

HISTORY AND EVOLUTION OF FLORIDA'S STORMWATER PROGRAM

The Proposed Statewide Stormwater Rule: How We Got There

At a Meeting of the



September 22, 2009

At the Science Applications International Corporation Facilities, Orlando Fl

a program

from the
Stormwater
Management
ACADEMY



"Managed Stormwater is Good Water"

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THE STORMWATER PROBLEM

Humans cause:

- **Changes in land use**
- **Development in floodplains**
- **Alteration of natural stormwater systems**
- **Compaction of soil, imperviousness**
- **“Drainage” systems**
- **Addition of pollutants**

Resulting in:

- **Decreased recharge**
- **Increased speed of runoff**
- **Increased volume of runoff**
- **Increased pollutant loads**

STORMWATER IMPACTS FROM URBANIZATION

- **Changes in ground water infiltration**
- **Changes in watershed hydrology**
- **Changes in stream hydrology**
- **Changes in stream morphology**
- **Changes in riparian zone habitat**
- **Changes in water quality**
- **Changes to aquatic habitat**
- **Changes in aquatic ecosystems**

EVOLUTION OF STORMWATER MANAGEMENT IN FLORIDA

- **Drainage**
- **Erosion and sediment control**
- **Stormwater treatment**
- **Stormwater retrofitting**
- **Watershed management**

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

2010? Chapter 62- 347, FAC

DEP/WMD ERP rules

TECHNOLOGY BASED

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

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

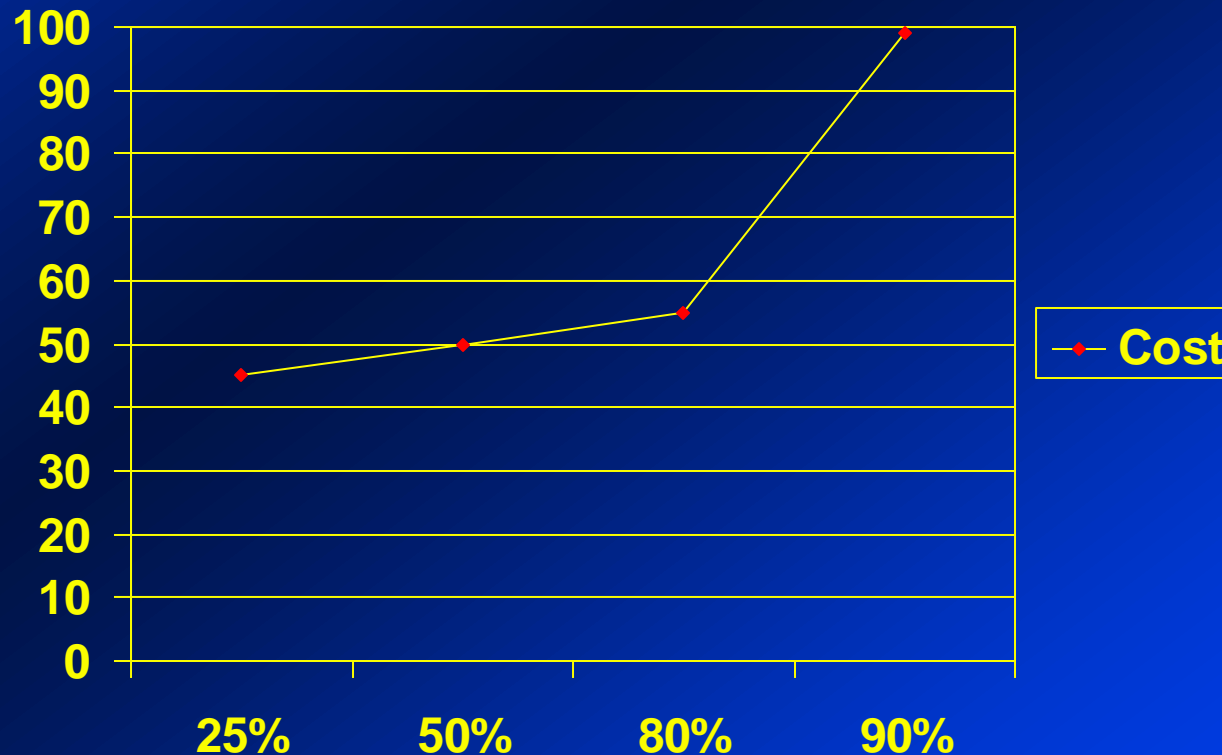
- 80% average annual load reduction
- 95% average annual load reduction
- “Of Total Suspended Solids”

Stormwater quality – 1990

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

WHY 80% TSS LOAD REDUCTION?

