



Bureau of Onsite Sewage Research Program

Research Program Update 2008

By: Elke Ursin

Environmental Health Program Consultant

Florida Department of Health, Division of Environmental Health

Bureau of Onsite Sewage Programs





Objectives

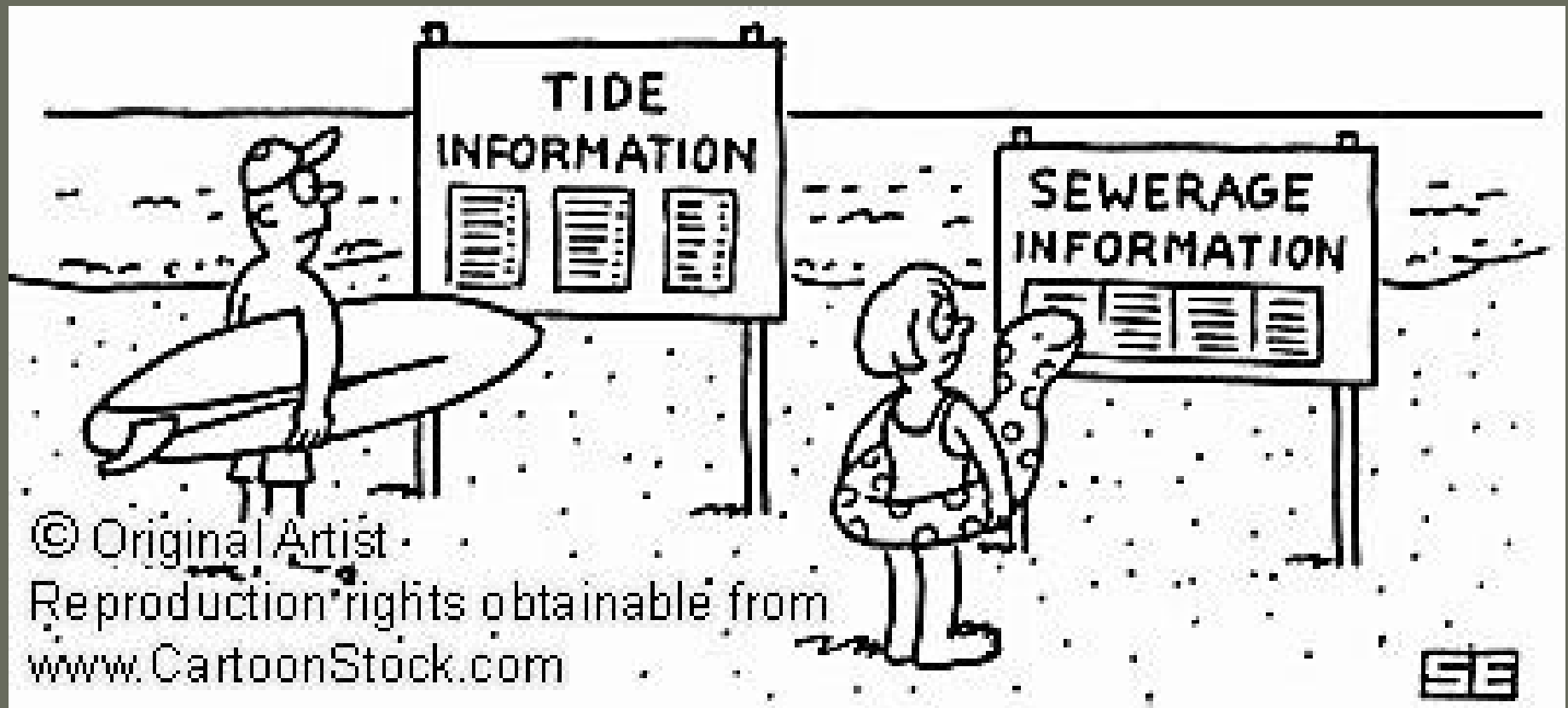
- Identify current issues that drive research in onsite sewage
- Show how the research program is working to find solutions
- Provide brief summaries of current research projects and recently completed projects



Current Issues & Finding Solutions

Issue:

Increased nutrients in water bodies





Florida Onsite Sewage Nitrogen Reduction Strategies Study



- Study on cost-effective ways to reduce the impact of nitrogen contributed by onsite sewage systems throughout the State of Florida
- Anticipated 3-year project with a budget of \$5,000,000



Florida Onsite Sewage Nitrogen Reduction Strategies Study



Objectives:

- Preselection of technologies and prioritizing technology for field testing
- Field testing of technologies at actual home sites and cost documentation
- Evaluation of nitrogen reduction provided by soils and the shallow groundwater below and down gradient of various systems
- Development of a simple model for predicting nitrogen fate and transport from onsite wastewater systems



