



Florida Department of Environmental Protection

Basin Management Action Plan (BMAP) Crystal River/Kings Bay

August 23, 2016

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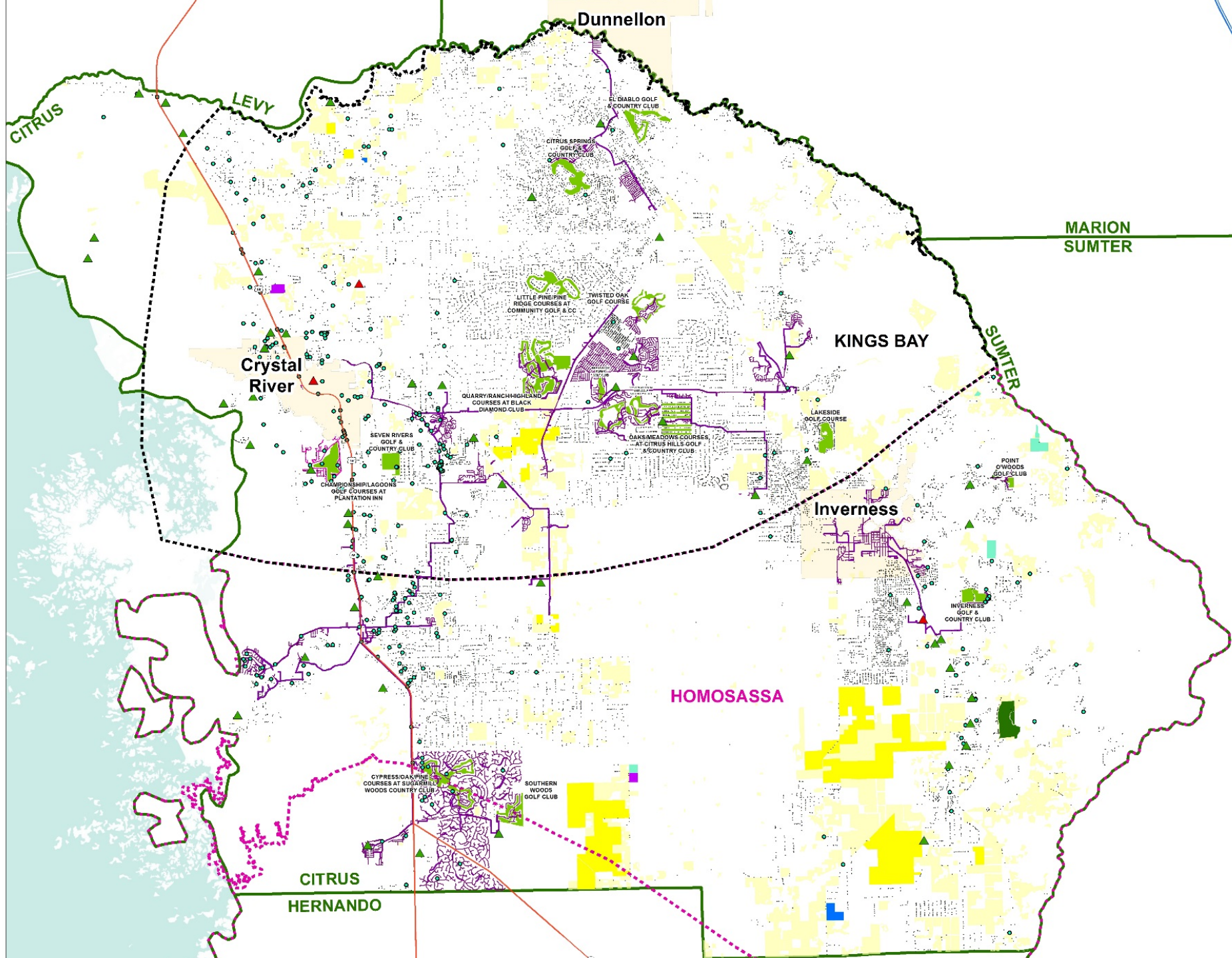
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Topics

- Priority focus area (PFA)
- Planning projects and level of effort
 - Necessary reductions
 - Additional nitrogen source reduction measures
- Onsite Sewage Treatment and Disposal System (OSTDS) Remediation Plan (*continued*)
 - Science/research
 - Projects
 - Public education strategy





