

Research Review & Advisory Committee (RRAC) Meeting

October 21, 2016

Elke Ursin

Bureau of Environmental Health
Onsite Sewage Programs

Division of Disease Control and Health Protection
Florida Department of Health

To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Agenda

9:00 – 9:15	Introductions and housekeeping
9:15 – 9:25	Old business & research program news
9:25 – 9:30	Review of minutes from December 10, 2015 meeting
9:30 – 10:30	Update on onsite wastewater nitrogen reduction activities since last meeting
10:30 – 11:30	Florida Water Management Inventory
11:30 – 11:45	New business <ul style="list-style-type: none">• Research priorities
11:45 – 11:55	Public comment
11:55 – 12:00	Closing comments, next meeting, and adjournment

Introductions & Housekeeping

- Committee roll call
- Identification of audience
- How to view web conference
- Mute / unmute phone line = *6
- Do not put phone on hold
- Download meeting material:

<http://www.floridahealth.gov/environmental-health/onsite-sewage/research/rrac.html>

Old Business

1. Update on RRAC positions up for renewal in January 2017:
 - Consumer
 - State University System
 - Local Government (Florida Association of Counties and Florida League of Cities)
2. Nitrogen Study Final Report submitted to Legislature December 31, 2015

<http://floridahealth.gov/nitrogen>

Research Program News

Restructuring of program: Research & Engineering section



Eberhard Roeder
Program Engineer

- Performs program engineering
- Technical expert



Elke Ursin
Program Manager

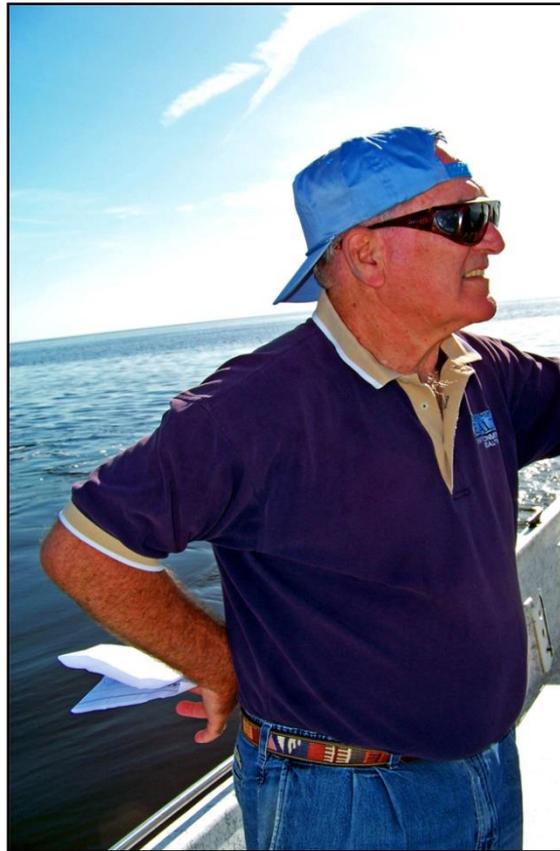
- Coordinates program
- Manages research projects



Xueqing Gao
Program Consultant

- Coordinates outreach
- Technical assistance

Research Program News



Passing of Paul Booher on August 12, 2016

Review of December 10, 2015 Meeting Minutes

Action items from previous meeting:

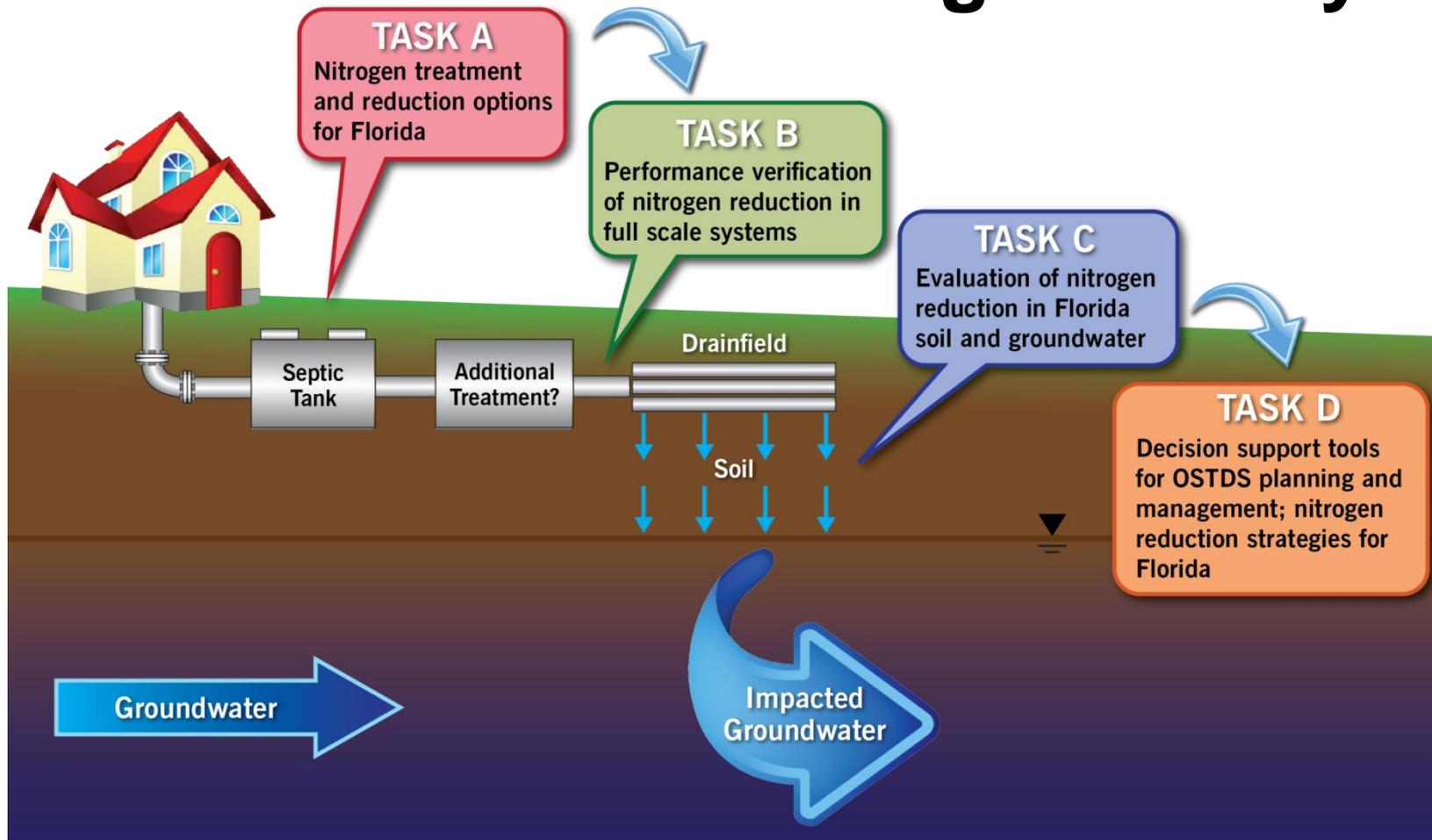
Elke Ursin will send the December 8, 2015 version of the report with tracked changes to the RRAC.

Status: Completed on December 16, 2015

Elke Ursin will send an email to the RRAC email distribution list for interested parties within the next several days summarizing the meeting and informing them of the comment deadline of close of business on December 16, 2015

Status: Completed on December 16, 2015

Florida Onsite Sewage Nitrogen Reduction Strategies Study



DOH Involvement in the DEP – Led, OSTDS Remediation Plan Development

Dr. Xueqing Gao

Onsite Sewage Program
Bureau of Environmental Health
Division of Disease Control and Health Protection
Florida Department of Health

October 21, 2016

Topics

- Florida Department of Environmental Protection (DEP)'s onsite sewage treatment and disposal system (OSTDS) remediation plan development
- Florida Department of Health (DOH)'s involvement in the OSTDS remediation plan development
- Proposed rule revision on Florida Administrative Code Chapter 64E-6

Acknowledgement

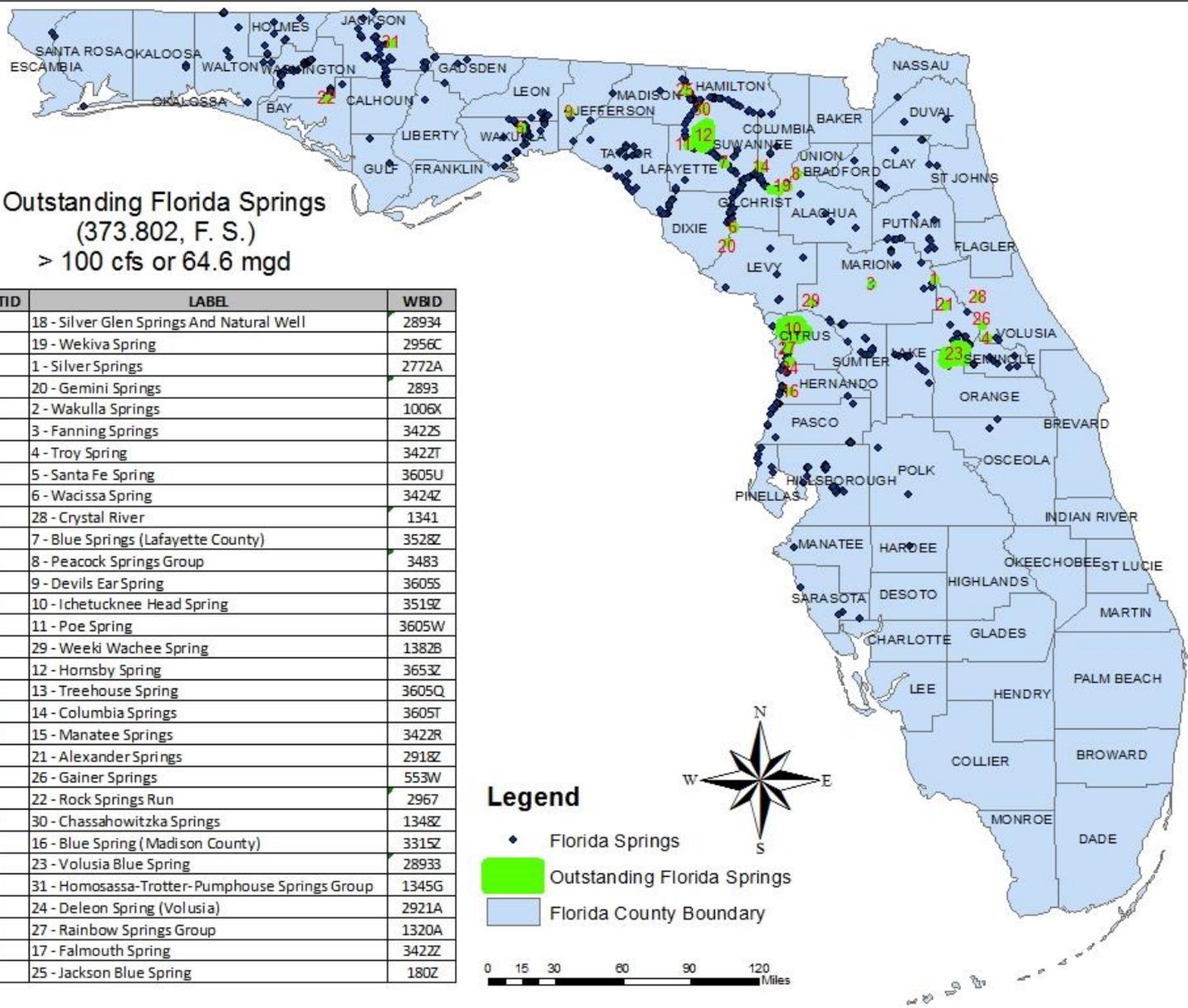
Many slides from this presentation were provided by:

Ms. Elke Ursin

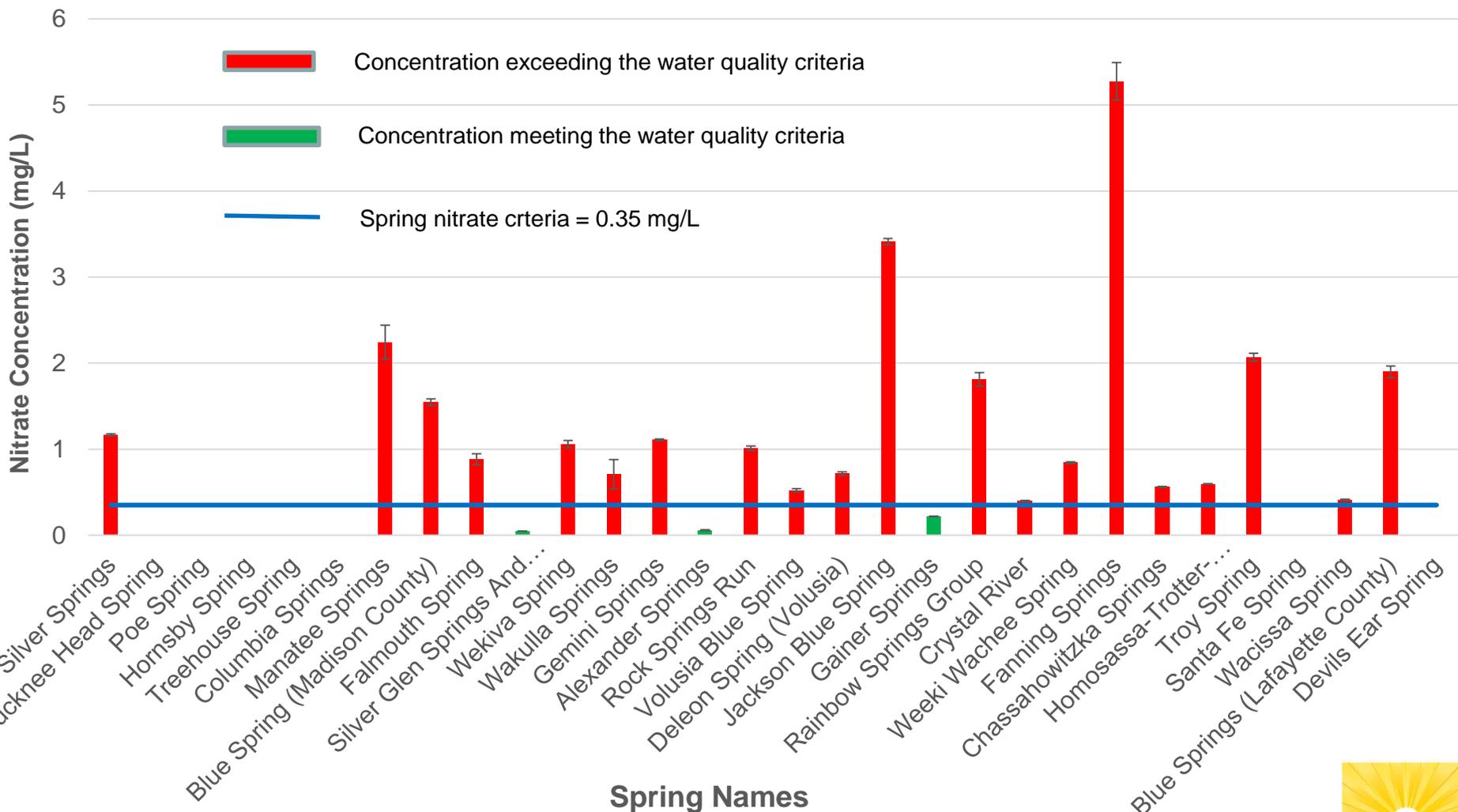
Mr. Ed Barranco

Outstanding Florida Springs
 (373.802, F. S.)
 > 100 cfs or 64.6 mgd

OBJECTID	LABEL	WBID
1	18 - Silver Glen Springs And Natural Well	28934
2	19 - Wekiva Spring	2956C
3	1 - Silver Springs	2772A
4	20 - Gemini Springs	2893
5	2 - Wakulla Springs	1006X
6	3 - Fanning Springs	3422S
7	4 - Troy Spring	3422T
8	5 - Santa Fe Spring	3605U
9	6 - Wacissa Spring	3424Z
10	28 - Crystal River	1341
11	7 - Blue Springs (Lafayette County)	3528Z
12	8 - Peacock Springs Group	3483
13	9 - Devils Ear Spring	3605S
14	10 - Ichetucknee Head Spring	3519Z
15	11 - Poe Spring	3605W
16	29 - Weeki Wachee Spring	1382B
17	12 - Hornsby Spring	3653Z
18	13 - Treehouse Spring	3605Q
19	14 - Columbia Springs	3605T
20	15 - Manatee Springs	3422R
21	21 - Alexander Springs	2918Z
22	26 - Gainer Springs	553W
23	22 - Rock Springs Run	2967
24	30 - Chassahowitzka Springs	1348Z
25	16 - Blue Spring (Madison County)	3315Z
26	23 - Volusia Blue Spring	28933
27	31 - Homosassa-Trotter-Pumphouse Springs Group	1345G
28	24 - DeLeon Spring (Volusia)	2921A
29	27 - Rainbow Springs Group	1320A
30	17 - Falmouth Spring	3422Z
31	25 - Jackson Blue Spring	180Z



