



Florida Department of Environmental Protection

Silver Springs and Rainbow Springs Basin Management Plan Onsite Sewage Treatment and Disposal System (OSTDS) Remediation Plan Meeting

September 15, 2016
Mary Paulic





Agenda

- Welcome and Opening Remarks
- Follow-up from July Meeting
 - Sunshine Law
 - Request for project updates
 - NSILT questions
- Determination of Target Loading
 - Atmospheric deposition consideration
 - Calculation of OSTDS target loading
- Characteristics of OSTDS Distribution
- Education/Outreach Strategy
- Public Comments
- Summary and Action Items
 - Next meeting date and location
 - Summary of action items



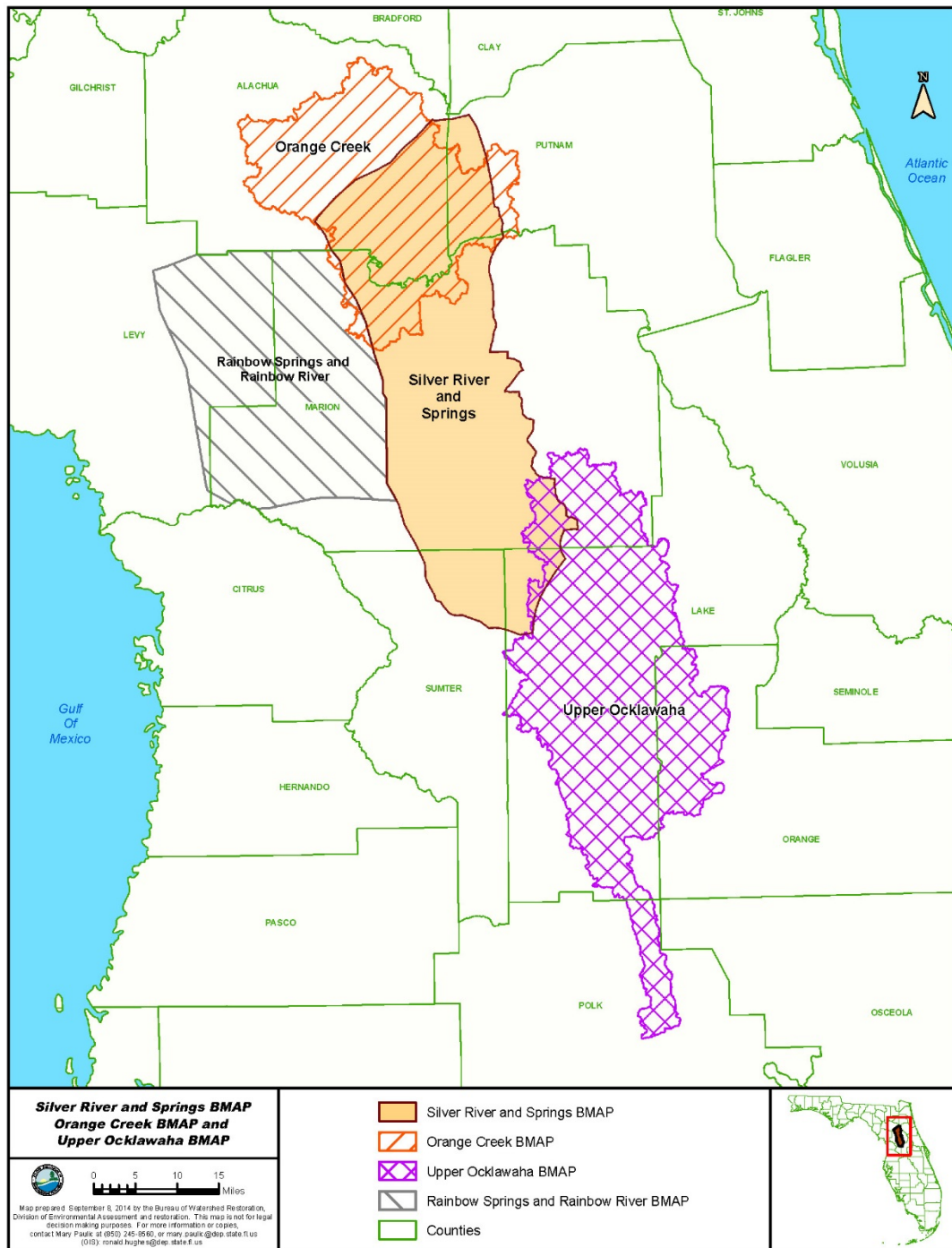
Remediation Plan

- Reminder of why we are all here.
- Plan needs to:
 - Provide for BMAP revision by July 2018.
 - Include development of 5-year, 10-year, and 15-year goals.
 - o 20 year plan started at adoption of BMAPs in 2015.*
 - Include detailed plan to meet TMDL in 20 years.
 - Include elements of each of the three “prongs”.
- OSTDS Advisory Committee members:
 - Represent the sectors that are affected by the OSTDS Remediation Plan.
 - Have expertise to lend to the process and to successful outcomes to reduce nitrogen loadings from OSTDS sources.



Area Covered

- Merges Rainbow Springs and Silver Springs BMAP areas.



Comparison of Tools - Silver

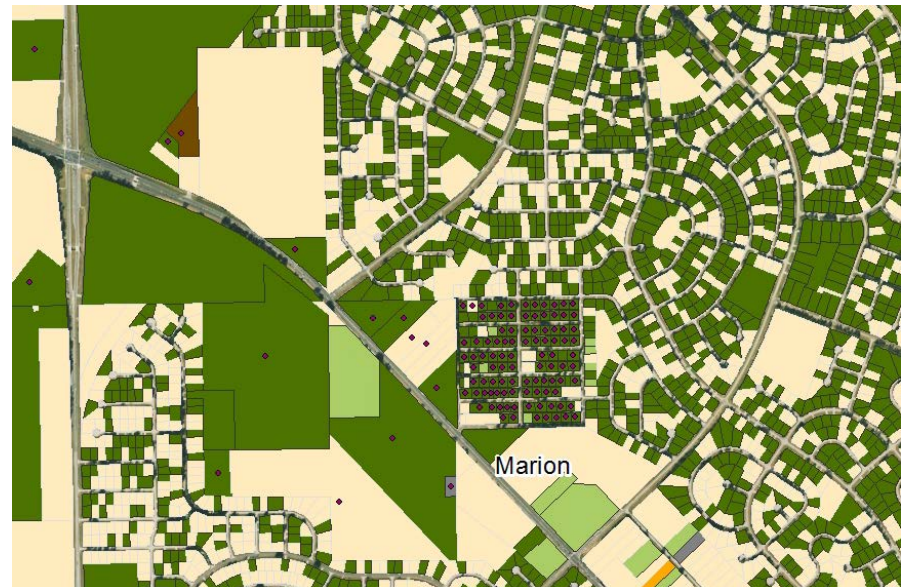
Compared DOH's Florida Water Management Inventory (FLWMI) #'s to DEP's Nutrient Source Inventory Loading Tool (NSILT) #'s:

	FLWMI	NSILT	Matching parcels
# septic systems (BMAP)	75,998	59,622 66,289	61,741 (81%)

FLWMI has over 9,700 more onsite systems, most in Marion County.

For unmatched ones, main difference is:

- FLWMI has many more known and likely septic parcels





Advisory Committee Sunshine Law

- OSTDS Advisory Committee operates under the Sunshine Laws (Article 1, Section 24, Florida Constitution and Section 286.011, F.S.)
- Discussion or any form of communication between committee members on matters reasonably expected to come before the committee is **prohibited** outside of a publicly noticed meeting.
 - Communication includes but not limited to phone calls, writing, texting, and emailing another committee member.
 - Discussion between a committee member and non-committee members, including staff, is permissible.
 - Discussion of committee topics between a committee member and their alternate representative is permissible.



