Paying for Nutrient Reduction and Management in Jordan Lake

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Acknowledgements

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About the EFC

The EFC is part of a network of university-based centers that work on environmental issues, including water resources, solid waste management, energy, and land conservation. The EFC partners with organizations across the United States to assist communities, provide training and policy analysis services, and disseminate tools and research on a variety of environmental finance and policy topics. The EFC is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

Learn more at efc.sog.unc.edu.

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Executive Summary

For the past three years, the Environmental Finance Center (EFC) at the UNC School of Government has been researching and investigating options for financing nutrient management in Jordan Lake. By starting with an inventory of the current state of the watershed, the EFC focused initially on identifying how the current streams of revenue are flowing from local governments or other entities to the lake. In addition, the EFC sought to evaluate whether such streams of revenue have a positive impact on water quality.

After a general finding that the water quality spending in the Jordan Lake watershed is fragmented and often lacks communication or collaboration between entities, the EFC spent its second year of research looking for better ways to connect and integrate the current spending into more regionalized approaches. The EFC also examined different ways to calculate the potential revenue that exists in the Jordan Lake watershed that could be used for water quality improvements such as nutrient management. This included creating a "revenueshed" approach, which visualizes the concept of changing existing rate and tax structures for the purpose of revenue generation and incorporating beneficiaries into the revenueshed. For example, rather than the current boundary—which is defined by the regulatory requirements of the Jordan Lake Nutrient Strategy and includes only those in the Jordan Lake watershed—a wider boundary could be drawn to include local governments holding drinking water allocations for Jordan Lake. Within the different boundaries, the EFC calculated potential scenarios based on manipulating various revenue generation structures, including property taxes, water and wastewater rates, and stormwater fees, which are all existing mechanisms available to local governments for water quality improvements. Additionally in the second year, the EFC identified other existing tools that local governments can utilize to generate funds for the purpose of water quality improvements.

While the first two years of research focused heavily on evaluating both the existing spending and the potential revenue streams for future spending, the third year of research focused more on what would be required for implementation of any new spending or governance approach for Jordan Lake. In considering how a new nutrient management strategy could be funded and carried out, the EFC broke down its research and findings into three basic questions:

Defining "Watershed Management"

This report uses the term "watershed management" to include both quantity and quality issues. While the report and research were driven by a need to fund nutrient management specifically, many of the examples are financing mechanisms and options for water supply or for other water quality challenges, leading to the use of this broader term. Additionally, the use of more inclusive terminology is consistent with the discussion of financing with "One Water" in mind, an approach explored later in this report.

1. **What is the source of revenue for the watershed management?**
2. **Who holds the revenue and what does the governance structure look like?**
3. **How is the revenue spent to improve water quality?**

In its final year of research, the EFC looked into regional watershed governance approaches, both within North Carolina and in other states. Additionally, the EFC looked at some other state strategies for water quality-specific revenue generation. Finally, the EFC highlighted some existing revenue sources in North Carolina, which could be expanded or aggregated in different ways.

Future Finance and Governance Approaches to Consider—*at a Glance*

This report summarizes several different governance approaches that involve regional watershed management, both within North Carolina and across the country. Additionally, the report highlights four approaches which involve different legislative or implementation changes which provide the potential for increasing revenue generation, aggregating funding at a more regional level, and spending funds through a broader watershed wide approach.

As a starting point in evaluating options forward, the following four approaches highlighted in this report include:

- **Existing Framework:** The Existing approach relies on the existing revenue generation mechanisms, local governments, and existing boundaries which are currently in place. Adjusting the existing mechanisms would require no legislative changes, but the potential to increase effectiveness and collaboration is lower than any of the other approaches.

- **Expanded Framework:** The Expanded approach expands upon the existing framework by identifying what else is possible in North Carolina for generating, governing, and spending revenue for nutrient management, and then making slight legislative modifications to the boundary within which revenue can be generated, how it can be aggregated, or where it can be spent.

- **Watershed Fees or Taxes:** The Watershed fees/taxes approach relies upon the existing framework for governance, but brings in new, legislatively-created revenue generation mechanisms that are not currently a part of state statutes. While this approach requires more substantial statutory changes, the revenue generating potential is much greater and more consistent than in previously discussed approaches.

- **Regional Watershed Utility:** The Regional Watershed Utility approach starts anew. It creates a new entity with its own financing mechanisms and spending authority. While this approach would require the most legislative change, it provides the most streamlined potential for dedicated revenue, centralized governance, and watershed wide spending.

While the EFC has provided the four specific combinations of frameworks or strategies described above, there are myriad more combinations which decision makers can implement. The components of these approaches provide opportunities for the state to: remove barriers that have prevented cross-

jurisdictional spending; increase flexibility of boundaries within which revenue can be generated, create new dedicated sources of revenue for watershed management, and centralize pooling and governance of funding. By making such changes, the State can impact the ability of local governments to invest more holistically in watershed management.

Figure 1: Potential Variations of a New Nutrient Management Approach

Comparing Revenue, Governance, and Spending Policies

	Revenue	Governance	Spending
Existing Framework	Existing	Existing	Existing
Expanded Framework	Expanded	Expanded	Expanded
Watershed Fees/Taxes	New	Existing	Existing or Expanded
Regional Watershed Utility	New	New	New

Key Findings

Current North Carolina Governance Approaches Involving Regional Watershed Management

The EFC identified three existing governance approaches in North Carolina involving regionalized nutrient or watershed management:

Catawba-Wateree

In December 2007, Duke Energy Carolinas and 18 water supply entities came together to incorporate the Catawba-Wateree Water Management Group (CWWMG). In the decade since, CWWMG has invested heavily in initiatives to maintain water supply in order to keep up with population growth, while simultaneously protecting the ecological integrity of the waterway.

Duke Energy operates 11 reservoirs on the Catawba River under one Federal Energy Regulatory Commission (FERC) license, and the CWWMG grew out of Duke Energy's FERC relicensing. In its renewal of this license, Duke Energy wanted to charge water withdrawal fees to the 18 public water supply entities withdrawing from the Catawba River and adjacent reservoirs. However, pushback from the public water supply entities and a widespread desire to reinvest in the river system caused the 18 utilities and Duke Energy to form the CWWMG, to which all utilities and Duke Energy contribute financially. As long as utilities are active members of CWWMG in good standing, Duke Energy does not charge them water withdrawal fees.

What is the source of revenue for watershed management?

The majority of funding for CWWMG comes from member dues. Each member pays dues based on its gross withdrawals from the Catawba River Basin relative to the group's total gross withdrawals. Additionally, there is a surcharge for any water transferred out of the basin.

CWWMG also leverages funding such that it is able to provide $1.50 of work for every $1.00 paid in membership dues. In addition, external grant funding has been made available from the Water Research Foundation, the Duke Energy Foundation, as well as other funding partners. CWWMG has also received funding for approaching this sort of work as a result of a lawsuit the Catawba River Basin Association of South Carolina filed against North Carolina.[1]

Who holds the revenue and what does the governance structure look like?

CWWMG is a 501(c)(3) consisting of Duke Energy Carolinas, LLC and 18 water supply utilities withdrawing from 11 reservoirs in the Catawba River Basin. Water utilities withdrawing from these reservoirs are considered eligible participants in CWWMG, and those who do not pay membership fees to CWWMG are charged water withdrawal fees. Only these pre-designated eligible participants may become members. Eligible participants who do not join when first eligible may join CWWMG on a specified date by paying the current year's dues and past dues covering up to four missed years of eligibility. Current members may resign from the group at any time and for any reason.[2]

Large CWWMG members each get to nominate one member representative and one alternate member representative. These member representatives of large CWWMG members each receive one vote, and their votes determine who will be the member representatives for all small CWWMG members from North Carolina and South Carolina, respectively. Once all member representatives and alternates are decided upon, member representatives elect officers amongst themselves. Officers manage the administration and operations of CWWMG.[3]

Although membership in CWWMG is completely voluntary, Duke Energy will charge water withdrawal fees to eligible participants who do not join and remain in good standing. As such, it is the threat of water withdrawal fees, in addition to expensive legal proceedings, that disincentivizes free riding or dropping out of the watershed management group.[4]

The secretary/treasurer of CWWMG collects member dues, which total approximately $700,000 annually[5] based on the annual contribution schedule. The organization holds the funds in the Watershed Management Fund Account.[6]

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1. Personal correspondence with Barry Gullet. February 26, 2019
2. Bylaws
3. Bylaws
4. Personal correspondence with Barry Gullet. February 26, 2019
5. Personal correspondence with Barry Gullet. February 26, 2019
6. Bylaws

How is the revenue spent to improve water quality?

Each year, CWWMG produces a five-year water supply master plan. The plan describes future and current projects and consists of three phases: water quantity, water quality, and economic concerns.[7] Projects described in the plan may be managed by members or by third-party organizations, such as the United States Geological Survey.[8]

Upper Neuse River Basin Association

The United States Army Corps of Engineers built the dam resulting in the inundation of Falls Lake in 1978 to address flooding and water supply issues faced by the city of Raleigh and surrounding areas. This was done despite warnings from the North Carolina Department of Environment and Natural Resources—now the North Carolina Department of Environmental Quality (DEQ)—that the lake would have problems with nutrient pollution. In 1996, local governments formed the Upper Neuse River Basin Association (UNRBA) to protect the water quality of Falls Lake. As a nonprofit collaboratory of local governments, public and private agencies, and community stakeholders within the 770-square mile Falls Lake watershed, the UNRBA works to influence and comply with the Falls Lake Rules. The Falls Lake Rules are a nutrient management strategy designed to reduce nutrient discharges to the lake from various sources (stormwater runoff from development, agriculture, etc.).

What is the source of revenue for watershed management?

The majority of the UNRBA's funding comes from member dues. Of the total member dues, 10% is portioned equally among all members, constituting the base participation rate; 50% comes from members based on their share of the total annual water demand from the Falls Lake watershed. The remaining 40% of the total member dues is assigned based on members' shares of land area within the Falls Lake watershed.

Additional funding for the UNRBA may come from donations, bequests, gifts, grants, and payments for services performed. The total of all funding amassed to form operating budgets of approximately $1 million for the past few years.

Who holds the revenue and what does the governance structure look like?

Though there have been changes in management, the UNRBA has always been a 501(c)(3) nonprofit organization. The UNRBA is member-based; only members wield voting power and pay dues. Only political jurisdictions located completely or partially within the Falls Lake watershed may be members, and any local government that fits the aforementioned description may be a member of the UNRBA so long as it submits an application to the UNRBA's board of directors and pays the required membership dues. Members may leave the UNRBA at any time; to do so, they simply submit a request.
When issues are not resolved via a consensus agreement, each member of the UNRBA receives one

7. Personal correspondence with Barry Gullet. February 26, 2019

8. Bylaws

vote. However, this is rarely an issue, as consensus is a fundamental pillar of the UNRBA's structure. This focus on consensus was formalized in the Consensus Principles regarding implementation of Stage II of the Falls Lake Rules.

The Division of Water Resources (DWR), a division of North Carolina DEQ, runs nutrient credit trading and enforces the Falls Lake Rules. The UNRBA works with the DWR by providing an interface for governments in the Falls Lake watershed to provide consensus comments on issues like regulation changes.

One clear concern with having voluntary dues-paying membership, as the UNRBA does, is that potential members will free ride rather than pay into the organization. The UNRBA has not experienced this issue in practice, as 19 of its 20 possible members have joined and pay dues. Only one municipality has not joined. The UNRBA's executive director attributes this high rate of membership to the various benefits the UNRBA offers, many of which stem from the organization's focus on reaching consensus agreements.

