Regulatory Framework USEPA Region 4

SESWA Annual Stormwater Seminar
March 31, 2017

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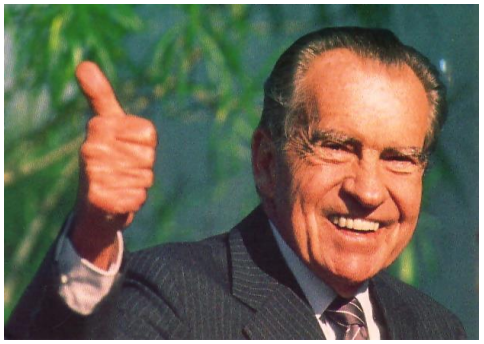
Brown AND Caldwell

Regulatory Framework - Federal



Clean Water Act (1972)

- Classifications according to Designated Uses
  - Surface waters of the United States
- Surface water quality standards by state
- Total Maximum Daily Load (TMDL)
- National Pollutant Discharge Elimination System (NPDES) Program

NPDES MS4 Requirements
Minimum Control Measures (MCMs)

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention/Good Housekeeping for Municipal Operations Maintenance

Urban Stormwater Management in the United States by NRC (2008)

- EPA's current approach is unlikely to identify problem areas nor control waterbody impairment
- Flow and impervious cover should be considered a proxy for pollutant loading
- More vigilant regulatory oversight for products that pollute stormwater (i.e. deicing chemicals, brake linings)
- Federal government should provide financial support to states and local governments

NRC Recommended Stormwater Management Approaches

- Individual controls inadequate; need system of structural and non-structural controls (treatment train approach)
- Non-structural volume reduction techniques, such as better site design, should be used first to reduce volume and load from new development
- Implement techniques that harvest, infiltrate and evapotranspirate to reduce runoff volume from small storms
- Additional research on performance efficiencies is needed
- Retrofitting urban areas
- Base all wastewater and stormwater permits on watershed not political boundaries

Treatment Train - Implementing Cost Effective BMPs For Non-Point Source Management

MAXIMIZE

Runoff & Load Generation

Regulations
Public education
Erosion control
Roof runoff
Disconnect IA
Landscaping
Pervious paving
Pavement cleaning

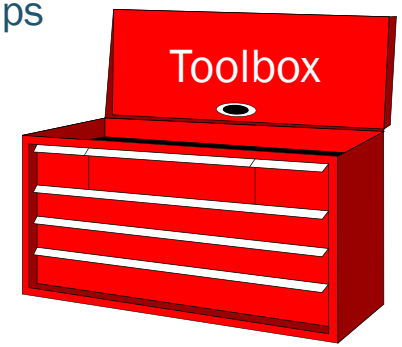
GI

Conveyance and Pretreatment

Swales
Catch Basins
Inlets filters
Oil/water separators
Trash/sediment traps

Additional Treatment & Attenuation

Detention
Wetland
Storage
Sediment sump



MINIMIZE

Final Treatment and Attenuation

Retention
Detention
Wetland
Chemical
Ozone
UV
Reuse
End of pipe

Comparison of BMP Treatment Efficiencies for Primary Pollutants

Type of BMP	Estimated Removal Efficiencies (% Load Reduction)			
	TN	TP	TSS	BOD
INFILTRATION/REUSE Volume Reduction 1.00" VOLUME 1.50" VOLUME	 80 90	 80 90	 80 90	 80 90
WET DET (14-21 day WSRT)	25-35	60-70	90	50-70
WET DET/FILTER	0-10	50	85	70
DRY DETENTION	10-20	20-40	20-60	20-50
DRY DET/FILTER	(-)-20	(-)-20	40-60	0-50
CHEMICAL TREATMENT	20-40	80-90	>90	30-60
WETLAND TREATMENT	(-)-90	(-)-90	50-90	(-)-50

Volume Reduction

No volume = no load
Also reduces conveyance requirements and cost.