Advisory Committee Operating Procedures and Guidance

- Purpose:
 - Provide ideas, comments, suggestions and concerns to DEP toward reducing nitrogen loads from on-site treatment and disposal systems (OSTDS) sources through development of an effective and cost-efficient OSTDS Remediation Plan.
- Key Operating Procedures:
 - Members will generally not vote or create recommendations as a group, but will relay the concerns and comments from the individual sectors represented on the committee to DEP.
 - Members are expected to come prepared to share their suggestions and comments during the meetings for the benefit of the other members and for the public in attendance.
 - DEP will give consideration to all comments and recommendations submitted by committee members for inclusion in the plan.

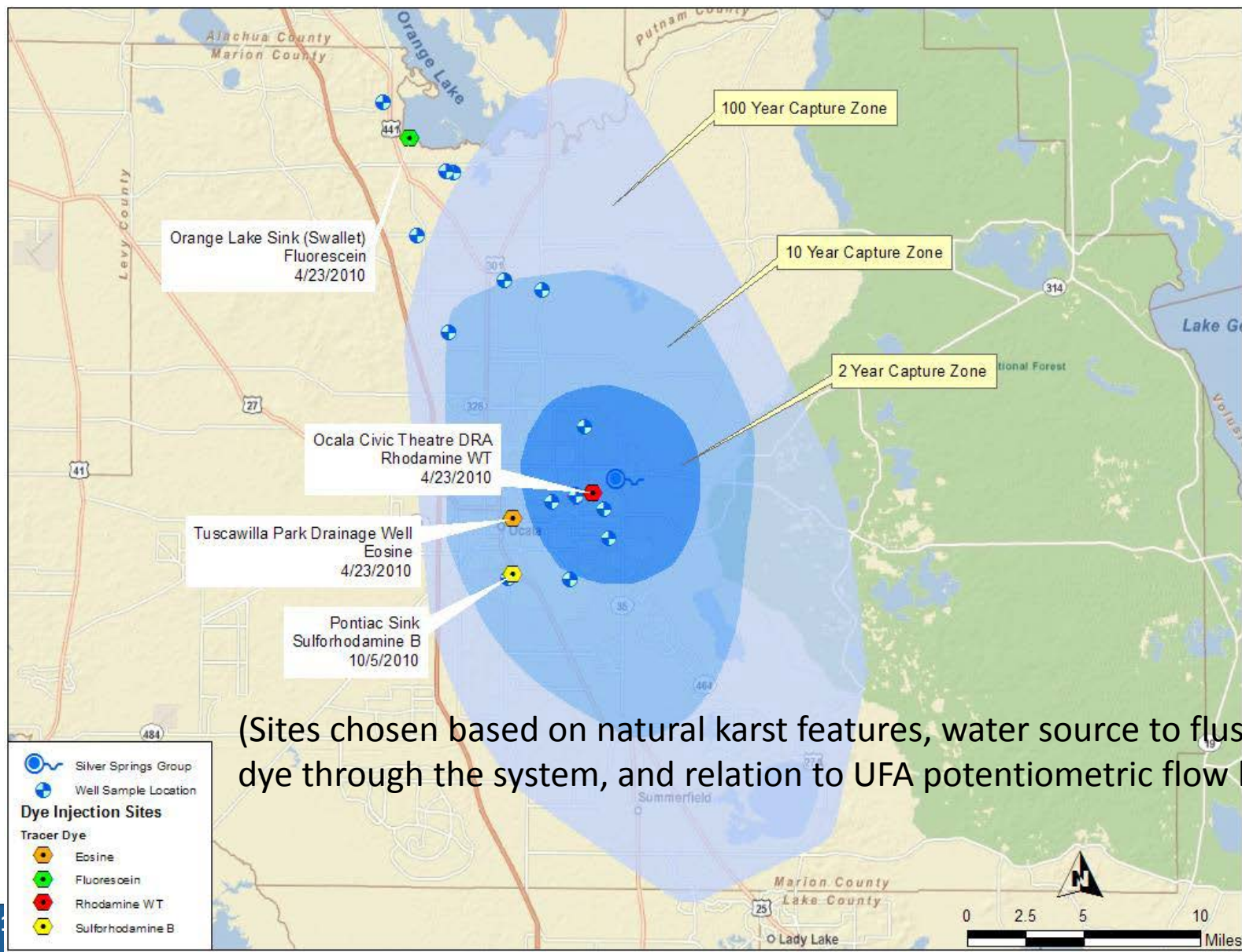


Request for Projects

- Request for project corrections and updates sent to stakeholders September 1.
- Covers projects contributed by all source categories.
- Preparation for annual update.
- Deadline for submission to DEP September 23.

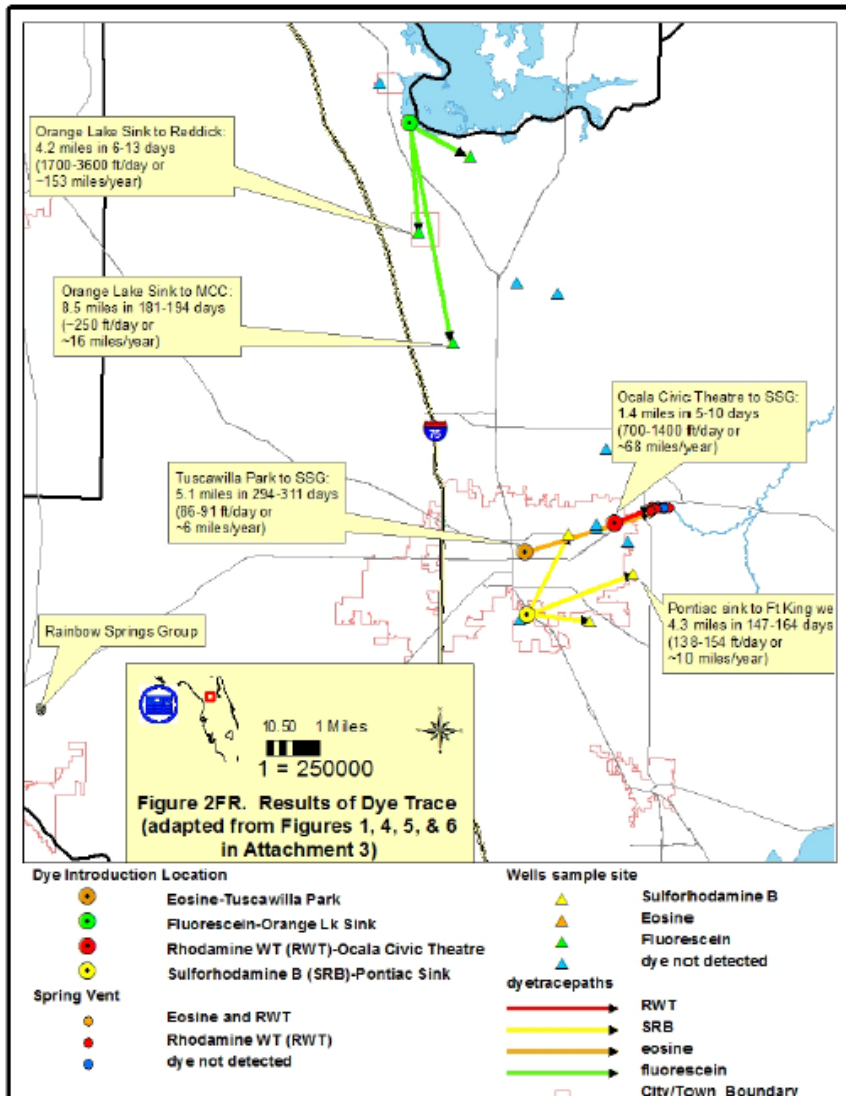


Dye Introduction and Well Sample Locations





Silver Springs Time of Travel Results



Task3_DyeTrace_results_Fig2FR.mxd, 08-2011

- Orange Lake to Marion Correctional Institute (green) 181-194 days.
- Tuscawilla Park to Silver Springs Group (orange) 294-311 Days.
- Pontiac Sink to Ft. King (yellow) 147-164 days.
- Ocala Civic Center to Silver Springs Group (red) 5-10 days.