Though issues may come to a vote if there is conflict among members, the UNRBA typically makes decisions based on the consensus of the group. This group consensus often includes non-member stakeholders in the watershed, who cannot be dues-paying members but are invited to sit in on public meetings and share comments and concerns. Much of this focus on consensus stems from the organization's formalized Consensus Principles, which emphasize the importance of a collective effort by local governments to run the UNRBA and of reevaluating the feasibility and costs of the Falls Lake nutrient strategy.

Due to this focus on consensus, as well as its official Consensus Principles, the UNRBA is able to provide a strong voice on behalf of the whole watershed. Having a unified voice helps better direct policy by presenting already-supported potential approaches to regulatory agencies. As a result, the Falls Lake watershed is less likely to experience delays in implementation of the Falls Lake Rules due to pushback from individual members and is better able to entice local jurisdictions to pay membership dues.

This focus on consensus agreements additionally gives the UNRBA extra weight when assisting jurisdictions in negotiations with the state. This clout is especially valuable to smaller jurisdictions with limited staffing and financial resources and is one additional way the UNRBA prevents free riding.

The consensus approach does present its challenges. The Falls Lake watershed contains a multitude of governments with a wide range of interests and cultures, so as every consensus agreement must please each of these diverse groups, it can be difficult to find a solution that all 19 members agree on.

The UNRBA additionally provides a third-party mechanism through which jurisdictions may pool funds for projects with watershed benefits. Pooling funds allows for jurisdictions to better maximize the cost effectiveness of nutrient management projects. The members recently did this to fund nutrient pollution

reduction development such that stakeholders in the Falls Lake watershed would have an expanded toolbox to meet nutrient reduction goals.

In the end, the executive director of the UNRBA attributes its overall success to the association's ability to bring all relevant stakeholders to the table to better cooperate and collaborate as they work to reach a specific goal.

How is the revenue spent to improve water quality?

The UNRBA recently spent considerable time, energy, and funding on registering five types of practices as nutrient pollution reduction creditable. This project significantly increased the toolbox available to stakeholders in the watershed looking to meet water quality standards or participate in nutrient credit trading. Aside from this project, the UNRBA spends the majority of its funds on water quality monitoring.

Many of the individual members of the UNRBA spend their own funds on nutrient pollution mitigation projects like wastewater treatment plant upgrades and wetland stormwater treatment.

Soil and Water Conservation Districts

In the 1930s, the Dust Bowl prompted the federal government to pass legislation providing for the creation of soil and water conservation districts. North Carolina passed the Soil and Water Conservation Districts Law as a result of this legislation.[9] Soil and Water Conservation Districts currently exist in each county in North Carolina and are tasked with managing conservation programs and natural resource management.[10]

What is the source of revenue for watershed management?

Soil and Water Conservation Districts (SWCDs) receive funding from a variety of sources. Federal funding, personnel, and technology are available to SWCDs through the Natural Resources Conservation Service. The state provides administrative and technical assistance, as well as funding through matching funds, agricultural cost shares, the Community Conservation Assistance Program, grants, and special project funds. On a local level, county governments will fund specific projects and assist with overhead costs. SWCDs may also raise funds independently through grant applications and selling or renting out products as trees and no-till drills.[11]

Who holds the revenue and what does the governance structure look like?

SWCD boundaries coincide with borders for every county in North Carolina with the exception of the Albemarle SWCD (which encompasses five counties in the eastern portion of the state: Camden, Chowan, Currituck, Pasquotank, and Perquimans Counties). The remaining 96 SWCDs each have a

9. http://www.ncagr.gov/SWC/districts/index.html

10. NC § 139.1

11. http://www.ncagr.gov/SWC/districts/index.html

five-member board of supervisors with three elected, non-partisan board members and two appointed board members. Albemarle SWCD has a 17-member board of supervisors.[12]

How is the revenue spent to improve water quality?

SWCDs deliver state and federal conservation programs, assist communities with natural resource management, natural disaster cleanup and restoration, and respond to projects of local interest. This is done through holding monthly meetings to establish priorities, installing and implementing best management practices (BMPs), and partnering with nonprofits, businesses, and state, local, and federal agencies.[13]

Current North Carolina Financing Mechanisms for Watershed Management

Raleigh Watershed Protection Fee

The City of Raleigh Public Utilities Department (CORPUD) draws and treats water from Falls Lake to provide potable water to its 600,000 customers spread across 275 square miles. Concern about maintaining water quality led CORPUD to look for ways to increase its customer base's contribution to protecting water quality in the lake.

What is the source of revenue for watershed management?

To protect water quality in Falls Lake, the City implemented a nutrient reduction fee for new developments in 2005. In 2011, that fee was replaced with the current volumetric watershed protection fee for all water customers. This watershed protection fee arises from North Carolina General Statutes §160A-314, §162A-9, §162A-49, which allow for opportunities for local governments to implement a variety of watershed protection revenue systems.

Via the watershed fee, CORPUD charges individual water users $0.15 per 1,000 gallons of water used. This averages out to a monthly charge of approximately $0.60 per residential water customer, and, when distributed over CORPUD's 600,000 residential and commercial customers, raises $2.25 million in annual revenue.

Funding for CORPUD's natural asset investments comes from its watershed fee and funds leveraged by land trusts. To date, Raleigh has contributed over $13.75 million in watershed protection fee revenue and $6 million in nutrient reduction fee revenue to fund these projects. In addition, the Upper Neuse Clean Water Initiative (UNCWI)—discussed below—has leveraged an additional almost $90 million in grant funding and land-owner donations.

12. Ibid.

13. Ibid.

Who holds the revenue and what does the governance structure look like?

All revenue from the watershed fee is dedicated to the Upper Neuse Clean Water Initiative (UNCWI), a land trust partnership coordinated by the Conservation Trust for North Carolina. Thus, the Conservation Trust for North Carolina (CTNC) acts as the fiscal agent for the funds generated by Raleigh's watershed fee.

How is the revenue spent to improve water quality?

Participating land trusts use funds from CORPUD, as well as from other nonprofits, state agencies, and local governments, to invest in natural assets that protect water quality in Falls Lake and its tributaries. Each year, CORPUD sends $270,000 of its fee revenue to CTNC for administrative and programmatic expenses, and the rest can only be spent on water quality protection projects.

Stormwater Utility Fee

A city may establish a stormwater fee under NC §160A-314. A county may also establish a stormwater fee under NC §153A-277. Regional authorities also have the same fee-setting powers as those listed for cities and counties in the aforementioned statutes.

What is the source of revenue for watershed management?

Revenue is raised via stormwater utility fees, which are based on the area of impervious surface on a customer's parcel. Stormwater fees may be distinctly set for different customer classes including residential, commercial, multi-family, and industrial. Residential fees are frequently collected as flat fees, which apply to the structures regardless of the amount of impervious, as the variation in impervious surface for residential parcels is small. This reduces the administrative costs associated with measuring the impervious surface on each parcel.

Who holds the revenue and what does the governance structure look like?

The revenue is held by the local government stormwater utility and may be collected on a utility bill, a standalone bill, or a property tax bill. The local government stormwater utility may be part of a municipality, county, or regional authority. Delinquent stormwater fees may be collected in the same manner as delinquent property taxes. Stormwater utility fee revenue is held within a stormwater enterprise fund.

How is the revenue spent to improve water quality?

Spending of stormwater revenue must be done within jurisdictional boundaries for the entity that generates the revenue. Revenue can be spent such that it does not exceed the city's "cost of providing a stormwater management program and a structural and natural stormwater and drainage system." A county has the additional authority to spend stormwater revenues for flood control such as elevating, demolishing, or retrofitting flood-prone structures under NC § 153A-274.1.

New North Carolina County Watershed Improvement Tax

What is the source of revenue for watershed management?

Under NC § 139-39, a county has the potential to levy and collect a special tax at a rate of no more than $0.25 for every $100.00 valuation of property in the county. The tax is known as a "watershed improvement tax."

Who holds the revenue and what does the governance structure look like?

In order to implement the new tax, the board of county commissioners has to hold a special election and the county residents have to vote in favor of a tax going in place. Once that happens, then the county itself levies and collects the tax in the same manner as general county taxes.

The watershed improvement tax allows for several options for a governance structure. Once the tax is approved by a majority of voters, the board of county commissioners shall have all the powers of a soil and water conservation district. They can either exercise those powers themselves, create watershed improvement commissions (each is made up of three appointed members), or delegate their powers to their soil and water conservation district (SWCD).

The county is required to submit watershed work plans to the SWCD to be reviewed and approved, and the SWCD has ongoing oversight of the implementation of such plans.

How is the revenue spent to improve water quality?

In general, under North Carolina statutes, the watershed improvement tax has to be used for the "prevention of flood water and sediment damages, and for furthering the conservation, utilization and disposal of water and the development of water resources."

Further, a county may "take any authorized watershed action and may expend funds for any authorized watershed purpose (including acquisition of real and personal property, easements, options, or other interests in real property) outside as well as inside the boundaries of the county, if the board of county commissioners finds that substantial flood prevention, drainage or water supply benefits will accrue to property located within the boundaries of the county as a result of such action or expenditure."[14]

14. NC § 153A-274.1

Other Existing Revenue Generating Mechanisms

As was discussed in the *Summary of Second Year Research*,[15] there are other revenue generating mechanisms that local governments in North Carolina can use to finance nutrient management. These mechanisms include:

- **Existing Property Taxes:** Jurisdictions in the Jordan Lake watershed have authority to use revenue from property taxes to cover nutrient management initiatives.

- **Sales Tax:** Jurisdictions in the Jordan Lake watershed have the ability to utilize a portion of sales tax revenues for nutrient management. They cannot, however, increase sales tax to generate additional revenue for nutrient management.

- **New Municipal Service Stormwater District Tax:** Municipalities within the Jordan Lake watershed have the authority to create special service districts within their boundaries that are assessed specific district property tax rates based on services provided in the district, which could include stormwater infrastructure projects.

- **Business Improvement District Tax:** Another variation of municipal service districts, municipalities also have the authority to create a tax district to support downtown revitalization, which could include stormwater infrastructure projects.

- **New County Special Services District Tax:** Counties have a similar authority as Municipal Service Districts, and can create a sub-county district made up of property owners who benefit from a particular investment.

- **Non-designated Water or Wastewater Utility Customer Charges:** This is how many of the stormwater projects related to nutrient management in Jordan Lake are currently funded. Utilities do not need a specific fee designated to stormwater in order to utilize rate revenue for some nutrient management projects that are integrated into the provision of their water and wastewater services (e.g. protecting water supply watersheds). Moreover, wastewater plant upgrades are most often funded from utility revenue bonds.

- **Property Assessments:** Cities have authority to invest in infrastructure on public and private land and to attach the cost of the infrastructure on the property through a tax assessment. This is an underutilized environmental finance tool in North Carolina.[16]

While some of these revenue sources are specific and targeted toward a project or stormwater infrastructure in general, these are not dedicated sources for watershed management which would enable regionalized spending. Additionally, some of these sources, such as general property taxes or

15. http://go.unc.edu/year-two-jordan-lake

16. For more on property assessments in North Carolina, see: http://go.unc.edu/special-assessments

sales tax, are pooled but then allocated in many directions. Thus, they are not necessarily good options for a protected stream of revenue that would ideally be limited to watershed management projects and priorities only.

