



Kings Bay and Crystal River BMAP



Recognizing the Role of Onsite Wastewater

July 19, 2016

Elke Ursin, PMP, CPM

Environmental Manager

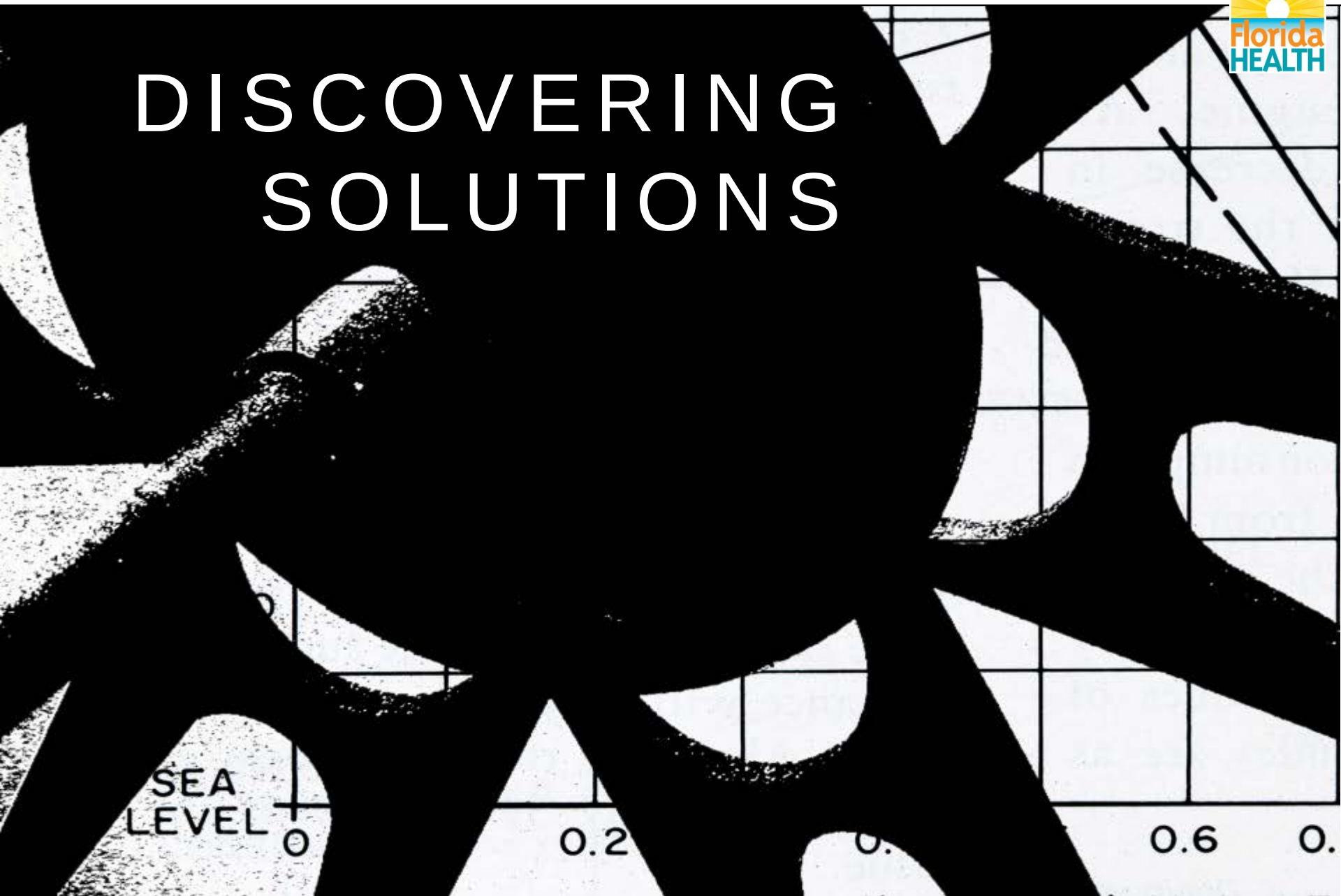
Onsite Sewage Research and Engineering

Division of Disease Control and Health Protection

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



DISCOVERING SOLUTIONS



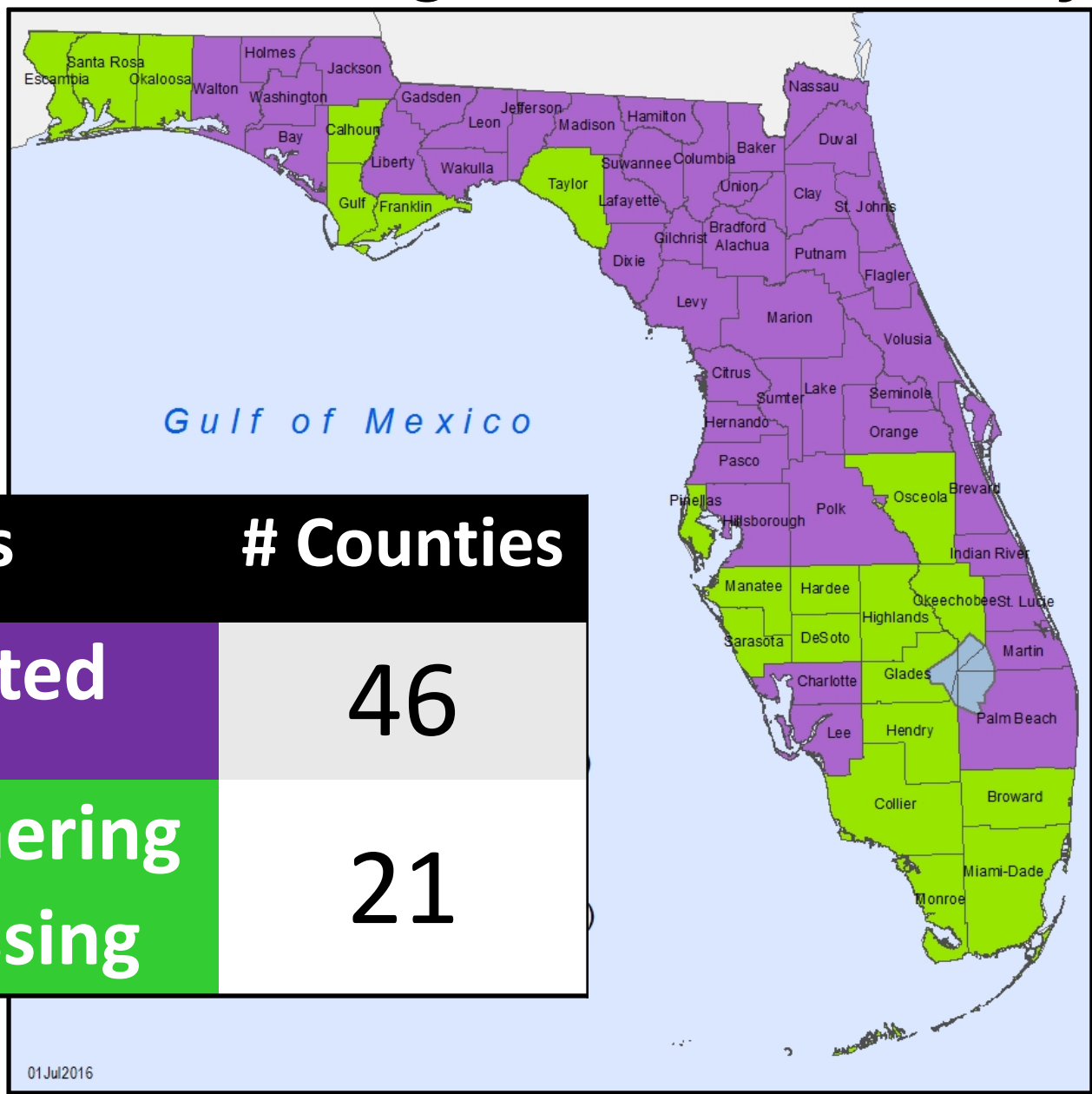


floridahealth.gov/FLWMI

GOAL:

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

Florida Water Management Inventory



Status	# Counties
Completed	46
Data Gathering & Processing	21

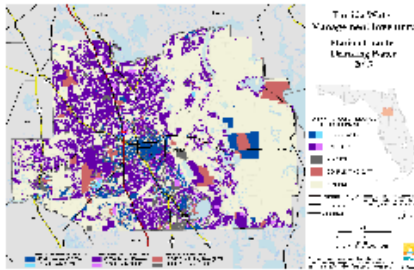
County Dashboard Webpages



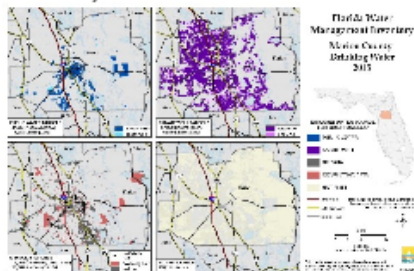
The mapping for this county was completed on 5/1/2015.