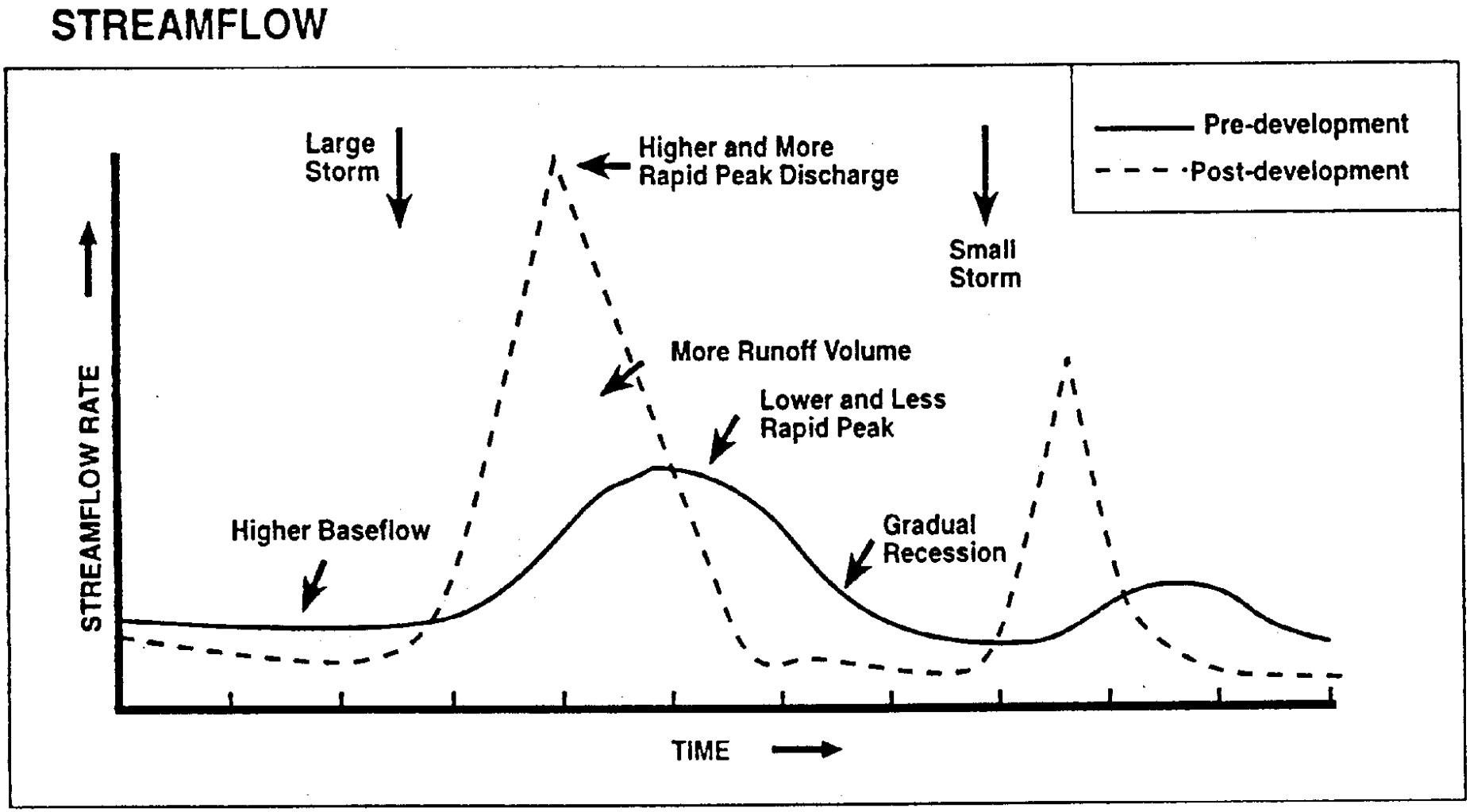
Disconnect Impervious Areas

Rainwater Harvesting and Reuse

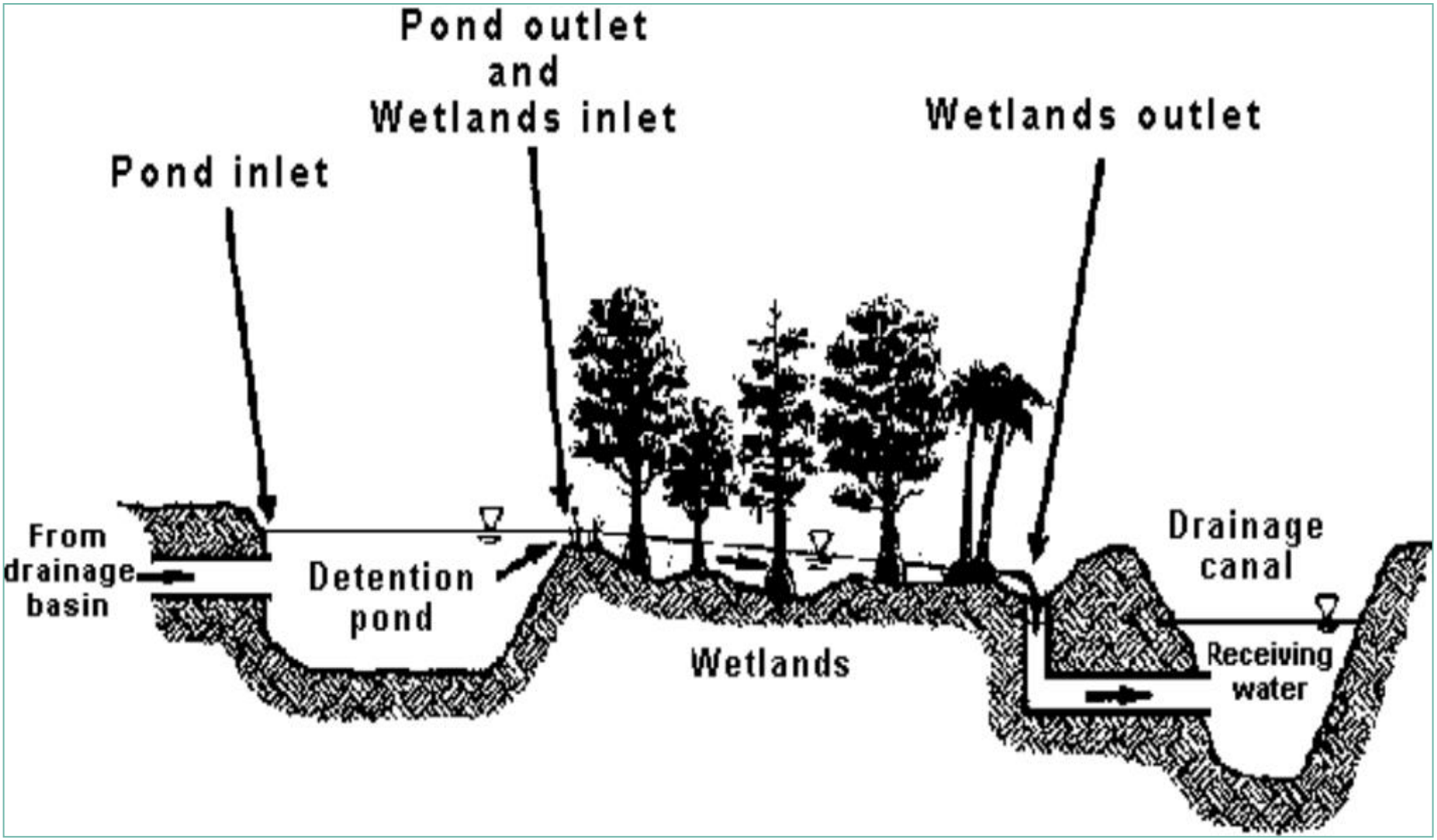
Stormwater Storage and Reuse

Low Impact Development
and Infiltration Practices

Development Impacts Streams and Estuaries



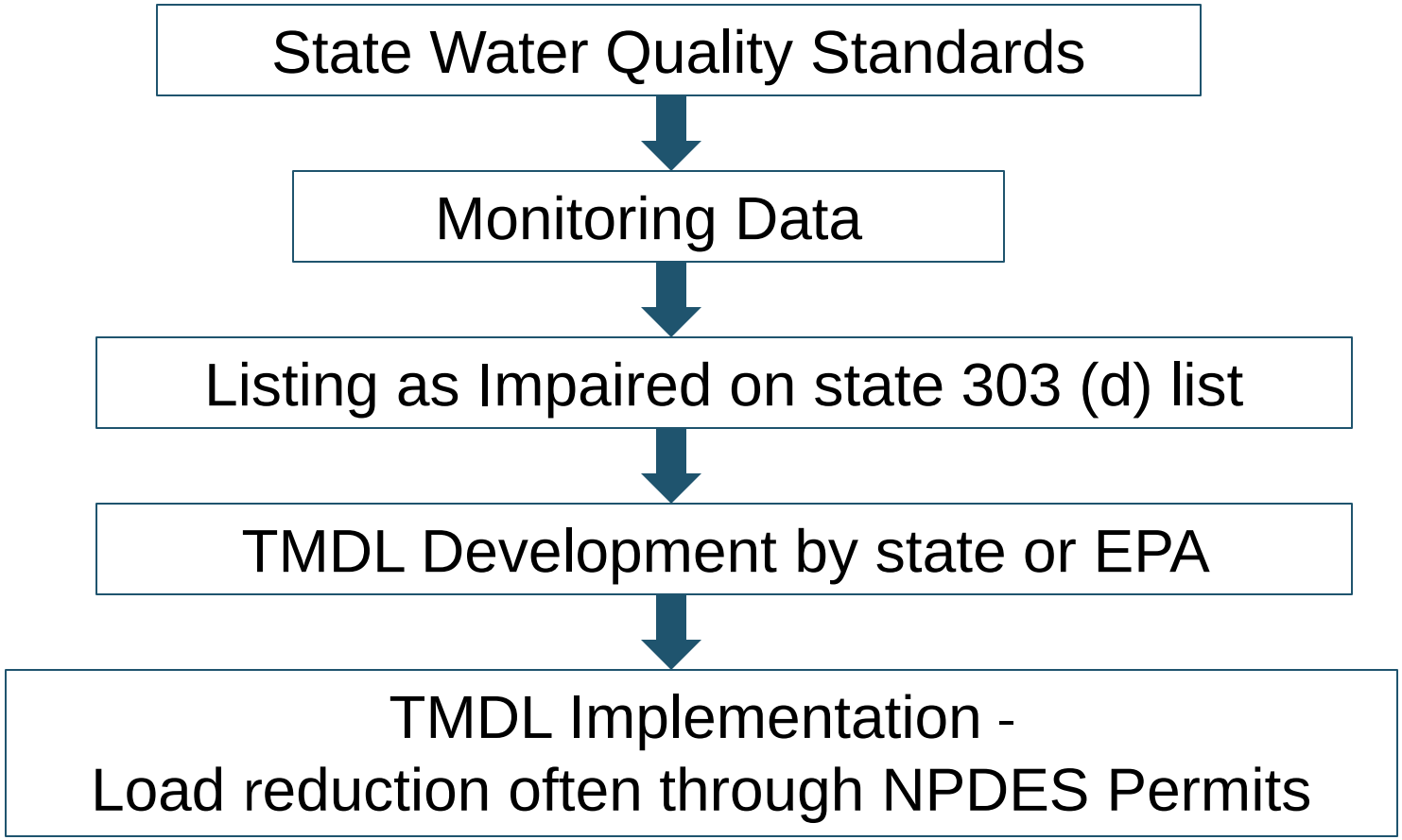
Valuable Freshwater Resource Is Lost to Tide



Regulatory Framework - Federal

- Indefinite hold on National Stormwater Rule:
