Updating the State Stormwater Design Criteria – Take #2

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Senate Bill 712 (Clean Waterways Act)

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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 <u>new</u> development.

Source: Department of Environmental Protection

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

Source: Department of Environmental Protection

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.

Source: Department of Environmental Protection

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**.

Source: Department of Environmental Protection

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)

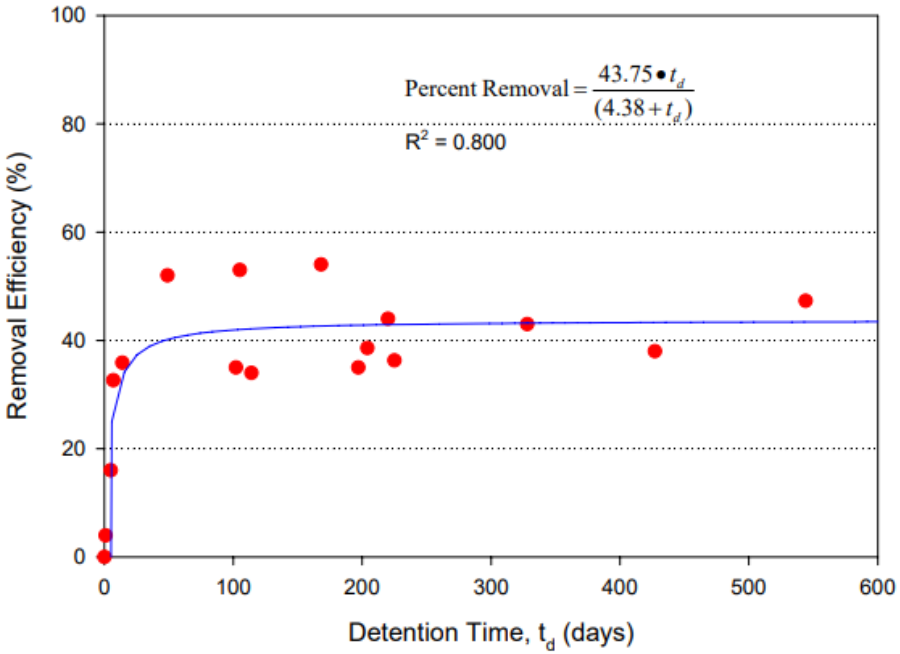


Figure 5-10. Removal Efficiency of Total Nitrogen in Wet Detention Ponds as a Function of Residence Time.

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)

Where Are We Today and What Could New Criteria Consider?

- In the 10 to 15 years from the last attempt at a Statewide Design Criteria, some things have changed…and some things haven't.
- "Old" problems are still there and pressure to fix them is increasing.
- But there are now "new" problems, new technologies, and new local efforts.

Old Problems (Don’t) Get Better With Age

- Older BMAPs for surface waters have gone through more cycles.
- Load reduction allocations are now being made.
- Challenge: Reduce pollutant load while new loads being added.


Newnans Lake from East

Newnans Lake required TN reductions and credits (lbs-TN/yr) by jurisdiction

From: Orange Creek BMAP Amendment

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,155	2,078	299	65	1,714	2,077	1,448	5,239
FDOT, District 2	878	439	42	3,414	-3,017	439	0	0
Gainesville	4,094	2,047	294	1,034	719	2,047	113	2,879
Waldo	239	120	10	0	110	119	0	229
Total	9,366	4,684	645	4,513		4,682	1,561	8,347

Old Problems (Don’t) Get Better With Age

- Some problems have apparently increased.
- Example: the recent coastal algae blooms.
- Requirements for new development will be looked at. What about redevelopment?

“New” Water Quality Concerns

- There are more TMDLs being adopted for surface waters.
- Example: Lochloosa Lake TMDL completed in 2017. Lake added to the Orange Creek BMAP.
- BMAP went straight to allocations for this lake.

“New” Water Quality Concerns

- The last attempt at design criteria didn’t deal with stormwater impacts to groundwater.
- Now, there are TMDLs for nitrate and BMAPs for springs.
- Some surface waters may also affected by stormwater impacts to groundwater.
- Stormwater impacts to groundwater may be considered this time.

Sea Level Rise and Climate Change

- This is a growing concern in coastal areas (Southeast Regional Climate Compact).
  - Broward County has taken the step of analyzing impact of future flooding conditions
- Inland areas are also affected. Alachua County will be performing a climate change vulnerability analysis
- Are our design storms and methods out of date? Are higher criteria needed?

New 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)

- Previously, wet detention and dry retention systems accounted for nearly every BMP implemented in Florida.

