A Local Government Perspective

The Proposed Statewide Stormwater Rule: How We Got There

At a Meeting of the

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS®

Proudly Serving the Environmental Engineering Profession since 1955

September 22, 2009

At the Science Applications International Corporation Facilities, Orlando Fl

a program from the

University of Central Florida Stormwater Management Academy

"Managed Stormwater is Good Water"

Presentation by

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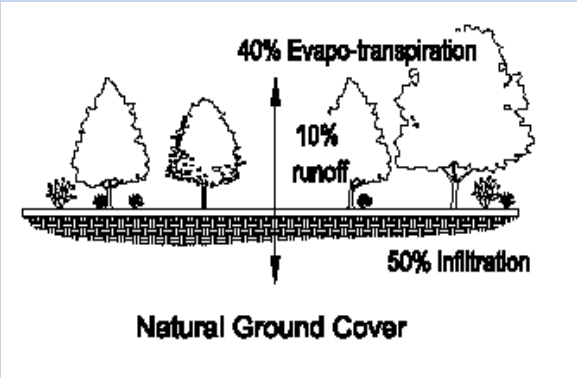
Environmental Manager

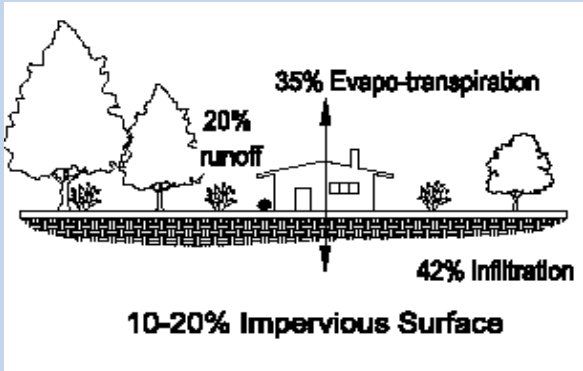
Sarasota County Government

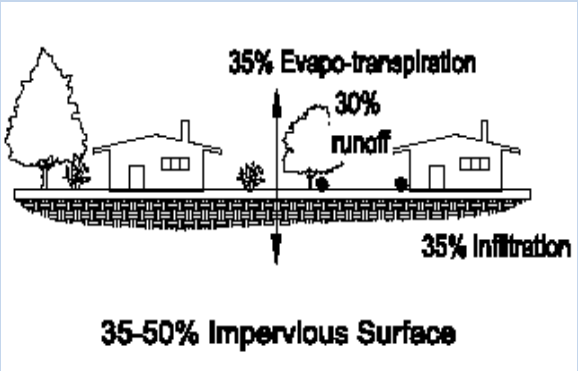
Sarasota County

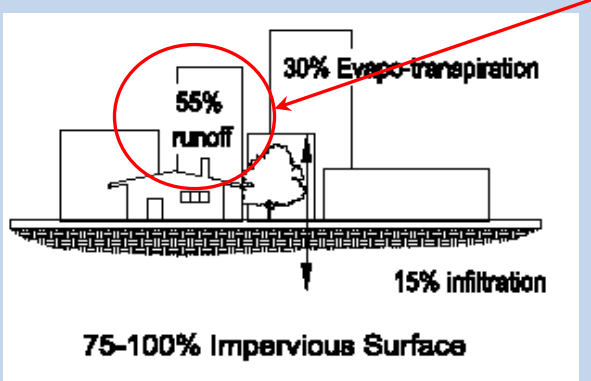
Why Do We Need Statewide Stormwater Rule?

The diagrams show how groundwater infiltration decreases and surface runoff increases dramatically as a watershed is developed.









Want to control this!

