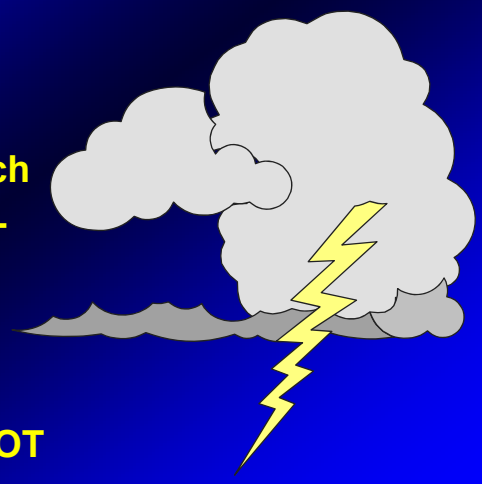
Statewide FDEP Stormwater Rule

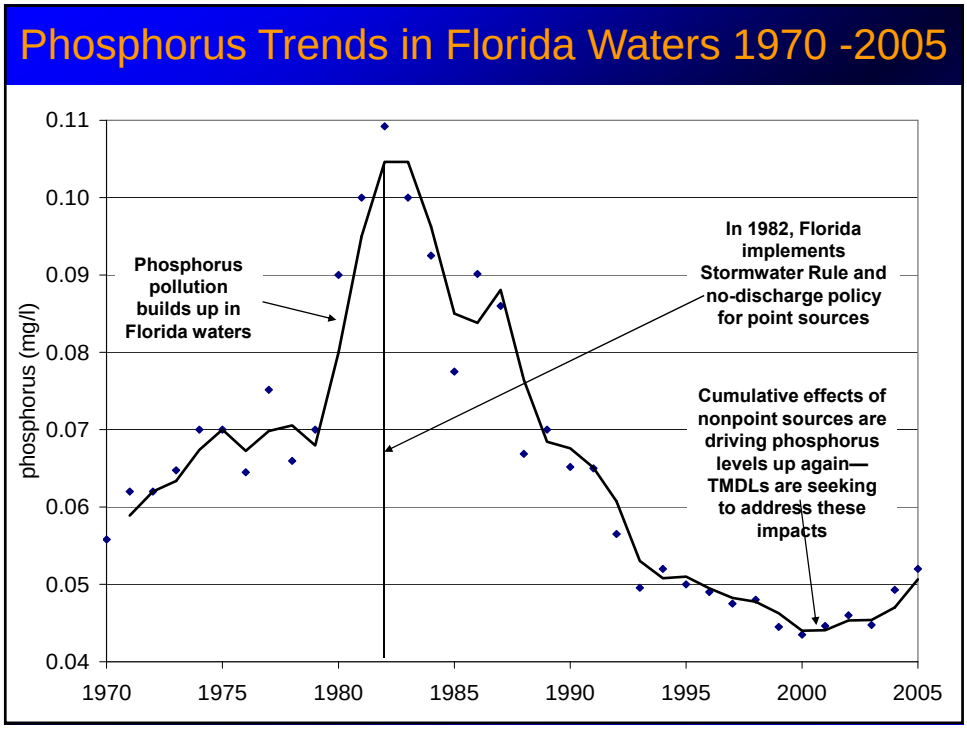
Design Conference

July 29, 2008

Outline of Topics

- Why a New Rule
- Target Treatment
- Undergirding Research
- Implications for FDOT
- Treatment Strategies
- Stormwater TAC
- Ongoing Efforts by DOT




Phosphorus Trends in Florida Waters 1970 -2005
phosphorus (mg/l)
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
1970
1975
1980
1985
1990
1995
2000
2005
Phosphorus pollution builds up in Florida waters
In 1982, Florida implements Stormwater Rule and no-discharge policy for point sources
Cumulative effects of nonpoint sources are driving phosphorus levels up again— TMDLs are seeking to address these impacts