More Information

- Presentation given by Don Boniol (SJRWMD) March 2013 and available at
- District Publication:
 - **Silver Springs Nutrient Pathway Characterization Project SJ2012-SP3 Dye Trace Studies**
<http://www.sjrwmd.com/technicalreports/spubs1.html>



Nitrogen Source Inventory and Loading Tool (NSILT)

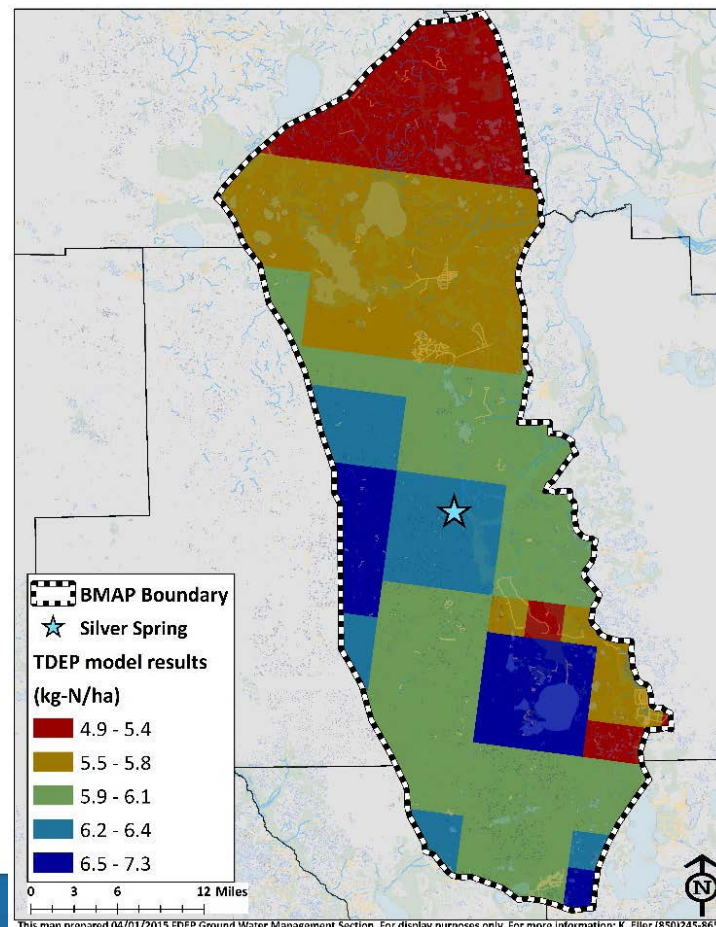
- Planning tool that provides the best available assessment of how nitrogen is currently being applied in BMAP area.
- Estimates nitrate loads from multiple sources:
 - Atmospheric deposition.
 - Agricultural and nonagricultural fertilizer.
 - Livestock waste.
 - Drainage wells.
 - Septic systems.
 - Wastewater application.
- GIS and spreadsheet-based tool.
 - Estimate the relative contribution of nitrogen from various sources relative to each other.
 - Identifies general spatial distribution of nitrogen loading from different sources.



Atmospheric Deposition

- Silver Springs

- Used hybrid approach that combines dry deposition data from monitoring networks and modeled data from the Community Multi-scale Air Quality Model combined with National Trends Network wet deposition data.
- Data period 2011 to 2013.
- 16 kilometer model grid.





Rainbow Springs Atmosphere Deposition

- Both wet and dry deposition from monitoring network data.
 - Wet data from Bradford Forest and Chassahowitzka National Wildlife Refuge stations of the National Atmospheric Deposition Program.
 - Dry data from Indian River Lagoon station of the Clean Air Status and Trends Network.
- Sum of rates for total.