Long-term Average Nitrate Concentrations in Outstanding Florida Springs

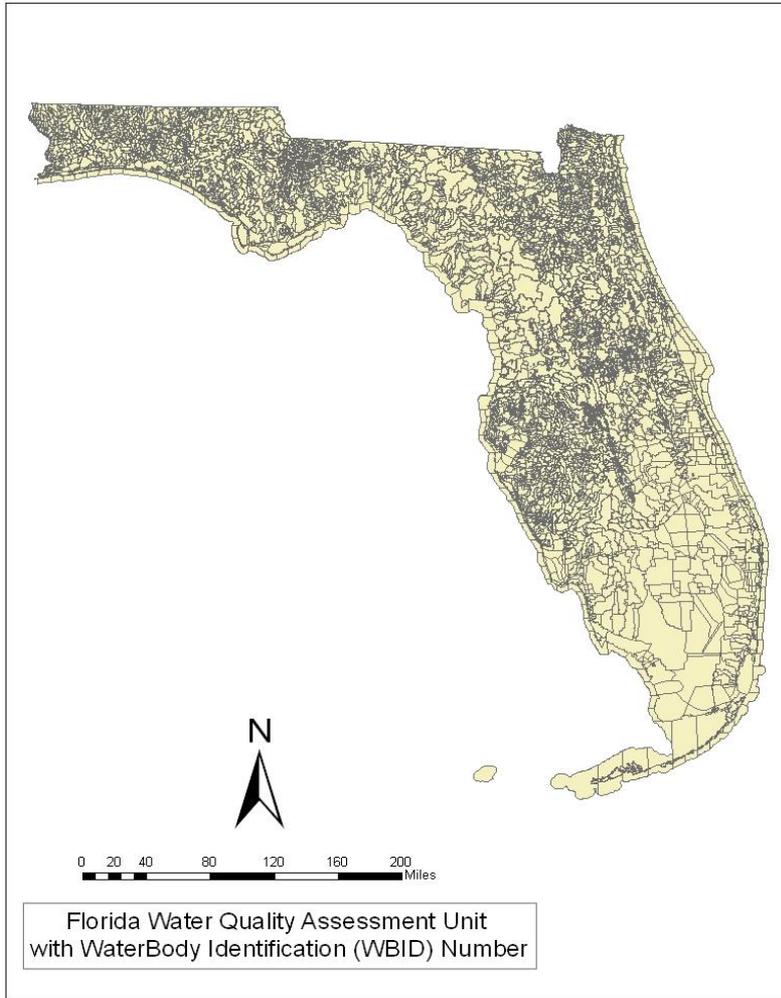


Florida Watershed Restoration Act (Section 403.067 Florida Statute (F.S.))

- Requires DEP to identify and list impaired waters in Florida on the Verified List adopted as Secretarial Order
- Develop Total Maximum Daily Loads (TMDLs) for verified impaired water-parameters
- Develop Basin Management Action Plans (BMAPs) to implement TMDLs
- Implement TMDLs



Waterbody Segments Assessed by FDEP

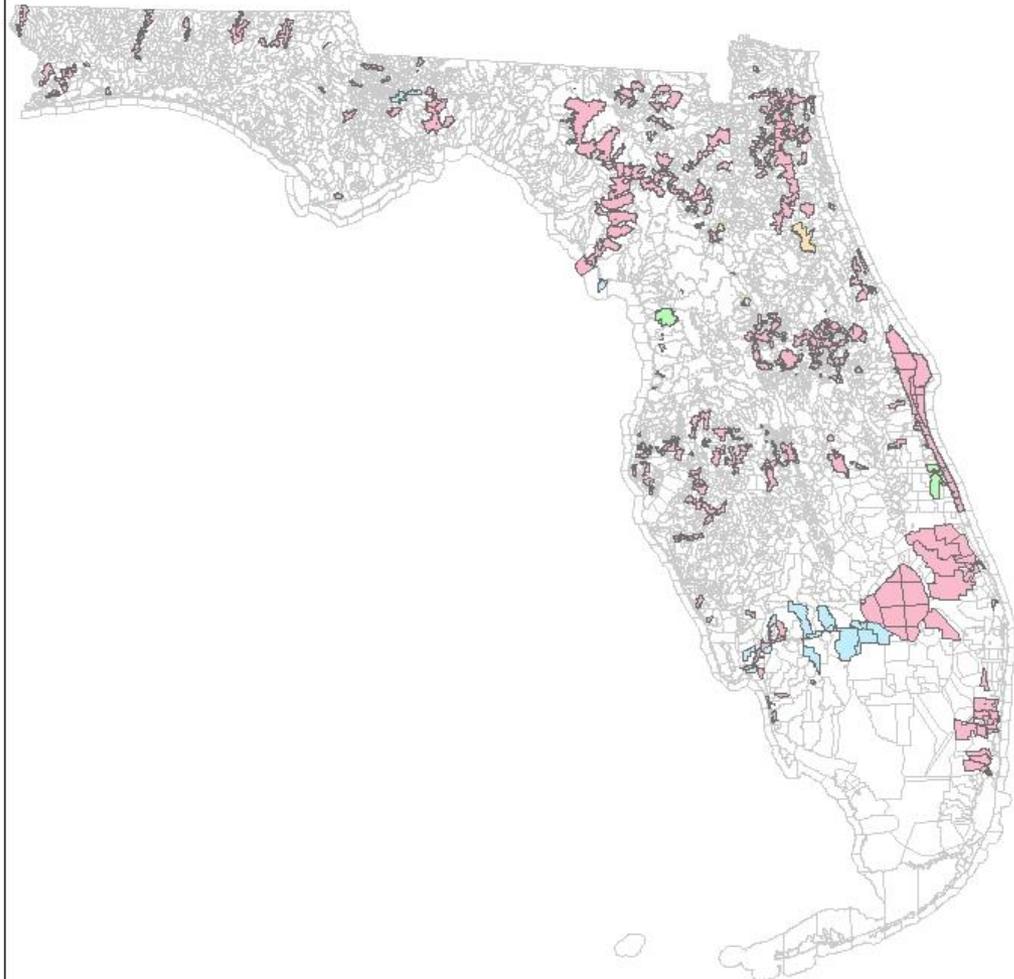


Waterbody Types	WBID Counts
Lake	1,449
Stream	3,790
Estuary	1,226
Spring	139
Total	6,604

Verified Impairments on FDEP's Comprehensive Verified List

Parameters Assessed	Number of Listed WBID-Parameter Combinations	Percent Listing
Nutrient/DO Listing	1,062	38%
Mercury Listing	900	32%
Bacteria Listing	677	24%
Other Listing	136	5%
Total Listing	2,775	100%

Florida TMDLs (Not Including the Statewide Mercury TMDLs)



Legend

 Waterbody ID (WBIDs)

Florida TMDL Status

 Draft

 State Adopted TMDL

 State Adopted TMDL and EPA Approved

 Under Development



Miles

0 20 40 80 120 160 200

1:4,238,734

Albers Equal Area NAD83 HARN



This map is based on sources of varied accuracy and scale provided by multiple organizations. FDOH assumes no liability for the use of this map and associated data.

Protection of Water Quality in Outstanding Florida Springs (OFSs) (Section 373.807 F. S.)

- Identify all OFSs impaired for nutrients by July 1, 2018
- Concurrent with the TMDL adoption, the BMAP development shall initiate, and final BMAP shall be adopted within **two** years from the initiation
- BMAPs shall target achievement of TMDL goals in 20 years
- Phased targets shall be established for 5, 10, and 15 years

Protection of Water Quality in OFSs (Section 373.807 F. S.) - Continued

- If OSTDS contributed 20% or more of the nonpoint source nitrogen loads to groundwater or DEP determines it is needed, an OSTDS remediation plan will be developed as part of the BMAP
- DEP will work with DOH, local governments, public, and private wastewater utilities to develop the remediation plan and adopt the plan as part of the BMAP
- BMAPs adopted before July 1, 2016, addressing OFSs will be revised by July 1, 2018, if necessary

Protection of Water Quality in Outstanding Florida Springs (OFSs) (Section 373.807 F. S.) - Continued

Three Major Components of the OSTDS Remediation Plan:

1. Cost effective and financially feasible projects to reduce nitrogen loads from OSTDS
2. Scientific information on effects of nutrients, especially nitrogen, on springs and spring systems
3. Public education plan to provide area residents with reliable, understandable information about onsite sewage treatment and disposal systems and springs

Outstanding Florida Springs

Impairment

Impaired, OSTDS Remediation Plan Needed

Not Impaired

Insufficient Data

Spring	County	Spring	County
Hornsby Spring	Alachua	Alexander Springs	Lake
Poe Spring	Alachua	Manatee Spring	Levy
Treehouse	Alachua	Fanning Spring	Levy
Gainer Springs	Bay	Madison Blue Spring	Madison
Kings Bay Springs /Crystal River	Citrus	Silver Springs	Marion
Chassahowitzka Spring Group	Citrus	Rainbow Springs	Marion
Homosassa Springs	Citrus	Silver Glen Springs	Marion
Santa Fe Spring	Columbia	Wekiwa Spring	Orange
Ichetucknee Springs Group	Columbia	Rock Springs	Orange
Columbia Spring	Columbia	Peacock Springs	Suwannee
Devil's Ear Spring	Gilchrist	Falmouth Spring	Suwannee
Weeki Wachee Spring	Hernando	Volusia Blue Spring	Volusia
Jackson Blue Spring	Jackson	DeLeon Springs	Volusia
Wacissa Group	Jefferson	Gemini Springs	Volusia
Lafayette Blue Spring	Lafayette	Wakulla Spring	Wakulla
Troy Spring	Lafayette		

Springs-BMAP Development with FDOH involvement

Contribution of N from Different Sources
Sum of Fields



BMAP ID	PROJECT	BMAP ¹ Status	PFA ² Status	NSILT ³ Status	Total Nitrate Loads to Groundwater (lb-N/yr.)	Percent Nitrate Contributed by OSTDS ⁴	Percent Difference between NSILT OSTDS to FLWMI ⁵ OSTDS
0	Volusia Blue Springshed	Q2-17	Oct-16	drafted	514,095	54%	Using FLWMI
1	Wakulla Springs	Oct-15	Completed	Completed	341,848	51%	4%
2	Rainbow Springs and Rainbow River	Dec-15	Completed	Completed	602,405	19%	-41%
3	Silver Springs	Oct-15	Completed	Completed	752,978	38%	-11%
4	Wekiva	Oct-15	Sep-16	Feb-17			
5	Kings Bay	Jun-17	Drafted	Updated	592,440	42%	Using FLWMI
6	Weeki Wachee	Q3-2017	Drafted	Updated	900,000	30%	Using FLWMI
7	Aripeka	Q3-2017	Not Needed	drafted	19-Oct	19-Oct	Using FLWMI
8	Homosassa	Q4-17	Drafted	drafted	19-Oct	19-Oct	Using FLWMI
9	Chassahowitzka	Q4-17	Drafted	drafted	19-Oct	19-Oct	Using FLWMI

Note:

1: BMAP stands for Basin Management Action Plan.

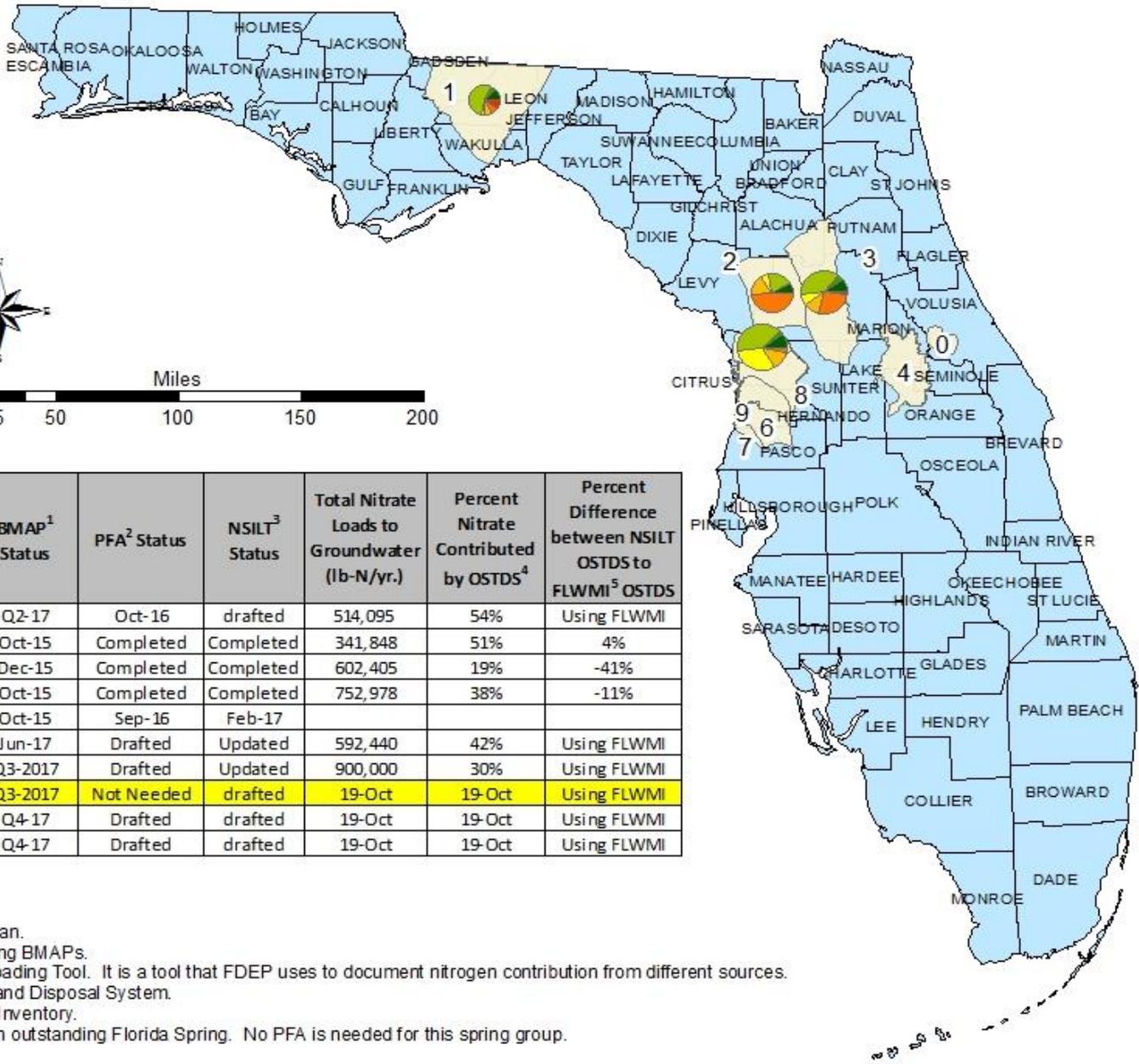
2: PFA stands for the Priority Focus Area for Spring BMAPs.

3: NSILT stands for Nitrogen Source Inventory Loading Tool. It is a tool that FDEP uses to document nitrogen contribution from different sources.

4: OSTDS stands for Onsite Sewage Treatment and Disposal System.

5: FLWMI stands for Florida Water Management Inventory.

Aripeka Springs (highlighted with yellow) is not an outstanding Florida Spring. No PFA is needed for this spring group.



OSTDS Remediation Plan Meetings since December 2015

Spring Basin	Impacted Counties	# of Meetings
Volusia Blue Spring	Volusia	3
Wakulla River Basin	Gadsden, Jefferson, Leon, and Wakulla	4
Kings Bay – Crystal River	Citrus	6
Weeki Wachee Basin (Aripeka)	Hernando and Pasco	6
Homosassa - Chassahowitzka	Citrus and Hernando	1
Wekiva River and Rock Springs Run Basin	Lake, Seminole, and Orange	3
Rainbow and Silver Springs Basin	Alachua, Putnam, Marion, Lake, Sumter, Levy	3

OSTDS Remediation Plan Meetings Summary

1. BMAP overview
2. Advisory committee (if used) establishment and Sunshine Law (Rainbow, Silver, Wekiwa, and Wakulla)
3. Statutory requirement of OSTDS remediation plan (Section 373.807, F.S.)
4. Establish the priority focus area (Section 373.803, F.S.)
5. Three major components of the OSTDS remediation plan

OSTDS Remediation Plan Meetings Summary, cont.