Other State Governance Approaches for Regional Watershed Management

Iowa: Watershed Management Authorities

Ten years ago, Iowa passed legislation establishing a framework for the formation of regional watershed authorities, called water management authorities (WMAs). These WMAs are designed to address both nutrient pollution and flooding. In regard to mitigating nutrient pollution, WMAs primarily assist with the administration of measures outlined in the Iowa Nutrient Reduction Strategy intended to help the state reduce the amount of nitrogen and phosphorus leaving Iowa via waterways by 45%.[17]

What is the source of revenue for watershed management?

While WMAs initially rely on state funding, they must turn to alternative funding sources once they have been established and created watershed plans, primarily because there is little state money dedicated to these projects. WMAs derive project funds from a diverse variety of sources, including state-appropriated funds, money collected by the Iowa Department of Natural Resources, private and public donations, and interest on the balance remaining in the respective WMA reserve fund. Additionally, the Iowa Department of Agriculture and Land Stewardship is a major source of funding for nutrient mitigation projects.

The most consistent and reliable funding source for WMAs is self-funding. Though WMAs do not have the authority to levy taxes, member jurisdictions may raise their own revenue and dedicate it to the WMA. Only two WMAs currently raise funds via member dues, one of which is the Indian Creek Watershed Management Authority (ICWMA). To establish this framework, the ICWMA first had to gain full consensus from its member jurisdictions on its annual budget and how funding this budget would be divided among members. In fiscal year 2016, ICWMA's operating budget was $50,000. The contribution from each member of ICWMA was calculated using two measures of stake in the watershed: percentage of total area in the watershed and percentage of total valuation in the floodplain. A total of 40 percent of the contribution is based on total area and the remaining 60% is based on valuation in the floodplain.[18]

Because of their reliance on grants, greater diversity in project motivation can be helpful when WMAs are seeking out funding opportunities for project implementation. Flooding is associated with urgency and has financial returns that can help motivate funding mitigation efforts, even among smaller, local

17. https://www.desmoinesregister.com/story/money/agriculture/2017/03/14/study-whos-using-cover-crops-iowa-hardly-anyone/99168598/

18. Personal correspondence with Jennifer Fencl. October 26, 2018.

jurisdictions.[19] Federal funding is also available for flood mitigation efforts. Recently, 10 WMAs in flood-prone areas of eastern Iowa received a total of $93 million from the University of Iowa Flood Center thanks to a U.S Department of Housing and Urban Development grant the flood center received after 2008 and 2009 flooding events.[20] Though this was a large federal grant, over half of the existing WMAs did not receive any of the grant funding, highlighting the disparity in funding availability between WMAs.

Oftentimes, WMAs will also work to encourage private landowners to implement projects with their own money.[21] Much of this effort is focused on farmers and includes educating them on practices like no-till farming and cover crops. Incentivizing voluntary, privately financed efforts is often difficult, even with state cost-share programs.

Who holds the revenue and what does the governance structure look like?

WMAs are formed when at least two political subdivisions—which can be counties, municipalities, or soil and water conservation districts—within the same watershed enter into an agreement with a basic administrative framework that has been standardized by the state, called a 28E agreement.[22] Membership in the WMA is voluntary, but all political subdivisions within the watershed must be notified of its formation and invited to join within 30 days of establishment.[23]

WMAs have little authority on their own. They cannot tax, issue permits, or implement land-use restrictions. Their ability to take action is dependent upon support from member jurisdictions, which possess the aforementioned authorities to implement regulatory change. The WMAs themselves serve as a means of coordination for these member jurisdictions to decide what water quality or flood mitigation projects they want to implement and to complete those projects if granted that power.

WMAs can expand to encompass more political subdivisions within the watershed and may even include nonprofit organizations. Expansion may occur at any time, as long as new WMA members sign the 28E agreement. In addition, political subdivisions may be members of multiple WMAs. If a jurisdiction contains multiple watersheds or subwatersheds, it may be beneficial for it to join the WMA overseeing each so it remains involved in all watersheds in which it contributes nutrient pollution and experiences flooding. The most limiting stipulation for WMA membership is that members must be located within its respective U.S. Geological Survey hydrologic unit 8-digit code watershed.[24]

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19. Personal correspondence with Kayla Bergman. October 30, 2018.

20. Personal correspondence with John Swanson. October 23, 2018.

21. Ibid.

22. See an example here: www.indiancreekwma.org/uploads/2/1/4/4/21443298/sofs_filed_wma_agreement.pdf

23. Legislation: https://www.legis.iowa.gov/DOCS/ACO/IC/LINC/Chapter.466b.pdf

24. More information on USGS hydrologic units: https://water.usgs.gov/GIS/huc.html

How is the revenue spent to improve water quality?

The oldest WMAs have only been implementing projects for about two years—too short of a time to really see any quantifiable impacts.[25] The combination of WMAs' newness and their lack of authority has led them to focus more intently on educational efforts. Spreading public knowledge and creating a culture change is slow work, but WMA staff feel confident they are making great strides in these regards. Many of their educational efforts have had significant preliminary results within their watersheds.

Recently, a WMA in the Des Moines metropolitan area launched an educational program on rain gardens in a neighborhood in a lake's watershed. Within a few years, nutrient monitoring in the lake showed a 40% reduction in nitrogen flows. WMA staff members are confident the educational rain garden program was the primary cause of the improvement in water quality, and such positive results have given hope to other educationally-based WMA efforts in the state.[26]

WMAs also focus heavily on improving soil health. Healthy soil is much more absorbent than unhealthy soil. This absorbency mitigates the effects of droughts for farmers and reduces the volume and velocity of stormwater entering waterways that contribute to flooding and nutrient loading. The extremely high prevalence of agriculture within the state has a significant impact on soil health and therefore many of these efforts are concentrated on farmers.[27]

Prairie Rivers of Iowa, the nonprofit responsible for the Squaw Creek WMA's project implementation, has a variety of programs focused on education and improving soil health. The Small Landowner Assistance Program offers free land management consultations to owners of land smaller than 100 acres within five miles of the city of Ames in an attempt to improve soil health and water quality.[28] The nonprofit also operates Women Caring for the Land workshops, which educate local female landowners on soil health, water quality, and conservation practice options.[29] Prairie Rivers of Iowa additionally assists farmers in applying for the Iowa Department of Agriculture and Land Stewardship cost-share funds for a variety of water quality practices, including no till, strip till, buffer strips, bioreactors, perennial planting, extended rotations with alfalfa, and cover crops.[30]

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25. Personal correspondence with John Swanson. October 23, 2018.

26. Ibid.

27. Personal correspondence with Kayla Bergman. October 30, 2018; Personal correspondence with John Swanson. October 23, 2018.

28. http://www.prrcd.org/watershed_waterways/squaw-creek-watershed-small-landowner-program/

29. http://www.prrcd.org/watershed_waterways/other-special-projects/

30. http://www.prrcd.org/watershed_waterways/squaw-creek-water-quality-initiative/ | https://www.iowaagriculture.gov/press/2018press/press05172018b.asp

Minnesota: Watershed Districts

As urbanization increases impervious coverage in Minnesota, the volume and velocity of stormwater flowing into waterways subsequently increases as well. With this comes greater nutrient pollution and flooding. The state's strong water ethic and desire to protect homeowners from flooding prompted state lawmakers to pass legislation allowing for the establishment of local watershed districts and granted these watershed districts the authority to effectively and efficiently deal with nutrient pollution and flooding.[31]

What is the source of revenue for watershed management?

Funding for watershed districts primarily comes through ad valorem taxes levied by the counties encompassed in the district. Tax burden per county is limited to the respective county's net tax capacity relative to the net tax capacity of the watershed district. The ad valorem taxes have limitations on the overall percentage of value and individual percentages of value for designated purposes. Designated purposes with taxation limitations include organizational expenses, bond payoff, construction and implementation of water quality projects, repair and maintenance of water quality projects, and surveys and data acquisition.[32]

Beyond direct allowance of ad valorem taxes, watershed district law is broad and gives individual watershed districts great flexibility in financing projects. Additional funding may come from assessments against properties abutting projects, debt financing through bonds, fees for permits and services, stormwater utilities, and creative taxing mechanisms. In 2009, Shell Rock River Watershed District received special permission from the state to implement a local sales tax dedicated to funding programs that benefit clean water, land preservation, and the arts. A portion of this tax revenue goes to the watershed district. Funding via sales tax is particularly advantageous for this district due to the large amount of out-of-state spending along a major highway that passes through it.[33]

Watershed districts may also form special sub-financing districts, which are taxed more heavily to help fund projects that distinctly benefit that respective area. Though residents of sub-financing districts bear heavier financial burdens than they would otherwise, funding for distinctly beneficial projects is still distributed across whole districts. The watershed district board determines what the balance between funding from the sub-financing district and the district as a whole will be, and sets taxation rates accordingly.[34]

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31. Personal correspondence with Tina Carstens and Chris O'Brien. November 1, 2018.

32. Legislation

33. Personal correspondence with Steve Woods. February 13, 2019 | Personal correspondence with Karen Kill. January 22, 2019.

34. Ibid.

Who holds the revenue and what does the governance structure look like?

Under this legislation, a majority of political jurisdictions—either by population or number of political subdivisions—or a minimum number of citizens within the potential watershed district's jurisdiction must petition the state to form a watershed district. Once accepted by the Minnesota Board of Water and Soil Resources (BWSR), the watershed district encompasses all jurisdictions within its boundaries. Local governments within the watershed district that did not originally wish to join are mandated to comply with its regulations.

Changing the boundaries of a watershed district is feasible, but requires the district to maintain a contiguous jurisdiction. The watershed district may, however, contain all or part of multiple watershed districts and counties. Enlarging watershed districts requires a minimum number of signatures on a petition from one of a variety of listed groups within the area proposed to be added. Once the petition is signed, the new watershed district must be approved by the BWSR.

Withdrawing territory from a watershed district is more difficult. To withdraw, the area proposed to leave the watershed district must also acquire a minimum number of signatures on a petition from one of a variety of listed groups. However, the petitioner must also prove to the BWSR that the proposed withdrawing area is not in a watershed primarily managed by the watershed district, the watershed district can operate without the area's inclusion, and the withdrawing territory gains no benefit from inclusion in the watershed district.[35]

How is the revenue spent to improve water quality?

