



Florida Department of Environmental Protection

Wacissa Springs Basin Management Action Plan (BMAP)

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Water Quality Framework

Monitor and report progress annually

Adapt and change – new statewide annual report

Collect data

Analyze and verify

List “impaired” waters

REPEAT

Measure success and adapt

Set water quality standards

Monitor water quality

Determine pollution problems

Develop and implement restoration plans (BMAPs)

Work with community leaders

Establish restoration goals (TMDLs)

Allocate responsibilities

Identify projects

- Infrastructure
- Best Management Practices (BMPs)

Establish schedules

Identify success criteria

Excessive nutrients

Bacteria, Metals, and Other Impairments

Gather additional data

Evaluate water quality

Adopt pollutant reduction targets





Wacissa River & Springs Basin Total Maximum Daily Loads (TMDLs)

- TMDL
- Data Period of Record: January 1, 2005 through June 30, 2012
- Adopted June 2016
- TMDL Study Results:
 - Nitrate shown to be primary factor in causing algal blooms
- TMDL:
 - Springs - 0.24 milligrams per liter (mg/L) nitrate monthly average concentration (or lower) will not cause an imbalance in the flora or fauna





Regulatory Framework

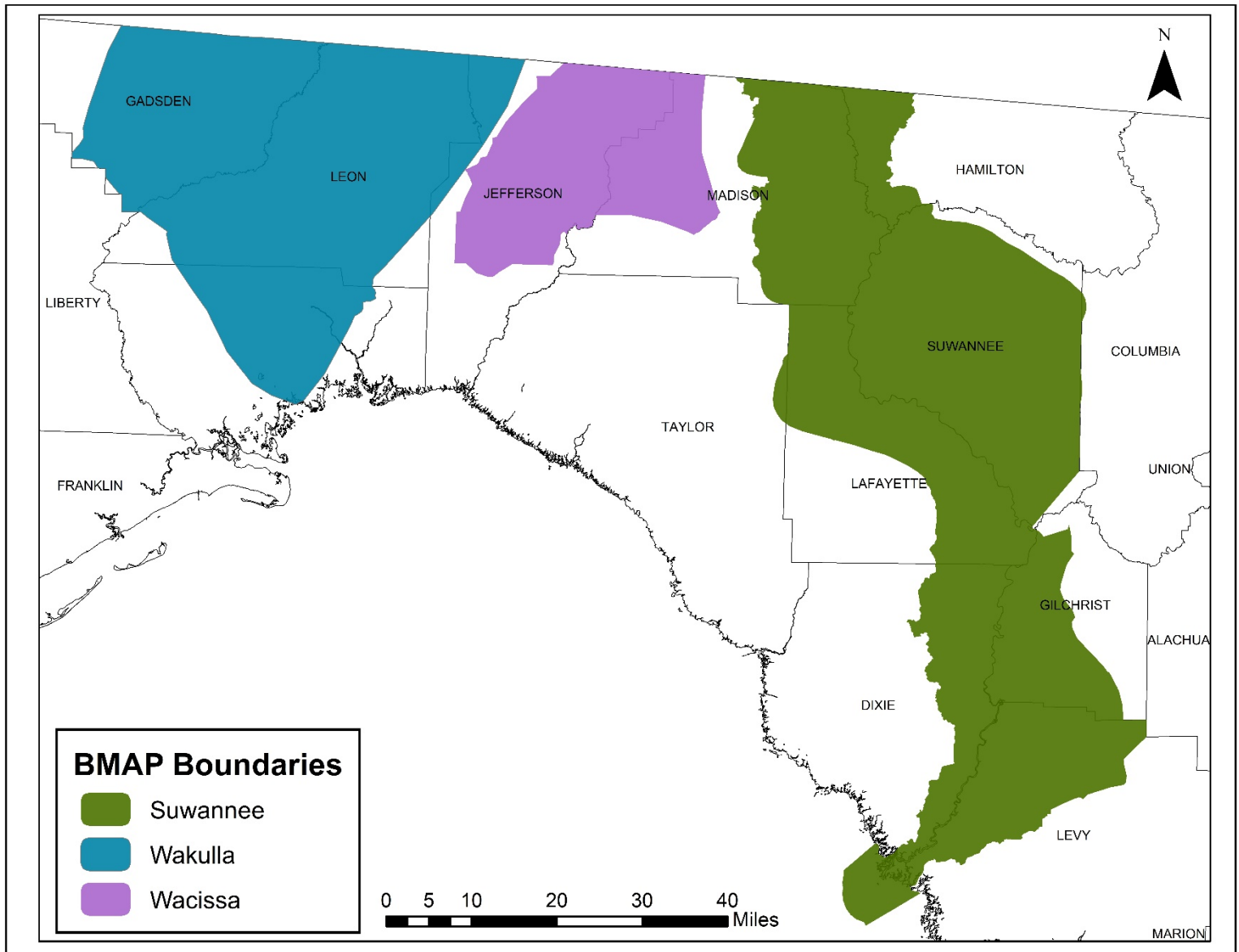
The process for preparing BMAPs is found in:

- Section 403.067, Florida Statutes (F.S.), known as the “Florida Watershed Restoration Act”
- The 2016 Florida Springs and Aquifer Protection Act lists requirements for BMAPs for OFS
- Requirement is to achieve TMDL in 20 years
 - Plan is to achieve:
 - 30 % reduction in 5 years
 - 80 % in 10 years
 - 100 % in 15 years