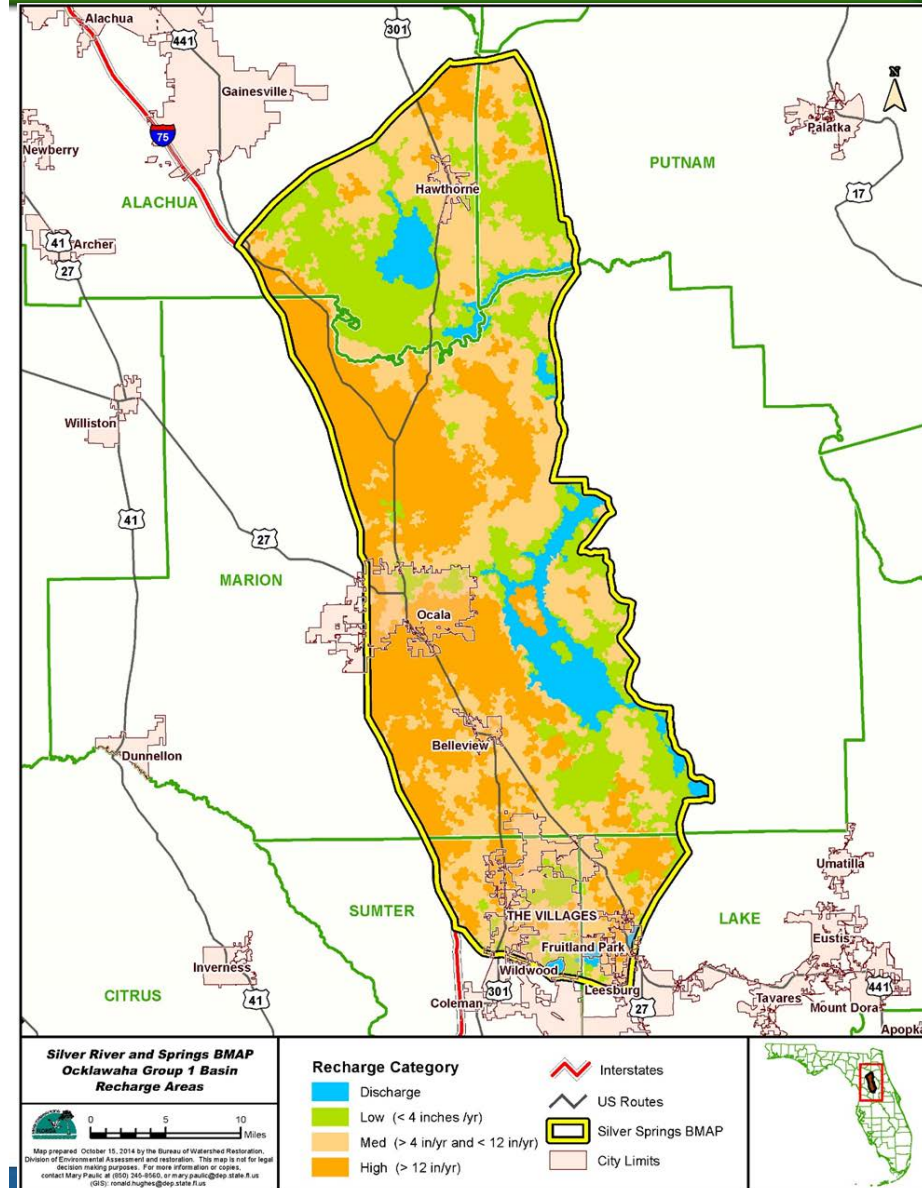
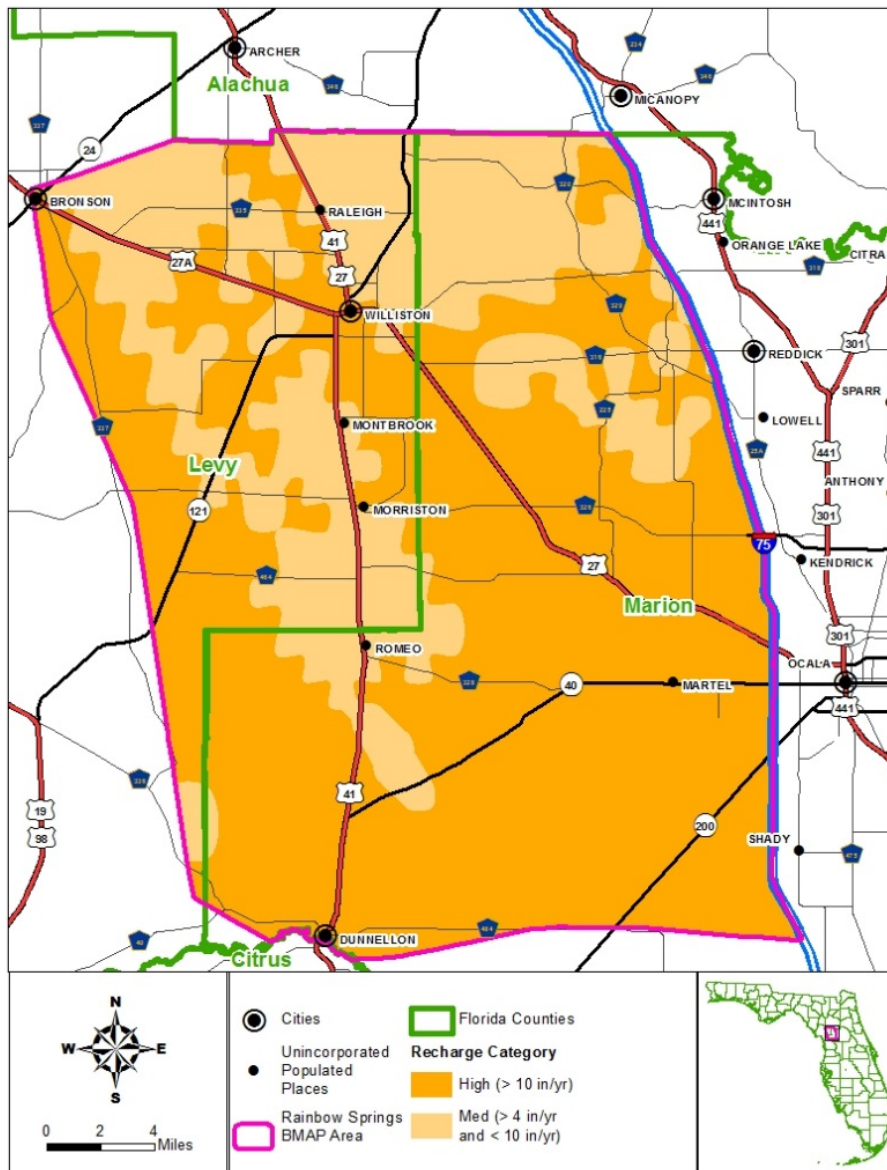


OSTDS NSILT Approach

- Combined local Marion County estimates of number of OSTDS with 2009 FDOH estimates with other counties.
- Average number of people per household obtained for each county from 2010 census data. Number of OSTDS times people per household for total number of people.
- Literature estimates are 4.5 kg-N/person/year.
- Attenuation rate or amount of loading removed by environment is 40%.
- Attenuation by recharge rate applied. Recharge incorporates soil and unsaturated zone properties. Lower recharge rate greater potential for biological remediation of nitrate.
 - High recharge=10% attenuation
 - Medium recharge=50% attenuation
 - Low recharge=90% attenuation.



Recharge Rates





Setting Loading Reduction Targets

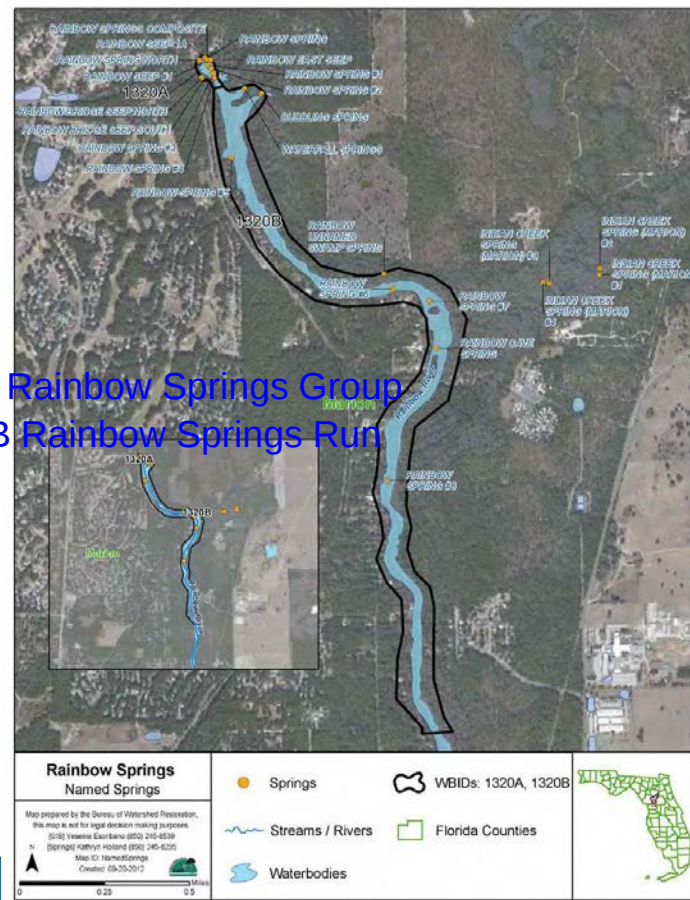


TMDLs

- Target nitrate concentration of 0.35 mg/L.
- Silver requires 79% reduction in concentration.
- Rainbow requires 82% reduction in concentration.