6. Major nitrogen sources in each basin and load contribution (nitrogen source inventory loading tool – NSILT)
7. Percent reduction of nitrogen loads needed to achieve TMDL targets
8. 5-year, 10-year, and 15-year milestone load reduction goals
9. Compilation of sewage treatment projects
10. Education program: message, audience, and methods of communication

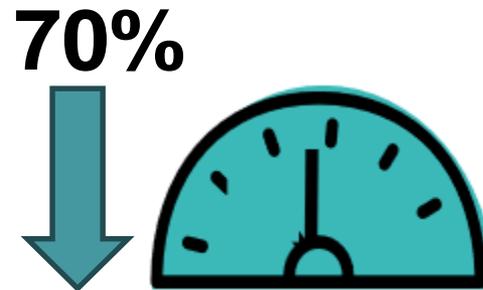
DOH Involvement in OSTDS Remediation Plan Development

1. DOH County Health Departments - Advisory Committee members in Wakulla, Wekiva, Silver and Rainbow Springs
2. Central Office staff presented on:
 - Passive nitrogen removal strategy study
 - Available nitrogen removal OSTDS technologies
 - Tools for evaluating OSTDS efficiency and life-cycle cost
 - How passive systems will be permitted
 - Florida Water Management Inventory

Nitrogen Reduction Options for Onsite Wastewater



Conventional
systems



Lined drainfield
& existing
advanced
technologies



Nitrogen
reducing
systems

“Passive” Nitrogen Reduction Systems

Reduce effluent N using reactive media for denitrification and a single liquid pump, if necessary.

Wastewater from home



Stage 1
(nitrification)



Dispersal



Stage 2
(denitrification)



Test Facility

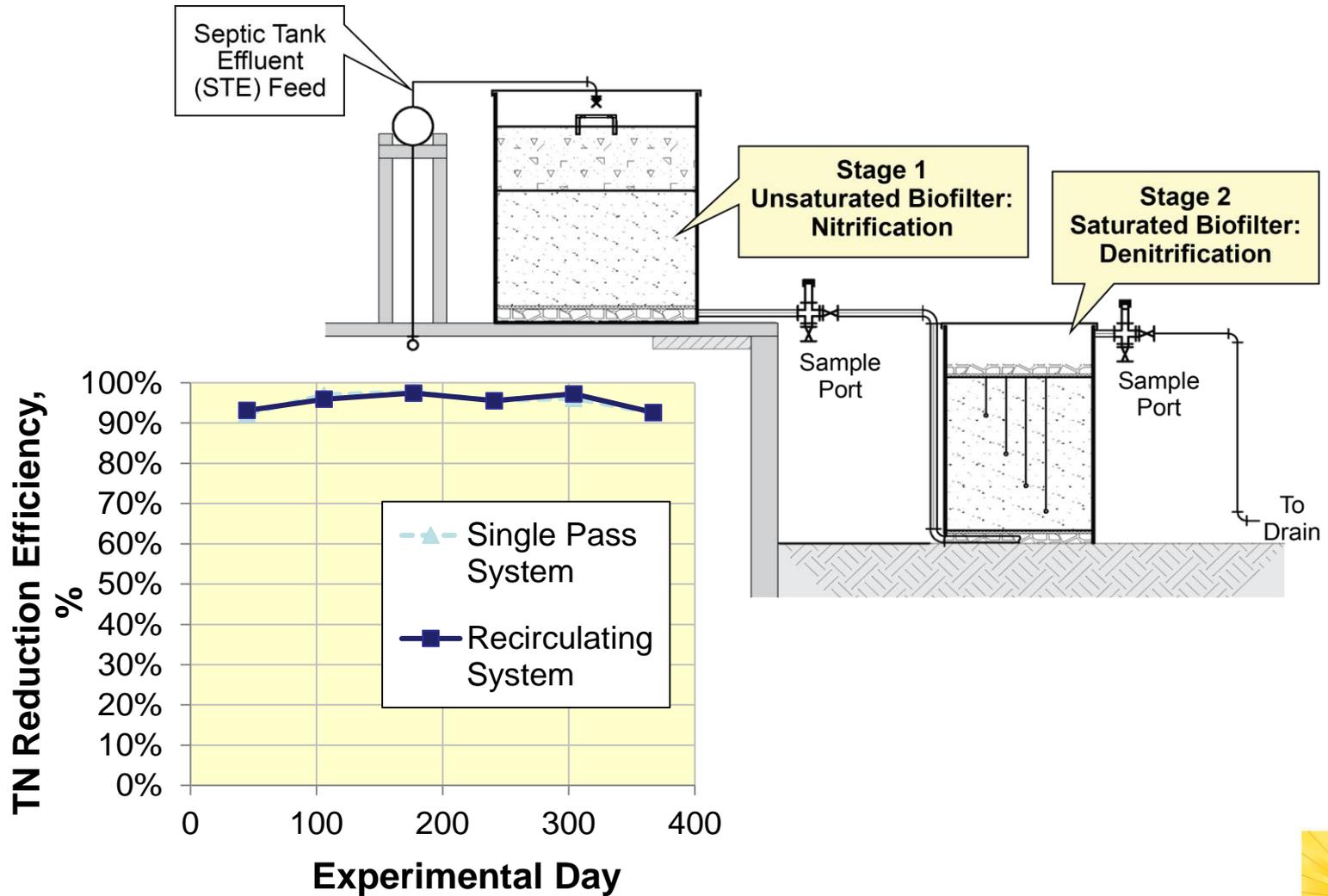
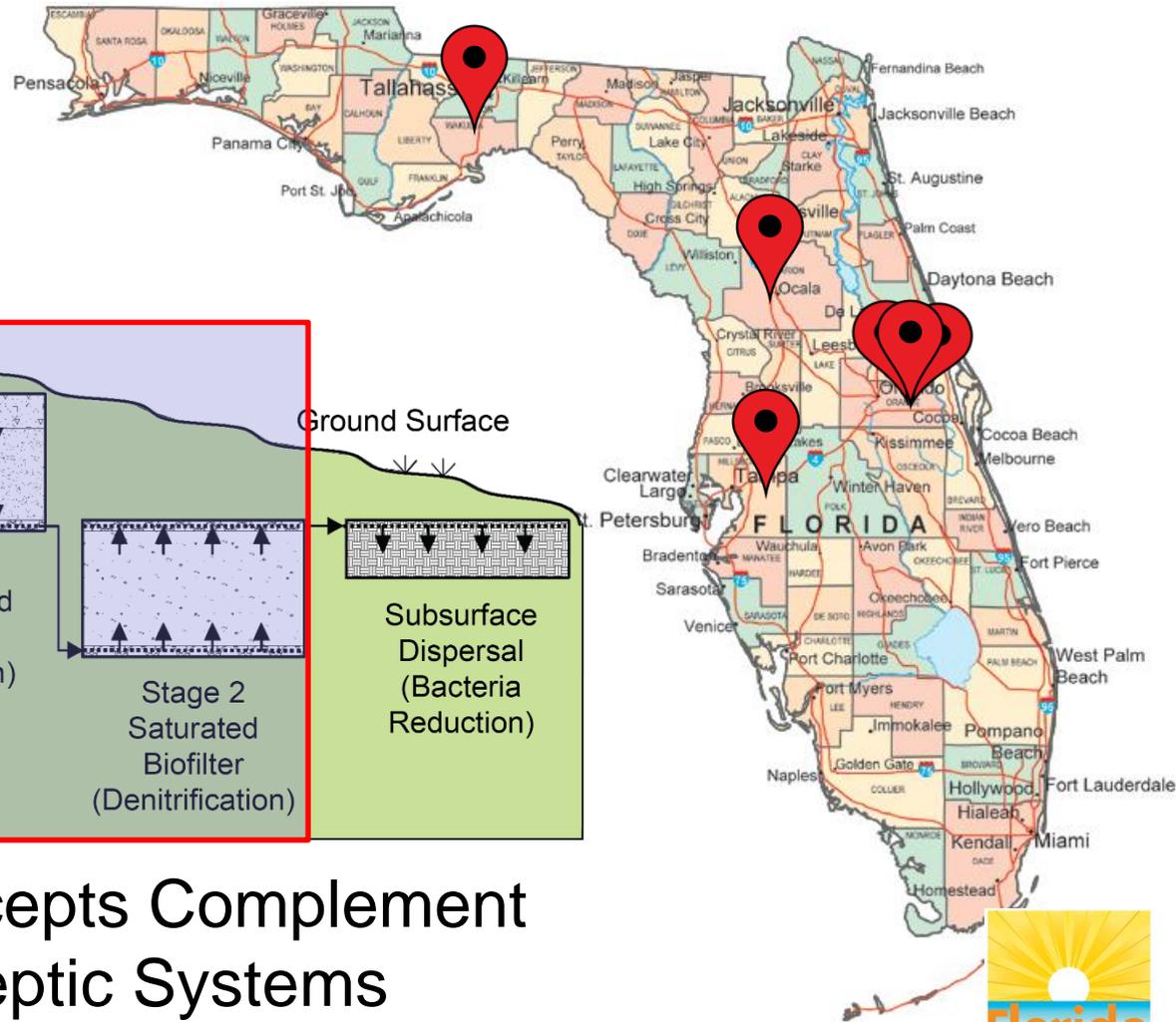
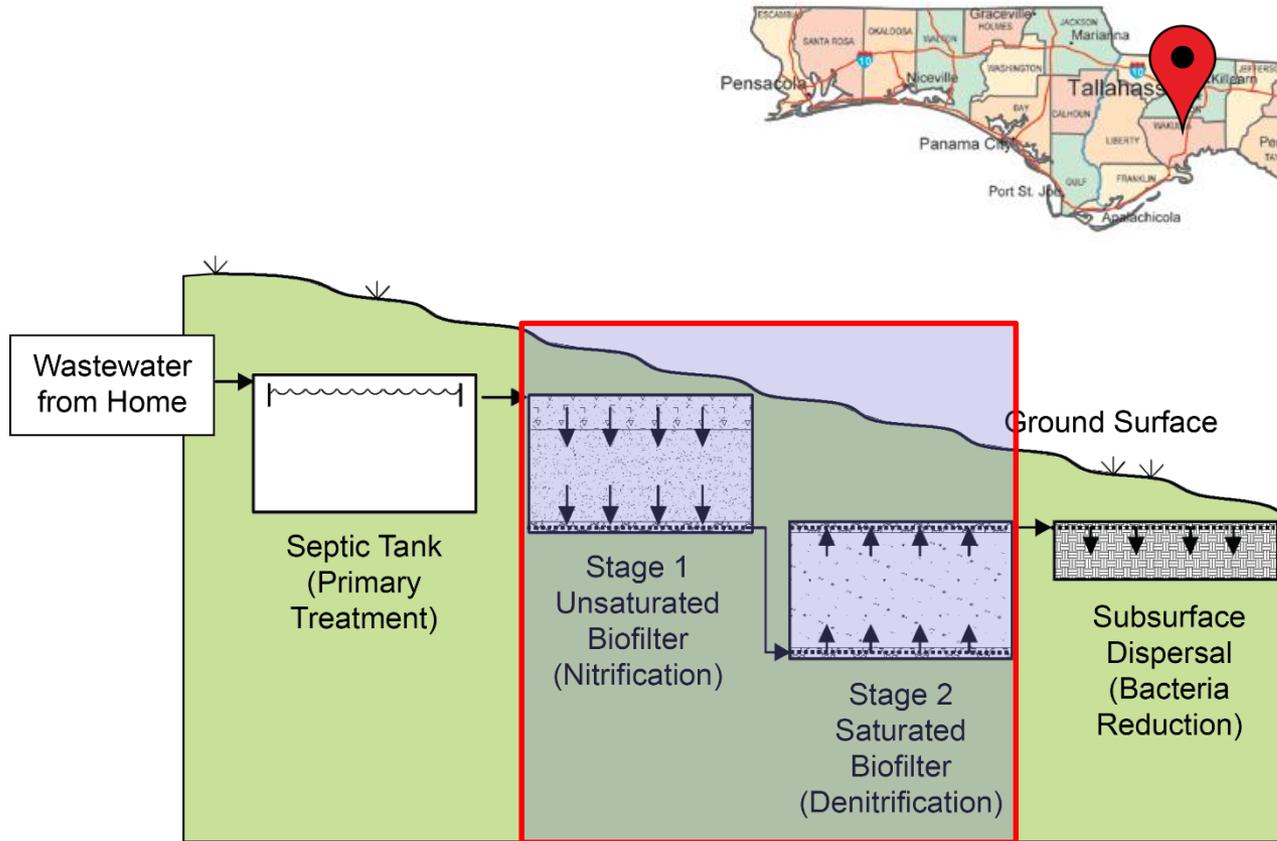


Image Credit: Hazen and Sawyer

Nitrogen Reduction at Field Sites

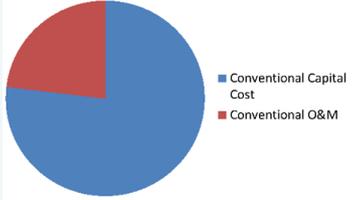


Full Scale Concepts Complement Existing Septic Systems

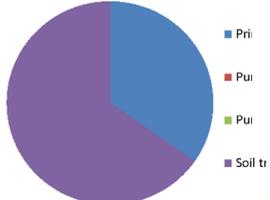


CONVENTIONAL

Present Worth (2015 dollars)



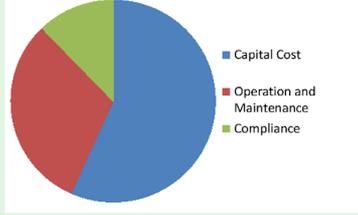
Capital Cost



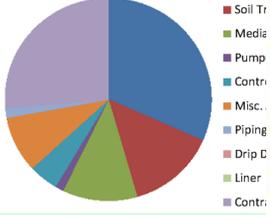
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PASSIVE NITROGEN

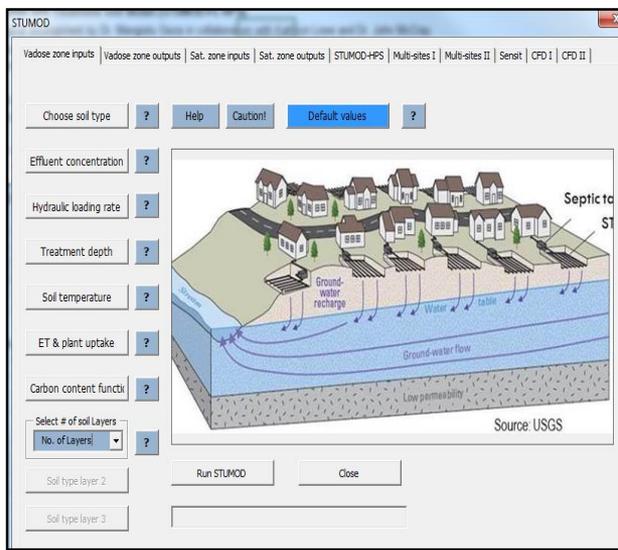
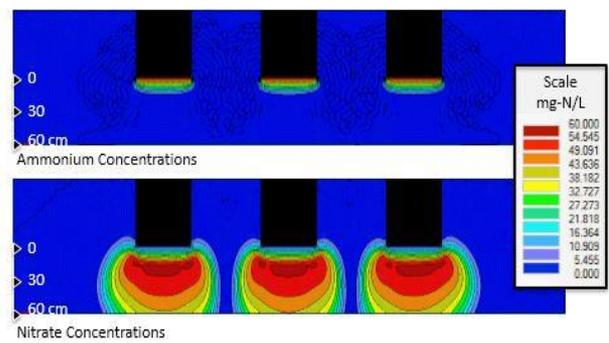
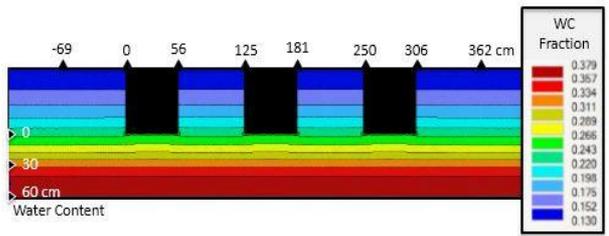
Present Worth (2015 dollars)