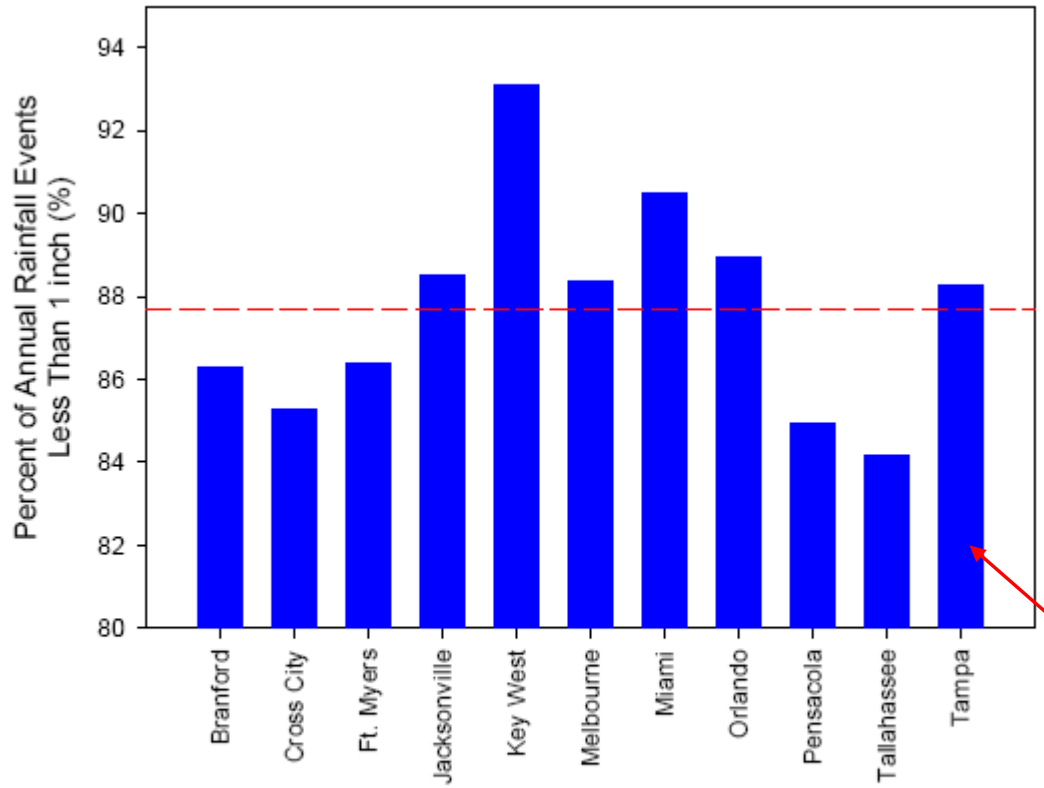
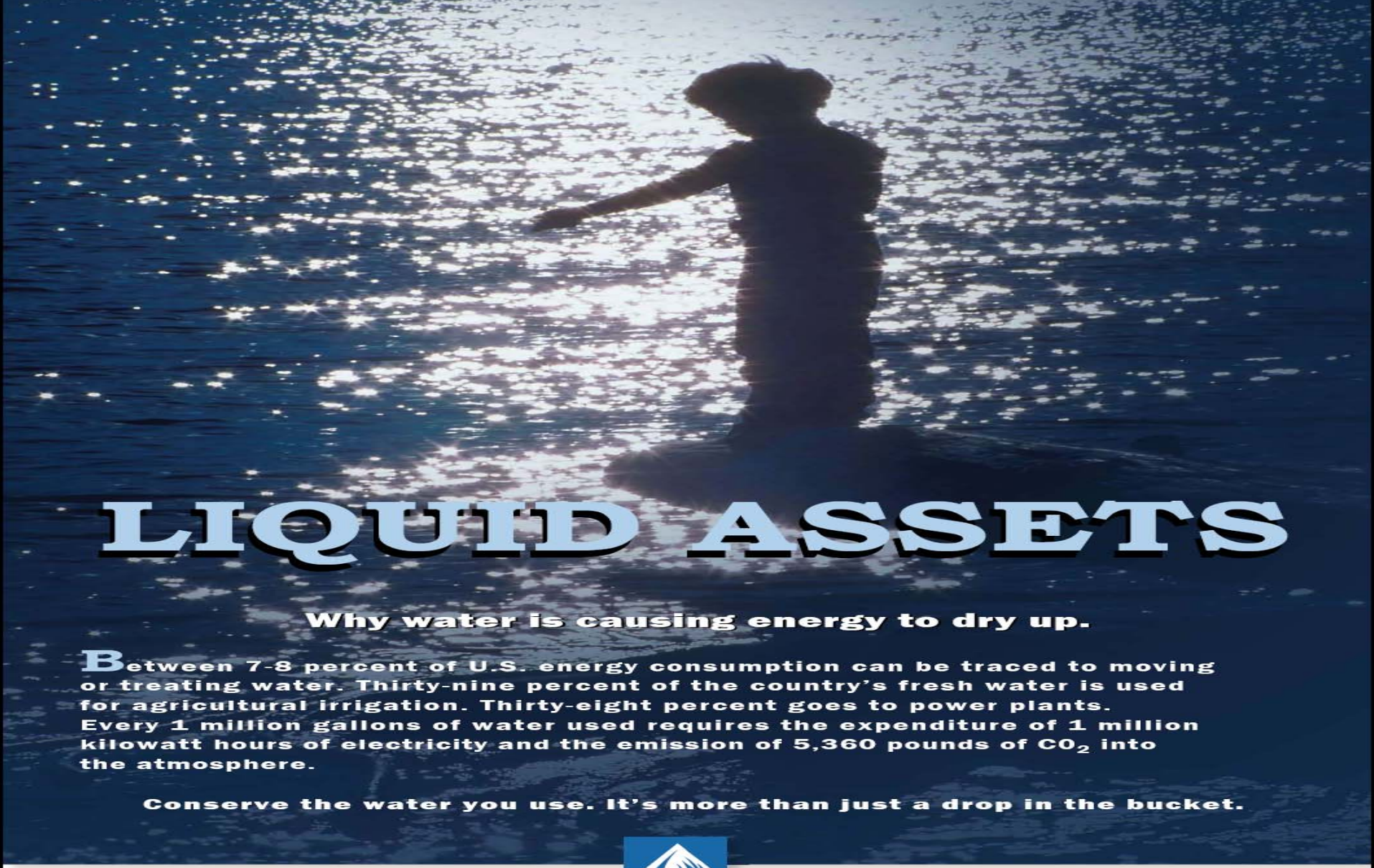


