

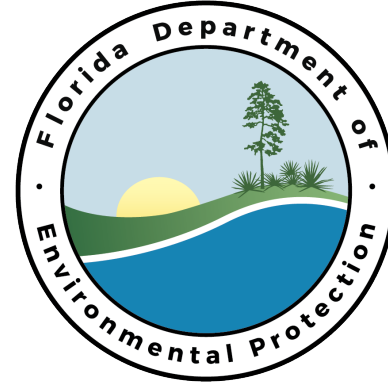
# QUANTIFYING FERTILIZER IMPACTS: A CASE STUDY INVESTIGATING YEARS OF EDUCATIONAL WORKSHOPS

Tina McIntyre

Florida Friendly Landscaping Agent  
UF/IFAS Extension Seminole County

# Thanks!

- Seminole County Watershed



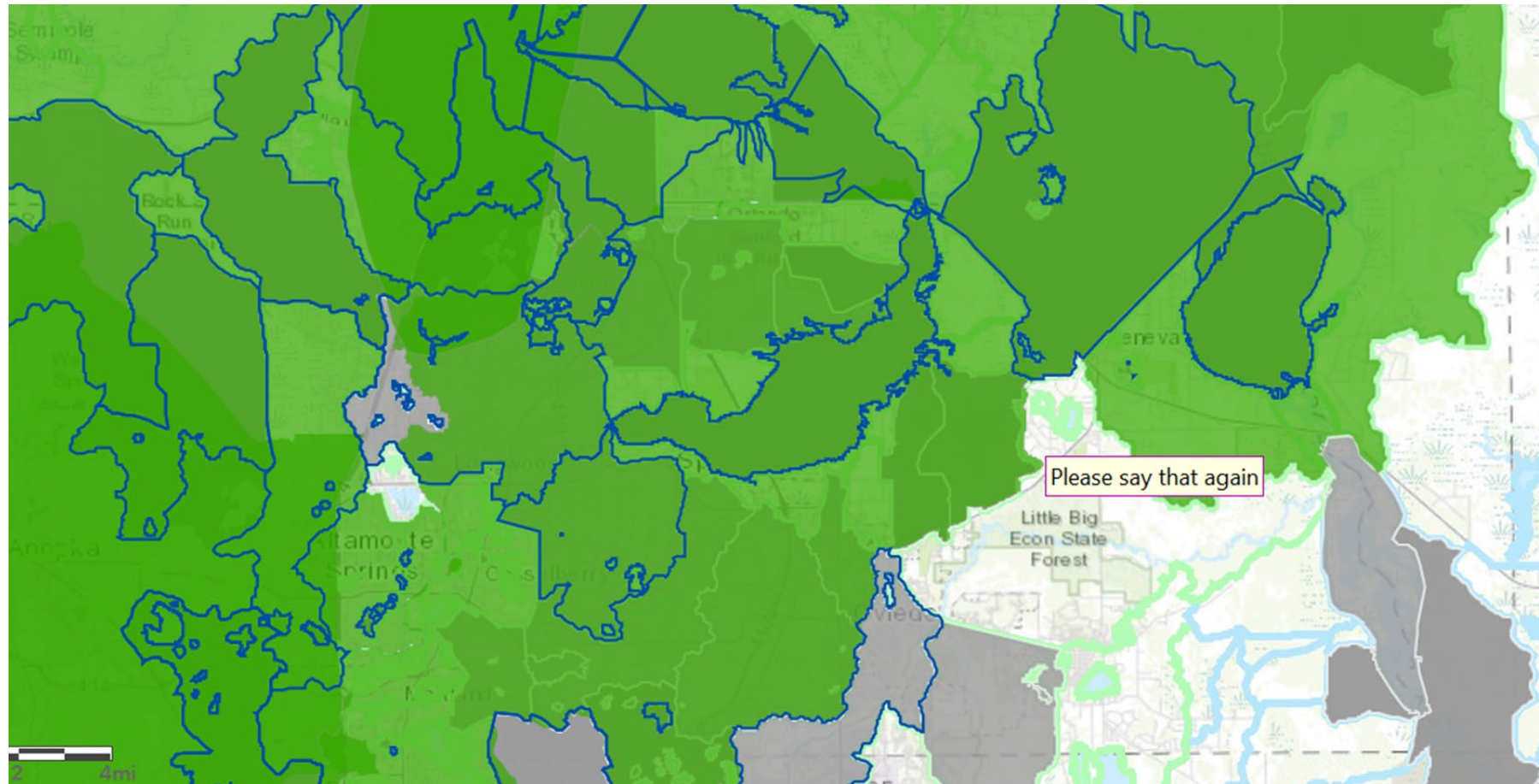
- Dr. AJ Reisinger,
  - Assistant Professor Of Urban Soil And Water Quality,
  - Soil and Water Sciences Department