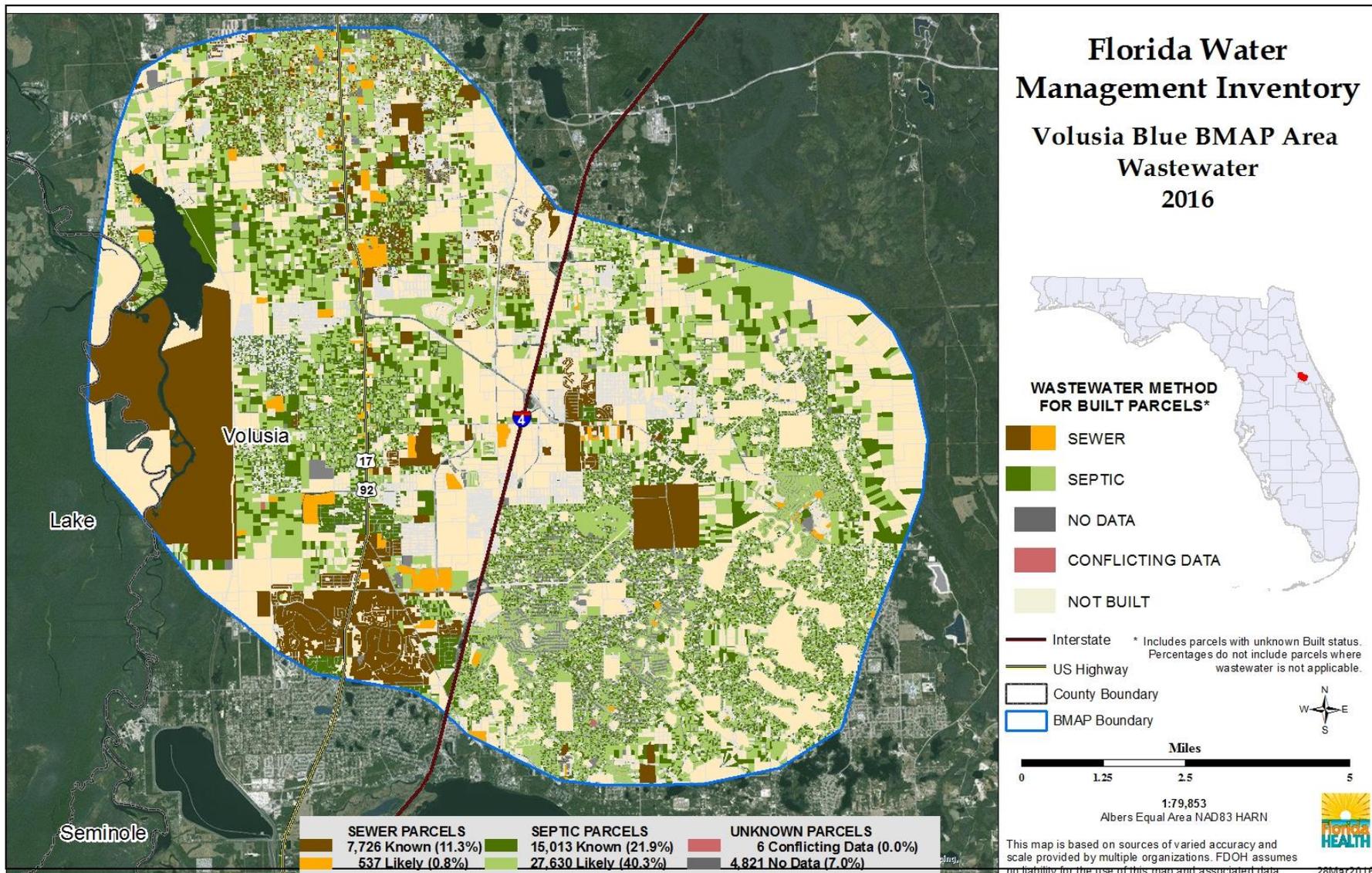
Capital Cost



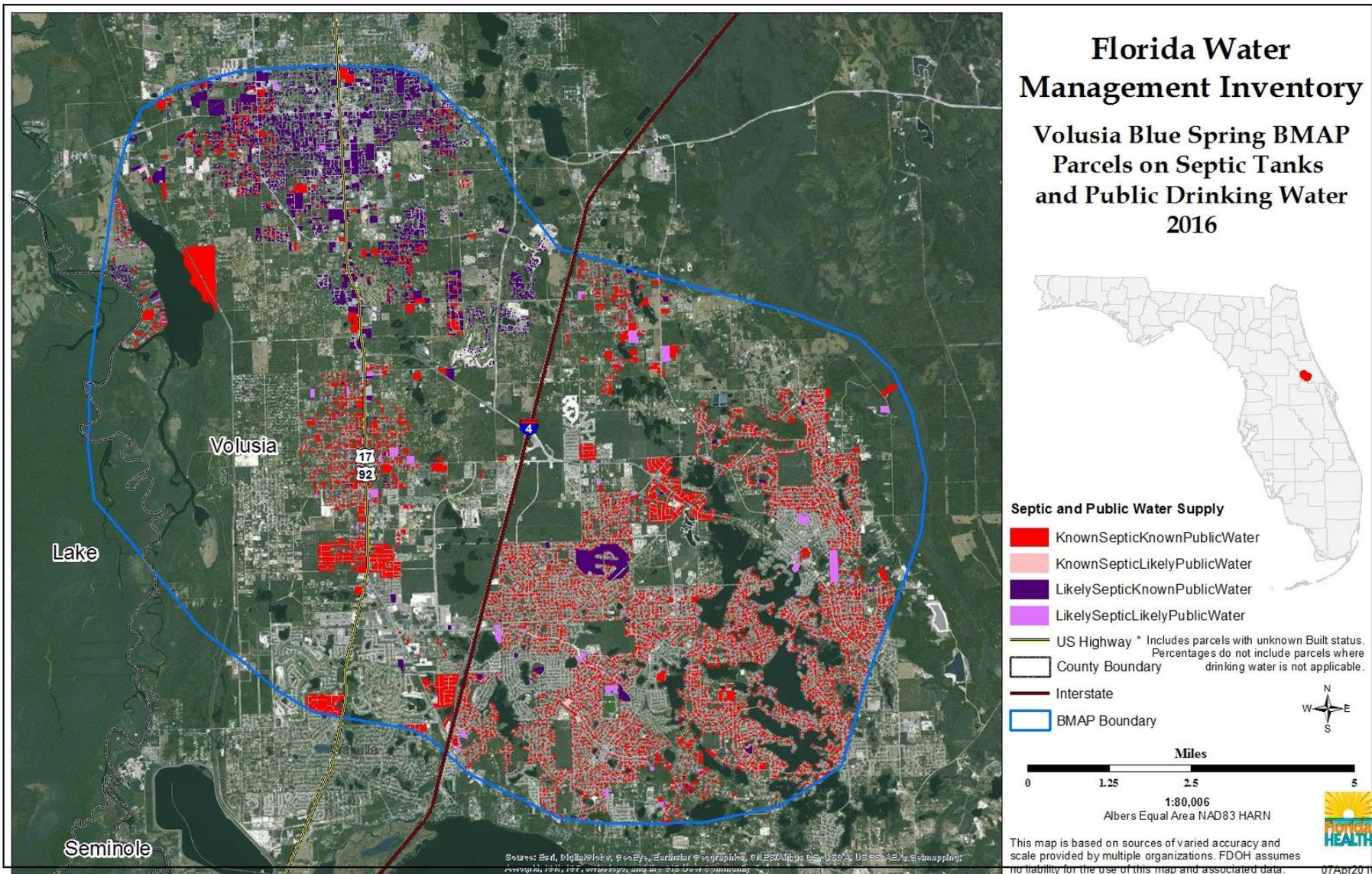
- Tanka
- Soil Tr
- Media
- Pump
- Contr.
- Misc.
- Piping
- Drip D
- Liner
- Contr.



Wastewater Distribution



Expanding the Analysis



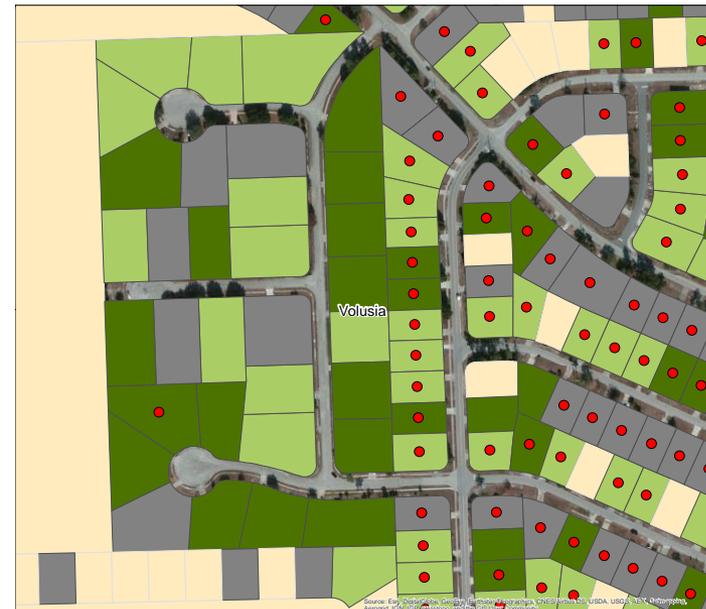
Comparison of Tools

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

	FLWMI	NSILT	Matching Parcels
# septic systems (BMAP)	43,131	41,171	36,207 (89%)

For the ones that don't match, main differences are:

- NSILT septic tanks are missing from FLWMI parcels that are known or likely on septic



DOH Involvement in OSTDS Remediation Plan Development - Continued

3. DOH headquarter staff frequently meet with DEP staff to:
 - Discuss OSTDS related issues
 - Review NSILT reports and provide feedback
 - Perform quality assurance/quality control (QA/QC) on the OSTDS data used in DEP NSILT development
 - Provide technical assistance to DEP's water quality model development
 - Provide data and analyses to help DEP identify locations for priority projects

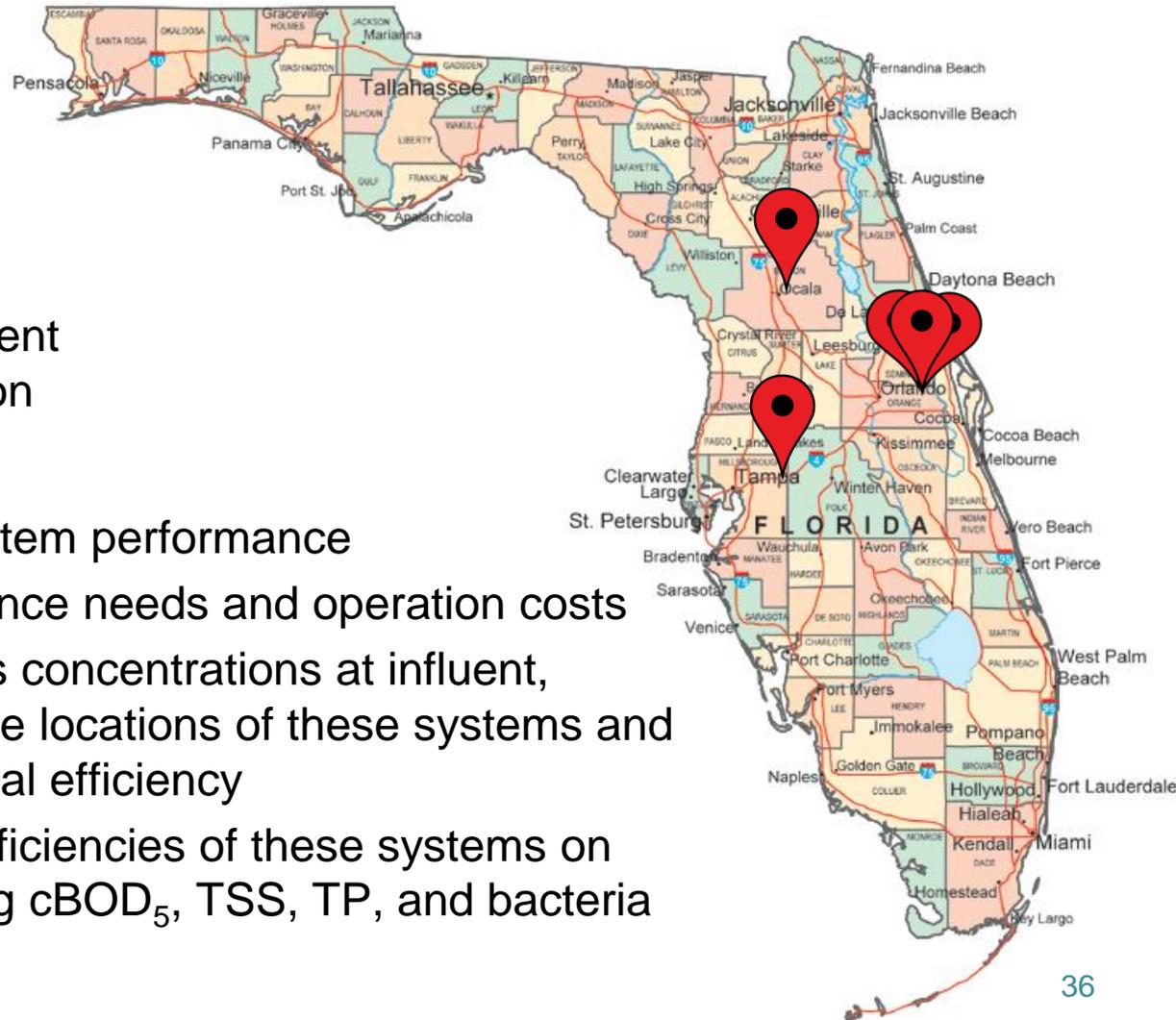
DOH Continues Monitoring on Five Full Scale Passive Nitrogen Removal OSTDS

1. Goals

- Establish long-term performance of the two-stage passive nitrogen removal technology
- Provide guidance for possible system refinement and future implementation

2. Objectives

- Continue monitoring system performance
- Document the maintenance needs and operation costs
- Monitor nitrogen species concentrations at influent, effluent, and intermediate locations of these systems and evaluate nitrogen removal efficiency
- Monitor the treatment efficiencies of these systems on other pollutants including cBOD₅, TSS, TP, and bacteria



OSTDS Rule Revision

Liner system: Incorporation of a nitrogen-reducing media layer of lignocellulosic material over an impermeable membrane liner beneath the drainfield.

1. Standard septic tank followed by standard sized drainfield
2. 18 inches of sand or fine sand (Nitrification region)
3. 12 inches of media mixed with finer sand (denitrification region)
4. Impermeable membrane
5. Media and membrane extend 3.5 feet beyond the perimeter of the drainfield
6. Water table at least 6 inches below the membrane
7. Estimated overall nitrogen reduction treatment effectiveness of 60-65%

OSTDS Rule Revision - Continued

1. Proposed revisions were presented to the Technical Review Advisory Panel (TRAP) on October 22, 2015, and August 31, 2016.
2. TRAP and stakeholders provided feedback on proposed rule and emphasized the need for monitoring the first 25-30 liner systems installed.
3. A group of stakeholders and a TRAP member met with DEP on September 16, 2016, discussing the need for monitoring and possible funding sources to support the monitoring.
4. The group and DEP reportedly concluded to support the proposed rule language, with some revisions.
5. Stakeholders are working on revising the proposed rule revisions. Revised new rule language will be provided to DOH soon.
6. DOH staff members are developing performance specifications for systems using the in-tank passive nitrogen removal unit in preparation of classifying these systems as performance-based treatment systems.



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Onsite Sewage Research and Engineering
Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Environmental Health

To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.