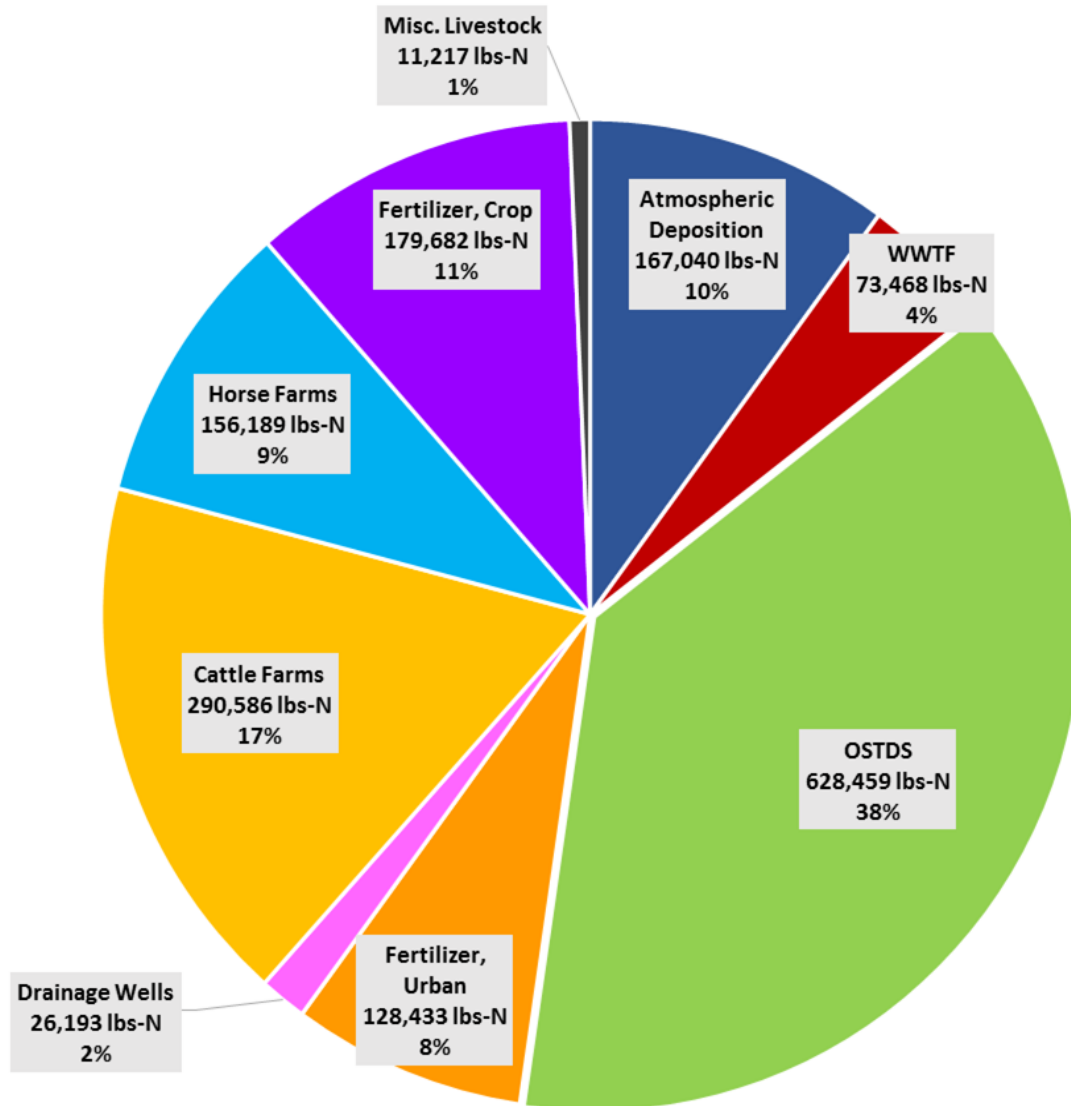


- 1320A Rainbow Springs Group
- 1320B Rainbow Springs Run





Silver Springs BMAP Area NSILT Result

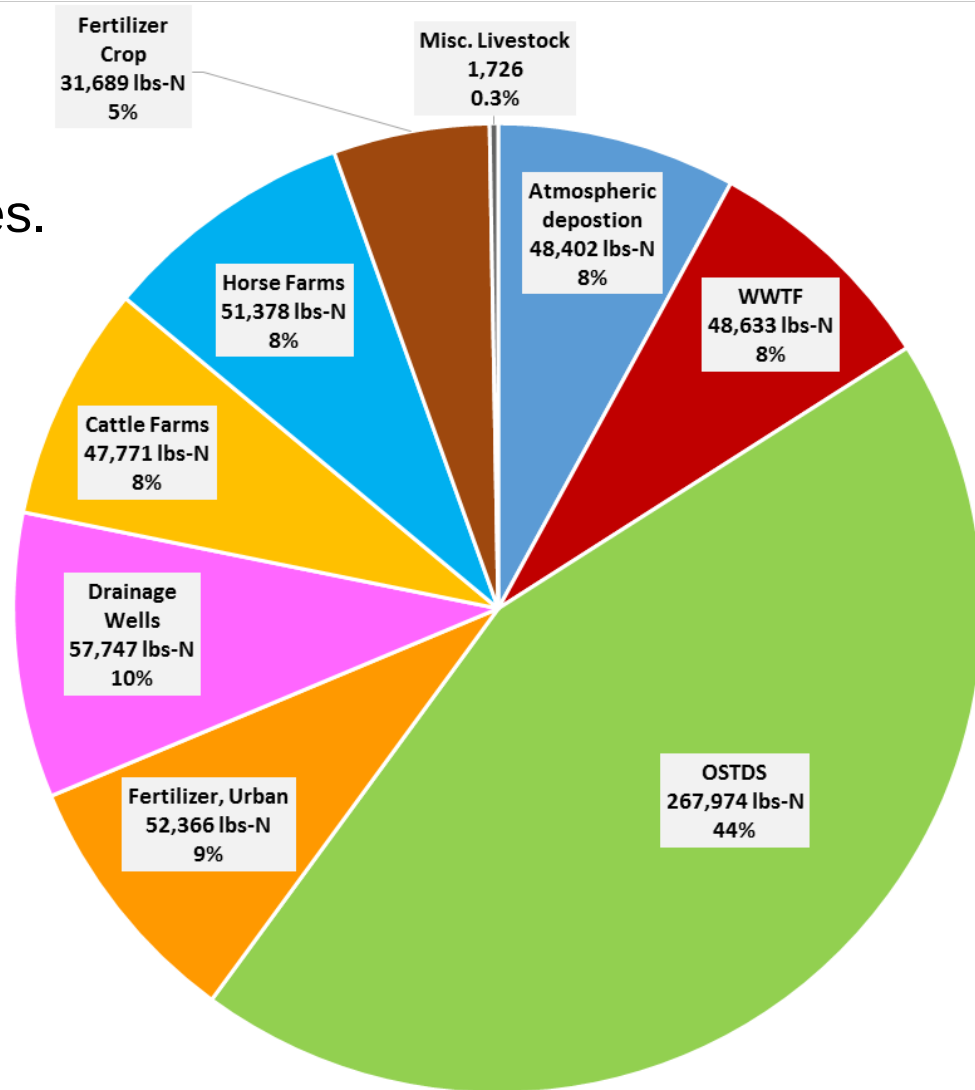


- Estimated input of nitrogen loading to Upper Floridan aquifer.
- Agriculture 38%.
- OSTDS 38%.
- Urban 14%.
- Total load at Upper Floridan =1.66 million lbs-N



Silver Springs NSILT Priority Focus Area

- OSTDS portion of loading increases.
- Urban sources more prominent.
- Agriculture 21.3% of loading.
- Total load at Upper Floridan = 607,686 lbs-N.





Atmospheric Deposition Load

- Distributed across land surface.
- Currently no feasible remediation techniques.
- Set aside to be addressed in later BMAP cycle as tools become available.
- Not assigned to other sources.
- Strategy applies to both Silver and Rainbow.



Silver Springs Reduction Priority Focus Area

- Use NSILT estimates of loading with percent reduction needed by TMDL.
- OSTDS load x 79% reduction.