  - Incentives
  - Technical assistance
  - Tools to implement strong stormwater programs
  - Leverage existing requirements to strengthen municipal stormwater permits
  - Continue to promote green infrastructure as an integral part of stormwater management
- US EPA continues to promote TMDL compliance and green infrastructure; requirements vary with state

TMDL Process



USEPA Region 4 Approved TMDLs by State

State Name	Number of TMDLs
Alabama	305
Florida	2,246
Georgia	1,700
Kentucky	345
Mississippi	1,440
North Carolina	13,443
South Carolina	524
Tennessee	1,276

Total: 21,279 TMDLs

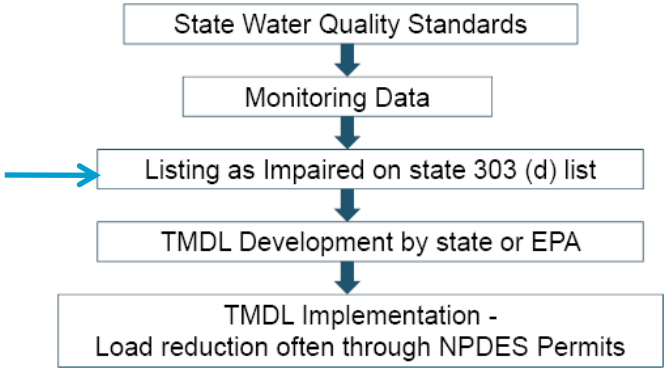
USEPA Region 4 Approved TMDLs

Pollutant Group	Number of TMDLs
Mercury	14,474
Pathogens	2,915
Nutrients	1,267
Sediment	1,057
Organic Enrichment/Oxygen Depletion	642
Pesticides	335
Metals (other than Mercury)	122