An Overview of The Florida Water Management Inventory

October 21, 2016

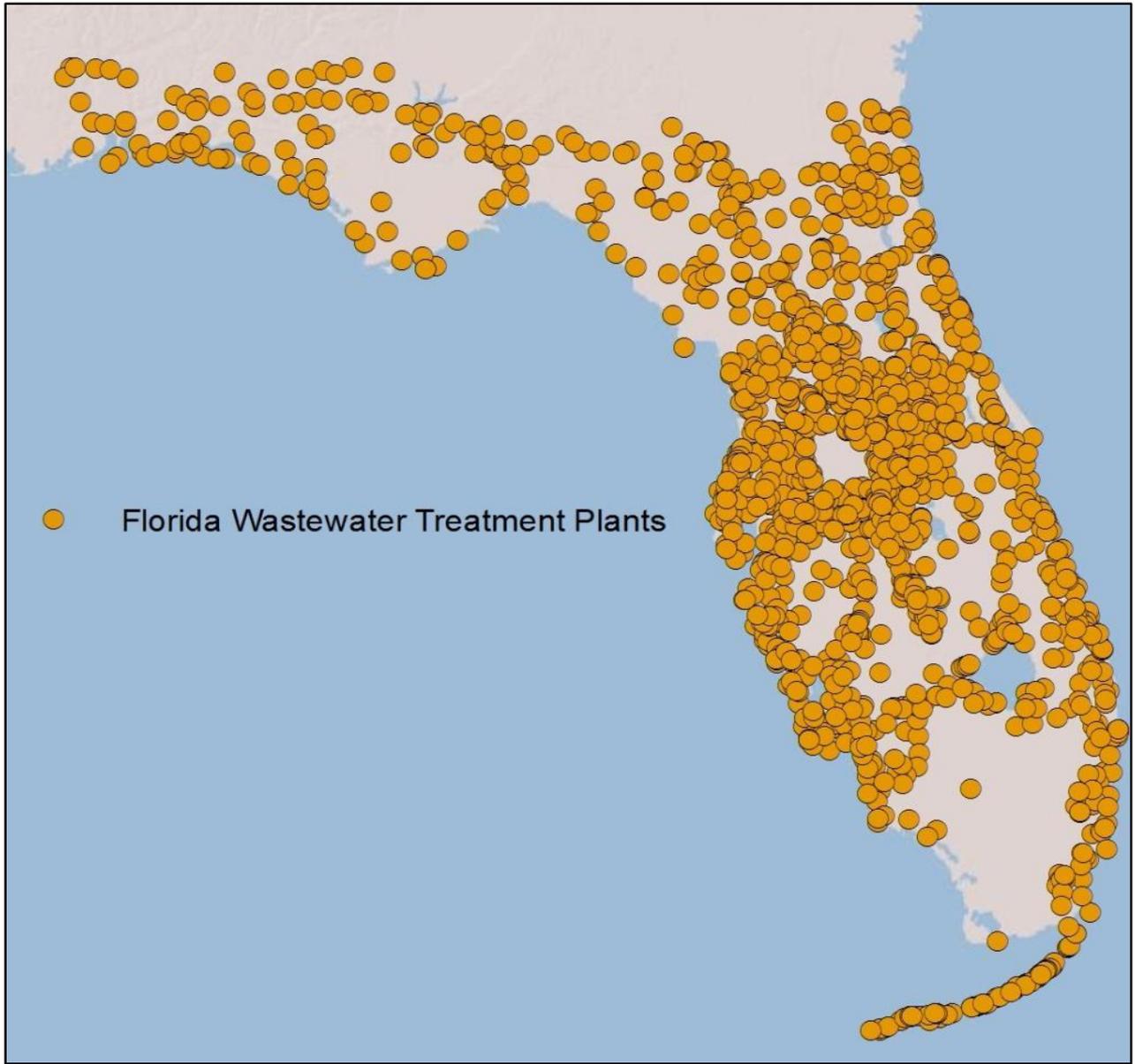
Florida Department of Health

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WHERE DOES IT GO?





History

Laws of Florida, 2008-152, Specific Appropriation 1682:
Department of Health to provide a statewide inventory of
onsite treatment and disposal systems

Completed under contract by EarthSteps and GlobalMind
June 2009

Estimated 3.5-million septic systems in Florida, compared
to DOH estimate from census data of 2.68-million

Collected data representing 80% of all permitted DEP
wastewater treatment facilities

RRAC voted the continuation of this project as a priority at
the May 27, 2009 meeting



floridahealth.gov/FLWMI

PROJECT GOAL

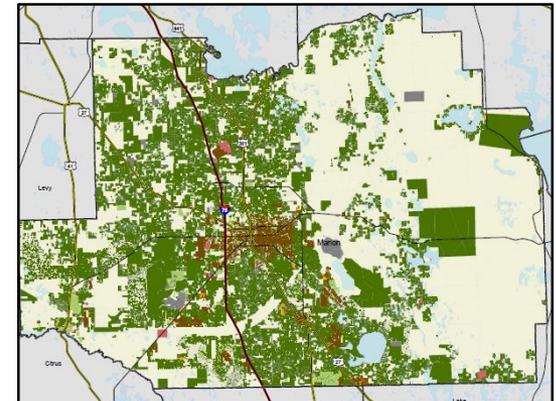
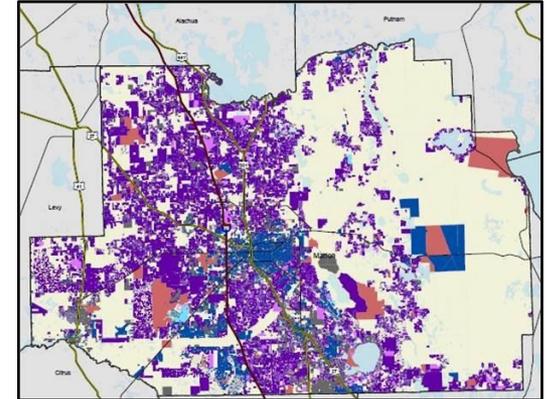
To map the drinking water source and wastewater treatment method for every built property in Florida

Project Goal



The goal of the **Florida Water Management Inventory** project is to link each built property/parcel in the state to the following information:

- Drinking Water Source
 - Public Water, Private Well, or Limited Use Well
- Wastewater Treatment Method
 - Central Sewer, or Onsite Wastewater



Business Need

- Florida has no centralized data source for wastewater treatment methods or drinking water sources
- Data are fragmented between several public and private entities
- Current data are often not reliable:
 - They are not uniform in their structure; or
 - They are out of date; or
 - There are conflicts between different entities

Business Need (cont.)

- Information about drinking water sources and wastewater treatment methods are vital for disaster preparedness and response activities, local planning evaluations, and environmental risk assessments.
- These activities relate to environmental health and the protection of public health by detecting and preventing disease caused by natural and manmade factors in the environment.

Data Sources



Property Appraisers &
DOR

- Parcel Data

DEP

- Locations of Wastewater Treatment Facilities
- Location of Public Water Systems

Water Management
Districts

- Private Well Permitting Data

County DOH Offices

- Septic Tank Permitting Data
- Private Well Permitting Data (*Delegated Counties*)

DOH Central Office

- Environmental Health Database (EHD)

Public Service
Commission

- Utility Service Area Boundaries

DBPR

- Limited Data on Licensed Businesses

DOACS

- Limited Data on Licensed Businesses

Utilities

- Locations of Properties Served

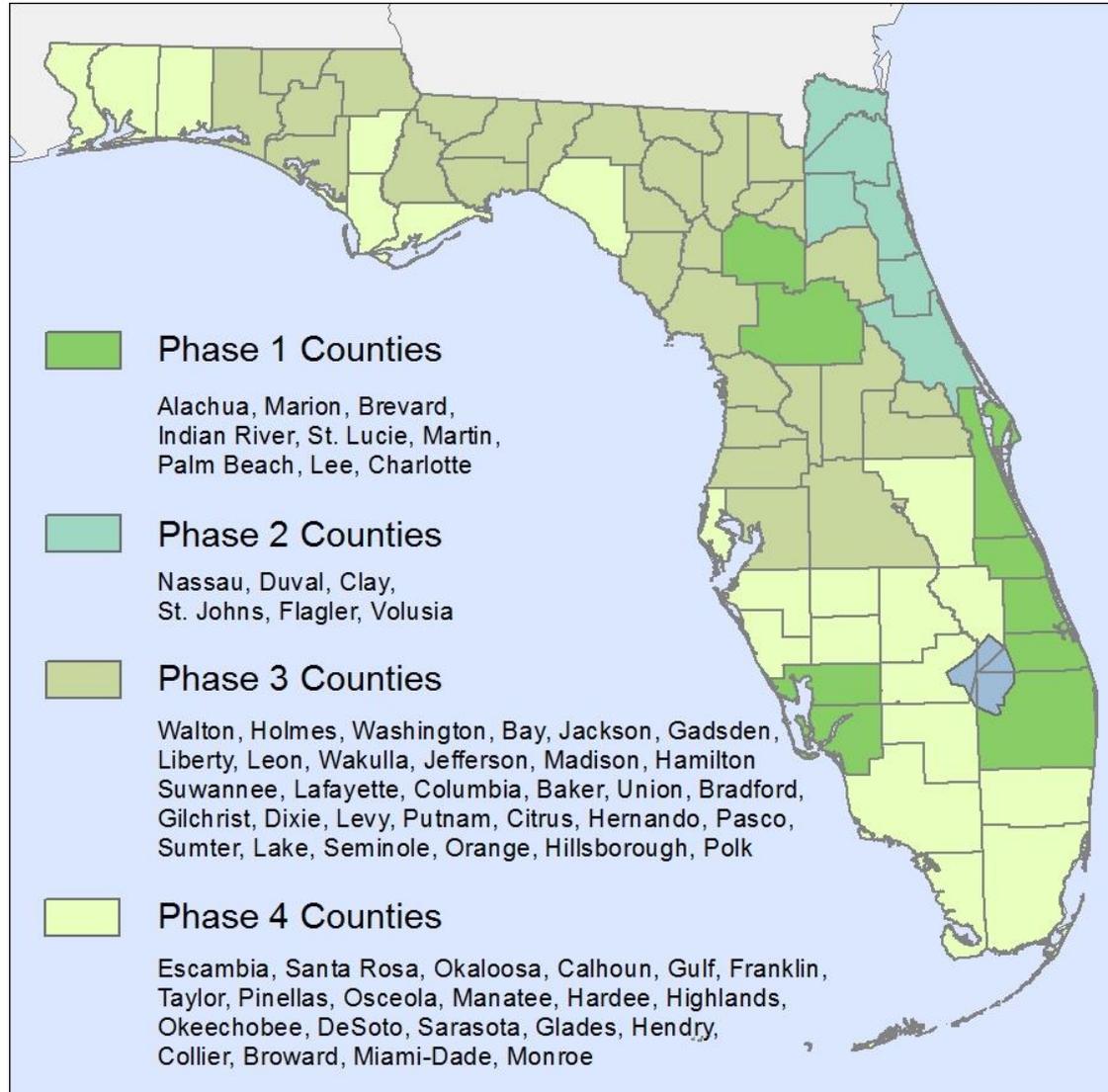
Project Team & Roles

- Responsible to Stakeholders for Project Goals
- Strategic Decision Making



- Primary Resource for Standardizing Source Data Sets and Geocoding
- Day-to-Day Task Management and Decision Making
- Primary Resource for Data Gathering & Contact Management
- Primary Resource for Compiling, Analyzing, and Mapping Source Data Sets in GIS

Counties by Phase



Contact Management & Data Gathering



- DEP Permitting Information as Source Data
- Contact Utility Providers
- Log Responses in Inventory Database
- Create Indexes for Each County

FacilityID	CountyName	ParentOrganization	FacilityName	ContactFirstName	ContactLastName	Email
2014211	Alachua	Alachua County Parks	LAKE LOCHLOOSA PARK	James	Robbins	JAROBINS@ALACHUACOU
2014216	Alachua	Alachua County Parks	OWEN-ILLINOIS PARK	Robert	Avery	RMA@ALACHUACOUNTY.US
2014217	Alachua	Alachua County Parks	MONTEOCHA PARK	Robert	Avery	RMA@ALACHUACOUNTY.US
2014203	Alachua	ALACHUA LEARNING CENTER	ALACHUA LEARNING CENTER	Tom	Allin	taillin500@gmail.com
3424636	Marion	ALFIES IRISH PUB & RESTAURANT	ALFIES IRISH PUB & RESTAURANT	Allan	Evans	1-NO-EMAIL
4504969	Palm Beach	ALL STAR KIDS EARLY LEARNING CENTER	ALL STAR KIDS EARLY LEARNING CENTER	Michelle	O'Neill	oneillmichelle@bellsouth
6080009	Charlotte	Alligator Mobile Home Park	ALLIGATOR PARK	Gloria	Ponn	ALLIGATOR-MANAGER@CO
FLA014121	Charlotte	Alligator Mobile Home Park	Alligator Mobile Home Park	Gloria	Ponn	ALLIGATOR-MANAGER@CO
5364115	Lee	ALVA COUNTRY DINER	ALVA COUNTRY DINER	Steve	Sexton	BYOB223@COMCAST.NET
5364162	Lee	ALVA VILLAGE MARKET	ALVA VILLAGE MARKET	Mary Ann	Spence	1-NO-EMAIL
FLA010754	Marion	Amadeus Hotel & Conference	Amadeus Hotel & Conference	Maresh	Marolia	1-NO-EMAIL
6424732	Marion	AMERICAN LEGION POST #58	AMERICAN LEGION POST #58		Facility Contact	1-NO-EMAIL
3424942	Marion	AMERICAN PANEL CORPORATIC	AMERICAN PANEL CORPORATIC	Harmon	Lewis	1-NO-EMAIL
4505008	Palm Beach	AMERIGROW RECYCLING	AMERIGROW RECYCLING		Facility Contact	DAVE@AMERIGROW.COM
5084081	Charlotte	AMI KIDS CROSSROADS WILDE	AMI KIDS CROSSROADS WILDE	John	Davidson	CROSSROADS-ED@AMIKIDS
4434564	Martin	AMVETS POST #14	AMVETS POST #14	Danny	Robinson	1-NO-EMAIL
FLA013847	Martin	Angle Inn Motor Court	Angle Inn Motor Court	Christopher J	Mcarthur	1-NO-EMAIL
4565178	St. Lucie	ANGRY BULL INC.	ANGRY BULL INC.	Eric	Jason	1-NO-EMAIL.YET
3420235	Marion	ANNIE'S FULLMOON SALOON	ANNIE'S FULLMOON SALOON	Scherrie	Gregoire	NEWBREMEN1@HOTMAIL.C
3424991	Marion	ANTHONY FIRST BAPTIST CHURCH	ANTHONY FIRST BAPTIST CHURCH	Julie	Luffman	1-NO-EMAIL
3425061	Marion	ANTONE'S FOREST PIZZA	ANTONE'S FOREST PIZZA	Tony	Labadie	1-NO-EMAIL
3424917	Marion	ANTONIO'S MADE IN ITALY	ANTONIO'S MADE IN ITALY	Karen	Deconna	DALAKIKO@YAHOO.COM
3421560	Marion	Aqua America	OCALA OAKS SUBDIVISION (2)	Patricia	Williams	PRWILLIAMS@AQUAAMERI
3424036	Marion	Aqua America	WEST VIEW SUBDIVISION	Patricia	Williams	PRWILLIAMS@AQUAAMERI

FacilityID	FacilityName	Data Set Status	Data Set Folder	Additional Comments	2014RequestStatus
4434572	I-95 SOUTHBOUND WEIGHT	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
FLA013777	Martin County Rest Area	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
FLA013796	First Fairway WWTF	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website	Inventory Team Researched
4434513	FOX CLUB	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website	Inventory Team Researched
FLA013837	The Fox Club (fka Cobblest	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website	Inventory Team Researched
4431748	FPL - MARTIN PLANT	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	System is only for the power plant; received via	Received
FLA013851	Hohe Sound Mobile Home	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website	Inventory Team Researched
4434549	HUMANIE SOCIETY OF THE	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Received via email on 7/16	Received
4434415	I-95 REST AREA	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
4430667	INDIANTOWN COMPANY INC	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
FLA029939	Indiantown Company Inc	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
4434443	INDIANWOOD CO-OP	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website; no parcel	Inventory Team Researched
4431870	I & S FISH CAMP	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
FLA013821	Jonathan's Landing Golf	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS has two connections, physical address fo	Received
4434418	OLD TRAIL CLUBHOUSE	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS has two connections, physical address fo	Received
4434453	OLD TRAIL GOLF MAINT BLD	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS serves single connection, physical addre	Received
4434435	JUPITER/TEQUESTA CHURCH	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS serves single connection, physical addre	Received
4434473	HOBE SOUND PLAZA	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched parcel on PA website	Inventory Team Researched
4430774	LAKESIDE VILLAGE MHP	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
FLA013853	Lakeside Village MHP	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
4430956	NATALIE ESTATES MOBILE	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
4434567	POMA PARCEL 15	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	Levi researched property, collected parcel ID	Inventory Team Researched
4431456	SOUNDINGS MCHT & TENI	No GIS, Parcel, or Address Data	No Folder	No Correspondence	No Response
4431582	WOODBRIDGE MOBILE VILL	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PID to office; Map image	Inventory Team Researched
4431695	LOUIS DREYFUS CITRUS	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS serves single connection, physical addre	Inventory Team Researched
4431891	MARTIN CO UTILITIES	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
FL0043214	Martin County Tropical Fair	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
FLA043192	Martin County Utilities	GIS Data Available	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014		Received
4434447	MIDWINTER FARMS COUW	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS serves single connection, physical addre	Received
4434516	NEW BEGINNINGS COMMU	In Small Data Spreadsheet	\\hsd00sdissease01\nefFiles\EH\HSES_Research\Projects\Inventory\2014	PWS serves single connection, physical addre	Received

Assistance from County DOH

- Determining if office has any OSTDS or well data that are not currently in EHD
 - For example, Delegated Environmental Health Programs
- Are you aware of other groups or projects related to drinking water or wastewater?
 - WMD information on water systems or domestic wells?
 - Plans for septic to sewer conversions?
 - Other studies similar to the one conducted for the Indian River Lagoon area?
 - Utility expansion plans?
 - Others?