Priority Focus Area Source Category	Draft Load lbs-N	Draft Target Load Reduction lbs-N
OSTDS	267,974	211,699



Silver Springs BMAP Area Reduction

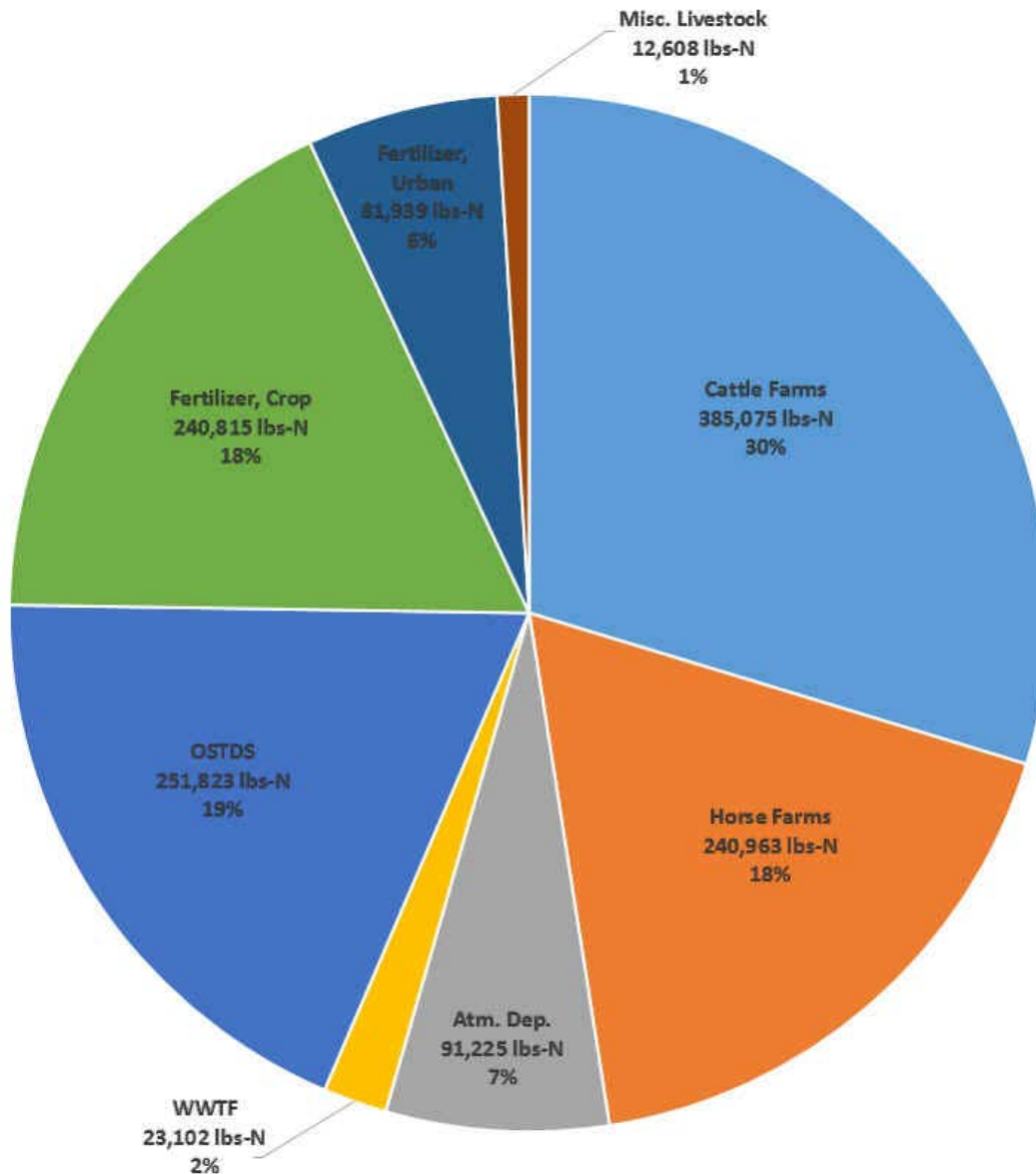
Entire BMAP Area Source Category	Draft Load lbs-N	Draft Target Load Reduction lbs-N
OSTDS	628,459	496,483

- Priority focus area is included within BMAP area. Need to adjust BMAP area. Calculation to account for Priority Focus Area.
- BMAP area – PFA loading and loading reduction.

Entire BMAP Area Source Category	Draft Load lbs-N Adjusted for PFA	Draft Target Load Reduction lbs-N Adjusted for PFA
OSTDS	360,485	284,784



Rainbow NSILT Results



- Estimated input of nitrogen Loading to Upper Floridan aquifer.
- Agriculture 67%.
- OSTDS 19%.
- Urban 6%.
- Total load to Upper Floridan = 1.33 million lbs-N



Rainbow Springs BMAP Area Reduction

- Use NSILT estimates of loading with percent reduction needed by TMDL.
- OSTDS load x 82% reduction.

Entire BMAP Area Source Category	Draft Load lbs-N	Draft Target Load Reduction lbs-N
OSTDS	251,823	206,495



Questions?

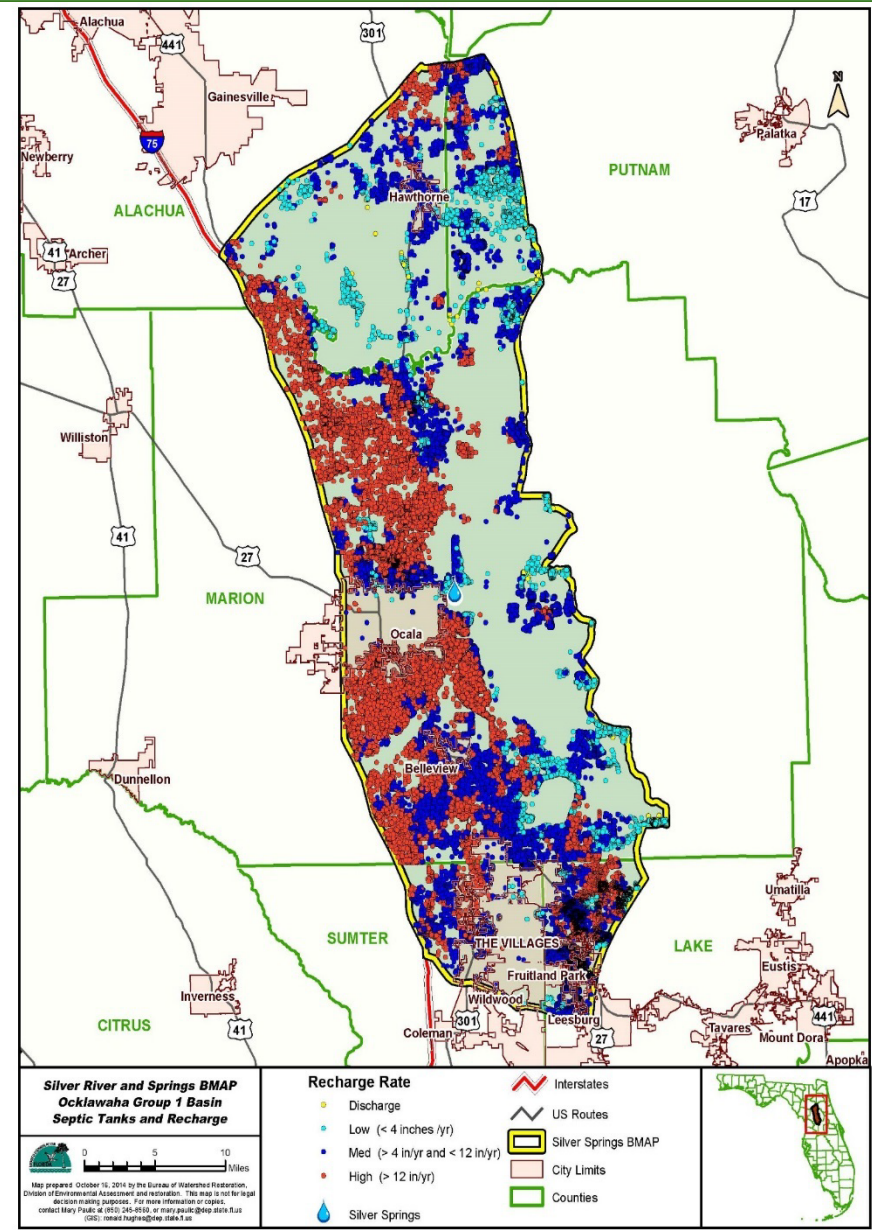




Silver Springs Estimated OSTDS Distribution

- Number of OSTDS by county and recharge area.

