



SSSA Onsite
Wastewater Conference
April 7-8, 2014

The Florida Onsite Sewage
Nitrogen Reduction Strategies
(FOSNRS) Project

FOSNRS 1: The Florida Onsite Sewage Nitrogen Reduction Strategies (FOSNRS) Study, Project Overview

April 7, 2014

Elke Ursin, PMP

Environmental Health Program Consultant

Division of Disease Control and Health Protection



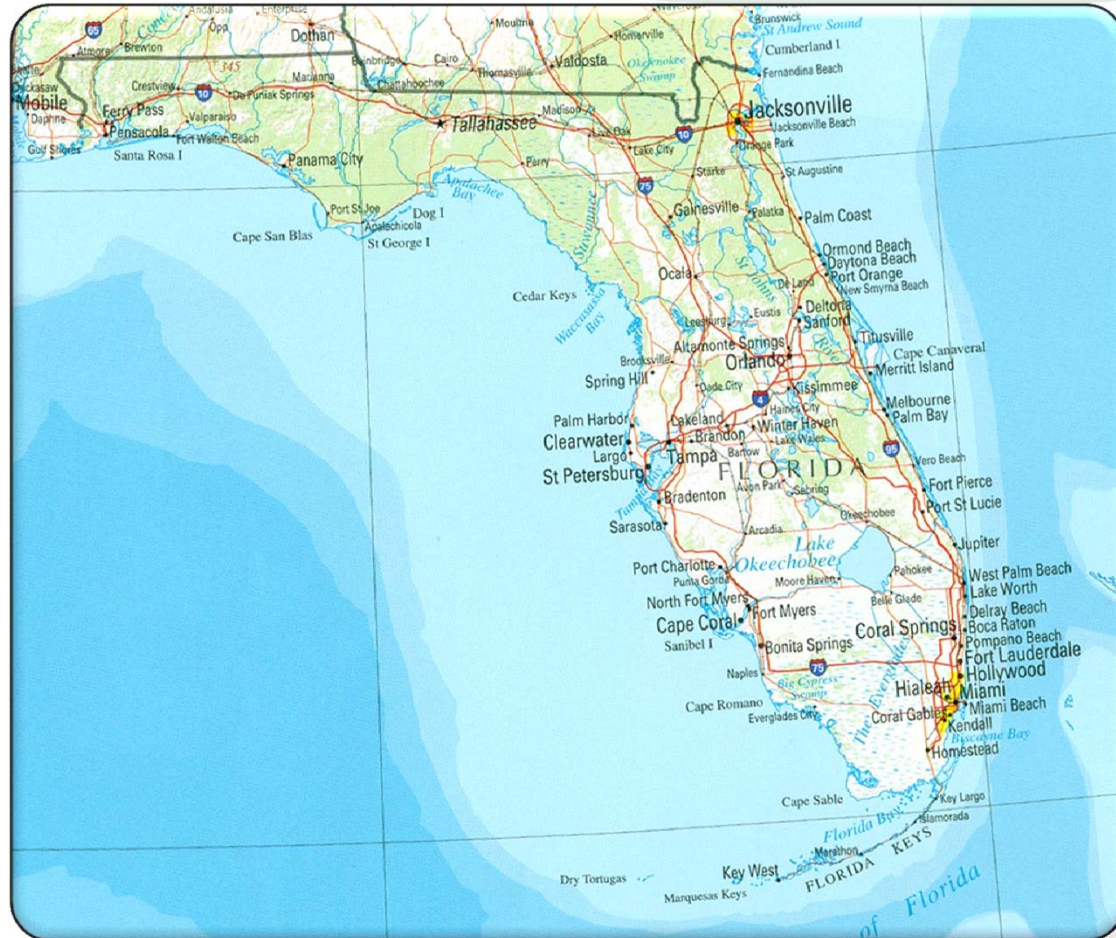
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Overview

