Tax Credit		\$25.7	\$20.0	\$16.5	\$12.0	\$13.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-100%
Cost-Share Programs		\$10.5	\$8.1	\$7.6	\$6.2	\$5.8	\$6.7	\$5.6	\$6.0	\$6.2	\$5.3	\$6.3	-40%
Coastal Conservation		\$2.4	\$3.5	\$5.8	\$5.1	\$5.7	\$3.7	\$4.8	\$5.3	\$4.9	\$4.7	\$6.4	163%
Other		\$0.0	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.8	\$0.8	\$0.5	\$3.3	759%
Grand Total		\$219.9	\$209.7	\$178.9	\$116.3	\$115.3	\$50.4	\$72.5	\$39.6	\$45.5	\$51.5	\$70.7	-68%
Per Capita Funding													
Population		9.1	9.3	9.4	9.6	9.7	9.8	9.8	9.9	10.0	10.2	10.3	13%
\$ Per Capita		\$24.12	\$22.53	\$18.93	\$12.15	\$11.94	\$5.17	\$7.36	\$3.98	\$4.53	\$5.07	\$6.89	-71%

*Note: In cases where the program had no funding in 2007, percent changes are calculated from the earliest year in which the program had funding

Table A-2. Data sources for North Carolina Land and Water Conservation Funding Data

PROGRAM NAME	PROGRAM TYPE	DATA SOURCE
Agriculture Water Resource Assistance program (AgWRAP)	Cost Share	NCDACS
Community Assistance Conservation Program (CCAP)	Cost Share	NCDACS
Conservation Reserve Enhancement Program (CREP)	Cost Share	NCDACS \$1.8
Forest Development Program (FDP)	Cost Share	2007-2008: NCFS; 2009-2017: NCFS annual reports
NC Agricultural Cost Share Program (ACSP)	Cost Share	NCDACS
Albemarle Pamlico National Estuary Partnership (APNEP)	Coastal	DEQ
Artificial Reef Program (ARP)	Coastal	DEQ
FerryMon	Coastal	DEQ
N.C. Coastal Reserve and National Estuarine Research Reserve Program (NCCR/NCNERR)	Coastal	DEQ
Oyster Sanctuary Program	Coastal	DEQ
Shellfish Rehabilitation Program	Coastal	DEQ
Natural Heritage Program	Other	NCR
North Carolina Science Museums Grant Program	Other	NCR
Conservation Tax Credit	Tax Credit	Estimated from annual report figures
ADFPTF Grants	Trust Fund	ADFPTF Reports
Clean Water Management Trust Fund	Trust Fund	NCR
Natural Heritage Trust Fund	Trust Fund	NCR
Parks and Recreation Trust Fund	Trust Fund	NCR

Appendix B: Southeastern State Profiles

The table below presents some demographic and geographic characteristics that were considered when comparing North Carolina's land and water conservation investments with other states in the Southeast.

CHARACTERISTIC	NORTH CAROLINA	SOUTH CAROLINA	VIRGINIA	TENNESSEE	GEORGIA	FLORIDA
Area (square miles)	53,819	32,020	42,774	42,143	59,425	65,755
2016 Population	10,146,788	4,961,119	8,411,808	6,651,194	10,310,371	20,612,439
GDP per capita (\$)	44,325	37,063	51,736	43,267	44,723	39,543
Ten-year historic population growth rate	15%	15%	10%	10%	10%	14%
Miles of coastline	3,375 mi	2,876 mi	3,315 mi	0	2,344 mi	8,436 mi
Miles of inland waterway	1,150 mi	480 mi	670 mi	950 mi	720 mi	1,540 mi
Land use characteristics	58% forest, 14% cropland, 10% urban, 5% pasture and range, 5% parks and wildlife areas, remaining 8% other	68% forest, 10% cropland, 8% urban, 5% pasture and range, 9% other	61% forest, 13% cropland, 11% pasture and range, 7% urban, 8% other.	51% forest, 20% cropland, 13% pasture and range, 7% urban, 9% other	66% forest, 11% cropland, 9% urban, 14% other	45% forest, 15% pasture and range, 14% urban, 11% parks and wilderness areas, 8% cropland, 7% other.
Projected ten-year population growth rate	11%	7%	10%	8%	13%	11%
Wetland Area (thousand acres)	4,750.2	3,719.8	1,549.5	641.2	6,516.0	8,728.0
Average 5-year rate of lost agricultural land	5%	4%	3%	3%	7%	1%

89 <https://www.osbm.nc.gov/demog/county-projections>

90 <http://abstract.sc.gov/chapter14/pop5.html>

91 <http://demographics.coopercenter.org/virginia-population-projections/>

92 <http://tndata.utk.edu/sdcpopulationprojections.htm>

93 http://www.georgialibraries.org/lib/construction/georgia_population_projections_march_2010.pdf

94 https://www.bebr.ufl.edu/sites/default/files/Research%20Reports/projections_2017.pdf

Appendix C: State Fact Sheets

This appendix contains fact sheets summarizing data collected for this study about North Carolina's neighboring southeastern states:

- Virginia
- Tennessee
- South Carolina
- Georgia
- Florida

Note that data on program-level funding is for selected programs only and does not represent the full investment of each state in land and water conservation.

