

FLORIDA'S STATEWIDE STORMWATER TREATMENT RULE

PUBLIC WORKSHOP ON MARCH 2010 DRAFT RULE AND APPLICANT'S HANDBOOK



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- Damon Meiers, SFWMD
- Susan Martin, SFWMD



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WORKSHOP AGENDA AND PROCESS

- **Welcome and Introductions**
- **Background and rule objectives**
- **Presentation and discussion of draft rule, 62-347, F.A.C.**
- **Presentation and discussion of draft Applicant's Handbook – focus on areas we are seeking input and questions**
- **Next steps**



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62-347 — Stormwater Quality Rule

62-347.010

- (1) - Stormwater treatment quality only; not quantity**
 - Does not replace current permit requirements; only changes treatment and design criteria**
- (2) - Incorporates by reference Stormwater Quality Applicant's Handbook**
 - Identification of rules of Water Management Districts (WMDs) that are superseded (likely to be moved to WMD rules)**
- (3) Does not affect agriculture or silviculture**



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62-347, Continued

.020 — Definitions

.051 — Exemptions (1)

**.091 — Documents incorporated by
reference (4)**

.900 — Forms (2)

Preliminary draft; will change!



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62-347 DRAFT RULE

QUESTIONS AND DISCUSSION



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STORMWATER RULE

BACKGROUND AND OBJECTIVES



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FLORIDA'S STORMWATER RULES

- 1979** Chapter 17-4.248, F.A.C.
- 1982** Chapter 17-25, F.A.C.
- 1994** Chapter 62-25, F.A.C./ERP
- 2011?** Chapter 62-347, FAC

TECHNOLOGY BASED

- **Performance Standard**
- **BMP Design Criteria**
- **Presumption of compliance**
- **Dynamic BMP designs**



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Water Resource Implementation Rule Section 62-40.432, F.A.C.

Institutional Framework

- **DEP (Chapter 403, F.S.)**
- **WMD (Chapter 373, F.S.)**
- **Local Governments (Chapter 163, F.S.)**

Program Goals

- **Quantity**
- **Quality**

Stormwater Treatment Performance Standards

- **New discharges**
- **Older discharges**



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62-40

STORMWATER MANAGEMENT — GOAL FOR NEW DEVELOPMENT

Post \leq Pre

Peak discharge rate

Volume

Recharge

Pollutant loading



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Performance Standard for New Stormwater Discharges (62-40, F.A.C.)

Erosion and sediment control

- Retain sediment on-site
- Not violate turbidity standard

Stormwater quality – Original 1982

- 80% average annual load reduction
- 95% average annual load reduction
- “Of Total Suspended Solids”

Stormwater quality – 1990

- 80% average annual load reduction
- 95% average annual load reduction
- “Of pollutants that cause or contribute”

