



Silver Springs and River and Rainbow Spring Group and Rainbow River Basin Management Action Plan Updates

October 30, 2024 at 9:00 AM EDT

In-person

*Mary Sue Rich Community Center – Banquet Hall #2
1821 NW 21st Ave.
Ocala, FL 34475*

Agenda

- Background.
- Analysis Results Summary.
- Basin Required Reductions.
- Entity Required Reductions.
- Poster Session.

Please note the FTP site for documents pertaining to the various BMAPs:
[publicfiles.dep.state.fl.us - /DEAR/BMAP/Silver Rainbow Springs/Public Meetings/2024 October Meeting/](https://publicfiles.dep.state.fl.us/-/DEAR/BMAP/Silver_Rainbow_Springs/Public_Meetings/2024_October_Meeting/)
For more information on the Silver Springs and River and Rainbow Spring Group and Rainbow River Basin BMAP,
contact: Jessica Fetgatter at (850) 245-8107 Jessica.Fetgatter@FloridaDEP.gov.



RAINBOW SPRING GROUP AND RAINBOW RIVER AND SILVER SPRINGS AND UPPER SILVER RIVER BASIN MANAGEMENT ACTION PLAN (BMAP)

Jessica Fetgatter

Division of Environmental Assessment and Restoration/
Water Quality Restoration Program
Florida Department of Environmental Protection

Ocala, FL | Oct. 30, 2024



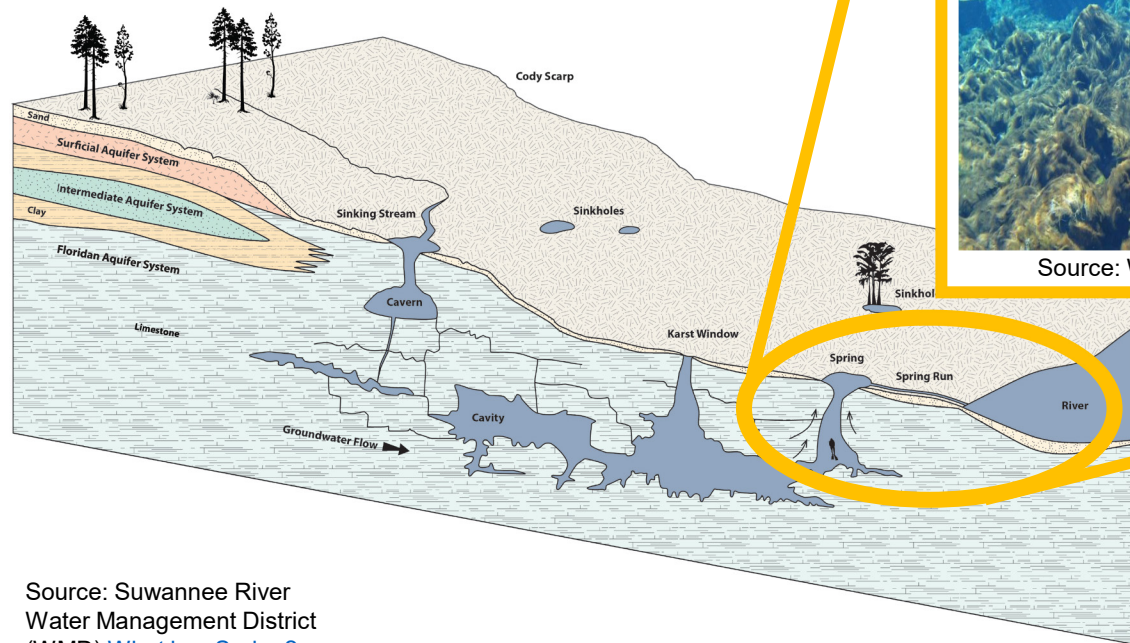
AGENDA

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BACKGROUND SPRINGS RESTORATION



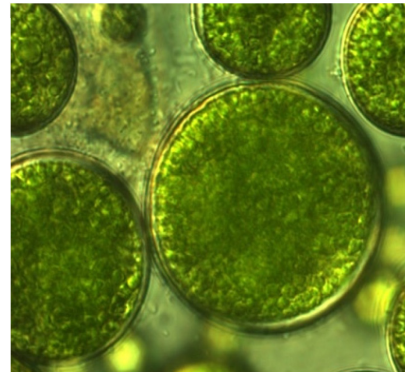
Source: Suwannee River
Water Management District
(WMD) [What is a Spring?](#)

Impairment: Not meeting water quality standards.



Source: Weeki Wachee TMDL

Algae growth can be caused by **excess nutrients**.



Source: Shutterstock

Total maximum daily load (TMDL): The maximum amount of a pollutant that a waterbody can receive and still maintain its designated uses. **This represents the target for restoration.**

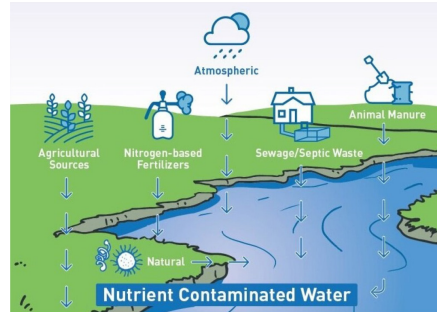


Source: Florida Geological Survey
- Rainbow Spring #4



BACKGROUND SPRINGS RESTORATION

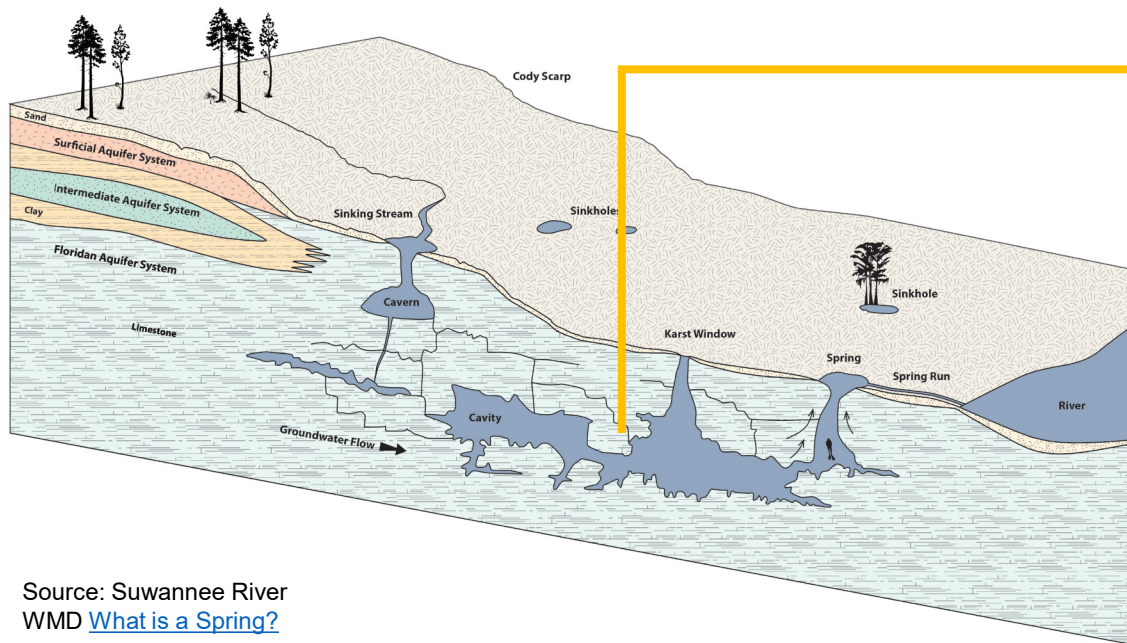
Excess nutrients come from **sources on the landscape.**



Source: Beta Analytics

BMAP Projects: Efforts that result in the reduction or prevention of nutrients to the waterbodies addressed by the BMAP.

BMAP: An adaptive framework for water quality restoration that contains a comprehensive set of solutions developed to achieve the pollutant reductions established by TMDL.



Source: Suwannee River WMD [What is a Spring?](#)

Complex groundwater dynamics lead to variable travel times to the spring vent.

Water quality monitoring is performed through a network of surface water, spring vent and groundwater stations to assess waterbodies and measure progress towards restoration goals.



Source: Florida Geological Survey - Rainbow Spring #4

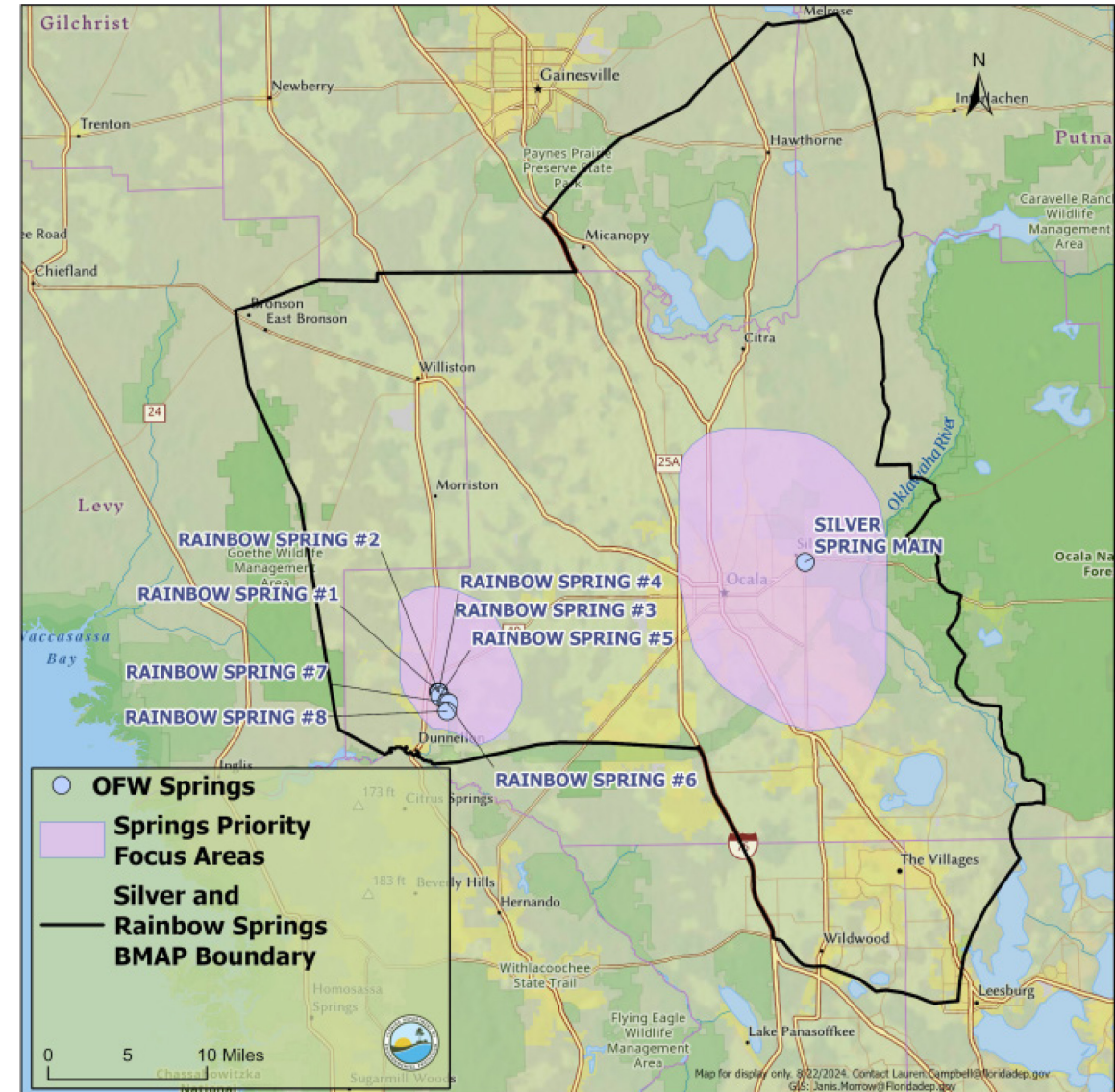


BMAP BACKGROUND

- The Rainbow Spring Group and Rainbow River and Silver Springs and Upper Silver River BMAP area is approximately 1,668 square miles.
- It includes areas of Alachua, Putnam, Levy, Marion, Lake and Sumter counties.

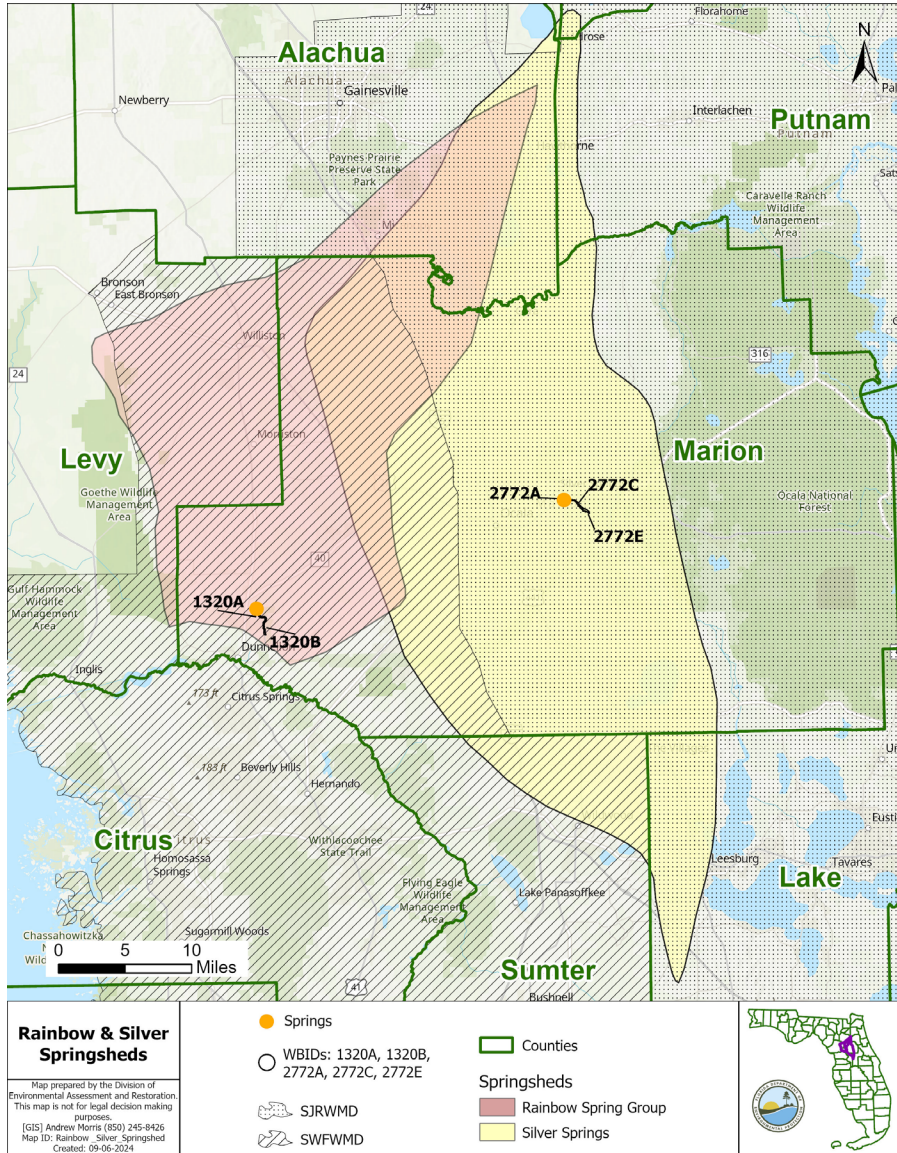
Waterbody	Waterbody Identification (WBID)	Parameter	TMDL (mg/L)
Rainbow Springs Group and Rainbow Springs Group Run	1320A, 1320B	Nitrate, as monthly average	0.35
Silver Springs, Silver Springs Group, and Upper Silver River	2772A, 2772C, 2772E	Nitrate, as monthly average	0.35

TMDL: total maximum daily load.
mg/L: milligrams per liter.