Wekiva Seasonal Variability

- Future project ranked by the RRAC and approved by TRAP
- Investigate if there is a seasonal variability of nitrogen concentrations from OSTDS in the Wekiva Study Area of Central Florida
- Planned to be part of the nitrogen reduction strategies project



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 2008 to evaluate the long-term effect of sewerage on water quality



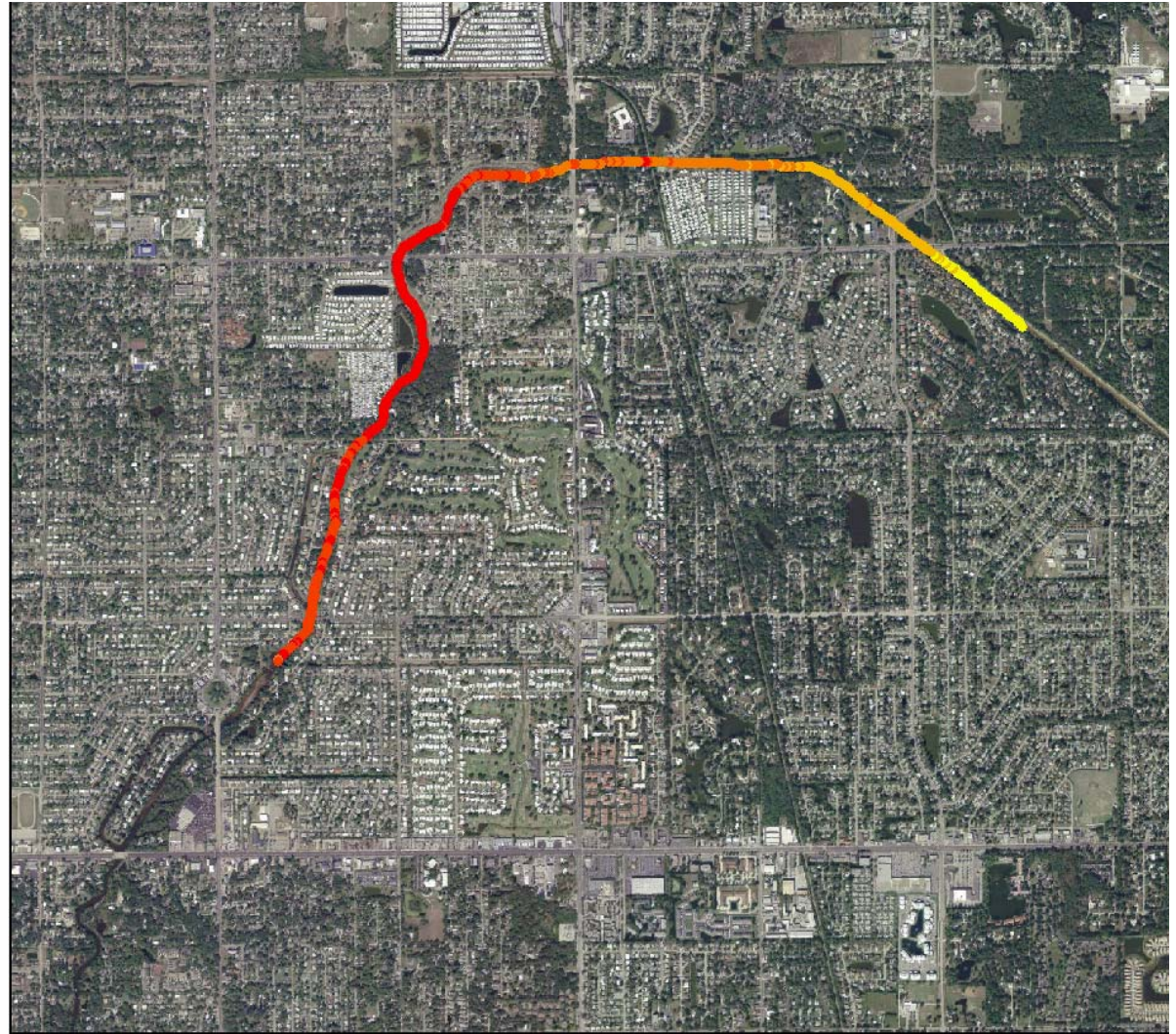


Optical Wastewater Tracers Study



- Grant from Environmental Protection Agency (EPA)
- Test the feasibility of detecting wastewater inputs to Florida surface waters using optical characteristics such as optical brighteners from laundry detergents as tracers