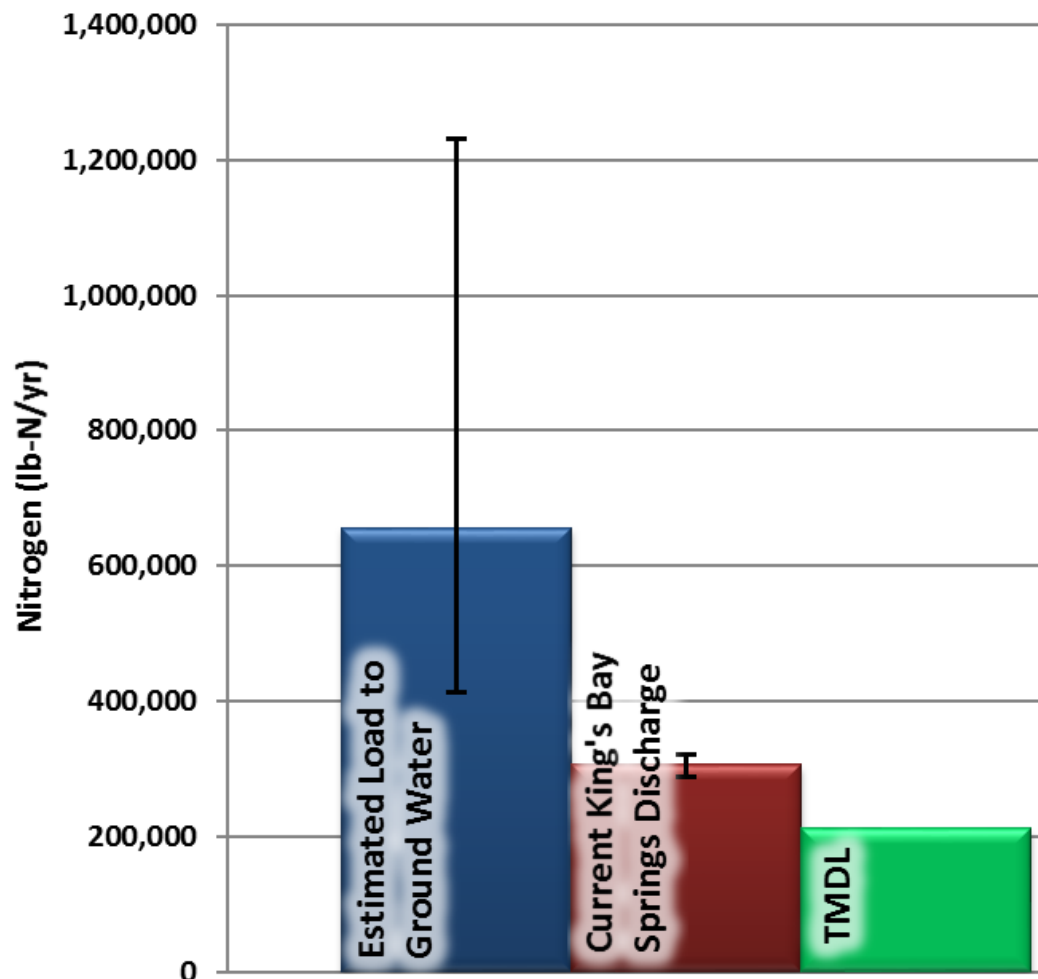
Kings Bay Discharge of Nitrogen

◇ Current

- ◇ Discharge = 466 cubic feet per second (ft^3/sec)
- ◇ TN = 0.33 milligrams per liter (mg/L)
- ◇ Load = 305,897 pounds of nitrogen per year (lbs-N/yr)

◇ TMDL

- ◇ Using current discharge
- ◇ Nitrate = 0.23 mg/L
- ◇ Load = 210,648 lbs-N/yr





PFA



PFA Requirements

- Sub-Section 373.802, Chap. 2016-1 Laws of Florida:
 - 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 ground water pathways and an Outstanding Florida Spring (OFS).