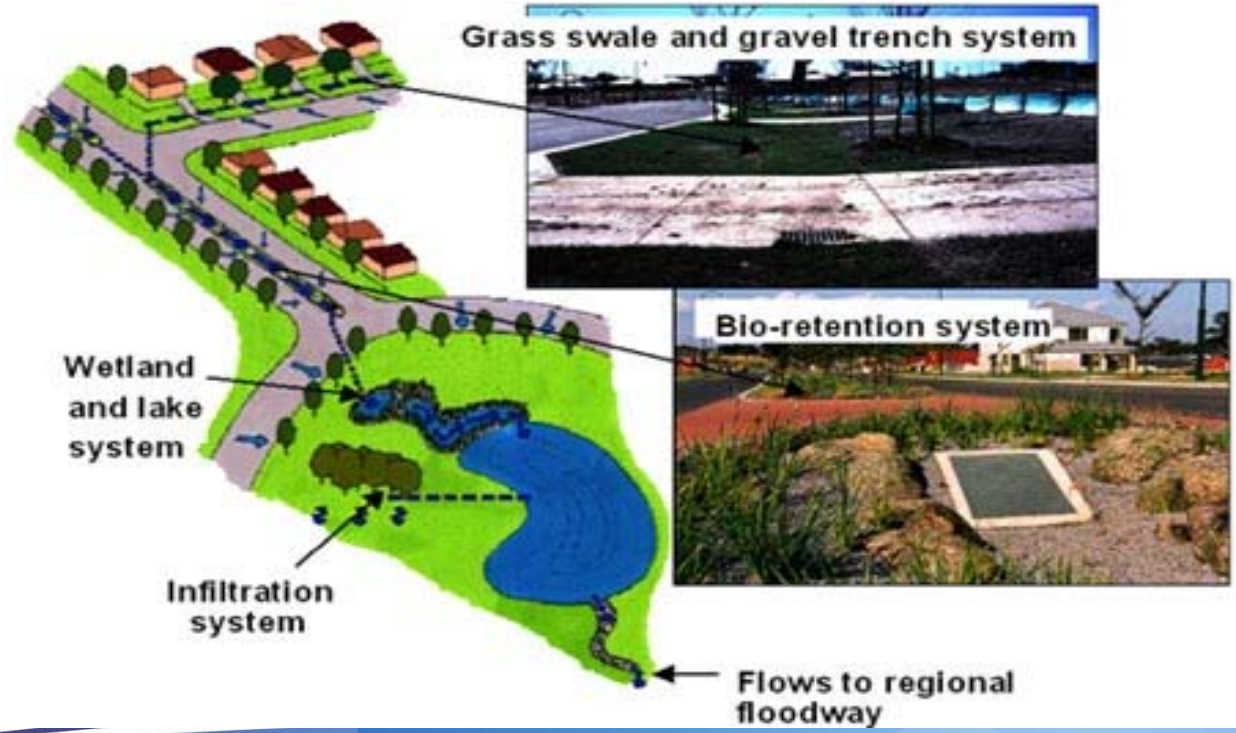
LID/GI for Runoff Reduction

- Conservation land and buffers (waterbody, floodplain, wetland, karst feature) protect from excess runoff and pollution.

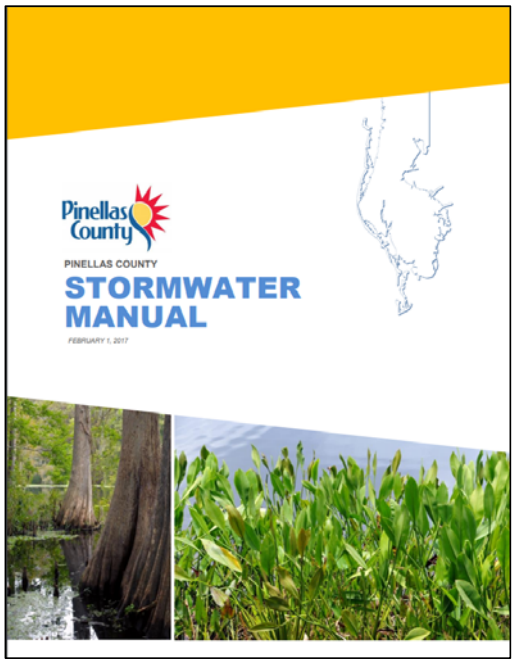
- Some LIDs reduce runoff from developed areas

LID for Water Quality

- LID that reduce runoff reduce pollutant load
- LID can also provide water quality treatment of runoff as part of a treatment train.
- LID techniques can be designed to encourage denitrification.