[Download the project maps and data](#) (opens in new window)

Drinking Water

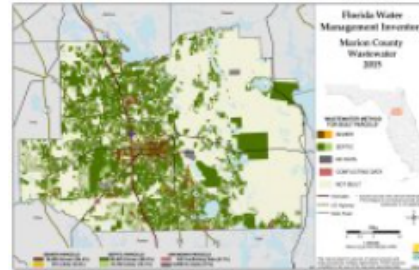


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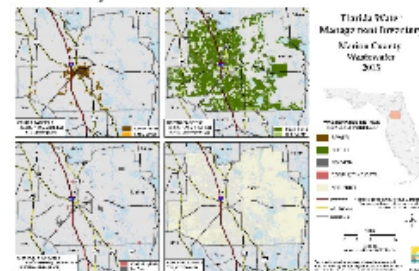


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Wastewater



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Drinking Water Summary

Known public water parcels = 48,461

Known well parcels = 57,998

Percent of built parcels with known drinking water = 70.8%

Estimated public water parcels = 5,246

Estimated well parcels = 6,670

Percent of built parcels with estimated drinking water = 7.9%

Sewer Summary

Known sewer parcels = 36,695

Known septic parcels = 90,525

Percent of built parcels with known wastewater = 84.7%

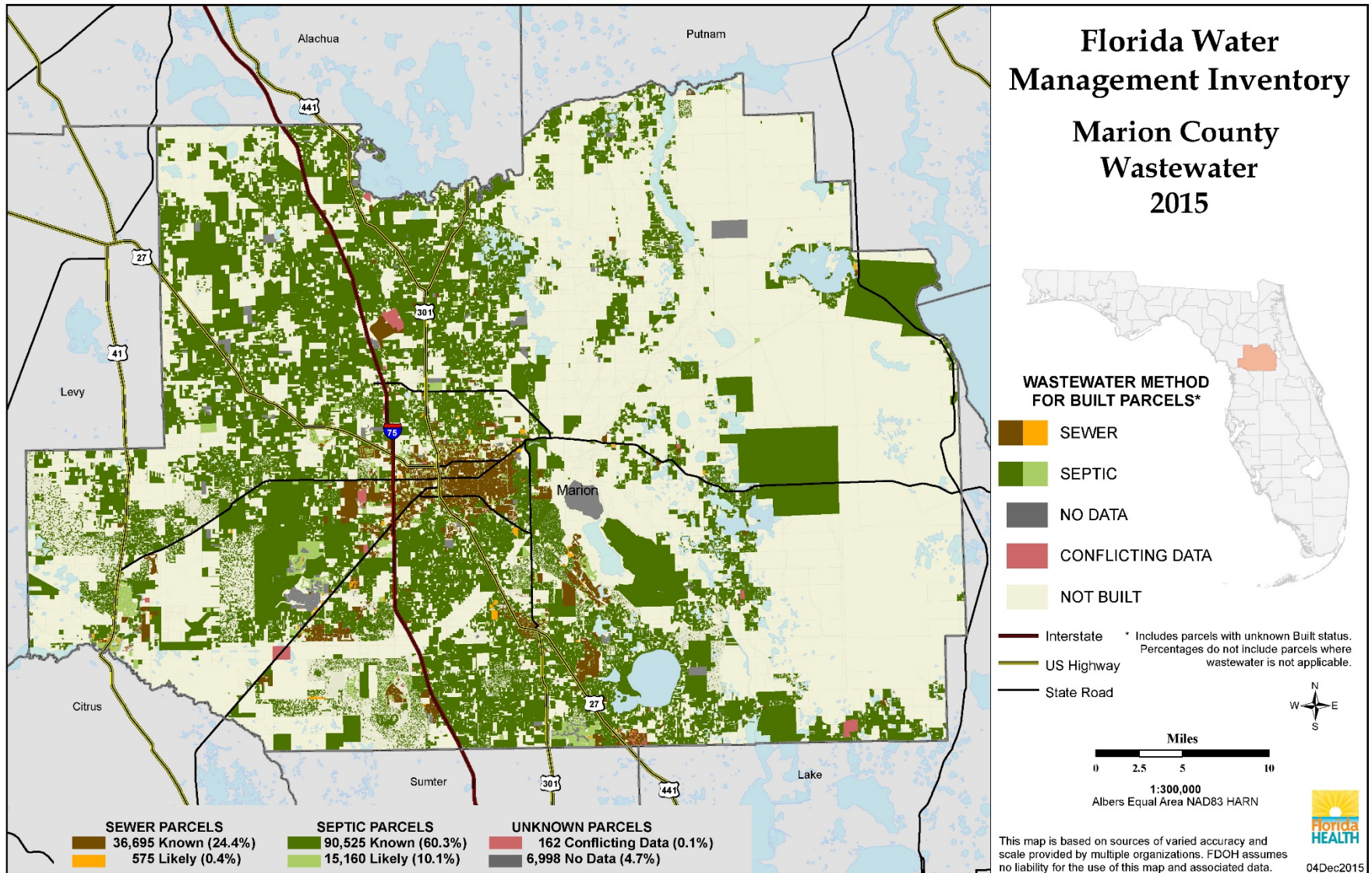
Estimated sewer parcels = 575

Estimated septic parcels = 15,160

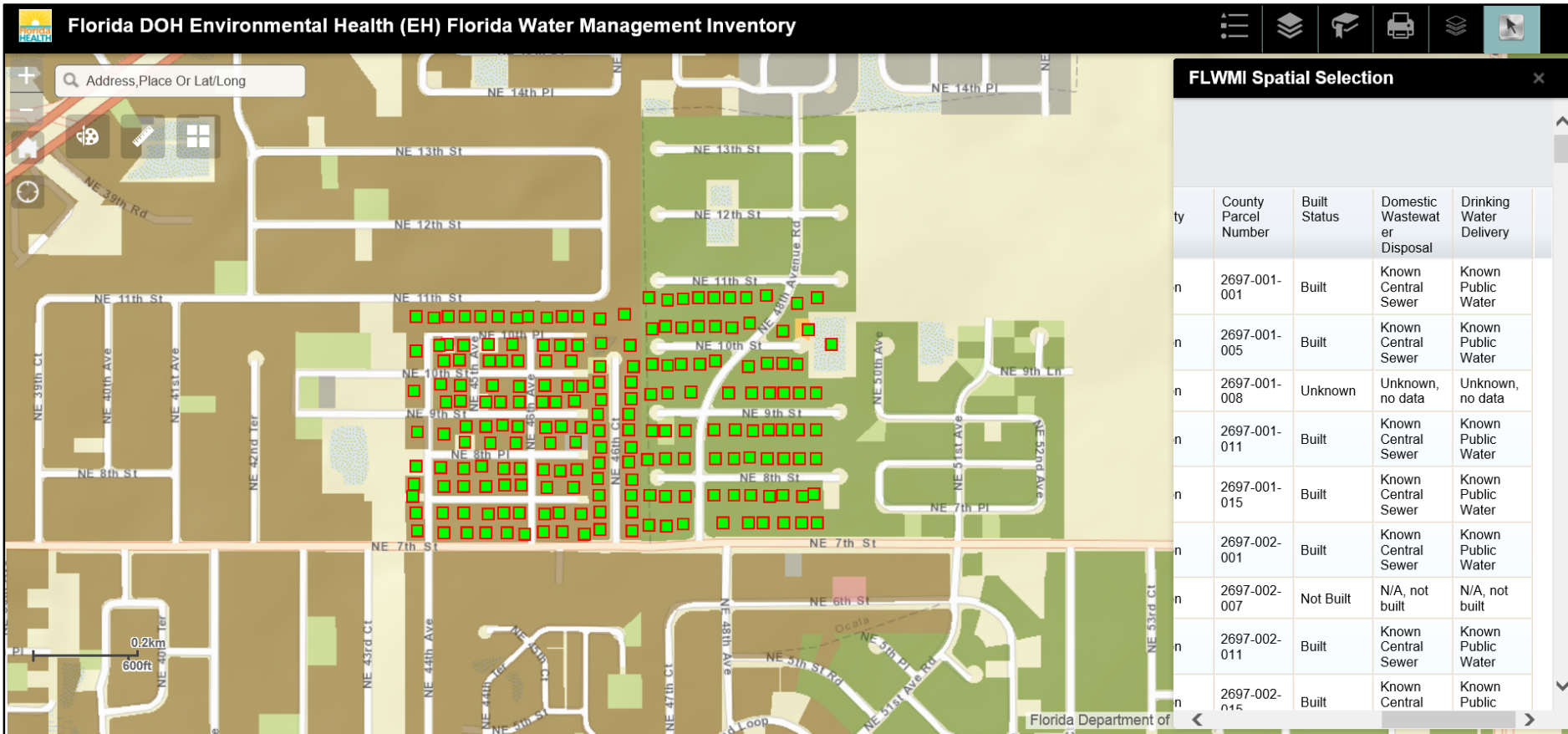
Percent of built parcels with estimated wastewater = 10.5%



Final Maps



Searchable Web Application

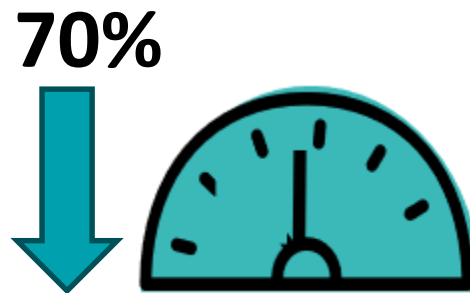


<https://gis.flhealth.gov/FLWMI>

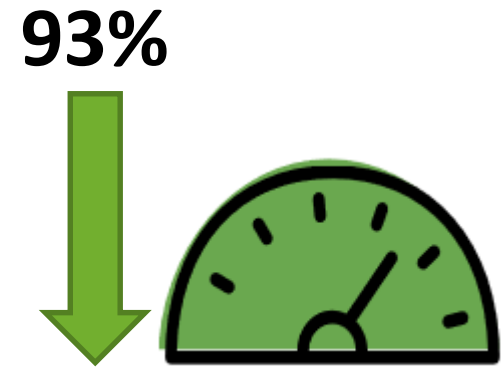
Nitrogen Reduction Options for Onsite Wastewater