Regional BMAPs



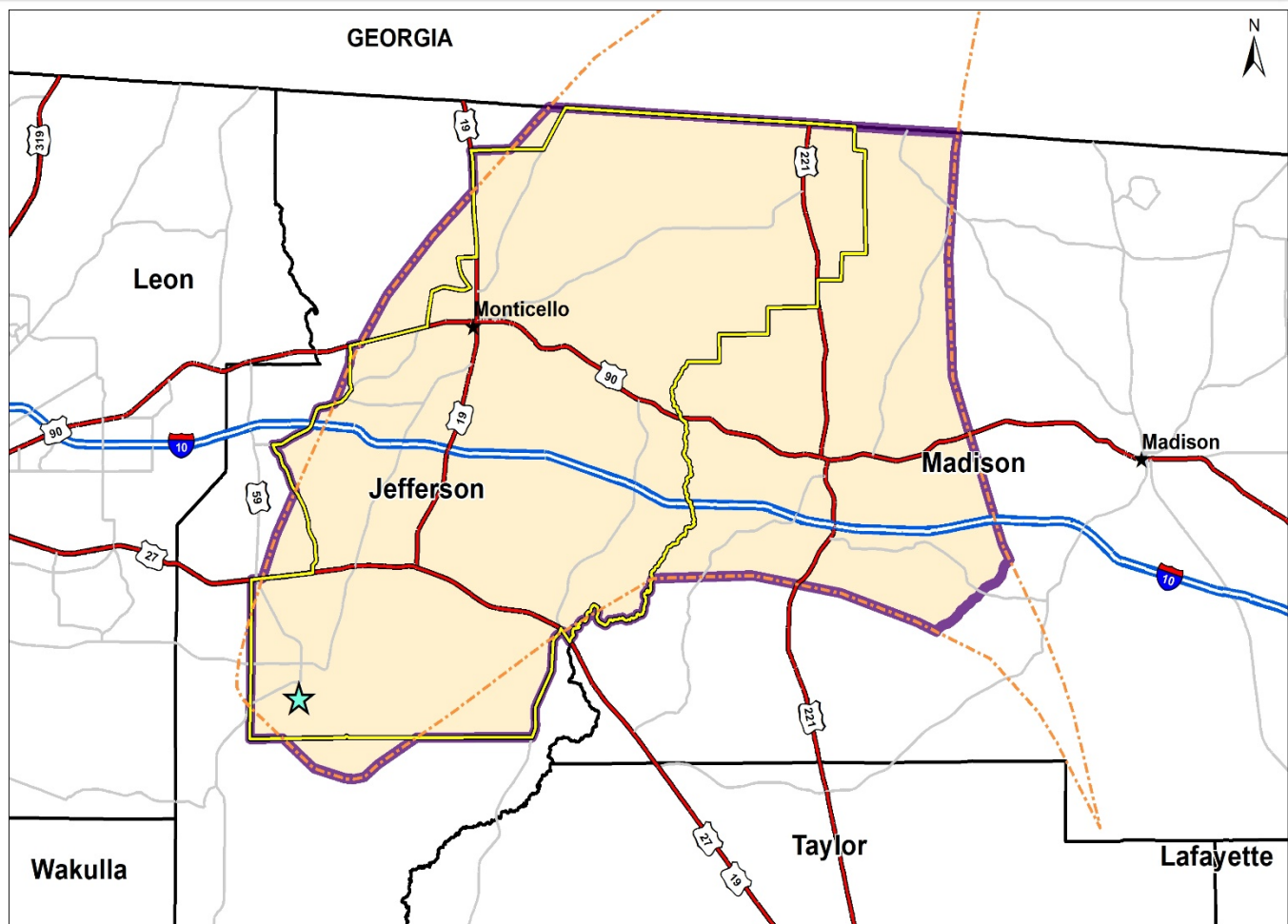


Wacissa BMAP Area

Land Uses:

- Upland Forest (43%)
- Agricultural (16%)
- Wetland/Water (37%)
- Urban/Built-Up (3%)
- Other (1%)

Both agricultural and urban BMPs are being implemented.



Map prepared by the Division of Environmental Assessment and Restoration.
This map is not for legal decision making purposes.
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Map ID: Wacissa (BMAP/PFA/Springshed)
Created: 05-01-2018



★ Wacissa Spring

○ Wacissa Springshed

○ Wacissa PFA

○ Wacissa BMAP

★ Cities

— Interstate

— Primary and US Highways

— Secondary, State and County Highways

□ Florida Counties



2016-1 Requirements

INCLUDE:

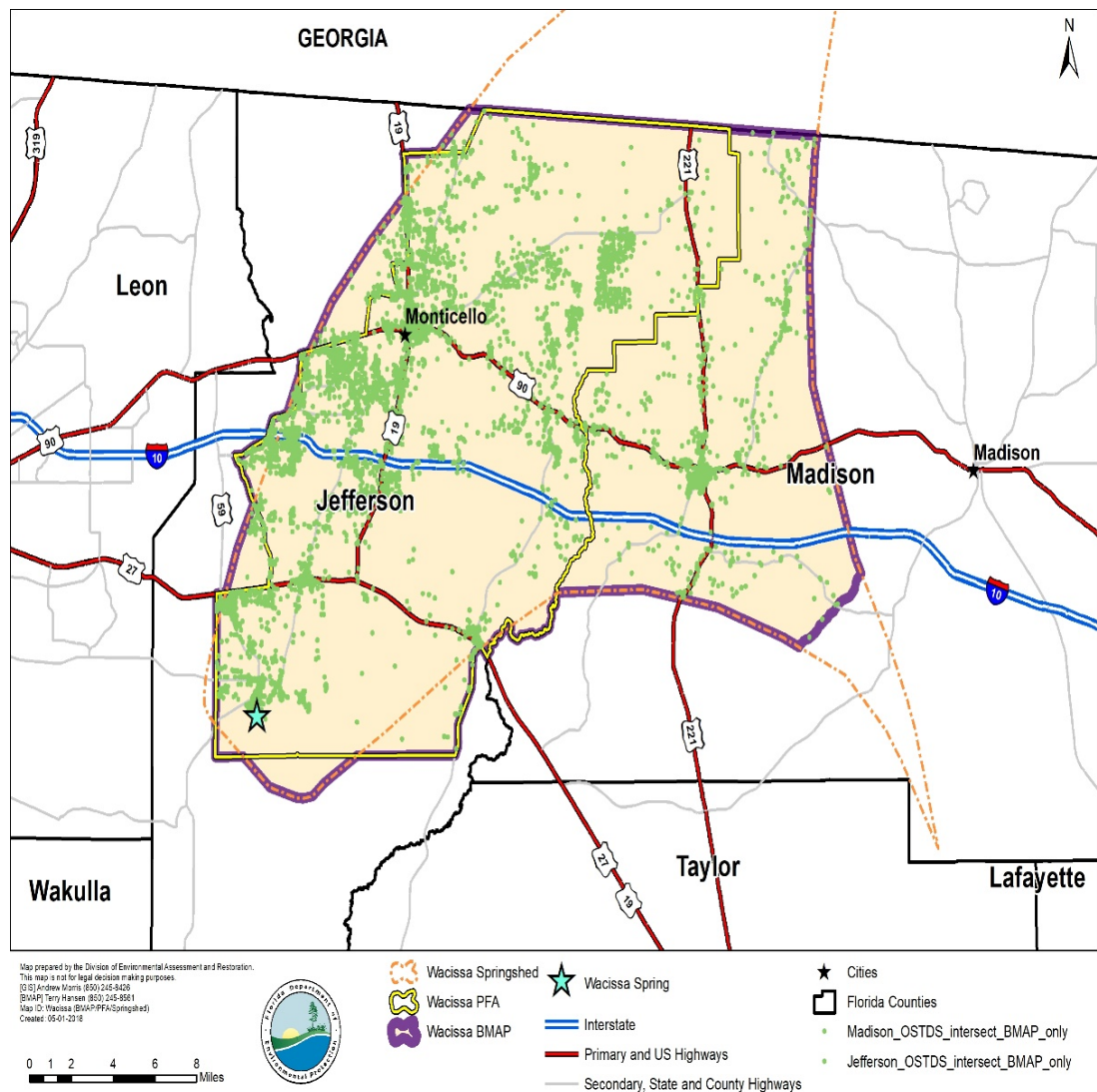
- Priority Focus Area (PFA) delineation
Area(s) of basin where Floridan Aquifer is generally most vulnerable
- Identification of point source or category of nonpoint sources with the estimated allocation of the load for each.
 - Nitrogen Source Inventory Loading Tool (NSILT)