South Carolina

State Profile Facts

Population

4,961,119

10-year Population Growth Rate

15%

Population Density (pop./sq. mi.)

155

Total Area

32,020 sq. miles

Acres of Farmland (2012)

4,971,244 acres

Miles of waterway

480 miles



Charleston, SC (Photo credit: Niharika Bandaru)

Conservation in South Carolina is supported at the state level by multiple mechanisms including an income tax credit, the South Carolina Conservation Banks, and the Heritage Land Trust Fund. From 2007 to 2016, these programs provided over \$253 million to support conservation efforts. The Heritage Land Trust Fund has been in place since 1986. The Conservation Bank has been providing grants since 2004 but came under fire in 2017 after a critical audit and an investigation by the state's Inspector General. A bill to reauthorize the Bank indefinitely in 2018 with some caveats including removing its dedicated funding passed the state House of Representatives in February 2018 and goes to the state Senate for its vote.^{95 96}

DEDICATED REVENUE SOURCES

Deed Stamp Tax

South Carolina's deed stamp tax is responsible for funding the South Carolina Conservation Bank and the Heritage

Land Trust Fund. The deed stamp tax gives the state \$1.30 for every \$500 of value, 25 cents of which goes to the Conservation Bank and 10 cents of which goes to the Heritage Land Trust Fund.⁹⁷

TRUST FUNDS

Heritage Land Trust Fund

The Heritage Land Trust Fund provides funding for land acquisition through the state's Heritage Trust, a program of the state Department of Natural Resources. This land includes both natural and cultural sites. Cultural sites are primarily sites of archeological interest. Once these sites are designated as 'Heritage Preserves' by the Heritage Trust, no development may occur at that site. The Heritage Land Trust Fund is funded primarily by the state deed stamp fee, as well as sales of Endangered Species License Tags, some appropriations, and some donations from the public.⁹⁸

⁹⁵ https://www.postandcourier.com/news/south-carolina-legislators-might-have-compromise-to-save-the-conservation/article_a94480ee-0d06-11e8-b36a-ff01414e77df.html

⁹⁶ <https://www.schamber.net/media-center/article/business-community-thanks-house-107-3-vote-conservation-bank-reauthorization>

⁹⁷ <http://www.conservationalmanac.org/secure/almanac/southeast/sc/programs.html>

⁹⁸ <http://heritagetrust.dnr.sc.gov/history.html>

9.1 TAX CREDITS

South Carolina Conservation Initiatives Act

South Carolina offers a state income tax credit for donations of land to be used for conservation or as a conservation easement. The credit is available for 25 percent of the fair market value of the land, with two caps to this credit. There is a \$250 per acre cap and a \$52,000 per year cap. Unused credit in one year can be carried forward or transferred to a third party.⁹⁹

9.2 OTHER

South Carolina Conservation Bank

The South Carolina Conservation Bank was created in 2002 through the South Carolina Conservation Bank Act. The Bank receives its funding through a portion of the state's deed stamp fee. This funding is disbursed through grants to support conservation of environmentally sensitive lands, funding conservation efforts in wetlands, agricultural land, woodlands, historic sites, urban parks, and more.¹⁰⁰

SOUTH CAROLINA FUNDING DATA

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Department-level Funding, \$ per capita, 2007-2015*											
Natural Resources	\$58.39	\$66.23	\$52.18	\$48.44	\$42.84	\$41.62	\$41.24	\$44.81	\$43.20		
Parks & Recreation	\$26.38	\$26.57	\$22.81	\$22.18	\$17.31	\$16.72	\$18.24	\$22.46	\$22.86		
Total	\$84.77	\$92.80	\$74.99	\$70.62	\$60.14	\$58.34	\$59.47	\$67.27	\$66.06		
Selected Program-Level Funding, \$millions											
State Land Preservation Tax Credit	\$3.11	\$6.95	\$6.34	\$39.68	\$7.64	\$7.46	\$7.47	\$6.99	\$7.25	\$6.52	
Heritage Land Trust Fund	\$16.2	\$13.24	\$0.3	\$2.6	\$2.05	\$2.13	\$2.67	\$3.19	\$3.72	\$4.25	
Conservation Bank	\$25.63	\$17.56	-	-	-	-	\$15.99	\$14.16	\$10.69	\$20.1	\$6.03

* U.S. Census Bureau State Government Expenditures Survey

99 <http://www.scdhec.gov/HomeandEnvironment/docs/ModelOrdinances/SCExamples/SCConservationIncentivesAct.pdf>

100 <http://sccbanc.sc.gov/about/Pages/Mission.aspx>

Virginia

State Profile Facts

Population

8,411,88

10-year Population Growth Rate

10%

Population Density (pop./sq. mi.)