Figure 3-4. Percentage of Annual Rain Events Less than 1 inch at the Selected Regional Sites.

FDEP\STORMWATER TREATMENT REPORT

We're here 88% <1"



LIQUID ASSETS

Why water is causing energy to dry up.

Between 7-8 percent of U.S. energy consumption can be traced to moving or treating water. Thirty-nine percent of the country's fresh water is used for agricultural irrigation. Thirty-eight percent goes to power plants. Every 1 million gallons of water used requires the expenditure of 1 million kilowatt hours of electricity and the emission of 5,360 pounds of CO_2 into the atmosphere.

Conserve the water you use. It's more than just a drop in the bucket.

get ENERGYsmart

Stop draining our energy resources.

Sarasota County

WATER=ENERGY

- The further we move/treat water the more energy we use… 7-8% of US energy
- 1 million gals of water uses 1 million kilowatts of electricity and 5360 lbs of CO_2
- When we use highly treated drinking water to flush toilets or water our grass….Think about the energy going down the toilet and all the unnecessary CO_2 going into the atmosphere!!!

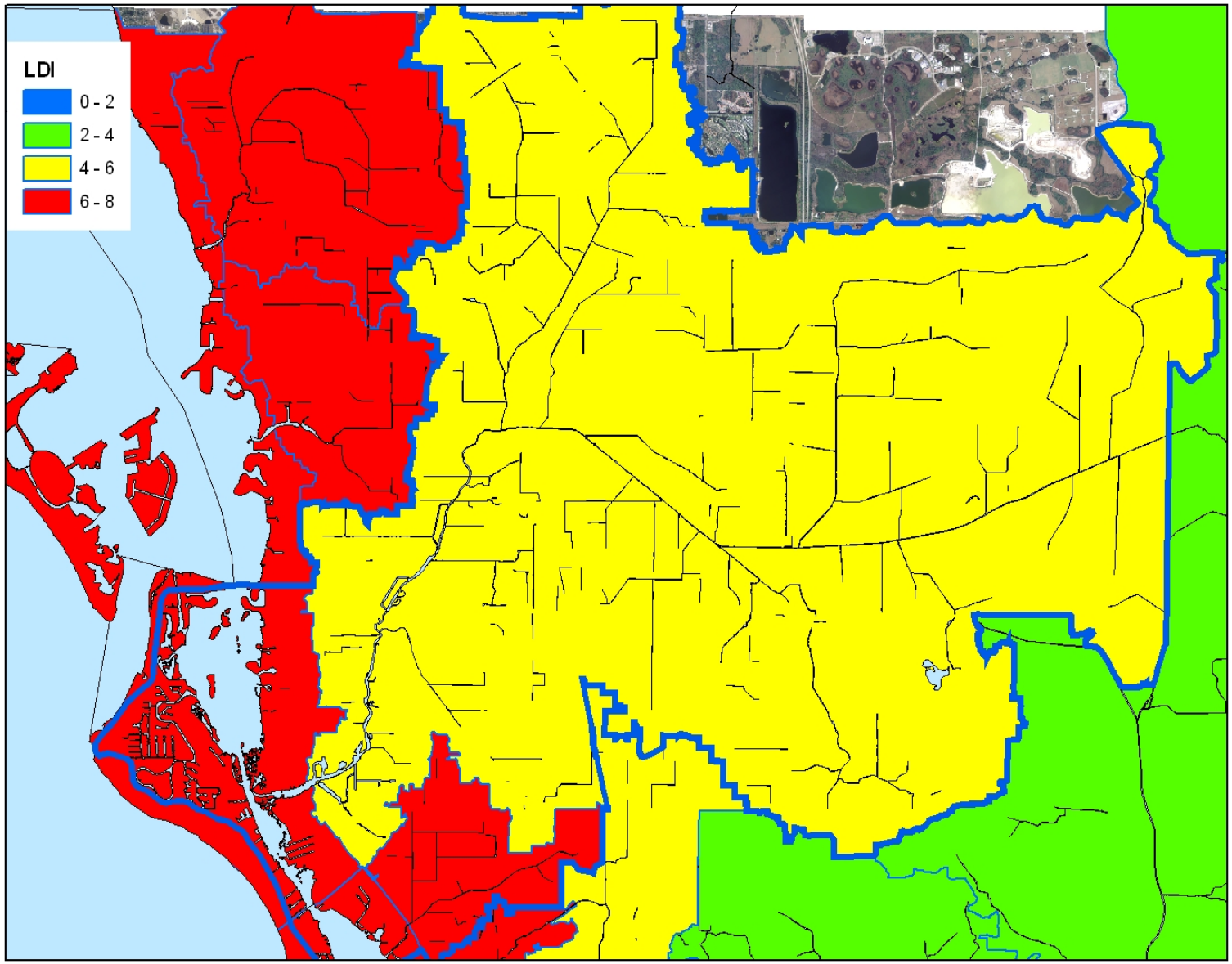
Water…….where does it come from and what do we use it for?

- Rainwater
- Stormwater
- River water
- Waste Water
- Reclaimed Water
- Floodwater
- Surface Water
- Groundwater
- Condensate water
- Irrigation Water
- Gray Water
- Drinking Water
- Runoff
- Evapotranspiration
- Harvested rainwater (stormwater)
- Soil or pore water
- Cooling water

Redevelopment and Retrofitting is a Priority for Sarasota County!