County	OSTDS High Recharge	OSTDS Medium Recharge	OSTDS Low Recharge
Alachua	818	1,299	583
Lake	3,328	3,807	532
Marion	28,088	17,926	3,732
Sumter	713	1,682	184
Putnam	372	1,551	1,719
Total	33,319	26,265	6,705





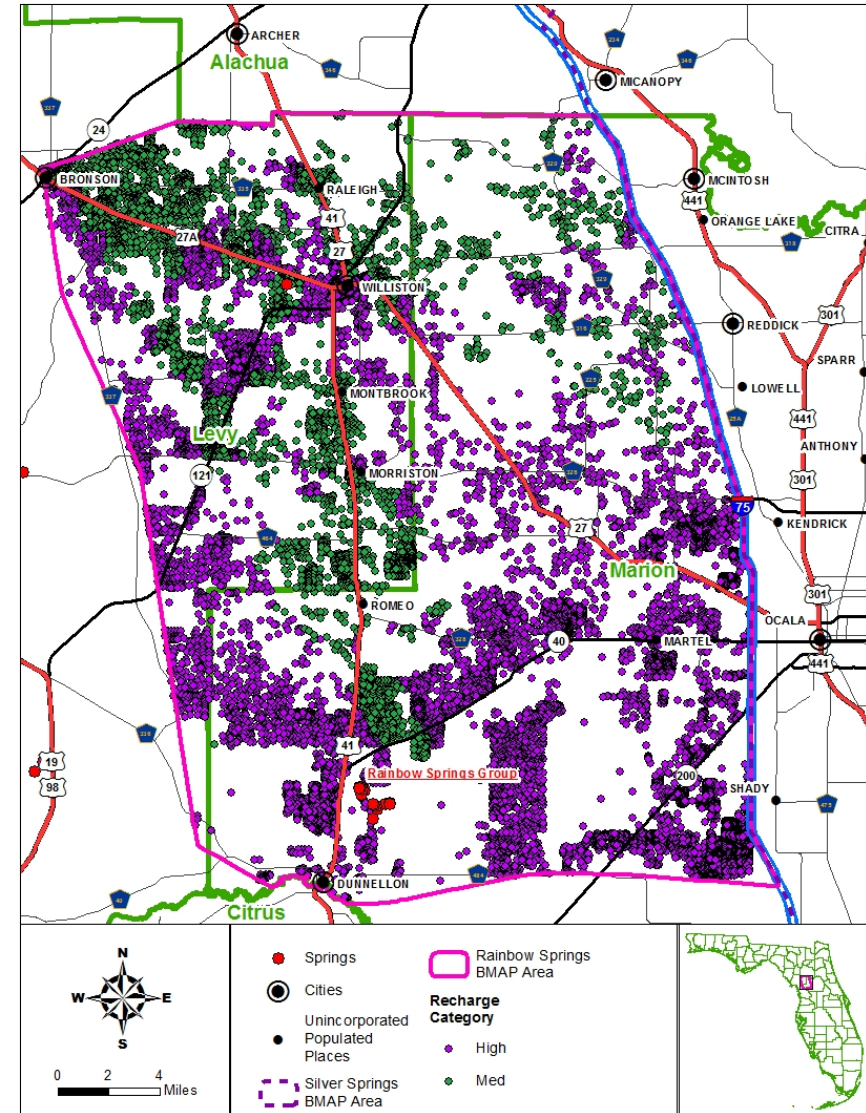
Estimated OSTDS Loading

Recharge Rate	Estimated Nitrogen Load to Groundwater lbs-N/year
High	430,072
Medium	188,579
Low	9,808
Total Input	628,469



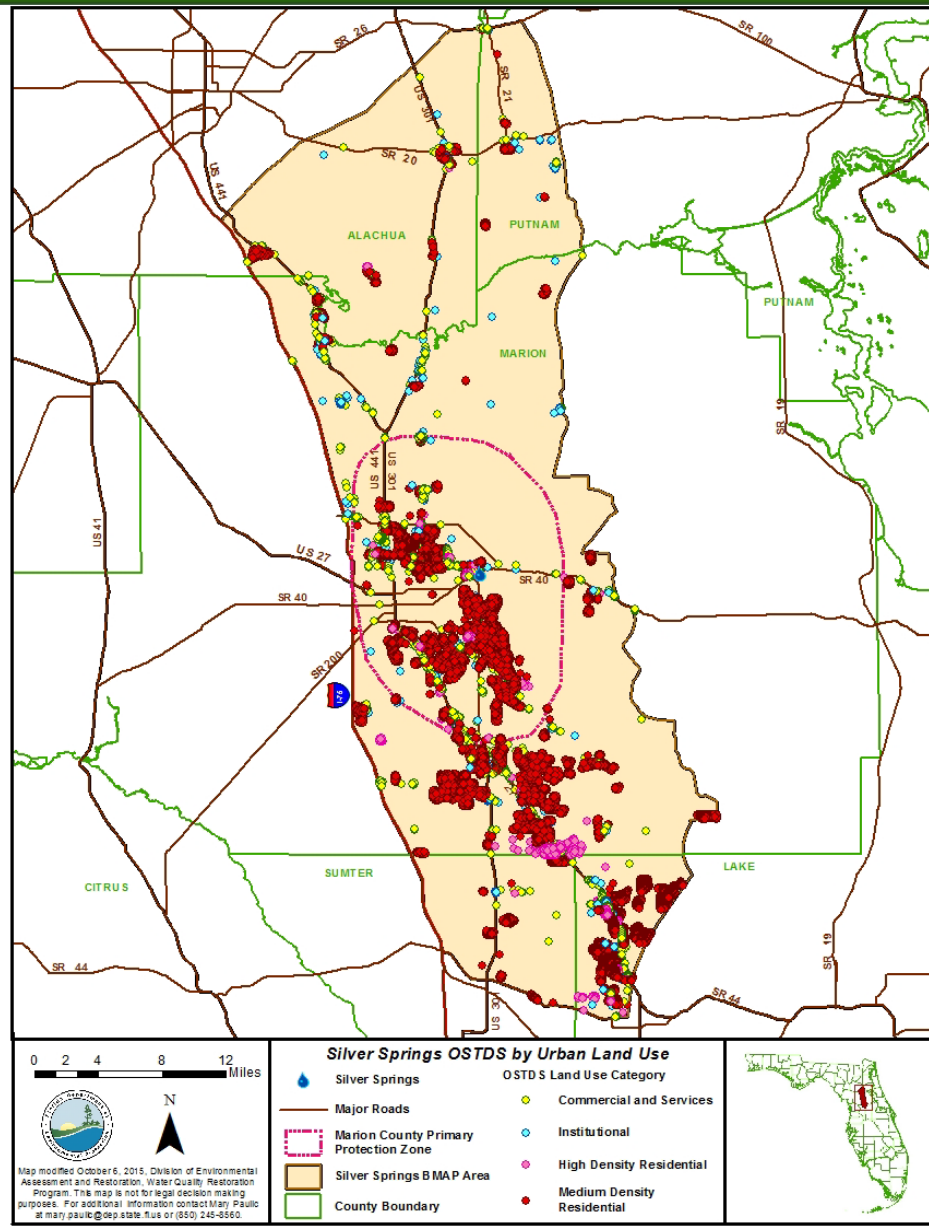
Rainbow Springs OSTDS Distribution

County	OSTDS High Recharge	OSTDS Medium Recharge
Marion	11,992	1,016
Levy	4,244	4,520