RAINBOW AND SILVER SPRINGS TMDL SPRINGSHEDS



The decision to merge the BMAP areas was based on the following considerations:

- **The two spring systems have a zone of interaction that influences the movement and direction of groundwater flow. There is no clear delineation between the two systems' groundwater contributing areas.**
- Management strategies and policies implemented to address pollutant sources are the same for both spring systems.
- Marion County has the largest land area within both springsheds — approximately 60% of Silver Springs and 65% of the Rainbow Spring Group. The City of Ocala also spans both areas.
- For these systems, a single BMAP provides greater consistency in local jurisdiction planning and policymaking.



STAKEHOLDERS

Local Governments:

- Marion County.
- Alachua County.
- Lake County.
- Sumter County.
- Levy County.
- Putnam County.
- City of Ocala.
- City of Dunnellon.
- City of Belleview.
- The Villages.
- City of Wildwood.
- On Top of the World.
- Town of McIntosh.
- City of Williston.
- Town of Bronson.
- City of Leesburg.
- City of Micanopy.
- City of Hawthorne.
- Town of Lady Lake.
- Town of Reddick.
- City of Fruitland Park.

Other Responsible Entities:

- Agricultural Producers.
- Private Wastewater Treatment Facilities.
- Private Golf Courses.

Regional and State Agencies:

- Florida Department of Agriculture and Consumer Services (DACS).
- Florida Department of Environmental Protection (DEP), including Silver Springs State Park and Rainbow Springs State Park, Ocklawaha River Aquatic Preserve, and Rainbow Springs Aquatic Preserve.
 - Florida Department of Health.
 - Florida Department of Health in Marion County.
 - Florida Department of Health in Alachua County.
 - Florida Department of Health in Levy County.
 - Florida Department of Transportation District 2.
 - Florida Department of Transportation District 5.
 - St. Johns River Water Management District.
 - Southwest Florida Water Management District.

Homeowners, the public and any other interested parties.



BILLS AND LEGISLATION

SUMMARY

- Florida Watershed Restoration Act, section 403.067, Florida Statutes (F.S.).
- Florida Springs and Aquifer Protection Act, Part VIII of Chapter 373, F.S.
- 2020 Senate Bill (SB) 712, Clean Waterways Act.
- 2023 House Bill (HB) 1379.
- 2024 HB 1557.

Summary of latest updates:

- No new conventional onsite sewage treatment and disposal systems (OSTDS) on lots one acre or less.
- Wastewater treatment plans and OSTDS remediation plans from local governments.
- List of identified project to meet five-year milestones.
- Agricultural Cooperative Regional Elements (ACE).
- For the spring BMAPs, prohibitions expanded from priority focus area (PFA) to the entire BMAP.
- Advanced waste treatment (AWT) required for more types of effluent, including certain reclaimed water.



ACE

- Cooperative Agricultural Regional Water Quality Improvement Elements include a collaborative framework for identifying, prioritizing and implementing regional projects that address nutrient loading from agricultural operations in Florida's waterways.
- Continuous efforts among key stakeholders, including:
 - DEP.
 - DACS.
 - WMDs.
 - Agricultural producers.
 - Local communities.



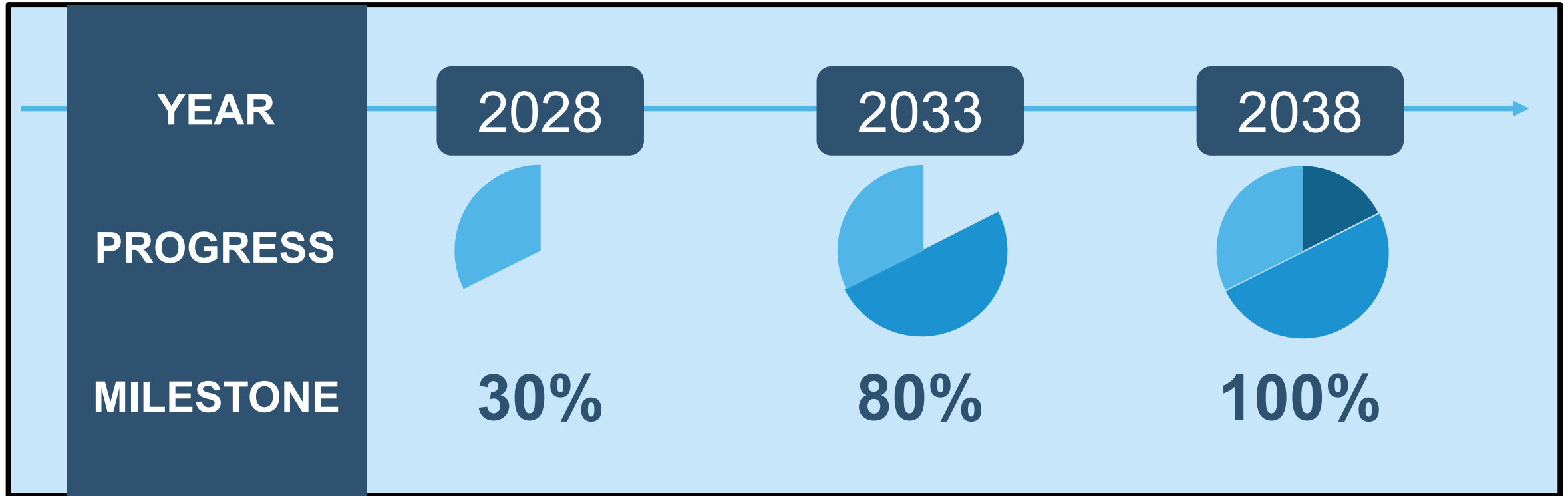
ACE

- Engaging producers in the decision-making process is key to this element and ensures that projects are practical, feasible and tailored to the needs and realities of agricultural operations.
- Partner agencies work in annual cycles to provide technical support, regulatory guidance and funding opportunities, enhancing the implementation and success of regional water quality improvement initiatives.



BMAP MILESTONES

FIVE-, 10-, AND 15-YEAR MILESTONES/REDUCTION SCHEDULE



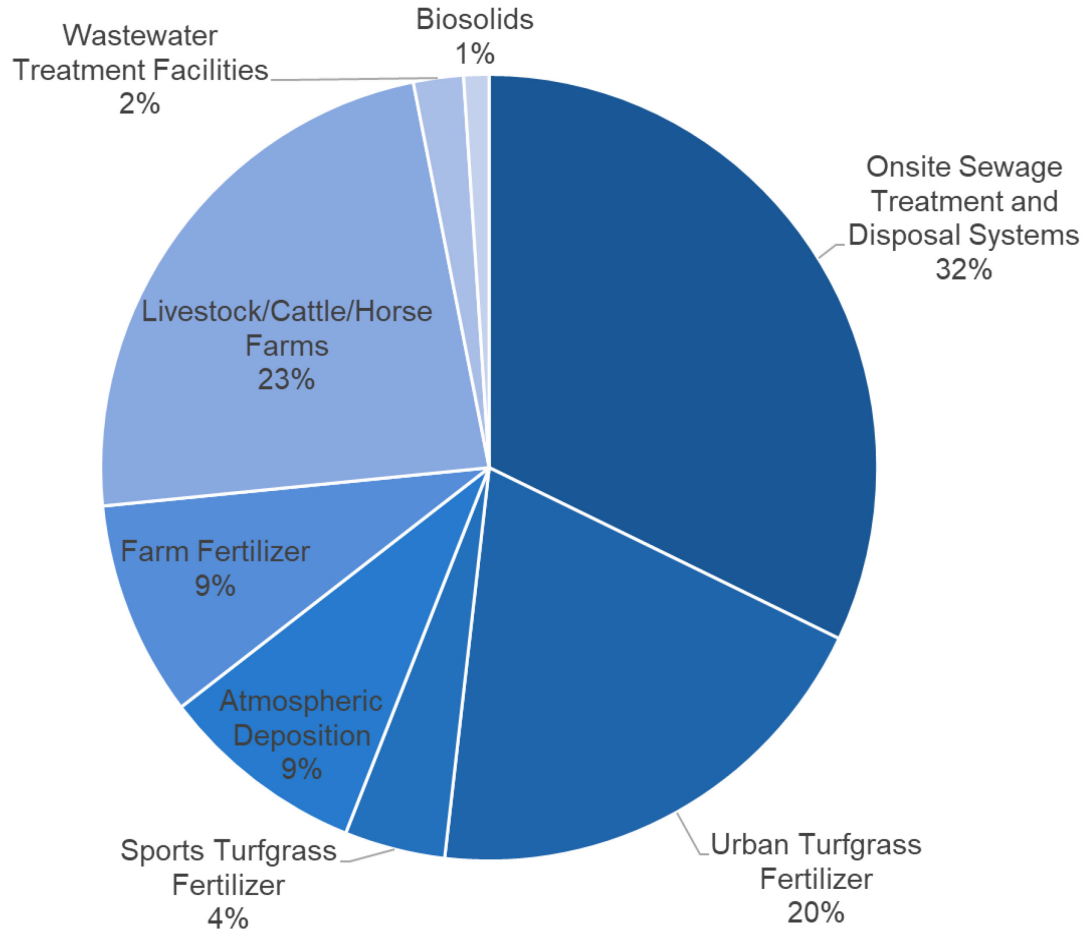
Assessment of progress toward these milestones must be conducted every five years and revisions to the plan must be made as appropriate. BMAPs use an adaptive management approach that allows for incremental load reductions through the implementation of projects and management strategies; however, the restoration target – the TMDL – remains the same.



NSILT – RAINBOW AND SILVER COMBINED

DRAFT RESULTS

Percent Contribution by Source



Rainbow Spring Group and Rainbow River and Silver Springs and Upper Silver River BMAP Area	
Source	Estimated Annual Loading (lbs-N/yr)
Atmospheric Deposition	336,808
Wastewater Treatment Facilities	81,898
Onsite Sewage Treatment and Disposal Systems	1,265,209
Urban Turfgrass Fertilizer	774,333
Sports Turfgrass Fertilizer	164,784
Farm Fertilizer	348,742
Livestock/Cattle/Horse	921,420
Biosolids	41,561
Total	3,934,755



BMAP UPDATES

DRAFT LOADING SUMMARY

	Nitrogen Loads (lbs-N/yr)	Source
Total Load at Spring Vents (October 2023)	4,313,434	Upper 95 % confidence interval – nitrate and flow data 2012-2022
TMDL Load	872,682	TMDL target is 0.35 mg/L and using the same flow data and proportions
Percent Required	80%	
Total NSILT Load (October 2023)	3,934,755	2023 NSILT
Required Reductions	3,138,686	Proportional decrease in NSILT load

mg/L: milligram per liter



REDUCTIONS

DRAFT SPRINGSHED REDUCTIONS

Nitrogen Source	Allocations by Source (lbs-N/yr)	Percent of Total Reduction
Atmospheric Deposition*	268,665.39	8.56%
Onsite Sewage Treatment and Disposal Systems	1,009,235.82	32.15%
Wastewater Treatment Facilities	42,277.73	1.35%
Farm Fertilizer (BMP Implementation)	52,311.37	1.67%
Livestock Waste-NonCAFO (BMP Implementation)	92,142.01	2.94%
Other Agriculture	860,231.29	27.41%
Urban Turf	617,671.96	19.68%
Sports Turf	131,445.15	4.19%
Regional Projects*	64,705.24	2.06%
Total	3,138,686	100.00%

- An 80% reduction, as determined in the spring vent analysis, is used to determine the required reduction for most categories.
- For WWTFs, estimated reduction is determined based on meeting required effluent standards.
- For agricultural sources, an estimated reduction of 15% will be achieved when all crop producers are enrolled in the DACS Best Management Practice (BMP) program and implement BMPs, and an estimated reduction of 10% is when all livestock producers enroll in the DACS BMP program and implement BMPs. The remaining allocated reduction to agriculture will be addressed through a combination of regional projects, ACE, innovative technologies and cost-share projects.

* Not allocated to entities.

CAFO: confined animal feeding operation.