PFA/NSILT Requirement

- **Priority Focus Area (PFA)** – developed for OFS(s) and used to focus restoration efforts
- **Nitrogen Source Inventory Loading Tool (NSILT)** – developed for OFS springsheds to estimate sources of nitrogen to groundwater

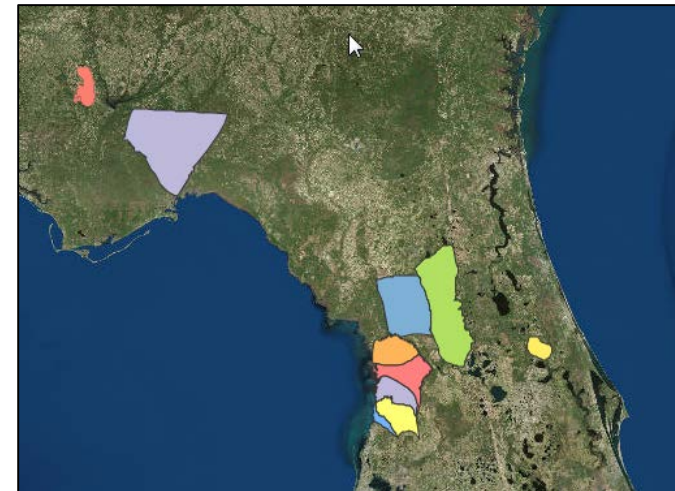
Used to determine if >20% load is from OSTDS





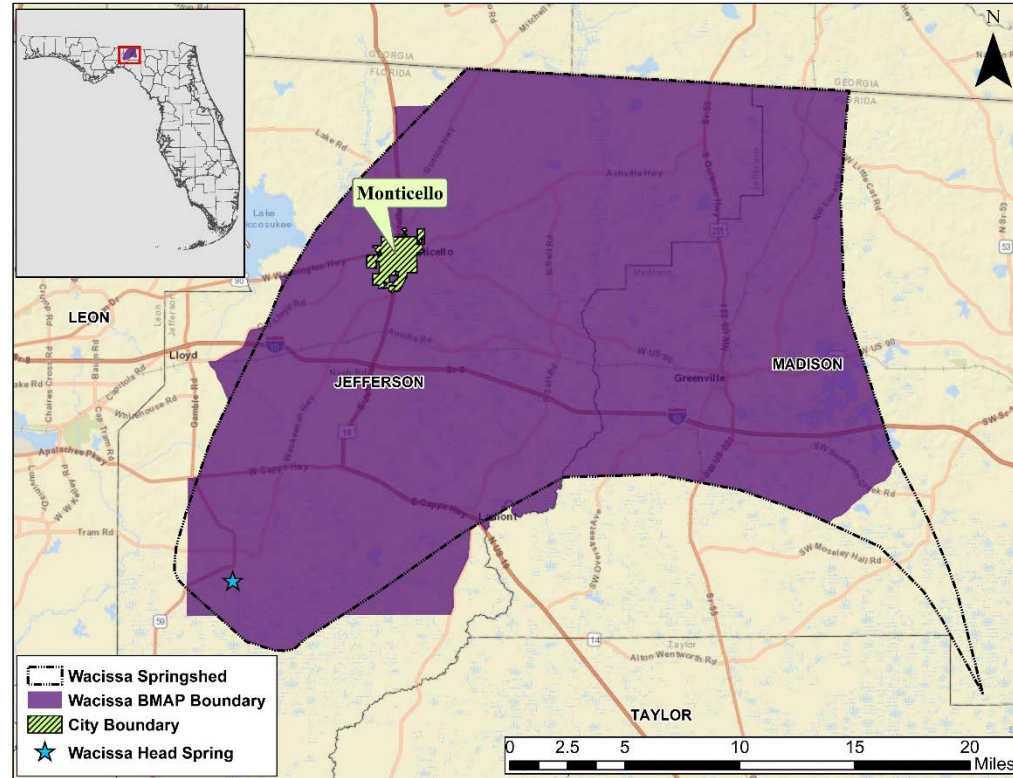
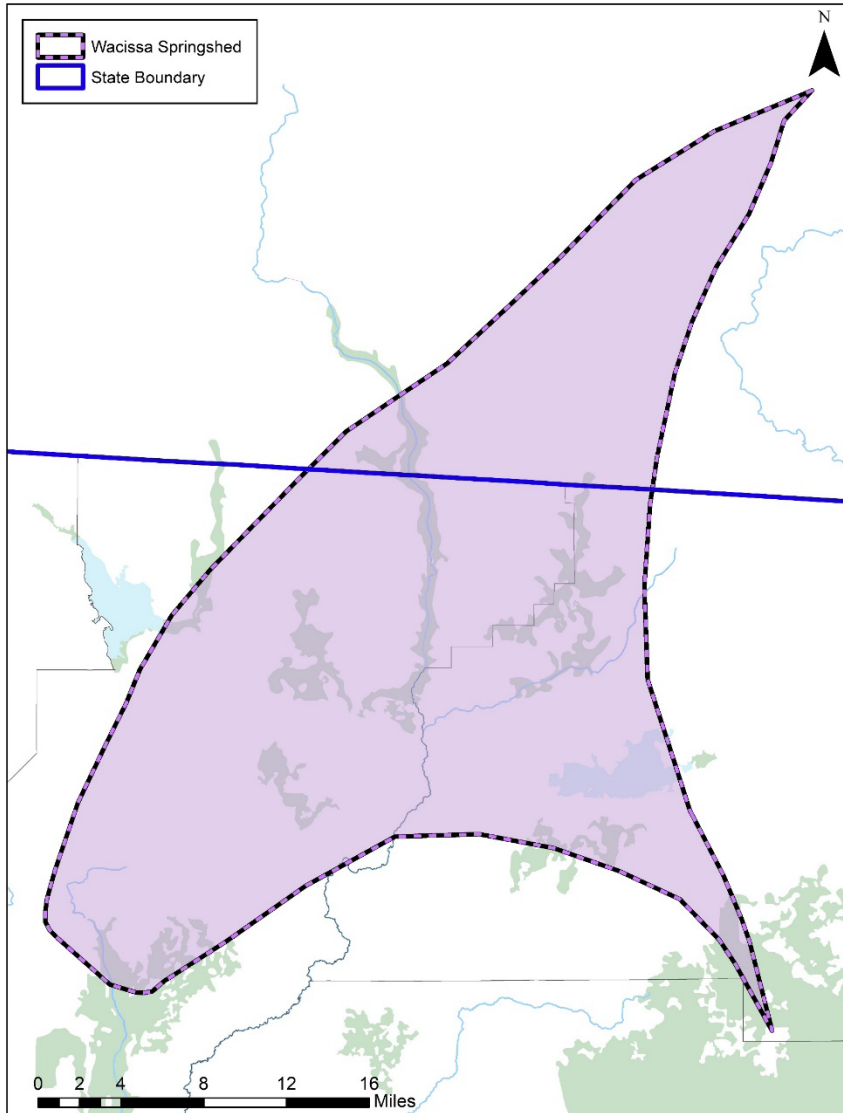
NSILT