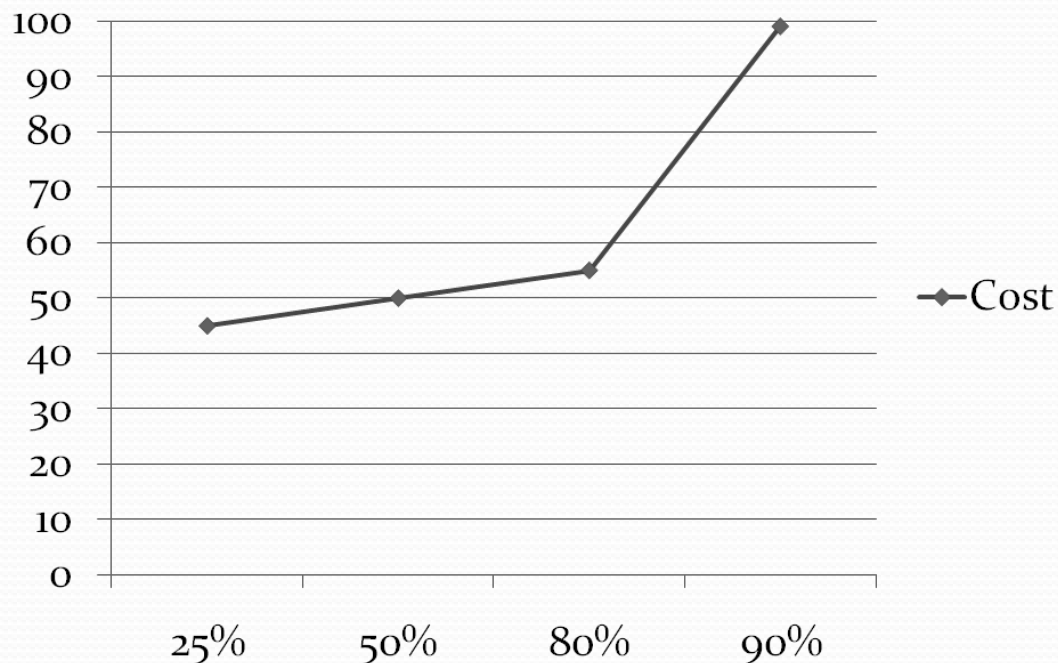


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WHY 80% TSS LOAD REDUCTION?

- **Equitability with point sources**
 - **Min treatment = secondary = 80% TSS**
- **Cost effectiveness**
 - **80% = “knee of the treatment curve”**



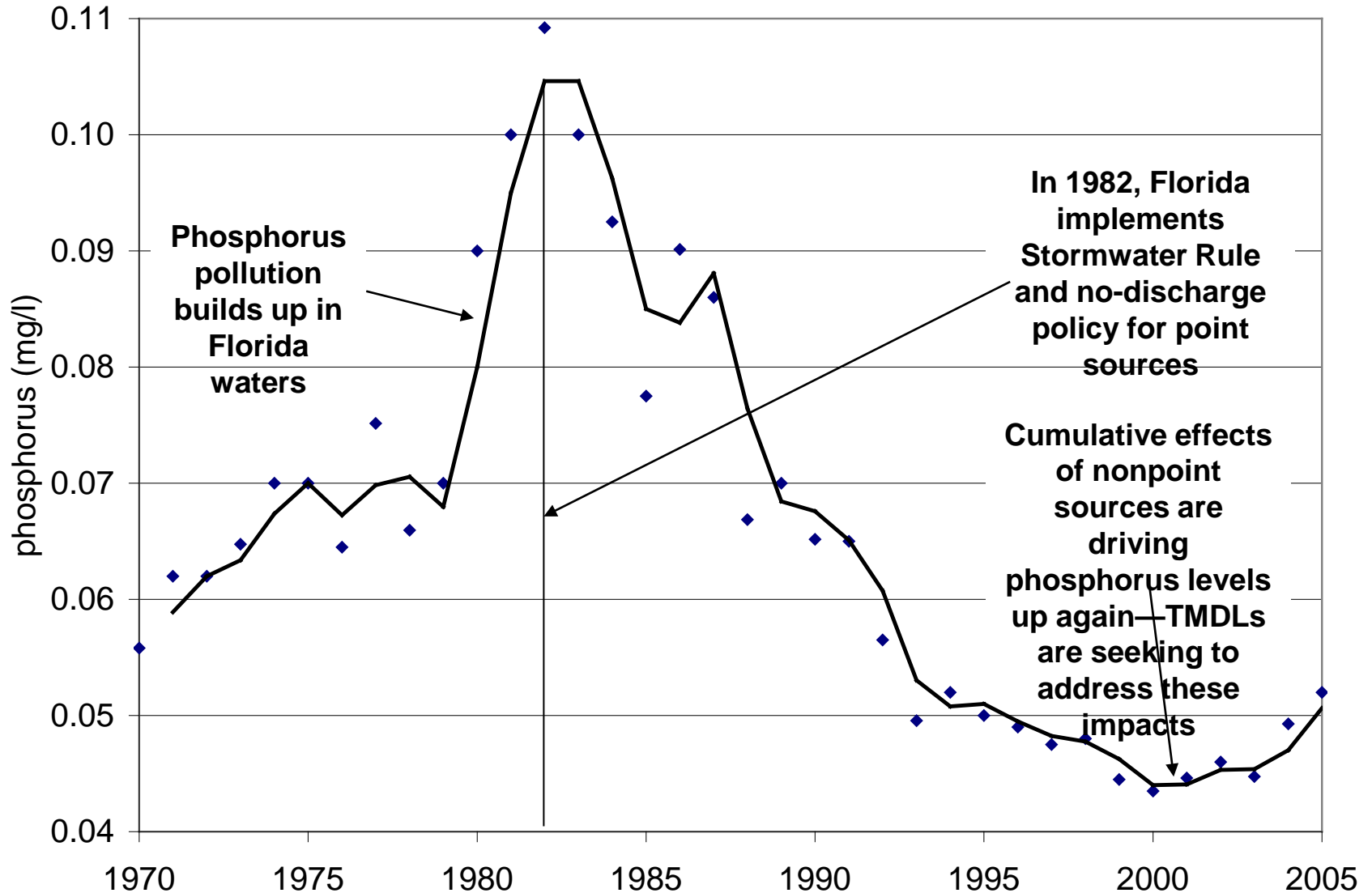
NEED FOR BETTER STORMWATER TREATMENT (NUTRIENT REMOVAL)