REDUCTIONS

DRAFT ENTITY REQUIRED REDUCTIONS

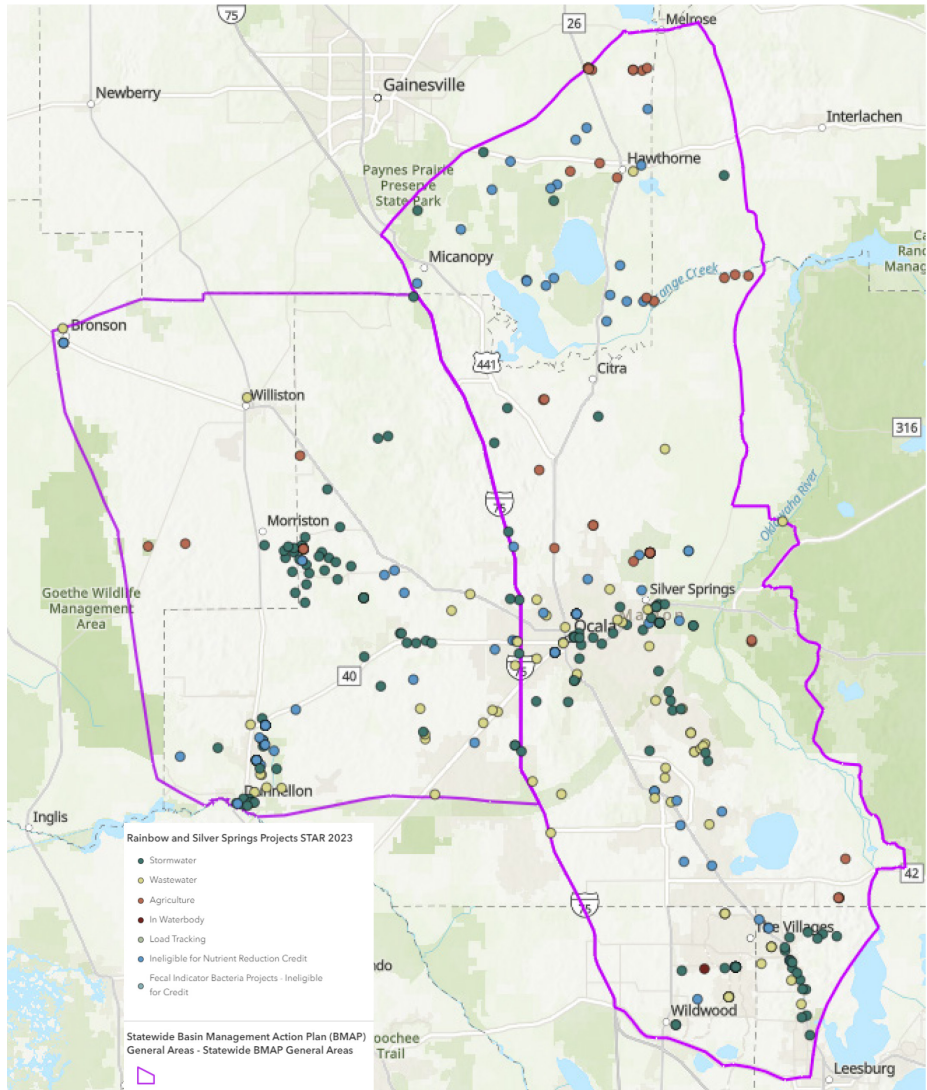
- All local municipalities are allocated reduction targets based on the loading estimated to occur under their jurisdiction from wastewater, OSTDS and urban fertilizer.
- Agriculture is allocated based on reduction targets.
- Private wastewater treatment facilities are required to meet advanced waste treatment standards or other BMAP wastewater requirements through permits.
- Golf courses are required to develop nutrient management plans.

Entity	2028 Milestone Required Reductions (lbs-N/yr) (30%)	2033 Milestone Required Reductions (lbs-N/yr) (80%)	2038 Milestone Required Reductions (lbs-N/yr) (100%)
Alachua County	4,801	12,803	16,004
Bay Laurel Center CDD	2,555	6,813	8,516
City of Belleview	2,302	6,139	7,674
City of Dunnellon	1,884	5,023	6,279
City of Fruitland Park	5,954	15,878	19,847
City of Hawthorne	646	1,722	2,153
City of Leesburg	307	818	1,023
City of Ocala	31,514	84,036	105,045
City of Wildwood	2,239	5,971	7,464
City of Williston	5,579	14,878	18,598
Lake County	15,749	41,996	52,495
Levy County	24,248	64,660	80,825
On Top of the World	9,201	24,535	30,668
Marion County	356,343	950,249	1,187,811
Putnam County	6,431	17,148	21,435
Sumter County	8,555	22,814	28,518
Town of Bronson	1,042	2,779	3,474
Town of Lady Lake	5,484	14,623	18,279
Town of McIntosh	1,154	3,078	3,848
Town of Micanopy	812	2,165	2,706
Town of Reddick	1,155	3,081	3,851
Villages Center CDD	19,932	53,152	66,440
Agriculture	301,405	835,747	1,004,684
Private Wastewater Facilities*	4,277	11,406	14,257
Private Golf Courses*	27,184	72,490	90,612

*Reductions for these entities will largely be tracked through permits and compliance actions.



PROJECTS



HB 1379 (2023) requires responsible entities to report on projects that meet their five-year milestones.

- Entities are required to plan and report projects to the state through the Statewide Annual Report (STAR) process. All projects needed to fulfill milestones should be added, even if a funding source has not been identified.
- Reporting projects in the project portal for the STAR allows the state to evaluate funding needs and to assist in prioritizing projects to promote maximum environmental benefit.



UPCOMING SCHEDULE

May-
Aug. 2024

Individual meetings on allocations and milestones with BMAP stakeholders.

Aug. 1,
2024

Final wastewater and OSTDS plans due from stakeholders.

Aug. -
Nov. 2024

BMAP Portal opened early for project collection. Public meetings on allocations.

Technical analyses, project identification and BMAP document drafting.

June -
Dec. 2024

Final draft BMAP document and public meetings.

Dec.
2024-
Jan
2025

Statutory deadline to update nutrient BMAPs.

July 1,
2025



RESOURCES

BMAP WEBSITE AND STORY MAPS

Florida Springs Basin Management Action Plans (BMAPs)

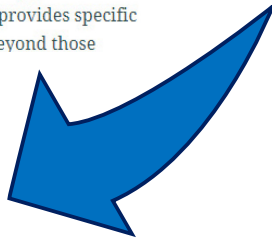
Welcome to the Florida Springs Basin Management Action Plan (BMAP) StoryMap

The springs BMAPs are developed with specific provisions for the protection and restoration of the state's Outstanding Florida Springs. This story map focuses on the springs-related BMAPs; for more details about other BMAPs or more information about the BMAP program in general, visit <https://floridadep.gov/bmaps>.

* The story map will display differently depending on the screen size and resolution being used. Story map best viewed in Chrome or Firefox.

Overview

The Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.) provides for the protection and restoration of the state's Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, 6 additional named springs, and their associated spring runs. The act provides specific requirements for OFS BMAPs beyond those



1 Legislative Requirements



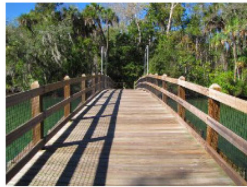
2 Crystal River - Kings Bay BMAP StoryMap



3 DeLeon Spring Story Map



4 Gemini Springs Story Map



5 Homosassa and Chassahowitzka Springs...



6 Jackson Blue and Merritts Mill Pond BMAP Story Map



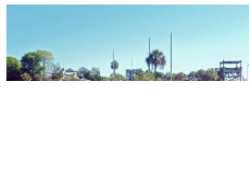
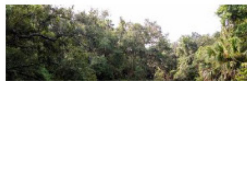
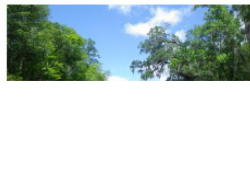
7 Rainbow Springs Group and Rainbow Springs Group Run...



8 Santa Fe River BMAP Story Map



9 Silver Springs and Upper Silver River BMAP Story Map



Basin Management Action Plans (BMAPs)

Home » Divisions » Division of Environmental Assessment and Restoration » Water Quality Restoration Program » Basin Management Action Plans (BMAPs)

Water Quality Restoration Program Quick Links

Basin Management Action Plans (BMAPs)

Statewide Annual Report

Water Quality Grant Opportunities 2024-25

BMAP Public Meetings

Impaired Waters, TMDLs and Basin Management Action Plans Interactive Map

Tools and Guidance for Calculating Total Nitrogen (TN) and Total Phosphorus (TP) Reductions

Florida Water Quality Credit Trading

Clean Waterways Act Requirements for WWP and OSTDS

All Water Quality Restoration Program Content

What is a Basin Management Action Plan?

A BMAP is a framework for water quality restoration that contains a comprehensive set of solutions to achieve the pollutant reductions established by a TMDL. Examples include permit limits on regulated facilities, urban and agricultural best management practices, wastewater and stormwater infrastructure, regional projects and conservation programs designed to achieve pollutant reductions established by a TMDL. A BMAP is developed with local stakeholders and relies on local input and commitment for successful implementation. BMAPs are adopted by Secretarial Order and are legally enforceable. BMAPs use an adaptive management approach that allows for incremental load reductions through the implementation of projects and management strategies, while simultaneously monitoring and conducting studies to better understand the water quality and hydrologic dynamics. Progress is tracked by assessing project implementation and water quality analyses. DEP continues to work with local and regional partners to identify additional projects necessary to meet reduction milestones to achieve the TMDLs and inform funding priorities.

What's New: Upcoming Meetings and BMAP Progress

July 1, 2025 BMAP Update Progress

As required by the Clean Waterways Act, DEP must prepare updates to its nutrient BMAPs by July 1, 2025. The [July 1, 2025 BMAP Update Progress](#) dashboard provides a visual representation of progress towards the completion of each of the required tasks and related sub-tasks leading up to the July 1, 2025 updates. Please visit the [BMAP Public Meeting Calendar](#) to find out about upcoming meetings and subscribe to meeting notices.

- [All BMAP Documents](#)
- [Map including BMAPs adopted and in progress](#)
- [Map of HB 1379 New and Existing OSTDS Requirements](#)

Nutrient BMAPs	Springs BMAPs	Fecal Bacteria Impaired BMAPs
Nutrient BMAPs contain a comprehensive set of solutions, such as permit limits on wastewater facilities, urban and agricultural best management practices, and conservation programs designed to achieve pollutant reductions established by a total maximum daily load	Springs BMAPs identify the sources of nutrient pollution, list the specific projects and programs necessary to reduce nutrient pollution, and establish priority focus areas where statutory prohibitions on certain activities apply (such as installation of new conventional septic systems).	Bacteria basin management action plans (BMAPs) include management strategies or projects, to be implemented by local stakeholders, that aim to eliminate and prevent the release of waste, containing pathogens, to natural waterbodies.



SUBSCRIBER PAGE

HOW TO CONTACT US



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THANK YOU

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OVERVIEW - BASIN MANAGEMENT ACTION PLANS (BMAPS)

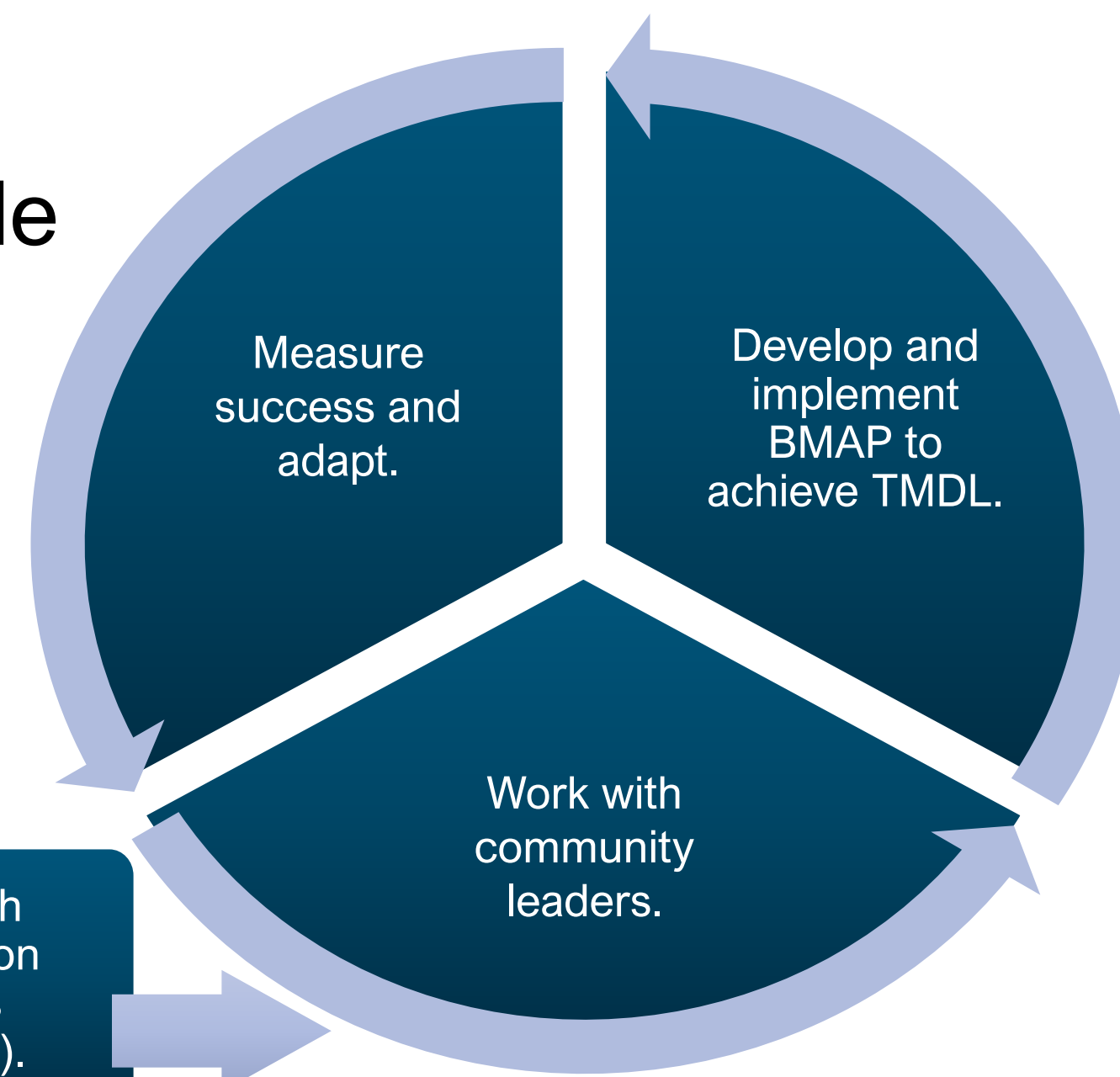
Outstanding Florida Springs Public Meetings, Fall 2024

Water Quality Framework

The Florida Department of Environmental Protection (DEP) monitors and assesses Florida's surface water and groundwater quality, including Outstanding Florida Springs.

DEP and partner agencies maintain and expand monitoring networks to provide water quality data for decision making.

The Statewide Annual Report (STAR) presents progress made towards water quality goals, including BMAPs.