- Quantifies nitrogen (N) sources and loading to groundwater, and highlights source categories where reductions in N loading could help achieve restoration of impaired waters
- Customizes the nitrogen inventory for each spring basin or BMAP area to account for hydrogeologic and land use differences
- Uses source category percentages to estimate the necessary and achievable reductions





Springshed and BMAP Boundaries





Estimating Nitrogen Loads to Groundwater

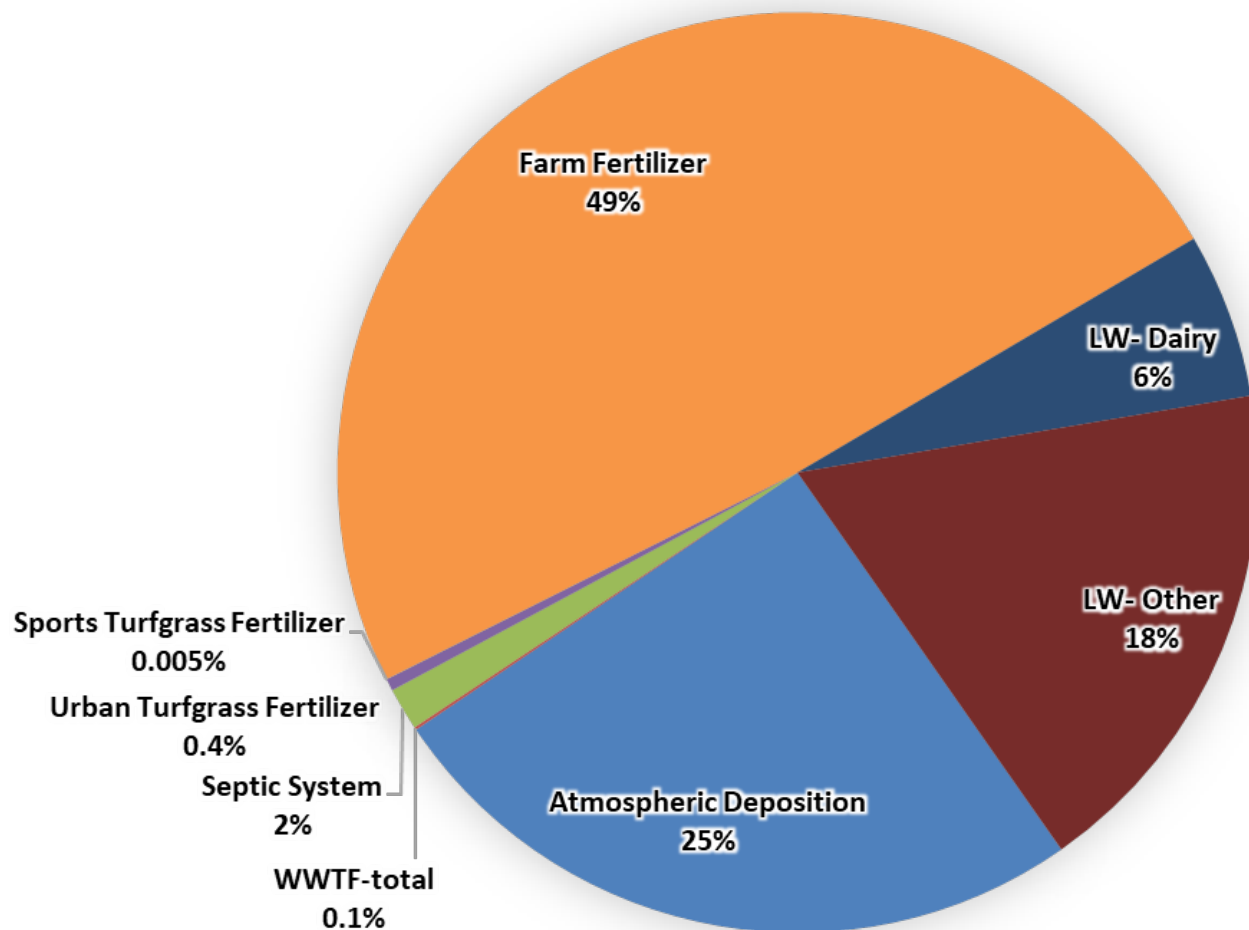
Steps:

1. Estimate the inputs of nitrogen to the land surface from the source inventory information **(best available and most current)**.
2. Apply attenuation factors based on the various environmental processes that could transform the various forms of nitrogen in the subsurface (such as denitrification, nitrification of ammonia, uptake by plants, mineralization of organic nitrogen).
3. Apply areal weighting factors that are based on the rate of recharge to groundwater to estimate nitrogen loads to groundwater.
4. Fine-tune estimates after getting feedback from stakeholders.





