




Florida's Onsite Sewage Research Program

Issues that Drive Research and Florida's Response

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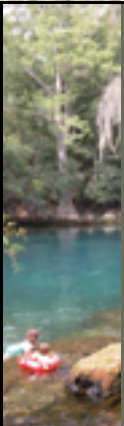




Objectives

- Introduce the research program
- Identify current issues that drive research in onsite sewage
- Show how the research program is working to find solutions



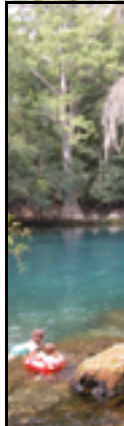
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What do septic systems contribute?

- 1/3 of population in Florida served by septic
- Septic is one of the largest artificial groundwater recharge sources in the state
- 90% of drinking water comes from groundwater



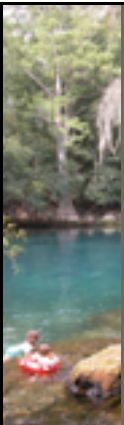
3

What is Florida's OSTDS Research Program?

- Program has been in place for over 25 years
- Funded through \$5 surcharge on new septic permits
- Results have changed the rules and paved the way for new technologies



4

Who are the key people in the Research Program?

- **Department of Health Staff**
 - o **Coordinator:** Elke Ursin
 - o **Supervisory and Technical Support:** Paul Booher, Eberhard Roeder, Gerald Briggs

5


Who are the key people in the Research Program?

(continued)

- **Research Review and Advisory Committee**
 - o Advise on directions for new research
 - o Review and rank proposals for research contracts
 - o Review draft research reports and make comments

6




Who are the key people in the Research Program?

(continued)

- **Contract Partners**
 - Universities
 - Consulting companies
 - Other state agencies
- **Outside funding Agencies**
 - EPA (Gulf of Mexico Program)
 - EPA (319 Grant Program)
 - NOAA

7

Current Issues & Finding Solutions

8

Issue:

Increased nutrients in water bodies

9

Inputs vs. Loads

10

Wekiva Nitrogen Study

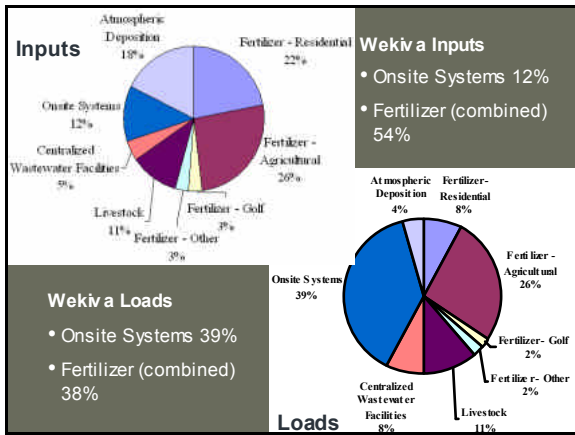
- Over 55,000 Onsite Systems in 475 square miles spanning 3 counties
- Quantify onsite nitrogen load contribution to groundwater
- Assess relative importance of onsite sewage in comparison to other sources
- Recommend cost-effective solutions

11

Nitrogen Load to Ground Water

- Nitrogen
 - 20-30 lbs per system released from typical septic tank
 - Some removal (10-50%) under drainfield
 - Further removal depends on ground water elevation, soil type, and other conditions
- Total load depends on number of people served by onsite systems and treatment level
- Relative importance depends on presence and magnitude of othersources

12

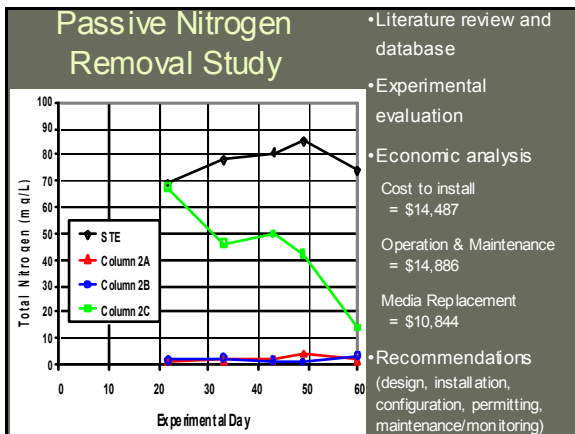


Passive Nitrogen Removal Study

Goal: Evaluate passive treatment media for onsite wastewater treatment

Media Evaluated:

- Stage 1 (unsaturated)
 - Zeolite
 - Expanded Clay
 - Tire Crumb
- Stage (saturated)
 - Elemental Sulfur
 - Expanded Shale
 - Oyster Shell



Passive Nitrogen Removal Study Award Winning!