- Florida onsite wastewater systems
- Assessment of system performance
- Current research:
 - Nitrogen removal technologies
 - Fate and transport

Onsite sewage systems in Florida

There are
approximately
2.6 million
onsite sewage
systems in
Florida

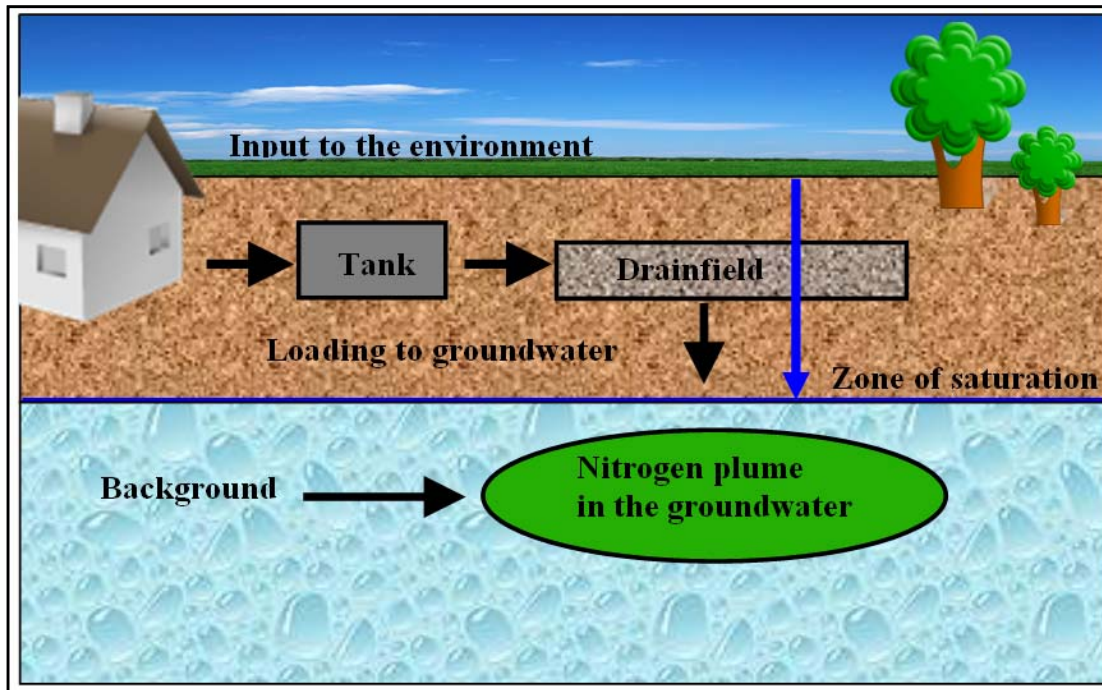


Florida Department of Health



Statewide rule
implemented by
67 county offices

Nitrogen from onsite systems depends on:

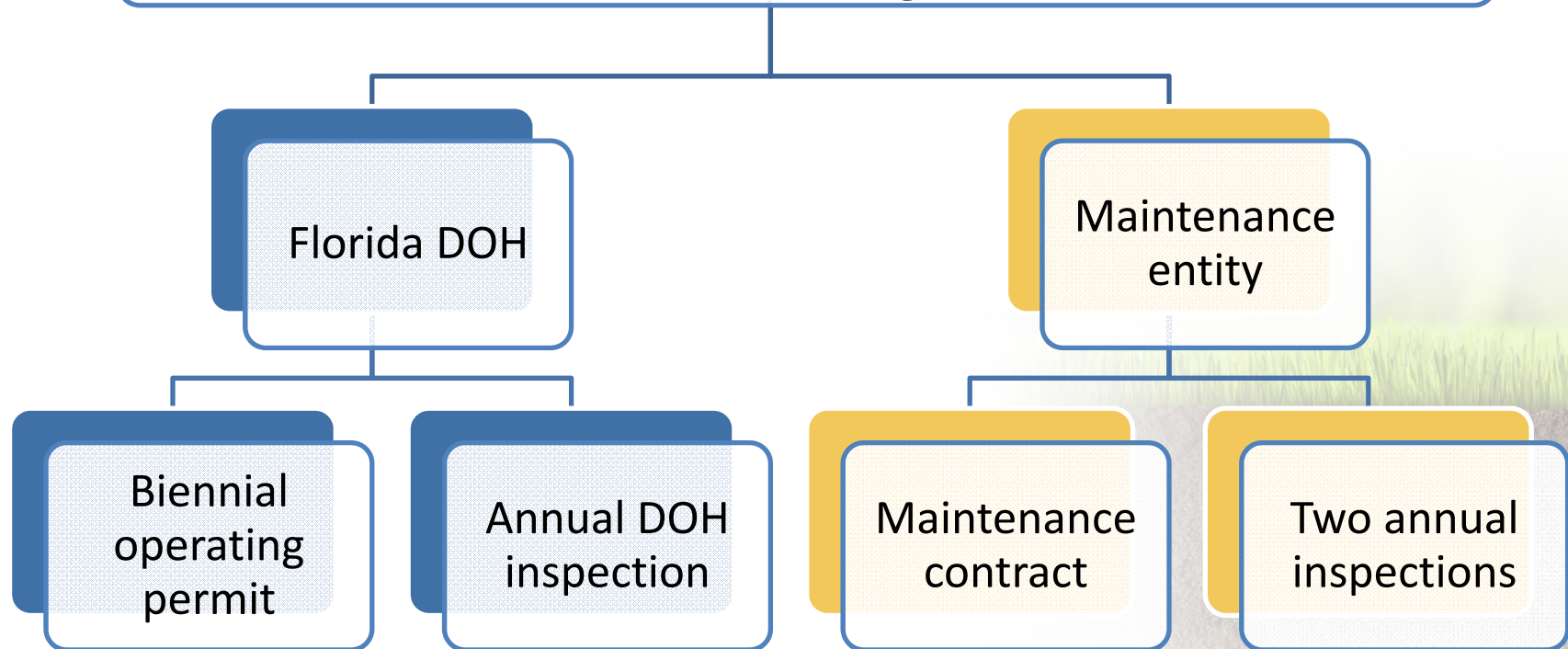


- System usage
- Treatment level
- Groundwater
- Soil type

“Advanced Systems”

- Aerobic Treatment Units (ATUs)
- Performance-based Treatment Systems (PBTS)