Estimates of Nitrogen Inputs



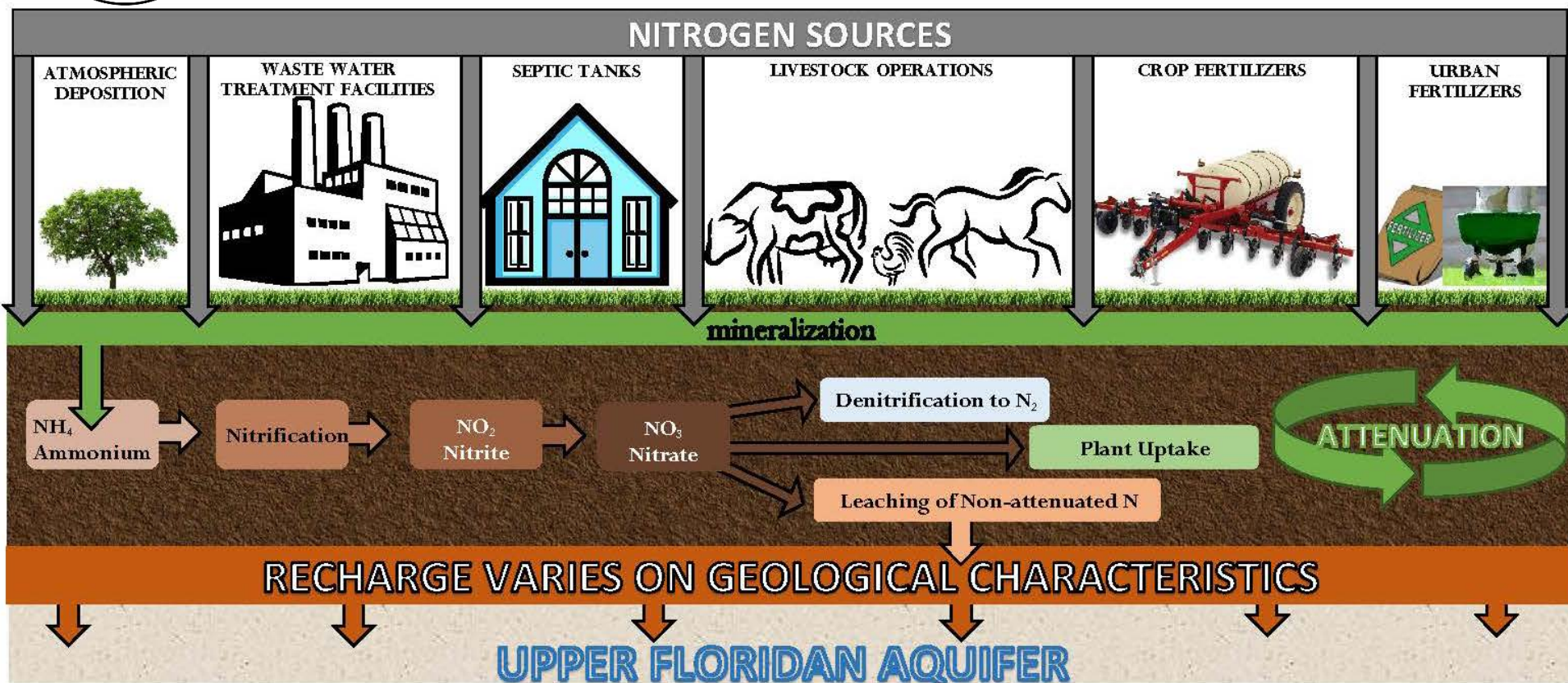


Source Categories

- Land Use evaluation provides potential groundwater sources of nitrate
 - Farm Fertilizer (FF)
 - Livestock Waste (LW)
 - Dairies
 - Urban Turfgrass Fertilizer (UTF)
 - Sports Turfgrass Fertilizer (STF)
 - Atmospheric Deposition (AD)
 - Wastewater Treatment Facilities (WWTP)
 - Onsite Treatment and Disposal Systems (OSTDS)



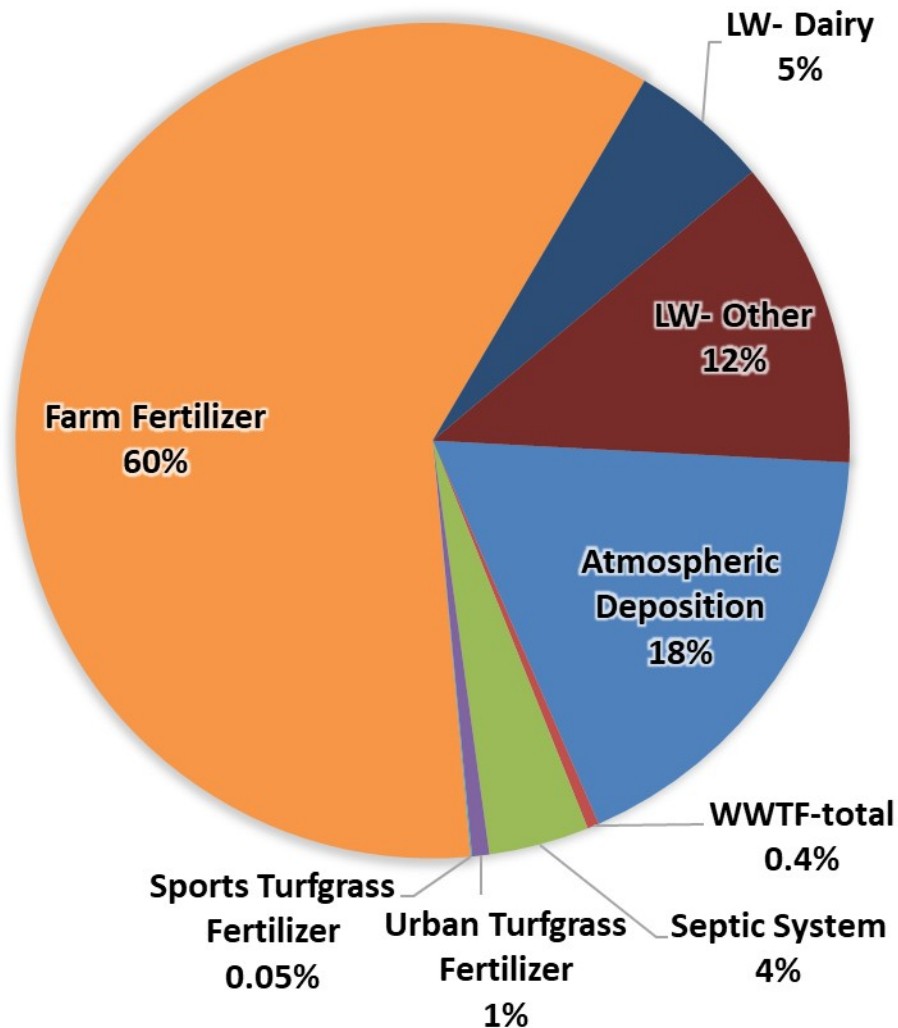
Nitrogen Cycle and Nitrogen Attenuation



LEACHING OF N TO GROUND WATER is related to many factors, such as variable soil conditions, fertilizer material, livestock type, crop types, irrigation, recharge to the aquifer.