# Water Quality Impairments




# TMDL's & BMAP's in Seminole County



## Legend

### Florida Total Maximum Daily Load (TMDL)

-  TMDLs Adopted
-  TMDL Activities In Progress

### Basin Management Action Plans (BMAPs)

-  Adopted BMAPs

### Waters Not Attaining Standards (WNAS)

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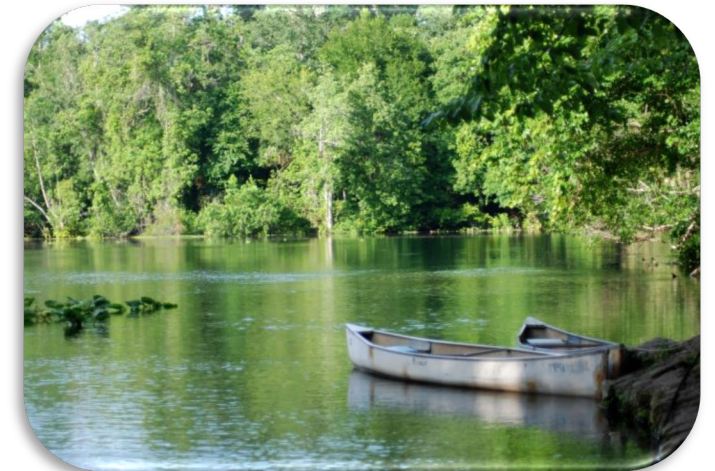
# Wekiva Springs River

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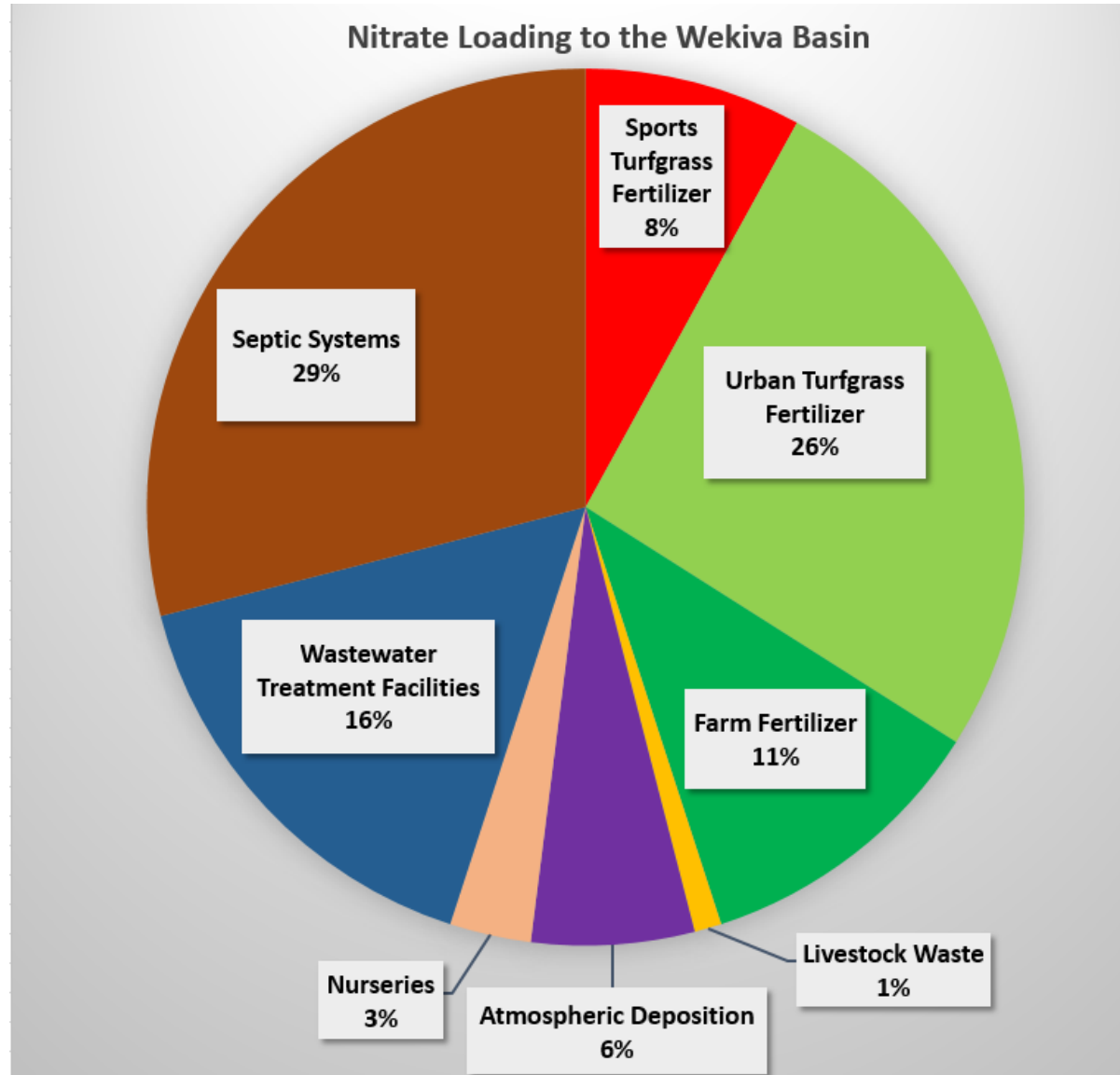
- National Wild & Scenic River
- Impaired by nitrogen and phosphorous
- Economically and environmentally tied to the area through recreation, property values, wildlife support and aquifer recharge.