Caloosahatchee River
October 15, 2005

STORMWATER MANAGEMENT GOAL FOR NEW DEVELOPMENT

Post-development ≤ Un-development

Pollutant Load for

Surface Waters or Groundwater

Evaluation of Current Stormwater Design Criteria within Florida [Harper Study, 2006]

Objectives

- Review BMP design criteria of DEP/WMDs
- Update Florida stormwater EMC data
- Update/analyze Florida rainfall data
- Estimate predevelopment hydrology and stormwater loadings

Evaluation of Current Stormwater Design Criteria within Florida [Harper Study, 2006]

Objectives…

- Update Florida BMP effectiveness data
- Model BMP treatment effectiveness
- Evaluate adequacy of BMP design criteria
  - 80%,95%, no net increase in nutrients

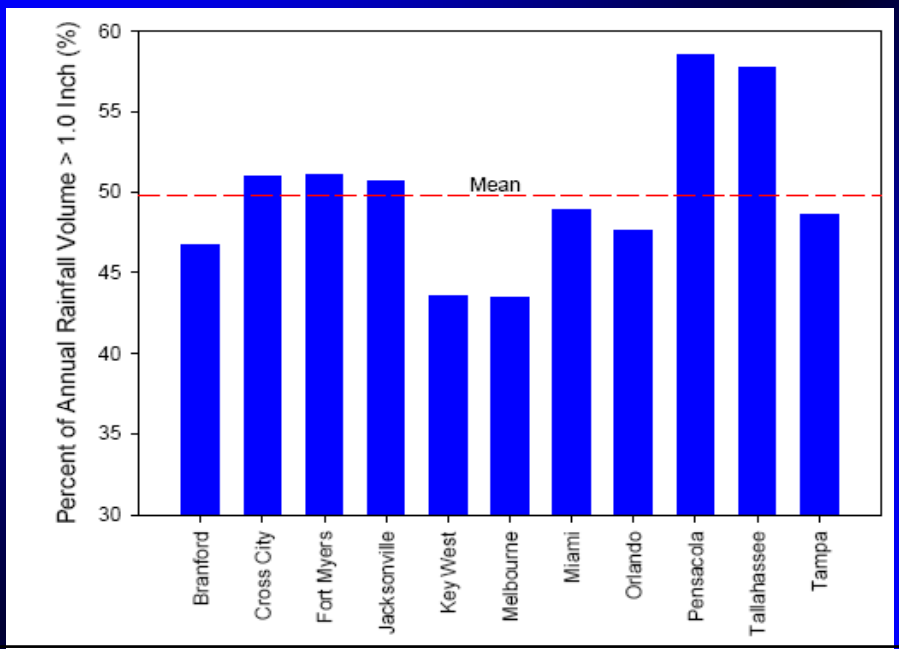
Major Findings

- Rainfall more highly variable
- EMCs are updated
- Annual runoff coefficients more variable
  - Consequently, loadings more variable