The issues watershed districts address are tailored to each individual district, but as of the 1990s, watershed districts began shifting focus from flood control to deal more intensively with water quality. Today, flooding issues are primarily resolved,[36] and the primary nutrient-based water quality issue is excessive levels of phosphorus. Much of this phosphorus enters the water from salted roads in winter months.[37]

Watershed districts do not have land use authority, so in order to affect water quality via land use, watershed districts have three avenues available to them: changing what rules they can, changing prices, and changing people's minds. Changing rules generally means implementing permitting programs, which have been effective for some districts[38] but is generally considered time consuming, expensive, and ineffective.[39] To change the price of land use patterns, watershed districts sometimes provide cost-shares for farmers who set aside easements. Other times, watershed districts will purchase land for conservation purposes. Finally, to change the community's mind on land use, watershed districts will

35. Legislation

36. Personal correspondence with Karen Kill. January 22, 2019.

37. Personal correspondence with Tina Carstens and Chris O'Brien. November 1, 2018.

38. Ibid.

39. Personal correspondence with Steve Woods. February 13, 2019.

run water education programs for local community members. Through this, they seek to better inform different groups about the water quality issues facing the district and how they can take steps that benefit themselves and the region's water quality. The end goal of educational programs is generally to create bottom-up change within the district.[40]

The Twin Cities metropolitan area saw striking results in its 35-year review of the watershed district program. Over this timespan, the population of the metro area increased by 1.2 million people to a total of 3.5 million, and yet 92% of lakes maintained or improved their water transparency. Data was similar for surface streams. Though different watershed districts have different approaches to administering water quality programs, the executive director of the Minnesota Freshwater Society believes one thing is clear: watershed districts are largely to thank for these impressive water quality numbers.[41]

Ramsey-Washington Metro Watershed District, one of the watershed districts in the Twin Cities area, credits its permitting authority for the improvements in water quality in many of its 18 lakes. After the watershed district instituted a permitting program in the area around these lakes, several that had been close to an impaired waters listing saw improvements in water quality (keeping them off the list) and one, Kohlman Lake, was delisted.[42]

The state listed Kohlman Lake as impaired in 2002 as a result of its excess nutrients and chloride content.[43] Since then, Ramsey-Washington Metro Watershed District has implemented several water quality improvement projects in the lake's watershed, in addition to a permitting program. These projects range in cost from $25,000 to $6.5 million, with funding sources including the district's own funds, Clean Water Fund grants, city funds and assessments, and the Minnesota Department of Natural Resources.[44]

Washington: WRIA Planning Units

The state of Washington implemented its watershed planning program in 1997. This legislation allowed for the creation of Water Resource Inventory Area (WRIA) planning units, in which the political sub-jurisdictions of one or more WRIAs could collaborate and produce watershed plans to improve water quality and habitats for fish.[45]

What is the source of revenue for watershed management?

State appropriations are available to help WRIA planning units get started. Single WRIA planning units may apply for up to $50,000 from the state to initiate their programs; Multi-WRIA planning units may apply for up to $75,000. After this point, state funding opportunities become more equalized between single

40. Ibid.

41. Ibid.

42. Personal correspondence with Tina Carstens and Chris O'Brien. November 1, 2018.

43. https://www.rwmwd.org/projects/kohlman-lake/

44. https://www.rwmwd.org/projects/kohlman-creek/

45. http://app.leg.wa.gov/RCW/default.aspx?cite=90.82

and multi-WRIA planning units. Instream flow and water quality components of watershed assessments are capped per project. However, each WRIA could potentially have multiple projects. State funding to conduct watershed assessments, develop watershed plans, and make actionable recommendations is capped per WRIA. Planning units with multiple WRIAs face no additional limitations on receiving these funds. Funding caps do exist at the planning unit level for assessments of instream flows after the completion of initial watershed assessments, detailed assessments of multipurpose water storage opportunities, and studies of specific multipurpose storage projects.[46]

Washington also offers a matching grant for Phase IV watershed plan implementation. The planning unit must match at least 10% of the grant's value. This match funding can be provided by the member jurisdictions of the planning unit or by federal agencies, tribal governments, local governments, special districts, or other local organizations.[47] The state nominally caps this grant funding as well.

Who holds the revenue and what does the governance structure look like?

The state of Washington pre-designated Water Resource Inventory Areas (WRIAs), the basic unit that may constitute a watershed for watershed planning purposes. Local governments within a WRIA may come together to form either a single WRIA planning unit or a multi-WRIA planning unit. Regardless of the number of WRIAs in a planning unit, every county, the largest city or town, and the water supply utility withdrawing the largest quantity of water in each member WRIA must all agree to terms of establishment before the planning unit can be formed and assigned a lead state agency. Once a planning unit is formed, it has one year to develop an implementation plan that provides enough water for agriculture production, commercial, industrial, and residential use, and instream flows. The implementation plan should also define responsibilities and any needed local agreements or permits.[48]

How is the revenue spent to improve water quality?

The WRIAs are created for watershed planning purposes. However, since their statutory designation, the state has modified the authority given to WRIA planning units to include activities that focus more heavily on restoring and promoting instream flows.[49]

Maryland: Bay Restoration Fee

Maryland is a member of the Chesapeake Bay Program, an inter-state organization established through the Chesapeake Bay Watershed Agreement in 2014 to guide the restoration of the Chesapeake Bay. Through the partnership, member states set respective pollution reduction goals and are then given full freedom in reaching those goals. In an effort to meet its nutrient pollution reduction goal, Maryland implemented a pooled, flat fee to fund wastewater treatment plant and septic tank upgrades.

46. RCW 90.82.040

47. RCW 90.82 §040.2(e)

48. Personal correspondence with Kristen Johnson-Waggoner. November 16, 2018.

49. https://ecology.wa.gov/Water-Shorelines/Water-supply/Water-rights/Case-law/Hirst-decision

What is the source of revenue for watershed management?

The Bay Restoration Fund is a Maryland state fund dedicated to upgrading wastewater treatment plants with enhanced nutrient removal (ENR) technology. This fund is divided into two subsets, the Wastewater Treatment Plant Fund and the Onsite Disposal Fund, and each subset has its own revenue source.

The Wastewater Treatment Plant Fund is supported by monthly fees charged to residential dwellings with sewer bills and onsite sewage disposal, residential dwellings with sewage holding tanks that pay water bills, and commercial and industrial users. Residential users whose sewage discharges into the Chesapeake Bay, including out-of-state residential users whose sewage enters a wastewater treatment plant in Maryland, pay a flat, $5.00 surcharge per month added to their sewage bill; those whose sewage enters a Maryland wastewater treatment plant but does not discharge into the Chesapeake Bay pay only $2.50 per month; and residential users who demonstrate substantial financial hardship may be exempt from the fee. Industrial and commercial users are charged $5.00 per equivalent residential unit (ERU) per month for up to 2,000 ERUs.

The Onsite Disposal Fund is supported by annual fees charged to residential owners of onsite sewage disposal systems or holding tanks who do not pay water bills. Their annual fee is $60, which is equivalent to the monthly $5.00 fee paid into the Wastewater Treatment Plant Fund.

The Bay Restoration Fee generates about $100 million annually from wastewater treatment plant users.

Who holds the revenue and what does the governance structure look like?

The fee is collected by the billing agencies and then sent to the Comptroller for the State of Maryland. The State holds the revenue in the two funds and determines how it is spent to improve water quality.

How is the revenue spent to improve water quality?

Revenues from the Wastewater Treatment Plant Fund are used to upgrade 67 major, publicly owned wastewater treatment plants with a discharge point that enters the Chesapeake Bay.

Revenues from the Onsite Disposal Fund are pooled to upgrade conventional septic systems by either hooking the dwelling up to a public sewer connection or installing a best available nitrogen-removing technology. The program prioritizes failing onsite sewer disposal systems and onsite sewer disposal systems on land within 1,000 feet of tidal waters, a state-designated critical area.

Los Angeles County: Special Parcel Tax

In November 2018, Los Angeles County voters passed a referendum allowing for the creation of the Safe Clean Water Program funded by a parcel tax of 2.5 cents per square foot of impervious surface. The objective of this program is to increase water supply, improve water quality, and invest in the local community. Many details have not yet been decided, but now that it has voter approval, the county will soon establish criteria and procedures for the program.

What is the source of revenue for watershed management?

Property owners will be taxed 2.5 cents per square foot of impervious surface on parcels within Los Angeles County. The Treasurer and Tax Collector of Los Angeles County will collect this tax revenue with property taxes, and standard tax exemptions and payment delays will be applied to its collection. Additionally, low-income, senior-owned parcels will be exempt from payment and the County may establish other low-income credits. Tradable credits will also exist for improvements that capture, treat, or reduce pollution within stormwater or urban runoff, as well as for improvements that increase the water supply or improve local communities, to assist parcel owners in satisfying obligations stemming from this special parcel tax.[50] Altogether, this special parcel tax is expected to raise approximately 300 million dollars annually.[51] Municipalities or districts may also issue revenue bonds funded by the parcel tax if they wish.

Before the Safe Clean Water Program, municipalities paid for and maintained the County's separate stormwater drainage system individually. Apart from the Los Angeles County Flood Control Act, which pays for flood control and conservation, there was no dedicated funding source to pay for this system. The new parcel tax, while not fully dedicated to stormwater drainage, helps better address needed stormwater infrastructure improvements.

Who holds the revenue and what does the governance structure look like?

The Safe Clean Water Program will be governed by Los Angeles County. The program does not establish a new governance structure.

How is the revenue spent to improve water quality?

After the Treasurer and Tax Collector of Los Angeles County collects the special parcel tax revenue and accounts for any administrative costs of collection, the funds are divided between the Los Angeles County Flood Control District (the District), municipalities within the District, and nine regional programs run by watershed area steering committees. Eligible projects include infrastructure development, property acquisition for project implementation, stormwater monitoring and approaching, and new technology to increase water capture and decrease runoff pollution.

50. SCW Final Ordinance; 7/11/2018

51. Personal correspondence

To receive Safe Clean Water funds, municipalities must enter into agreements with the District. Funds are returned to municipalities relative to how much special parcel tax revenue was generated within the municipality, with the exception of disadvantaged communities. Disadvantaged communities, in which the median annual household income is less than 80% of the statewide median annual household income, receive more money than they raise, in addition to receiving workforce training programs.

The watershed area steering committees tasked with allocating regional program funding must be made up of a specific mix of 15 members: six municipal representatives, five sector-specific stakeholders, and four community stakeholder representatives. Regional program funds are available to Native American tribes, public utilities, NGOs, nonprofit organizations, and other similar entities, and at least 90% of regional program funding must be allocated to infrastructure projects.

Water Allocation and Withdrawal Fees with Added Revenue Generation for Water Quality

One mechanism seen in some states is creating an additional fee associated with water allocations. This fee can be collected either as a withdrawal fee, a capacity fee, or both.

What is the source of revenue for watershed management?

For Pennsylvania, the state is presently proposing a withdrawal fee to raise $300 million to $500 million for water quality projects. This will be raised from withdrawal fees on businesses pulling out both ground and surface water.[52] The fee, as proposed by Pennsylvania House Bill 20 of 2017-18, would charge a 10 cent per 1,000 gallons withdrawal fee to all non-municipal, non-agricultural users withdrawing more than 10,000 gallons per day.[53]

Additional examples of capacity fees for allocation are abundant, including fees in Minnesota, Virginia,[54] and New Jersey.[55] Additionally, Wisconsin is an example of tiered pricing for annual water withdrawal capacity. The Wisconsin Department of Natural Resources charges an annual fee of $125 to any system with the capacity to withdraw 100,000 gallons per day or more from either ground or surface water. A graduated fee of up to $9,625 applies to systems with the capacity to withdraw 50 million gallons or more per year. Charging for capacity rather than actual withdrawal removes administrative burden of verifying withdrawal volumes, especially in Wisconsin, where private wells pay a fee as well. Minnesota generates about $4.7 million per year, New Jersey about $5.1 million and Wisconsin about $1 million.[56]

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52. https://www.mcall.com/opinion/mc-opi-pa-water-use-fee-muschick-20180702-story.html
53. https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2017&sessInd=0&billBody=H&billTyp=B&billNbr=0020&pn=1846
54. https://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterWithdrawalPermittingandCompliance/SurfaceWaterWithdrawalPermittingandFees.aspx
55. https://www.nj.gov/dep/rules/rules/njac7_19.pdf
56. https://www.mcall.com/opinion/mc-opi-pa-water-use-fee-muschick-20180702-story.html

Who holds the revenue and what does the governance structure look like?

For water allocation fees, the funds are held by the state.

With Pennsylvania's proposed fee, for example, the revenue will be held in the Water Use Fund within the State Treasury. The first $30 million in revenues will be used to cover program administration. An additional $35 million will be dispersed to multiple state agencies, and the remainder of the revenue will be used by PENNVEST[57] to back voter-approved watershed protection bonds.