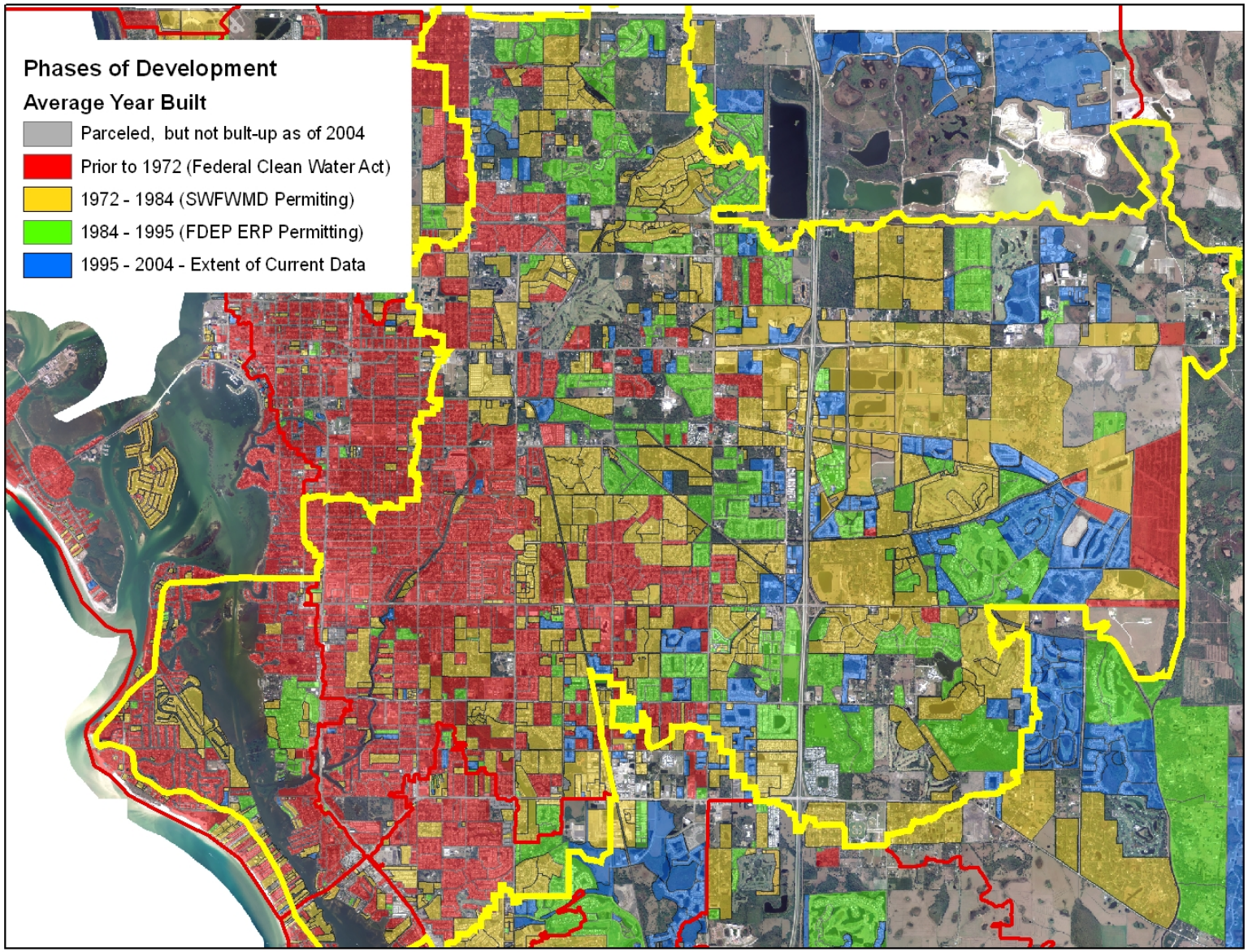
Our challenge in Sarasota County is reversing cumulative impacts which occurred one lot, one business, one person at a time!