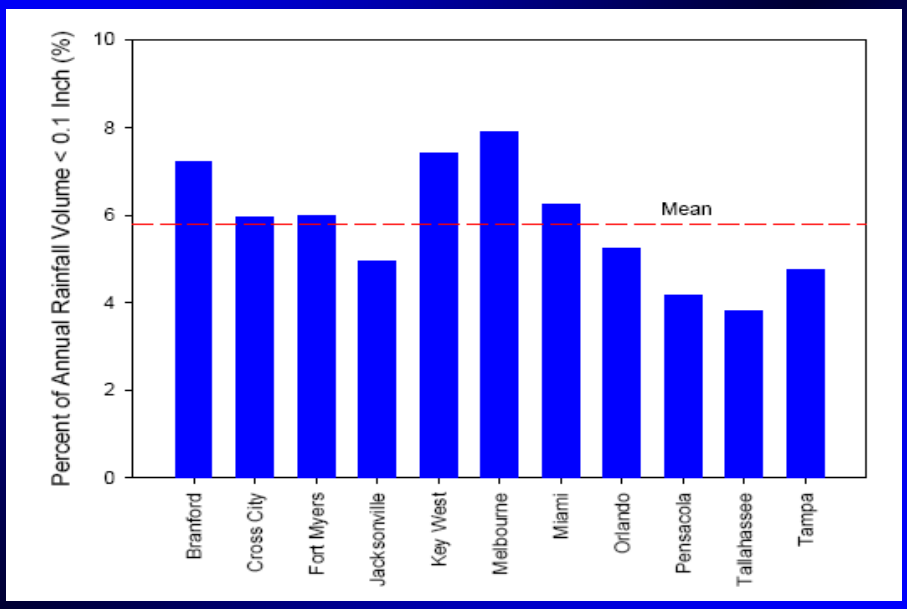
Major Findings …

- Current rules do not provide for 80 to 95% removal of nutrients
- Infiltration BMPs must retain more runoff can to meet higher levels
- BMP treatment train needed for wet ponds to meet higher levels of nutrient removal

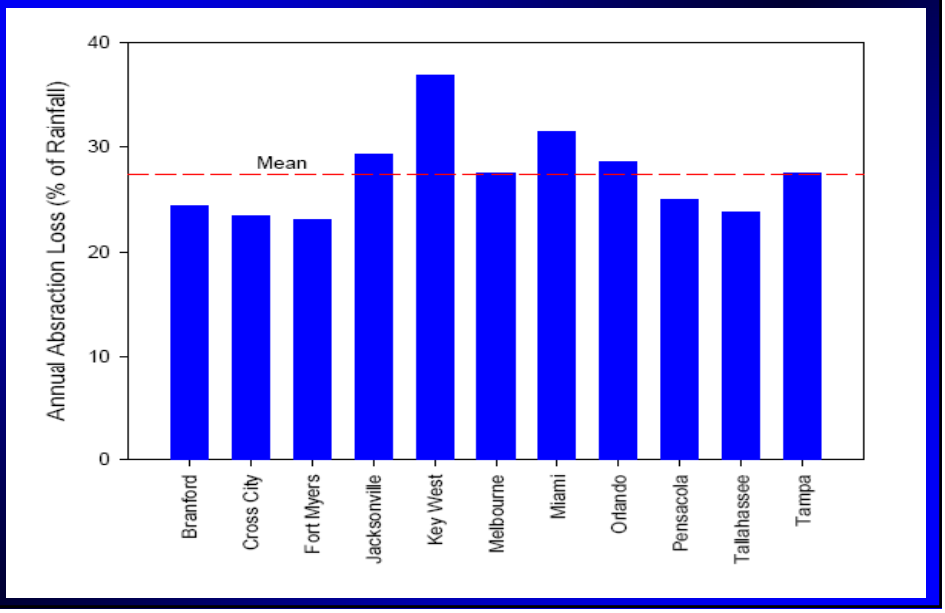
% Annual Average Rainfall Volume from Storms > 1”



% Annual Ave. Rainfall Volume - Storms < 0.1”



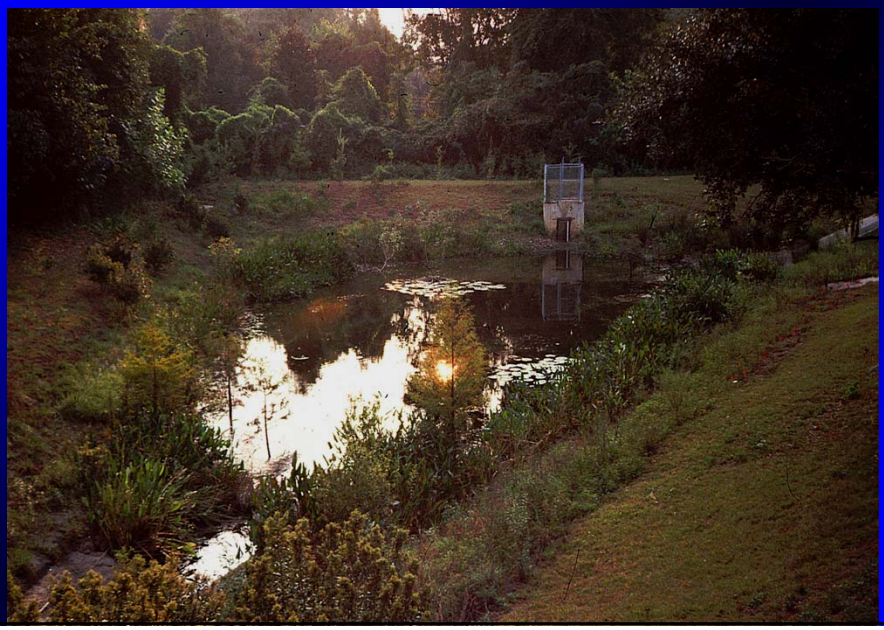
% of Annual Rainfall Depth Lost to Initial Abstraction on Impervious Surfaces