How is the revenue spent to improve water quality?

Wisconsin fee revenues are used to maintain a water resources inventory, document and monitor water use and quantity, administer the rules within the Great Lakes Compact, plan for water supply needs, and build a statewide water conservation and efficiency program.[58]

Proposed Pennsylvania fee revenues would be used on water quality projects that would clean up the Susquehanna River watershed and limit the pollution entering the Chesapeake Bay Watershed.

Moving Toward More Integrated Water Quality Management

Current Fragmented Spending

One of the research team's biggest findings during the first year of this research was that the current spending approach in Jordan Lake for nutrient management is fragmented. To date, the implementation of water quality improvements in Jordan Lake has largely been fragmented with each sector, each local government, and in some cases each local government department identifying and implementing measures on an individual basis. This fragmented spending has led to some cost inefficiencies, missed opportunities for collaboration, and, in some cases, less water quality benefits than might have occurred in a more integrated approach.

While regulatory requirements and the need for individual jurisdictional compliance have played a big part in how spending has occurred, there are innovative spending approaches that would better enable entities to meet those goals. These innovative spending approaches are more collaborative in nature and involve pooled resources with more far-reaching spending that is not limited to jurisdictional boundaries.

57. https://www.pennvest.pa.gov/Pages/default.aspx

58. https://dnr.wi.gov/topic/WaterUse/documents/WaterUseFeeFactSheet_2012.pdf

The "One Water" Approach

One Water is the idea that water, in all forms, is valuable and should be managed holistically.[59] In the Jordan Lake watershed, the Jordan Lake One Water (JLOW) association facilitates a cooperative One Water approach to integrated water resource management. JLOW focuses on a triple bottom line approach to water resource management, which incorporates economic, social, and environmental considerations within water resource management and planning. JLOW is administered by the Triangle J Council of Governments (TJCOG), with collaboration from the Piedmont Triad Regional Council, and is comprised of local governments, conservation groups, university groups, water utilities, agricultural entities, and private industry stakeholders.[60]

One incentive for a One Water approach is the generation of ancillary benefits for the communities involved. Ancillary benefits, or co-benefits, include secondary benefits, which may be environmental, economic, or social. While such benefits should be part of the evaluation of how money can be spent for nutrient management in a region, too much of an overemphasis on such benefits can be problematic. If ancillary benefits seem to fall disproportionately in certain communities only, then it can exacerbate feelings of inequity, which have already been strong in a region like the Jordan Lake watershed.

Ancillary benefits of stormwater control measures (SCM) include improving air quality, providing habitat for animals, and providing recreation space for residents. Ancillary benefits may extend beyond the boundaries of the political jurisdiction or watershed district in which the SCM is installed. For example, an SCM with recreational improvements, such as a greenway along a reconstructed stream, may be utilized by residents of neighboring towns or counties.

JLOW emphasizes the Triple Bottom Line of nutrient management. The Triple Bottom Line is an accounting framework to evaluate the performance of nutrient management programs using three metrics: social, environmental, and economic.[61] JLOW highlights that the Triple Bottom Line approach can facilitate stakeholder buy-in at all levels because it provides communities with alternative justifications for buy-in. While one community may be primarily interested in environmental benefits of nutrient management, for other communities the primary reason for instituting nutrient management projects may be economic or social with the environmental benefits being ancillary.

It is best to evaluate ancillary benefits of stormwater SCMs on a project and location-specific basis. The Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC) tool is one way to quantify these ancillary benefits. If several potential SCMs are being considered for a specific site and nutrient removal levels and costs are approximately equal, this tool could help incorporate the value of co-benefits into the decision-making process. The CLASIC tool is currently in beta testing and is expected to be released in late 2019 by the Water Research Foundation.

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59. http://uswateralliance.org/

60. https://www.tjcog.org/jordan-lake-one-water.aspx

61. http://www.ibrc.indiana.edu/ibr/2011/spring/article2.html

Prioritization through a Point System or Grant Program

One of the challenges that exists when spending is separated from a pure regulatory framework is that projects may not meet regulatory needs or reductions for water quality. If a centralized entity wants to spend all its revenue on land conservation, then there may not be sufficient revenue for point source upgrades. Thus, innovative financing and spending should include a plan for how funds can be spent to benefit communities, improve water quality, and support local government regulatory needs. One way that regional watershed programs have handled this challenge is through utilizing a point system or a grant proposal process.

Point System:

Triangle Land Conservancy (TLC) plans and implements land conservation in the Upper Cape Fear watershed using a prioritization system that scores parcels using watershed-specific conservation objectives and physical land characteristics.[62] TLC does so in collaboration with the City of Raleigh through a partnership called the Upper Neuse Clean Water Initiative. The relative importance of conservation objectives is reflected in a weighting system that was developed through a stakeholder engagement process administered by TLC. Parcels greater than 10 acres receive a score for each conservation objective. Conservation objective scores are summed to assign the parcel a prioritization score. TLC is updating the scoring system to include nutrient reduction and risk scenarios. A successful point system for nutrient reduction in the Jordan Lake Watershed could include metrics for nutrient reduction similar to those that the TLC is developing. Just like land conservation, installation of SCMs is opportunistic, and a scoring system would ensure that opportunities for highly impactful SCM installations that best work toward nutrient reduction goals are not lost.

Grant Proposal Approach:

A grant proposal approach involves identifying projects for prioritization via a competitive application process. Like the point system, a grant proposal approach requires the decision makers to identify a subset of priorities so that funded projects reflect the priority areas identified in a stakeholder engagement process. In fact, a successful grant proposal approach may include a point system.

The Santa Ana Watershed Project Authority (SAWPA) utilized a grant proposal approach to administer, along with the California State Water Resources Control Board, $220.9 million in grants for projects that aligned with the goals laid out in the Southern California Integrated Watershed Program (SCIWP). SAWPA is a joint powers agreement created in 1968 to address water quality and sustainability. Funding for SCIWP, which amounted to $235 million, came from the federal government and the California Water Bond of 2000. Local public agencies undertook all projects funded through SCIWP. Stakeholders in the Jordan Lake watershed have expressed interest in a competitive grant program, and SCIWP provides one such competitive grant approach that could be implemented in the Jordan Lake watershed.

62. https://www.tjcog.org/Data/Sites/1/media/jlow_3_27_19_final2.pdf

Future Finance and Governance Approaches to Consider *in Detail*

Given the current fragmented state of financing nutrient management in the Jordan Lake watershed, the EFC has found throughout the three years of this study that there have been clear inefficiencies, missed or avoided collaboration, and a minimal amount of forward momentum toward investing in more holistic nutrient management. However, based on the research into state governance approaches and financing mechanisms both within North Carolina and around the country, there is a myriad of options for moving the state forward, closer to its goals. The following four "approaches" are ways of thinking through some possible alternatives for addressing the questions related to revenue generation, governance, and spending. In practice, there are more than four options, but by walking through the specific opportunities and needs associated with these four combinations, most of the considerations which would arise with any other combination should be sufficiently highlighted.

Figure 2: Future Finance and Governance Approaches to Consider

Comparing Revenue, Governance, and Spending Policies in Detail

	Revenue	Governance	Spending
Existing Framework	**Existing** Water/Sewer Rates; Stormwater Fees; Property Taxes	**Existing** (in place) Municipalities; Counties; Water and Sewer Authorities; Stormwater Utilities	**Existing** within jurisdictional boundaries of local governments
Expanded Framework	**Expanded** County-level Stormwater Fees; Watershed Improvement Tax; Watershed Protection Fee; Removal of County Boundary for Fee Generation	**Expanded** Water and Sewer Authorities with regional watershed management; Joint Management Agencies; Interlocal Agreements	**Expanded** stormwater fees outside jurisdictional boundaries
Watershed Fees or Taxes	**New** Water Allocation Fees; Countywide Tax (e.g. LA County); Watershed-Wide Fee (e.g. Chesapeake Bay)	**Existing** Municipalities; Counties; Water and Sewer Authorities; Stormwater Utilities; State Agencies	**Existing or Expanded** Depending on Fee Structure
Regional Watershed Utility	**New** Fee or tax stream of revenue that would go specifically to a new utility (e.g. Minnesota)	**New** Local government Authority or Utility	**New** Watershed Boundary; Grant Proposal; Point System/Prioritization

Figure 3: Comparison of Revenue Potential, Integration Level, and Degree of Statutory Change Required

	Revenue Potential	Integration Level	Statutory Change Requirements
Existing Framework	Low	Minimal	None
Expanded Framework	Moderate	Medium	Some
Watershed Fees or Taxes	High	Minimal	Moderate
Regional Watershed Utility	Very High	Full	Significant

Existing Framework

Revenue: *Low Generation*

The Existing approach relies on the existing revenue generation mechanisms which are currently in place. The EFC surveyed and tracked the revenue flowing into the Jordan Lake watershed during the first year of the study, and in the second year, created tools to help calculate and test the revenue generating potential given the existing sources.

The Jordan Lake Revenueshed Model, a tool created by the EFC during the first year of this study, can be used to identify how such mechanisms could be more effective by increasing all sources by a specified amount.

Adjusting the existing revenue generation mechanisms would require no legislative changes, but the revenue generating potential based on the existing mechanisms is lower than any of the other approaches.

Governance: *Minimal Integration*

The Existing approach relies on the existing local governments in place in the watershed. As revenue is generated, the funds would continue to be pooled at the local government level, which would result in the most independent approach with the least amount of integration.

Spending: *Minimal Cross-Jurisdictional Spending*

The Existing approach relies on the existing boundaries within which revenue can be spent, and spending would continue to have the same limitations which have contributed to minimal cross-jurisdictional spending for nutrient management.

Expanded Framework

The Expanded approach expands upon the existing framework by identifying what else is possible in North Carolina for generating, governing, and spending revenue for nutrient management, and then making slight legislative modifications to the boundary within which revenue can be generated, how it can be aggregated, or where it can be spent.

Revenue: *Moderate Generation*

The Expanded approach would involve utilizing the financing mechanisms from the Existing approach, and additionally putting in place some of the funding mechanisms that are currently on the books in North Carolina, but which have not been made use of or maximized. Specifically, this could involve:

- **County Level Stormwater Fees:** As described previously, stormwater fees are a great way to generate a dedicated source of revenue for stormwater. Currently, there are no county stormwater utilities in the Jordan Lake Watershed, but some could be established to include unincorporated properties and areas. Person, Granville, Camden, and Mecklenburg are examples of counties with

stormwater fees. In both Person and Granville County, properties are charged a stormwater fee based on both total acreage and impervious surface area.

- **Watershed Improvement Tax:** This tax is currently on the books and not being utilized in the Jordan Lake watershed, and has been used rarely, if at all, in the state. As laid out in the statutes, this offers counties with a relatively robust option for generating funding (not to exceed $0.25 on every $100 valuation of property in the county) dedicated to be used for "prevention of flood water and sediment damages, and for furthering the conservation, utilization and disposal of water and the development of water resources."[63] This definition is relatively broad and covers much of the work that needs to be done to address nonpoint source issues in the Jordan Lake watershed. While the funding generation is done at the county level through property tax, the relationship between the county and the Soil and Water Conservation District could potentially be challenging to navigate. This is an option worth exploring further when investigating current mechanisms which could be used to generate revenue.