Regulatory requirements for advanced systems



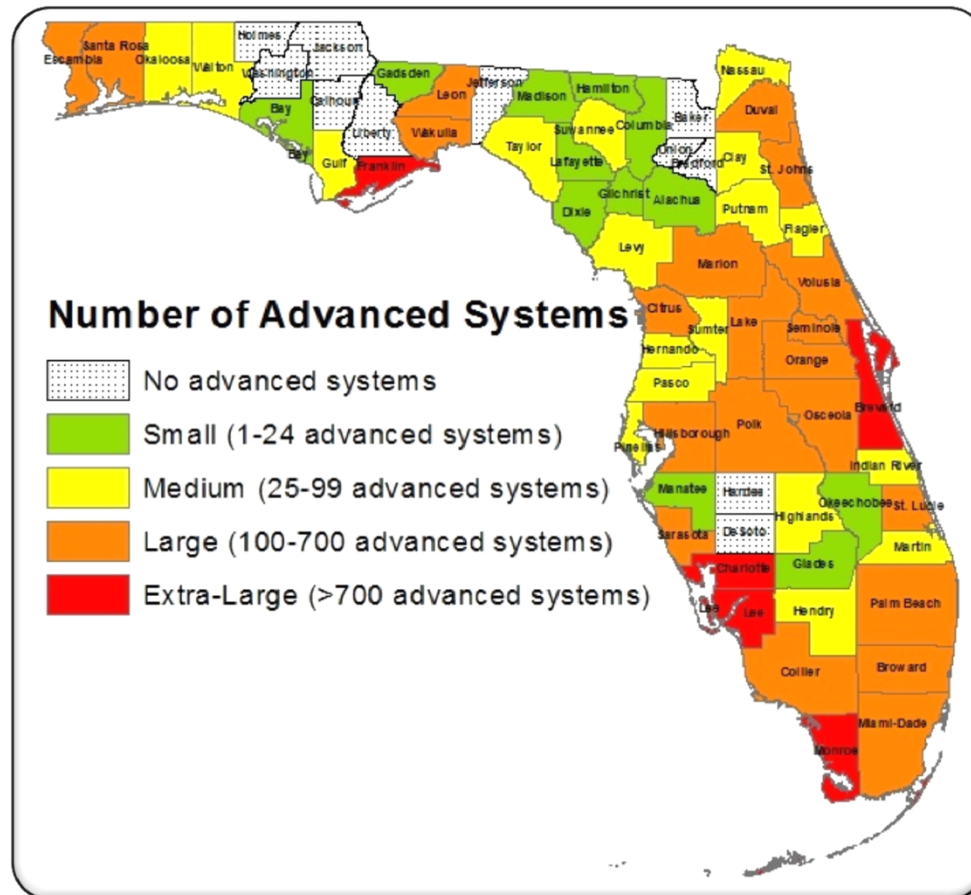
How are these systems working?

- What are the options?
- How effective are they?
- How are systems working day-to-day?
- How are these systems perceived?



Where are Florida's advanced systems?

There are approximately 12,000 advanced systems in Florida



Sampling protocol

Three groups of measurements:

1. Initial system assessment
2. System operation evaluation
3. Sample analysis

Sampling



Sampling results

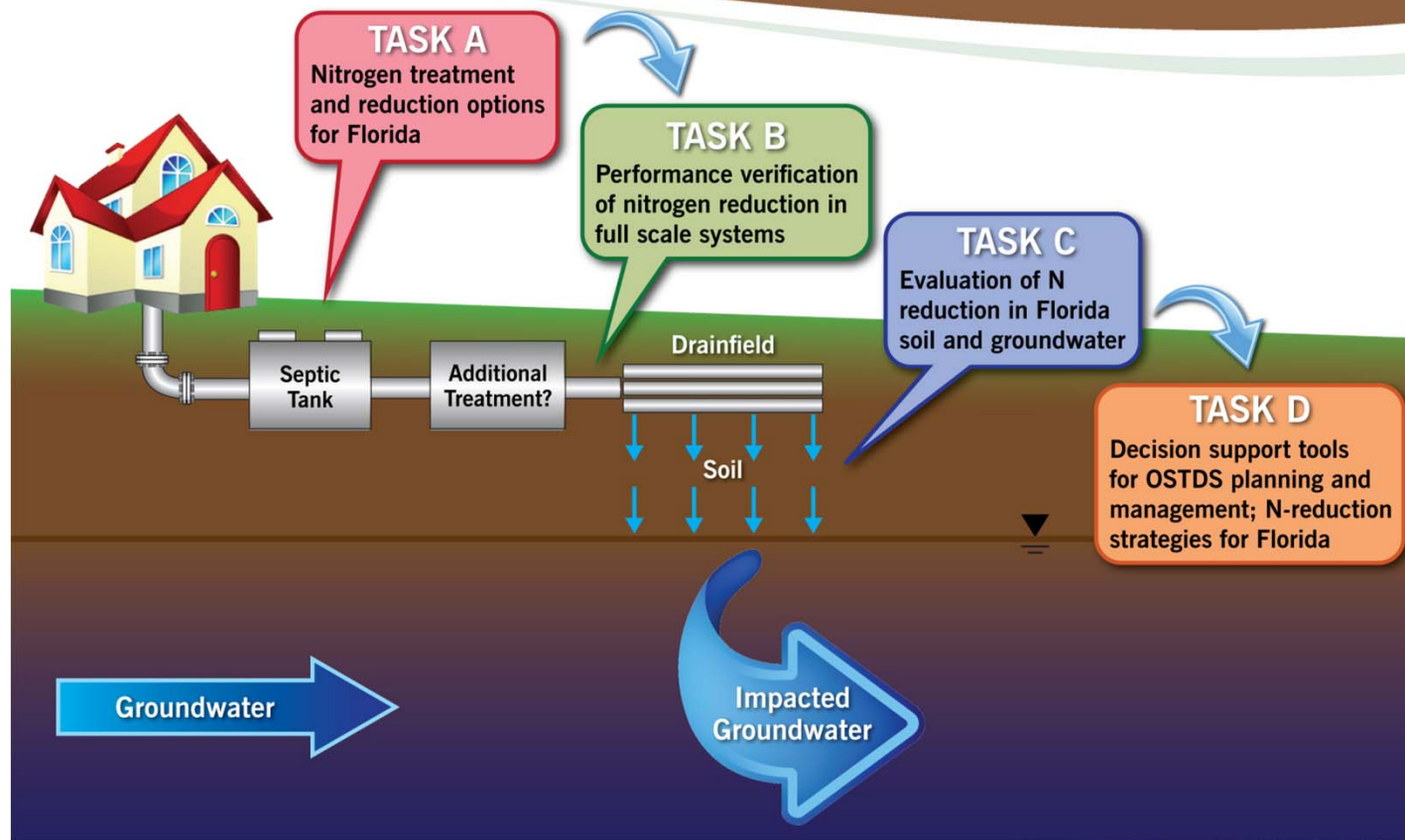
Median	cBOD ₅ (mg/L)	TSS (mg/L)	TN (mg/L)	TP (mg/L)
Influent (n=42)	95	66	45	7.9
Effluent (n=301)	5.5	19	30	7.5
% Removal	94%	72%	33%	6%