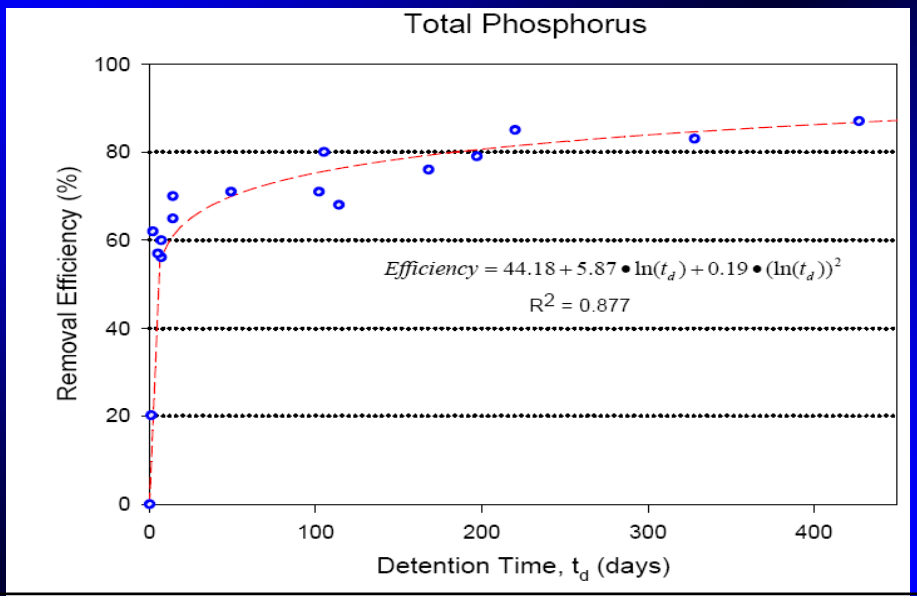
Major Findings: Treatment Levels

- Current rules do not remove 80% of nutrient
- Recommended Performance Standard:
  - post-development nutrient load = pre-development nutrient load
  - If removal standard = 80%, BMPs will provide much higher TN removals than needed
  - If removal standard = 95%, BMPs will provide much higher TN and TP removals than needed

WHAT ABOUT WET DETENTION PONDS



Wet Detention Ponds Removal Efficiency: Total Phosphorus vs. Residence Time.