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Phosphorus Trends in Florida Waters 1970 - 2005



**Caloosahatchee
River
October 15, 2005**



June 6, 2008

CURRENT STATUS OF IMPAIRED WATERS (Through Group 5)

# of Segments (WBIDs)	Verified Impair Parameters	Delisted Parameters	Parameters on Plan List	Group	Potentially Impaired Parameters Added to List
1746	258	185	213	1	1082
1657	446	235	167	2	1671
1217	196	182	255	3	1964
1088	163	146	TBD	4	TBD
575	224	119	TBD	5	TBD
6283	1287	865	635	Total	4717



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IMPAIRED WATERS: PROBLEMS AND POLLUTION SOURCES

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MAJOR POLLUTANTS OF CONCERN

- Nutrients, nutrients, nutrients!
- Oxygen demanding substances
- Bacteria

MAJOR SOURCES OF POLLUTANTS

- Stormwater – existing development
- Stormwater – future development
- Stormwater – agricultural
- Leaching – agriculture, landscape, OSDS

Microcystis Bloom - I-295 (north view) over mid-channel St. Johns River - 08.19.05 - 2:43pm

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FOCUS ON REDUCING NUTRIENT LOADS

- Low impact design BMPs
- Turf grass research project
- Florida friendly landscaping program
 - Florida Yards & Neighborhoods
 - FYN Builder/Developer
 - Green Industry BMP program
 - Model FFL landscape ordinance
 - Urban turf fertilizer labeling rule
- Golf course BMP manual
- Passive nutrient septic tank project
- Ag/urban nutrient mgmt BMPs
- **Unified stormwater treatment rule**



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BMP DESIGN CRITERIA ARE DYNAMIC!

- **1979** **17 -4.248, F.A.C.**
- **1982** **17-25, F.A.C.**
- **1984** **Modify BMP Design Criteria**
- **1985** **Wetland BMP Design Criteria**

Florida's BMP design criteria are outdated



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EXAMPLE PROJECT

	PRE DEVELOP	POST DEVELOP	POST WITH BMPs
LAND USE	90 ac forest 10 ac wetlands	95 ac SF 5 ac SWM	95 ac SF 5 ac SWM
% IMP		25%	25%
RUNOFF	82 ac ft/yr	123 ac ft/yr	123 ac ft/yr
TN LOAD	109 kg/yr	330 kg/yr	231 kg/yr
TP LOAD	5 kg/yr	51 kg/yr	18 kg/yr

Assume BMPs are wet detention

STORMWATER RULE OBJECTIVES

- Increase nutrient removal
- Establish requirements for discharges to impaired waters
- Statewide consistency
- Update BMP design criteria
- Allow BMP Treatment Train credits
- Encourage low impact design
- Encourage retrofitting



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ISSUES ON WHICH WE ARE SEEKING INPUT

- Performance standards
- Loading methodology
- Interim BMPs in rule
- Verified BMPs in rule
- Site data requirements
- Inspection and recertification
- Additional data



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COMMENTS SOUGHT ON PERFORMANCE STANDARDS

Issue: What is the appropriate performance standard to assure that nutrients in stormwater discharges do not cause or contribute to violations of nutrient criteria, either individually or cumulatively? Since the post-development total phosphorus loading increases by a factor of about 10 above predevelopment loading and that total nitrogen post-development loading increases by a factor of about 4, should there be one performance standard for TP and a different one for TN? If so, what should they be?

