



Updating Statewide Stormwater Design Criteria

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www.florida-stormwater.org



APPLIED SCIENCES

Florida Based. Regionally Skilled.

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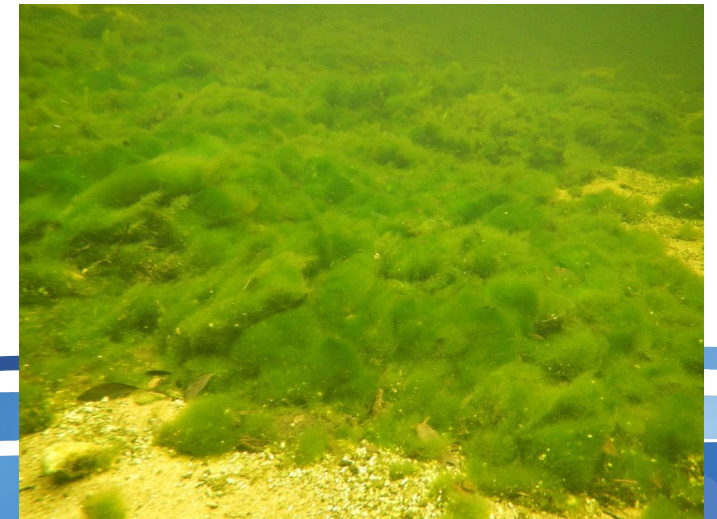


Updating the State Stormwater Design Criteria – Take #2.1

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Senate Bill 712 (Clean Waterways Act)



Senate Bill 712 (Clean Waterways Act)

By January 1, 2021:

(a) The department and the water management districts shall initiate rulemaking to update the stormwater design and operation regulations, including updates to the Environmental Resource Permit Applicant's Handbook, using the most recent scientific information available. As part of rule development, the department shall consider and address low-impact design best management practices and design criteria that increase the removal of nutrients from stormwater discharges, and measures for consistent application of the net improvement performance standard to ensure significant reductions of any pollutant loadings to a waterbody.



In the Beginning

- In 1981 Florida was the first state in the country to adopt a rule requiring the treatment of stormwater to a specified level of pollutant load reduction for all new development.



Key Rule Components

- A performance standard or goal for the minimum level of treatment
- Design criteria for best management practices (BMPs) that will achieve the performance standard
- A rebuttable presumption that discharges from a stormwater management system designed in accordance with the BMP design criteria will not cause harm to water resources.
- Periodic review and updating of BMP design criteria as more information becomes available to increase their effectiveness in removing pollutants

Original Basis of Rules

- Developed to meet a performance standard of reducing the average annual post-development stormwater pollutant loading of Total Suspended Solids (TSS) by 80 percent, or by 95 percent for stormwater discharges directly into Outstanding Florida Waters. This level of treatment was selected for two reasons:



- To establish equitability in treatment requirements between point and nonpoint sources of pollution. The minimum level of treatment for domestic wastewater point sources was “secondary treatment” which equated to an 80 percent reduction in TSS.
- The costs of stormwater treatment greatly increased as the level of treatment rose above 80 percent.

State Water Resource Implementation Rule (1990)

- One of the primary goals is to maintain, to the degree possible, during and after construction and development, the predevelopment stormwater characteristics of a site.
- Provided a specific minimum performance standard for stormwater treatment systems: to remove 80 percent of the post-development average annual stormwater pollutant loading of pollutants **that cause or contribute to violations of water quality standards.**

Rise of Nutrient Awareness

- Legal challenges
- Florida Watershed Restoration Act (TMDL Program)
- State Water Resource Implementation Rule 2005 amendment
- Numeric Nutrient Criteria
- Evaluation of Current Stormwater Design Criteria within the State of Florida (Harper and Baker, 2007)