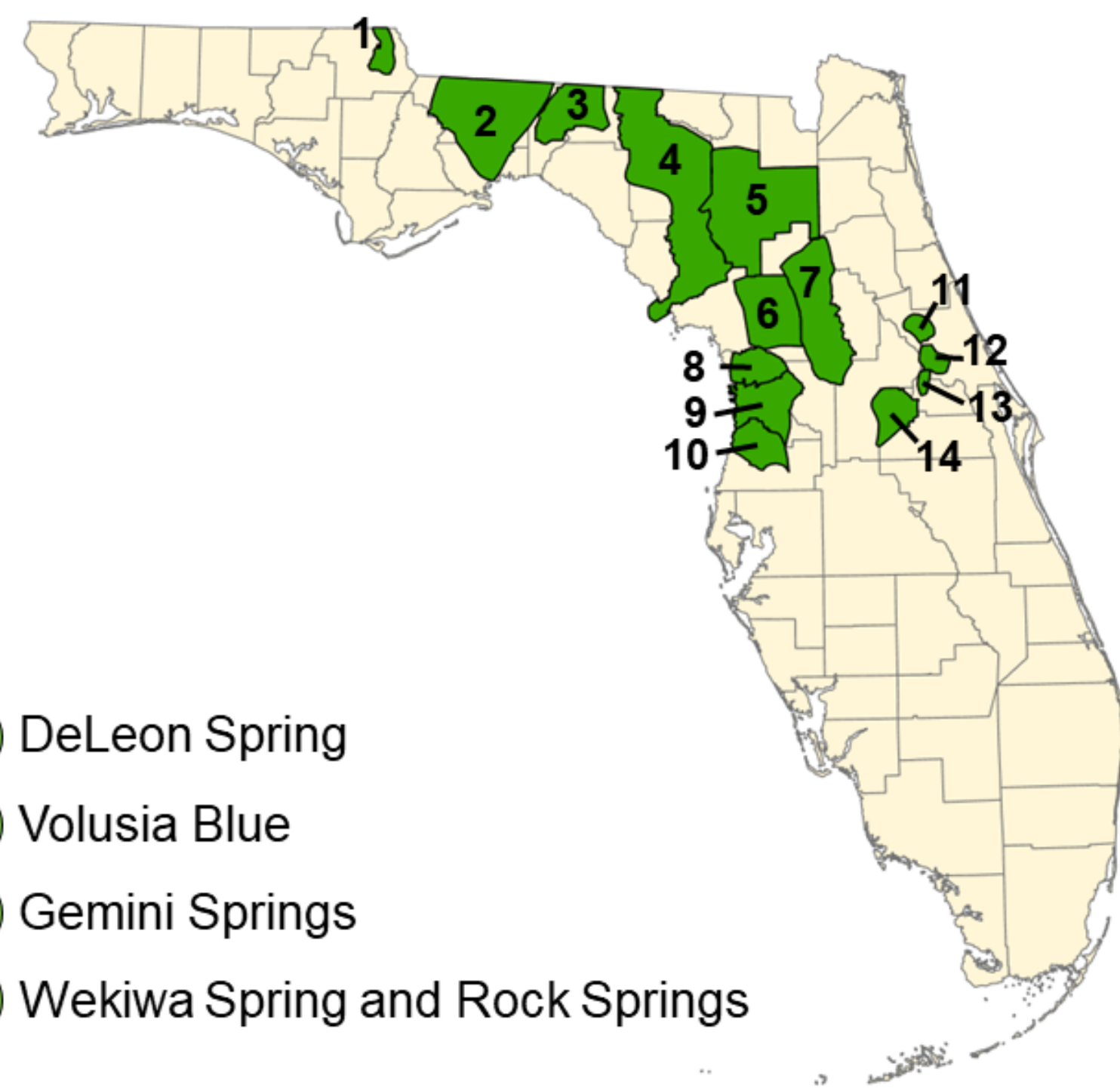
Outstanding Florida Springs BMAPs

A BMAP provides a water quality restoration framework to implement total maximum daily loads (TMDLs).

There are currently 13 BMAPs targeting the restoration of 24 Outstanding Florida Springs.

Springs BMAPs

- 1 Jackson Blue
- 2 Wakulla Spring
- 3 Wacissa
- 4 Suwannee
- 5 Santa Fe
- 6 Rainbow Springs
- 7 Silver Springs
- 8 Kings Bay-Crystal River
- 9 Chassahowitzka-Homosassa
- 10 Weeki Wachee
- 11 DeLeon Spring
- 12 Volusia Blue
- 13 Gemini Springs
- 14 Wekiwa Spring and Rock Springs



BMAP Legislation

Authority and responsibility for BMAPs is outlined in the following Florida Statutes (F.S.):

Florida Watershed Restoration Act (section 403.067, F.S.) - Outlines the process for identifying impaired waters and the strategies to restore them, including cooperative plans, known as BMAPs.

Florida Springs and Aquifer Protection Act (sections 373.801 - .813, F.S.) - Provides for the protection and restoration of the state's Outstanding Florida Springs, which is comprised of 24 first-magnitude springs, six additional named springs and their associated spring runs.

Recent amendments to the above laws include:

2020 - Promotes resilient wastewater infrastructure and utilities; requires local governments to develop wastewater treatment facility (WWTF) plans and onsite sewage treatment and disposal system (OSTDS) remediation plans.

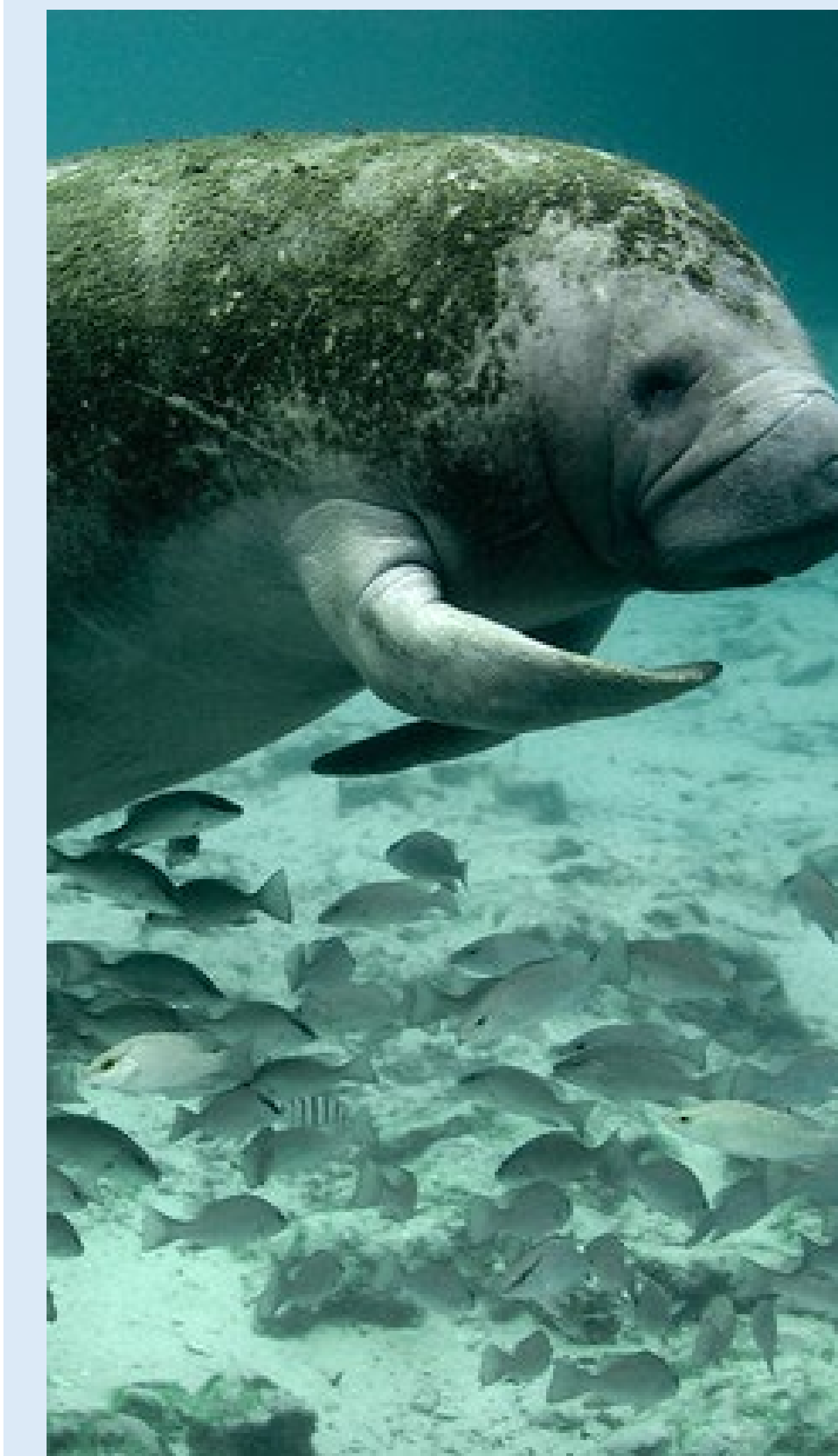
2023 - Requires a list of identified projects to achieve the five-year milestones in BMAPs and agricultural cooperative regional water quality improvement elements; adds requirements for local comprehensive planning; requires more stringent domestic wastewater treatment standards; expands eligibility for grant opportunities; and expands prohibitions in springs BMAP areas.

2024 - Requires advanced treatment of reclaimed water within BMAPs and requires private domestic wastewater facilities to coordinate with local governments in the development of wastewater treatment plans.

BMAP Components and Updates

Key Elements of BMAPs:

- The TMDL(s) that define the restoration targets.
- Physical description of the waterbody and contributing area.
- Description of the monitoring network and water quality.
- Identification of the pertinent pollution sources.
- Identification of responsible stakeholders.
- List of projects and strategies to reduce nutrient loading.



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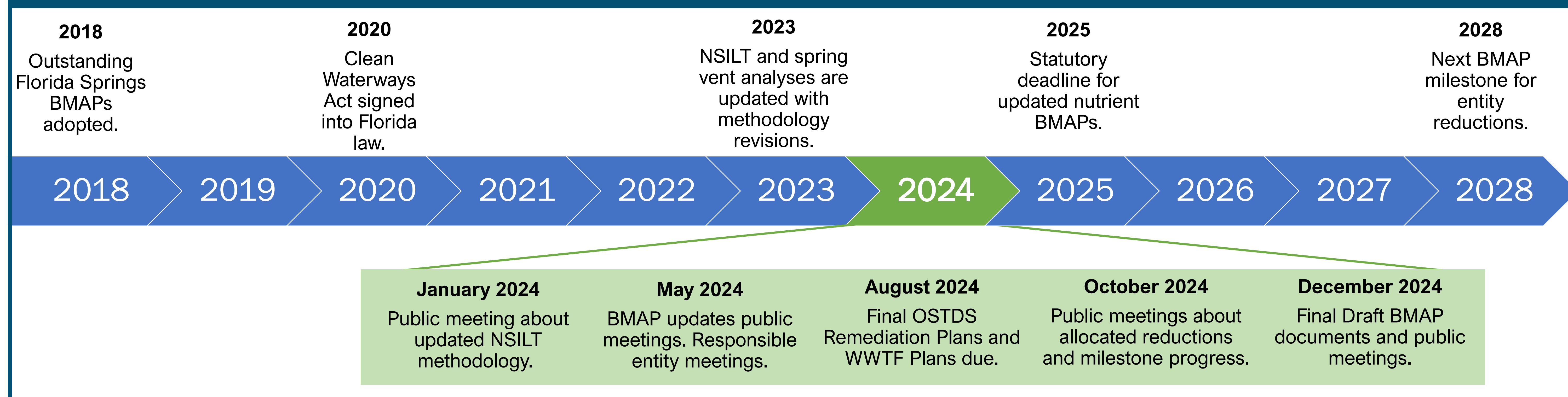
Recent Updates:

- 2023 Nitrogen Source Inventory Loading Tool (NSILT).
- Spring Vent Analyses.
- Evaluation and expansion of the monitoring network.
- Local OSTDS and wastewater remediation plans.
- Determination of entity allocations and milestones.
- Evaluation of milestone progress with stakeholders.

New Additions to the Springs BMAPs:

- More detailed groundwater analyses.
- Updated spring vent water quality analyses.
- Incorporation of law requirements adopted 2020-24.
- Entity allocations.

BMAP Timeline



FLORIDA SPRINGS – AN OVERVIEW

Outstanding Florida Springs Public Meetings, Fall 2024

Springshed Diagram

The diagram below represents an overview of the complex processes that impact water flow through a spring system. It also shows how human behaviors on the landscape affect nitrogen pollution in the groundwater. Eventually, groundwater flows back to the surface through the Outstanding Florida Springs (OFS). Pollutants from the surface can travel long distances, negatively impacting water quality and the biology of springs and rivers. The variable distances and underground conditions means it can take time to observe water quality improvements at the spring vent from restoration projects being implemented on the land surface across the springshed.

OFS

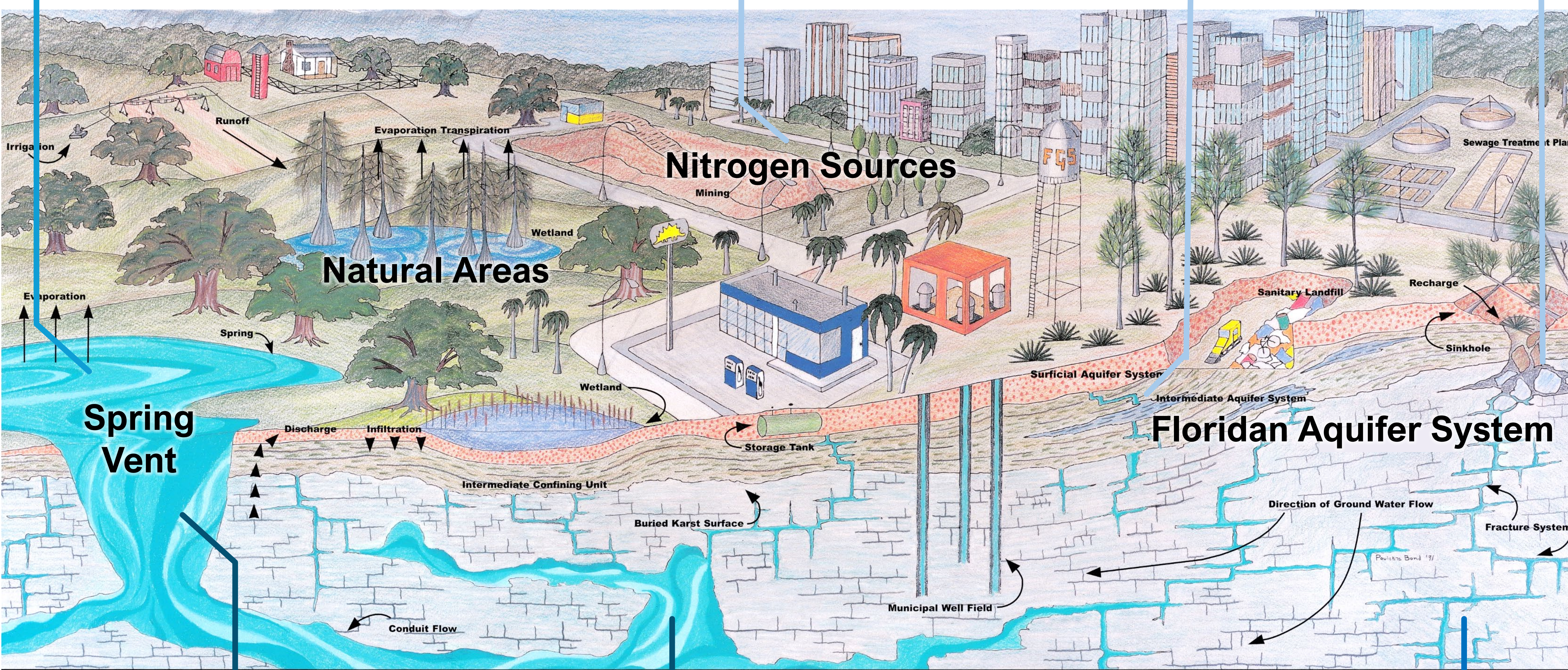
OFS includes all historic first magnitude springs and their associated spring runs as determined by DEP, using the most recent Florida Geological Survey springs bulletin (66), as well as the following additional springs and their associated spring runs: DeLeon Springs, Peacock Springs, Poe Springs, Rock Springs, Wekiwa Springs and Gemini Springs.