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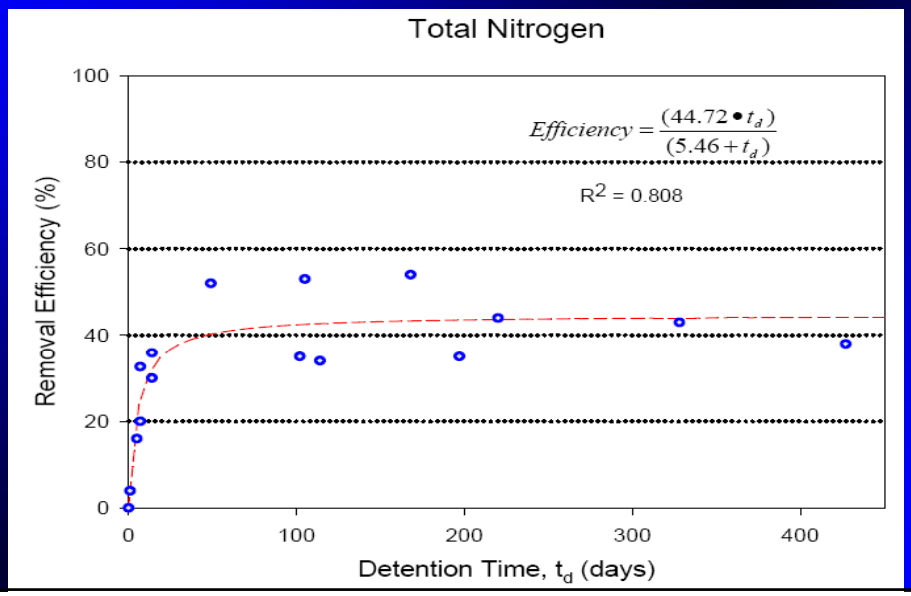


Design Approach

- Estimate Undeveloped Loading
- Estimate Post-development Loadings
- Determine Required Treatment Efficiencies
  - TP or TN
- Achieve Efficiencies via BMP Treatment Train

Estimate Undeveloped Loading for TN and TP

- Soil Type, Zone, Rangeland, 0% Imp., CN
  - Annual Rainfall & C from Tables
- Runoff = Rainfall depth x Site Area x C
- Apply EMCs for TN and TP to Obtain Loadings

Estimate Post-development Loading for TN and TP

- Soil Type, Zone, % Imp., % DCIA, Pervious CN
- Calculate non-DCIA CN
- Annual Rainfall & C from Tables
- Runoff = Rainfall depth x C
- Apply EMCs for TN and TP

Required Treatment Efficiency

Required Removal:
Post loading – undev. loading

Required Efficiency:
Required Removal / Post loading
or…. 1 – (undev. Loading / post loading)

Sample Problem

Pre-Development Conditions:

Land Use: rangeland/forest (fair condition)
10 acres – isolated wetlands

Soil Types: Hydrologic Soil Group (HSG) D
Wetland – hydric soils

Impervious Areas: 0% impervious, 0% Directly Connected Impervious Area (DCIA)

Sample Problem

Post Development Conditions:

Land Use: 25% imp. single-family residential

DCIA: 75% of Impervious Areas

5 acres of stormwater management systems

5 acres of preserved wetlands

Changes in Retention Volume

TREATMENT LEVEL	PENSACOLA	OCALA	KEY WEST
	DEP	SJRWMD	SFWMD
Class III	0.50”	0.5 - 1.0”	0.50”
OFW	0.75”	0.75 - 1.50”	0.75”
Post < Pre	TN= 69%	TN=69%	TN=57%
A. Removal	TP= 87%	TP=87%	TP=82%
B. Volume	1.78”	1.22”	1.74”

Potential Implications for DOT

- New / Larger Stormwater Ponds
- Treatment Train Approach
- More Intergovernmental Partnering - J/U Ponds
- Unstable Permitting Environment - Current Jobs
- Stormwater Treatment Banking
- New Treatment BMPs
- More Reforestation

UNIFIED STORMWATER RULE SCHEDULE

TASK	START	COMPLETE
Prepare rule conceptual outline	April 2	April 6 - Done
Modify NW ERP handbook to incorporate new design criteria	May 1	July 27
Send to WMD staff, DEP contractors	July 2	July 30
WMD, DEP contractor review/comments	July 2	August 30
Meeting to review draft	Mid to late August Antidrift meeting	Sept 6
Develop list of issues	September 6	September 14
Issue review/comment	September 14	September 28
Interim report with final issues/recommendations	September 28	September 30
Meet with DEP Secretary and WMD EDs	October 26	October 26
Second Rule draft	October 4	November 16
Send to WMD staff, DEP contractors	November 19	November 19
WMD, DEP contractor review/comments	November 19	December 31
Appoint TAC	November 1	December 1
First TAC meeting	January 16, 2008	
TAC meets	January 16	May 16
Rule making workshops	June	September
Secretary Rule adoption	November 5	
Rule effective	January 1, 2009	