Specific LID Practices Covered in Manuals



Some GI and LID Examples

Conservation
Open Space

Rinker Hall/Perry Construction Yard
on UF Campus

Madera Subdivision

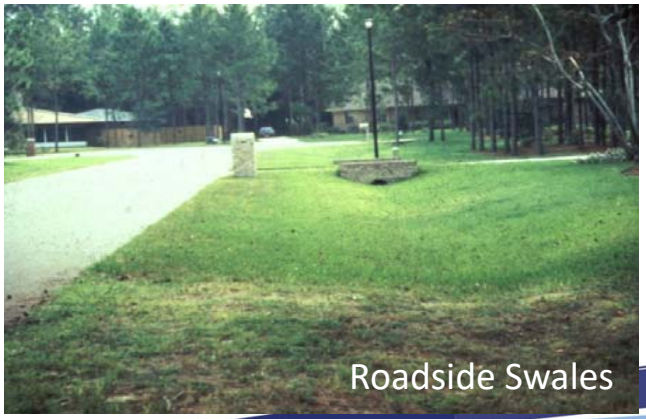
Some GI and LID Examples

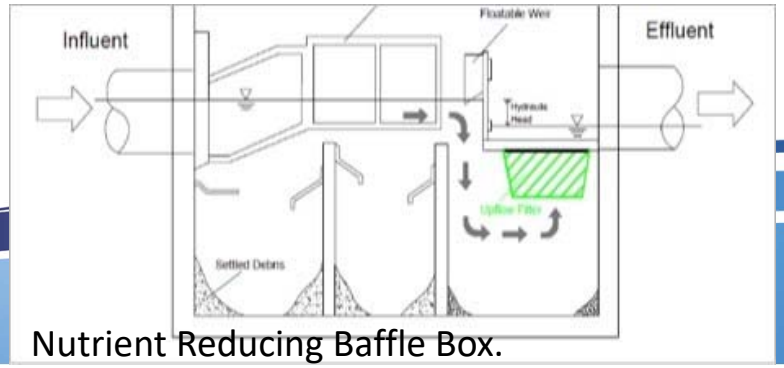

SW Rec Center - UF Campus


Innovation Square Bioretention


Tree Box Filter


Savion Park Apts. SW 5th Ave.


Roadside Swales



Nutrient Reducing Baffle Box.


CVS: Archer Rd. And Tower Rd.

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

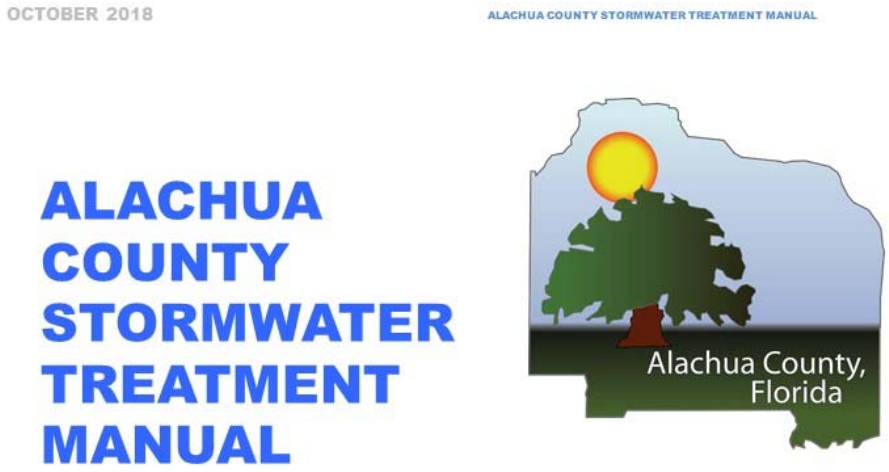
- In the last 10-15 years increasing numbers of local governments have taken steps to incorporate LID in new development.

- 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.

Differences Between Local Efforts on Stormwater

- LID is generally an option that may be used in design of a stormwater management system.
  - One exception: Alachua County requires LID in sensitive karst areas.
- Some jurisdictions have comprehensive stormwater manuals or LID guidance documents.
  - Examples: Sarasota County, Pinellas County, Alachua County



Differences Between Local Efforts on Stormwater

- Some jurisdictions do not have treatment volume or load reduction criteria, deferring to the Water Management District (Marion County)

- Some jurisdictions incorporate WMD criteria in their code (Alachua County Land Development Code)

- A few jurisdictions have adopted load reduction criteria similar to what was proposed in last statewide effort:
  - Pinellas County
  - Alachua County in a Water Quality Code separate from the Land Development Regulations

Comparison Between Pinellas and Alachua Counties

Alachua

a) Post-development load reductions of 70% total nitrogen and 80% total phosphorus
b) Reduction increase to 95% for direct discharges to OFWs
c) In watersheds of waters with nutrient impairment/TMDL/BMAP: either a (b if applicable) or load reduction to 10% below pre-development, whichever is greater

Pinellas

- The greater of:
  - Post-development load reduction of 55% total nitrogen and 80% total phosphorus
  - Load reduction to 10% below pre-development.

Comparison Between Pinellas and Alachua Counties

Alachua

- Additional requirement in sensitive karst areas that 1” of runoff be treated in LIDs
- Exempts redevelopment, single family, road modifications, agriculture, vested developments
- Waivers for small sites and building additions with minimal impact

Pinellas

- Does not exempt redevelopment
- Exempts single family and road modifications
- Exemption for less than 3,000 SF on impervious area
- Waiver for small sites

Questions for New Criteria

- How will LID/GI be incorporated?
- How will LID be accounted for in quantity calculations?
- Reasonable assurance (maintenance, easements, etc.)
- Will there be karst specific design requirements?

Questions for New Criteria

- When will net improvement requirements be required? How will it be defined?
- How will redevelopment be addressed?
- How will changing hydrologic conditions due to climate change be addressed?
- How will groundwater impacts from stormwater be addressed?

Questions