Impairment

Currently, 24 of the 30 OFS are impaired for the nitrate form of nitrogen. Anthropogenic sources of nitrogen such as human waste, livestock waste, farm fertilizer, urban fertilizer and other sources contribute to nitrate loading that results in an ecological imbalance.

Vulnerability evaluates how easily pollutants from the surface can impact groundwater quality.

Recharge occurs when rain or irrigation water infiltrates through the soil and enters an underlying aquifer system.



Monitoring

Spring vent monitoring is performed by DEP and partner agencies to measure progress towards meeting the total maximum daily loads (TMDLs).

Groundwater monitoring is performed by DEP and partner agencies to understand how nutrient loading and reduction activities impact water traveling to the spring vent.

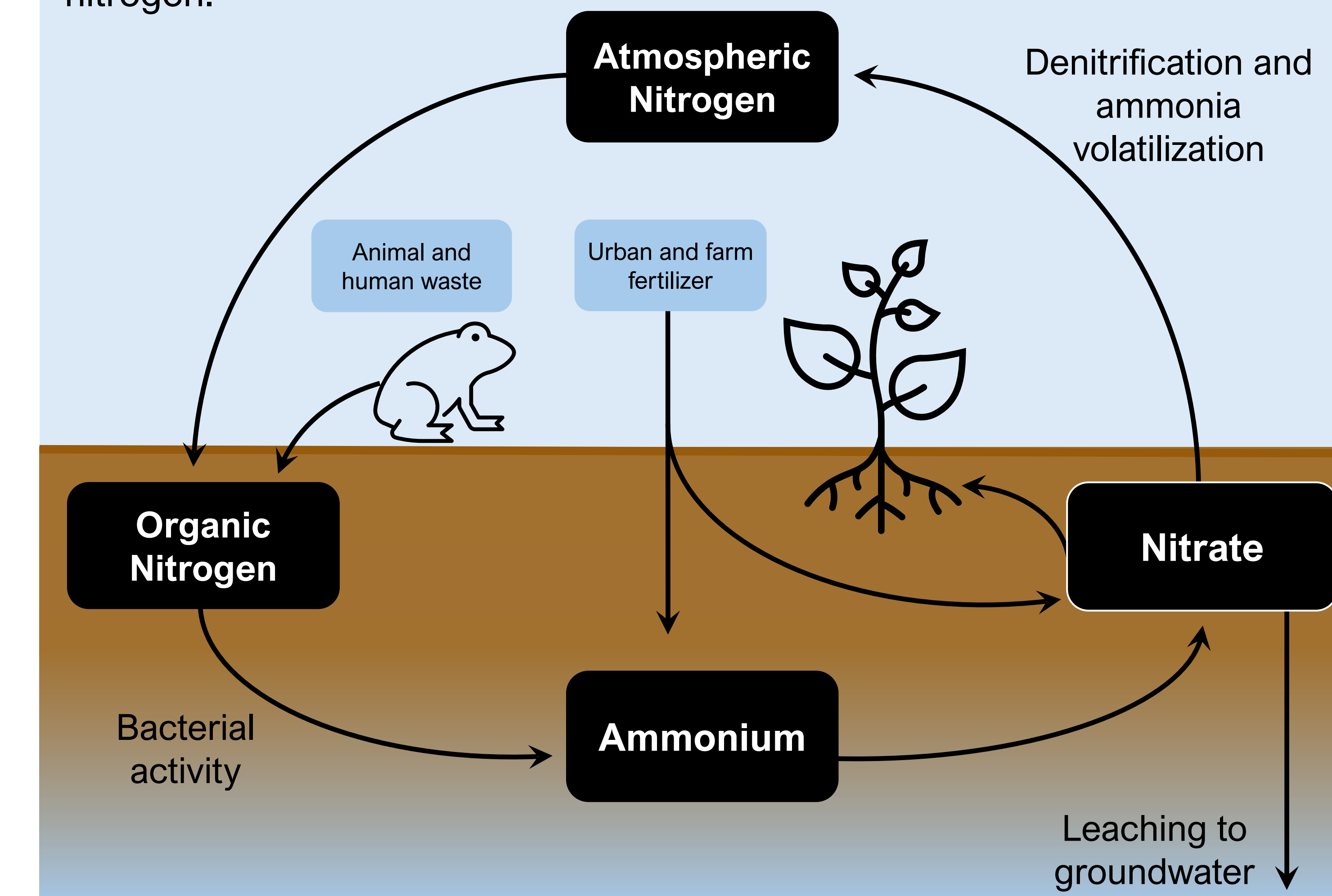
Karst Limestone

The Floridan aquifer is contained in limestone units that underly the state. Karst limestone results from the dissolution of calcium carbonate rock by acidic rainwater, creating voids and channels that result in sinkholes, conduits and springs. Water can travel rapidly from high recharge areas to spring vents through karst features.

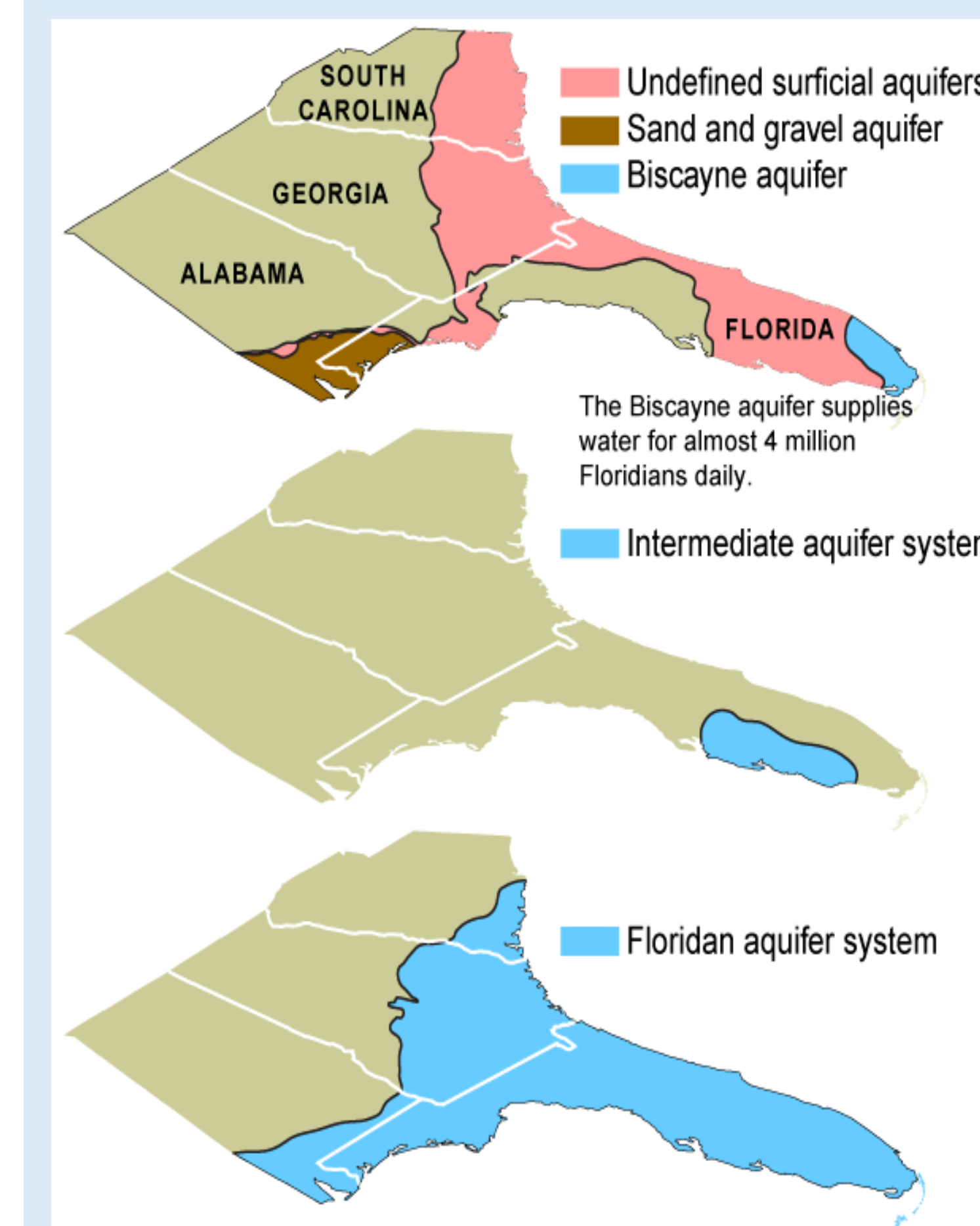
The Nitrogen Cycle

Nitrogen goes through biological, physical and chemical processes as it travels through the environment. This series of interactions is known as the nitrogen cycle.

Attenuation of nitrogen refers to the processes of immobilization, denitrification, volatilization and cation exchange that prevent leaching of nitrogen.



Florida's Aquifer Systems



The Floridan Aquifer underlies the entire state of Florida and is the source water for the state's springs.

In some areas of the state, a surficial aquifer system separates the Floridan Aquifer from the land surface.

In most OFS areas, the Floridan Aquifer is largely unconfined and vulnerable to leaching of nitrogen from the land surface.

[Springshed diagram: FGS PR5]

[Aquifer diagram: St. Johns River Water Management District (SRJWMD)]

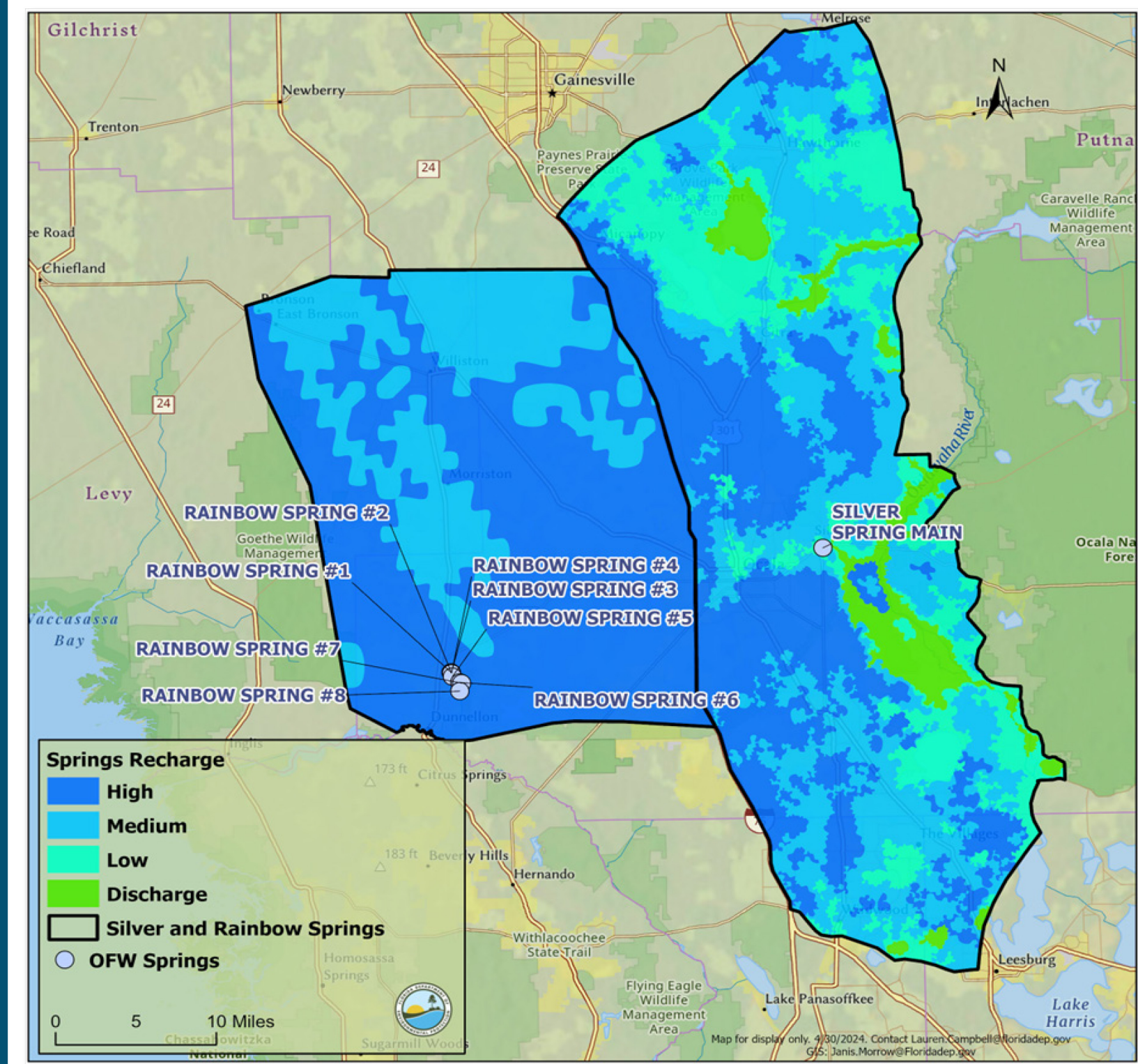




Silver Springs and Upper Silver River and Rainbow Spring Group and Rainbow River Springs Basin Summary

Silver Springs and Rainbow Spring Group Basin Management Action Plan (BMAP)

The first step to address nitrogen impairments in the Rainbow and Silver Springs is to inventory the sources of nitrogen in the basin. This was completed using the **Nitrogen Source Inventory Loading Tool (NSILT)**. The NSILT evaluates the loading from various sources to groundwater after attenuation and considers the recharge potential based on spatial and geologic factors.