Flow-through
fluorescence results
for Phillippi Creek,
Sarasota County,
FL. Data are
presented as the
ratio of OB (optical
brightener) to
CDOM (colored
dissolved organic
matter)

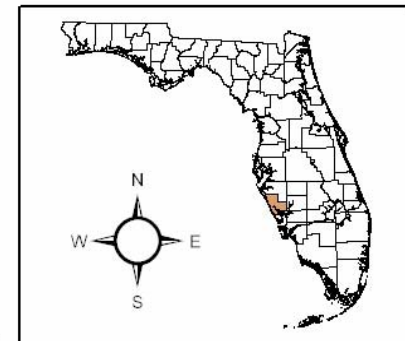


Legend

Phillippi Creek FTF

OB:CDOM

- 0.2132 - 0.2173
- 0.2174 - 0.2204
- 0.2205 - 0.2237
- 0.2238 - 0.2266
- 0.2267 - 0.2377

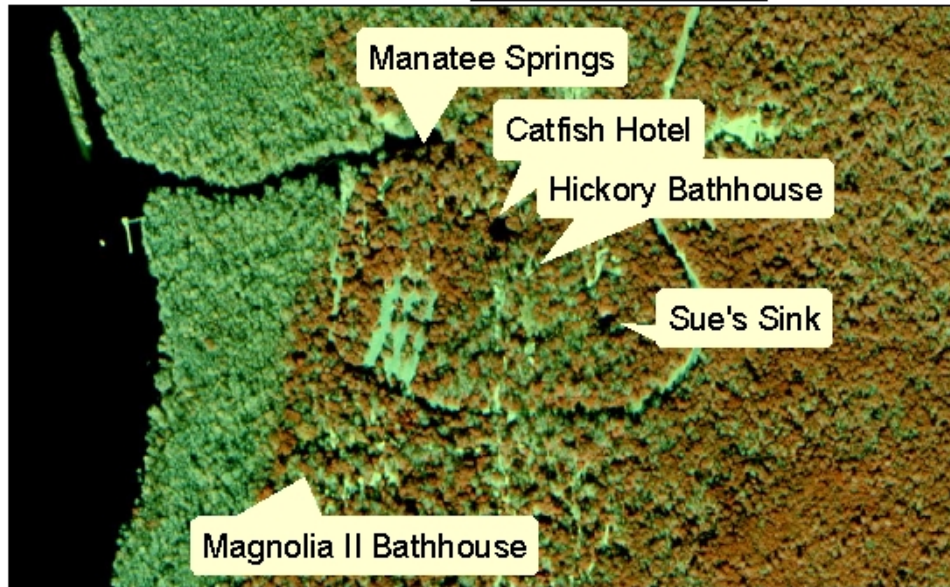
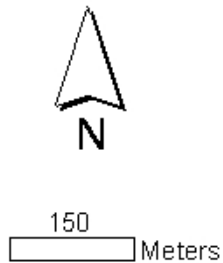


Issue:

Measuring the performance of onsite systems



Reducing Onsite Sewage Impacts: Manatee Springs



- Grant from Environmental Protection Agency (EPA)
- Suwannee River has experienced increasing nutrient concentrations, impacting water quality
- Manatee Springs State Park is remote, so OSTDS can be studied in isolation from other sources of nutrients
- History: 2004 study revealed elevated nitrates from onsite sewage systems traveling quickly through Karst to monitoring wells
- Existing systems will be retrofit to reduce nitrates and monitor groundwater concentrations resulting from the improved treatment



Performance and Management of Advanced Onsite Systems



- Grant with Environmental Protection Agency
- Assess water quality protection by advanced onsite sewage treatment and disposal systems



Performance and Management of Advanced Onsite Systems



Tasks:

1. Monroe County detailed study of variability of performance of advanced systems (Keys study)
2. Statewide database of advanced systems based on permit records
3. Survey of the perceived strengths and weaknesses of the current management of advanced onsite systems
4. Statewide assessment of operating condition and performance of advanced systems (random sample of 600 systems)
5. Quarterly influent and effluent sampling for a sample of systems (approximately 70 systems)
6. Booklet with case studies outlining both strengths and weaknesses of the current program and best practices in advanced onsite management

Issue:

New technologies and management methods for onsite systems





Long-term deformation of tanks of different materials

- Future project ranked by the RRAC and approved by TRAP
- Project is in response to problems observed in the field
- **Purpose:** Research how plastic tanks deform in the field and develop recommendations for protocols for structural proof testing, installation, monitoring and maintenance
- **Progress:** In scoping stages. Propose two stages:
 - Phase I: literature review on plastic tanks with assessment protocol to include different tank materials (fiberglass, concrete)
 - Phase II: field sampling numerous tanks of different materials based on the Phase I protocol