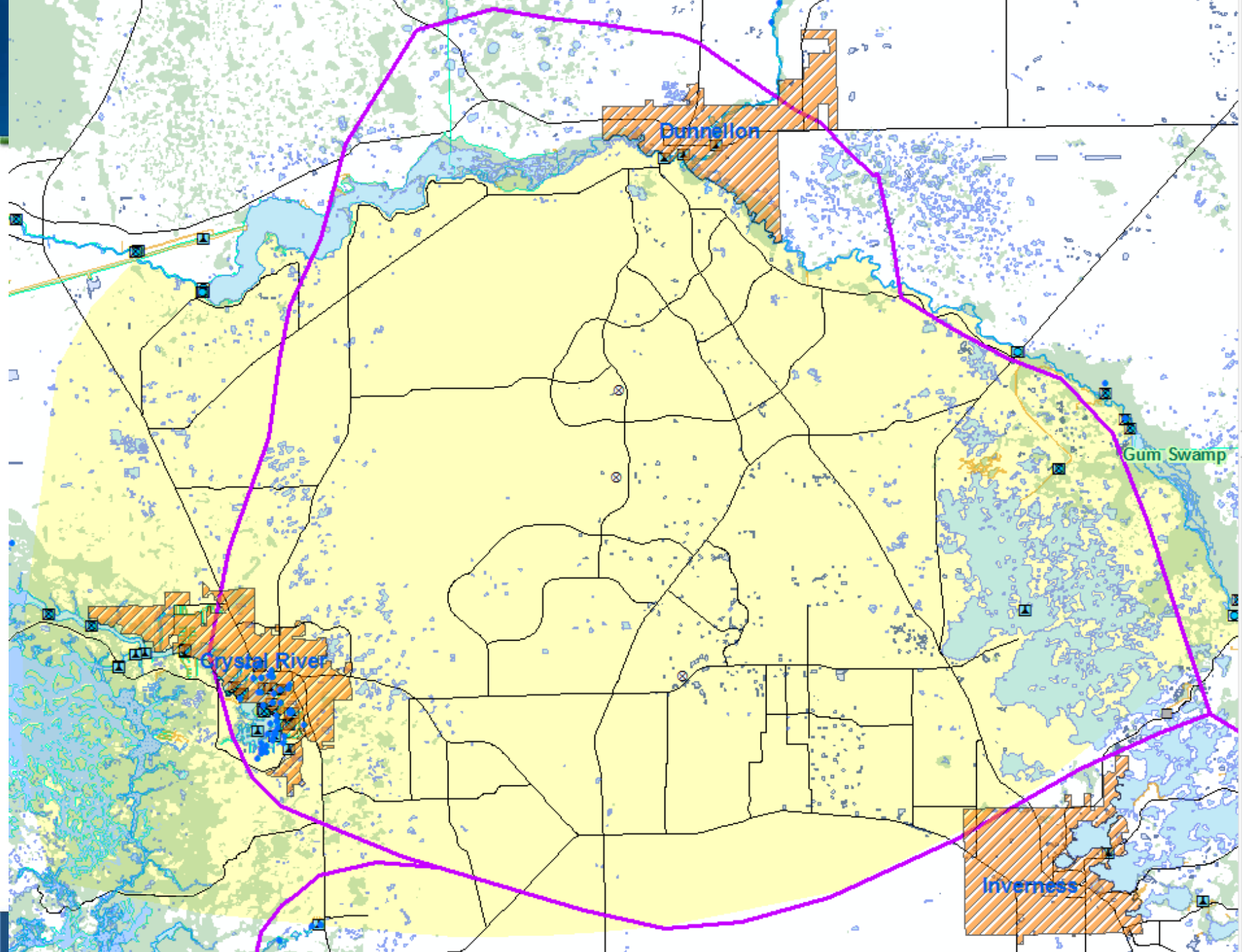
PFA Requirements

- Sub-Section 373.803, Chap. 2016-1 Laws of Florida:
 - To be delineated considering factors that may lead to degradation of an OFS, such as:
 - Groundwater travel time to spring
 - Hydrogeology
 - Nutrient load to spring
 - Additional factors
 - Soil types
 - Pollutant sources
 - Identifiable boundaries