Roberts Bay Watershed
Landscape Development Intensity Index



Slide by Jon Perry

Roberts Bay Watershed Average Age of Buildings



Slide by Jon Perry

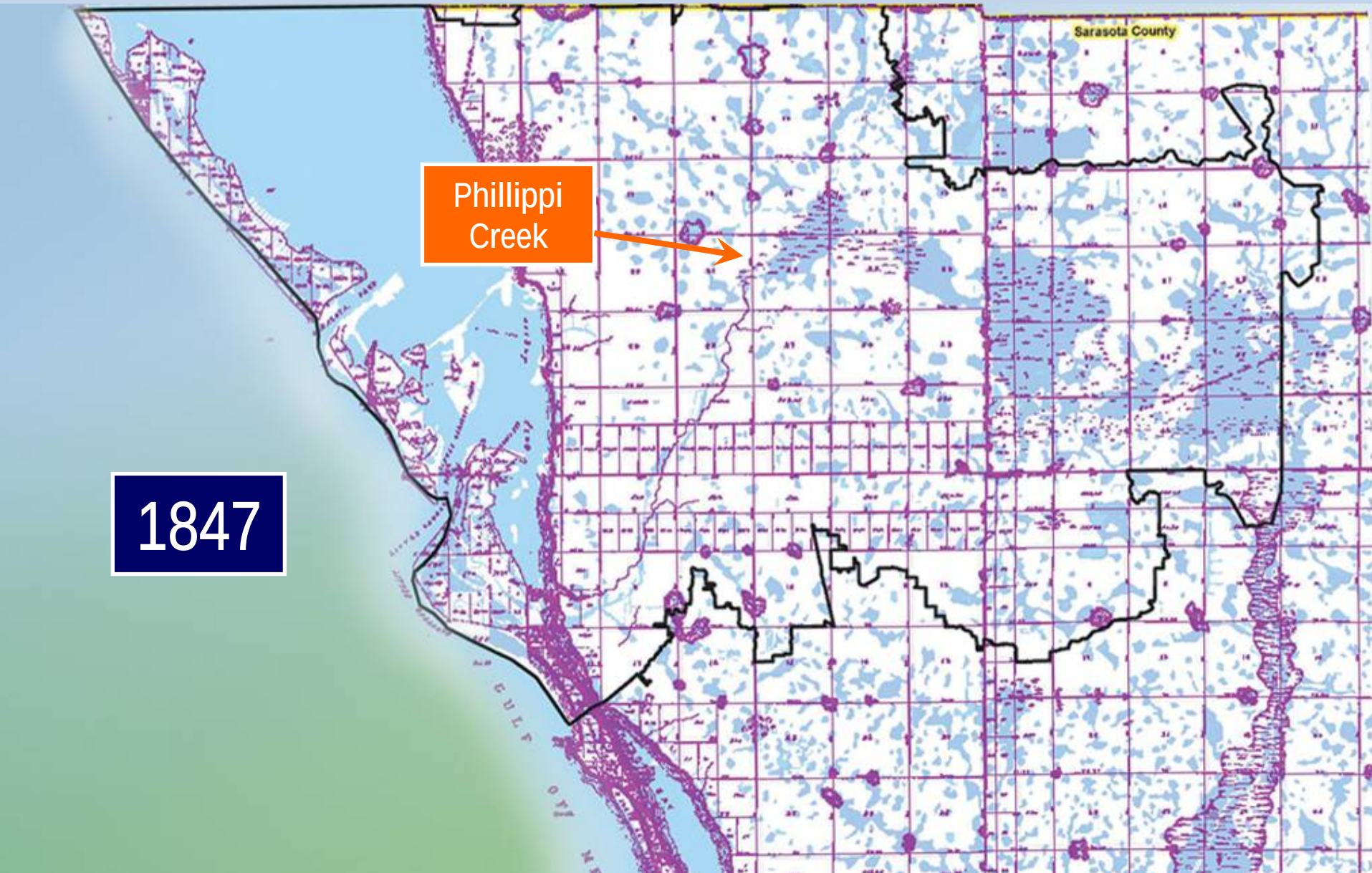
Old Style Development/Regulation

- Clear
- Fill
- Compact
- Make impervious
- Drain as fast as possible or possibly attenuate (control the rate of runoff but not the volume)