197

Total Area

42,774 sq. miles

Acres of Farmland (2012)

8,302,444 acres

Miles of waterway

670 miles



Mouth of Wilson, VA (Photo credit: Raz Bradley)

Virginia is home to numerous conservation initiatives and funding opportunities, including a conservation tax credit, several land trust funds, agricultural incentives, and water quality funding. These programs amount to over \$1.9 billion in funding in the last ten years. The state has also experienced significant conservation funding through bond measures which supported \$65 million in land conservation in 1992 and 2002.

TAX CREDIT

Land Preservation Tax Credit

An income tax credit is available for donated land through the Virginia Department of Conservation and Recreation. This tax credit may be claimed for up to 40% of the value of the land. In the last ten years, \$812.7 million in tax credits have been claimed for land of over 440 thousand acres.

TRUST FUNDS

Virginia is supported by many conservation trust funds including the Battlefield Preservation Fund, the Farmland

Preservation Fund, and the Land Conservation Foundation. The Land Conservation Foundation (VLCF) provides grant funding for land conservation and 50% matching grants for local governments and nonprofits. Eligible lands include open spaces and parks, farm and forest lands, permanent conservation easements, and lands with cultural or historical significance. VLCF also provides funding to the Open-Space Lands Preservation Trust Fund, which supports conservation of open spaces and conservation easements. The Preservation Trust Fund is responsible for most of the easements from the Land Preservation Tax Credit.¹⁰¹ Purchase of Development Rights programs are funded by the Farmland Preservation Fund, which provides match funding to local governments to preserve farmland by compensating landowners who establish permanent conservation easements. The Battlefield Preservation Fund is funded by the Department of Historic Resources and protects historic battlefield lands in the state. These include Revolutionary War, War of 1812, and Civil War battlefields.

AGRICULTURE

The Virginia Department of Conservation and Recreation offers several incentives for agricultural conservation.

¹⁰¹ <http://www.conservationalmanac.org/secure/almanac/midatlantic/va/programs.html>

These include a best management practices (BMP) tax credit program, a cost-share program, and the Conservation Reserve Enhancement Program (CREP). The BMP tax credit program provides tax credits for implementing agricultural BMPs to address nonpoint source pollution abatement and water quality improvement. The cost-share program provides cost-sharing assistance for agricultural conservation practices. CREP provides financial assistance, cost-share, and rental payments for implementing nonpoint source BMPs like planting riparian buffers and restoring wetlands. Virginia pays up to 25 percent of cost-share costs to implement riparian buffers for eligible lands enrolled in the USDA Conservation Reserve Program. The state also provides \$5 per acre in CREP rental and maintenance payments.¹⁰²

WATER

Water Quality Improvement Fund

The Virginia Water Quality Improvement Fund provides grants to support nutrient reduction and water quality im-

provement in the Chesapeake Bay watershed. The grants are awarded to publicly-owned wastewater treatment plants in the Chesapeake Bay watershed to implement nutrient reduction technologies. The Water Quality Improvement Fund grants are funded through state appropriations. The fund has received a total of \$908.28 million since its inception in 1997. In the past ten years, the fund has received \$743.5 million.

OTHER

Virginia FarmLink

The Virginia Department of Agriculture and Consumer Services funds a statewide FarmLink program that acts as an online community to connect farmers. The program helps farmers with land transition their land to new farmers and ensure it stays in agriculture. Virginia FarmLink also provides a certification program for farm seekers to help vet individuals that are seeking land to farm.

VIRGINIA FUNDING DATA

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Department-level Funding, \$ per capita, 2007-2015*											
Natural Resources	\$27.29	\$27.36	\$28.57	\$29.60	\$84.82	\$83.74	\$30.13	\$30.27	\$31.67		
Parks & Recreation	\$21.48	\$18.99	\$14.35	\$13.59	\$14.09	\$23.25	\$14.33	\$14.72	\$15.15		
Total	\$48.77	\$46.35	\$42.92	\$43.19	\$98.91	\$106.99	\$44.45	\$44.99	\$46.82		
Selected Program-Level Funding, \$millions											
State Land Preservation Tax Credit	\$100	\$102	\$106.60	\$106.80	\$108.42	\$56.23	\$59.96	\$64.08	\$48.63	\$59.97	
Heritage Land Trust Fund	□/□	N/A	N/A	\$0.67	\$0.59	\$1.25	\$0.86	\$0.80	\$1.14	\$1.01	\$0.69
Conservation Bank	\$15.04	\$13.59	\$15.49	\$22.96	\$10.32	\$21.22	\$28.27	\$30.87	\$48.26	\$8.87	\$9.96
Open Space Lands Preservation Trust Fund	\$0.99	\$0.85	\$0.5	\$0.5	\$0.13	\$0.38	\$0.25	\$0.25	\$0.25	\$1	\$2
Virginia Battlefield Preservation Fund	\$0.3	\$1.65	\$2.44	\$0.83	\$0.37	\$2.4	\$2.32	\$1			
Virginia Farmland Preservation Fund	-	\$4.25	\$0.5	\$0.64	\$0.1	\$1.2	\$1.33	\$1.06	\$1.58	\$2	\$0.50
Virginia Land Conservation Foundation	\$2.94	\$13.68	\$13.9	\$10.34	\$4.15	\$1.99	\$1.23	\$0.06	\$1	\$1	\$6.42
Virginia Aquatic Resources Trust Fund	\$7.68	\$11.26	\$1.59	\$2.13	\$2.27	\$2.79	\$3.18	\$3.4	\$2.06	\$2.52	
Conservation Reserve Enhancement Program	\$0.42	\$0.61	\$0.68	\$1.03	\$0.78	\$0.88	\$0.4	\$0.36	\$0.42	\$1.03	\$0.09
Water Quality Improvement Fund	\$215.52	\$18.19	\$3.85	\$250.35	\$3.1	-	\$87.57	\$106	-	-	\$59