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



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

HIGHER LEVELS OF STORMWATER TREATMENT – WHY?

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- Nutrient impaired surface waters (TMDLs)
- Elevated nitrates in springs
- Harmful algal blooms



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

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STATEWIDE STORMWATER RULE OBJECTIVES

- **Increased nutrient removal**
- **Statewide consistency**
- **Permit streamlining**
- **Promote “smart growth”**
- **Increase “BMP tools” available**

STATEWIDE STORMWATER TREATMENT RULE REVISED SCHEDULE

- Issues to DEP Secretary/WMD EDs (Oct 07)**
- Formation of TAC (Jan-Feb 2008)**
- TAC meetings (March - Nov 2008)**
- Project scenario analysis (Jan – Feb 09)**
- Final performance standard (March 09)**
- Revised Applicant's Handbook (Mar – June)**
- TAC meetings (July – September 09)**
- Rule workshops (Jan – May 10)**
- Authorizing legislation (May 2010)**
- Rule adoption by Secretary (May 2010)**
- Rule effective (July 1, 2010)**

STATEWIDE STORMWATER TREATMENT RULE

PERFORMANCE STANDARD CLASS 3

- 85% nutrient reduction, or
- $\text{Post} < \text{pre}$, where pre is the loading from natural vegetation communities
- Whichever is less

PERFORMANCE STANDARD OFWs

- $\text{Post} < \text{pre}$

PERFORMANCE STANDARD IMPAIRED

- Net environmental improvement

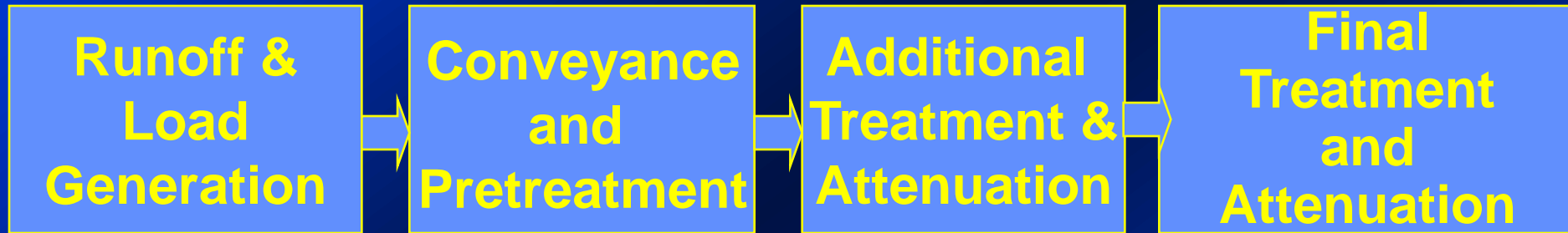
PROPOSED METHODOLOGY

- **Continuous simulation modeling charts**
- **Site specific assessment required**
- **Assumed predevelopment conditions**
 - **HSG, natural land EMCs**
- **Calculate pre-development nutrient loads**
- **Calculate post-development nutrient loads**
- **Calculate required load reduction: 85% or $\text{post}=\text{pre}$**
- **Develop BMP Treatment Train to achieve required load reductions**

UNIFIED STORMWATER RULE CONCEPTS

- **One storm does not fit all – 5 rainfall zones**
- **BMP treatment train required**
- **Debits/Credits for nonstructural BMPs**
 - **Higher CN for cleared areas (compaction)**
 - **Preserving vegetation, minimize clearing**
 - **Disconnect impervious areas**
 - **Green roofs**
 - **Pervious concrete**
 - **Florida Friendly Landscaping**
- **Compensating treatment (WQ Banking)**
- **Retrofit section**