Current Status of State-wide Numeric Nutrient Criteria

- Very few states have state-wide numeric nutrient criteria
- Most criteria are narrative – "cannot cause an imbalance of flora and fauna"
- South Carolina – phosphorus; adopted EPA Ecoregion values in 2001 (only state)
- Florida - phosphorus and nitrogen for freshwaters and estuaries

Most states currently have narrative nutrient criteria. Numeric nutrient criteria typically significantly increase the number of impaired waters.



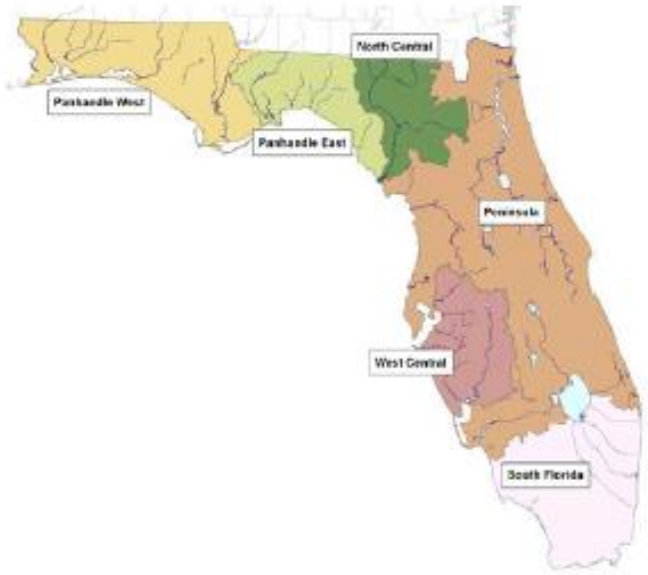
Florida's Lake Nutrient Criteria

Long Term Geometric Mean Lake Color and Alkalinity	Annual Geometric Mean Chlorophyll *a*	Minimum calculated numeric interpretation		Maximum calculated numeric interpretation	
		Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen	Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen
> 40 Platinum Cobalt Units	20 µg/L	0.05 mg/L	1.27 mg/L	0.16 mg/L[1]	2.23 mg/L
≤ 40 Platinum Cobalt Units and > 20 mg/L $CaCO_3$	20 µg/L	0.03 mg/L	1.05 mg/L	0.09 mg/L	1.91 mg/L
≤ 40 Platinum Cobalt Units and ≤ 20 mg/L $CaCO_3$	6 µg/L	0.01 mg/L	0.51 mg/L	0.03 mg/L	0.93 mg/L

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit is 0.49 mg/L, which is the TP streams threshold for the region.

Allowable TP and TN concentration to achieve chlorophyll a standard.

Florida's In-Stream Nutrient Criteria



Annual geometric mean not to be surpassed more than once every 3 years.

Nutrient Region	Total Phosphorus Threshold	Total Nitrogen Threshold
Panhandle West	0.06 mg/L	0.67 mg/L
Panhandle East	0.18 mg/L	1.03 mg/L
North Central	0.30 mg/L	1.87 mg/L
Peninsula	0.12 mg/L	1.54 mg/L
West Central	0.49 mg/L	1.65 mg/L
South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.[2]	

Rule includes Site Specific Alternative Criteria (SSAC) and mixing zones. Cannot have mixing zone in Impaired Water. Sound science.