* U.S. Census Bureau State Government Expenditures Survey

102 <http://www.dcr.virginia.gov/soil-and-water/crep>

Tennessee

State Profile Facts

Population

6,651,194

10-year Population Growth Rate

10%

Population Density (pop./sq. mi.)

158

Total Area

42,143 sq. miles

Acres of Farmland (2012)

10,867,812 acres

Miles of waterway

950 miles



Cherokee National Forest, VA (Photo credit: Andrew Neel)

Since 1986, a portion of the Tennessee's deed stamp tax has gone to support land and water conservation in the state. This began at \$0.035 per \$100 of value to support the Wetland Acquisition Fund. In 1991, this was amended to include the Agricultural Resources Conservation Fund, the Local Parks and Recreation Fund, and the State Lands Acquisition Fund, for a total of \$0.08 per \$100 of value from the deed stamp tax. In 2006, the Heritage Conservation Trust Fund was established but is funded through state appropriations instead.

DEDICATED REVENUE SOURCES

Deed Stamp Tax

A deed stamp tax of \$0.37 per \$100 of value is charged by the state. Of this, \$0.29 goes directly to the state's general fund while the remaining \$0.08 supports four state trust funds. These trust funds are the Agricultural Resources Conservation Fund, the Wetland Acquisition Fund, the Local Parks and Recreation Fund, and the State Lands Acquisition Fund.

TRUST FUNDS

Five trust funds provide conservation funding in the state of Tennessee. Four of these –the Agricultural Resources Conservation Fund, the Wetland Acquisition Fund, the Local Parks and Recreation Fund, and the State Lands Acquisition Fund – are funded by the state deed stamp tax. The fifth, the Heritage Conservation Trust Fund, is funded by state appropriations. The Heritage Conservation Trust Fund provides funding to conserve areas of significant value in the state including historical, cultural, archeological, and environmental areas and to promote tourism and recreation.¹⁰³ The Agricultural Resources Conservation Fund (ARCF) supports implementation of agricultural best management practices (BMPs) by providing cost-share funds to landowners who implement eligible BMPs. These include soil erosion and water quality-related BMPs. The ARCF receives \$0.015 per \$100 of value from the real estate transfer tax. The Wetland Acquisition Fund, which has been in operation since 1986, provides funding for

103 https://www.arts.tn.gov/content/dam/tn/environment/documents/board_heritage-conservation-trust-fund-board-report-2016.pdf

wetland and watershed acquisition for the purposes of restoring them. It receives \$0.0325 from the real estate transfer tax. The Local Parks and Recreation Fund, which receives \$0.0175 from the real estate transfer tax, provides funding for acquisition of land for recreational purposes and requires a 50% local match for its land acquisition

efforts. The State Lands Acquisition Fund is the final trust fund supported by the real estate transfer tax and receives \$0.015. It provides funding for the acquisition of land for state parks, natural areas, forests, trail systems, and historic sites, as well as conservation easements.¹⁰⁴

TENNESSEE FUNDING DATA

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Department-level Funding, \$ per capita, 2007-2015*											
Natural Resources	\$45.77	\$73.34	\$60.48	\$41.62	\$48.90	\$53.76	\$44.87	\$45.52	\$46.22		
Parks & Recreation	\$24.08	\$23.72	\$22.94	\$14.93	\$14.13	\$13.69	\$13.16	\$13.58	\$13.68		
Total	\$69.85	\$97.05	\$83.42	\$56.54	\$63.03	\$67.45	\$58.03	\$59.10	\$59.89		
Selected Program-Level Funding, \$millions											
Agricultural Resources Conservation Fund		\$16.0			\$3.14	\$4.33	\$2.61	\$3.18			\$3.19
Heritage Conservation Trust Fund	\$5.79	\$7.87	\$8.78	\$0.31	\$0.00	\$0.56	\$0.50		\$0.04	\$1.21	
Wetlands Acquisition Fund	\$7.17	\$3.09	\$3.35	\$0.13	\$0.87	\$0.34	\$1.78				
Local Parks and Recreation Fund	\$1.18	\$0.20	\$0.96	\$0.01	\$0.30	-	\$0.25	\$6.07	\$6.62	\$7.64	
State Lands Acquisition Fund	\$9.28	\$12.76	\$11.32	\$4.34	\$3.85	\$12.75	\$2.91		\$5.62	\$6.50	