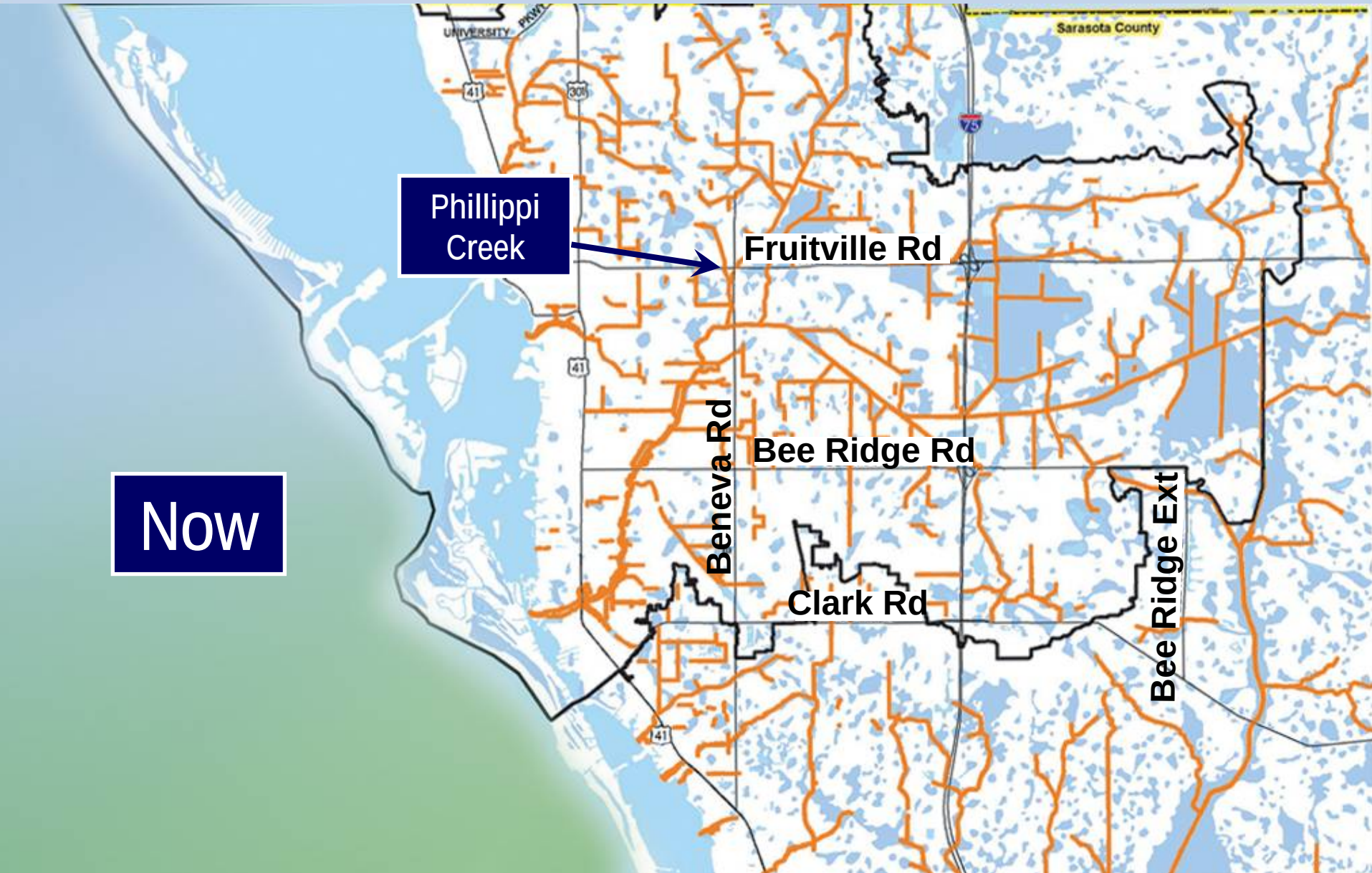
Results of This Style of Development

- Loss of native vegetation (including rainfall interception and evapotranspiration)
- Covering and compacting of native soils which were conducive to plant growth (our fertilizer ordinance and water efficient landscaping code have highlighted this as a problem).
- Loss/reduction of infiltration capacity of the native soil.
- Loss of local recharge of groundwater table.
- Impervious area (often Directly Connected) greatly increasing the volume and changing the timing of runoff resulting in salinity and pollutant load changes.

One watershed through the years



Today's watershed



Sarasota County's Decided to Develop an LID Manual

- Completed September 2008
- SWFWMD partnered with us on developing an LID manual that we both can use in the permitting process.
- Our goal was to make it compatible with the anticipated State-Wide Stormwater Rule.