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)



nitrification media:
sand & expanded clay



Dispersal



Stage 2
(denitrification)



denitrification media:
lignocellulosics & elemental sulfur

Test Facility

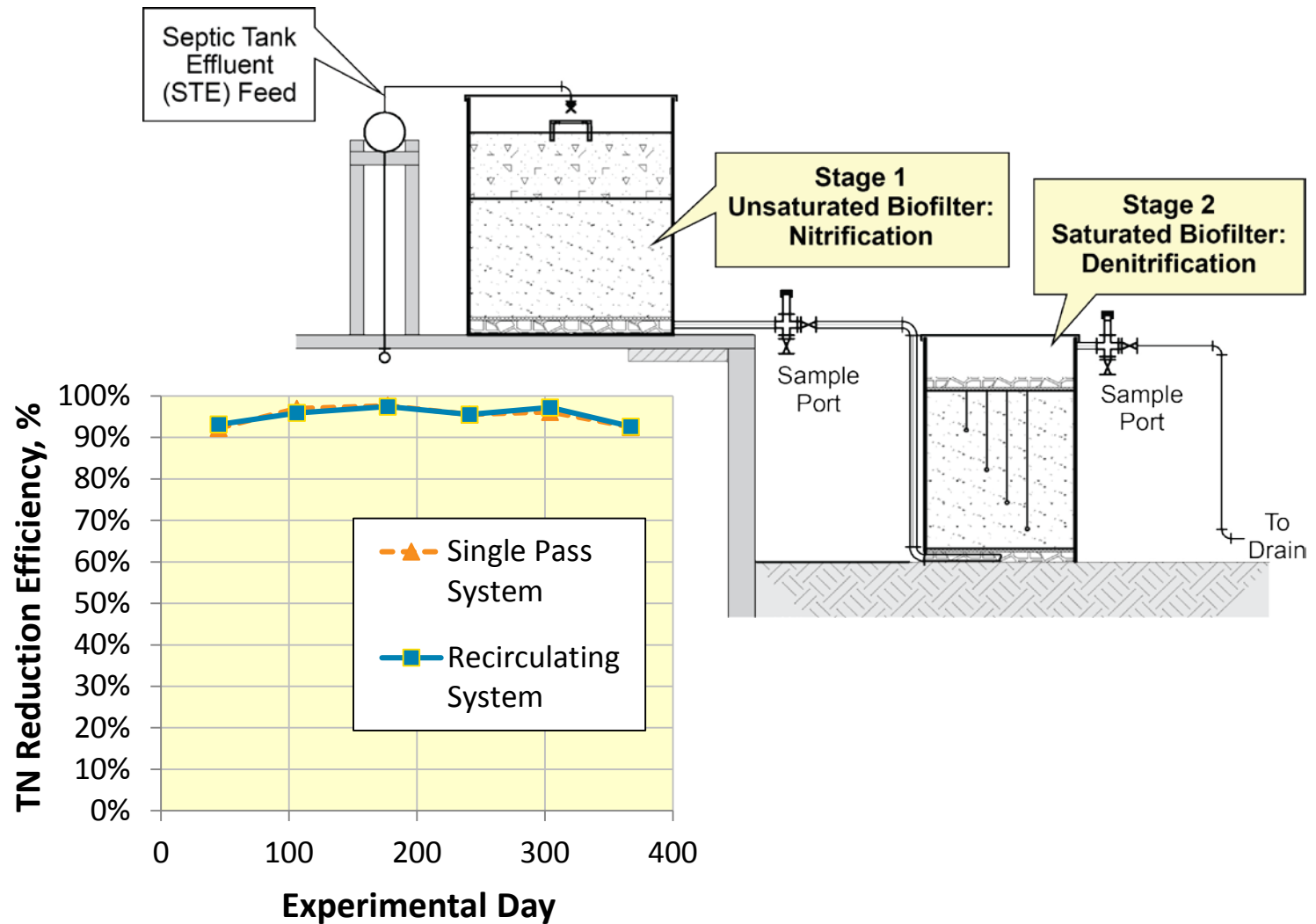
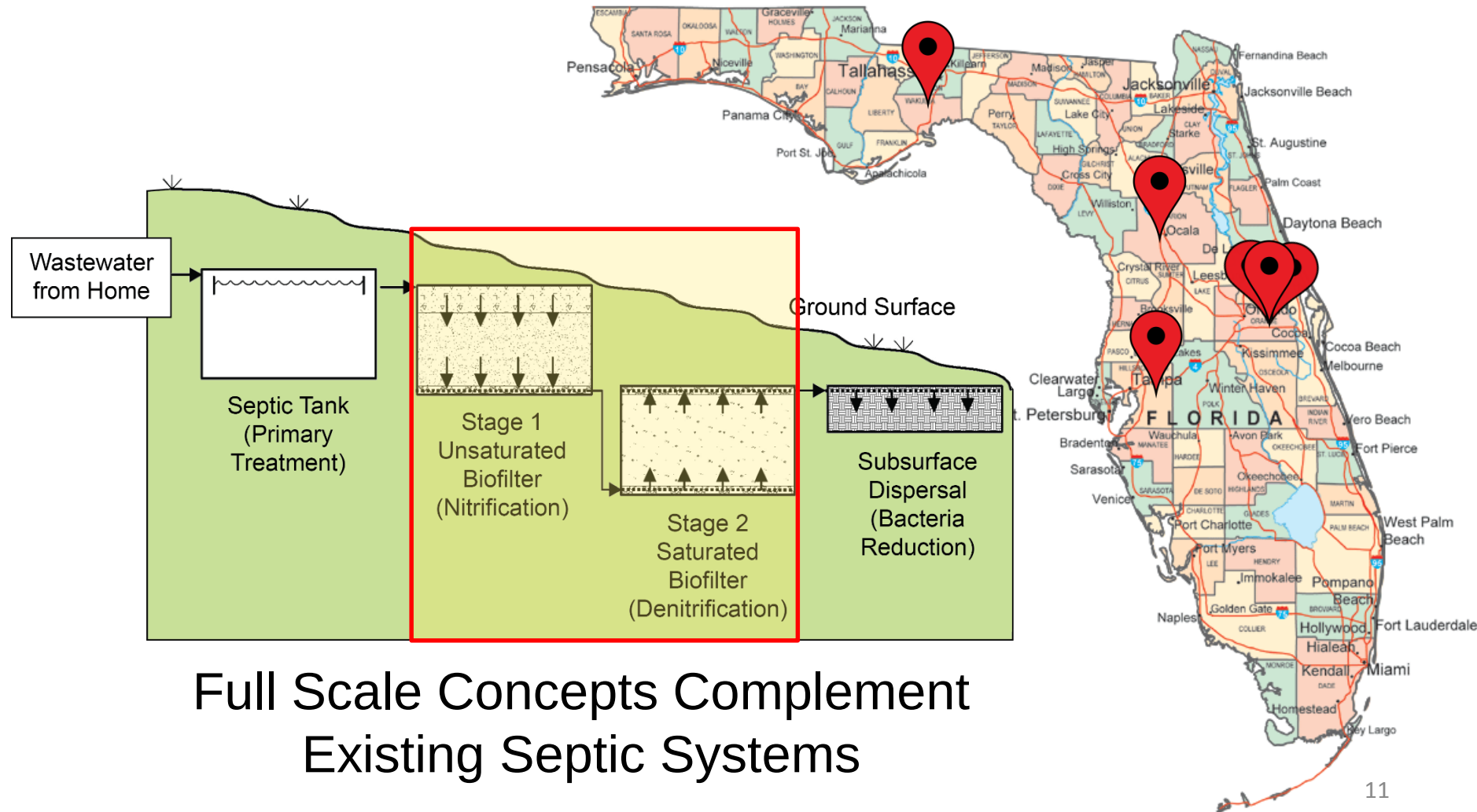