* U.S. Census Bureau State Government Expenditures Survey

104 <http://www.conservationalmanac.org/secure/almanac/southeast/tn/programs.html>

Georgia

State Profile Facts

Population

10,310,371

10-year Population Growth Rate

10%

Population Density (pop./sq. mi.)

173

Total Area

59,425 sq. miles

Acres of Farmland (2012)

9,620,836 acres

Miles of waterway

720 miles



Forsyth Park, Savannah, GA (Photo credit: Jessica Furtney)

Many significant conservation incentives and funding sources in Georgia are administered by the Georgia Land Conservation Program. These programs include the Conservation Tax Credit, the Land Conservation Fund, and the Land Conservation Loan Program. Since its start in 2005, the Georgia Land Conservation Program has leveraged over \$258 million in state funding to help permanently protect over 346,900 acres of land.¹⁰⁵

TRUST FUNDS

Land Conservation Trust Fund

The Georgia Land Conservation Trust Fund provides competitive grants for land acquisition and conservation easements through the Georgia Land Conservation Program. The eligible conservation purposes of the lands include water quality, flood protection, wetlands protection, erosion reduction, riparian buffer protection, prime agricultural and forest land protection, scenic protection, connecting existing areas of conservation, cultural and

heritage site protection, and provision of recreation.¹⁰⁶ The Land Conservation Trust Fund has been funded through appropriations, although the fund has not received any appropriations since fiscal year 2009.¹⁰⁷

In 2015, a bill was introduced to the Georgia State House of Representatives to create the Georgia Legacy Trust Fund which would provide funding for land conservation in the state going forward. The Legacy Trust Fund would be funded by a portion of the sales tax on outdoor recreation equipment sold in the state. At the time of this report, the Legacy Trust Fund is not in place.

TAX CREDITS

Conservation Tax Credit

Lands and permanent conservation easements donated to the state of Georgia are eligible for a tax credit of 25% of the fair market value of the land or easement donated. This is capped at \$250,000 for individual donors and \$500,000

¹⁰⁵ https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/2015-annual-report.pdf

¹⁰⁶ https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/glcp-program-rules-chapter-305.pdf

¹⁰⁷ https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/2015-annual-report.pdf

for partnerships or corporate donors. Unused credits may be carried forward for 10 years. The total amount available for all credits each year is \$30 million. This is available annually until 2021, when the tax credit is set to expire.¹⁰⁸ In 2012, the tax credit requirements were amended. Some of these changes included requiring that the land donated meet two (previously one) conservation purposes. These were defined as: water quality protection, wildlife habitat protection, outdoor recreation protection, agricultural or forestry land protection, and cultural, heritage, or archeological site protection. Prior to 2012, the maximum tax credit for partnerships was \$1 million, instead of \$500,000.¹⁰⁹ Since the program's start in 2006, over 220,000 acres have been donated.¹¹⁰

OTHER

Georgia Environmental Finance Authority

The Georgia Environmental Finance Authority (GEFA) manages loan programs for environmental projects including land conservation. Land conservation loans are available through the Georgia Land Conservation Loan Program, a sub-program of the Georgia Clean Water State Revolving Fund. Loan applications are overseen by the Land Conservation Council, a part of the Georgia Land Conservation Program. Land conservation projects receiving these loans must be for one of the approved conservation purposes mentioned in the previous sections and detailed in O.G.C.A. § 12-6A-2(5).¹¹¹ These loan funds may be used for bridge financing, which allows conservation efforts to continue while awaiting a more long-term funding source.

GEORGIA FUNDING DATA

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Department-level Funding, \$ per capita, 2007-2015*											
Natural Resources	\$49.54	\$54.52	\$48.77	\$47.68	\$57.02	\$46.77	\$45.57	\$46.35	\$50.41		
Parks & Recreation	\$20.04	\$22.01	\$21.79	\$19.05	\$19.91	\$19.00	\$19.70	\$18.93	\$20.21		
Total	\$69.58	\$76.53	\$70.56	\$66.73	\$76.94	\$65.78	\$65.26	\$65.28	\$70.62		
Selected Program-Level Funding, \$millions											
Georgia Land Conservation Trust Fund	\$18.24	\$2.69	\$2.57	\$0.10	\$0.03						

* U.S. Census Bureau State Government Expenditures Survey

108 <https://glcp.georgia.gov/georgia-conservation-tax-credit>

109 https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/glcp-hb386-summary.pdf

110 https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/2015-annual-report.pdf

111 https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/glcp-georgia-land-conservation-act.pdf

Florida

State Profile Facts

Population

20,612,439

10-year Population Growth Rate

14%

Population Density (pop./sq. mi.)