Comparison of results aerating and non-aerating systems

Parameter	Influent n=42	Aerating n=237		Non-Aerating n=42	
		Result	% Removal	Result	% Removal
cBOD ₅ (mg/L)	95	4.6	95%	38	60%
TSS (mg/L)	66	18	73%	23	65%
TN (mg/L)	45	29	36%	47	-4%
TKN (mg/L)	45	4.9	89%	42	8%
TP (mg/L)	7.9	7.3	7%	8.7	-10%

**Current paperwork
+
Regular inspections
=
Satisfactory system operation
=
Sample results meet standards**

Florida Onsite Sewage Nitrogen Reduction Strategies Study



Study cost-effective ways to reduce nitrogen from onsite wastewater treatment systems

Project Timeline

2008

Study
authorized by
Florida
Legislature

2009-2015

Project executed,
funding
appropriations
ongoing

**2015-
2016**

Anticipated
contract
completion

FDOH Research
Review & Advisory
Committee



Elke Ursin
Eberhard Roeder



Florida Department
of Environmental
Protection



Damann Anderson
Josefin Hirst
Harmon Harden
Sean Schmidt
Tasks A, B, C and D



Daniel Smith
Tasks A and B



John McCray
Kathryn Lowe
Robert Siegrist
Mengistu Geza
Cliff Tonsberg
Simon Farrell
Tasks C and D

Otis Environmental
Consultants, LLC

Richard Otis
Tasks A and B



Gurpal Toor
Yun-ya Yang
Mriganka De
Task C

Support
Services



Mechling Engineering
& Consulting, Inc.

SOUTHERN ANALYTICAL
LABORATORIES, INC.