BMP TREATMENT TRAIN REQUIRED FOR WET DETENTION RECOMMENDED FOR ALL SITES



Source controls
Public ed
Erosion control
Roof runoff
Florida Yards
LID
Illicit connections

Swales
Filter strips
Landscaping
Catch basins
Filter inlets
Baffle boxes
Biodetention

Sediment basins
Retention
Detention

MAPS
Alum/PAM
Reuse
Regional ponds

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COMPENSATING TREATMENT

- **Currently used for FDOT bridges**
- **How implemented?**
 - **Calculate load not treated**
 - **Provide treatment close to project**
 - **Buy into retrofit project**
- **Future use for small, commercial projects**

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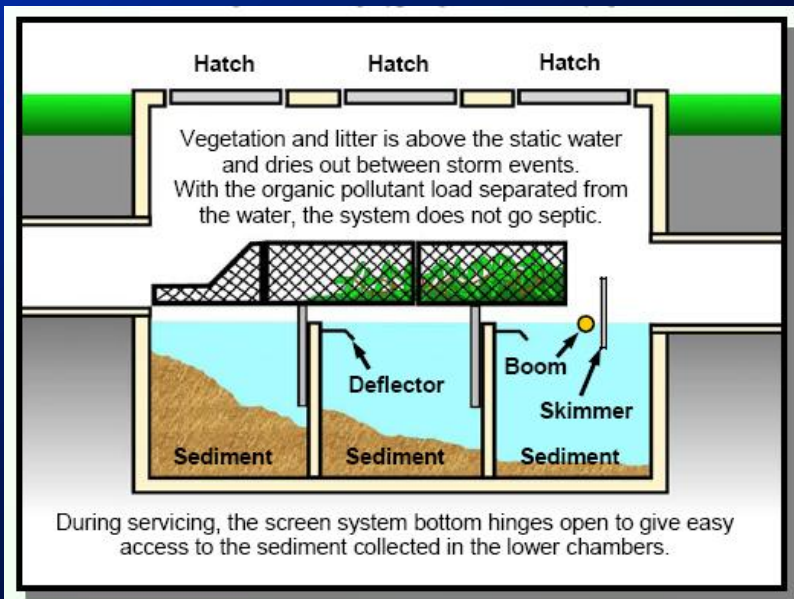
STORMWATER RETROFITTING IN FLORIDA



Greenwood Wetland



Lake Dot Alum injection



Baffle Boxes



Packed bed wetland

LOCAL LID LEGAL IMPEDIMENTS

- LDRs promote conventional development
- LDRs prohibit or inhibit Low Impact Design
- Code/Cultural changes needed
- Save the Swales
- Pervious pavements
- Reduce imperviousness
- Florida Friendly
- Landscaping-design, irrigation, fertilizer
- Reduce clearing of vegetation, protect native vegetation, minimize soil compaction



PROGRESSIVE STATE/LOCAL LID EFFORTS



Spr

REPORT

Strategies and Recommendations for Protecting Silver and Rainbow Springs



PROTECTING FLORIDA'S SPRINGS: AN IMPLEMENTATION GUIDEBOOK



July 2007

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FACT DEVELOPMENT MANUAL
FOR SARASOTA COUNTY

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September 2008

PROPOSED STORMWATER LEGISLATION

- **Grandfathering provisions**
- **Authorizes “rebuttable presumption” approach**
- **Authorizes alternative performance standards for urban redevelopment projects and retrofitting projects**
- **Single rule adoption by DEP with implementation by DEP and WMDs**
- **Harris Act exemption**

WHY A NEW STORMWATER RULE?

- Too Many Dirty Lakes!
- Too much nitrate in ground water/springs
- Integrate nonstructural BMPs
- Level the playing field
- Simply time to evolve – BMPs dynamic

regain our number 1 status!