313.47

Total Area

65,755 sq. miles

Acres of Farmland (2012)

9,548,342 acres

Miles of waterway

1,540 miles



East Fort Lauderdale, FL (Photo credit: Lance Asper)

Florida is typically regarded as having some of the most robust land and water conservation funding programs in the country, though funding has been more sporadic since the recession in 2008. Florida also has some of the most diverse sensitive ecosystems in the country relative to their size. The state has the second longest coastline in the country after Alaska and is home to more large natural springs than any other state. Additionally, the Everglades wetland ecosystem provides drinking water to one-third of the state, but is also at risk from overdevelopment and nutrient pollution.

Florida relies heavily on trust funds to manage funding for land and water conservation, which are funded by dedicated tax revenues and bond issues.

Florida also has an institutional framework that is unique in the southeast—a large amount of funding that is directed to land and water conservation is delegated to the regional water management districts, which are charged with managing natural resource and conservation priorities in their jurisdiction.

DEDICATED REVENUE SOURCES

Documentary Stamp Tax

In 2014, Floridians voted to divert one third of the revenue from the documentary stamp tax to the Land Acquisition Trust Fund. Since 2014, the allocation of funds has been hotly debated and subject to lawsuits (see Florida Forever section below).

TRUST FUNDS

Land Acquisition Trust Fund

The Land Acquisition Trust Fund (LATF) is the recipient of real estate transfer tax revenues. It was established in 2014 by constitutional amendment and is administered by the Department of Environmental Protection. The Florida legislature is responsible for allocating funds from the LATF every year. The first priority is debt service payments from outstanding bond issues for the Florida Forever program and Everglades restoration efforts.

FLORIDA FOREVER TRUST FUND

Florida Forever is historically held up as the largest land acquisition fund in the country, though in recent years it

has fallen out of favor with the Florida state legislature. Historically, Florida Forever is funded largely through bond issues. Legislation authorizes up to \$5.3 billion in bonds under Florida Forever, but since 1999, only \$2 billion has been issued.¹¹² In 2014, a constitutional amendment was approved by voters which was intended to fund Florida Forever through documentary stamp tax revenues. The allocation of funding has been hotly debated, however, because the legislature has chosen to limit allocations for Florida Forever to servicing existing debt rather than financing new acquisitions. Instead, additional funding through the documentary stamp tax has been directed to specific projects such as Everglades springs restoration.

Any Florida Forever funds that do not go to service debt are allocated across a statutorily mandated distribution, which includes water management district funding, parks and recreation, trails, the Florida Forest Service, and the Rural and Family Lands Protection Program.¹¹³

OTHER

Rural and Family Lands Protection Program

The Rural and Family Lands Protection Program (RFLPP) is a farmland preservation program that focuses on securing easements for farmland, with a focus on lands identified as particularly valuable or particularly at risk of development. RFLPP has historically been funded by the Florida Forever Trust Fund

FLORIDA FUNDING DATA

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Department-level Funding, \$ per capita, 2007-2015*											
Natural Resources	\$120.60	\$98.94	\$85.18	\$67.07	\$59.38	\$57.99	\$56.17	\$57.27	\$60.33		
Parks & Recreation	\$10.38	\$10.55	\$9.36	\$7.62	\$6.11	\$4.91	\$5.34	\$5.82	\$7.62		
Total	\$130.98	\$109.49	\$94.55	\$74.70	\$65.48	\$62.90	\$61.51	\$63.09	\$67.95		
Selected Program-Level Funding, \$millions †											
Florida Forever ‡	\$600.0	\$300	\$300	\$0.0	\$16.0	\$0.0	\$6.5	\$7.0	\$68	\$15	\$54
Land Acquisition Trust Fund (LATF)	\$643.5	\$355.9	\$381.7	\$416.3	\$542.3	\$598.1	\$699.9	\$751.4	\$784.4	\$355.9	\$381.7
Rural and Family Lands Protection (RFLP)	\$0.0	\$0.0	\$0.0	\$1.4	\$7.5	\$0.013	\$0.0	\$11.2	\$1.5	\$15.47	\$4.3

* U.S. Census Bureau State Government Expenditures Survey

† Funding for these programs are, in some cases, nested. Florida Forever receives funding from LATF and RFLP receives funding from Florida Forever. Thus, these funds should not be considered cumulatively. Florida Forever and LATF data are the amount of money that was allocated to each fund in each year. RFLP, however, is a record of expenditures. When money is allocated to Florida Forever, it is distributed to the recipient programs, which then have three years to spend the money.

‡ Funding estimated from 2017 Annual Assessment of Florida's Water Resources and Conservation Lands available at http://edr.state.fl.us/Content/special-research-projects/natural%20resources/LandandWaterAnnual%20Assessment_2017Edition.pdf.