- **N vs P reduction requirements**
- **Urban redevelopment**



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PROPOSED PERFORMANCE STANDARDS

NON-OFWs	OFWs	IMPAIRED WATERS	IMPAIRED WATERS WITH ADOPTED TMDL OR BMAP
<p>REDEVELOPMENT SITES ≤ X ACRES</p> <p>85% or Post=Pre, whichever is less unless feasibility analysis demonstrates lower level is appropriate</p>	<p>REDEVELOPMENT SITES ≤ X ACRES</p> <p>Post=Pre, unless feasibility analysis demonstrates lower level is appropriate</p>	<p>REDEVELOPMENT SITES ≤ X ACRES</p> <p>85% or Post=Pre, whichever is less unless feasibility analysis demonstrates lower level is appropriate AND Net improvement for pollutant not meeting water quality standards</p>	<p>REDEVELOPMENT SITES ≤ X ACRES</p> <p>85% or Post=Pre, whichever is less unless feasibility analysis demonstrates lower level is appropriate AND Net improvement or TMDL/BMAP % reduction, whichever is greater, pollutant not meeting water quality standards</p>

CONTINUED NEXT SLIDE

STATEWIDE STORMWATER TREATMENT RULE – PERFORMANCE STANDARDS

- “Urban redevelopment” means the construction of a stormwater treatment system on sites having existing commercial, industrial, institutional, or multifamily land uses where the existing impervious surface will be removed as part of the proposed activity
- Sites > X acres, meet perf stds above
- Sites < X acres, meet perf stds above or less with feasibility study



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PROPOSED PERFORMANCE STANDARDS, CONT.

NON-OFWs	OFWs	IMPAIRED WATERS	IMPAIRED WATERS WITH ADOPTED TMDL OR BMAP
<p>ALL OTHER ACTIVITIES</p> <p>85% or Post=Pre, Whichever is less</p>	<p>ALL OTHER ACTIVITIES</p> <p>Post = Pre</p>	<p>ALL OTHER ACTIVITIES</p> <p>85% or Post=Pre, Whichever is less, or, if the water body is an OFW Post=Pre AND in either case net improvement for the pollutant not meeting water quality standards</p>	<p>ALL OTHER ACTIVITIES</p> <p>85% or Post=Pre, Whichever is less, or, if the water body is an OFW Post=Pre AND in either case net improvement or TMDL/BMAP % reduction, whichever is greater, for the pollutant not meeting water quality standards</p>

COMMENTS SOUGHT ON LOADING METHODOLOGY

- **EMCs for urban land uses**
- **EMCs for natural communities**
- **Loadings from wetlands**



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LOADING METHODOLOGY EMCs FOR URBAN LAND USES

Original

Revised

LAND USE	TN mg/L	TP mg/L		TN mg/L	TP mg/L
Low D Residential	1.61	0.191		1.50	0.18
SF Residential	2.07	0.327		1.85	0.31
MF Residential	2.32	0.520		1.91	0.48
Low Intensity Commercial	1.18	0.179		0.93	0.16
Hi Intensity Commercial	2.40	0.345		2.48	0.23
Industrial	1.20	0.260		1.14	0.23
Highway	1.64	0.220		1.37	0.17
Undeveloped Natural	1.18	0.15			

LOADING METHODOLOGY EMCs FOR NATURAL COMMUNITIES

Original values

- TN = 1.18 mg/L, TP = 0.15 mg/L
- Based on four studies, limited data

2009 Report values

- Numbers by community type
- Numbers by TN and TP groupings
- Numbers by TN and TP loading rates
- Mean TN and TP across all communities