Assistance from County DOH (cont.)



- Determining which properties are served by small, “single-parcel” DEP-regulated facilities:
 - For example, mobile home or RV parks, churches, convenience stores, strip malls, city or county parks, etc.
 - Also, determining the wastewater and drinking water designations, where possible
 - This is valuable information, resulting in not having to contact these smaller utilities or organizations, and streamlining the process to make it more efficient
- Leveraging office’s local knowledge and expertise to provide up-to-date or corrected contact information

Assistance from County DOH (cont.)



- Obtaining GIS data sets is the key to efficiency in data collection and more robust, useful information
- Which organizations in the county are known to have GIS resources?
- We need assistance in linking up the Project Team and known sources for GIS data sets in the county

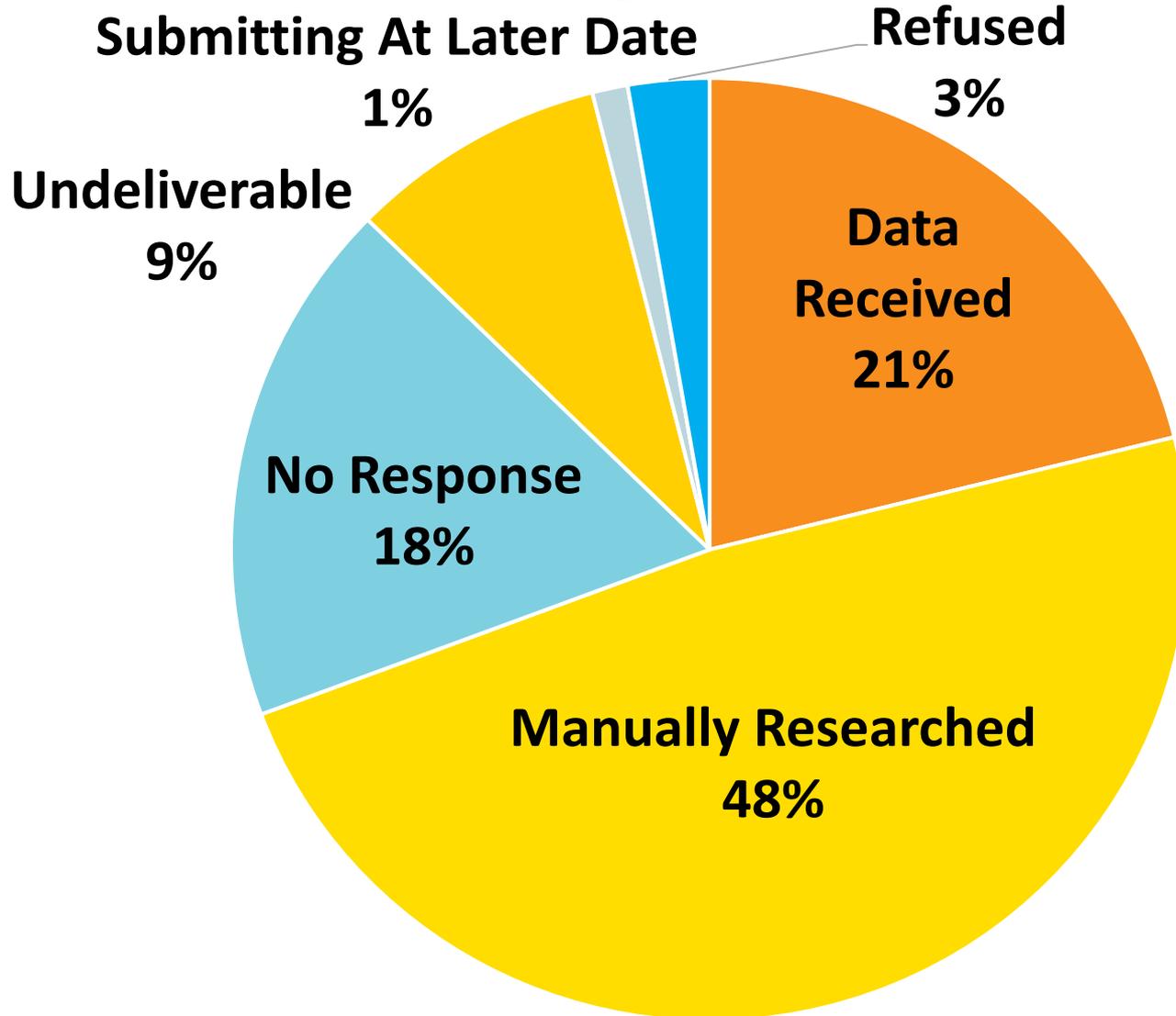


Date	Parcel Number	Physical Street Address	Physical City	Physical zip code	Wastewater Facility ID (if applicable)	Drinking Water Facility ID (if applicable)	Facility Name	Wastewater method (sewer, septic)	Drinking water source (public water system (PWS) or private well)
7/16/2014	12-39-40-002-063-00200-3	8901 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00190-5	8905 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00180-7	8909 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00170-9	8913 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00160-1	8917 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00140-6	8921 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00130-8	8925 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00120-0	8929 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00110-2	8933 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00100-4	8937 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00090-6	8941 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-047-00010-6	9029 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00120-5	9033 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00110-7	9037 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00100-9	9041 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00090-1	9045 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00080-3	9049 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00060-7	9053 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00050-9	9057 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00040-2	9061 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00030-4	9065 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00020-6	9069 SW Chevy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-020-00100-4	9333 SW Fleetwood Drive	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS

Centralized Data Gathering Model

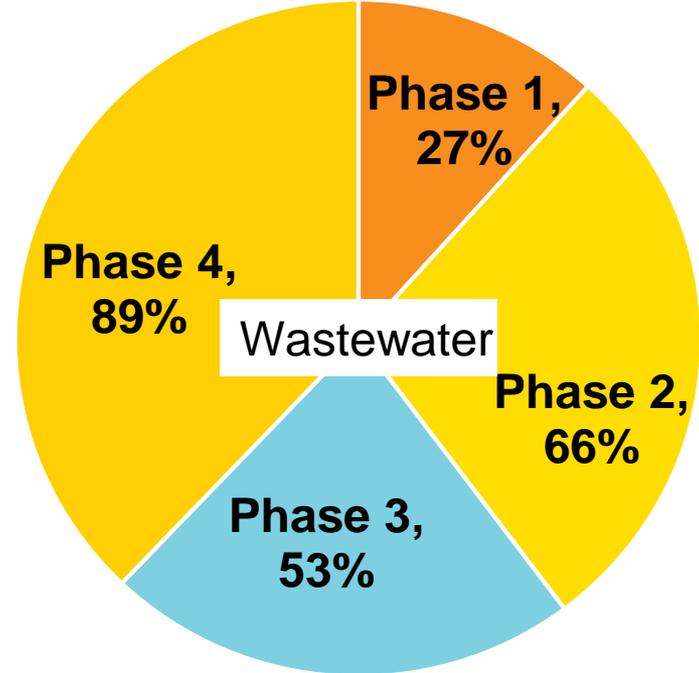
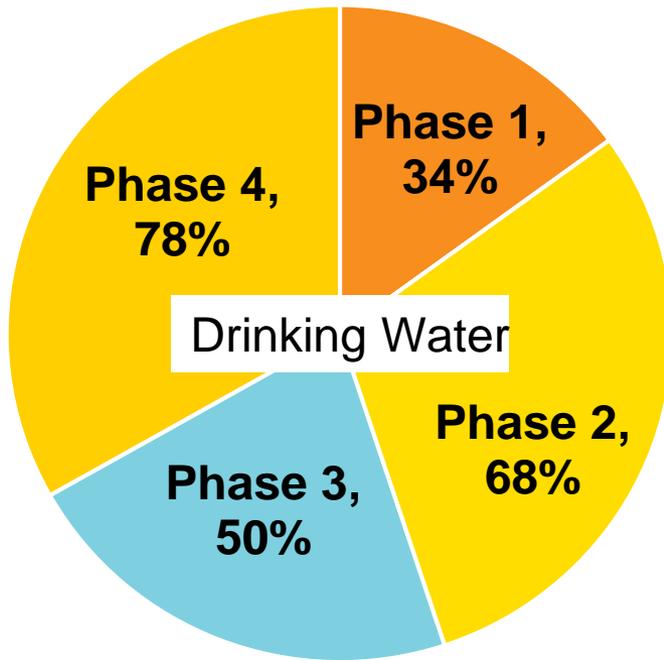
- Indian River, Leon, and Duval Counties coordinated meetings with county, municipal, and large utility entities
- All GIS data sets were gathered and compiled by one, centralized staff member, leveraging local knowledge and relationships:
 - Indian River: by the County GIS Department
 - Leon: by a temporary GIS analyst in DOH-Leon
 - Duval: by DOH-Duval
 - Their role has been essential to successful data gathering
- This led to Indian River, Leon, and Duval Counties having mostly GIS data, which results in more accurate point data

Getting the Data



All DEP Facilities (n=7,177)

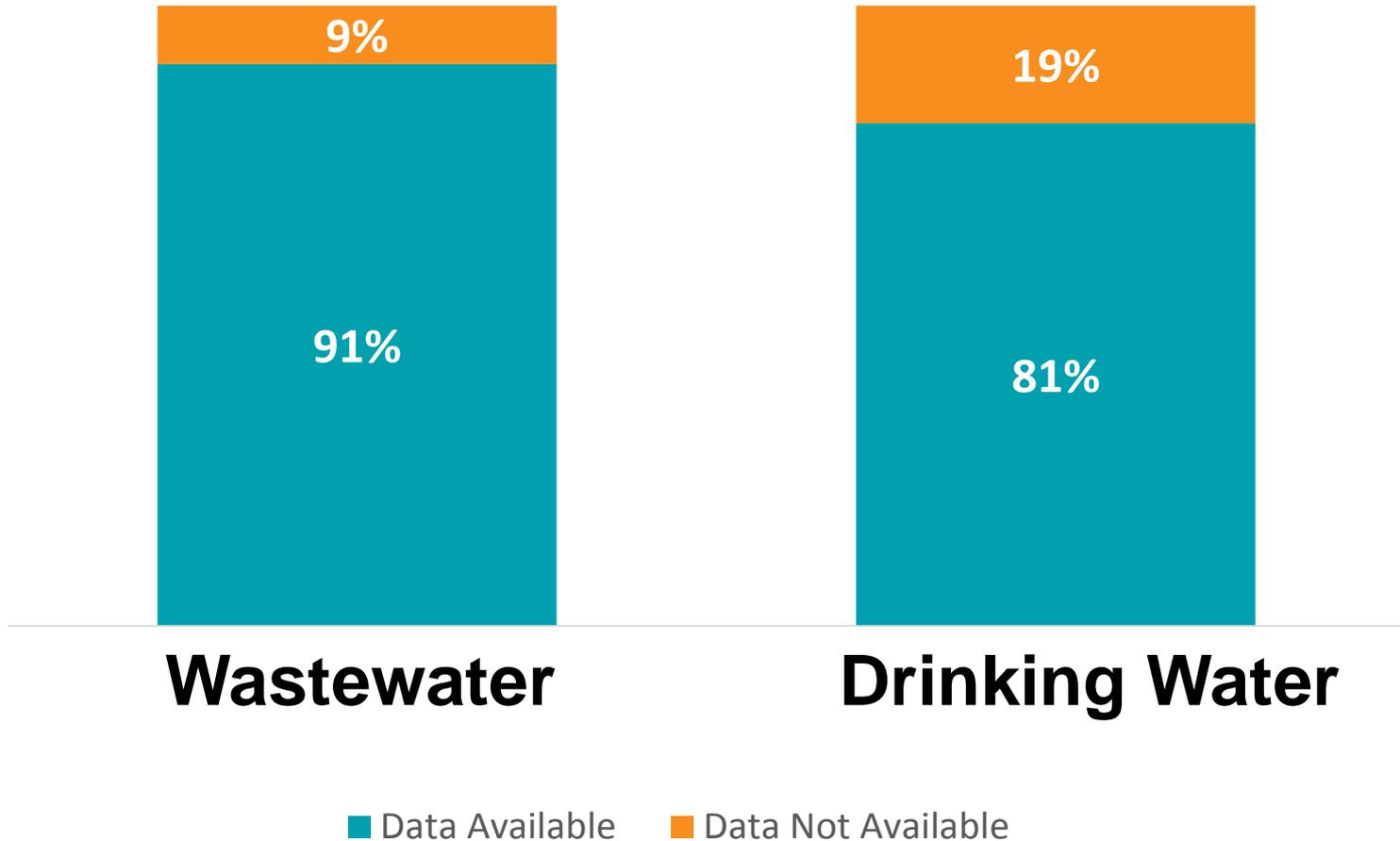
GIS Data Gathering



% of Drinking Water Population Served and Wastewater Permitted Capacity with GIS Data by Phase

GIS Data Sets Available?	Count of Facilities	% Facilities	% Drinking Water Population	% Wastewater Capacity
Yes	488	7%	61%	67%
No	7,177	93%	39%	33%

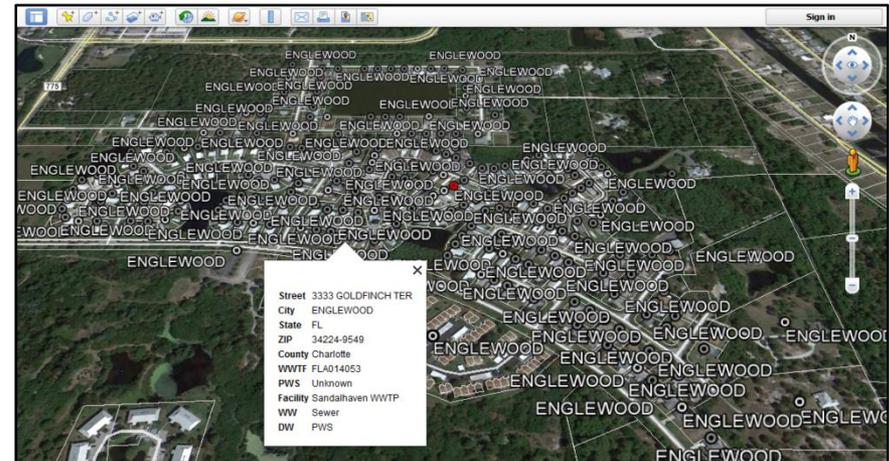
Overall Data Gathering Results



Data Processing

- Scrub and standardize data sheets
- Geocode physical addresses
- Prepare all data sets for import into GIS
- Update county indexes

Date	Parcel Number	Physical Street Address	Physical City	Physical zip code	Wastewater Facility ID (if applicable)	Drinking Water Facility ID (if applicable)	Facility Name	Wastewater method (sewer, septic)	Drinking water source (public water system (PWS) or private well (well))
7/16/2014	12-39-40-002-063-00200-3	8901 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00190-5	8905 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00180-7	8909 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00170-9	8913 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00160-1	8917 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00140-6	8921 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00130-8	8925 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00120-0	8929 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00110-2	8933 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00100-4	8937 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-063-00090-6	8941 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-047-00010-6	9029 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00120-5	9033 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00110-7	9037 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00100-9	9041 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
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7/16/2014	12-39-40-002-046-00080-3	9049 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00060-7	9053 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00050-9	9057 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00040-2	9061 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00030-4	9065 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-046-00020-6	9069 SW Chewy Circle	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS
7/16/2014	12-39-40-002-020-00100-4	9333 SW Fleetwood Drive	Stuart	34997	Unknown	4434014	ST. LUCIE FALLS	Sewer	PWS



Geocoding Data

A screenshot of a Google Maps interface. The map shows an aerial view of a residential area in Englewood, Florida, with numerous "ENGLEWOOD" labels overlaid on the map. A red pin is placed on a specific location. A white information popup window is open over the pin, displaying the following geocoding data:

Street	3333 GOLDFINCH TER
City	ENGLEWOOD
State	FL
ZIP	34224-9549
County	Charlotte
WWTF	FLA014053
PWS	Unknown
Facility	Sandalhaven WWTP
WW	Sewer
DW	PWS

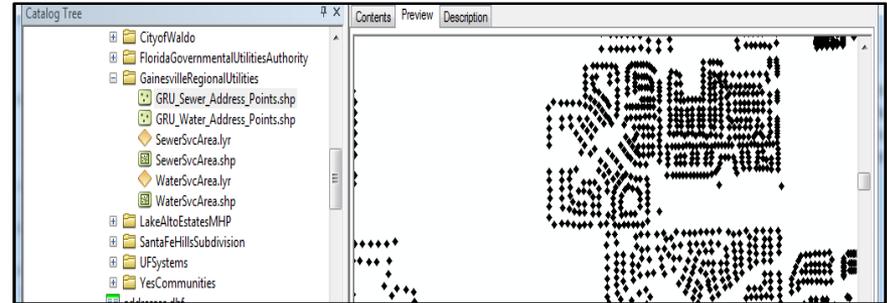
The popup window also includes a close button (X) in the top right corner. The map interface includes a toolbar at the top with various navigation and tool icons, a "Sign in" button in the top right, and a navigation control panel on the right side with a compass, a street view pegman, and a vertical zoom slider.