Study goals

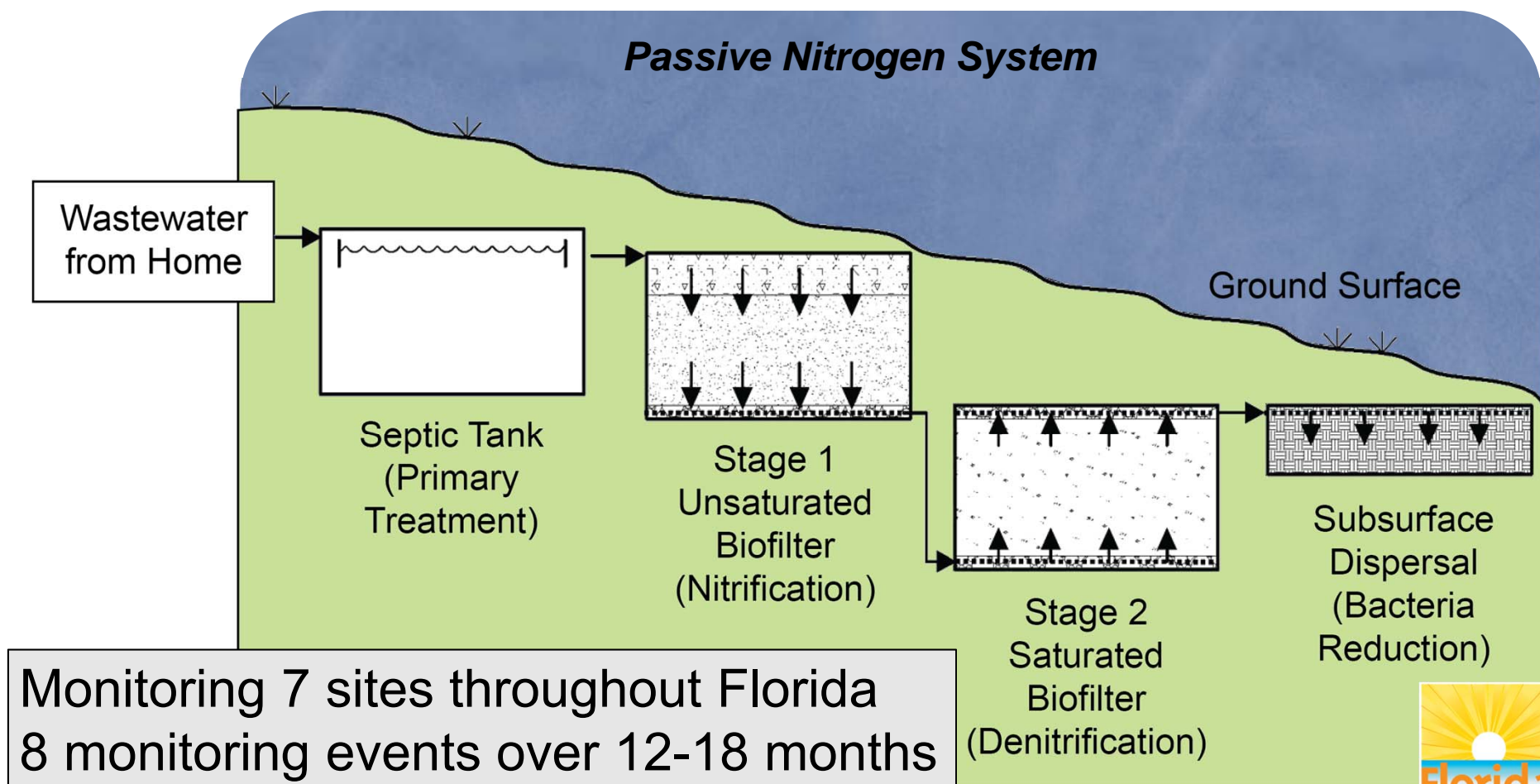
- Develop passive strategies for nitrogen reduction
- Complement use of conventional systems
- Develop cost-effective and ecologically protective nitrogen reduction strategies
- Evaluate nitrogen transport