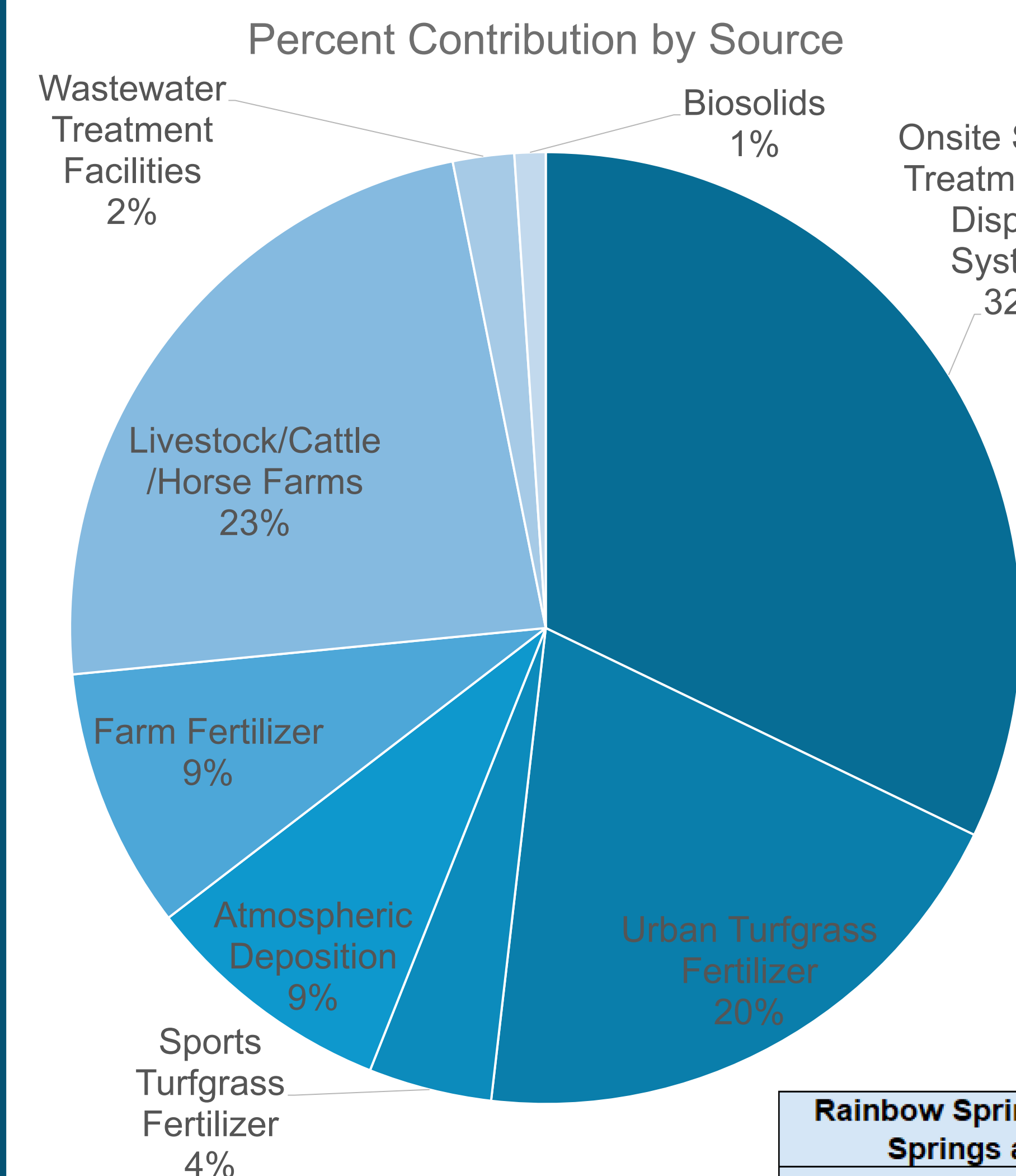


This figure shows the generalized recharge zones in the basin.

High recharge indicates areas where more water is expected to percolate into the Upper Floridan aquifer and travel to the spring vent.

Discharge represents areas where water is expected to flow to a surface waterbody and, therefore, not impact groundwater (GW).

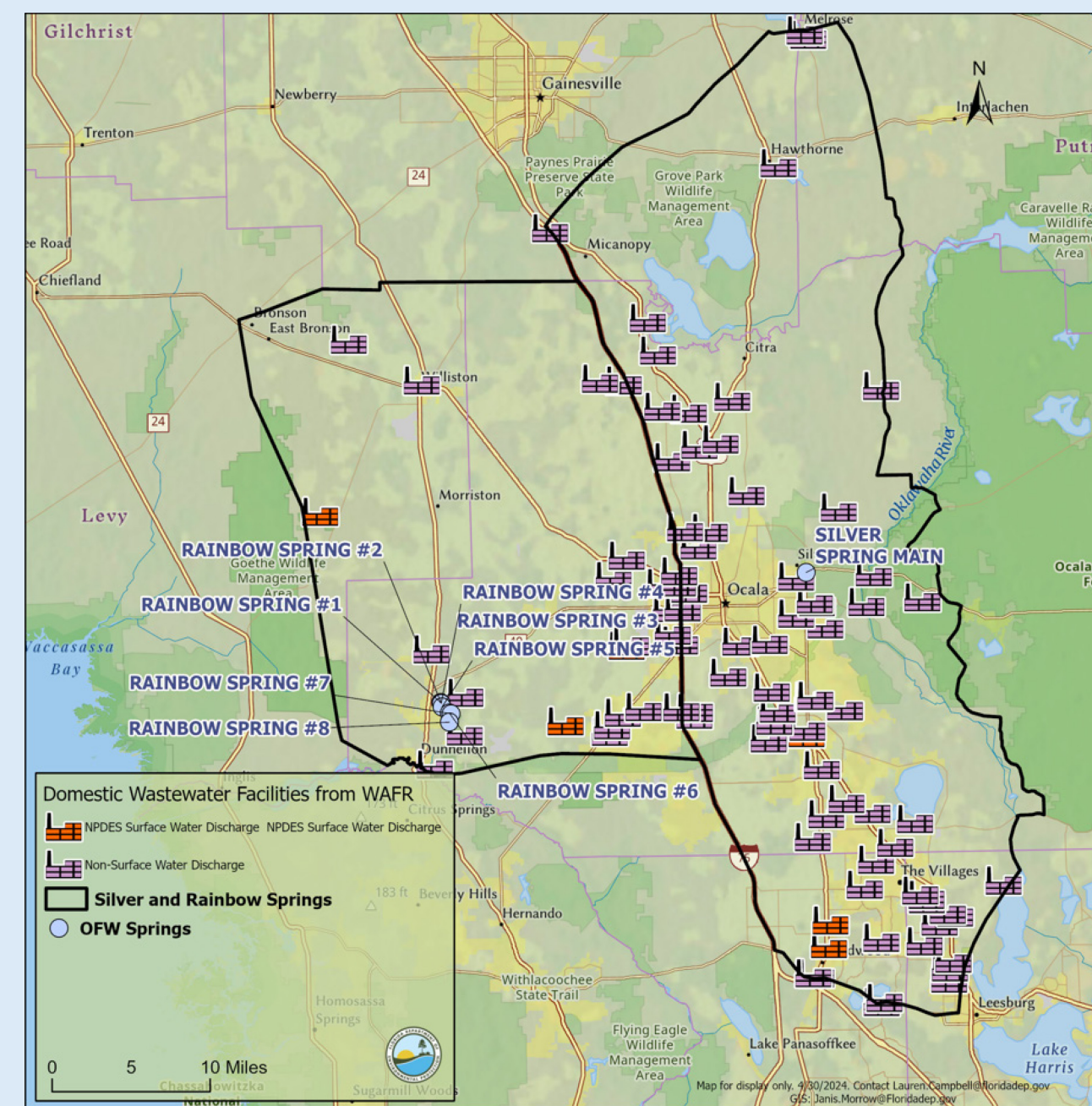
NSILT Summary



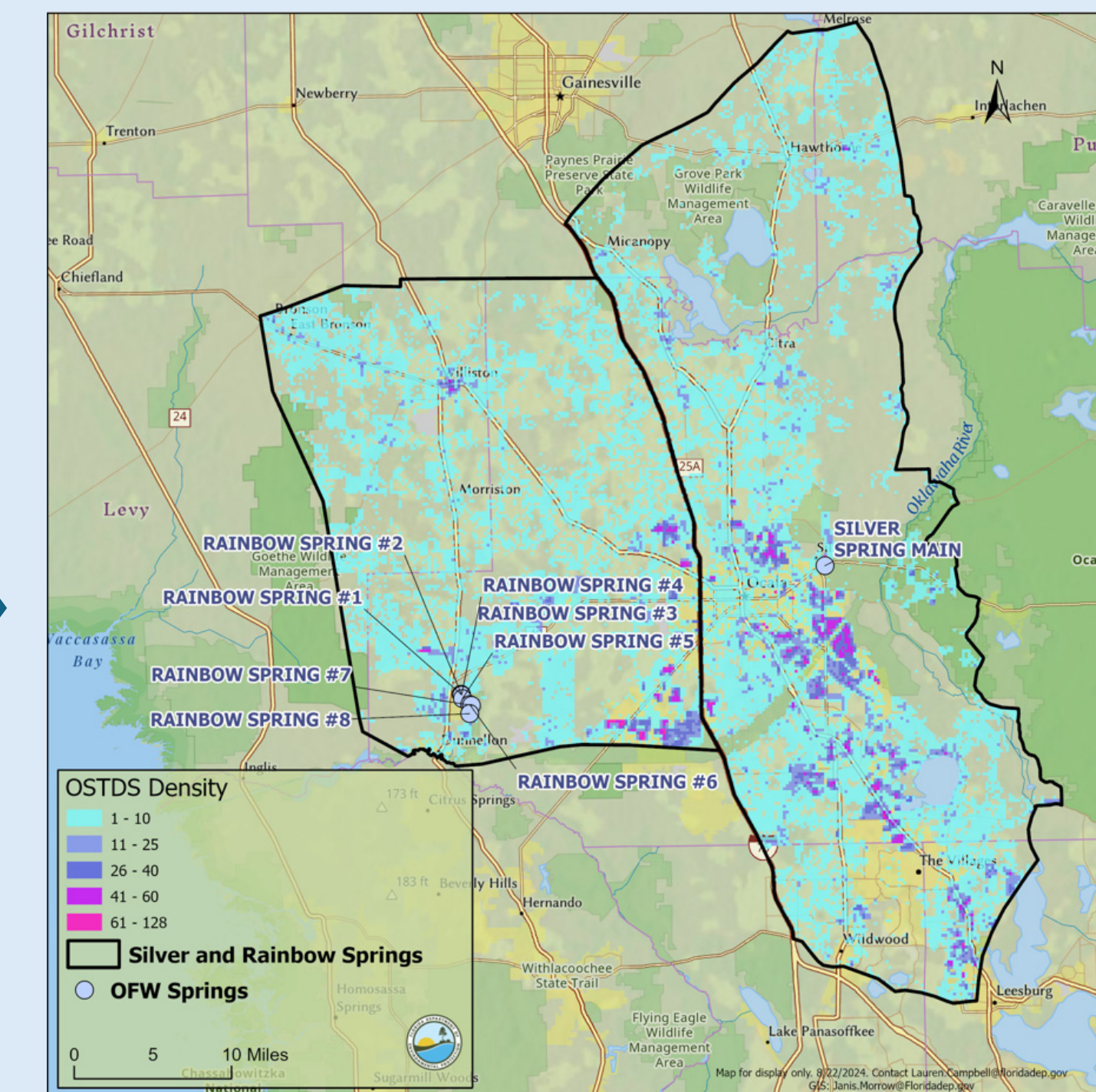
The pie chart shows the comparative contribution of various nitrogen sources in the Rainbow and Silver Springs Basins. The table shows the pounds of loading by source for the entire BMAP.

Rainbow Spring Group and Rainbow River and Silver Springs and Upper Silver River BMAP Area	
Source	Estimated Annual Loading (lbs-N/yr)
Atmospheric Deposition	336,808
Wastewater Treatment Facilities	81,898
Onsite Sewage Treatment and Disposal Systems	1,265,209
Urban Turfgrass Fertilizer	774,333
Sports Turfgrass Fertilizer	164,784
Farm Fertilizer	348,742
Livestock/Cattle/Horse	921,420
Biosolids	41,561
Total	3,934,755

Urban Source Loading



Approximately 115 **wastewater treatment facilities (WWTFs)** combine to contribute two percent of the total nitrogen load in the BMAP. The figure to the left shows the location of domestic WWTFs in the basins.



Onsite Sewage Treatment and Disposal Systems (OSTDS), also known as septic systems, contribute 32% of the nitrogen load in the BMAP. The figure to the right shows OSTDS density per 300-meter by 300-meter grid cell.