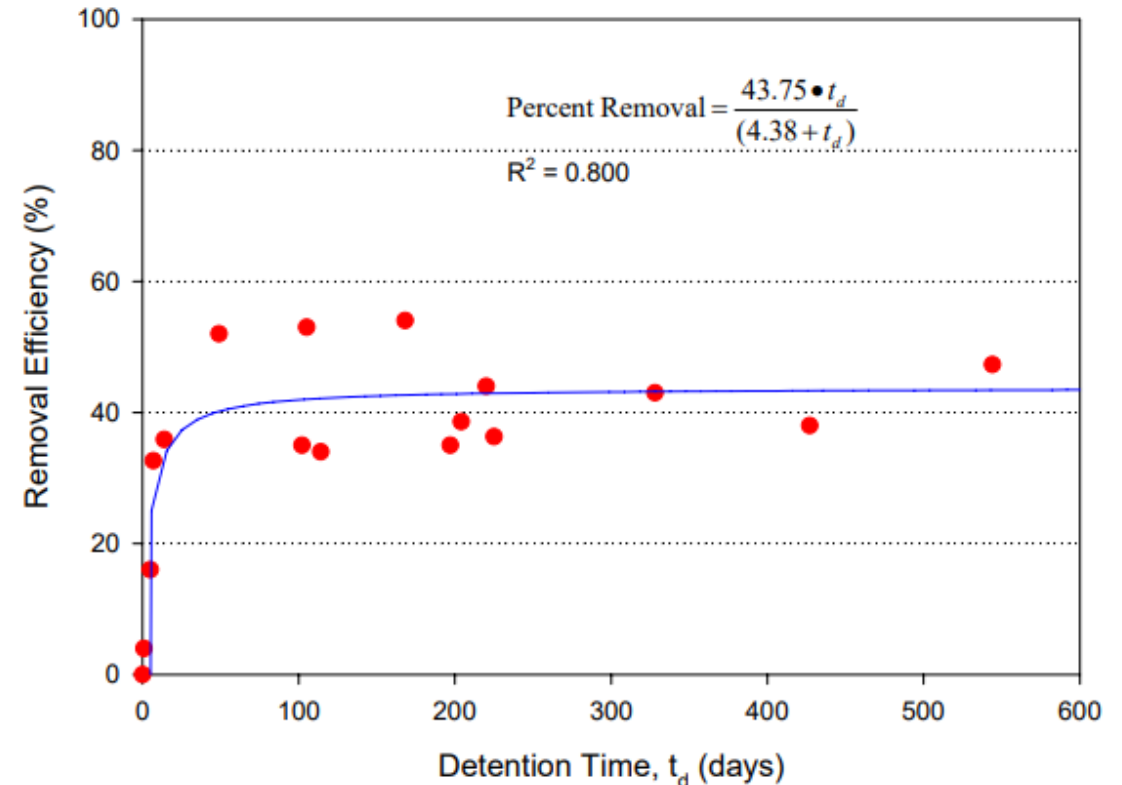
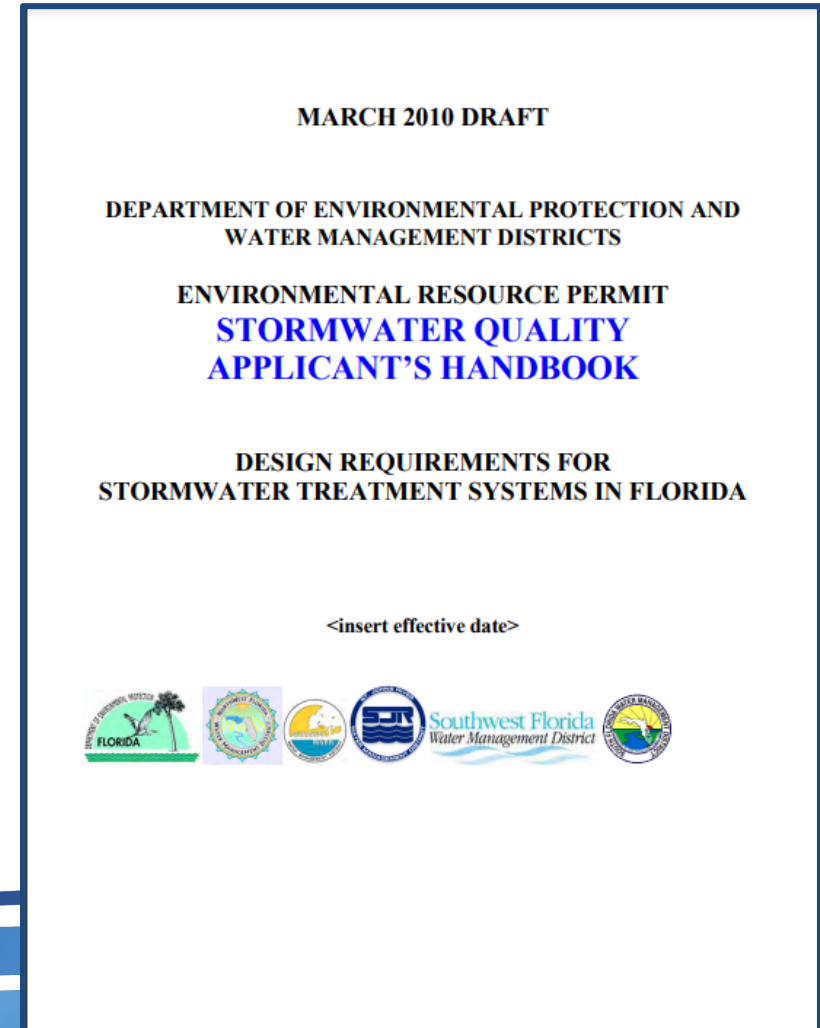


Figure 5-10. Removal Efficiency of Total Nitrogen in Wet Detention Ponds as a Function of Residence Time.

2010 Statewide Stormwater Rule

- Technical Advisory Committee began in 2008
- Higher levels of nutrient reduction
- Net improvement compared to predevelopment conditions
- Treatment trains advocated
- Low-impact design/green infrastructure recognized
- Karst-sensitive areas (connections to springs)



Technical Advisory Committee (TAC)

- The TAC members represent a wide variety of groups with interest in stormwater.
 - FSA is represented by the President.
 - Seminole County represents Counties and City of Orlando represents Cities.
- <https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/clean-waterways-act-stormwater>



FSA Position Paper

- FSA has developed a position paper on the topics that the TAC should address. Generally the items discussed in the position paper have been identified as priorities for the TAC.
- <https://www.florida-stormwater.org/advocacy>
- The position paper focuses on identifying subjects that either have not been addressed in past rulemaking or need further clarification.
- The paper does not advocate what the outcome of the discussion on these topics should be.



Leadership in Stormwater Management and Utilities

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POSITION PAPER 2021 STATEWIDE STORMWATER RULEMAKING

Excess nutrients are the leading cause of impairment in our surface water bodies and are a growing concern in groundwater and springs. It is critically important that stormwater treatment standards are enhanced to meet the intent of the original and current statewide stormwater rule and provide for increased levels of nutrient removal, better protection of groundwater, incorporation of green infrastructure, and more consistent and comprehensive best management practice (BMP) design criteria throughout the state.

Section 5 of Senate Bill 712 (Chapter 2020-150, Laws of Florida) directs the Department of Environmental Protection (Department) together with the state's five Water Management Districts to "initiate rulemaking to update the stormwater design and operation regulations . . . using the most recent scientific information available" and requires consideration of low-impact BMPs that "increase the removal of nutrients" and "measures for consistent application of the net improvement performance standard."

Background

The original "statewide" stormwater rule, Chapter 17-25, FAC, was adopted by the Environmental Regulation Commission in October 1981 with an effective date of February 1982. This rule was the successor to the state's first stormwater treatment regulations that were established in Rule 17-4.248, FAC, as an interim regulation.