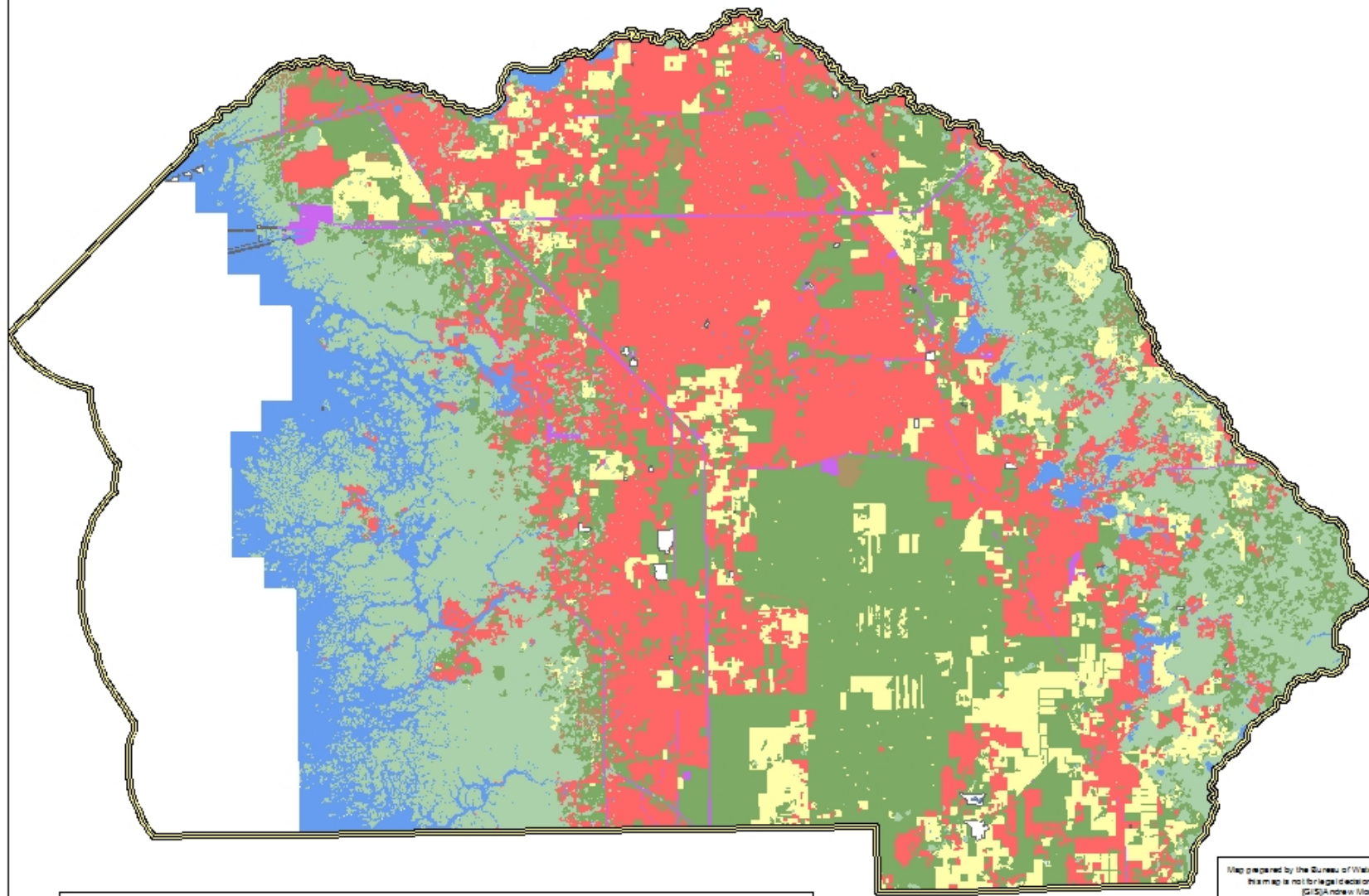


PFA Determination

- Establish groundwater **contributing area (CA)** for the spring.
- Identify regions within the CA where greatest recharge occurs.
- Identify regions within the CA where Floridan Aquifer is most vulnerable.
- Consider nitrogen loading and travel time.
- Consider groundwater travel time.
- Identify regions within CA to exclude or include based on land use and potential occurrence of pollutant sources.
- Create PFA boundary that corresponds with identifiable boundaries.



CITRUS COUNTY LAND USE



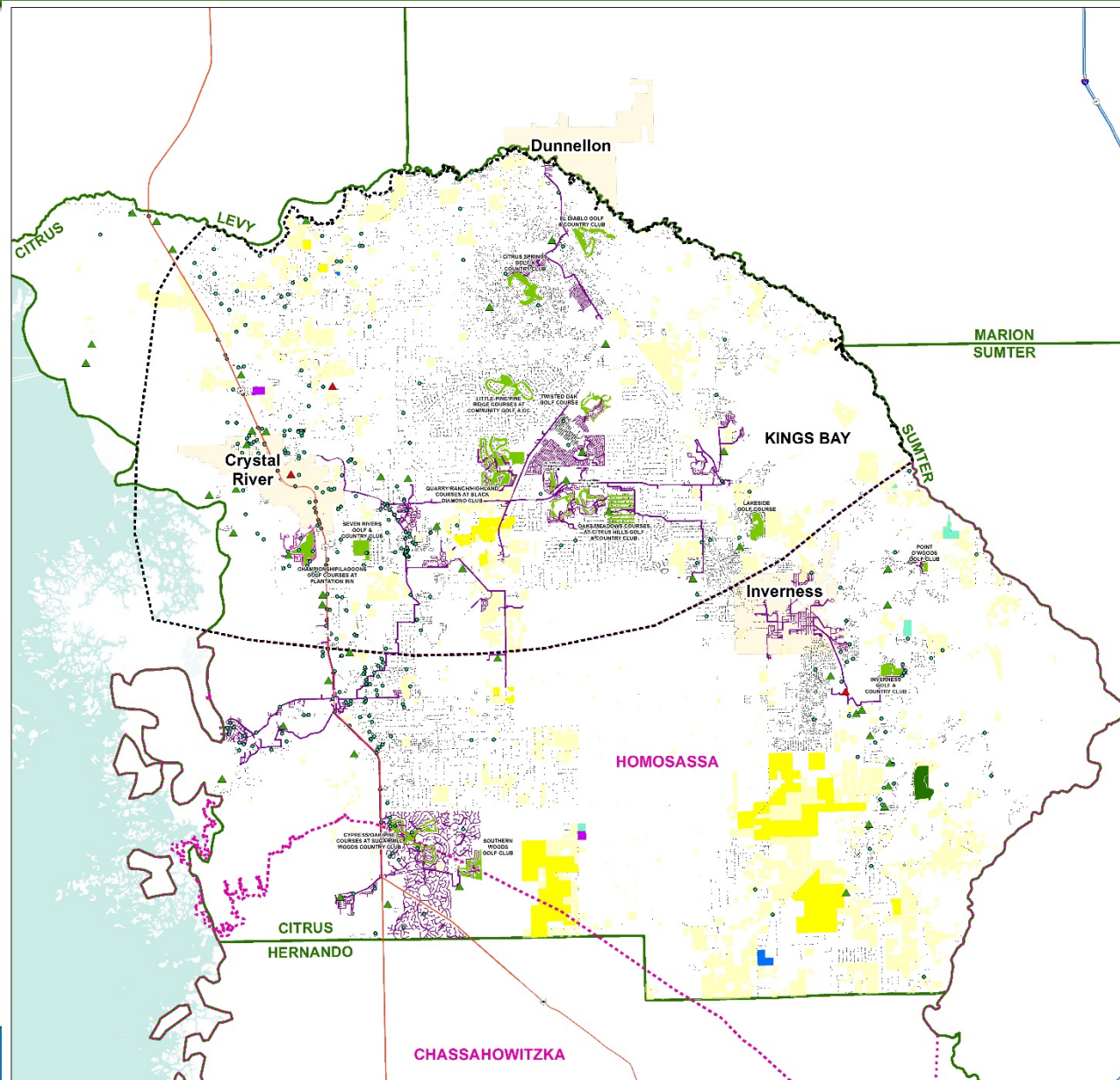
- | | | | |
|--|---|--|--|
|  Urban & Built-Up |  Rangeland |  Water |  Barren Lands |
|  Agriculture |  Upland Forest |  Wetlands |  Trans, Comm, Util. |