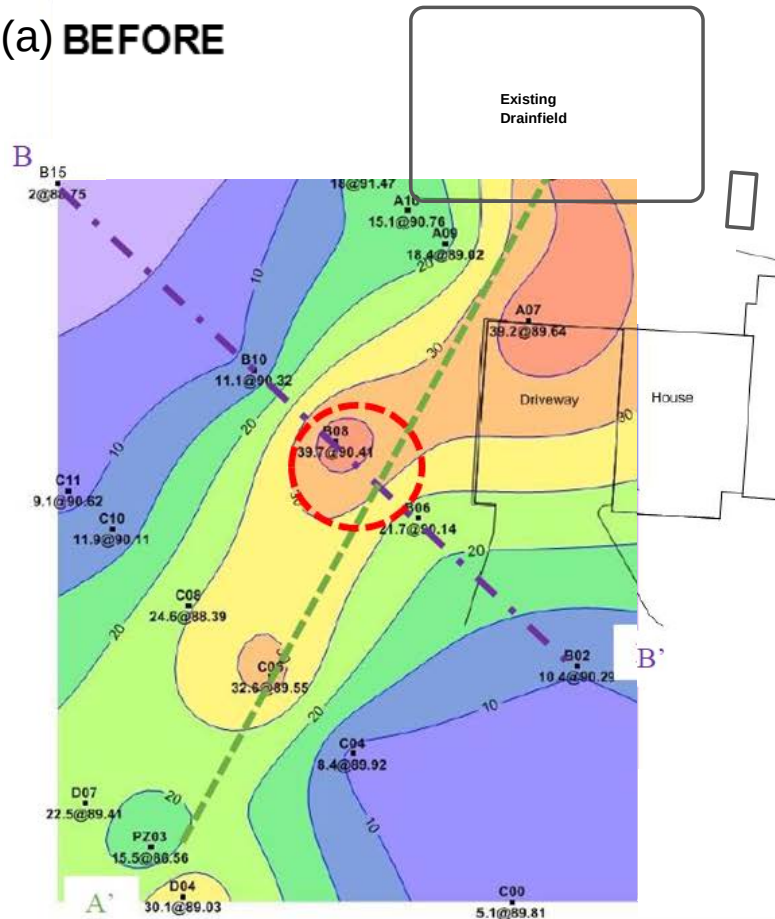
Image Credit: Hazen and Sawyer

Nitrogen Reduction at Field Sites

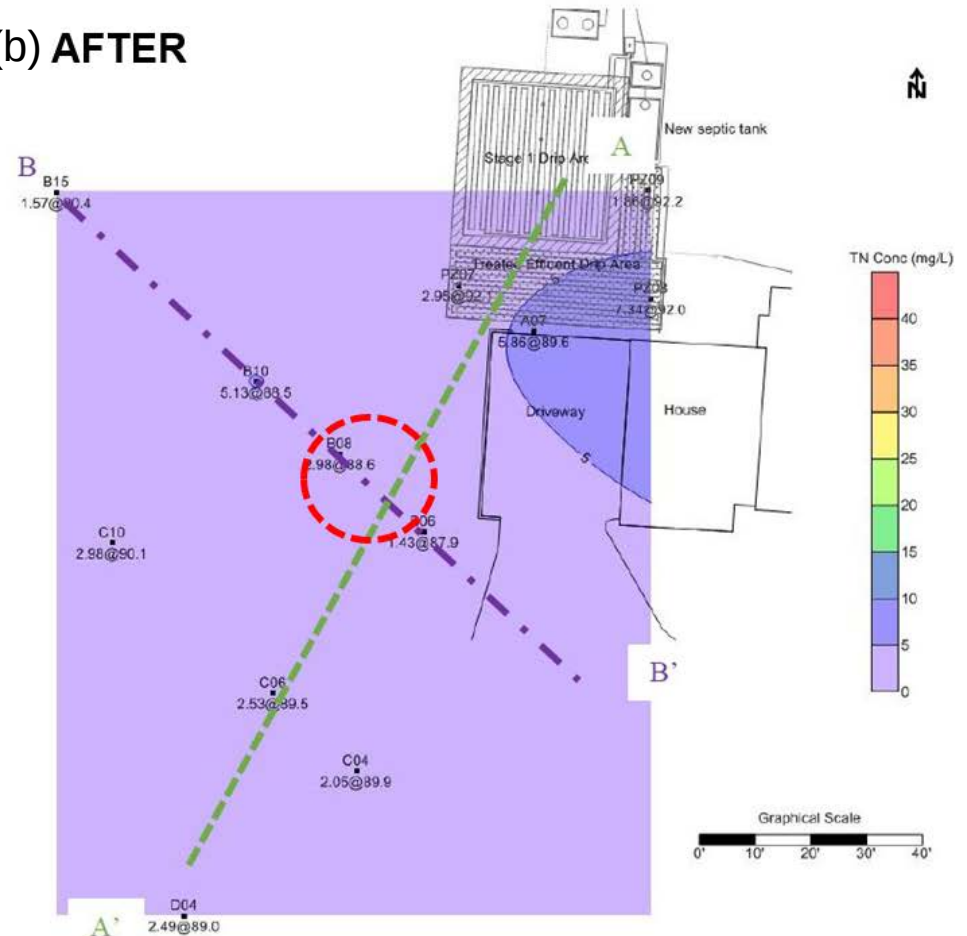


Case Study: Groundwater Monitoring

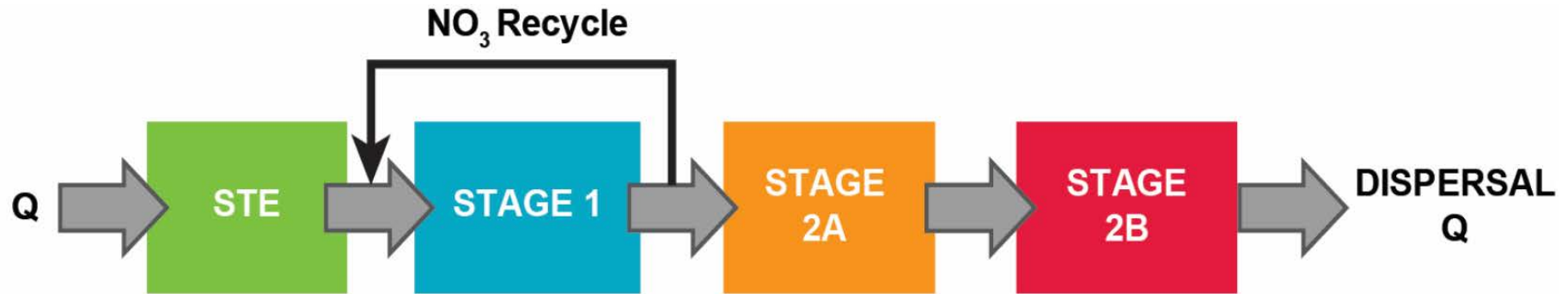
(a) BEFORE



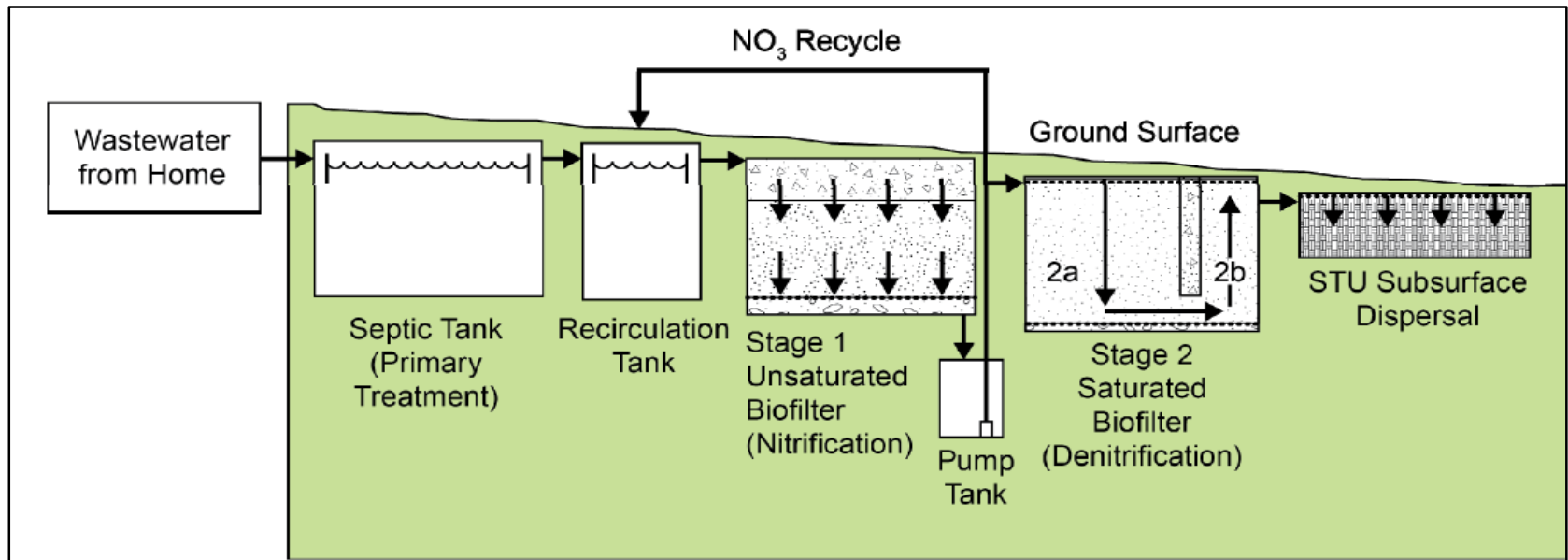
(b) AFTER



In-Tank Passive Nitrogen System



In-tank two stage biofilter with recirculation stage 1, dual media stage 2 lignocellulosic (2a) followed by elemental sulfur (2b)