Nitrogen Load to Groundwater





Source Categories

- Load to Groundwater evaluation provides comparison of potential groundwater sources of nitrate
 - Farm Fertilizer (FF)
 - Livestock Waste (LW)
 - Dairies
 - Urban Turfgrass Fertilizer (UTF)
 - Sports Turfgrass Fertilizer (STF)
 - Atmospheric Deposition (AD)
 - Wastewater Treatment Facilities (WWTP)
 - Onsite Treatment and Disposal Systems (OSTDS)



PFA Delineation

- Sub-Section 373.802, F.S.:
 - Definition: Area or areas of a basin where the Floridan Aquifer is generally most vulnerable to pollutant inputs where there is a known connectivity between groundwater pathways and an OFS
- Sub-Section 373.803, F.S.:
 - Delineation considers factors that may lead to degradation of an OFS, such as:
 - Groundwater travel time to the spring
 - Hydrogeology
 - Nutrient load, etc.



PFA Requirements

- Prohibitions

- Wastewater treatment facilities greater than 100,000 gallons per day (GPD), UNLESS advanced wastewater treatment (AWT) is used.
- New conventional OSTDS on less than one-acre lots.
- Ban on land application of Class A or B biosolids w/o approved NMP.
- New Hazardous waste facilities.

- Additional Requirements for Biosolids and Septage Application Practices

- Requirements for newly permitted sites or at renewal
- Verified BMPs for agricultural operations
- Effective nutrient management practices
- Groundwater monitoring requirements

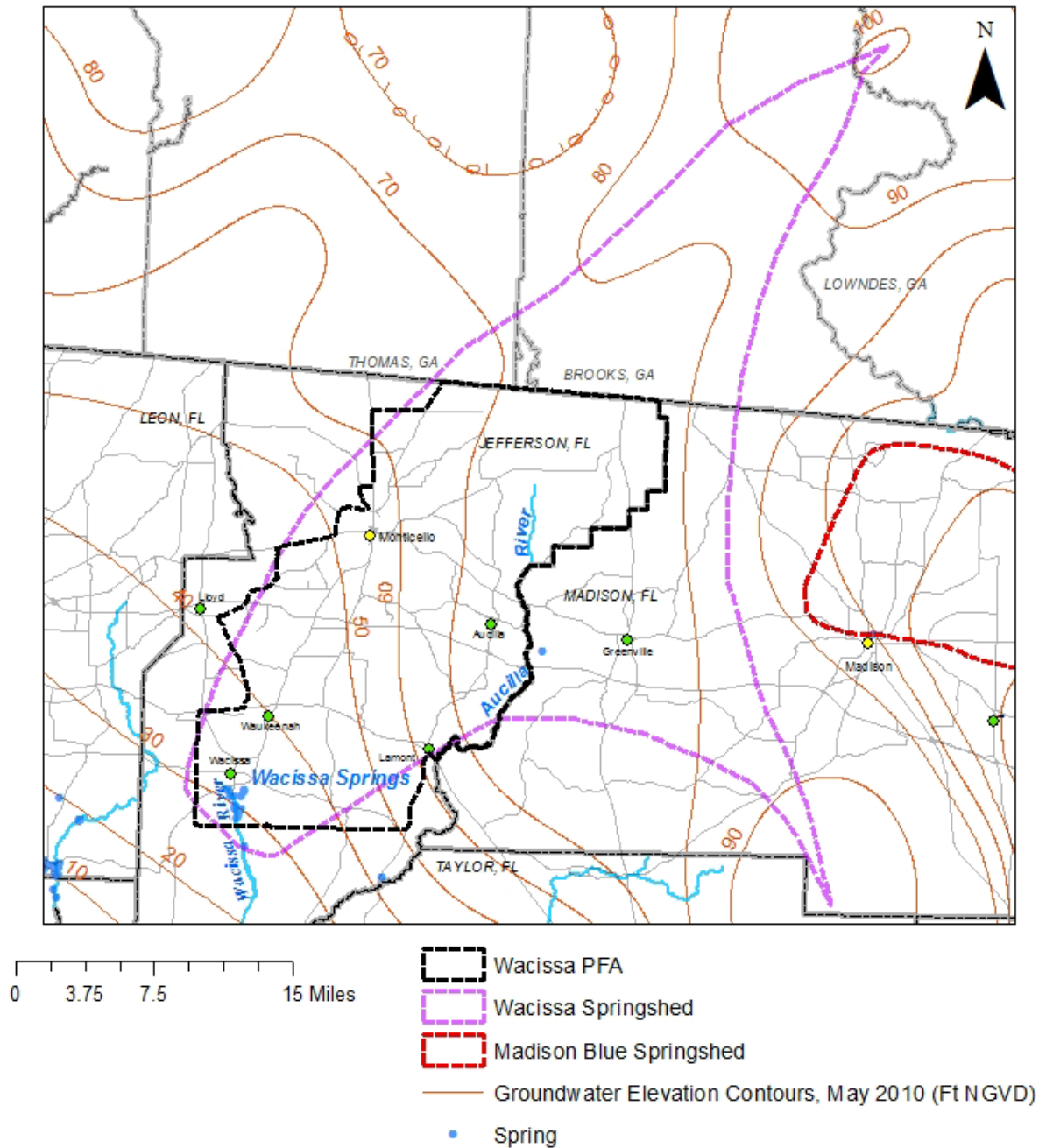


PFA Delineation

- Evaluate
 - Aquifer Recharge
 - Aquifer Vulnerability
 - Soil Leaching Potential
 - Land Elevation
 - Land Use
 - Conservation Lands
 - WWTP and OSTDS