Stormwater Rule TAC

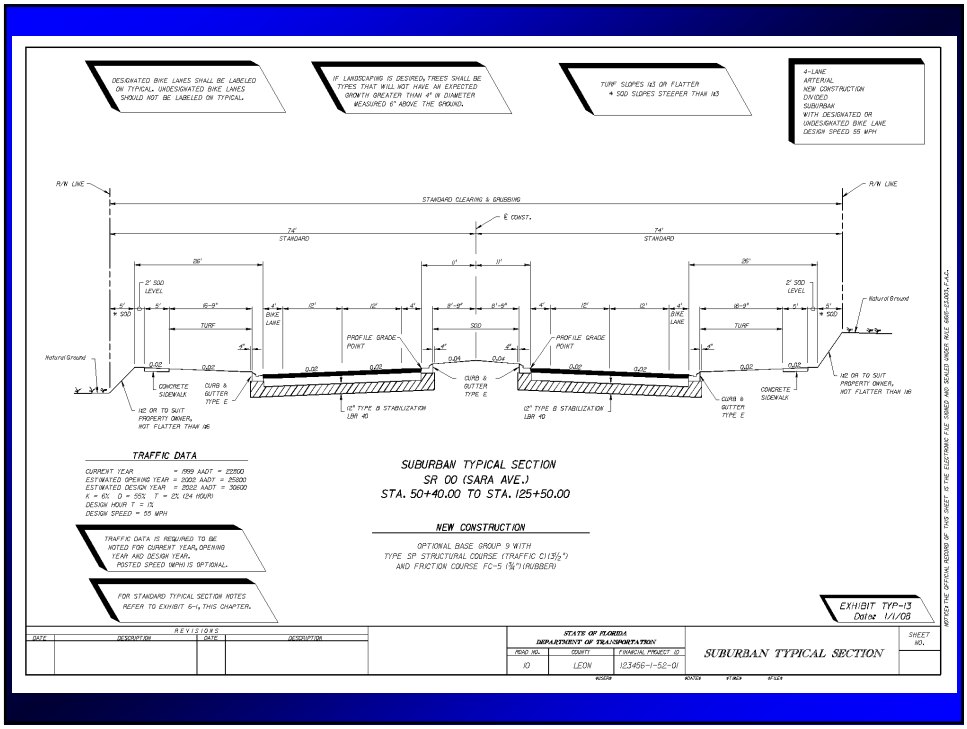
- DOT: Josh Boan / Rick Renna
- Seven Meetings Through November 2008
- Broad Range of Representation
- Numerous Issues…
  - ✓ Urban Re-development
  - ✓ Limited Data for EMCs
  - ✓ Karst Sensitive Areas
- http://www.dep.state.fl.us/water/wetlands/erp/rules/sw_swt_rule_dvlpmt.htm

Promising BMPs

- Water Reuse
- Reduced Fertilization
- Pervious Pavement
- Larger & Deeper Ponds
- Reduced Construction Footprints / Reforestation
- Stormwater Banking / Regional Ponds
- Retrofit Old Projects, Esp. Interchanges

Re-use / Infiltration with Pond

- Ponds Remove Max. 43% TN
- Onsite Re-use within PPM Typical Sections
  - Rural Typical Sections: OK
  - Urban & Suburban Sections: Offsite Re-use Needed
    - Interagency Cooperation Needed
- Discharge Through Pond Walls as Retention



What's Next

- TAC Meetings
- Assess Project Impacts
  - Evaluate Design Solutions
  - Pilot Re-use Projects
- Design Program
- Specs, Standards, Guidance
- Urban Redevelopment Criteria for DOT
- Approach DEP for Grandfathering

Questions / Comments?