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President
Pinellas County

Elliot Shoberg, PE
Vice President
City of Clearwater


Elizabeth Perez, PE
Secretary-Treasurer
Collective Water Resources

Danielle Hopkins, CMP
Executive Director


TAC Mission

- “The mission of the Clean Waterways Act Stormwater Rulemaking Technical Advisory Committee shall be to provide a **forum for identifying and constructively outlining recommendations** to the department and water management districts **for strengthening the stormwater design and operation regulations** implemented under Part IV, Chapter 373, F.S., including updates to the Environmental Resource Permit Applicant’s Handbook, **based on the most recent scientific information available** and the additional directions provided by Section 5, Chapter 2020-150, Laws of Florida. ”
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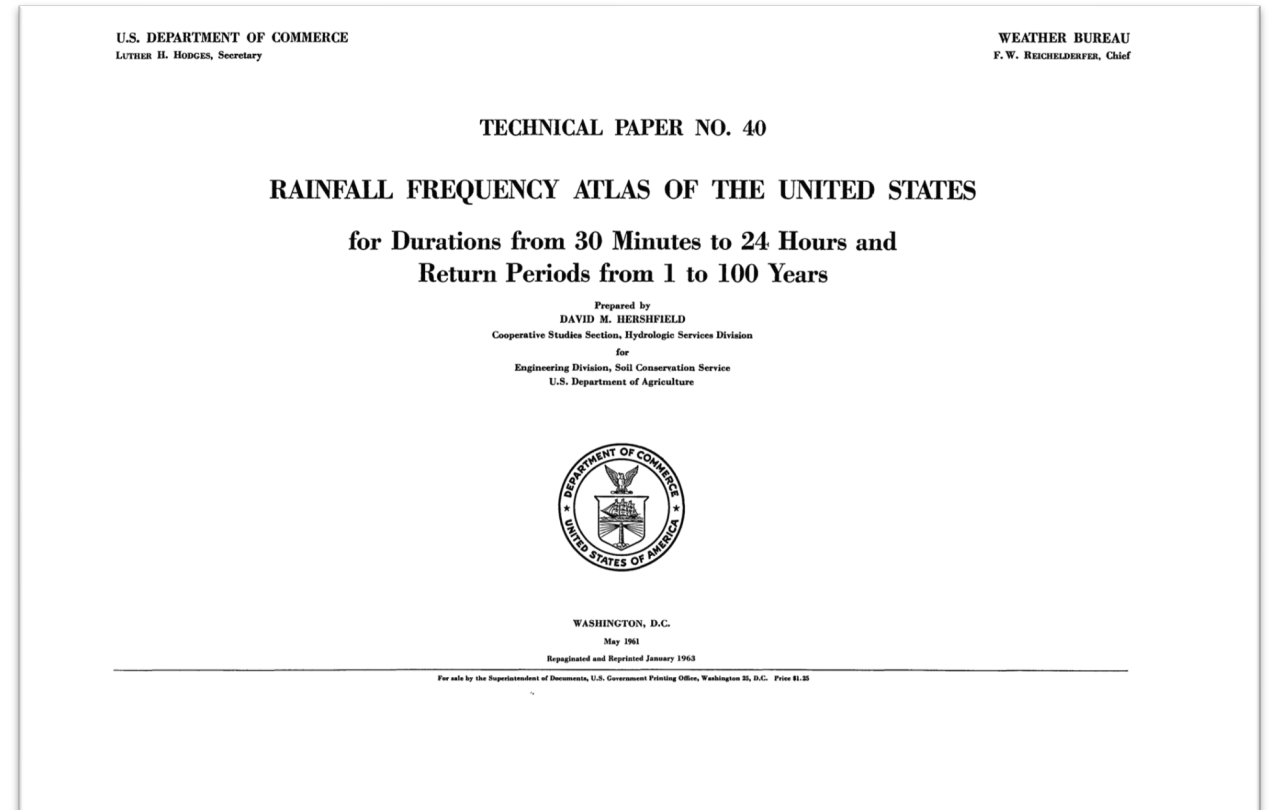
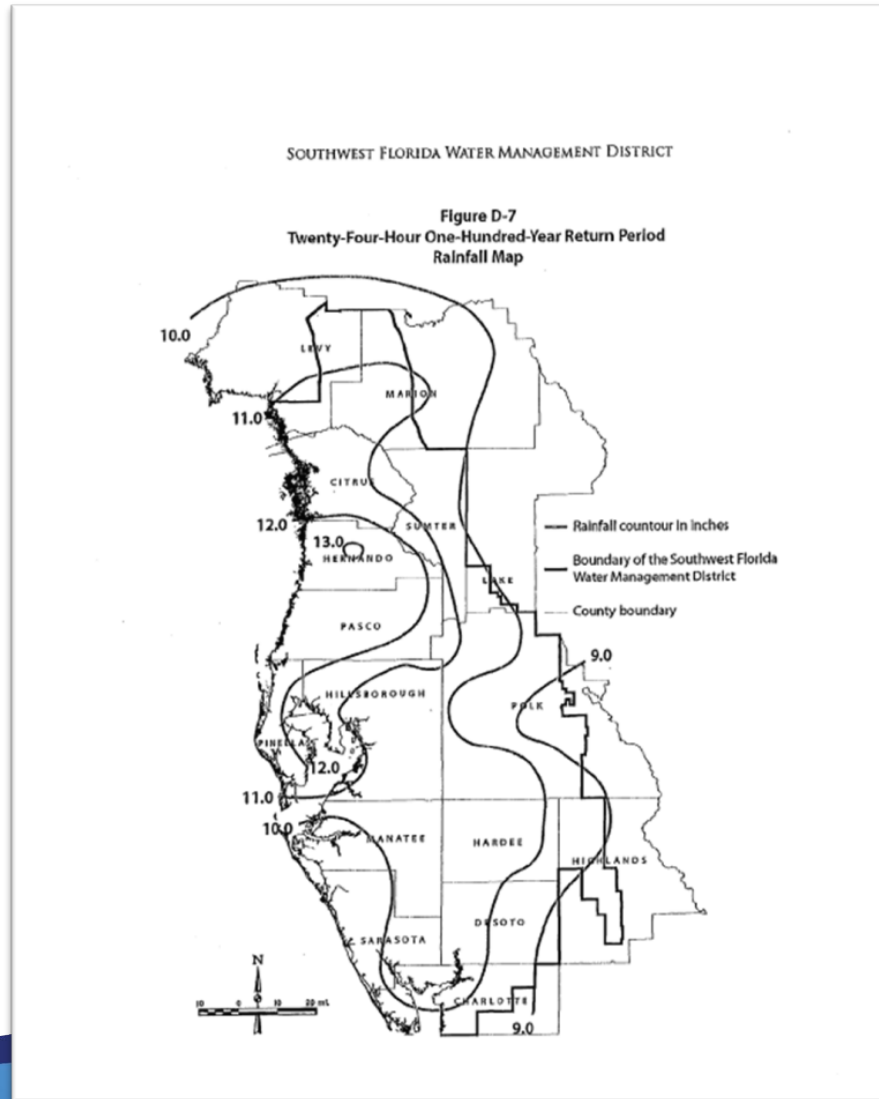
TAC Goals