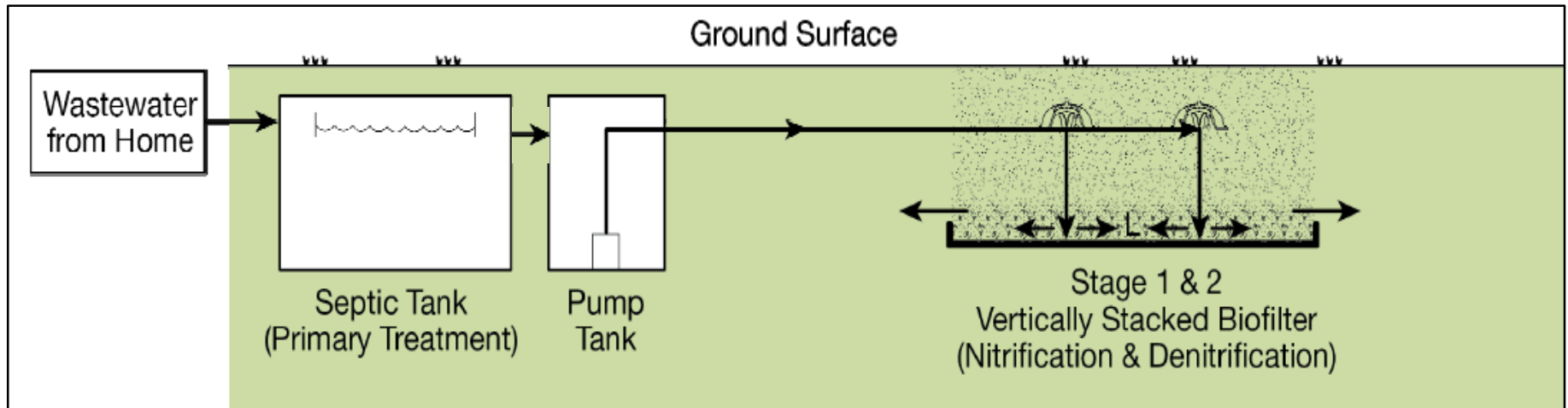




In-Ground Passive Nitrogen System



In-ground stacked biofilter, single pass stage 1 over stage 2
lignocellulosic





OKAY

LET'S

DO

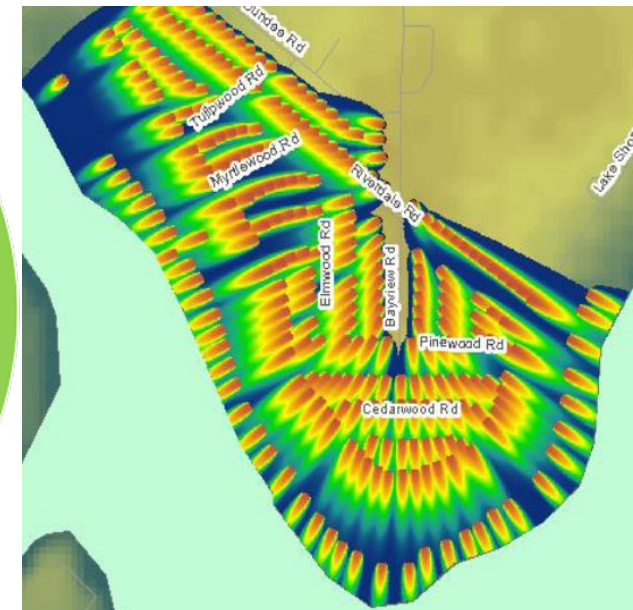
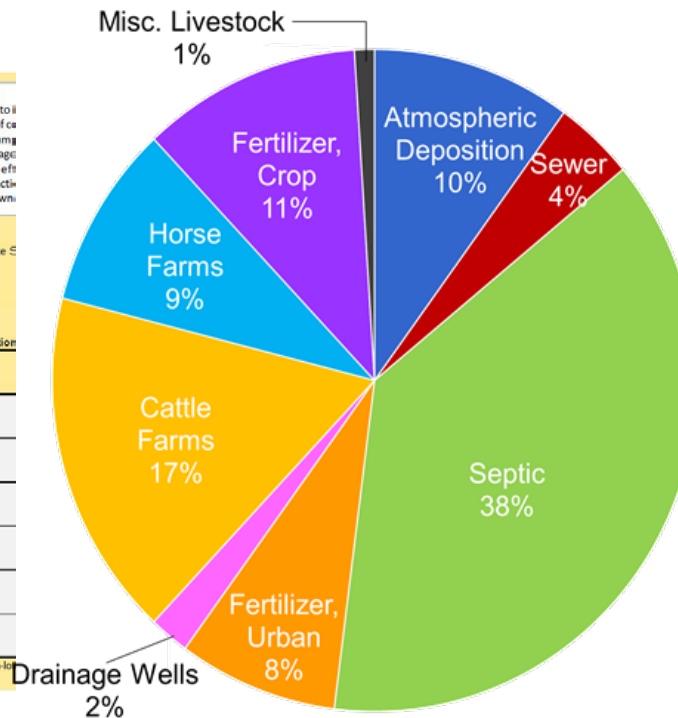
THIS



Name:	Mayor Smith	Collection Technologies: In cell C7, the user needs to model uses the number of ca frontage. Part of the assum The estimated road frontage If the user is interested in eft be served by STEG. This acti STEG/STEP ratio is unknown.
Location:	Anywhere	
Daily Wastewater Volume (gpd):	7,500	
Number of Connections:	30	
Selected Soil Texture:	Silt Loam	
Typical Distance Between Sources:	200	
Estimated Road Frontage (feet):	3,000	Assumes that Half of Sources are on opposite S
Enter the percentage of the effluent-sewer network that will be a gravity-based:	0	percentage (0 to 100%)

Cost Description (Not Including Engineering and other Professional Fees)	Collection	
	Low Pressure Sewer	Effluent Sewer
Installation Cost of Collection Network ¹	\$49,325 to \$73,987	\$48,713 to \$73,069
Installation Cost of On-Lot Components (one connection)	\$4,985 to \$7,477	\$2,806 to \$4,208
Total Installation Cost for Collection Network & On-Lot Components	\$198,869 to \$298,303	\$132,881 to \$199,321
Total Collection System Cost on a per Connection Basis	\$6,629 to \$9,943	\$4,429 to \$6,644
Annual On-Lot Maintenance Costs (assuming lot owner is responsible for maintenance)	\$234 to \$351	\$56 to \$70
Annual Maintenance Cost for both Collection Network & On-Lot Components (assuming the utility conducts the on-lot maintenance)	\$22,872 to \$34,308	\$10,663 to \$15,995

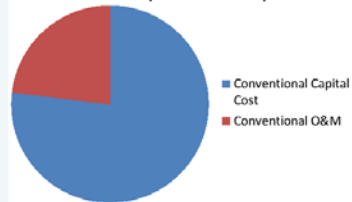
¹ These cost do not include the purchase and installation of the on-lot
² These cost include one vacuum pod for every two connections



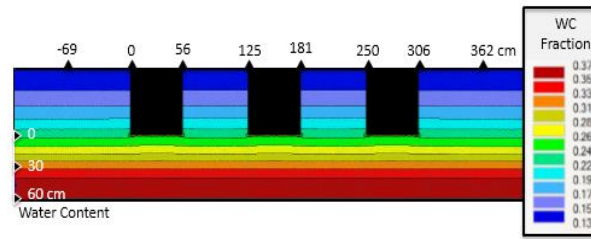


CONVENTIONAL

Present Worth (2015 dollars)

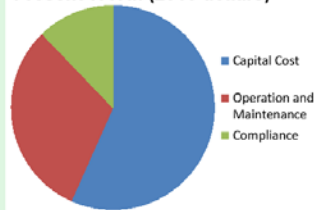


Capital Cost

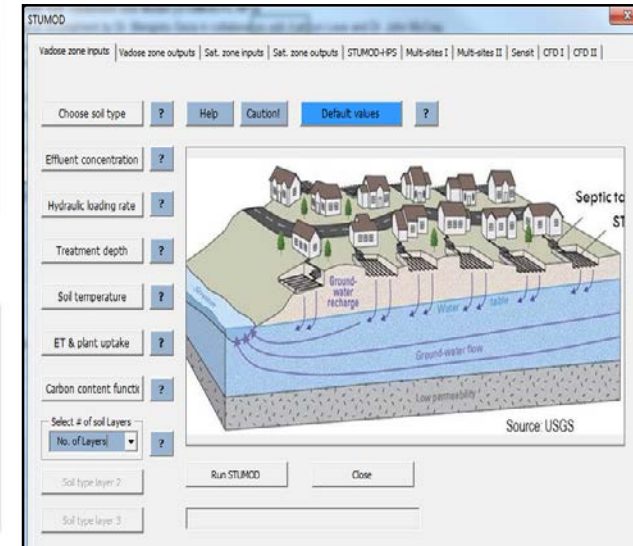
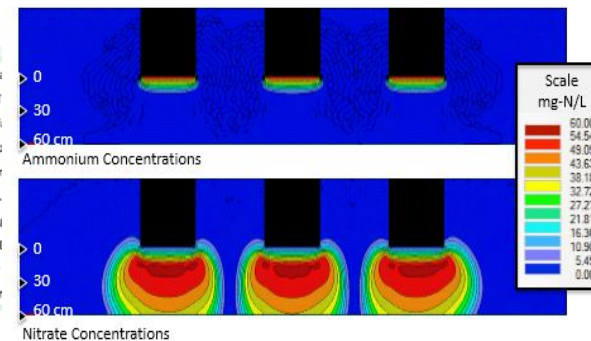


PASSIVE NITROGEN

Present Worth (2015 dollars)