Map prepared by the Bureau of Watershed Restoration
 This map is not for legal decision making purposes.
 (GIS) Andrew Morris (000) 04-04-00
 (BWA) Terry Hansen (000) 04-04-00
 Map ID: Citrus Co. Land Use
 Created: 06-08-00





PFA Determination- Septic System Locations





PFA Determination

Questions on PFA
Process?



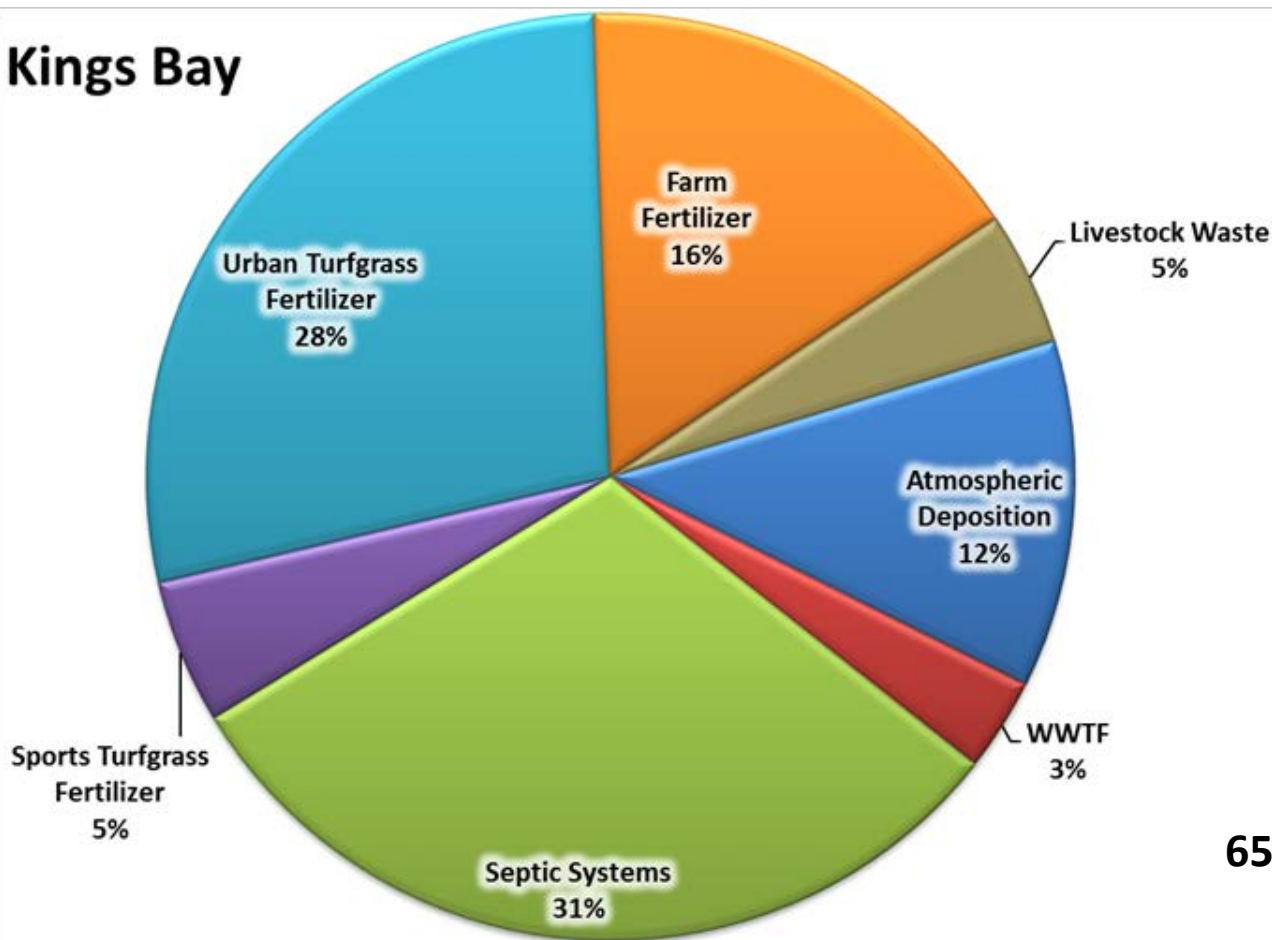
Planning Projects and Level of Effort



Nitrogen Source Reduction

NSILT Load to Groundwater