USEPA Promoting Integrated Stormwater and Wastewater Planning

- Status memo to EPA Regions January 2013
- Combine analysis of watershed wastewater and stormwater impacts and solutions
- Address most serious water quality issues first
- Find most cost effective/beneficial solutions
- Use Green Infrastructure – Sustainability
- Driven by local governments – early adopters – Baltimore, Seattle, Columbus OH

One Water Concept

Blueprint for **One Water**

The One Water concept, an integrated planning and implementation approach to managing finite water resources, has been adopted by some, and is of great interest to many others, for its collaborative approach to achieving sustainable, reliable, and resilient water systems. Previous efforts helped set the stage for integrated water resources planning, but many utilities have identified the need for tactical steps or guidance to develop a One Water framework. This blueprint provides practical guidance for One Water or Integrated Water Management efforts, including a roadmap for integrating a multi-stakeholder planning process as well as lessons learned from a diverse group of municipalities and water professionals.
This blueprint includes:

- Critical steps to developing a One Water approach
- Case study examples describing how utilities have taken innovative approaches to incorporate integrated water resources planning
- Methods for overcoming potential barriers and obstacles
- Key outcomes and milestones for each critical step

This document is intended to guide One Water planning processes and support utilities, cities, counties, municipalities, water professionals, and other stakeholders across multiple water resource sectors, including water supply, wastewater, reuse, watershed management, stormwater, and energy and resource recovery.

This blueprint was sponsored by Water Research Foundation (WRF) project 4660 and developed by Brown and Caldwell. The research methodology included an international survey with responses from more than 800 water professionals, more than ten one-on-one interviews, and a two-day international workshop with 35 water professionals.

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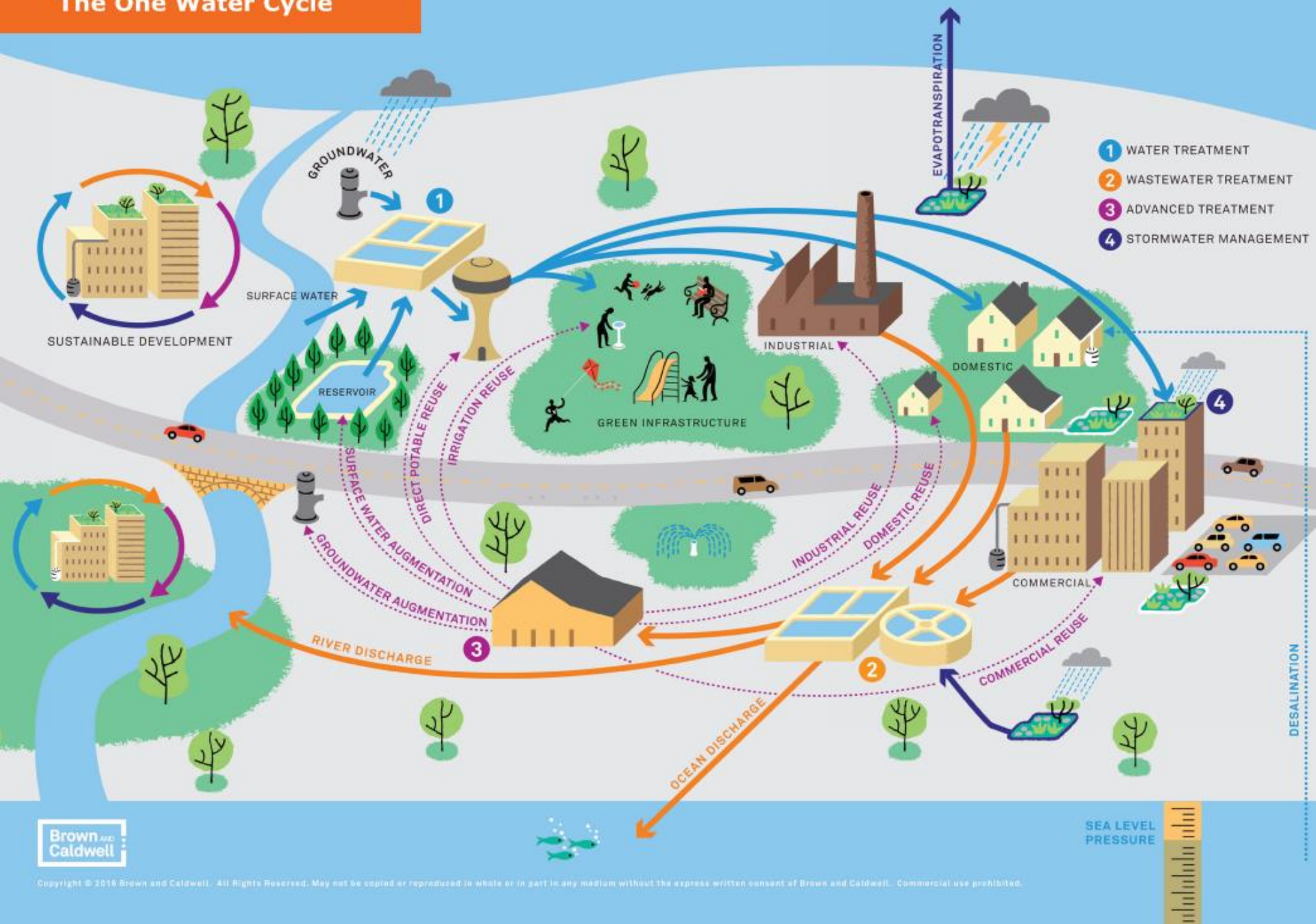
ISBN 978-1-60573-274-9 | Printed in the U.S.A