- **Watershed Protection Fees:** As is discussed earlier in this report, Raleigh has created a watershed protection fee, which has been used to fund land preservation to protect water quality in the Falls Lake watershed. Additionally, the City of Durham implemented a fee in 2011. These fees can be used in different ways for watershed protection, and more local governments in the Jordan Lake watershed could be making use of this revenue generating mechanism.

In addition to making use of some underutilized funding mechanisms, the Expanded approach could involve slight legislative modifications that would allow for a larger boundary within which revenue can be generated. Removing the "county" boundary for something like a watershed improvement tax would allow for such a tax to be collected from a broader base.[64] Depending on the needs and goals for how money should be collected, some of the existing funding mechanisms could be implemented at a watershed or subwatershed level, instead of within local government (county, municipality, or authority) jurisdictional boundaries.

Governance: *Medium Integration*

The Expanded approach would continue in part to rely on the existing local governments in the watershed. As revenue is generated, the funds would be pooled at the local government level, however the modifications to the spending boundaries would allow for spending to be done in a more collaborative way. Thus even though the funds would be raised and held at the local government level, the spending across jurisdictional boundaries would enable for more regional projects which could benefit the watershed.

Additionally, the Expanded approach highlights the opportunity to put in place and expand some existing collaborative governance frameworks that could allow for more regionalized nutrient management.

63. NC § 139-39.

64. The statutes governing the watershed improvement tax do allow for revenue to come in from other sources outside the county boundary, but that it is through voluntary, project-specific contributing and not done through the tax.

Examples of existing frameworks which could be utilized for some aspects of nutrient management include:

- **Joint Management Agency:** The Interlocal Cooperation Act, which covers interlocal agreements, also allows local governments to jointly establish a special type of interlocal agreement called a joint management agency.[65] Joint management agencies maintain some authority that resembles an autonomous utility, but they lack the full set of powers that would designate them as a truly independent entity or local government. The statutes provide very general authority with respect to the partnership, and to permissible mechanisms for generating revenue, essentially providing general authority for any unit of local government to enter into contracts with any other unit of local government in North Carolina or another state, to the extent allowed by law.

- **Water and Sewer Authority:** Existing utilities and local governments that want to join to form a new utility have the possibility of creating a water and sewer authority under North Carolina law.[66] The statutes are very specific about some aspects of authorities, such as allowing them to set user fees and issue revenue bonds, and prohibiting them from setting property taxes or issuing general obligation debt. The statutes provide broad discretion on governing board creation, and allow the initial establishing entities to set the number of board seats, the number of seats allocated to each member unit, and the criteria or qualifications for board member appointment.

- **Sanitary District:** While the enabling powers of many governance approaches, including water and sewer authorities and districts, have been created or substantially modified relatively recently, some other regional utilities rely on governable authority that has existed much longer. North Carolina allows for the creation of sanitary districts that, while similar in name to metropolitan sewerage districts, have very different construction and powers.[67] Sanitary districts were originally seen as a method of providing a range of public health services to areas of the state without other governmental capacity. Some sanitary districts provide service to very small geographic areas, while others, such as Cleveland County Water, have evolved into a more regional provider. Sanitary districts are the only special purpose local government unit where the governing board members are directly elected as is done with city council and county commissioners. Sanitary districts also have far reaching taxing authority and can issue revenue bonds.

North Carolina has some regional governance frameworks already available, but in the Expanded approach, the legislature could consider how this framework could be adapted by making some slight legislative changes. In some respects, the water and sewer authority option is best situated with some minor modifications to provide a regional utility governance framework for watershed management. Currently, it is the only statutory governance approach that creates an entirely new unit of government (the water and sewer authority itself) that specifically allows counties and cities to join together to provide water services, including many point and nonpoint nutrient management services. While they

65. See Interlocal Cooperation Act, NC Gen. Stat. § 160A-460 - § 160A-466.

66. NC Gen. Stat. § 162A.

67. See NC Gen. Stat. § 130A, Art. 2, Part 2.

do not have taxing authority, water and sewer authorities can issue bonds, use property assessments, and set a wide variety of fees and rates. The existing water and sewer authorities in the state focus on drinking water and wastewater provision, but the statues clearly envision them being used to operate stormwater utilities as well.

The current challenges with the water and sewer authority approach that would need to be addressed in order for it to contribute more significantly to watershed management would be how revenue is generated and dedicated. Although water and sewer authorities can use revenue for management (i.e. not just plants and facilities), without a dedicated stream of new revenue to be spent on stormwater or other watershed improvement projects, such projects would be contending for the same pot of revenue as water and wastewater needs. While authorities are permitted to set stormwater fees, the requirements related to these fees in relation to existing stormwater utilities in their service area may limit the amount of revenue they can generate.[68] While the powers related to dealing with stormwater management are fairly broad in the statutes, further reassurance that this approach could be used to provide a full suite of watershed management programs on public and private property may be needed to maximize full potential. Providing authorities with some expanding taxing power over their service area could also provide them with an additional revenue generating tool.

Spending: *Increased Cross-Jurisdictional Spending*

The Expanded approach would require legislative change with regard to how certain revenue generated from local governments can be spent. One of the most significant areas to consider modifications would be stormwater revenues, which currently are required to be spent within the jurisdiction where they are generated.

Additionally, if an existing framework is utilized or expanded under this approach, such as the water and sewer authority framework, then this approach should allow for broader boundaries within which revenues could be spent.

Watershed Fees/Taxes

The Watershed fees/taxes approach relies upon the existing framework for governance, but brings in new, legislatively-created revenue generation mechanisms that are not currently a part of state statutes. While this approach requires more substantial statutory changes, the revenue generating potential is much greater and more consistent than in previously discussed approaches.

Revenue: *High Generation*

The Watershed fees/taxes approach focuses on substantial legislative change to allow for new mechanisms for generating nutrient management revenue. As with all of the approaches, there are multiple ways that fees can be generated, and thus should not be considered in isolation. Decision makers could put in place multiple fees/taxes to reach a broader base of contributors.

68. Water and Sewer Authorities have powers to operate stormwater utilities, including in some regional forms. See NC Stat. Sec. 162A-9.

Some examples (described previously in this report) worth considering for new mechanisms include:

- ***Water allocation and withdrawal fees with added revenue generation for water quality—***One new source of revenue for watershed management could be an additional fee for Jordan Lake water allocation holders. Making a legislative change to allow for such an additional fee would provide a mechanism for generating revenue from "users" of Jordan Lake as a water supply source, which has not been done in the past. The momentum for identifying an opportunity to generate revenue for water quality protection from both dischargers and water supply users has been a theme repeatedly over the past three years of research. The current allocation fee for Jordan Lake water allocation holders is a capacity charge paid to the State. Allocation holders pay an annual fee for operations and maintenance that is equal to roughly $2,200 per one percent-allocation per year. Cary pays $102,761 annually for its 46.2% allocation, which is about $2,224 per one percent-allocation. Each allocation holder is also charged a fixed administration fee of $250. New allocation holders pay a one-time fee associated with the capital for providing water supply of about $91,000 per percent-allocation.[69] Therefore, annual current capacity charge allocation fees total to about $222,000. A new volumetric fee on actual withdrawals could be approached based on the $0.10 per 1,000 gallon volumetric withdrawal fee in the previously discussed Pennsylvania House Bill 20 of 2017-18. The Pennsylvania withdrawal fee would include both ground and surface water withdrawals throughout the Susquehanna River Basin, but would not charge for municipal withdrawals. Any application of this fee in the Jordan Lake watershed would need to include municipal withdrawals in order to ensure that the fee is charged for the bulk of the surface water withdrawals from Jordan Lake.

- ***Lake Protection Fee—***As explained earlier in the report, the Maryland Bay Restoration Fee is a flat-fee approach aimed at improving water quality through very specific wastewater upgrades and on-site system repairs. A similar type of fee could be considered on a statewide or watershed basis in North Carolina, but to address a variety of water quality challenges. Assuming the fee were implemented on a watershed basis, in the Jordan Lake revenueshed, an annual fee of $60 per year per residential structure and $240 per year per commercial structure would generate about $40 million. Assuming $240 per commercial structure may be conservative as fees for commercial structures in the Maryland Chesapeake Bay Fund approach are per equivalent dwelling unit (EDU) up to 2,000 EDUs and $240 is just four EDUs. Additionally, there is insufficient data readily available to breakdown this funding into structures discharging to septic and structures discharging to wastewater collection systems. This revenue could service the debt for about $600 million in revenue bonds issued at 3% over a 20-year period.

- ***County-Wide Special Parcel Tax Based on Impervious Surface—***The LA County special parcel tax has gained a lot of interest and curiosity of stakeholders over the last year. If put in place in North Carolina, however, the special parcel tax may be problematic due to the existence of multiple stormwater utilities across the state, many of which already have stormwater fees based on impervious surface. NC statute does not allow municipalities or counties to charge stormwater

69. https://files.nc.gov/ncdeq/Water%20Resources/Planning_Section/Basin_Planning/Cape_Fear/Jordan_Lake/Round4Apps/Cary-Apex-Morrisville-WakeCo_Final_JLA4_Application_20150126.pdf

fees where a stormwater fee already exists. However, the approach itself is helpful to look at as an example of how a new tax can be structured to address water quality concerns and to generate a substantial amount of money while at the same time maintaining certain protections, such as those related to affordability. There is insufficient total impervious surface area data readily available for the Jordan Lake watershed to quickly estimate the revenue generation potential of an LA-style special parcel tax.

Governance: *Minimal Integration*

The Watershed fees/taxes approach assumes no governance modifications. Rather, the fees would be structured to be collected and managed by existing state or local governments. The water allocation fees would go through the State, the statewide or watershed fee (if approached like Maryland) would also be likely to go through the State, and the special parcel tax would be done at the county level.

As is seen in the fourth potential approach below, these fees/taxes could be built into a new legislatively created approach. For purposes of different degrees of legislative change and impact, however, the watershed fees/taxes approach assumes that a new authority is not being created.

Spending: *Moderate Cross-Jurisdictional Spending*

How funding is spent under this sort of tax/fee approach depends on how the tax or fee is structured and which entity is holding it. It also depends on if additional legislative changes are made, which would allow for spending of certain funds across jurisdictional boundaries.

For something like a water allocation fee, some of the examples above highlight how the money is spent by the state. For example, in Pennsylvania, fee revenues would be used on water quality projects that would clean up the Susquehanna River watershed and limit the pollution entering the Chesapeake Bay Watershed. If the state were the entity spending the water allocation fees in this manner, then the cross jurisdictional spending would be high.

Regional Watershed Utility

The Regional Watershed Utility approach starts anew. It creates a new entity with its own financing mechanisms and spending authority. While this approach would require the most legislative change, it provides the most streamlined potential for dedicated revenue, centralized governance, and watershed wide spending.

Revenue: *High Generation*

With the implementation of a new utility approach, revenue generation would be built into the powers associated with the new entity. The most sustainable financing approach that was identified during the EFC's research is the Minnesota Watershed District approach. The key sources of revenue generation or funding that could be incorporated into a new North Carolina Regional Watershed Utility include:

- **Taxing authority**; primary source of funding is ad valorem taxes done by counties
- **Assessments**; against properties abutting or directly benefiting from watershed improvement

projects
- **Debt financing** through bonds
- **Fees** for permits and services
- **Stormwater** utility fees
- **Other** creative taxing mechanisms—e.g. using revenue from sales tax

Additionally, watershed districts may also form special sub-financing districts, which are taxed more heavily to help fund projects that distinctly benefit that respective area. Though residents of sub-financing districts bear heavier financial burdens than those in other areas, funding for projects with more broadly distributed benefits is still distributed across whole districts. The watershed district board determines what the balance between funding from the sub-financing district and the district as a whole will be, and sets taxation rates accordingly.