112 http://edr.state.fl.us/Content/special-research-projects/natural%20resources/LandandWaterAnnual%20Assessment_2017Edition.pdf

113 Ibid.

Appendix D: Detailed Benefits of Select Cost-Share Programs in North Carolina

The following data was provided by the N.C. Department of Agriculture and Consumer Services.

AGRICULTURAL COST-SHARE PROGRAM

FISCAL YEAR	FUNDING REQUESTED	FUNDS APPROPRIATED	ACRES AFFECTED	NITROGEN SAVED (LBS)	PHOSPHOROUS SAVED (LBS)	SOIL SAVED (TONS)	WASTE-N MANAGED (LBS)	WASTE-P MANAGED (LBS)
2007	\$22,364,502	\$5,644,897	75,888	711,639	119,640	184,528	3,361,156	4,414,865
2008	\$23,082,876	\$5,444,897	65,921	799,231	220,131	125,286	2,612,438	2,921,569
2009	\$24,759,782	\$5,176,066	55,725	513,365	87,617	89,464	1,772,276	2,497,851
2010	\$22,838,870	\$4,338,586	64,550	424,735	95,174	177,702	2,273,177	2,542,427
2011	\$24,866,476	\$4,311,218	55,366	361,310	83,688	71,517	1,400,573	1,483,307
2012	\$22,537,158	\$4,438,055	56,401	470,102	239,255	78,332	1,729,769	2,175,432
2013	\$20,332,655	\$4,228,566	45,622	384,143	181,843	53,490	1,505,231	1,490,810
2014	\$19,140,836	\$4,210,566	40,957	377,216	230,903	46,075	2,477,345	2,428,973
2015	\$19,586,411	\$4,016,998	36,682	630,254	271,029	57,488	1,807,194	1,846,854
2016	\$20,747,330	\$3,516,998	31,580	472,206	91,478	60,895	1,977,164	2,047,416
2017	\$20,783,651	\$4,016,998	44,289	305,663	51,294	47,180	36,427,851	3,685,844
Total	\$241,040,547	\$49,343,845	572,981	5,449,864	1,672,052	991,956	57,344,173	27,535,348

AGRICULTURAL WATER RESOURCE ASSISTANCE PROGRAM

FISCAL YEAR	FUNDING REQUESTED	APPROPRIATED FUNDING	GALLONS WATER INCREASED	GALLONS WATER PROTECTED	ACRES IRRIGATED
2012	\$4,358,076	\$850,000	71,893,139	23,173,001	2,906
2013	\$4,679,864	\$425,000	74,375,843	22,494,001	718
2014	\$4,026,667	\$425,000	96,805,401	16,067,381	1,265
2015	\$5,086,156	\$1,255,875	121,840,294	16,961,732	1,620
2016	\$5,375,615	\$830,875	77,939,443	20,999,371	1,421
2017	\$6,854,975	\$1,327,500	876,449,942	4,006,507	987
Total	\$30,381,353	\$5,114,250	1,319,304,062	103,701,993	8,917

CONSERVATION RESERVE ENHANCEMENT PROGRAM (BENEFITS SINCE 1999)

STREAM MILES PROTECTED	SEDIMENT REDUCTION (TONS)	NITROGEN REDUCTION (LBS)	PHOSPHORUS REDUCTION (LBS)
1,085 (estimated for cumulative acres)	246,465	1,923,760	441,599

COMMUNITY CONSERVATION ASSISTANCE PROGRAM

FISCAL YEAR	TOTAL FUNDING REQUESTED	APPROPRIATED BMP FUNDING	AREA TREATED (SQFT)	AREA TREATED (ACRES)	NITROGEN REMOVED (POUNDS)	PHOSPHORUS REMOVED (POUNDS)	SOIL SAVED (TONS)	TOTAL SUSPENDED SOLIDS REMOVED (POUNDS)	BUILDINGS TREATED	PEOPLE REACHED
2008	\$1,047,561	\$143,840	2,560,146	58.8	1	139	647	29	44	76,800
2009	\$2,836,173	\$143,840	2,986,141	68.6	0	0	124	5	1579	33,835
2010	\$2,058,211	\$143,840	505,936,098	11614.7	50,174	64	354	6,364	168	153,185
2011	\$2,314,662	\$136,937	4,076,070	93.6	45	20	0	332	358	59,494
2012	\$2,440,030	\$136,937	4,525,213	103.9	177	0	275	1,850	485	72,099
2013	\$2,333,481	\$136,937	1,055,042	24.2	257	72	523	989	690	46,808
2014	\$1,698,756	\$136,937	7,819,135	179.5	143	1	7	254	56	2,395
2015	\$1,995,962	\$136,937	11,561,125	265.4	22	22	50	0	127	5,136
2016	\$2,217,930	\$136,937	300,334	6.9	68	47	1,615	155	58	25,718
2017	\$2,230,853	\$136,937	294,278	6.8	6	1	620	74	30	1,773
Total	\$21,173,619	\$1,390,079	541,113,582	12,422	50,893	366	4,215	10,052	3,595	477,243