**“Outstanding natural, cultural,  
and recreational value in a free-  
flowing condition for the  
enjoyment of present and  
future generations”  
U.S. National Park Service**



# Nitrates in Wekiva River Basin



# Methods: Fertilizer Education



# Fertilizer Workshops

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- Fertilizer Workshops were conducted from Sept. 2018 – Sept. 2020
- Educate participants on Best Management Practices (BMP's) for landscapes
- Workshops targeted homeowners, who received a free bag of fertilizer formulated with 50% slow-release nitrogen for attending
- FDACS licensed landscaping professionals, who received over 520 fertilizer CEUs (271 professionals)





# Marketing

- Targeting those with an FDACS license
- Approve in multiple categories
  - Limited Urban Fertilizer
  - Limited Lawn & Ornamental
  - Limited Commercial Landscape Maintenance
  - Commercial Lawn and Ornamental
- Approved for FNGLA CEUs
- Educating members of FTGA (seminars, conferences & recordings)



# Results & Impacts



# Results

- Through 70 classes, 2,142 people were educated about fertilizer BMP's
- Of those participants, 1078
  - 97.2% increased their knowledge on the impact's fertilizer run-off had on local waterbodies
  - 98.8% intended to use the information to fertilize their yard appropriately
  - 95.3% were more confident they could fertilize appropriately



# Quantifying Impacts of Fertilizer Workshops on Nitrogen Leaching and Subsequent Economic Impacts: A Case Study<sup>1</sup>

Alexander J. Reisinger and Tina McIntyre<sup>2</sup>

## Introduction

Excess nitrogen (N) and phosphorous (P) are leading causes of water quality impairments in surface waters across Florida. A water body being impaired by nutrients means that the nutrients existing in the water are higher than state-mandated concentrations defined by the Total Maximum Daily Load (TMDL) program (<https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/total-maximum-daily-loads-tmdl-program>), which is a derivative of the Federal Clean Water Act. Although both N and P can lead to water quality impairments, N can be particularly troublesome due to the variety of different natural and human-influenced sources of N on the landscape. There are multiple ways that N can make its way into water bodies, including both natural (e.g., as rainwater) and human-derived (e.g., from fertilizer runoff). When surface waters are impaired, significant local, state, and/or national government funds are needed to return them into compliance, or “clean them up.” Nutrients can also feed aquatic vegetation and contribute to the prevalence of algae blooms (for more information on the relationship between nutrients and algal blooms, see “Rethinking the Role of Nitrogen and Phosphorus in the Eutrophication of Aquatic Ecosystems,” available at <https://edis.ifas.ufl.edu/publication/SG118>). Despite the multitude of different N sources on the landscape, urban fertilizer has been an increasingly