Capital Cost

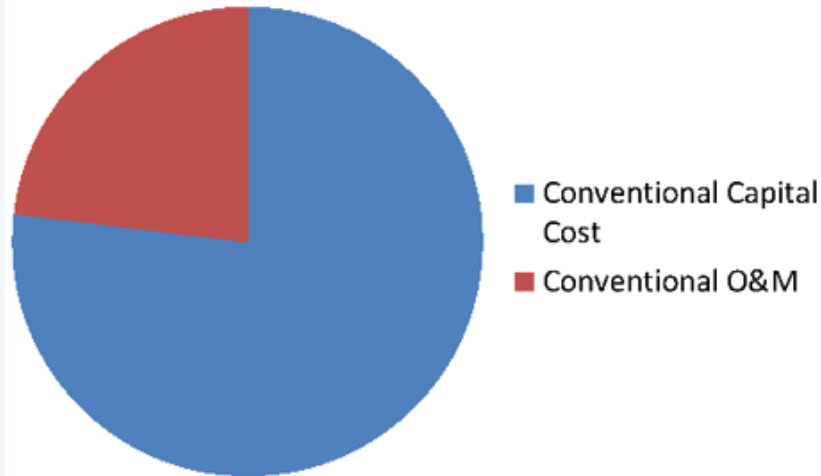




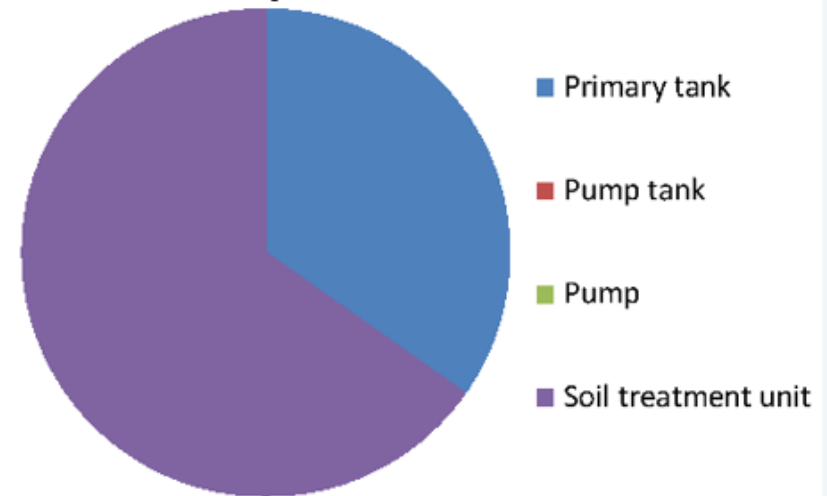
Life Cycle Costs

CONVENTIONAL

Present Worth (2015 dollars)

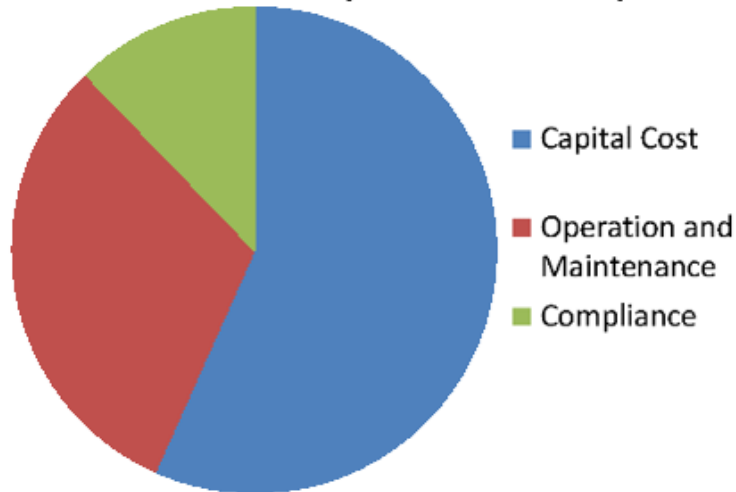


Capital Cost

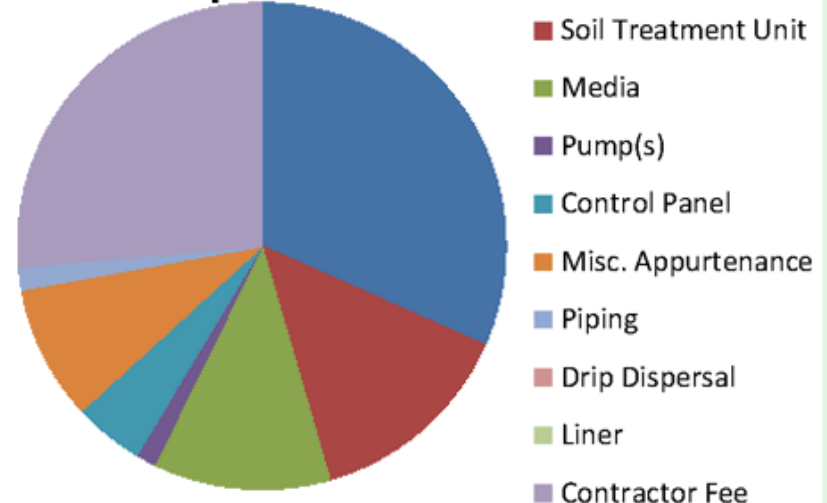


PASSIVE NITROGEN

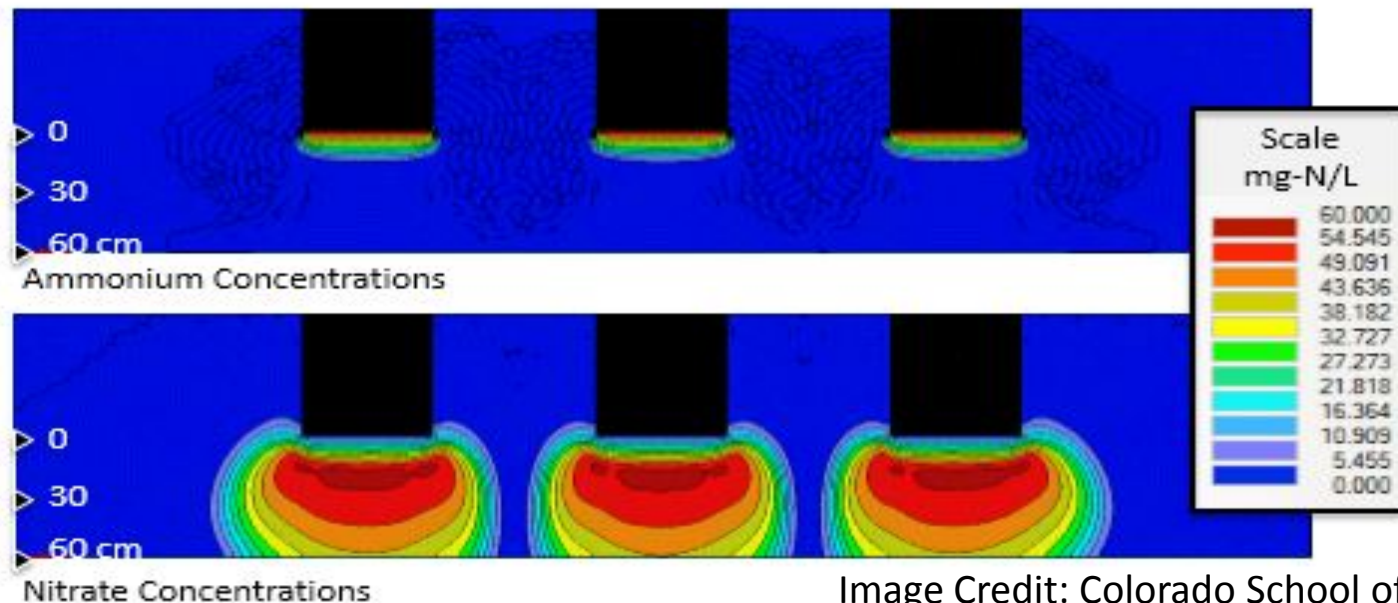
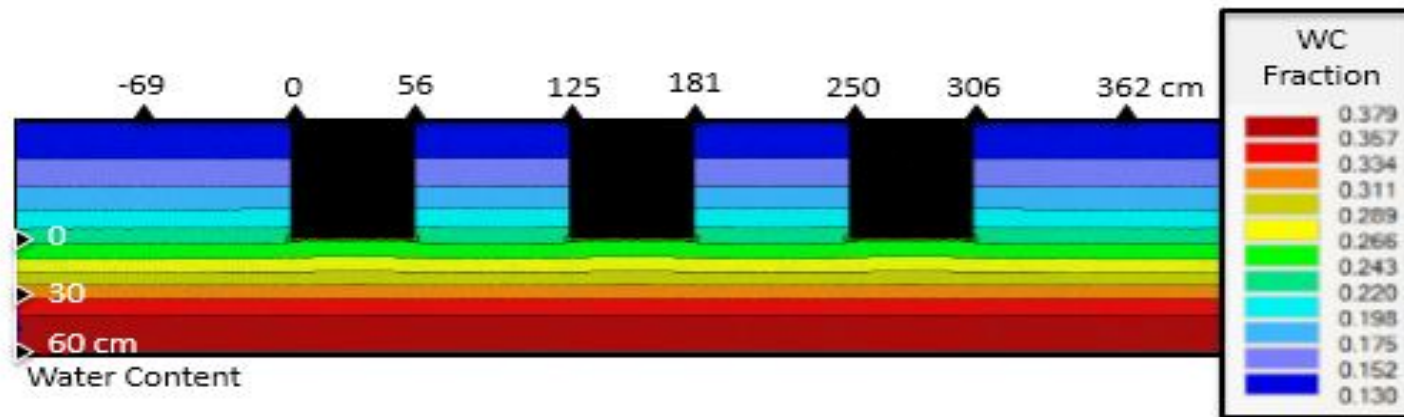
Present Worth (2015 dollars)