Assigning Values to Parcels

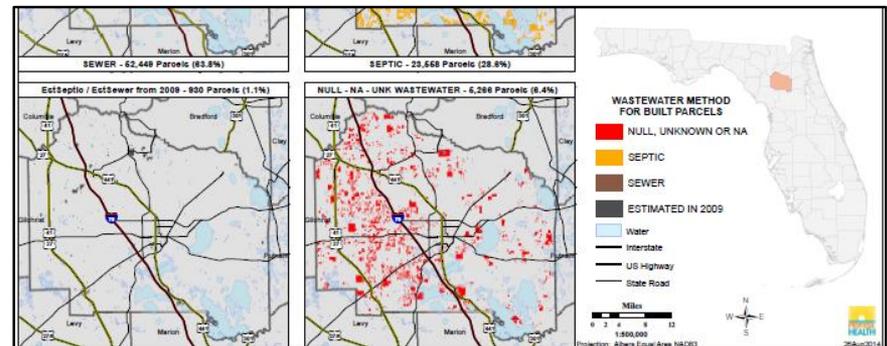
- "**Known**" = permitting authority or utility identifies property parcel and/or address
- "**Likely**" = non-permitting authority or non-utility identifies property parcel and/or address or other criteria point toward the designation
- "**Somewhat Likely**" = some data exist that point toward the designation, with less confidence than "known" or "likely"
- "**Undetermined**" = two or more conflicting data sources of equal weight
- "**Unknown**" = no data received or located

GIS Analysis & Mapping

- Compile parcel data
- Compile drinking water and wastewater data
- Analyze data assign values
- Prepare GIS maps summary reports

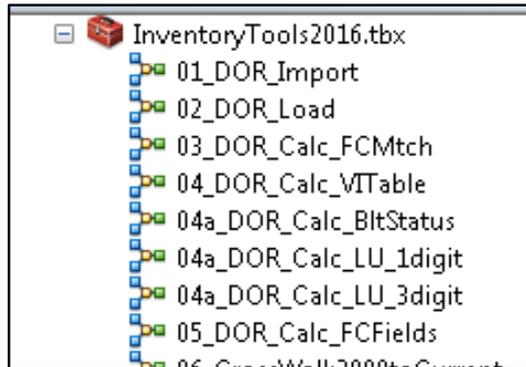


FID	Shape	OBJECTID	TaxParcelID	FullAddress	ZipCode	Source
0	Point	7661	06071-200-006	4907 NW 43RD ST, F, GAINESVILLE	32606	ACPA
1	Point	7718	08332-000-000	3425 NW 5TH ST, GAINESVILLE	32609	
2	Point	10687	08305-002-000	729 NW 29TH PL, GAINESVILLE	32609	
3	Point	10688	08305-001-000	733 NW 29TH PL, GAINESVILLE	32609	
4	Point	10689	08305-003-000	717 NW 29TH PL, GAINESVILLE	32609	
5	Point	10690	08274-010-003	3600 NW 12TH ST, GAINESVILLE	32609	
6	Point	10694	08565-010-002	1223 NW 34TH PL, GAINESVILLE	32609	
7	Point	10695	08565-010-001	1221 NW 35TH AVE, GAINESVILLE	32609	
8	Point	10696	09524-000-000	1230 NW 9TH AVE, GAINESVILLE	32601	
9	Point	11491	06097-100-005	2772 NW 26TH PL, GAINESVILLE	32605	GRU
10	Point	11492	06097-100-006	2786 NW 26TH PL, GAINESVILLE	32605	GRU
11	Point	11493	06097-100-007	2562 NW 28TH ST, GAINESVILLE	32605	GRU
12	Point	12299	06308-012-070	10052 NW 22ND RD, GAINESVILLE	32606	GRU
13	Point	12522	06097-100-008	2510 NW 28TH ST, GAINESVILLE	32605	GRU

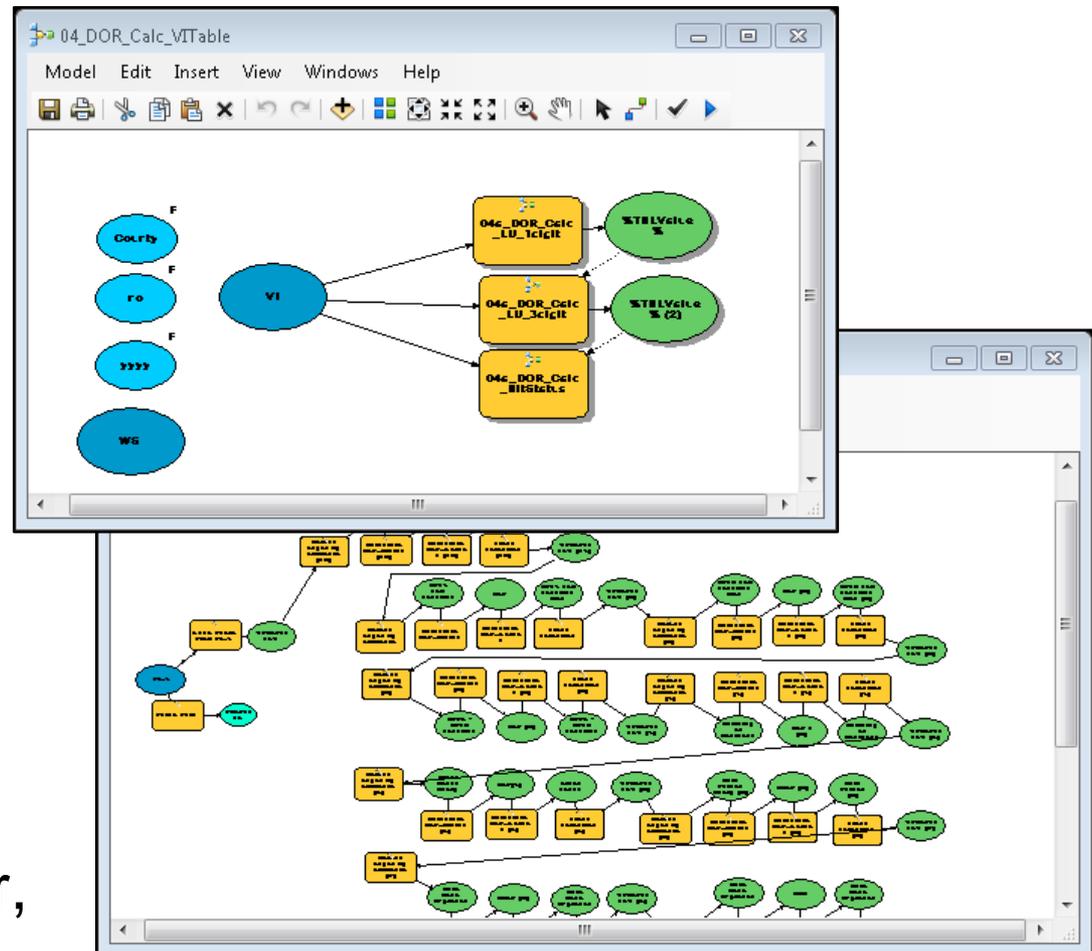


GIS Analysis & Mapping

Initial Parcel Data Processing

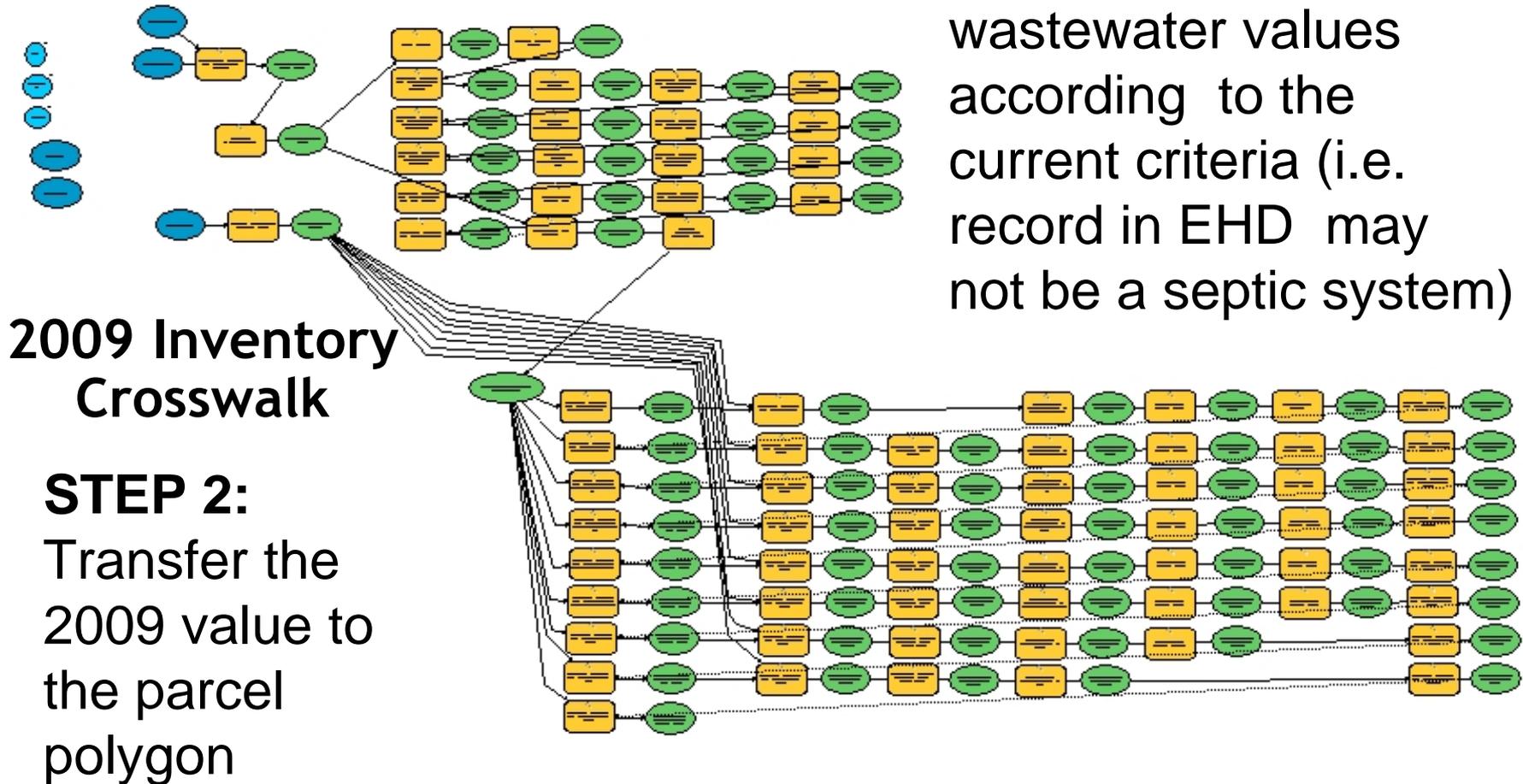


Results are parcel polygons and Built Status of Built, Not-Built, Unknown, Water, Right-of-Way



GIS Analysis & Mapping

STEP 1: Reassign wastewater values according to the current criteria (i.e. record in EHD may not be a septic system)

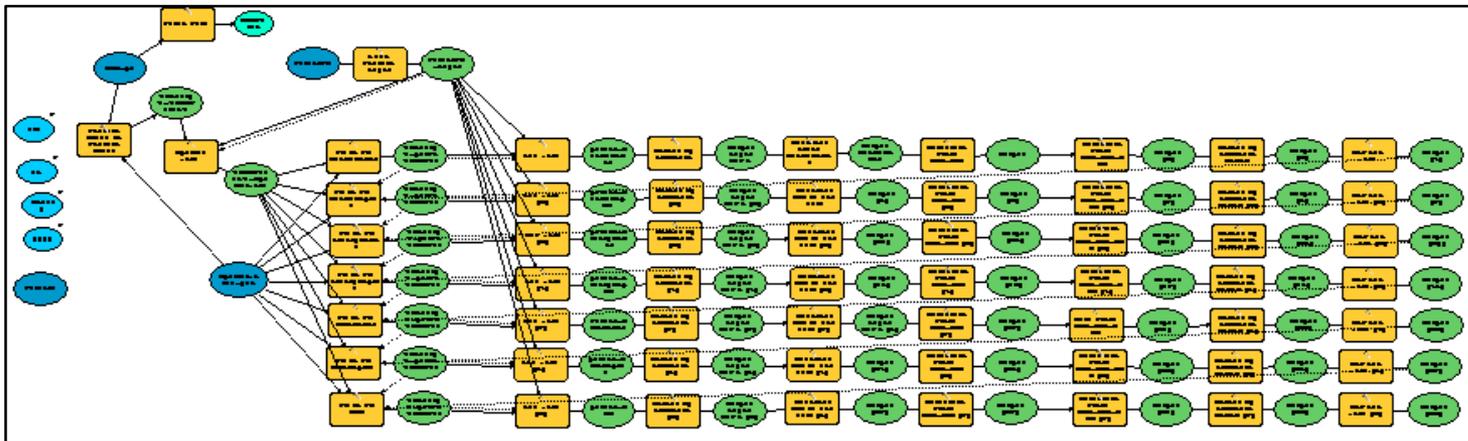


2009 Inventory Crosswalk

STEP 2:
Transfer the 2009 value to the parcel polygon

Query and Import from Environmental Health Database (EHD)

- Predefined queries are run against several tables in the EHD
- EHD records are geocoded to create points
- Data are imported to GIS where geoprocessing is performed, and parcels are assigned value from the EHD



Import and Process Information from Other DOH Programs and State Agencies

- DOH Well Surveillance sampling points
- DOH OSTDS Variance records
- DOH County Health Department information
- Permits from DBPR and DOACS
- DEP data for wastewater treatment plants, public water treatment plants, structures located in state parks
- Well permit points, and other domestic self supply data from the Water Management Districts

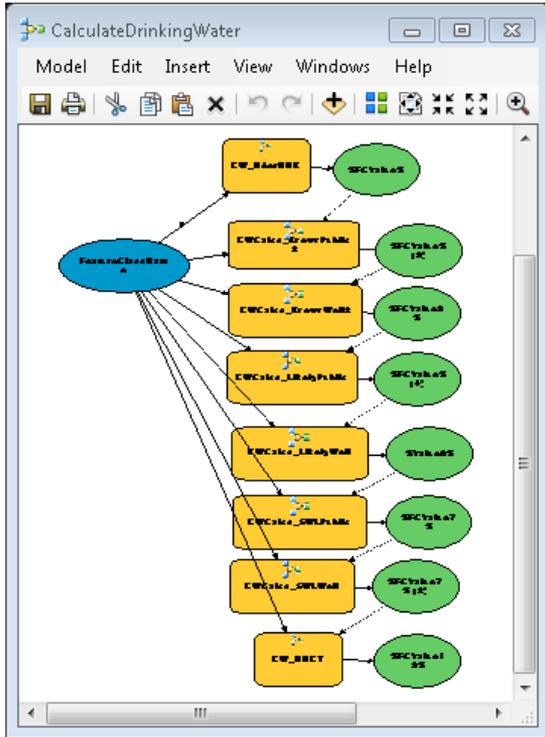
Intersecting parcels are assigned the corresponding wastewater or drinking water value

County Data from Utilities and Local Government

- Local data formats
 - Lists of Service Addresses
 - GIS polygons of service areas
 - GIS lines of infrastructure elements (mains and laterals)
 - GIS points of service addresses
- Evaluate information for relevance and usefulness
- Geocode address lists to create GIS points
- Import and process GIS data

Intersecting parcels are assigned the corresponding wastewater or drinking water value