Kings Bay



655,616 lb-N/yr



Nitrogen Source Reduction Strategy

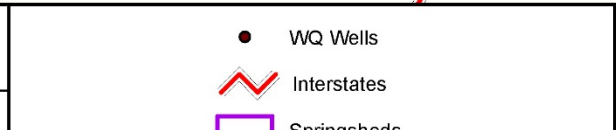
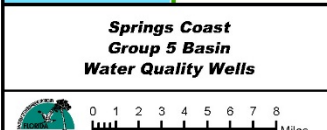
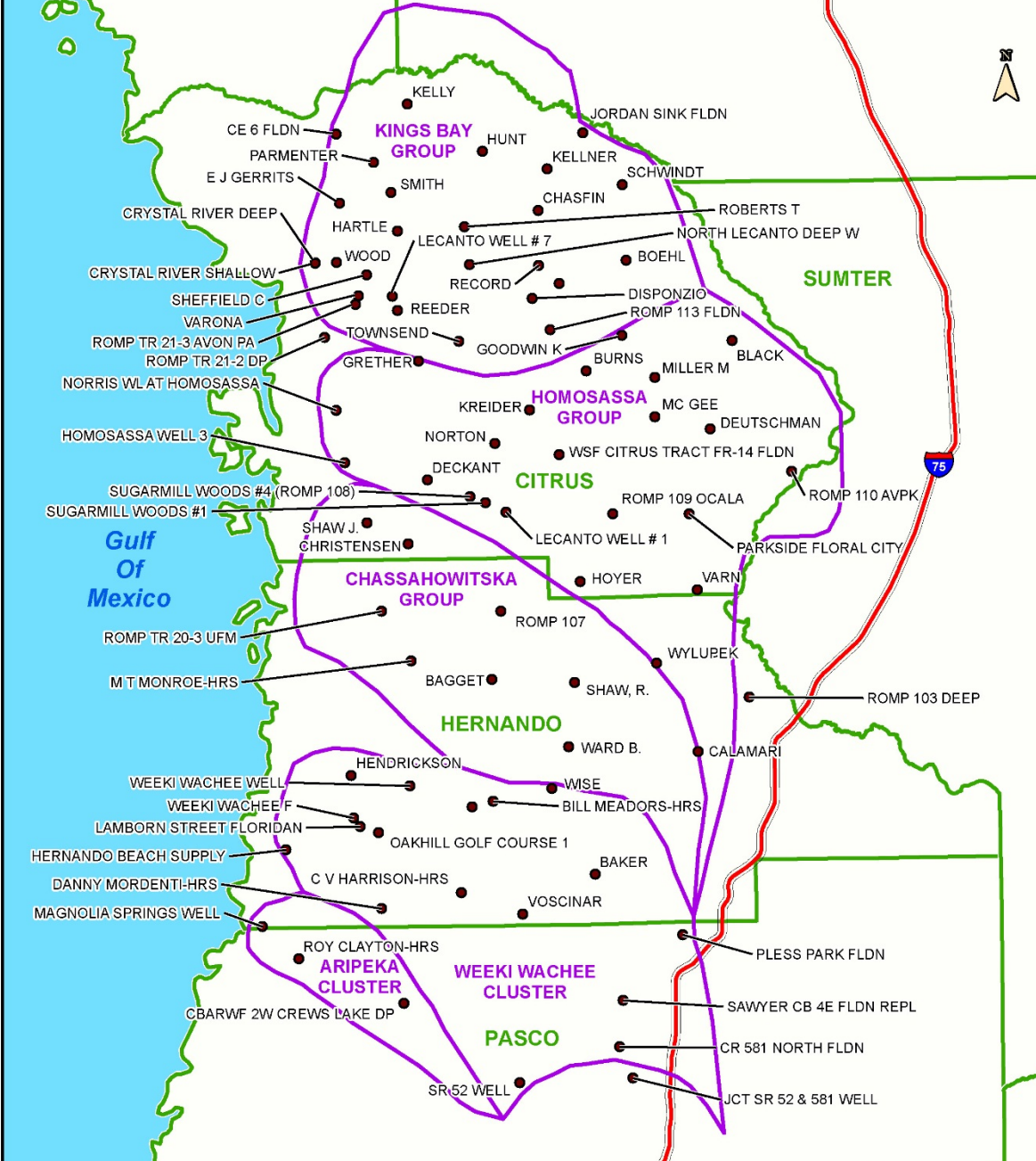
Source	% of total TN load (655,616)	Total estimated pounds/year TN to be reduced
Septic Systems	31	203,241
Urban Turfgrass Fertilizer	28	183,573
Sports Turfgrass Fertilizer	5	32,781
Farm Fertilizer	16	104,899
Livestock Waste	5	32,781
WWTF	3	19,669
Atmospheric Deposition	12	78,674