The ability of a new utility to implement sub-financing districts would allow for more directly linking revenue generation, spending, and benefits. If the new authority can identify targeted needs, such as an area with critical flooding challenges, or a hot spot of water quality contamination, then they can pull additional funds directly from the customers in that area who will benefit most from the project implementation. This would not be for all projects and spending, but allows there to be targeted revenue generation when appropriate, helping address some of the equity challenges that have permeated the current Jordan Lake nutrient management financing framework.

As discussed previously, revenue generation mechanisms do not need to be considered in isolation. The new regional utility approach could co-exist with new fees for water quality on allocation holders to be collected and utilized by the State. Additional legislative changes could be made to require or allow the State to contribute part of the added revenue from the allocation fees to the regional watershed utility. Furthermore, the creation of a regional entity with its own revenue generation should not take away the possibility of the expansion of current revenue-generating mechanisms for watershed management on a localized level. Rather, the more potential mechanisms for entities to use, the more revenue streams that will flow into improving Jordan Lake water quality.

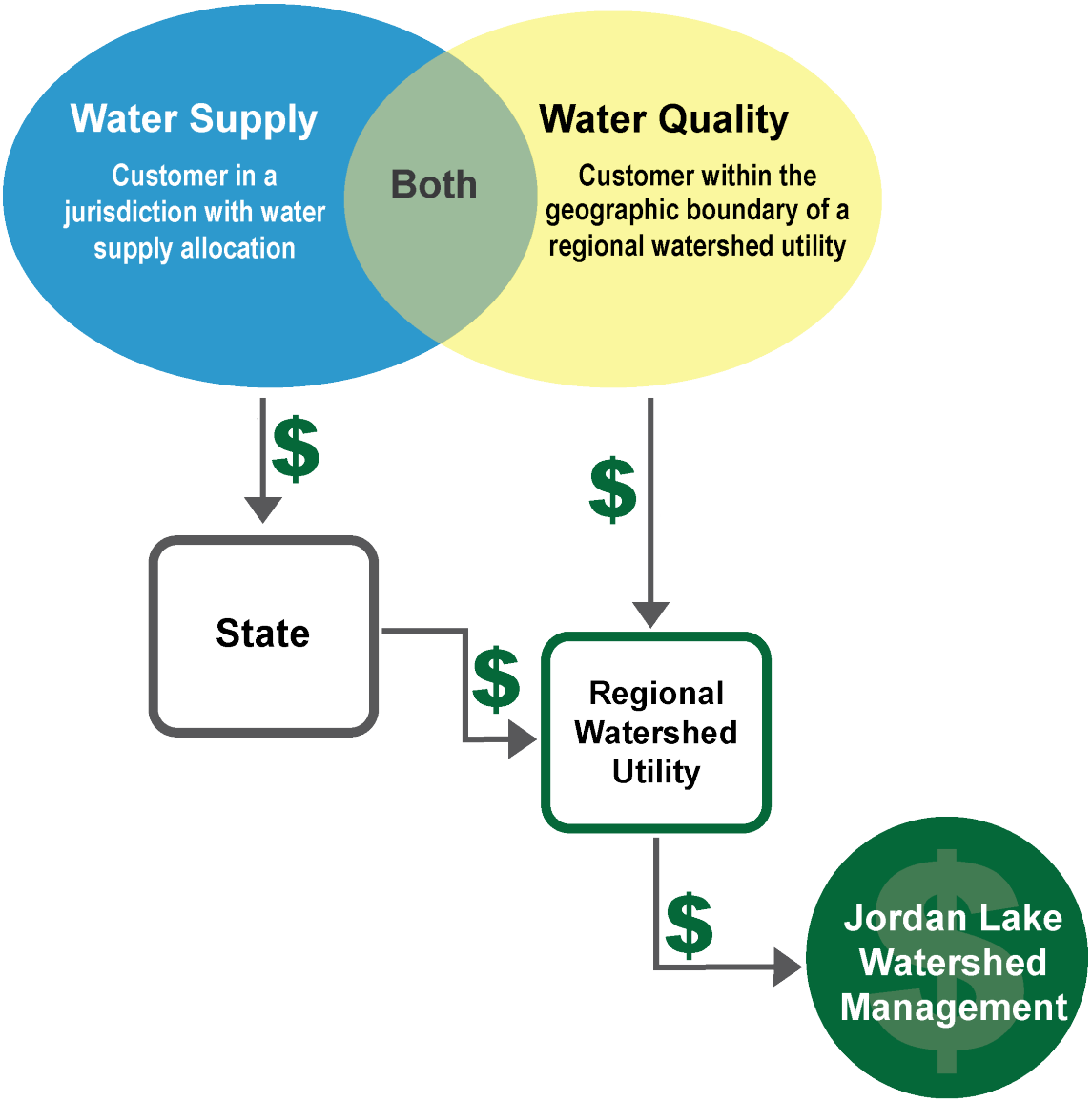
Governance: *Full Integration*

The Regional Watershed Utility approach relies on full integration by the participating jurisdictions. As discussed more below, whether participation is mandatory or voluntary will likely influence how many entities participate. However, the creation of a new entity allows for the fullest integration by centralizing the revenue generation, pooling, and spending. Under the Minnesota Watershed District approach, a majority of political jurisdictions—either by population or number of political subdivisions—or a minimum number of citizens within the potential watershed district's jurisdiction must petition the state to form a watershed district. Once accepted by the State, the watershed district encompasses all jurisdictions within its boundaries. Local governments within the watershed district that did not originally wish to join are mandated to comply with its regulations.

Spending: *Very High Cross-Jurisdictional Spending*

Because the Regional Watershed Utility approach centralizes revenue generation and pooling of funds, this approach creates the greatest potential for watershed spending that focuses not on county- or city-specific regulatory compliance projects, but rather projects that can cross jurisdictional boundaries, and benefit the watershed as a whole.

Figure 4: Regional Watershed Utility Cash Flow



Additional Considerations

No components of the approaches above are fit to be cut and pasted into future legislation or policy making. Rather, there are additional considerations that can help tailor these policy decisions to the specific needs and opportunities at the local level. This is a non-exhaustive list of considerations that should be raised as decision makers move forward:

Combining Approach Components

The four approaches described above each involve a combination of three approaches related to generating revenue, governance, and spending. For clarity and to present an example of how decision-makers can potentially move forward, the four approaches chosen are simplified and provide non-exhaustive descriptions. However, any of the three types of components can be combined differently to allow for more combination potentials and flexibility.

Total Maximum Daily Load (TMDL) Alternative

Though its listing as an impaired water under Section 303(d) of the Clean Water Act would typically be remedied with a total maximum daily load (TMDL), there exist alternative options for pollution mitigation in Jordan Lake. Local communities may voluntarily create their own programs for addressing water quality impairment in lieu of implementing a TMDL. A TMDL Alternative is a watershed restoration plan or set of actions pursued in the near-term that, when fully implemented, are designed to attain water quality standards.[70] Through a TMDL Alternative, communities may defer or bypass the need for a TMDL. TMDL Alternatives may either be a 9-element watershed plan (9E) (Category 5r) or a demonstration plan (Category 4b).

Once the U.S. Environmental Protection Agency (EPA) categorizes an impaired watershed as Category 4b, it is no longer on the 303(d) impaired waters list. A waterway qualifies for a 4b categorization and a TMDL is not needed if at least one designated use is threatened but other requirements are expected to result in water quality standard attainment in a reasonable time period. These additional requirements may be technology-based effluent limitations under the Clean Water Act (CWA), recently implemented more stringent effluent limitations at any applicable governmental level, or any other required pollution control measures, such as best management practices (BMP), at any governmental level. These programs have many of the same features as TMDLs and must assure implementation.

Examples of applicable measures across the nation include remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (known also as Superfund or CERCLA), health district ordinances, and U.S. Forest Service plans. Within North Carolina, three waterways are currently listed as 4b Impaired Waters. Examples of Category 4b TMDL alternatives include: local governments in the Falls Lake watershed creating the Falls Lake Rules; the North Carolina Department

70. https://deq.nc.gov/about/divisions/water-resources/planning/approaching-assessment/tmdl-alternative

of Transportation, City of Burlington, City of Graham, and NC DEQ's Division of Water Resources creating a Demonstration Plan for Little Alamance Creek; and Mecklenburg County creating a watershed plan for McDowell Creek. The acceptance of the Jordan Rules as qualifying for a TMDL alternative is likely dependent on the water quality of Jordan Lake relative to Falls Lake and the current and future delays in Jordan Rules implementation.

When applying for Category 4b status, applicants should address six elements of their plan to meet water quality standards in a timely manner:

1. Identification of the segment of the waterway and a statement of the problem causing water quality impairment
2. Description of required pollution controls and how they will help the waterway meet the water quality standard
3. Estimated time it will take to meet the water quality standard
4. Schedule for pollution control implementation
5. Water quality monitoring plan
6. The applicants' commitment to revising controls if needed

Alternatively, local governments responsible for the cleanup of an impaired waterway may develop a 9-element watershed plan (9E) (Category 5r). Should EPA accept the respective Category 5r application, the waterway remains on the 303(d) impaired waters list, but TMDL development is deferred until the completion of the watershed restoration plan's implementation. At the completion of the plan, the need for a TMDL is reassessed. Category 5r plans should contain the following elements:

1. Identification of the causes and sources of pollution
2. Estimated decrease in pollution loads from planned practices
3. Management practices needed to decrease pollution loads to meet water quality standards
4. Estimated technological and financial resources needed to meet water quality standards
5. Public awareness and participation campaign plans
6. Implementation schedule
7. Criteria for measuring progress
8. A water monitoring plan

Bald Creek, located in the French Broad River Basin and polluted with fecal coliform, is the only North Carolina waterway currently implementing a Category 5r Watershed Restoration Plan.

Mandatory vs. Voluntary Participation

The EFC has seen that allowing for strictly voluntary participation by local governments in regional watershed management frameworks is less effective in meeting water quality goals and raising revenue for watershed management than mandatory or "voluntary-plus" participation approaches. A voluntary-plus approach has significant incentives for participation or disincentives for not participating.

Mandatory. An example of a mandatory approach is the Minnesota approach, which requires that all jurisdictions within a watershed district comply with regulations once the district is formed.

Voluntary-Plus Disincentive. An example of a voluntary-plus approach is the Catawba Wateree, which is a fully voluntary, regional watershed authority that has been very successful at garnering membership and raising consistent funding. Its success in these areas contrasts significantly with other voluntary programs, suggesting it is the negative consequences of non-membership (requirement to pay water withdrawal fees) that has made this approach so successful and that a similar incentive structure would be needed if the Jordan Lake watershed wished to implement a similarly successful voluntary program.

Voluntary-Plus Incentive. The Upper Neuse River Basin Association has voluntary dues-paying membership, yet 19 of the 20 possible members have joined and pay dues. The UNRBA executive director attributes this high rate of membership to the various benefits the UNRBA offers, many of which stem from the organization's focus on reaching consensus agreements.

Voluntary. An example of a voluntary approach is the Iowa approach. Iowa WMAs must gain full consensus from members before levying a tax or instituting membership dues for self-funding. This limits revenue generation potential. Indian Creek WMA is one of two Iowa WMAs that have self-funding. In 2016, Indian Creek had an operating budget of $50,000. In comparison, the Minnehaha Creek watershed district within the Minneapolis metro area of Minnesota had $15 million in operating revenues in 2019.