Evaluate technologies

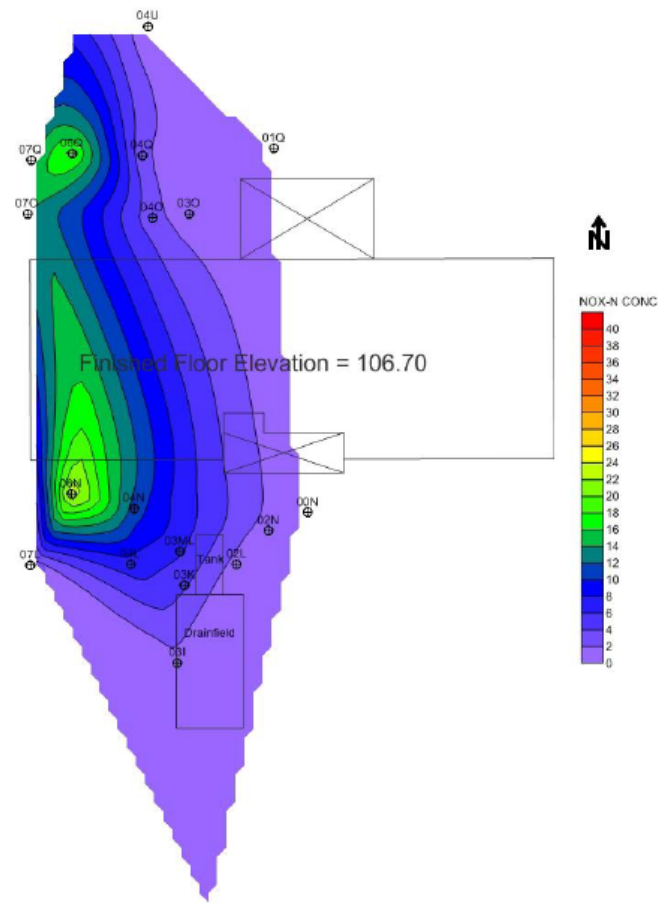
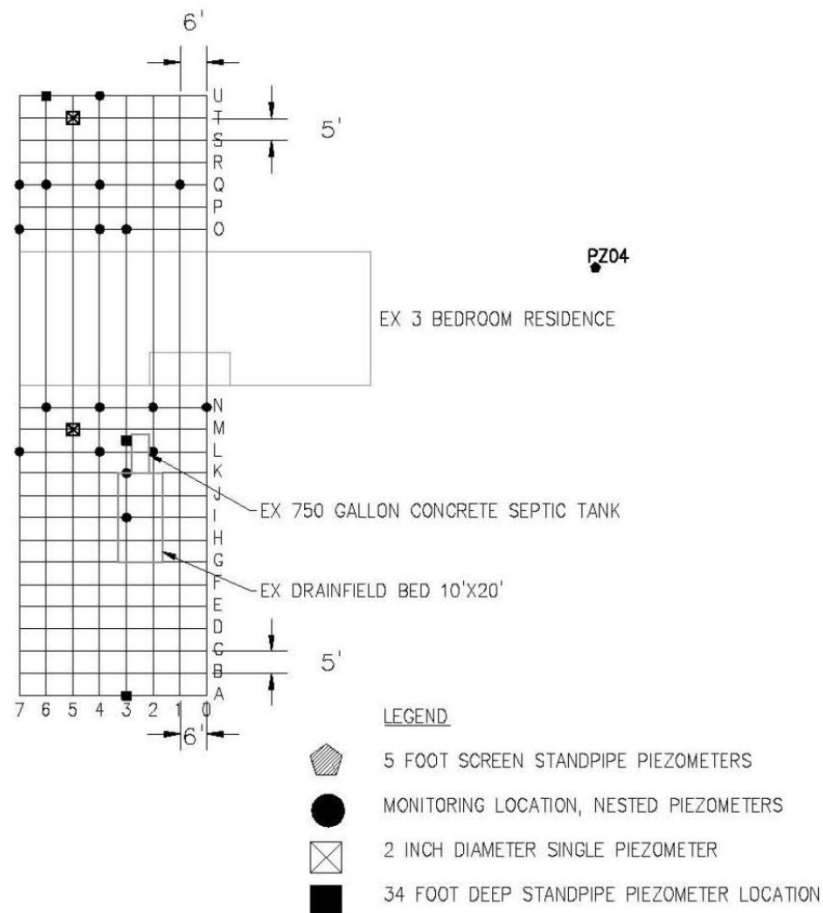
- Determine what nitrogen reduction strategies to study
- Bench-scale testing to develop design criteria