Alternative Drainfield Product Assessment

- Future project ranked by the RRAC and approved by TRAP
- Compare the functioning of alternative drainfield materials to standard aggregate
- Project has been temporarily postponed until the next budget cycle



Restoration of the University of South Florida (USF) Lysimeter Station



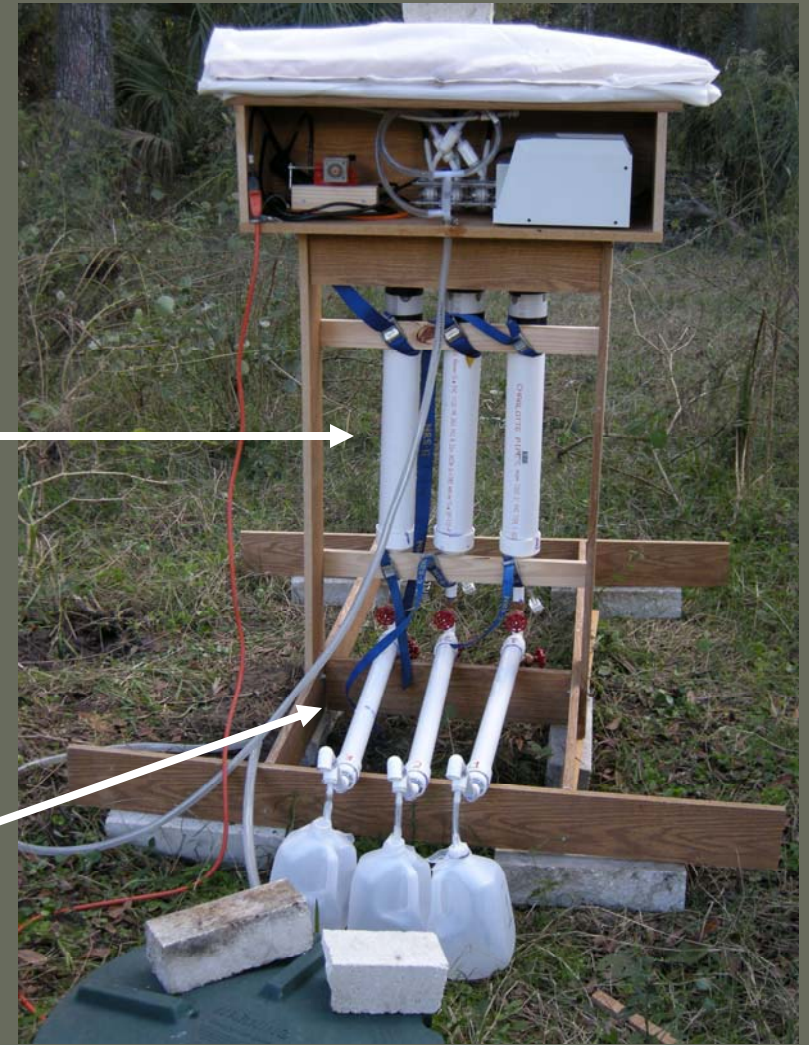
- Future project ranked by the RRAC and approved by TRAP
- Lysimeter Station was built in mid-90's to perform controlled experiments on wastewater and soil interactions
- The restoration is dependant on updating the memorandum of understanding between USF and FDOH
- If restored, several projects could potentially be conducted at the station
- Possibly work with the Patel Center for Global Solutions on global sanitation and potable water issues