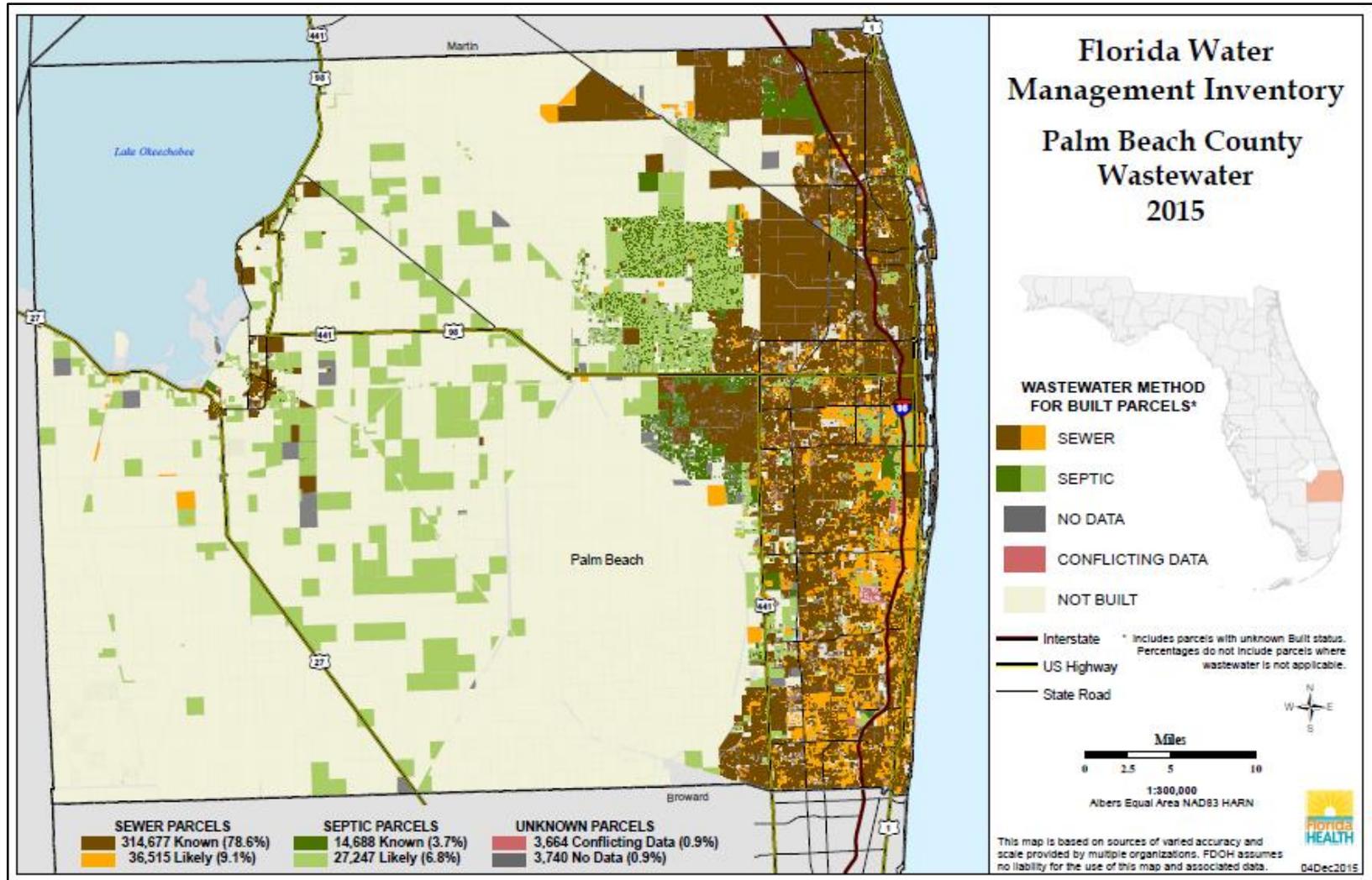
Final Assignment of Drinking Water and Wastewater



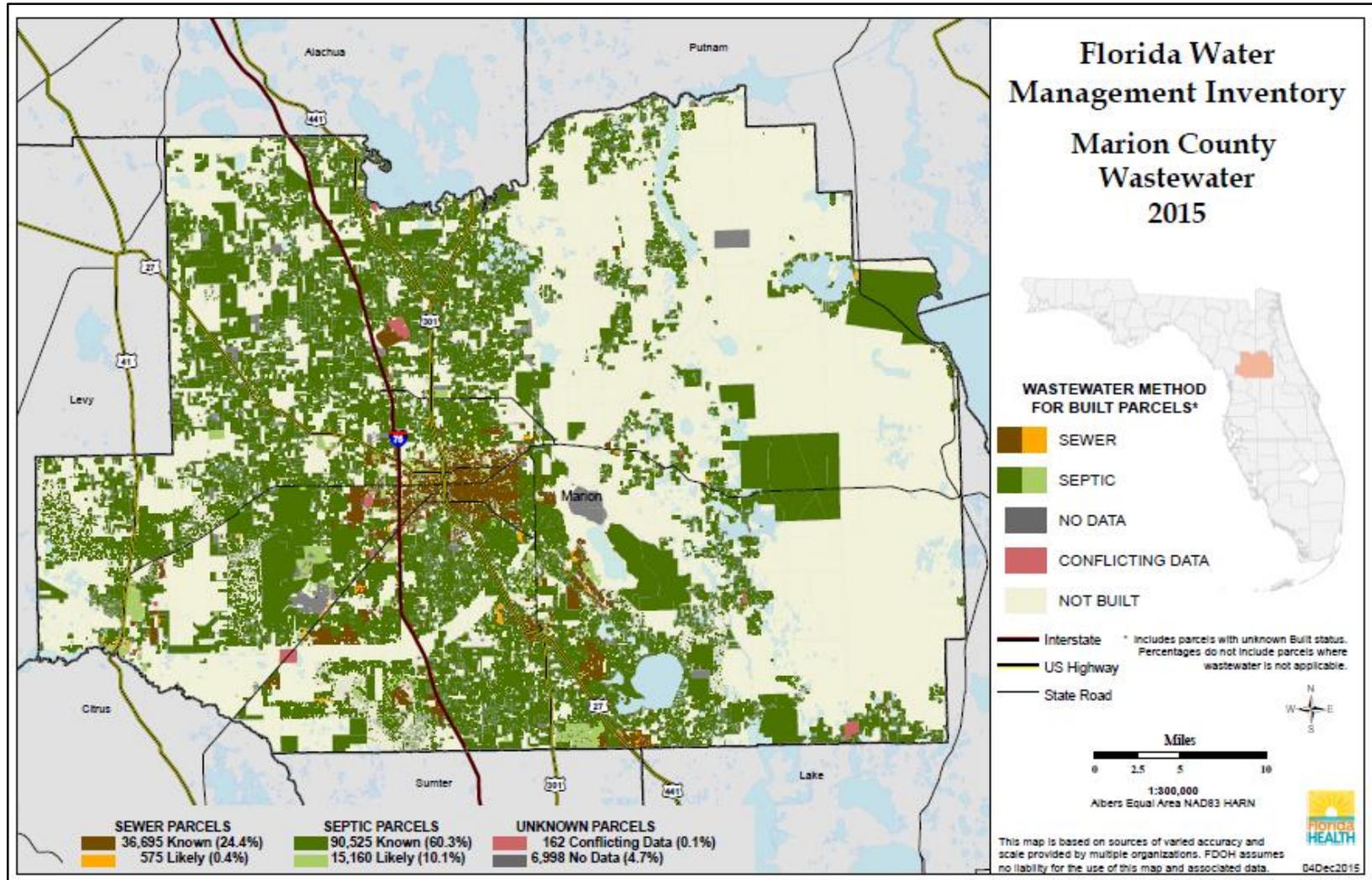
DRINKING WATER	WASTEWATER
Not Applicable, Not Built	Not Applicable, Not Built
Unknown, No Data	Unknown, No Data
Known Public Water	Known Sewer
Known Private Domestic Well	Known Onsite Septic
Likely Public Water	Likely Sewer
Likely Private Domestic Well	Likely Onsite Septic
Somewhat Likely Public Water	Somewhat Likely Sewer
Somewhat Likely Private Well	Somewhat Likely Septic
Undetermined, Conflicting Data	Undetermined, Conflicting Data

- Run Models
- Perform Final Quality Audit

Sample Map of “Sewer Heavy”



Sample Map of “Septic Heavy”



Summary of Onsite Wastewater in Florida



Counties with highest proportion of onsite systems (comparing total built to onsite)

Counties with most onsite systems

County	Sum of Highest Proportion of Onsite
Glades	95%
Jefferson	92%
Putnam	92%
Levy	89%
Dixie	88%
Taylor	87%
Liberty	86%
Holmes	86%
Gilchrist	85%
Union	85%

County	Sum of Total Onsite (Known + Estimated)
Polk	138,753
Dade	108,851
Pasco	108,827
Marion	105,685
Volusia	102,831

Summary of Onsite Wastewater in Florida

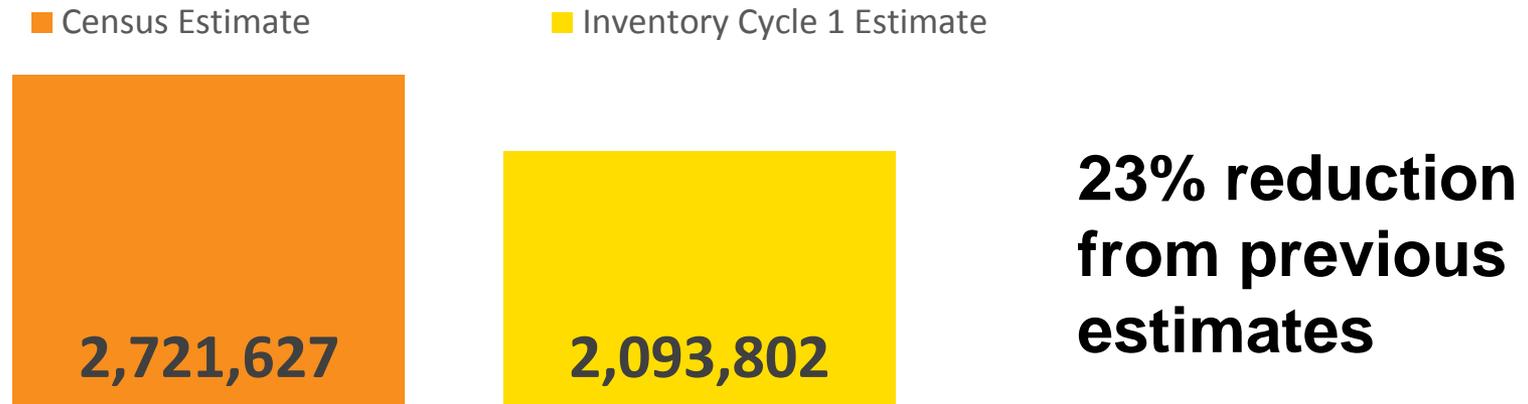
Counties with most accurate onsite inventory

County	Known Onsite Compared to Estimated Onsite
Indian River	100%
Nassau	97%
Marion	86%
St. Lucie	79%
Leon	73%

59 counties have a known to estimated ratio of less than 50%, showing a need for continued data validation

Summary of Onsite Wastewater in Florida

Onsite Systems in Florida



- 9,000,000 parcels in Florida
- 6,900,000 built parcels
- 2,100 000 (30%) of built parcels served by onsite system

Project Status



- The current project began in April 2014
 - Focus on developing new Business Processes and SOPs
- 2015
 - Parcel Data Compiled
 - Data Gathering & Data Processing completed for the Pilot Program, Phase 2, & Phase 3
 - GIS Analysis & Mapping completed for Pilot Program & Phase 2
- 2016
 - Data Gathering & Data Processing completed for Phase 4
 - GIS Analysis & Mapping completed for Phase 3 & Phase 4
- First cycle ended September 2016 with final reporting to complete by early November 2016

Inventory Website

- FloridaHealth.gov/FLWMI
 - Purpose
 - Benefits
 - Status
 - Requested Data Sets
 - Data Fields & Formats (including a Data Sheet spreadsheet template to use for submitting the requested data)
 - Knowing What to Submit in Your Data Set
 - Submitting Your Data Set to the Project Team
 - FAQ
 - Contact Information

Website

<http://floridahealth.gov/flwmi>



Maps and Data

All completed maps and data are available for public use.



Website

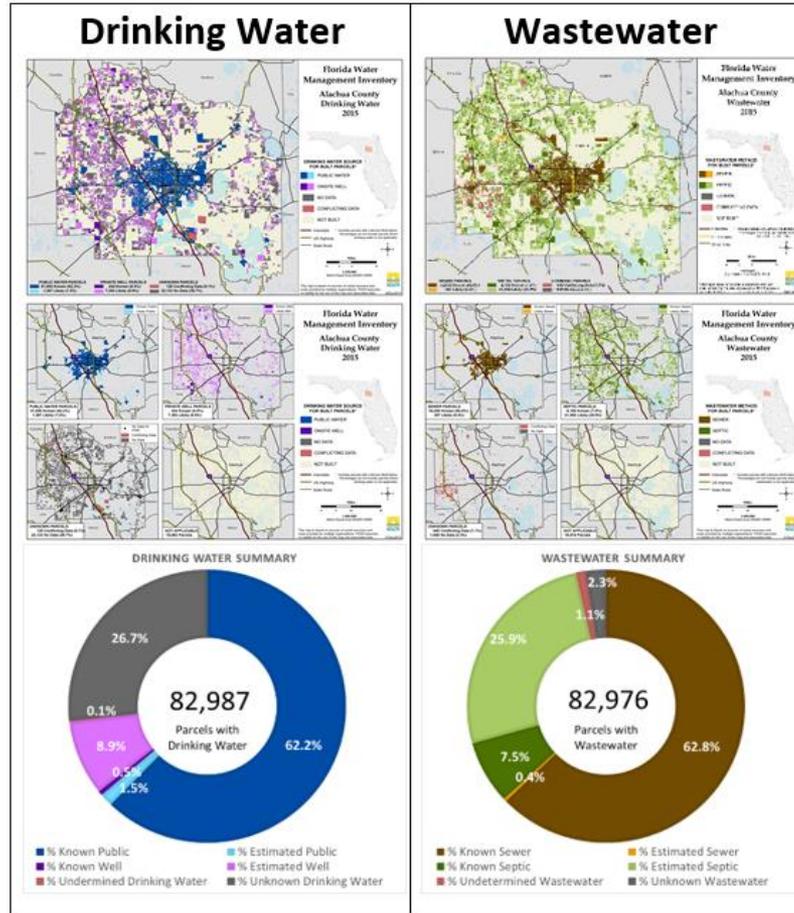
Alachua County



The mapping for this county was completed on 5/1/2015.

[Download the project maps and data.](#)

[View data on our interactive web map.](#)



Website



<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 Alachua_DW.pdf	04-Dec-2015 10:02	2.4M	
 Alachua_DW_singlePanel.pdf	04-Dec-2015 10:09	3.0M	
 Alachua_WW.pdf	04-Dec-2015 10:19	1.4M	
 Alachua_WW_singlePanel.pdf	04-Dec-2015 10:26	3.0M	
 FLWMI_Alachua.xlsx	21-Apr-2016 14:25	12M	
 alachua_fre.xlsx	07-Dec-2015 04:38	11K	
 alachua_public.zip	07-Dec-2015 06:59	14M	

Web Application



Florida DOH Environmental Health (EH) Florida Water Management Inventory

Address, Place Or Lat/Long

Legend

FLWMI

- Wastewater
 - Known Sewer
 - Likely Sewer
 - Known Septic
 - Likely Septic
 - Conflicting Data
 - Unknown
- Florida_Response_Areas
 - Counties

Wastewater: 11615 000 000

WW: KnownSewer
DW: KnownPublic
BLT_STATUS: BLT
LANDUSE: INST
PHY_ADD1: 1734 SE HAWTHORNE RD
PHY_CITY: GAINESVILLE
PHY_ZIPCD: 32601
PARCELNO: 11615 000 000
ALT_KEY: 11615-000-000
Shape.STArea:
CO_NO: 11

Zoom to

60m / 200ft

Florida Department of Health | County of A

Planned Improvements

- Online data accessibility
 - Developing standardized web page for each county
 - Improvements to the interactive mapping tool
 - Integration with needs for other state programs
 - Public Health Dental Program and fluoridated drinking water systems
 - Environmental Public Health Tracking to improve reporting to CDC
 - Integration with the State Emergency Response Team (SERT) Geospatial Assessment Tool for Operations and Response (GATOR) system to improve disaster response
- Enhancements to the Environmental Health Database (EHD)
 - Linking points back to EHD for better geo-spatial references
- Updating county data to fill in blanks and refine estimations
- Ground-truthing data

Questions & Feedback



Direct Inquires to:

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Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Environmental Health



New Business

Research Priorities

Last ranking completed in 2011 Steps:

1. RRAC review past project considerations
2. RRAC submit new project ideas
3. DOH compile and send

RRAC rank priorities

What format? **How much detail?**

2011 RRAC Research Priorities

Ranking	Project
1	Continuation of Inventory of OSTDS in Florida
2	Effectiveness of Outlet Filters
3	Life Expectancy of Onsite Systems
4	Drip Disposal With Septic Tank Quality Effluent
5	Correlations Between Water Quality, OSTDS, and Health Effects

Public Comment

Closing Comments, Next Meeting, and Adjournment

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Division of Disease Control and Health Protection
Florida Department of Health

To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