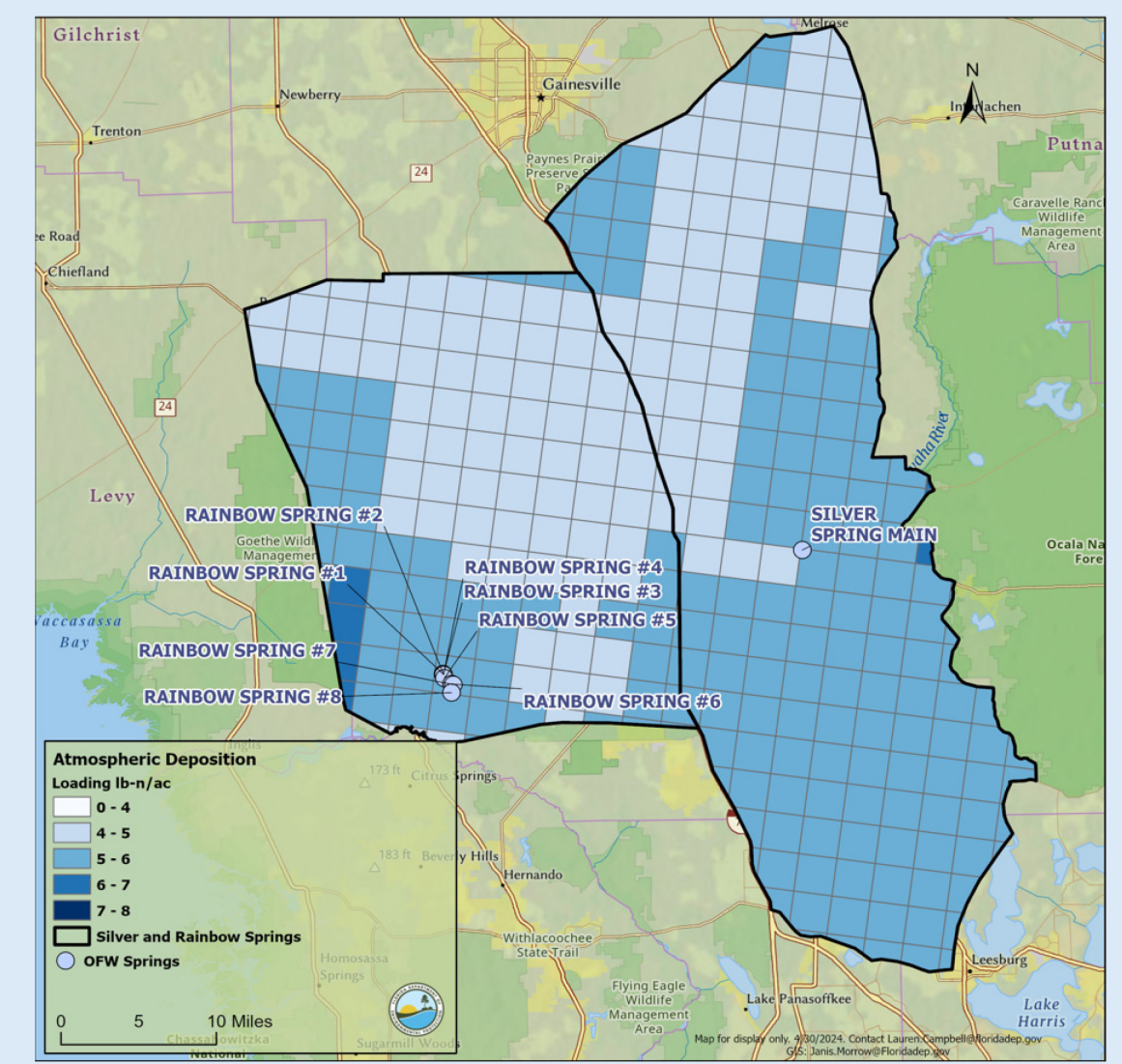
Urban turfgrass fertilizer (UTF) from single family residential sources, and other urban areas combine to total 20% of the total nitrogen load in the basins.

Sports turfgrass fertilizer (STF) estimated from educational institutions, athletic/sports facilities, and recreational areas contribute 4% of the total nitrogen load in the basins.

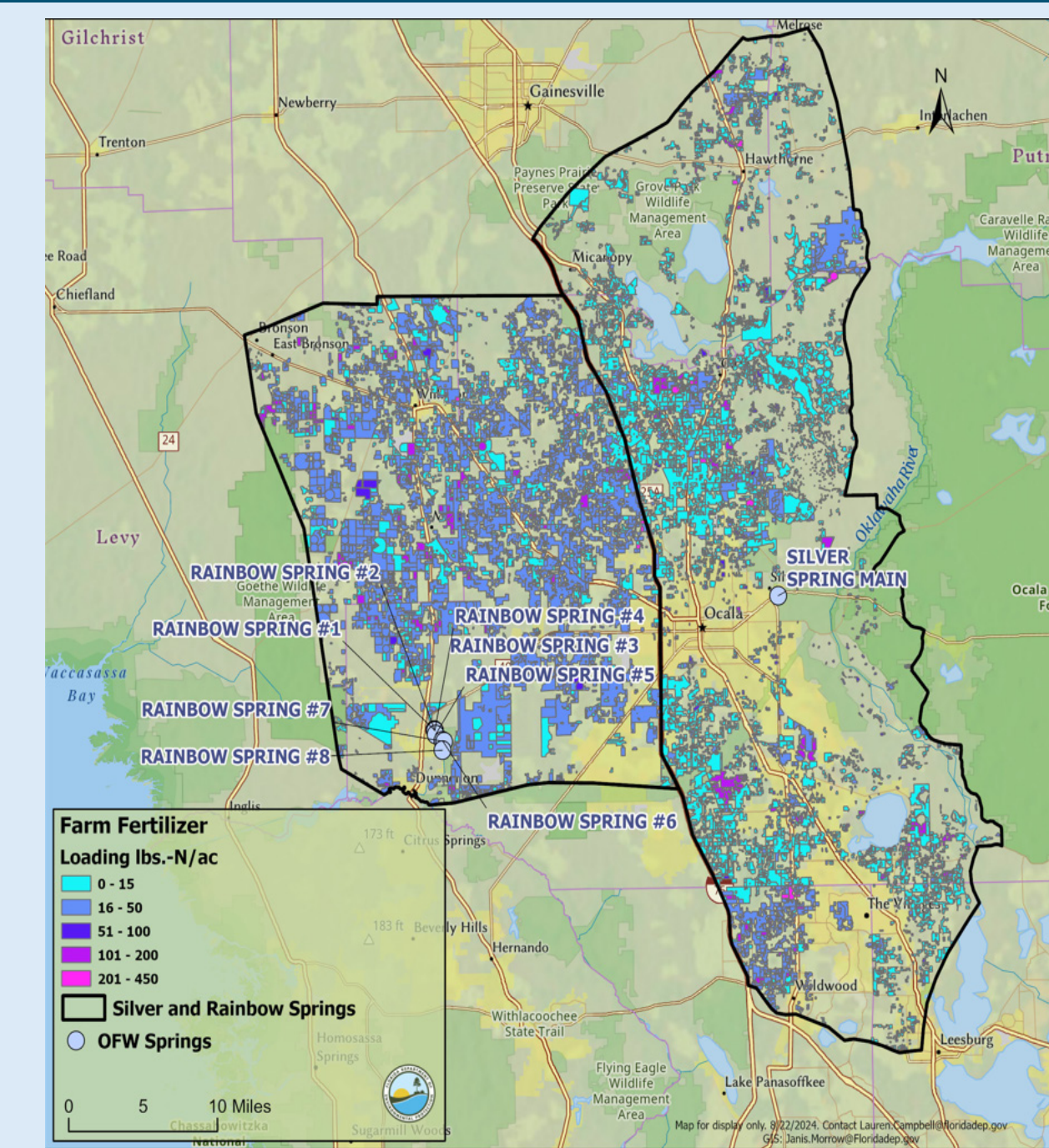
Atmospheric Deposition

Atmospheric deposition (AD) was estimated using data from the Total Deposition Science Committee (TDep) Model. TDep estimates annual deposition on 4-kilometer (km) by 4-km grid squares.

AD accounts for 9% of total loading within the Rainbow and Silver Springs BMAP area.



Agricultural Source Loading

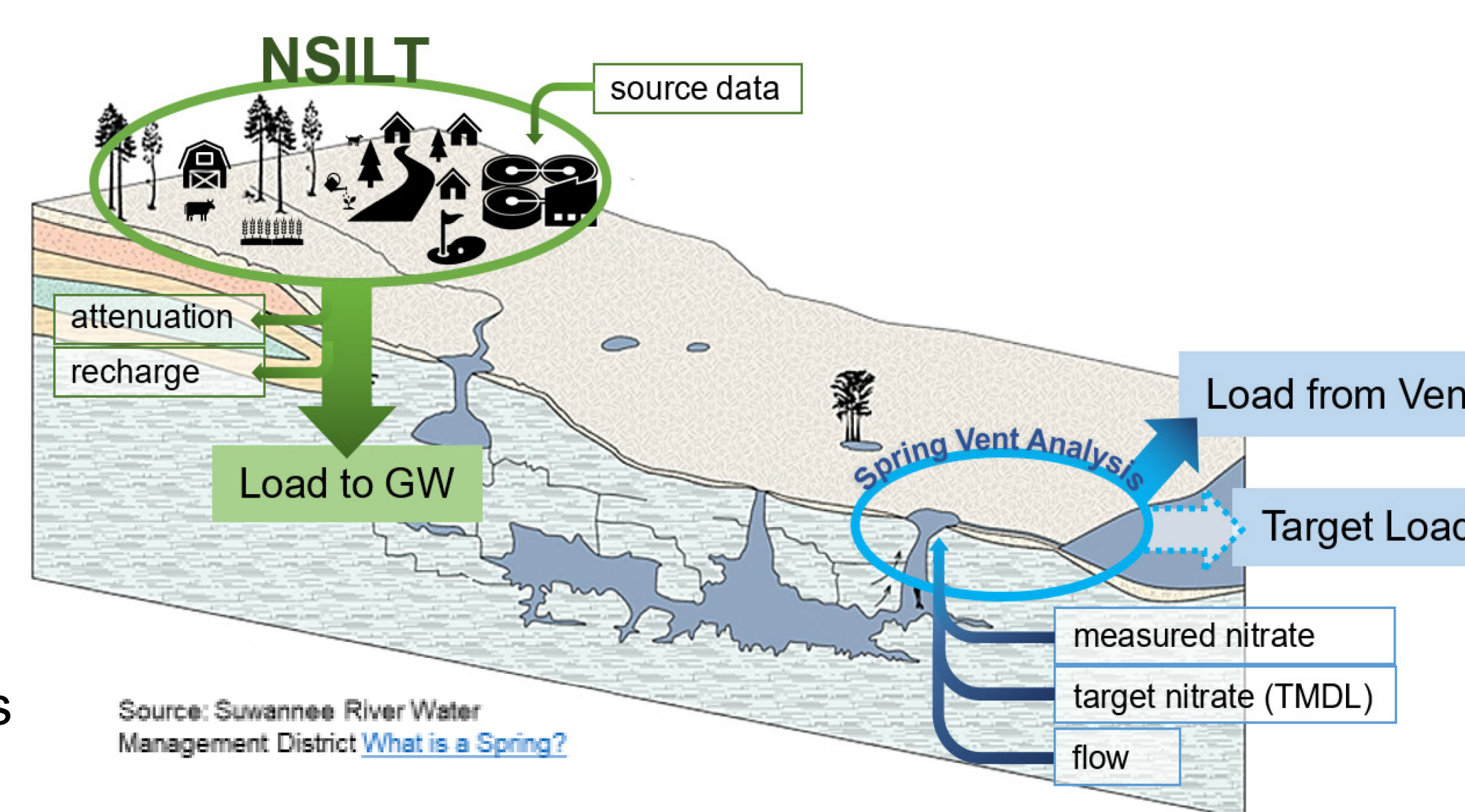


Agricultural sources include farm fertilizer (FF) and livestock waste (LW), which contribute nine and 23%, respectively. The Florida Department of Agriculture and Consumer Services (DACS) Florida Statewide Agriculture Irrigation Demand (FSAID) database and the U.S. Department of Agriculture (USDA) Census of Agriculture data were used to estimate agricultural loading.

Spring Vent Analysis

Spring flows and nitrate concentration data were reviewed to evaluate the total mass (lbs-TN/yr) of nitrate discharging from the spring.

Approximately 80% more nitrate is discharged than the waterbodies can assimilate without impairment. This represents the reductions needed to achieve the water quality goals.

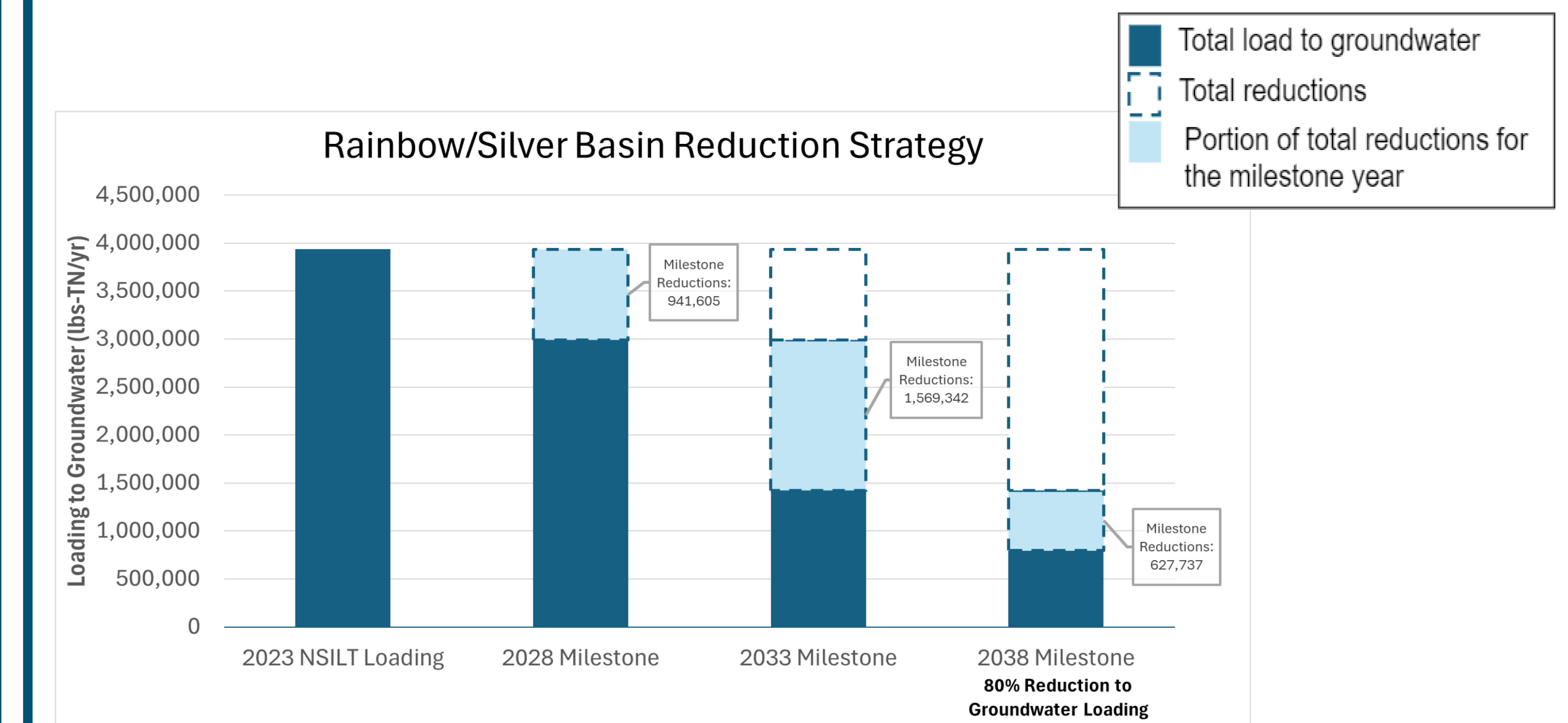


	Nitrogen Loads (lbs-N/yr)	Source
Total Load at Spring Vents (October 2023)	4,313,434	Upper 95 % confidence interval – nitrate and flow data 2012-2022
TMDL Load	872,682	TMDL target is 0.35 mg/L and using the same flow data and proportions
Percent Required	80%	
Total NSILT Load (October 2023)	3,934,755	2023 NSILT
Required Reductions	3,138,686	Proportional decrease in NSILT load

Putting It All Together

The results of the NSILT are summarized in the first bar in the figure below, with different sources contributing to the total estimated load to groundwater. The percent reduction on the far right reflects the outcomes from the spring vent analysis. A proportional reduction in loading is needed from sources. Therefore, the reduction percentage was applied to the total load to groundwater to define the necessary reductions.