- Provide consensus stormwater rulemaking recommendations for DEP and WMDs through public discussion and constructive deliberation. The initial charge questions for the TAC, when convened, are proposed below:
 1. What are the options for identifying stormwater design criteria and best management **practices that are effective for increasing the removal of nutrients** from stormwater discharges in the state?
 2. What measures are recommended for **consistent application of the net improvement performance standard** to ensure significant reductions of any pollutant loadings to a waterbody thought to be impaired by stormwater discharges?
 3. What changes are recommended **for improving existing stormwater operation regulations** to ensure water resources are protected under the rulemaking directed under the Clean Waterways Act?
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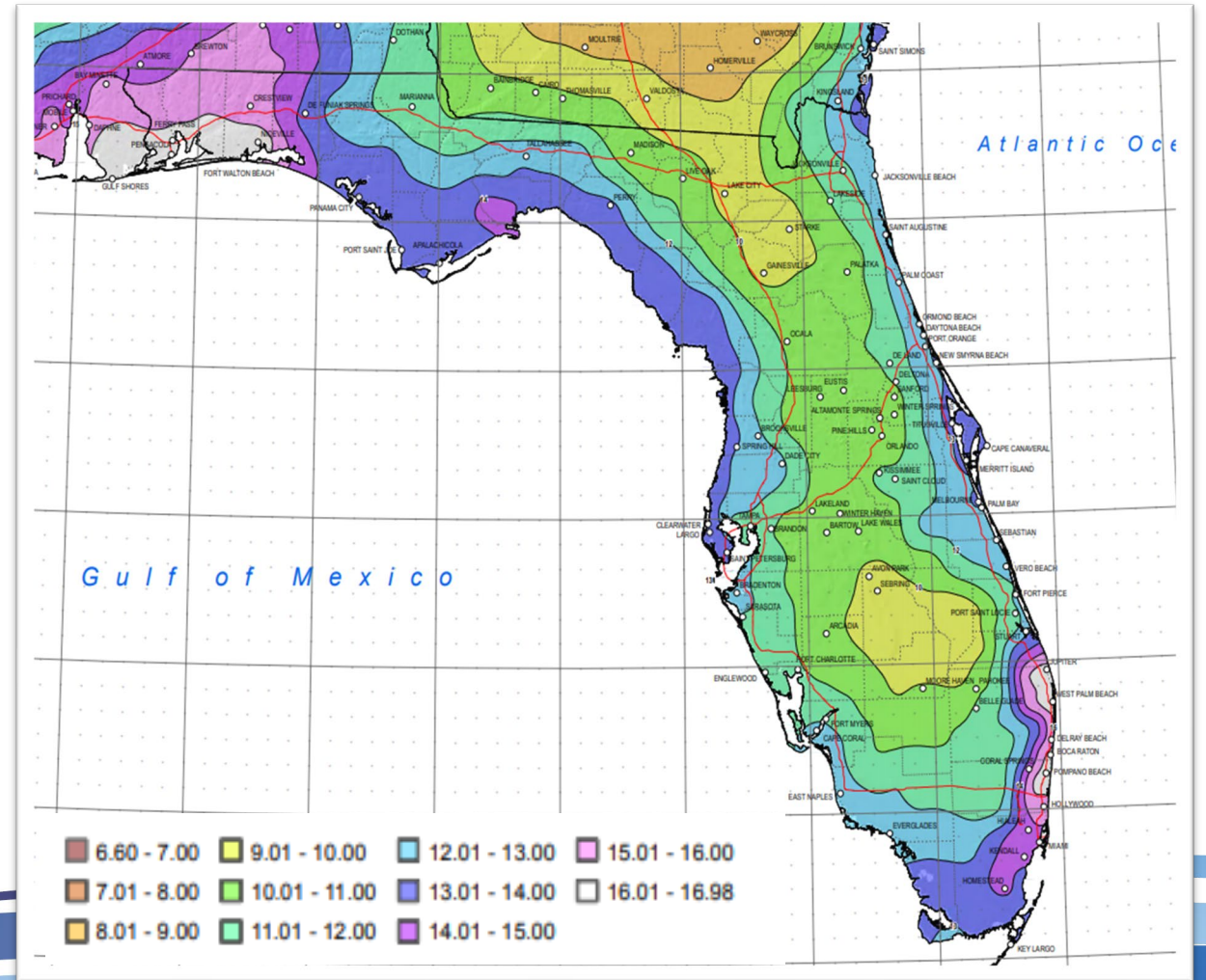
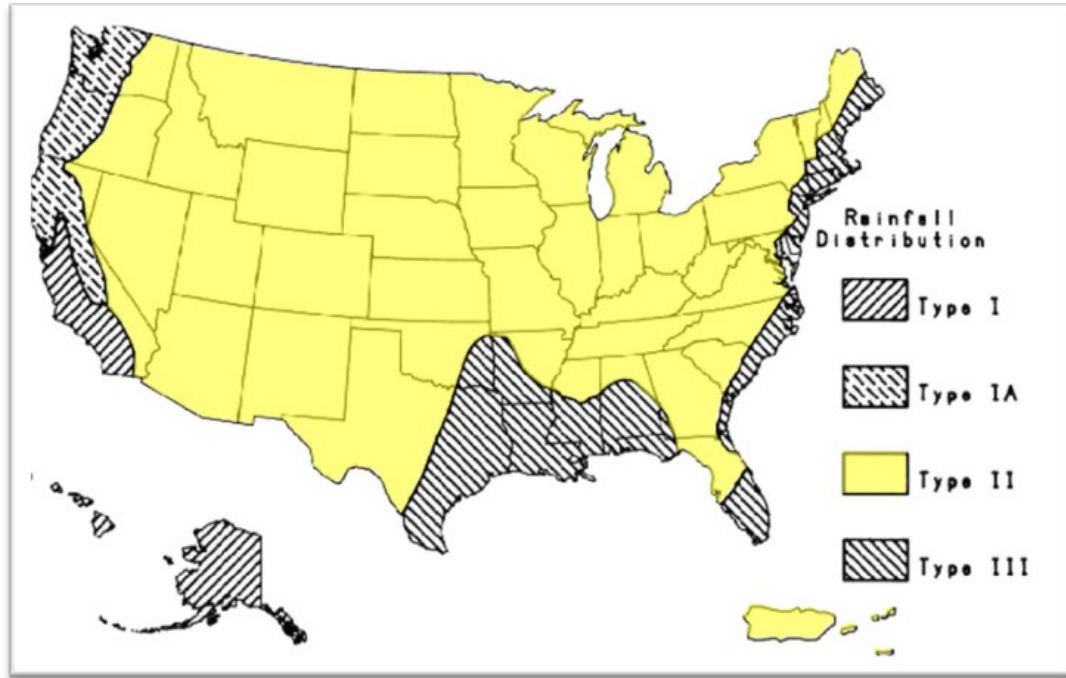
TAC Meetings To Date