targeted N source for management action (for more information on N sources in urban landscapes, see “Sources and Transformations of Nitrogen in Urban Landscapes,” available at <https://edis.ifas.ufl.edu/publication/SS681>). For example, more than 50 counties and municipalities in Florida now have formal fertilizer ordinances (for more information on urban fertilizer ordinances, see the Florida Friendly Landscaping™ (FFL) app at <https://ffl.ifas.ufl.edu/fertilizer/> and “Urban Fertilizer Ordinances in the Context of Environmental Horticulture and Water Quality Extension Programs: Frequently Asked Questions,” available at <https://edis.ifas.ufl.edu/ae534>).

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) has multiple programs targeted at reducing nutrient pollution from residential landscapes while still maintaining acceptable landscape quality (e.g., the FFL program [<https://ffl.ifas.ufl.edu>], which includes the Green Industry Best Management Practices [GIBMP] program [<https://gibmp.ifas.ufl.edu>]). In an effort to protect and improve Florida’s water quality by minimizing N pollution of surface waters, these programs are used or adopted by counties, UF/IFAS Extension offices, utility providers, and other entities throughout the state.

Despite the various programs and numerous individuals working towards minimizing residential landscape





# Impacts: 2018-2021

- In a 6 month follow up survey participants reported they were using BMP's
- Used UF/IFAS research on nutrient leaching Saham et. al. (2007) and Wang and Alva (1996)
- Assumptions:
  - Average lawn size of 3,000 sq. ft. per home
  - Value of \$500 per lb. N removed from the environment

# Impacts

- 514 participants stated they had used a 50% or more Slow Release Nitrogen (SRN) product
  - reduced annual N leaching by 78.5 – 921.3 pounds
  - provided an economic benefit of **\$39,268 to \$460,674**
- 434 reported following the restricted period requirements
  - reduced annual N leaching by 109.4 – 781.2 pounds
  - with a monetary value estimated at **\$54,684 to \$390,600**

# Impacts

- Combined, these two behaviors alone amount to
  - **859.7 – 1,030.7 pounds N prevented**
  - **\$93,952 - \$851,274 in savings**
- The wide range in monetary savings is due to the wide range of possible scenarios that people might have in their home landscape.

# Conclusion



# Conclusion

- Educational efforts resulted in significant behavior changes
- Seeks to reduce local levels of nitrogen and phosphorous, pollutants that lead to harmful algae blooms and FDEP impairments
- Participants better understand sources of water contamination resulting from fertilizer misuse
- Have acted to change those behaviors

# In Service Training

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- Delivering & Quantifying Fertilizer Education: A New Tool to Measure Impacts
- IST Training #32070
- Hosted By: Tina McIntyre & Dr. AJ Reisinger
- June 2nd, 2022, 10:00am-12:00pm
- Register in advance: On Zoom and in PDEC

## Agenda

10:00- Overview of need for quantifying water quality impacts & EDIS Publication: Quantifying Impacts of Fertilizer Workshops on Nitrogen Leaching and Subsequent Economic Impacts: A Case Study

10:15- Case study example of Fertilizer Program in Seminole County

10:45- Calculating impacts for your educational programs related to fertilizer

11:15- Brief overview of water calculator

11:20- Available and editable packaged curriculum

11:30- Sample Impact Statement

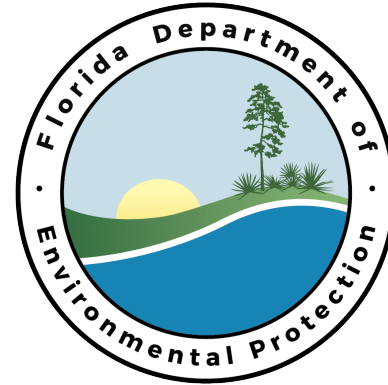
- Participants will receive both the text of a sample impact statement and access to an excel spreadsheet that allows them to enter numbers to see the nitrogen leaching mitigated and the associated economic impact.

11:45- Question & Answer session



# Thanks!

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