Appendix E: Selected Programs Identified as Models for Best Practices in Land and Water Conservation Funding

EXAMPLE NAME	DESCRIPTION	STATE
Great Outdoors Colorado	Constitutional amendment passed in 1992 that dedicates 50% of the proceeds from the Colorado State Lottery to the great outdoors Colorado (GOCO) trust fund and a Board of Trustees that has fiduciary responsibility for the fund. GOCO is strictly a grant-making entity and cannot legally hold title to land. ¹¹⁴	Colorado
Clean Water, Land and Legacy Amendment	In 2008, the Clean Water, Land and Legacy Amendment was passed. This amendment funds conservation, recreation, water quality, arts, history and culture with a sales tax increase of three-eighths of one percent for 25 years. Proceeds are directed to four separate funds: the Outdoor Heritage Fund; the Clean Water Fund; the Parks and Trails Fund; and the Arts and Cultural Heritage Fund. ¹¹⁵	Minnesota
Wyoming Wildlife and Natural Resource Trust	The Wyoming Legislature created the Wildlife and Natural Resource Trust in 2005. Funded by interest earned on a permanent account, donations and legislative appropriation, the purpose of the program is to enhance and conserve wildlife habitat and natural resource values throughout the state. ¹¹⁶	Wyoming
California State Coastal Conservancy	The Conservancy implements statewide resource plans through its projects, including the California Water Action Plan, and the Wildlife Action Plan. ¹¹⁷ The Conservancy provides a mechanism to conserve coastal resources and a way to secure public access to the coast. This organization has spent over \$1 billion in voter-approved bond funding. ¹¹⁸	California
Design for Conservation	The Design for Conservation Sales Tax is a 1/8th of a cent sales tax that goes directly to support fish, forest and wildlife conservation efforts through the Missouri Department of Conservation. The permanent tax passed and was implemented in 1976. ¹¹⁹	Missouri
Washington Wildlife and Recreation Program	In a rare case of a long-standing program dependent on annual appropriations, Washington State's local governments, nonprofits and state agencies received \$42 million for conservation and outdoor recreation through WWRP. ¹²⁰ This legislation, passed in 1990, and subsequent funding have come about through the support of Governors, the Legislature, and groups such as the many organizations comprising the Washington Wildlife and Recreation Coalition. ¹²¹	Washington
Alabama Forever Wild	A 1992 constitutional amendment that directs the Alabama State trust to give Forever Wild 10 percent of the interest and capital gains from the trust fund, up to a cap of \$15 million annually. Royalties from oil and gas leases are the source of the fund's revenues. ¹²²	Alabama
Land for Maine's Future	In 1987, Maine voters approved a bond to purchase lands of significance for recreation and conservation. ¹²³ This fund is dedicated to conserve the working farms, productive forestlands, commercial waterfronts, recreational areas and valuable wildlife habitat which are the critical elements of Maine's natural resource-based economy. ¹²⁴	Maine

EXAMPLE NAME	DESCRIPTION	STATE
Massachusetts Community Preservation Fund	The Community Preservation Act (CPA) is a smart growth tool that helps communities preserve open space and historic sites, create affordable housing, and develop outdoor recreational facilities. CPA allows communities to create a local Community Preservation Fund for open space protection, historic preservation, affordable housing and outdoor recreation. Community preservation monies are raised locally through the imposition of a surcharge of not more than 3% of the tax levy against real property, and municipalities must adopt CPA by ballot referendum. To date, 172 municipalities in the state have adopted CPA. ¹²⁵	Massachusetts
Green Acres Program	The Green Acres, Farmland, Blue Acres, and Historic Preservation Bond Act of 2007 authorized \$12 million for acquisition of lands in the floodways of the Delaware River, Passaic River or Raritan River, and their respective tributaries, for recreation and conservation purposes. An additional \$24 million was approved by the voters in the Green Acres, Water Supply and Floodplain Protection, and Farmland and Historic Preservation Bond Act of 2009. ¹²⁶ Green Acres structured its matching grant program to give municipalities a financial incentive to have an approved Open Space and Parks Plan. Those with a plan, and a community open space tax, are eligible for a 50 percent match to their local dollars through Planning Incentive funding. ¹²⁷	New Jersey
New Hampshire Conservation Land Stewardship Program	In 1994, the State of Hampshire established a stewardship program to protect, in perpetuity, the conservation values and the investment in lands protected through the Land Conservation Investment Program (LCIP). ¹²⁸ The stewardship program monitors state-owned conservation land and provides technical assistance, training, and field support to municipalities and nonprofit groups. The endowment was created with public and private funds to ensure perpetual monitoring and stewardship of land protected with state funds. ¹²⁹	New Hampshire

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