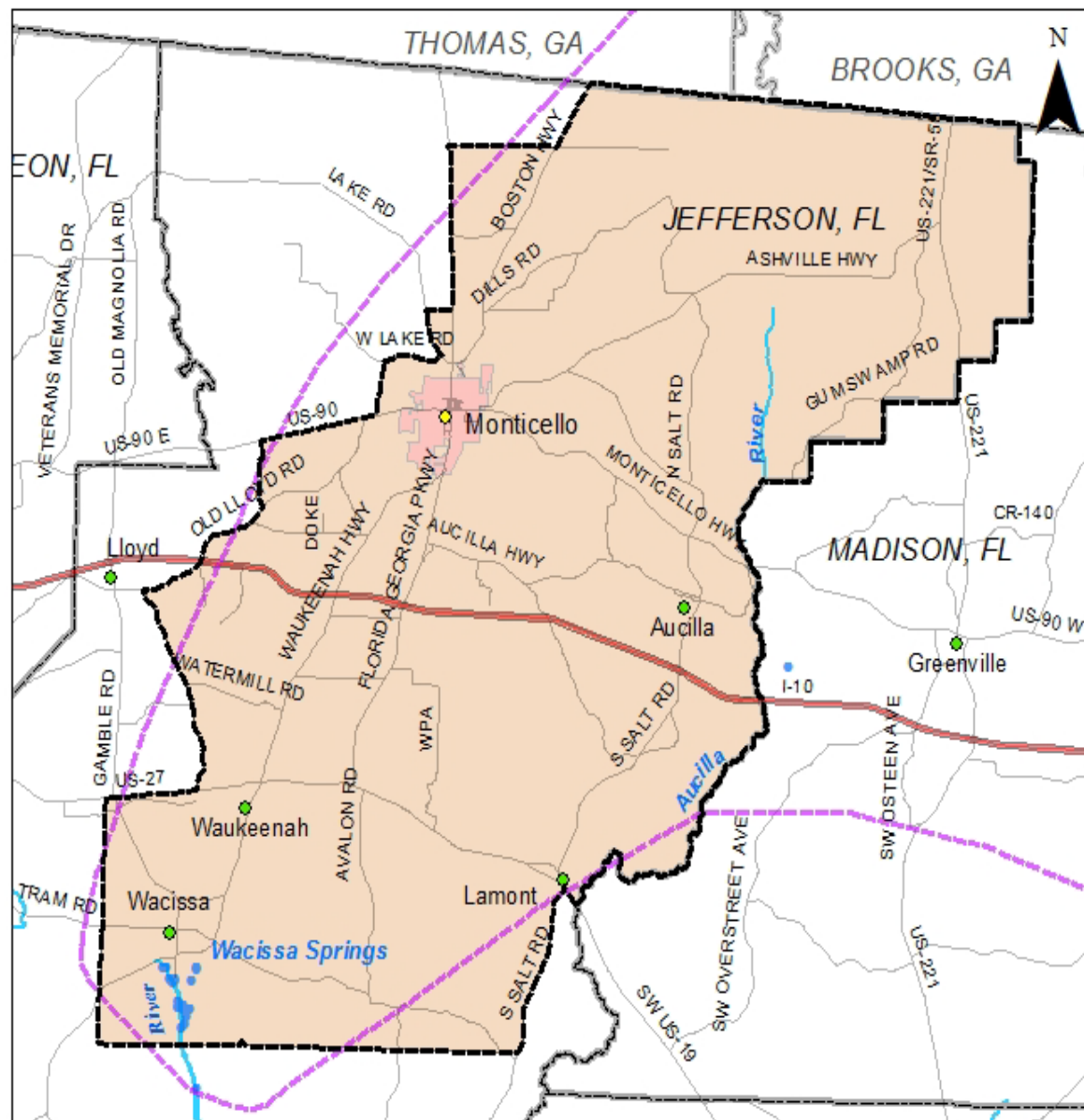


PFA – Boundary





PFA – Boundary



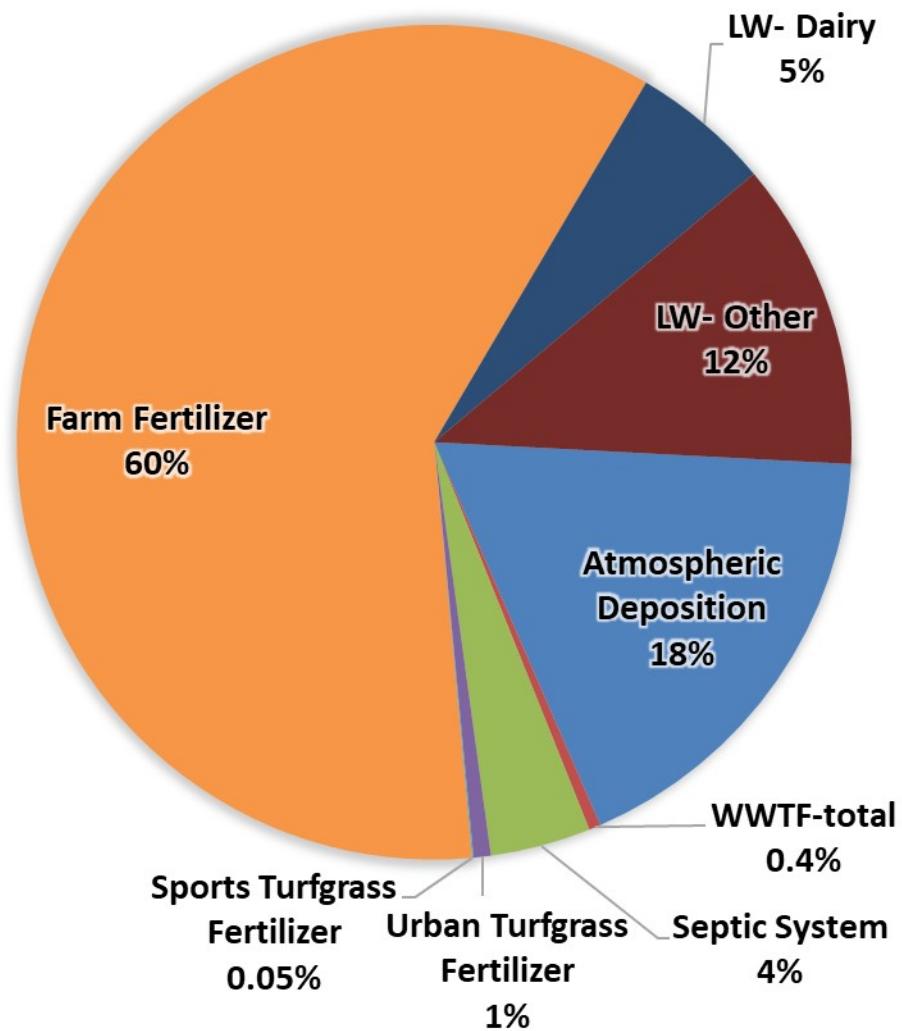
0 2 4 8 Miles

- Wacissa PFA
- Wacissa Springshed
- Spring



Wacissa

Nitrogen Loads to Groundwater



572,438 lbs-N/yr



Wacissa BMAP Nitrogen Reductions

Determine required reduction to meet TMDL - using most accurate and current data - 2012 to 2018

- Calculate spring group vent load
- Calculate TMDL load
- Determine required reduction to meet TMDL

Total Reduction Required to Meet the TMDL

	Total Load (lb-N/yr)	TMDL Load (lb-N/yr)	Required Reduction to Meet TMDL (lb-N/yr)
Spring Vent	193,149	114,680	78,469