- Load Reduction Targets:
 - 5 years – 30% of total
 - 10 years – Additional 50% (80% total)
 - 15 years – Remaining 20% (100% total)



Nitrogen Source Reduction Strategy

- Propose to set atmospheric deposition reductions aside and focus on controllable load reductions.
- Next step, provide reduction amounts to each entity and to agriculture.
- Yearly - Track load reduction progress and make adjustments as needed.
- At 5-year milestone:
 - Assess progress.
 - Adjust load reductions as necessary.
 - Determine if atmospheric deposition reductions should be assigned.
- Monitor existing groundwater and springs sampling locations.





Source Categories & Solutions?

- Ideas for urban turfgrass fertilizer (183,573 lbs/yr reduction):
 - Ordinances
 - Enforcement
 - Education
 - Fertilizer sales bans
 - New types of fertilizer
- Ideas for sports turfgrass fertilizer (32,781 lbs/yr reduction):
 - Municipal and school sports fields
 - Application program for field managers



Springs Coast Ordinances, Comp Plans & Land Development Codes

Local Government	Topic				
	Fertilizer Ordinance	Reclaimed Water Ordinance	Stormwater Utility Ordinance (sets up funding)	Septic Systems/Wastewater	
				Inspections	Require mandatory connections to central sewer
Brooksville	No ordinance or comp plan policies	No ordinance; few comp plan policies			X
Citrus County	X*	No specific ordinance, but comp plan policies	X		X
Crystal River	No ordinance, but city does ban the residential and commercial use and sale of fast release fertilizer	No ordinance; few comp plan policies			X
Hernando Co.	X	X	X		
Pasco County	X	X	X		X

*Citrus County's fertilizer ordinance has detailed citation and financial penalty text not common to the DEP model ordinance.



Source Categories & Solutions?

- October 18, 2016 – Joint meeting for Crystal River/Kings Bay and Weeki Wachee stakeholders at SWFWMD headquarters in Brooksville.
- Nanette O'Hara, Public Outreach Coordinator, Tampa Bay Estuary Program.
 - Education efforts and successes.





Source Categories & Solutions?

Questions on Source Categories and Solutions?





Onsite Sewage Treatment and Disposal System (OSTDS) Remediation Plan (*continued*)

Science/research

Projects

Public education strategy



OSTDS Remediation Plan

Recap of 2016-1 Requirements

- Collect and evaluate credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and springs systems.
- Develop a public education plan to provide area residents with reliable, understandable information about onsite sewage treatment and disposal systems and springs.



OSTDS Remediation Plan

Recap of 2016-1 Requirements (continued)

- Include options for repair, upgrade, replacement, drainfield modification, addition of effective nitrogen reducing features, connection to a central sewerage system or group of systems within a PFA (if OSTDS are 20% or more of the total nitrogen source – in Crystal River/Kings Bay OSTDS are 31% of the nitrogen sources).
- Priority ranking of the projects to assist with funding.



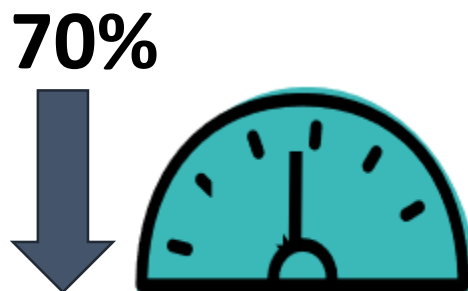
OSTDS Remediation Plan



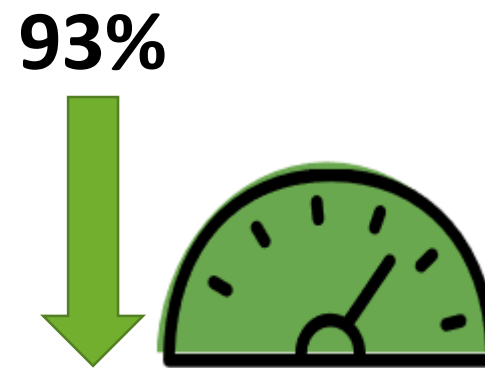
Nitrogen Reduction Options for Onsite Wastewater



Conventional systems



Lined drainfield & existing advanced technologies



Nitrogen reducing systems



Science-Related Actions– 2015 Crystal River/Kings Bay SWIM Plan

Management Action	Lead Entity
Monitoring and Research	
Improve our understanding of the ecological responses to nutrient enrichment and reductions	FDEP/SWFWMD/ Universities
Maintain and expand water quality monitoring programs	SWFWMD/FDEP
Report annual status and trends	SWFWMD
Evaluate new and emerging technologies	SWFWMD
Septic Tank Systems	
Research and develop advanced septic tank systems	FDOH/FDEP/UF-IFAS



