

Financing Nutrient Management in the Jordan Lake Watershed

Erin Riggs, Evan Kirk

UNC Environmental Finance Center

riggs@sog.unc.edu

emkirk@live.unc.edu

www.efc.unc.edu



SCHOOL OF GOVERNMENT
Environmental Finance Center

Evolution of research questions

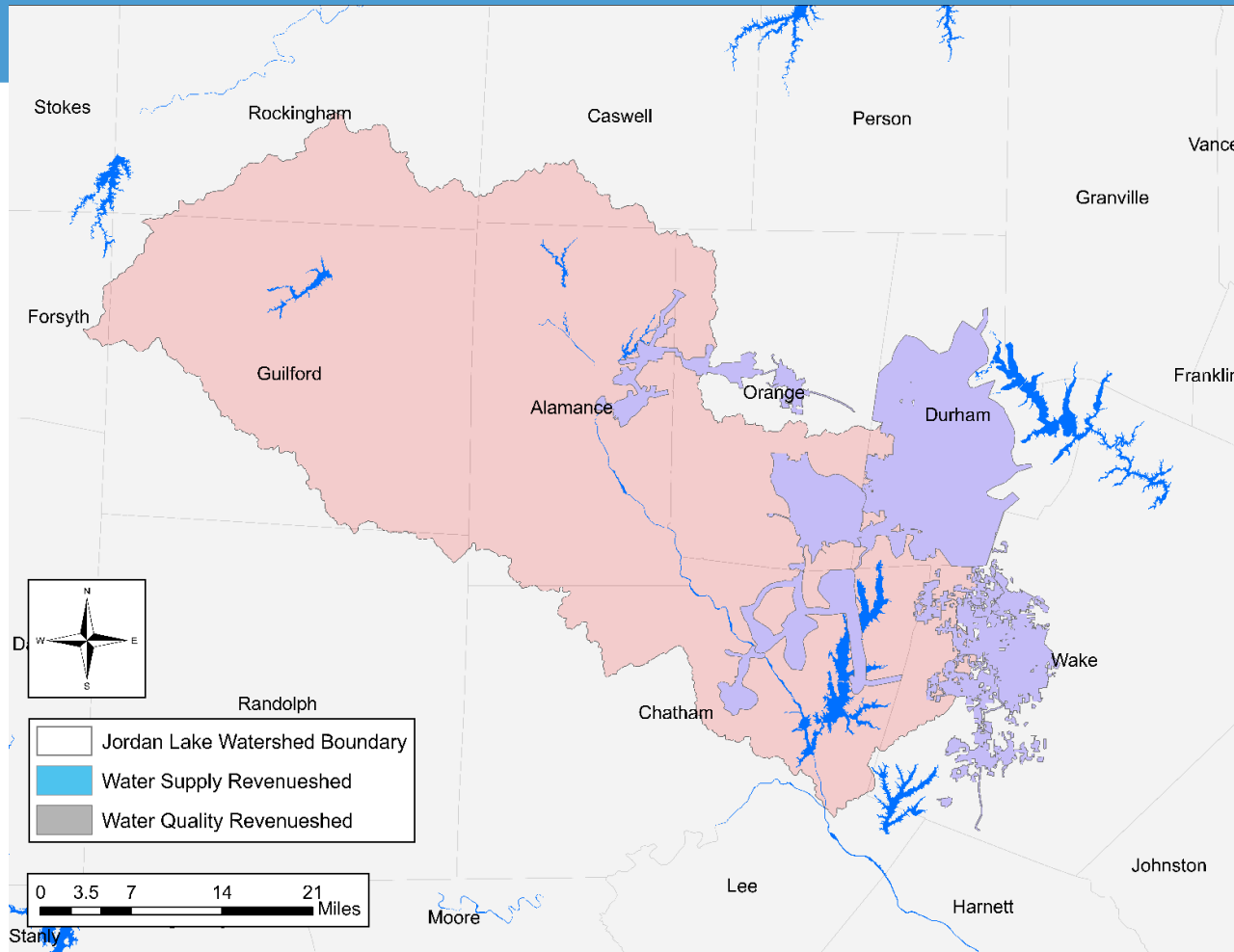
- State of the watershed – under existing framework
 - How is revenue currently generated for water quality?
 - How is revenue currently spent?
 - What is the revenue potential?
- Options for modifying framework
 - What are other states doing?
 - What is the relative cost effectiveness of spending on nutrient removal practices?

Current research questions

Potential Framework for North Carolina

1. Options for revenue generation?
2. Who holds the revenue?
3. How is it spent?

Research Findings – Potential Revenueshed



Key Research Findings

- In other states, we have seen that mandatory participation in regional watershed models leads to more effective revenue generation and greater water quality improvement than voluntary participation.
- State and/or federal financial support are a key component upon program inception.
- Consideration and evaluation of “benefits” could take into consideration co-benefits of nutrient management strategies.
- There are a variety of finance and governance structures both inside and outside of North Carolina and that could inform North Carolina watershed management policy.

Policy implications

Matrix of options for policy makers:

1. What are revenue generation tools for Jordan Lake watershed?
2. Who will hold the revenue? What is the governance structure of this entity?
3. How will the revenue be spent?

Other Nutrient Study Research Capstone:

Research Question:

What are the anticipated environmental impacts of Chatham Park, and how is the development/community planning to address those impacts?



Cost-Effectiveness Analysis of Various BMP/SCMs

BMP	Average of TP Reduction [\$/lb]	Average of TN Reduction [\$/lb]	Count of TP Reduction	Count of TN Reduction
Baffle Box	\$ 2,200	\$ 825	1	1
Bioretention	\$ 16,935	\$ 1,186	4	7
Buffer Restoration		\$ 1,750		1
Disconnected Impervious Surfaces	\$ 7,322	\$ 1,652	1	2
Dry Pond	\$ 22,373	\$ 1,531	5	7
Erosion and Sedimentation Control		\$ 775		2
Illicit Discharge Control Program	\$ 53	\$ 13	1	1
Infiltration Trench	\$ 103	\$ 135	1	3
Land Conversion	\$ 910	\$ 291	3	3
Level Spreader-Filter Strip		\$ 5		1
MS4 Stormwater Retrofit		\$ 538		2
Nutrient Management Programs	\$ 131	\$ 42	5	6
Permeable Pavement	\$ 18,709	\$ 3,572	2	2
Proprietary Structures	\$ 32,723	\$ 7,115	1	1
Riparian Buffer	\$ 165	\$ 23	3	3
Sand filter	\$ 22,285	\$ 1,018	3	1
Stormwater Wetland	\$ 2,726	\$ 136	5	6
Stream Restoration	\$ 5,500	\$ 1,676	1	4
Street Sweeping	\$ 9,553	\$ 3,408	1	2
Treatment Swale	\$ 2,642	\$ 203	1	3
Urban Forestation	\$ 1,843	\$ 216	1	3
Wet Pond	\$ 2,251	\$ 427	2	7
WWTP Upgrade	\$ 174	\$ 9	4	2
(blank)	\$ 190	\$ 206	4	5
Grand Total	\$ 7,536	\$ 854	49	75

If you had one more dollar to give to a nutrient removal project in the Jordan Lake watershed, what would you invest it in to remove the greatest amount of nutrients?

One sentence take-away

There is currently no perfect solution for North Carolina watershed management, and the State will have to look to legislative change in order to make use of some of the more effective models that our research identifies.

Paying for Nutrient Management and Reduction in the Jordan Lake Watershed

Erin Riggs

Project Director

riggs@sog.unc.edu

Evan Kirk

Research Assistant

emkirk@live.unc.edu