Water Research Foundation

Brown AND Caldwell

The One Water Cycle



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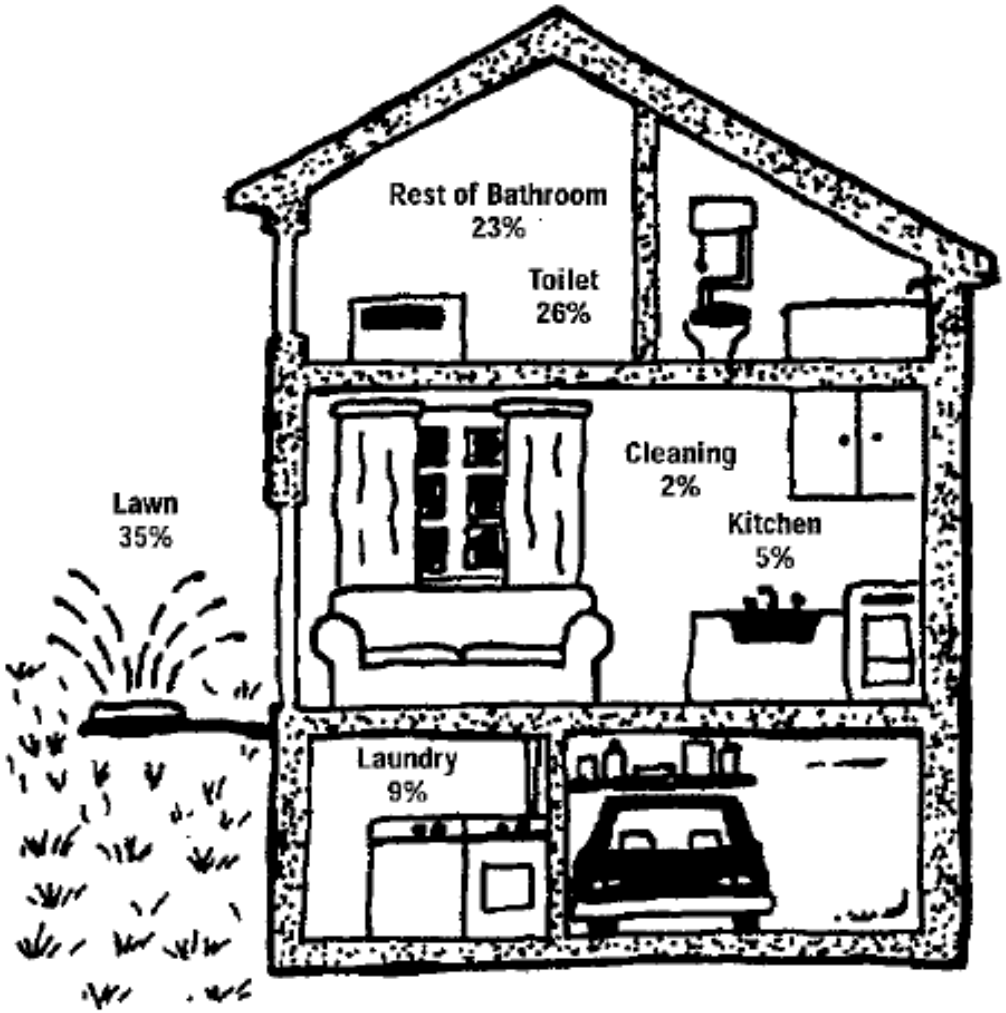
Up to 60% of our water use does not require potable water



Questions

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