The intermediate bars show the basin-wide reductions for all entities and sources for the 2028, 2033 and 2038 milestones.





Silver Springs and Upper Silver River and Rainbow Spring Group and Rainbow River Allocated Reductions, Milestones and Progress

Basin Reductions

Nitrogen Source	Allocations by Source (lbs-N/yr)	Percent of Total Reduction
Atmospheric Deposition*	268,665.39	8.56%
Onsite Sewage Treatment and Disposal Systems	1,009,235.82	32.15%
Wastewater Treatment Facilities	42,277.73	1.35%
Farm Fertilizer (BMP Implementation)	52,311.37	1.67%
Livestock Waste-NonCAFO (BMP Implementation)	92,142.01	2.94%
Other Agriculture	860,231.29	27.41%
Urban Turf	617,671.96	19.68%
Sports Turf	131,445.15	4.19%
Regional Projects*	64,705.24	2.06%
Total	3,138,686	100.00%

* Not allocated to entities.
CAFO: Confined animal feeding operation.

BMAP Management Strategies

Source-Specific Management Strategies:

- **Atmospheric Deposition:** Due to continuing air regulations, atmospheric nitrogen emissions have been trending downwards in Florida since at least 2005 (Himes & Dawson, 2017).
- **Onsite Sewage Treatment and Disposal Systems (OSTDS):** No new installation of conventional OSTDS. All existing conventional OSTDS within the BMAP must be enhanced or sewerred.
- **Wastewater Treatment Facilities:** Surface water discharges from facilities must meet advanced waste treatment (AWT). Other discharge methods must meet AWT standards, if the Florida Department of Environmental Protection (DEP) determines the treatment is needed.
- **Farm Fertilizer Best Management Practice (BMP) Implementation:** An estimated 15% reduction in nitrogen loading when a producer enrolls in the Department of Agriculture and Consumer Services (DACS) BMP program and implements BMPs.
- **Livestock Waste BMP Implementation:** An estimated 10% reduction in nitrogen loading when a producer enrolls in the DACS BMP program and implements BMPs.
- **Other Agricultural Activities:** The remainder of reductions allocated to agricultural sources will need be addressed through a combination of regional agricultural projects, agricultural cooperative regional elements, innovative technologies and cost-share projects.
- **Urban Turfgrass Fertilizer:** Ordinances, education, street sweeping and structural stormwater improvements to reduce impact from urban turfgrass fertilization.
- **Sports Turfgrass Fertilizer:** Owners/operators must follow the appropriate BMP manual. Additionally, all golf courses will be required to provide a nutrient management plan (NMP).
- **Biosolids:** Land application of Class A or Class B domestic wastewater biosolids must be in accordance with a DEP-approved NMP.

Tracking Progress

Project collection and reporting are crucial to the successful implementation and management of basin management action plans (BMAPs). Projects are reported to the Florida Department of Environmental Protection (DEP) annually through the Statewide Annual Report (STAR) process.

Responsible entities are required to provide lists of projects to achieve their required reductions for each five-year milestone.

It is important that all projects needed to achieve milestones are included in the project portal for the STAR, even if a funding mechanism is not currently identified. This information provides the state information on the funding needs to achieve BMAP goals, and the ability to prioritize projects.

Reduction milestones must be met to ensure sufficient progress towards meeting the total maximum daily load (TMDL) target.

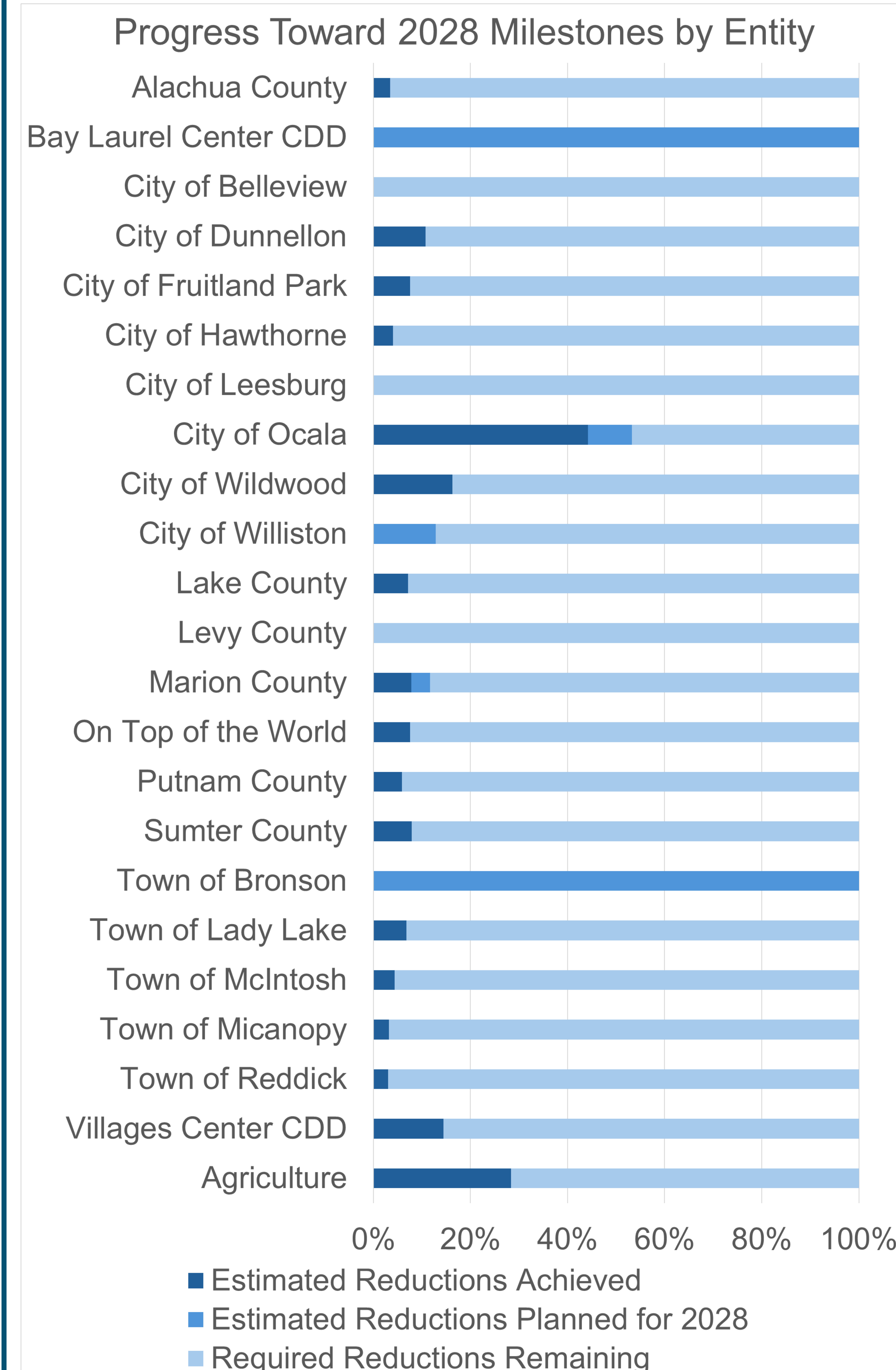
Entity Required Reductions

Entity	2028 Milestone Required Reductions (lbs-N/yr) (30%)	2033 Milestone Required Reductions (lbs-N/yr) (80%)	2038 Milestone Required Reductions (lbs-N/yr) (100%)
Alachua County	4,801	12,803	16,004
Bay Laurel Center CDD	2,555	6,813	8,516
City of Belleview	2,302	6,139	7,674
City of Dunnellon	1,884	5,023	6,279
City of Fruitland Park	5,954	15,878	19,847
City of Hawthorne	646	1,722	2,153
City of Leesburg	307	818	1,023
City of Ocala	31,514	84,036	105,045
City of Wildwood	2,239	5,971	7,464
City of Williston	5,579	14,878	18,598
Lake County	15,749	41,996	52,495
Levy County	24,248	64,660	80,825
On Top of the World	9,201	24,535	30,668
Marion County	356,343	950,249	1,187,811
Putnam County	6,431	17,148	21,435
Sumter County	8,555	22,814	28,518
Town of Bronson	1,042	2,779	3,474
Town of Lady Lake	5,484	14,623	18,279
Town of McIntosh	1,154	3,078	3,848
Town of Micanopy	812	2,165	2,706
Town of Reddick	1,155	3,081	3,851
Villages Center CDD	19,932	53,152	66,440
Agriculture	301,405	835,747	1,004,684
Private Wastewater Facilities*	4,277	11,406	14,257
Private Golf Courses*	27,184	72,490	90,612

*Reductions for these entities will be tracked through permits and compliance actions.

Entity Progress Toward 2028 Milestones

The chart below shows estimated progress toward the 2028 milestones by entity as of **December 2023**.



Florida Department of Environmental Protection (DEP)
Rainbow Springs and Silver Springs Basin Management Action Plan (BMAP) Meeting Summary
October 30, 2024, 9:00 am – 11:00 am
Mary Sue Rich Conference Center-City of Ocala
1821 NW 21st Ave, Ocala, FL 34475

Attendees

Leslie Burges, Geosyntec	Haley Moody, Florida Springs Institute
Tiffany Busby, Wildwood Consulting	Daryl Myers, Hanson
Lauren Campbell, DEP	Mark Nelson, Jones Edmunds
Carol Carroll, Citizen	Walt Nickel, Wright-Pierce
Andrew Carswell, Levy County	Mandy Odom, City of Dunnellon
Cathie Catusus, Lake County	Bob Palmer, FSC
Chris Denmark, FDACS	Jim Peterson, SJRWMD
Jeff Earhart, Lake County	Robyn Preston, City of Ocala
Burt Eno, FSC	Crysta Reaves, FDACS
Kris Eskelin, SRWMD	Captain Erika Ritter, A Cruising Down the River
Jessica Fetgatter, DEP	Lisa Saupp, Aqua Pure
Agustin Francisco, FDACS	Katherine Saylor, Defenders of Wildlife
Tiare Fridrich, Save the Manatee	Kim Shugar, DEP
Alice Gardner, Citizen	Michelle Sivilich, One Rake at a Time
Stacie Greco, Alachua County	Jodi Slater, SJRWMD
Trisha Green, DEP	Ryan Smart, FSC
Aaron Grimes, FDACS	Renee Smith, Vikus Water
Roxanne Groover, FOWA	Matthew Stanley, City of Ocala
Sam Hankinson, DEP	Mary Stoker, Alachua County
Maddy Hart, FDACS	Nadine Stokes, Town of Reddick
Tammy Hinkle, FDACS	Matthew Tadlock, Sumter County
Moira Homann, DEP	Bob Titterington, City of Belleview
Brian Icerman, Jones Edmunds	Madison Trowbridge, SWFWMD
Art Jones, One Rake at a Time	Chad Ward, City of Dunnellon
Jennifer Kampwerth, City of Ocala	Grace Ward, FDACS
Chandler Keenan, DEP	Scott Weeks, Kimley-Horn
Trevor Knight, Marian County	Ondine Wells, UF/IFAS
Celeste Lyon, RES	Stephanie Wolfgang, Vikus Water
Bonnie Meyer, Save Lake Weir	

Presentation

Jessica Fetgatter gave a brief overview of the Rainbow and Silver Springs BMAP, basin required reductions, entity required reductions, and the upcoming BMAP schedule. She explained that the total maximum daily loads (TMDLs) are 0.35 milligrams per liter (mg/L) of nitrate. Based on recent water quality data, additional reductions of 80% are needed to meet the water quality targets. She noted that for BMAP load reduction and project calculation purposes, the Rainbow and Silver Springs have been combined.

Jessica reviewed the milestones for 2028, 2033, and 2038. The reductions to be achieved by each milestone are 30%, 80%, and 100%, respectively.

Jessica suggested that if there are environmental groups who were not listed in the current BMAP that would like to be listed as stakeholders to contact her with their information.

Poster Session

Posters were presented, along with the opportunity for attendees to review BMAP information and ask questions of DEP and Florida Department of Agriculture and Consumer Services (FDACS) staff. St. Johns River Water Management District also had a poster and staff to answer questions.

Written Comments

Erika Ritter commented that she would like to see the Ocklawaha River Preserve included in the Silver-Rainbow BMAP area. She added that it is mostly Silver River by volume. Also, it is a section highly impacted by agricultural runoff via Highway 315.

Art Jones wrote his thanks “for putting us on the BMAP stakeholder list. We live on the Rainbow River.”

Katherina Saylor asked DEP to let her know what the Defenders of Wildlife can do to advocate for long-term enforcement of the changes laid out in the BMAPs. The lift is heavy and wrote that she appreciates the DEP efforts and coordination between agencies. The nitrogen load reduction for Marion County is significant and will require resources to achieve. She asked DEP to call upon her organization for support in advocating for long-term springs improvements for wildlife and people.

Action Items

All--Jessica suggested that if there are environmental groups who were not listed in the current BMAP that would like to be listed as stakeholders to contact her with their information.

DEP—Post the meeting materials online after the meeting.

DEP—Confirm that Art Jones or his organization are on the stakeholder list for the 2025 BMAP update.

DEP—Follow up with Haley Moody on her written question which asked how they can help.