- December 15, 2020 – Organizational.
 - January 27, 2021 – 2007 Stormwater Study; Previous rulemaking and TAC; TAC member priorities.
 - February 25, 2021 – Stormwater basin research in Naples, NOAA Atlas 14, TAC discussion on updating rainfall data and redevelopment; Discussion of future topics.
- 

Current Practice



NOAA ATLAS 14



Use Atlas 14 Depth and Distribution



NOAA Atlas 14

Precipitation-Frequency Atlas of the United States

Volume 9 Version 2.0: Southeastern States
(Alabama, Arkansas, Florida, Georgia,
Louisiana, Mississippi)

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy,
Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta,
Geoffrey Bonnin

U.S. Department
of Commerce

National Oceanic
and Atmospheric
Administration

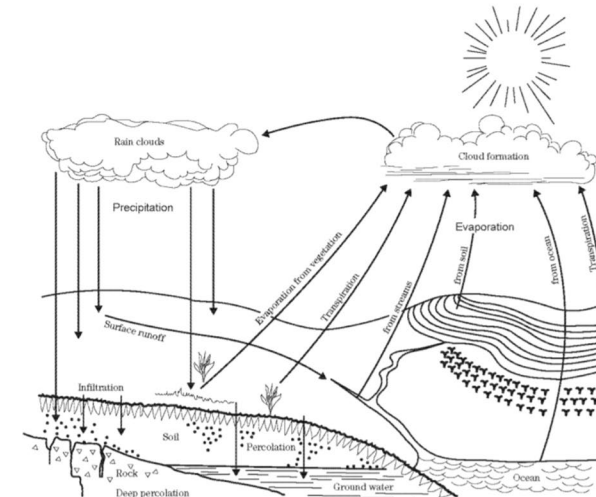
National Weather
Service

Silver Spring,
Maryland, 2013

USDA United States
Department of
Agriculture
Natural Resources Conservation Service

Part 630 Hydrology National Engineering Handbook

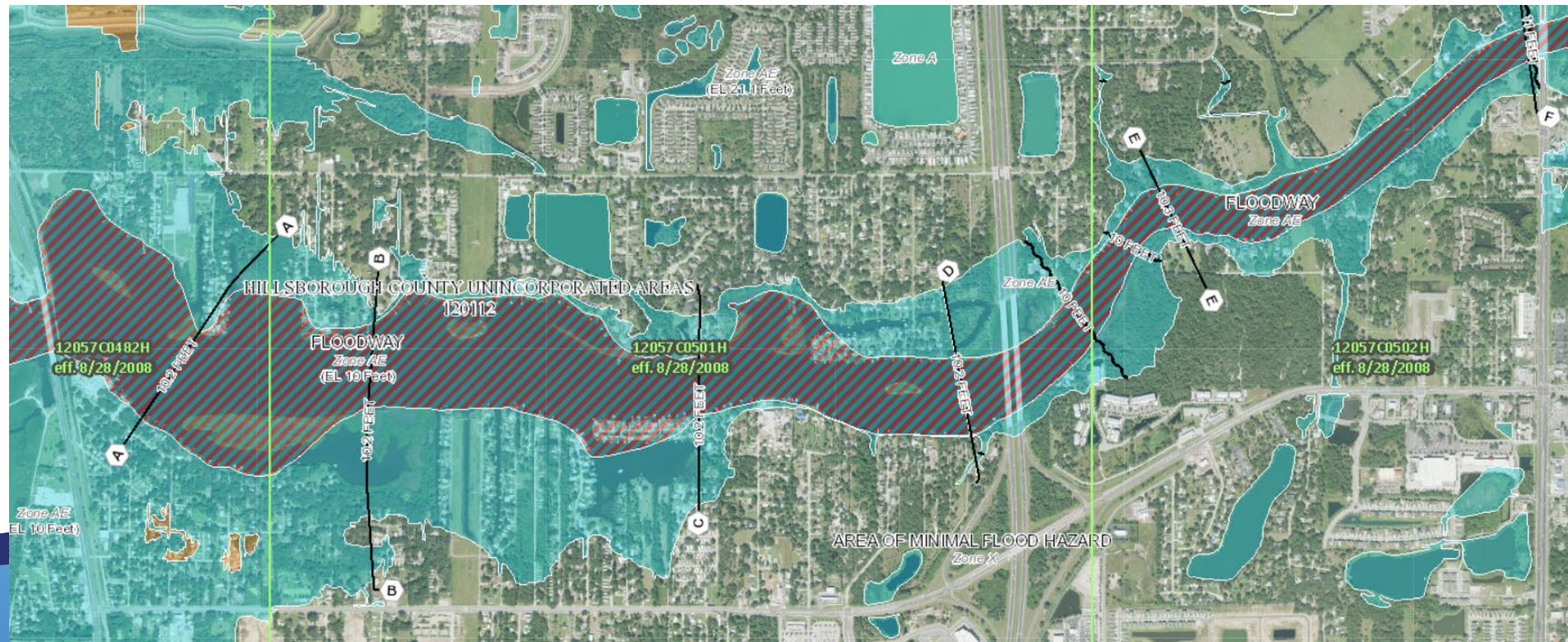
Chapter 4 Storm Rainfall Depth and Distribution