Project Credit Analysis		
Nitrogen Source	Credits to Load to Groundwater (lb-N/yr)	Description
Onsite Sewage Treatment and Disposal Systems (OSTDS)	TBD	Credits identified for stakeholder OSTDS projects (onsite enhancement or sewer)
Urban Turfgrass Fertilizer (UTF)	230	DEP approved credits (up to 6 %) for public education activities as well as credits identified for stakeholder stormwater projects
Atmospheric Deposition (AD)		No reduction
Farm Fertilizer Reductions	51,500	15 % BMP credit on FF load to groundwater, assuming 100 % owner-implemented BMPs on all fertilized lands
Sports Turfgrass Fertilizer (STF)	25	6 % BMP credit for sports fields and 10 % BMP credit for golf courses (where applicable) on STF load to groundwater, assuming 100 % BMP implementation on golf courses and sports fields
Livestock Waste	6,850	10 % BMP credit on load to groundwater, assuming 100 % owner-implemented BMPs at all livestock facilities
Livestock Waste Permitted Dairy	4,650	15 % BMP credit on permitted dairy load to groundwater, assuming 100% owner-implemented BMPs at permitted dairies
Wastewater Treatment Facilities (WWTF)	2,000	Achieved by BMAP WWTF policy if BMAP-wide (achieving 3 or 6 mg/L total nitrogen concentration at discharge)
Total Credits	65,250	



Wacissa BMAP Nitrogen Reductions

Total Reduction Required to Meet the TMDLs			
	Total Load (lb-N/yr)	TMDL Load (lb-N/yr)	Required Reduction to Meet TMDL (lb-N/yr)
Spring Vent	193,149	114,680	78,469
Projects Credits			65,250
Additional Project credits needed			13,250



Additional Potential Reductions

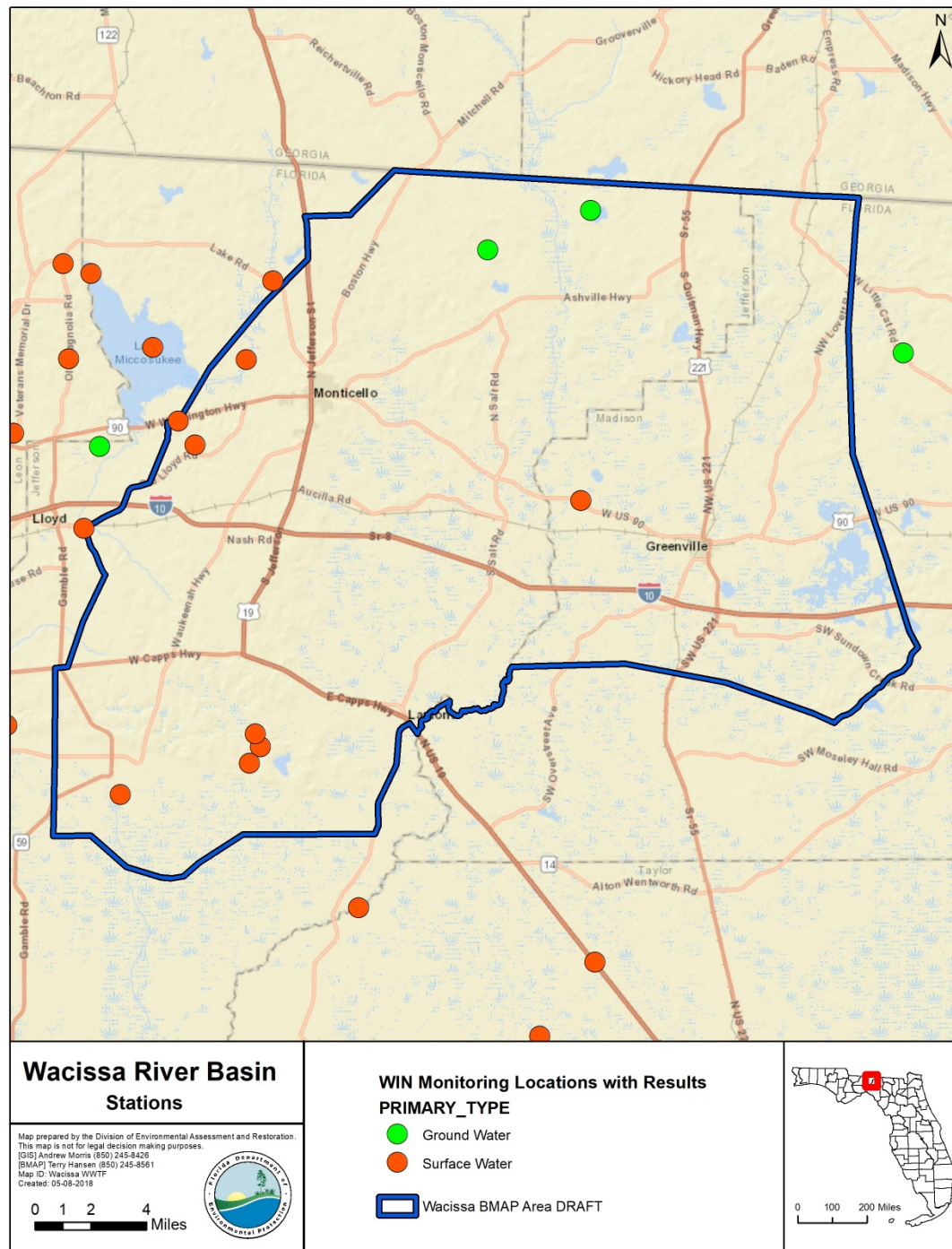
Additional Ag Practices Estimated Reduction Credit (lb-N/yr)

Action	High Recharge Area (100%)	Med. Recharge Area (100%)
Precision Irrigation	2,021	1,123
Precision Fertilization	24,223	13,457
Soil Moisture Probes	44,334	24,630
Controlled Release Fert.	7,096	3,942
Cover crops	71,345	39,636
Fertilizer Banders	39,172	21,762



Additional Potential Reductions

Existing OSTDS in PFA (lb-N/yr)				
	High Recharge Area		Med. Recharge Area	
	Tanks	Credit	Tanks	Credit
Parcels <1 ac	161	1,000 lbs.	74	250 lbs.
Parcels >1ac	728	4,400 lbs.	715	2,400 lbs.





Statewide TMDL, BMAP, Minimum Flows and Levels (MFLs) Annual Report

- 403.0675(1), F.S. – requires a report that will include status of MFLs, TMDLs, and BMAPs
- Replacement of individual BMAP annual progress reports
- Annual meetings will continue
- Calendar year reporting
- Report will contain project information: funding, proposed priority ranking for implementation
- Progress made towards restoration goals
- Information will be requested in late November, due by the end of January
- Info. needed will include: entity activities, compliance, project information, and milestones
- Report is due to the Governor and Florida Legislature July 1, 2018 and every year thereafter



Questions?



<http://publicfiles.dep.state.fl.us/DEAR/BMAP/WACISSA/>