Equity Concerns: Double Dipping

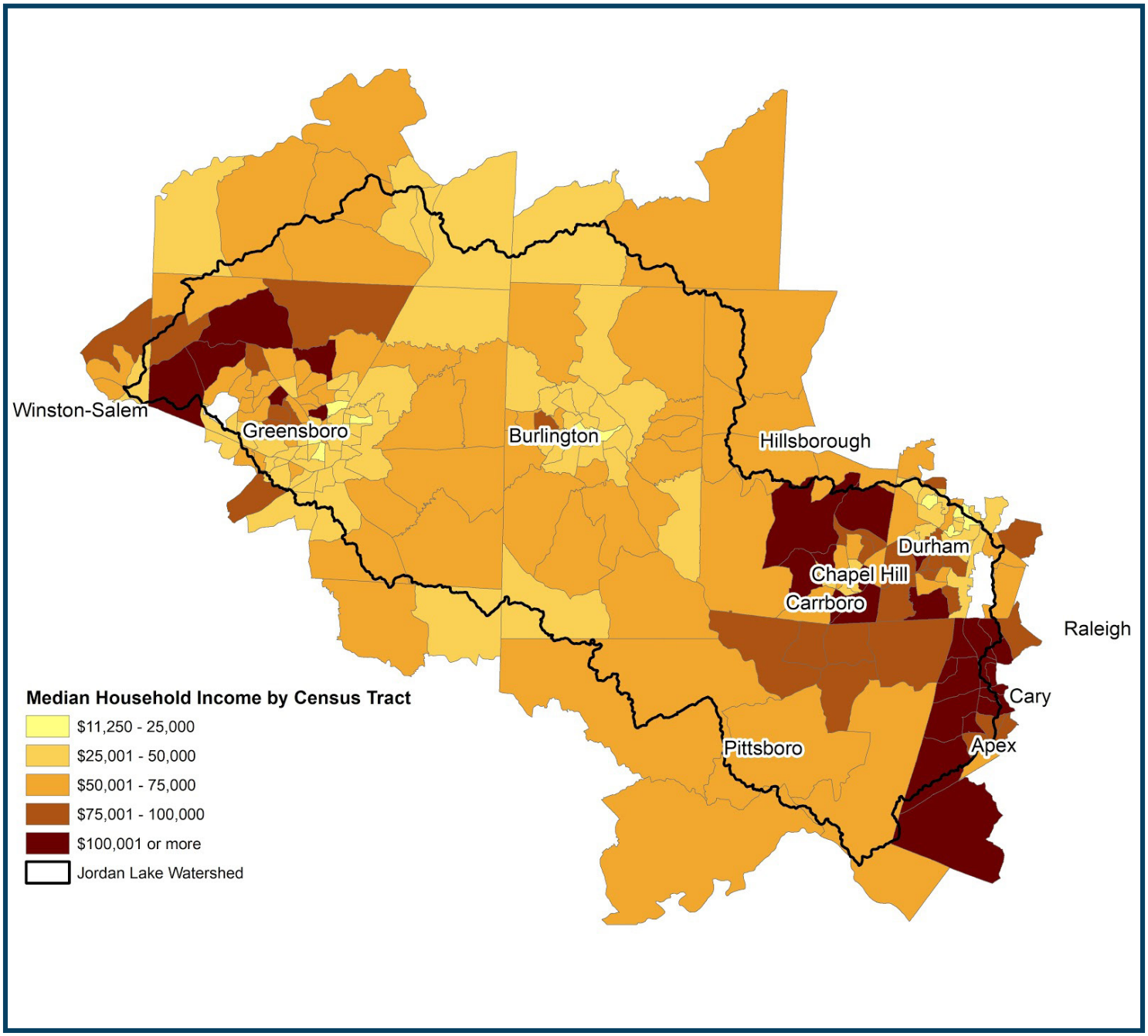
There may be equity concerns associated with charging residents for watershed management when residents may already pay for water quality in the form of stormwater fees, wastewater fees, etc. Imagine that Community A has invested millions of dollars in wastewater treatment upgrades to comply with the Jordan Lake rules. The costs of those upgrades are paid out of rate revenue, and therefore are coming directly from the customers of that community. Imagine now that a new watershed fee is put in place to further improve the water quality of Jordan Lake, and shows up on the bill of the same Community A customers. This may feel like "double dipping" and raise equity concerns.

This concern may be reduced if any new watershed management fee is based on something other than that which existing fees are based. Moreover, new spending for watershed management may ease the regulatory burden of existing stormwater and wastewater utilities by working in tandem to meet water quality goals. Local governments with stormwater utilities, for example, might be able to pay watershed improvement fees out of their stormwater revenues, which could allow some of the other revenue to be used on localized projects to address stormwater needs not driven by regulation. In considering how to structure any new revenue mechanism or expansion of existing revenues, decision makers ought to consider those revenue mechanisms already in place to alleviate the concern of double dipping.

Affordability

As with any charge for an environmental service, concerns may arise around the affordability of a new revenue generation mechanism or expansion of an existing mechanism for watershed management. Moreover, there is significant disparity in median household income (MHI) for areas across the Jordan Lake watershed. Figure 5 shows the MHI of census tracts is highest in the urbanized areas of the watershed and lowest throughout rural areas. Affordability may have to be addressed in different ways for rural residents than the ways in which it may be addressed for urban residents.

Figure 5: MHI by Census Tact in Jordan Lake Watershed

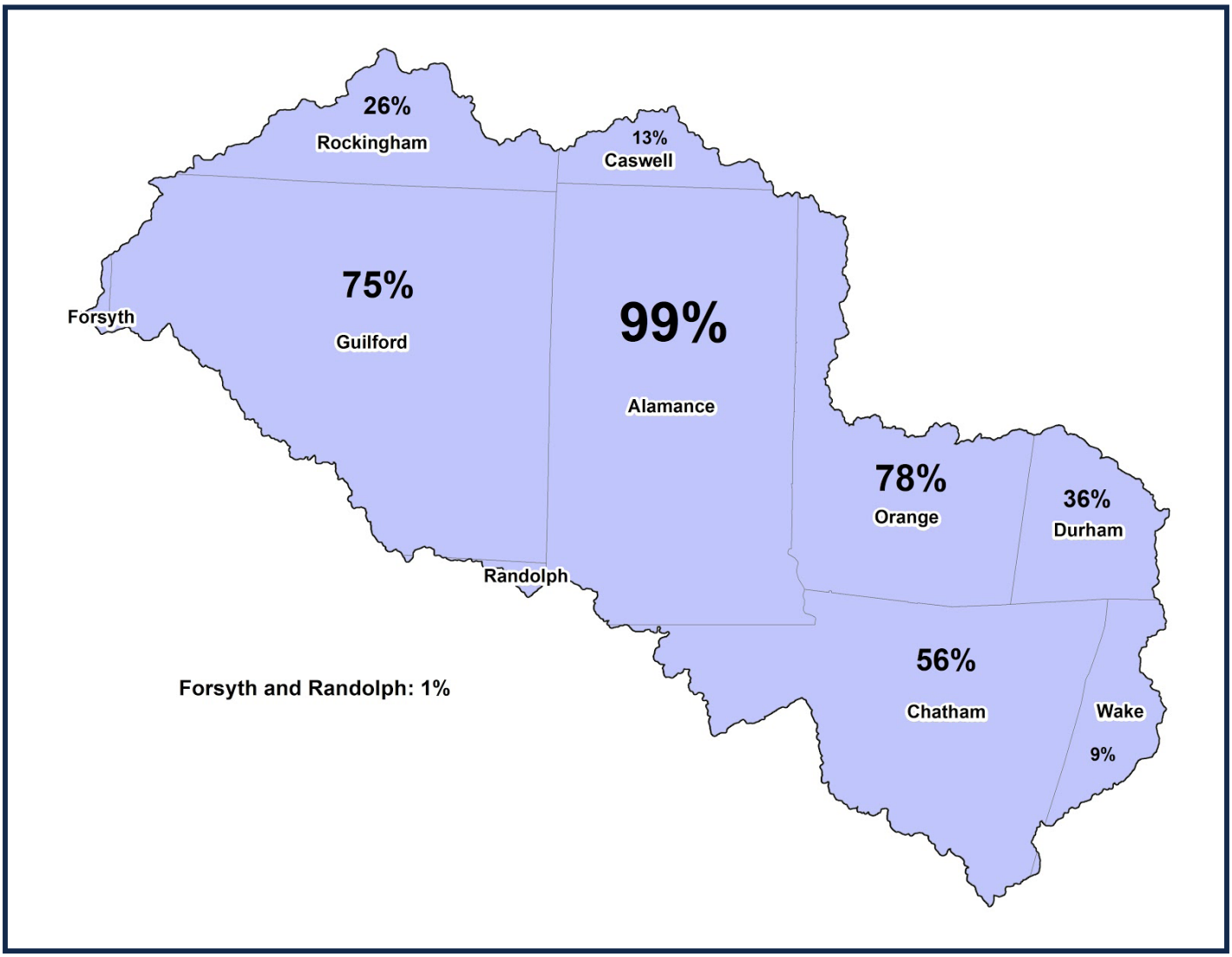


District Boundaries

Watershed districts most often align with the HUC 8 watershed, the level at which the Jordan Lake watershed is currently defined. However, in Minnesota, a watershed district may contain all or part of multiple watersheds and counties. This presents flexibility for pooling funds in ways that limiting the watershed district to the HUC 8 watershed does not. For example, with this added flexibility, jurisdictions located outside the watershed but withdraw water from Jordan Lake may be included within the governance structure of any new watershed authority.

Figure 6 shows the percentage of the total taxable value of each county in the Jordan Lake watershed. Percentage of total taxable value within the watershed is one way the revenue generation responsibility and board representation may be divided among the counties. Other ways include total impervious surface, total nutrient loading, population, and total land area. One way in which the percentage of the total taxable value may be used would involve, for example, an ad valorem tax on 78% of Orange County's total taxable value.

Figure 6: Total Taxable Value per County in Jordan Lake Watershed



Conclusion

In the first year of this study, the EFC highlighted the ongoing work of local governments and that of the State of North Carolina aimed at improving the water quality in Jordan Lake. Fragmented spending, political tension, rising costs, and emerging challenges have been evident in the Jordan Lake watershed; however, as the research continued in the subsequent two years of the study, the efforts and intention with which state and local representatives are continuing to work to more efficiently and holistically address water quality has stood out.

What the EFC research team was not able to find is a quick fix to a complex challenge—it does not exist. There is not one approach which has worked perfectly somewhere else and could be implemented tomorrow in the Jordan Lake watershed. Instead, the EFC found that there are lessons learned, strategies proven effective, and lots of promising frameworks across the country and within North Carolina itself. This report aims to highlight those lessons, strategies, and frameworks so that decision-makers can tailor an approach to the unique landscape of both the Jordan Lake watershed and North Carolina as a whole.

Many options exist at a legislative level for expanding the boundaries within which revenue can be generated, adding additional fees to link water quality and quantity protection, and for modifying or creating new regional utility approaches where funds can be generated and spent for watershed management. At a local level, there are options not only for generating more revenue and collaborating with neighboring jurisdictions, but also spending local revenue on water quality projects in a way to maximize ancillary benefits.

By adding new streams of revenue or modifying those existing, state and local governments can increase revenue generating potential, further a more integrated approach, and allow for more far-reaching benefits—ultimately adding to the value of Jordan Lake, communities within the watershed, and the state as a whole.

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