(210-630-H., Amend. 88, Aug 2019)

Potential Impact Flood Insurance

- Potential to change FEMA effective maps should communities choose to adopt new rainfall depths and distributions
- Flood insurance requirements and rates will be affected



TAC Timeline


- There is no set timeline for the TAC to complete its work.
 - A suggestion was made that the TAC goal be September 2021 to finish.
 - After the TAC concludes, FDEP still has rulemaking and public workshops.
- 

What Might the TAC Address?


- FDEP presented the TAC with a list of 13 topics.
- The TAC added a 14th.
- Each member was asked to identify their top five so it's not certain that each topic will be discussed.




Potential Discussion Topics

1. Post-construction standards, guidelines, monitoring and inspection frequency. (February)
 2. NOAA Atlas 14 Rainfall Update. (February)
 3. Model language similar to NJDEP Laboratory protocol and TAPE for Stormwater studies and evaluation.
 4. BMPTrains model tool, approach for incorporating updates, increase consistency. Create optional procedures, and increase number of technologies listed.
 5. Evaluation of natural wetlands related to stormwater treatment.
 6. Pre-development land use definitions and benefits of “natural” functions.
- 


Potential Discussion Topics

7. Net improvement definition:
 7. For receiving water per section 373.414(1)(b)3 F.S.
 8. For redevelopment – a net improvement of the quality of stormwater per section 373.4131(1)(b)2 F.S.
 8. Establish minimum baseline standards with the WMDs being able to apply stricter guidelines that are region specific
 9. Sea level rise and climate change impacts on stormwater systems.
 10. Redevelopment/retrofitting standards and definitions, incentives for redevelopment
 11. Stormwater harvesting quality and standards
- 

Potential Discussion Topics

12. Stormwater potential effect on groundwater quality, springs' and adjacent surface waters
 13. Low Impact Development/Green Infrastructure criteria BMPs and incentives, barriers (“barriers” added by TAC)
 14. What to do about dry detention (added by TAC)
- 

Some Common Threads in the 14 Topics

- Performance
 - Minimum standards
 - Definition of pre-development
 - Definition of Net Improvement
 - Redevelopment
 - O&M requirements
 - Springs/groundwater protection
 - Technology
 - How to evaluate new technology?
 - Modeling
 - BMP standards/use
 - LID
 - Climate
 - Rainfall
 - Sea level rise impacts
- 

Water Quality Problems Get Better With Age?

- Older BMAPs for surface waters have gone through more cycles.
 - Load reduction allocations are now being made.
- More waters becoming impaired.

Newnans Lake from East



What Should the Water Quality Requirements Be?

- Challenge: Reduce pollutant load while new loads being added.
 - What are the minimum standards?
 - What is the definition of predevelopment?
 - Where should net improvement apply?
 - Are new operation and maintenance standards needed?