Science & OSTDS Related 2015 SWIM Plan Projects

Ongoing Projects	Lead Entity
Quarterly Springs Water Quality Monitoring	SWFWMD
Stream Water Quality Monitoring	SWFWMD
Upper Floridan Aquifer Nutrient Monitoring	SWFWMD
Springs Initiative Monitoring	SWFWMD
Evaluation of Nitrogen Leaching from Reclaimed Water Applied to Lawns, Spray Fields, and RIBs	SWFWMD
Project COAST	SWFWMD
Florida Onsite Sewage Nitrogen Reduction	FDOH
Developing Tools for Surface Nutrient Loading Attributable to Reclaimed Water	WaterReuse / Water Management Districts / FDEP
USGS Ground Water Data Collection	USGS / SWFWMD
USGS Surface Water Data Collection	USGS / SWFWMD



Science & OSTDS Related 2015 SWIM Plan Projects

Proposed Projects	Lead Entity
Nutrient Hot Spot Loading Identification	FDEP / SWFWMD
Groundwater Quality Monitoring for BMAP Assessment	FDEP / SWFWMD



Science Strategy

- SWIM Plan Item: Research and develop advanced septic tank systems
- Are there other OSTDS-related science questions we haven't covered?
 - Are there other data needed to identify potential project areas?
 - Are there specific questions about the ground water system we would like to answer?
 - Are there specific questions about project effectiveness we would like to answer?



Project Strategy

- Overall reductions needed:
 - By source category.
 - By entity or group.
- Calculating project credits:
 - OSTDS improvements.
 - Efforts in other source categories.
- Sharing additional information.



Septic Field Enhancements

Project topics to contemplate for a future meeting: Septic Field Enhancements

- Florida Department of Health
 - Are there site conditions/limitations that should be considered for installation of field enhancements?
 - What site conditions affect the cost estimates (up or down)?
- All
 - Do we have the information we need to evaluate site conditions for field enhancements?
 - Do we have the information we need to estimate costs of field enhancements?



Public Education

Recap of Public Education Recommendations: Target Audiences

- Policy makers – local, regional, and state
- Residents in Citrus, Hernando, and Pasco Counties
- Utilities and public works managers
- Schools; bottom-up curriculum; kids to adults
- Camps (emphasize connection to springs)
- Septic tank contractors
- Business community (through the chambers of commerce)
- Civic groups
- Homeowner associations
- Builders/realtors/developers



Public Education

Recap of Public Education Recommendations: Messaging

- Conventional septic systems provide minimal nitrogen treatment; enhancement is needed
- Convey costs of doing nothing
- Convey costs on a monthly basis rather than an overall lump sum
- We are all a part of the problem and all are part of the solution
- People need to understand water and wastewater— where it comes from and where it goes
- Keep messaging simple and focused
- The watershed is large
- Case studies (cost/benefit)
- TV commercials



Public Education

Recap of Public Education Recommendations: Existing Materials/Resources

- Public service announcements
 - Florida Department of Health
 - Florida Onsite Wastewater Association
 - Citrus County
- SWFWMD springs education webpage
- City of Tallahassee's TAPP (Think About Personal Pollution) Campaign
- Tampa Bay Estuary's "Be Floridian" campaign
- UF-IFAS new outreach program to homeowners
- U.S. EPA "Septic Sam" in the SepticSmart outreach toolkit
- Social media
- Door-to-door



Public Education

Stakeholder Public Education Priorities

Recommended Target Audiences		
Brooksville	Crystal River	Citrus County
Schools – Bottom-up Curriculum – Kids to Adults	Utilities	Builders / Realtors / Developers / Business Community
Residents in Citrus, Hernando, and Pasco Counties		Septic System Contractors
Policymakers – Local, Regional, and State		

Recommended Messaging		
Brooksville	Crystal River	Citrus County
TV commercials	Keep the messaging simple	Convey cost of doing nothing
People need to understand water- where it comes from and where it goes		Conventional septic system provides minimal nitrogen treatment; septic system enhancement is needed
We are all part of the problem and all part of the solution. Show the negative and positive contributions by people. For example, the duck campaign used by the City of Tallahassee in its TAPP (Think About Personal Pollution) program.		

Recommended Materials / Resources		
Brooksville	Crystal River	Citrus County
Florida Department of Health's public service announcements on septic systems		
City of Tallahassee's TAPP program	Crystal River social media	Florida Onsite Wastewater Association's public service announcements on septic systems
Brooksville website	Citrus County public service announcements	Southwest Florida Water Management District's springs education webpage



Basin Management Action Plan

Next Meeting: Thursday, September 29, 2016

Proposed Topics:

1. Site considerations/field enhancements for OSTDS
2. Approaches to load reduction calculations
3. Potential efforts/reductions in other source categories



Basin Management Action Plan

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<http://www.dep.state.fl.us/water/>

http://publicfiles.dep.state.fl.us/DEAR/BMAP/Springs Coast/BMAPs/CR_KB_BMAP/