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Natural Land Use Runoff Characteristics

(Values reflect log-normal means)

Land Type	N	Total N ($\mu\text{g/l}$)	Total P ($\mu\text{g/l}$)
Dry Prairie	12	1950	107
Hydric Hammock	17	1072	26
Marl Prairie	3	603	10
Mesic Flatwoods	26	1000	34
Mixed Hardwood Forest	39	288	501
Ruderal/Upland Pine	2	1318	347
Scrubby Flatwoods	17	1023	27
Upland Hardwood	79	891	269
Upland Mixed Forest	16	676	2291
Wet Flatwoods	77	1175	15
Wet Prairie	9	776	9
Xeric Hammock	1	1318	2816
Xeric Scrub	3	1158	96

Statistically Similar Groupings for TP EMCs in Natural Communities

Group 1		
Community Type	Log TP	Mean TP
Wet Flatwoods	1.171	15
Marl Prairie	1.017	10
Wet Prairie	0.959	9
Mean Value	1.049	11



Group 2		
Community Type	Log TP	Mean TP
Dry Prairie	2.030	107
Xeric Scrub	1.981	96
Mesic Flatwoods	1.532	34
Scrubby Flatwoods	1.425	27
Hydric Hammock	1.418	26
Mean Value	1.677	48

Group 3		
Community Type	Log TP	Mean TP
Mixed Hardwood	2.704	506
Ruderal/Upland pine	2.537	344
Upland Hardwood	2.433	271
Mean Value	2.558	361



Group 4		
Community Type	Log TP	Mean TP
Xeric Hammock	3.450	2818
Upland Mixed Forest	3.356	2270
Mean Value	3.403	2529

Statistically Similar Groupings for TN in Natural Communities

Group 1		
Community Type	Log TN	Mean TN
Dry Prairie	3.288	1941
Xeric Hammock	3.120	1318
Ruderal/Upland Pine	3.120	1318
Wet Flatwoods	3.066	1164
Xeric Scrub	3.064	1159
Hydric Hammock	3.033	1079
Scrubby Flatwoods	3.013	1030
Mesic Flatwoods	3.002	1005
Upland Hardwood	2.954	899
Wet Prairie	2.889	774
Upland Mixed Forest	2.834	682
Marl Prairie	2.782	605
Mean Value	3.014	1032

Group 2		
Community Type	Log TN	Mean TN
Mixed Hardwood	2.456	286
Mean Value	2.456	286

Natural Land Use Runoff Characteristics

Table 3.2 Natural Vegetative Community Areal Loading Rates

METEROLOGICAL ZONE	TP LOAD (kg/ac-inch-yr)		TN LOAD (kg/ac-inch-yr)	
	Group 1	Group 2	Group 1	Group 2
1	0.00025	0.00372	0.00131	0.01199
2	0.00015	0.00226	0.00064	0.00769
3	0.00023	0.00333	0.00141	0.00978
4	0.00016	0.00236	0.00080	0.00752
5	0.00027	0.00396	0.00157	0.01217



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Natural Land Use Runoff Characteristics

Means of all data across all communities

TN = 1.125 mg/L, TP = 0.10 mg/L

Original values

TN = 1.18 mg/L, TP = 0.15 mg/L



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LOADING METHODOLOGY FOR WETLANDS

- No loading assigned to wetlands (which are “waters”)
- Flow through vs isolated wetlands
- **NOT INTENDED TO APPLY TO HYDRIC SOILS!**
- Very limited TN and TP data (UF study)
- Highly variable



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COMMENTS SOUGHT ON “INTERIM” BMPs

**Issue is related to data documenting
nutrient load reduction effectiveness
of BMPs**

- **Underdrain filtration**
- **Dry detention**
- **Wetland treatment trains**
- **Vegetated natural buffers**
- **Managed aquatic plant systems**
- **Low impact design BMPs**



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UNDERDRAIN FILTRATION

- Know need for alternative BMPs in “flatwood” areas, clay soils
- **ISSUE:** This is an interim BMP since no data currently is available on the nutrient removal effectiveness of this BMP. The DEP-WMD stormwater team is identifying sites for monitoring and will be monitoring underdrain systems during the next several months to obtain data on nutrient removal effectiveness.
- The DEP-WMD stormwater team also is seeking input on alternative BMPs for sites on HSG C and D soils that are effective in removing nutrients.
- Also seeking comment on the filtration media



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DRY DETENTION

- Allowed by SJRWMD and SFWMD
- Unknown nutrient removal performance
- **ISSUE:** Need data on nutrient removal effectiveness, especially for SFWMD systems. Currently looking for good sites to monitor.