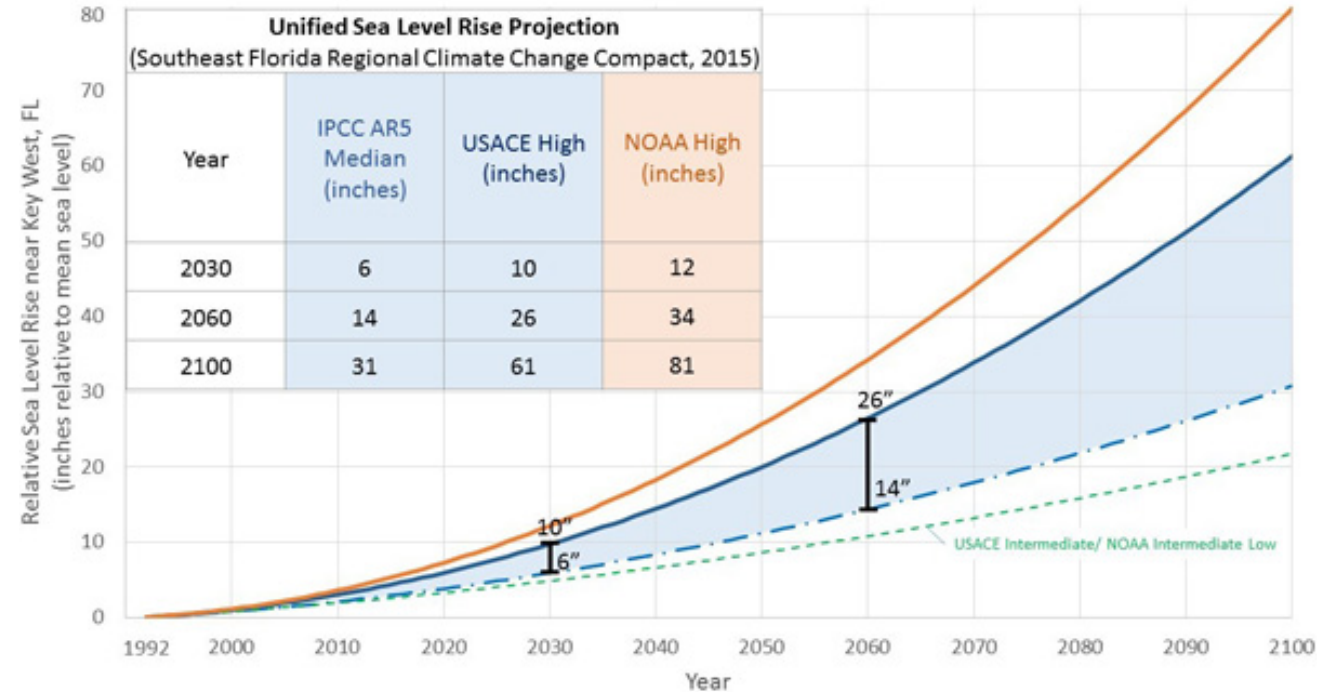
Groundwater and Aquifer Protection

- The last attempt at design criteria didn't deal with stormwater impacts to groundwater.
- Now, there are TMDLs for nitrate and BMAPs for springs.
- Surface waters may also be affected by nearby stormwater impacts to groundwater.




Sea Level Rise and Climate Change

- This is a growing concern in coastal areas on the resiliency of stormwater management systems to sea level rise.
 - Southeast Regional Climate Compact.
- Inland areas are also affected by increased or changing rainfall patterns.



New (and Old) Stormwater Treatment Technologies

- Another important development over the past 10 to 15 years has been the emergence of new BMP technologies.
 - Low Impact Development (LID) and Green Infrastructure (GI)
 - Biosorption Activated Media (BAM)
 - Stormwater Harvesting
 - Previously, wet detention and dry retention systems accounted for nearly every BMP implemented in Florida. T
 - here is still apparently some use of dry detention.
 - Best practices for modeling.
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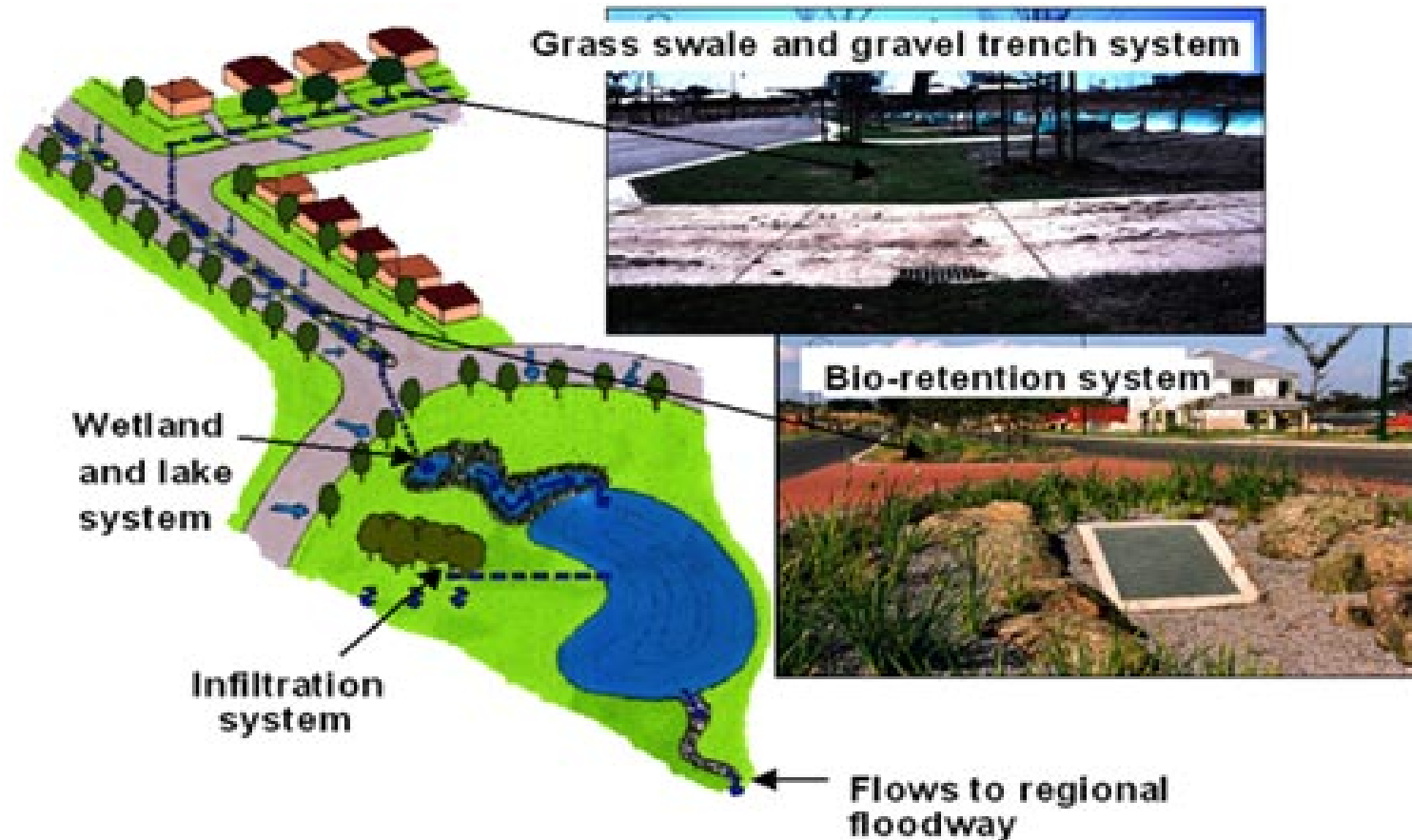
LID/GI for Runoff Reduction

- Conservation land and buffers (waterbody, floodplain, wetland, karst feature) protect from excess runoff and pollution.
- Some LIDs reduce runoff from developed areas.
- Potential barrier is how to account for these, often decentralized, features in calculations.