Install Full-Scale Systems at Actual Home Sites

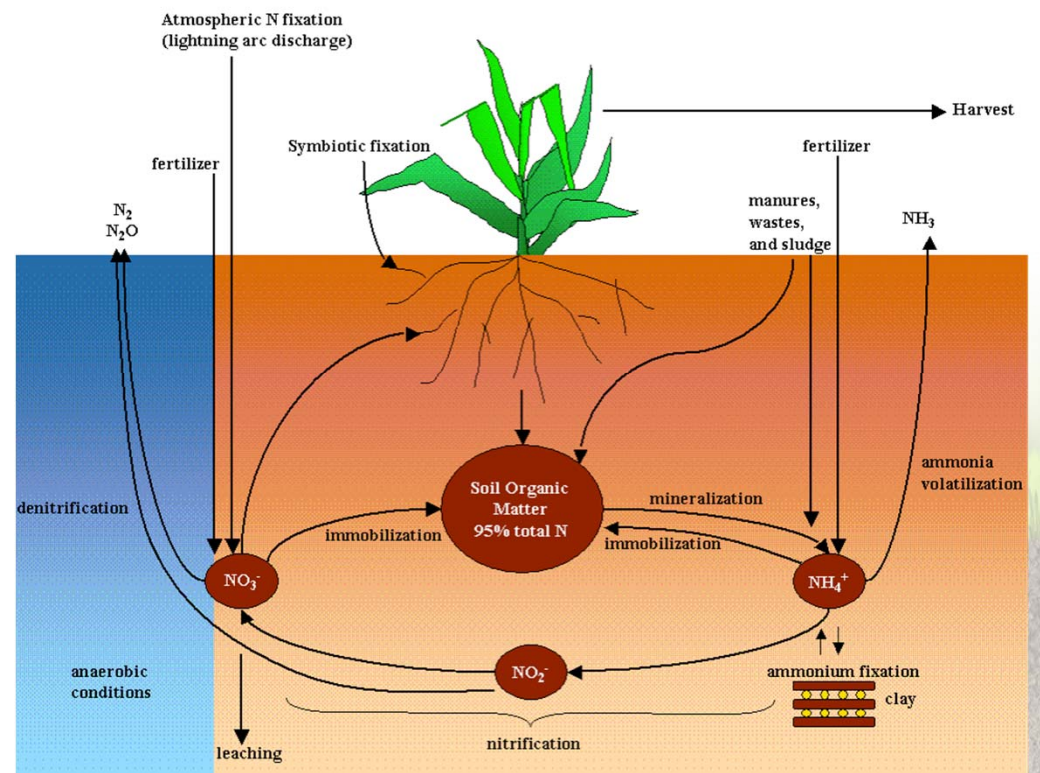


Evaluate nitrogen reduction in Florida soils and groundwater



Model Nitrogen Removal

- Shows treatment in soil and groundwater
- Use for assessment, planning, and siting
- Simple to use
- Calibrate to site specific data



Neitsch et al., 2002

What's next?

Florida Department of Health Research Review and Advisory Committee



Summary

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**Florida Department of Health
Division of Disease Control & Health Protection
Bureau of Environmental Health**

Email: Elke.Ursin@flhealth.gov

Phone: 850-245-4444 Ext. 2708