American Academy of Environmental Engineers:
Excellence in Environmental Engineering (E3) Award in Applied Research and Practice

Dr. Daniel Smith accepts E3 Award from AAEE President Dr. Deborah Reinhart of UCF

Florida Onsite Sewage Nitrogen Reduction Strategies Study

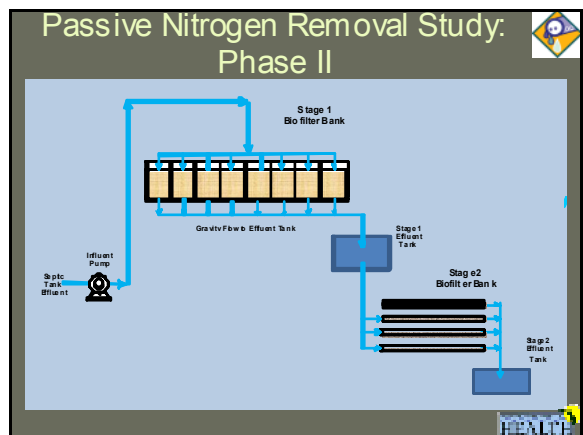
Study cost-effective ways to reduce the impact of nitrogen contributed by onsite sewage systems throughout Florida

- TaskA - N-removal system options
- TaskB - N-removal performance verification
- TaskC - Evaluation of N reduction in soil & groundwater in Florida
- TaskD - Decision tools for setting N-removal goals for OWTs

Onsite Sewage System

Soil & Groundwater

Property Line



Stage 1 Media (nitrification)

Zeo-Pure clinoptilolite
 Expanded polystyrene
 Expanded clay

Stage 2 Media (denitrification)

Lignocellulosics
 Elemental sulfur
 Expanded clay

Issue summary

- Nutrient loading issues are a rising concern in many areas
- Research is paving the way to making a positive change
- Providing a solution to increased nutrients in water bodies

21

Issue:

Finding the onsite sewage input in impaired water bodies

Evaluating Impact of Sewering an Area Previously on OSTDS: Town of Suwannee

- Grant from National Oceanic and Atmospheric Administration (NOAA)
- Historical data from pre-sewer in 1996 and immediately post-sewer in 1997
- Resample the Town of Suwannee in 2009 to evaluate the long-term effect of sewerage on water quality

Evaluating Impact of Sewering an Area Previously on OSTDS: Town of Suwannee

Sample site locations

Coastal Community Coliform Study: Taylor County

- Grant from Environmental Protection Agency (EPA)
- Beaches have high indicator bacteria
- Numerous sources contribute
- Samples were taken at various locations
- Compounds sampled to identify sources

25

Coastal Community Coliform Study: Taylor County

Results:

- Beach water quality frequently requires advisories
- No difference in water quality between beaches with and without development
- Creeks and canals upstream from beaches generally showed poorer water quality than beaches
- Environmental factors, such as rainfall and temperature, affected water quality
- No consistent differences were found between areas with septic systems and central sewer

Optical Wastewater Tracers Study

- Grant from Environmental Protection Agency (EPA)
- Can you detect wastewater inputs to surface water by looking for optical brighteners from laundry detergents?

27

Results:

- Different brands of detergent have different concentrations of optical brighteners
- Important to look at ratio of OB (optical brightener) to CDOM (colored dissolved organic matter)
- Results are good platform for developing a field instrument

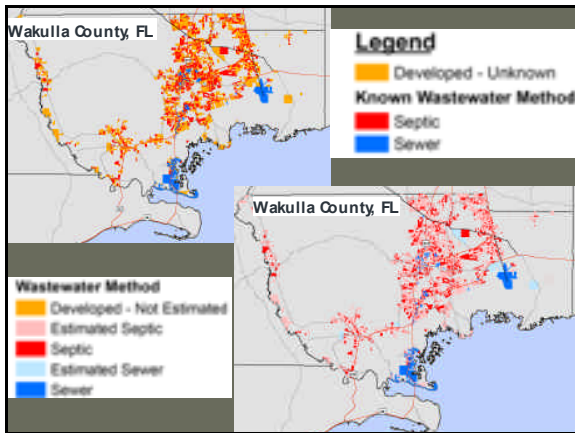
Flow-through fluorescence results for Phillippi Creek, Sarasota County, FL

Issue summary

- Figuring out the source of the problem can be difficult
- We are developing methods to help determine the onsite sewage input
- Results can be used to help with planning decisions

29

Issue: Measuring the performance of onsite systems



Statewide Inventory of OSTDS: Next Steps

- Currently we now have a snapshot, challenge will be to maintain information
- This is the first statewide inventory to be attempted in the U.S.: Other states to follow soon

38

Issue summary

- Management of systems allows us to keep track of the onsite sewage impact

39

What's Next?

40

Research = Results

- The results from studies have historically helped shape the septic industry as it exists today
- Conclusions generated from these studies help to formulate new rules and modify existing ones, as well as influence local ordinances

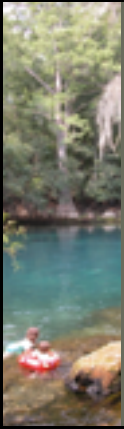
41

Big Picture View

Our vision is to make the Florida onsite sewage program a model for the nation using research as the cornerstone to develop scientific standards.

How can you help?

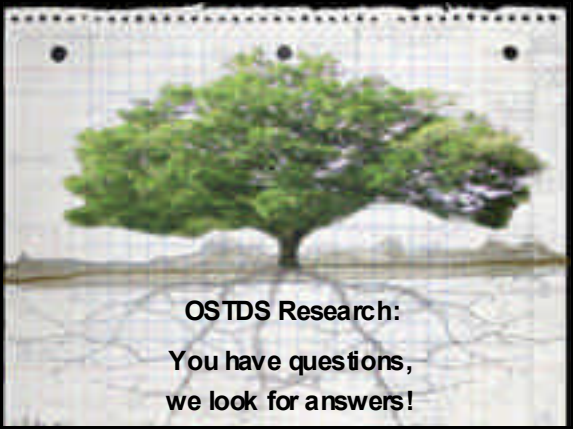

42



Thank you!

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43



**OSTDS Research:
You have questions,
we look for answers!**