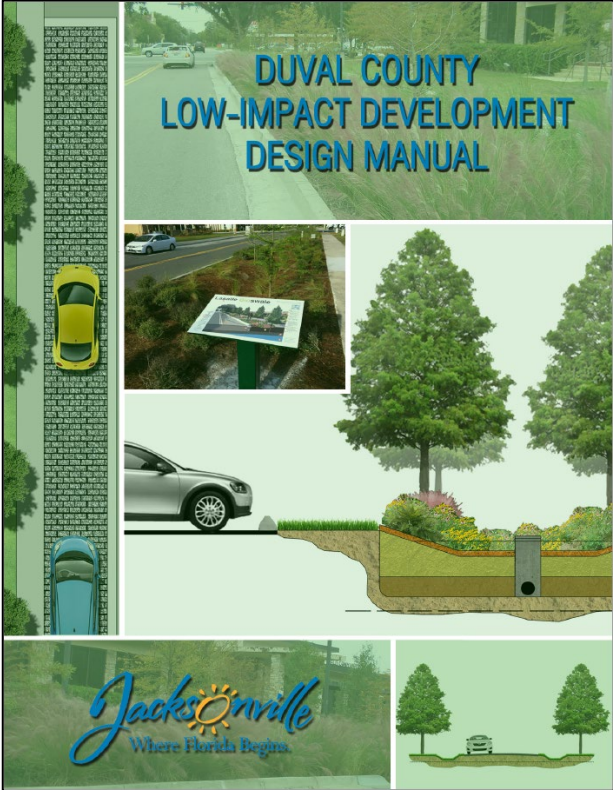
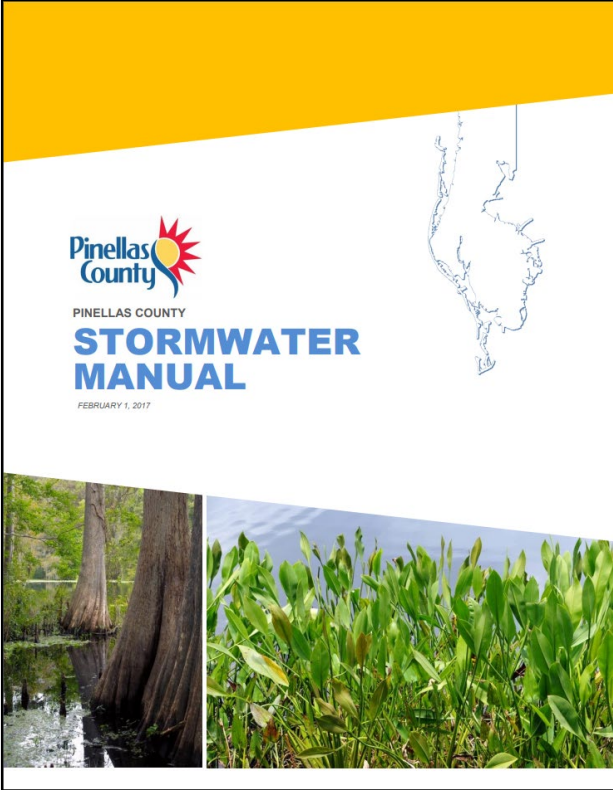


LID for Water Quality

- Subsequent generations of LID have focused more on water quality.
- What is the best science on design?
- Will LID design for denitrification be discussed?



Specific LID Practices Covered in Manuals



Some GI and LID Examples



Conservation
Open Space

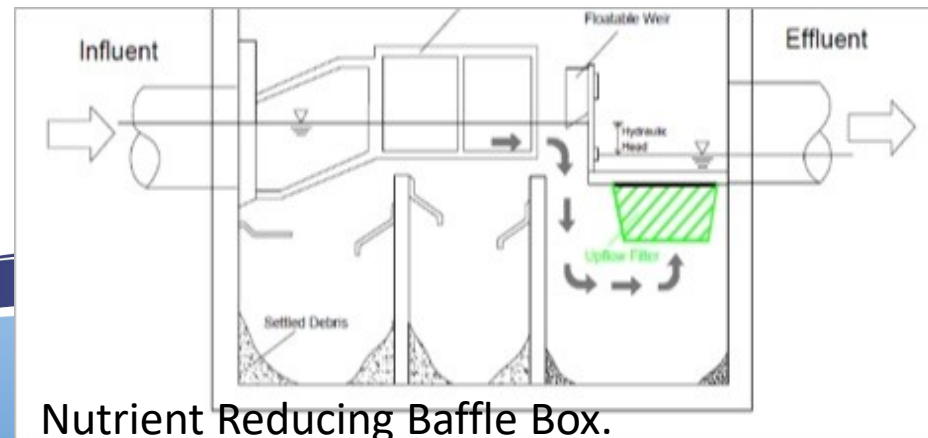


Madera Subdivision



Rinker Hall/Perry Construction Yard
on UF Campus

Some GI and LID Examples




Biosorption Activated Media

- Replacing soils in retention BMPs with a pre-mixed media that increases nutrient removal
- Also used in baffle boxes and out-flow filters
- Converting organic nitrogen to nitrate improves removal
- When used in retention BMPs BAM allows recharge to continue



Local Efforts on Stormwater

- In the last 10-15 years increasing numbers of local governments have taken steps to incorporate LID in new development.
 - A few Counties have adopted stormwater treatment criteria similar to what was proposed in the first attempt at a statewide rule.
 - As would be expected, there are differences in approach.
- 

Questions