Passive Nitrogen Removal Study

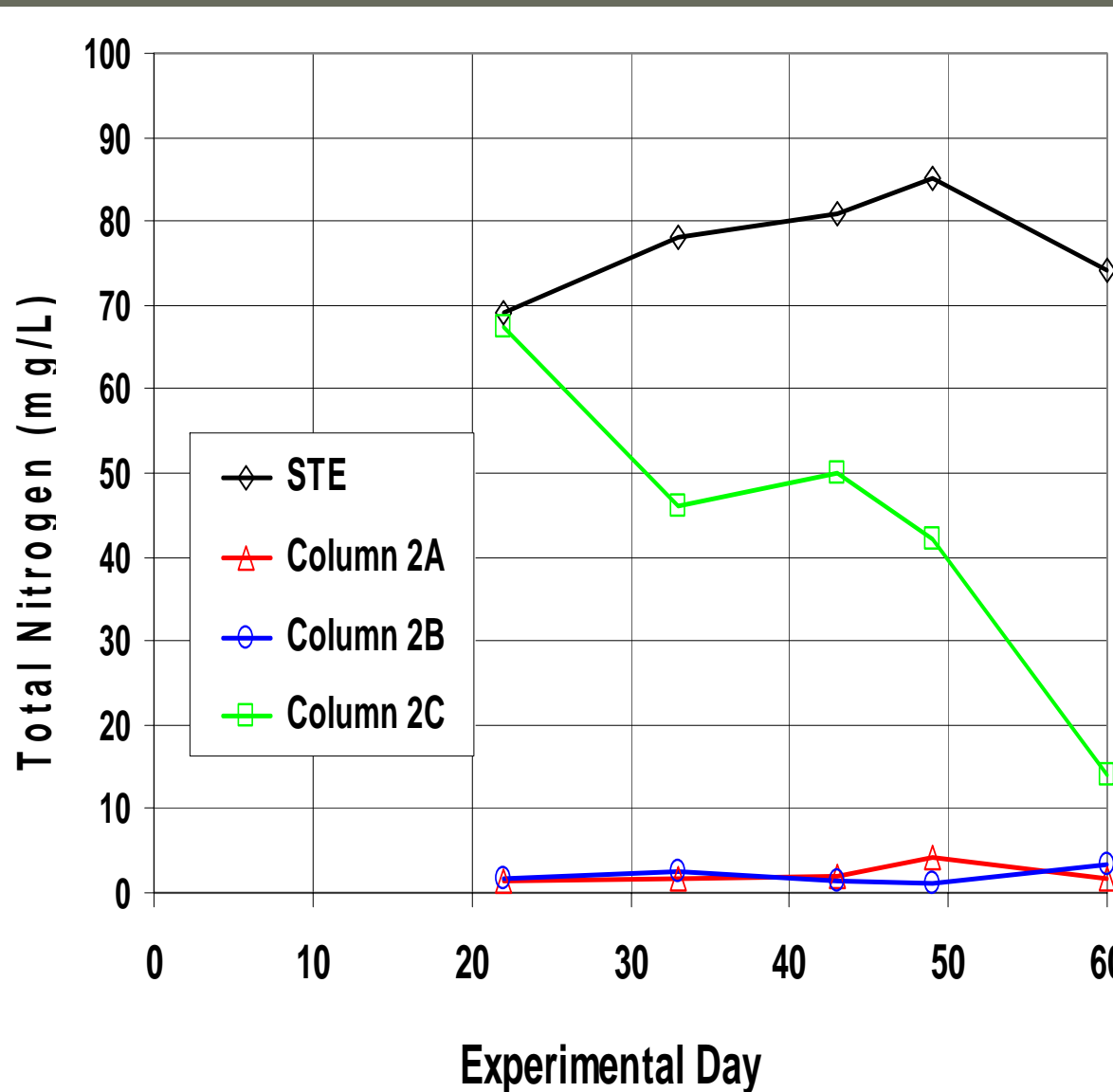
Goal: Evaluate passive treatment media for onsite wastewater treatment

Media Evaluated:

- Stage 1 (unsaturated)
 - Zeolite
 - Expanded Clay
 - Tire Crumb
- Stage 2 (saturated)
 - Elemental Sulfur
 - Expanded Shale
 - Oyster Shell



Passive Nitrogen Removal Study



- Literature review and database

- Experimental evaluation

- Economic analysis

Cost to install
= \$14,487

Operation & Maintenance
= \$14,886

Media Replacement
= \$10,844

- Recommendations (design, installation, configuration, permitting, maintenance/monitoring)



Phase II of the Florida Passive Nitrogen Removal Project



- Future project ranked by the RRAC and approved by TRAP
- Build on the results of the Phase I study to go from a lab scale project to a prototype scale project
- Project in scoping stages



Statewide Inventory of OSTDS



- Develop a comprehensive inventory of the approximate 2.5-million onsite sewage systems
- Having this inventory will assist in:
 - Accurately estimating the impact of these systems on the environment
 - Providing the information necessary to implement a program to improve, maintain, and manage these systems
- 1-year project with a budget of \$150,000



Statewide Inventory of OSTDS

Objectives:

- Collect available data on how many septic systems are in each county and where they are located
- Develop a method for performing an inventory based on best management practices from other similar inventories
- Develop a database and put all collected information into it
- Using the best available data, provide a revised estimate of the number of onsite sewage systems in the State of Florida



What's Next?

(lots of work)



Thank you!

Contact me at:

Elke Ursin

850-245-4070 x 2708

Elke_Ursin@doh.state.fl.us

<http://MyFloridaEH.com>



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

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