Estimated Number of Urban OSTDS



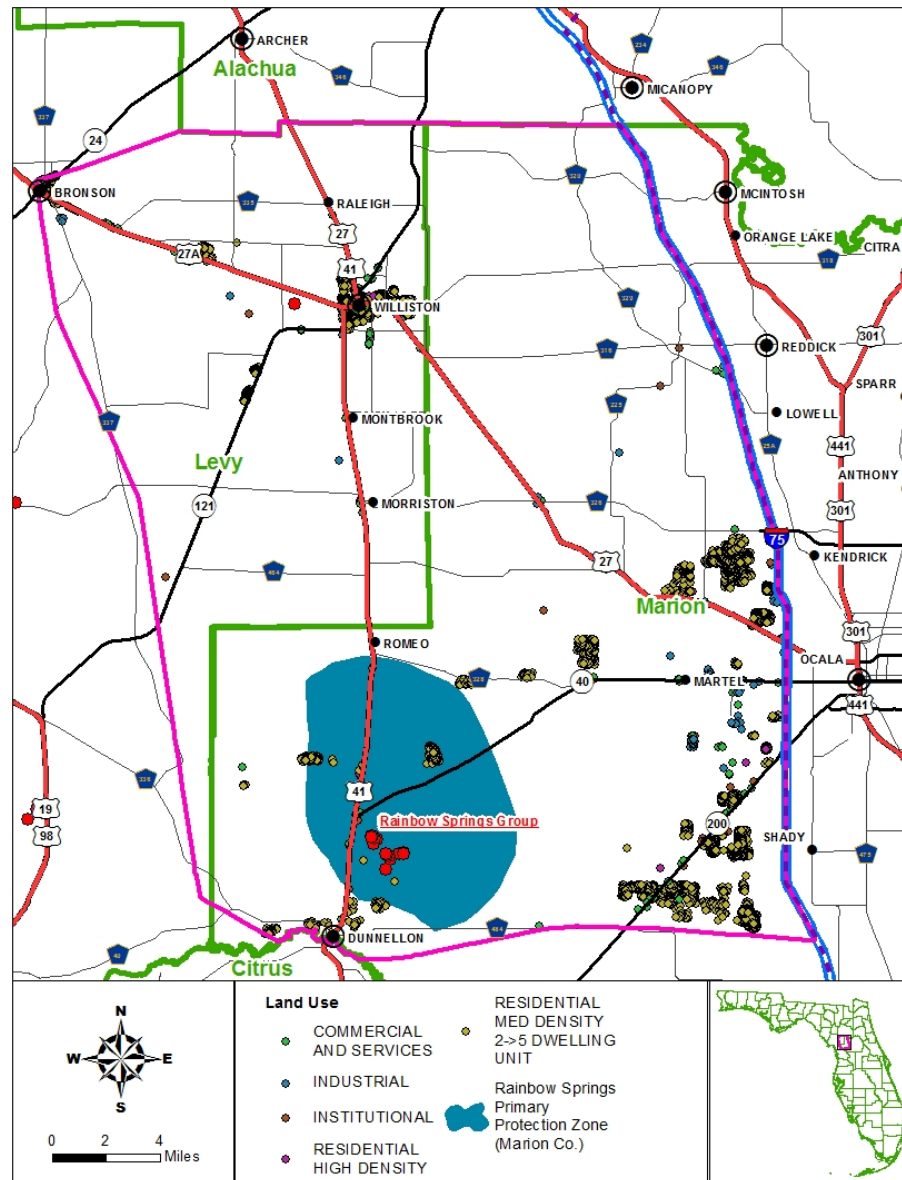


Estimated Urban OSTDS Count

2009 LAND USE CATEGORY	HIGH-RECHARGE NUMBER OF OSTDS	MEDIUM- RECHARGE NUMBER OF OSTDS	LOW-RECHARGE NUMBER OF OSTDS	Total Number of OSTDS
Commercial	558	553	91	1,202
Industrial	82	34	5	111
Institutional	123	67	18	208
Recreational	21	21	12	54
Low-density residential – less than two dwelling units per acre	10,441	8,846	2,833	22,120
Medium-density residential – two to five dwelling units per acre	17,472	12,013	2,255	31,740
High-density residential – six or more dwelling units per acre	207	957	25	1,189



Urban OSTDS





Urban OSTDS Count

SWFWMD LAND USE CATEGORY	HIGH-RECHARGE NUMBER OF OSTDS	MEDIUM-RECHARGE NUMBER OF OSTDS
Commercial	282	29
Industrial	87	6
Institutional	44	1
Recreational	8	0
Low-density residential – less than two dwelling units per acre	9,239	4,058
Medium-density residential – two to five dwelling units per acre	4,306	225
High-density residential – six or more dwelling units per acre	37	0



Public Education

- BMAP timeline.
 - Draft outline of plan in one year.
- Inventory of public education components.
 - Ongoing education efforts.
 - Identify education needs.
- Overall goal:
 - Communicate consistent coordinated message to public.
 - Community and policy maker buy in.
 - Increase public education/awareness about:
 - o Wastewater management issues including septic systems.
 - o Springs protection.
 - o Local groundwater systems and nutrient connections.



Issues List

- Address inconvenience of sewerage an area.
- Monthly sewer bill.
- People don't see themselves as part of the problem.
- Property rights.
- Adequate facts to make appropriate policy.
- Policy or permitting hurdles or barriers.
- Buy in from decision makers and the public that OSTDS are a source of water quality impairment.
- Willingness to address the problem.



Social Marketing Steps

- Identifying Barriers and Benefits.
- Designing a strategy that utilizes behavior change tools.
- Piloting the strategy with a small segment of a community.
- Evaluating the impact of the program once it has been implemented.
- Fostering Sustainable Behavior, authors Doug McKenzie-Mohr and William Smith.



Barriers

- Internal barriers: Individual or personal obstacles.
- External barriers: outside the control of the individual. Could require changes in legislative or regulatory frameworks.



Multiple Messages

- Multiple audiences different barriers and approach.
- Multiple messages.



Tiered Approach

- State level.
- Regional Level.
- Local level



Questions?



Next Meeting

- Propose meeting dates for November and December.
- Tentative topics for these meetings.
 - Define the magnitude of the problem.
 - o Where is the problem located? Started to define.
 - What we know about wastewater and OSTDS management in these basins.
 - o Utility planning proposed or underway.
 - What we can do to manage the problem.
 - o Planning requirements.
 - o Local ordinances.
 - o Alternative treatment systems.
 - Education Plan development.
 - Funding sources.



Scientific Information Request

- Library of literature available at http://publicfiles.dep.state.fl.us/DEAR/BMAP/Silver_springs/Library/
- Additional references should be sent to Mary Paulic at mary.paulic@dep.state.fl.us and Shane Williams at evan.williams@marioncountyfl.org.



Summary and Action Items

- Summary.
 - TMDL needs to be achieved no more than 20 years after adoption of BMAP.
 - o Wastewater/OSTDS Remediation Plan developed with input from Advisory Committee to help achieve TMDL reduction within 20 years.
- Need to update information (data, projects, studies, etc.) and start gathering necessary information.
 - Identify projects to meet the 5-year, 10-year and 15-year targets.
 - Identify what and where scientific information is needed.
 - Identify what public education efforts exist & what needs to be done.
- Action Items.
 - Return annual project information to DEP/Marion County.
 - Propose meeting topics.
 - Next meeting dates-tentative.
 - o November and December?



Contacts

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