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WETLAND TREATMENT TRAINS

- **Section 373.414(3) authorizes**
- **ISSUE: We have proposed this BMP as a retention practice because of the high variability in the literature with respect to TN and TP removal by various types of wetland systems. We are seeking input on this approach. We also are seeking input and data on the urban stormwater TN and TP removal efficiencies for various types of wetlands (we are not seeking wastewater data).**
- **ISSUE: The ground water data used in the continuous simulation must be representative of the site's conditions and will be considered in evaluating adverse effects of wetland functions.**



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VEGETATED NATURAL BUFFERS

- Treatment via infiltration
- How calculate effectiveness since flowing retention system?
- Only for natural buffers or also include planted buffers?
- If allow planted buffers, how determine effectiveness while plants mature?



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MANAGED AQUATIC PLANT SYSTEMS

- Nutrient removal effectiveness data needed
- Should littoral zones be allowed behind residential lots?
- If yes, how assure they remain healthy and functional?



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LOW IMPACT DESIGN BMPs

- Need to verify how credits will be calculated and applied.
- Urban tree planting suggested as BMP but need nutrient removal effectiveness data



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COMMENTS SOUGHT ON “VERIFIED” BMPs

- Range of issues associated with the BMP design criteria, applicant data needs, etc.
- Retention BMPs
 - Sensitive Karst Areas
 - Meeting design infiltration
 - Wet vs dry exfiltration systems
- Wet detention - depth



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COMMENTS SOUGHT ON “VERIFIED” BMPs

- **Retention BMPs**
 - **Sensitive Karst Areas delineation methods**
 - **Meeting design infiltration after construction**
 - **Wet vs dry exfiltration systems**
 - **Conveyance swale effectiveness**
 - **Cascading systems effectiveness**



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COMMENTS SOUGHT ON “VERIFIED” BMPs

- **Wet detention**
 - **Maximum pond depth and mean pond depth**
 - **Stormwater harvesting conflicts between ERP and WUP**
 - **Cascading systems effectiveness**



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COMMENTS SOUGHT ON BMP SITE DATA REQUIREMENTS

- **Section 21 Methodologies**
 - **Ground water mounding analysis**
 - **Retention BMP recovery analysis**
 - **Soil testing – borings**
 - **Soil testing – saturated hydraulic conductivity**



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COMMENTS SOUGHT ON BMP INSPECTION AND COMPLIANCE

- **Issue:** The DEP-WMD stormwater team will be focusing over the next few months on how to best address OM of stormwater treatment systems. We are seeking input on the frequency of inspections, the requirements for inspections, the frequency of recertifying whether a stormwater treatment system is operating as designed and permitted, and whether the recertification forms should be submitted to the Agency or retained by the permittee. Also see Section 32 of this Handbook.



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STATEWIDE STORMWATER TREATMENT RULE

REVISED SCHEDULE

- Rule workshops (May 2010)
- Comments due June 15
- Revised draft rule and Applicant's Handbook (June – September)
- Rule workshops (November 2010)
- Comments due by December 15
- Final revised draft rule and Applicant's Handbook (March 2011)
- Authorizing legislation (May 2011)
- Rule adoption – no earlier than July 1, 2011



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COMMENTS DUE JUNE 15

Please submit comments on draft rule to:
Doug.fry@dep.state.fl.us

Please submit comments on draft
Applicant's Handbook to:
Eric.livingston@dep.state.fl.us



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HOW TO STAY UP TO DATE

- Web site:

<http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater/index.htm>

- Sign up for email list on web site



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