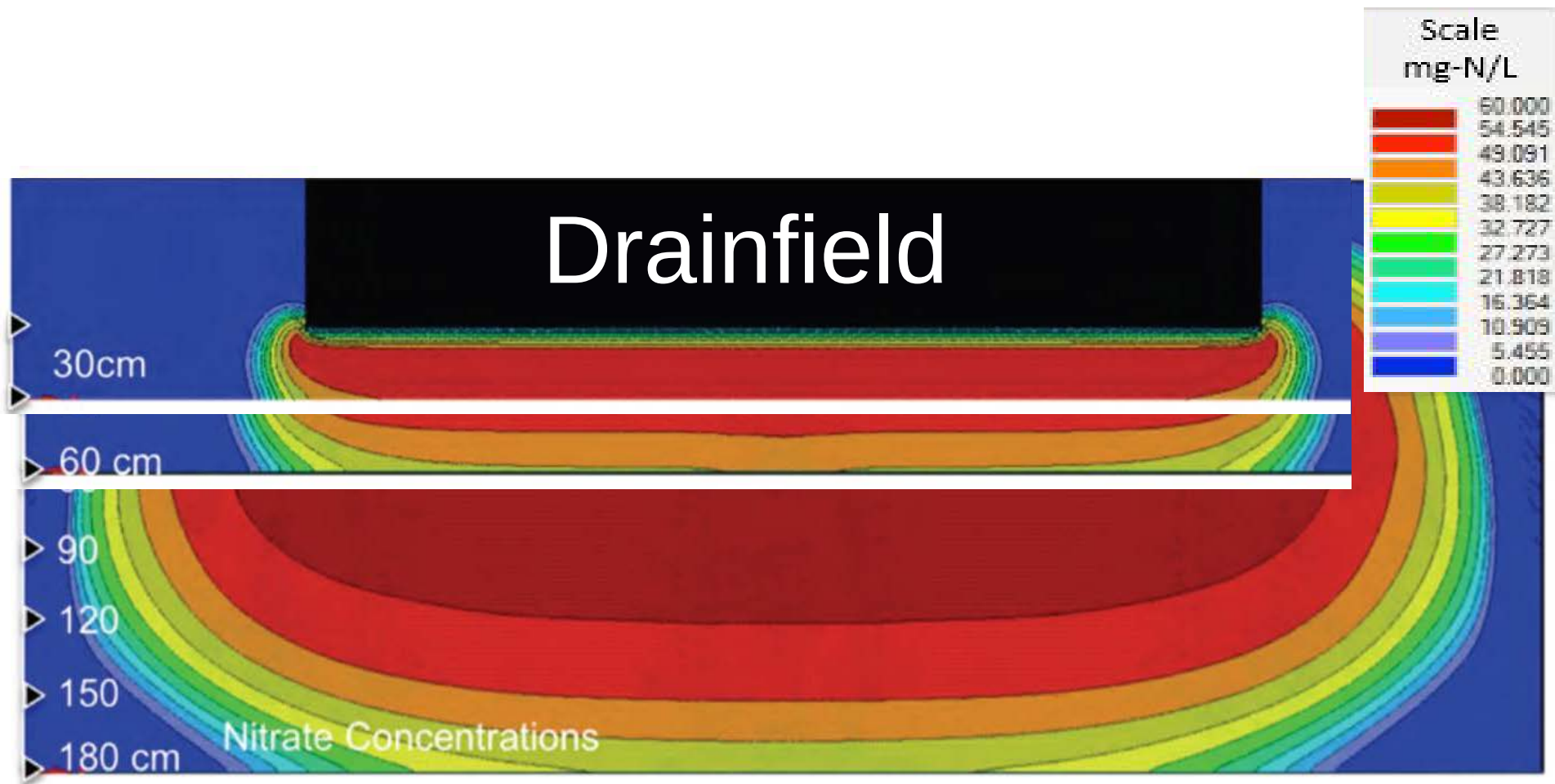
Capital Cost



Vadose Zone Model Example



Modeling Nitrogen Under Drainfields

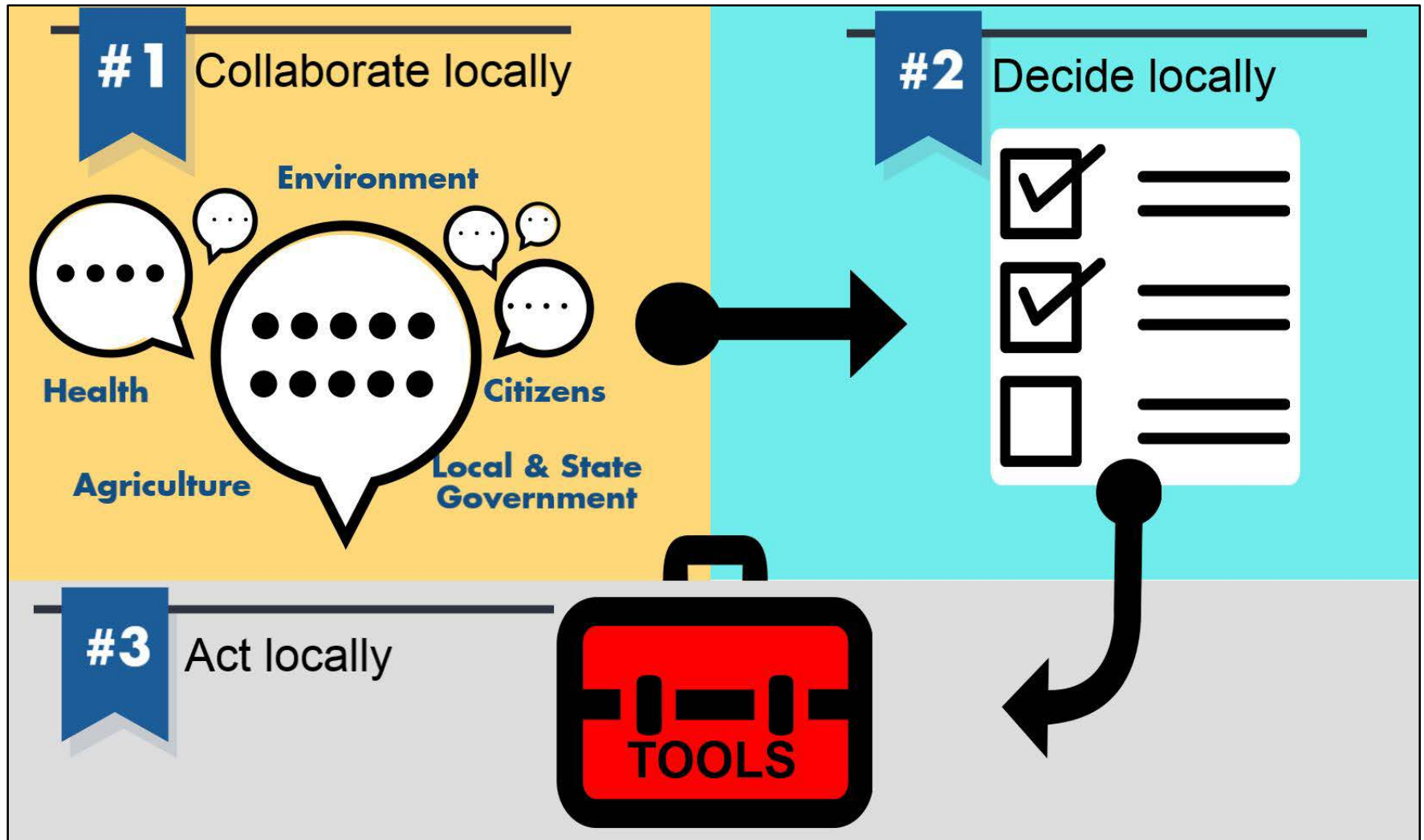


Nitrogen Model





Get Involved





Water Bill

“Florida Springs and Aquifer Protection Act” 373.807, F.S.



Dock and diving platform on Santa Fe River O'Leno State Park, Florida, 1940

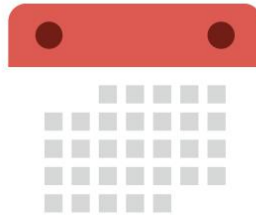
Photo Credit: State Archives of Florida, *Florida Memory*, <https://floridamemory.com/items/show/152931>



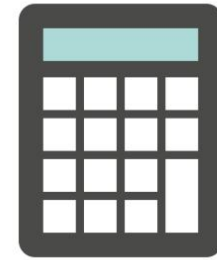
OSTDS Advisory Committee



**Priority project
list**



**Implementation
schedule**



**Load reduction
targets**



**List of data
needs**



**Ideas for public
education**



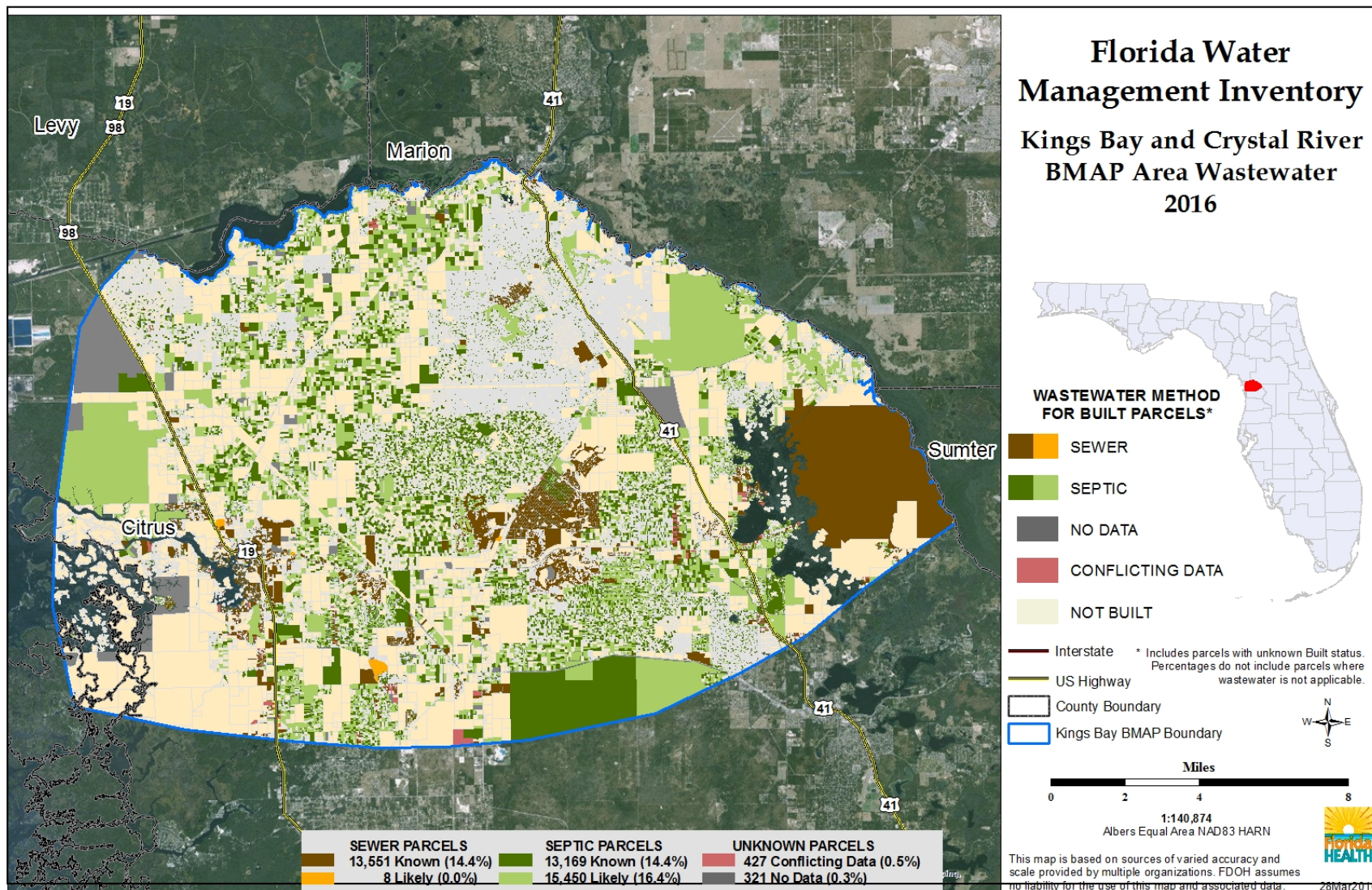
**List of existing
studies & results**



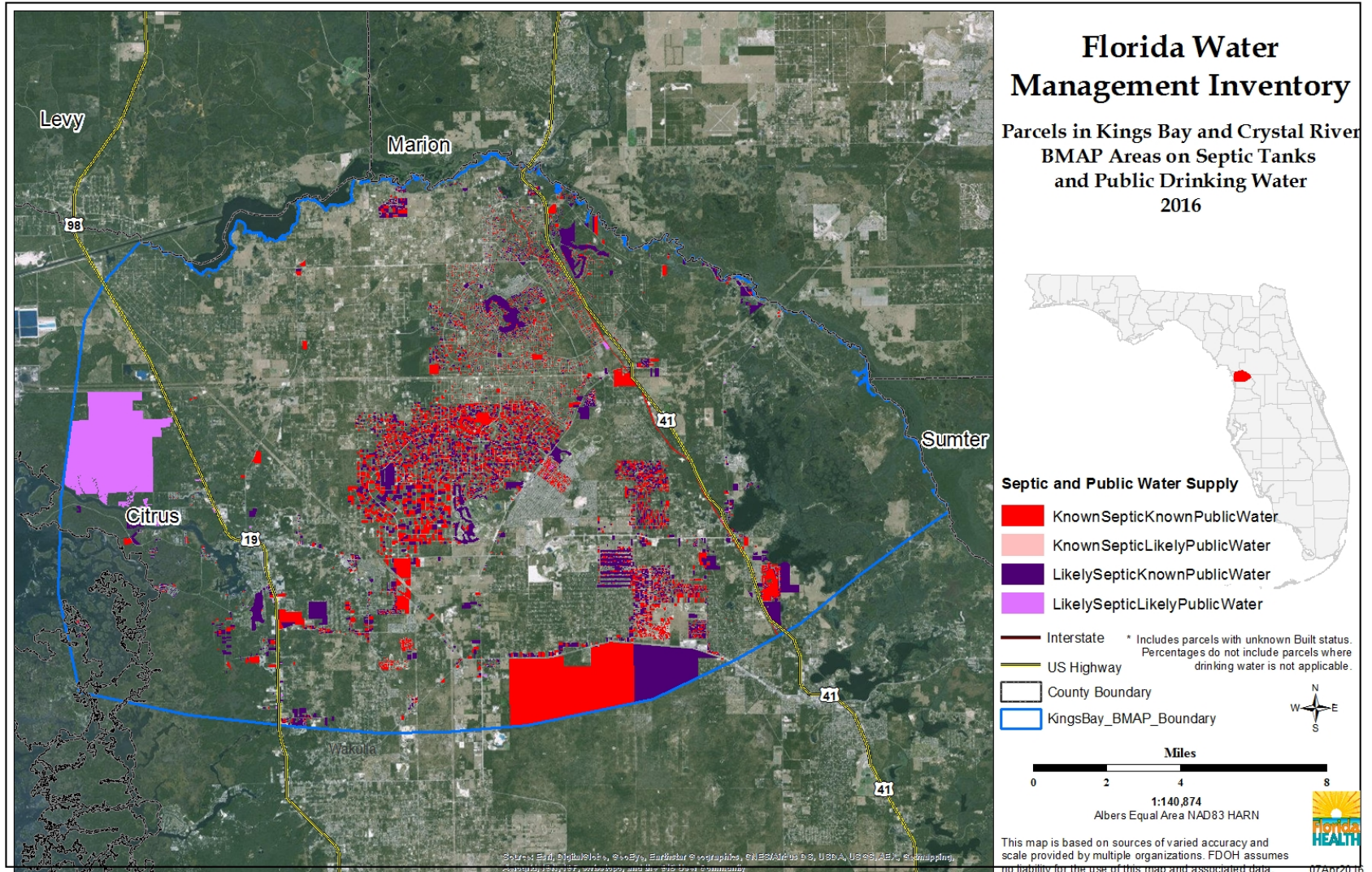
How OSTDS Research Fits In



Wastewater Distribution



Expanding the Analysis



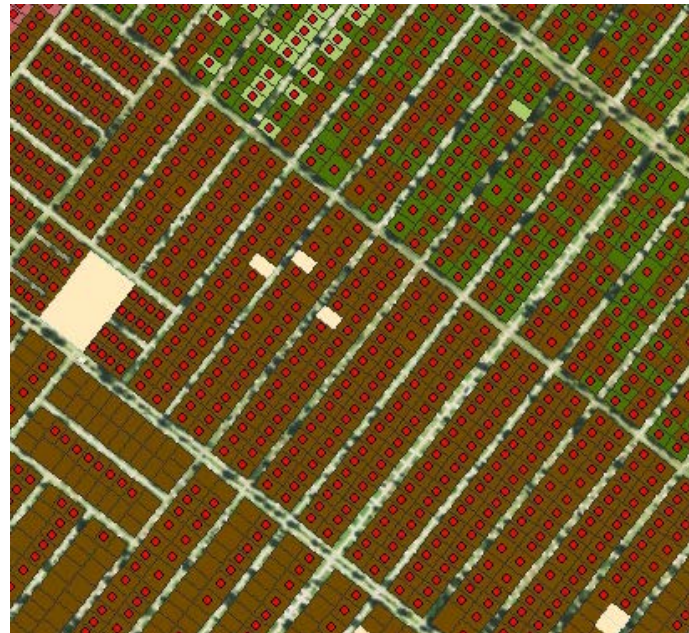
Comparison of Tools

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

	FLWMI	NSILT	Matching parcels
# septic systems (BMAP)	28,726	32,903	24,984 (87%)

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

- NSILT septic parcels are on known or likely sewer parcels





1
Implementation
Plan

Approve baseline conventional septic system enhanced for nitrogen reduction (in-ground system)

Requires rule change.

Status: Tabled by Technical Review and Advisory Panel on October 22, 2015 for more details

2

Implementation Plan

Incorporate nitrogen study systems as approved performance-based systems

Requires development of system specifications

Status: Being developed

3

Implementation Plan

Develop new nitrogen reducing systems section
in Chapter 64 E-6 Florida Administrative Code

Requires rule and possibly statute changes

Status: Requires multiple public meetings

4

Implementation Plan

Provide public education and training on nitrogen reduction strategies

Requires training development and message standardization

Status: Ongoing

5

Implementation Plan

Share planning-level tools to assess nitrogen reducing strategies (inventory, model)

Requires coordination with local stakeholders

Status: Ongoing

6

Implementation Plan

Determine funding solutions for nitrogen reduction efforts

Requires coordination with Department of Environmental Protection and local stakeholders

Status: Pending

Research Benefits Floridians

- Field-tested designs
- Nitrogen model
- Cost estimates
- Options



Seeing Silver Springs in glass bottom boats

Photo Credit: State Archives of Florida, *Florida Memory*, <http://floridamemory.com/items/show/161202>



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Florida Department of Health

Division of Disease Control and Health Protection

Bureau of Environmental Health