- Put together a team to develop the manual including JEA, Program for Resource Efficient Communities (U.F.), and Dr. Marty Wanielista.(U.C.F.) plus a committee of interested professionals for an LID Manual Working Group.

Sarasota County LID Manual

- Lid Overview and Site Evaluation (Designing with Nature)
- Four LID Practices
  - Green roof/cistern
  - Detention with Biofiltration
  - Permeable Paving
  - Stormwater Harvesting
- Mechanisms for long-term operation and maintenance (U of Fla Law School)

GREEN ROOF WITH CISTERN

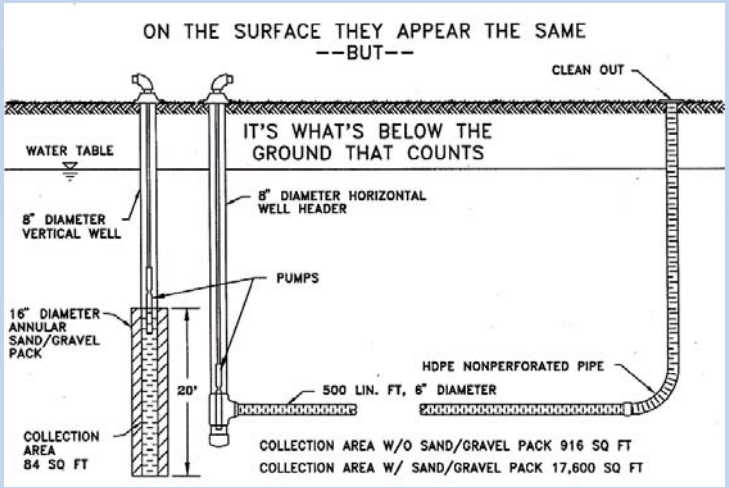
UCF Green Roof/Cistern

Sarasota's first Greenroof

National Home Builders New American Home Orlando

Bank of America Parking Garage in Tampa

Stormwater Harvesting



Horizontal Wells

Ponds

Cistern at the Hillsborough County Courthouse

Florida House Cistern

PERVIOUS PAVING

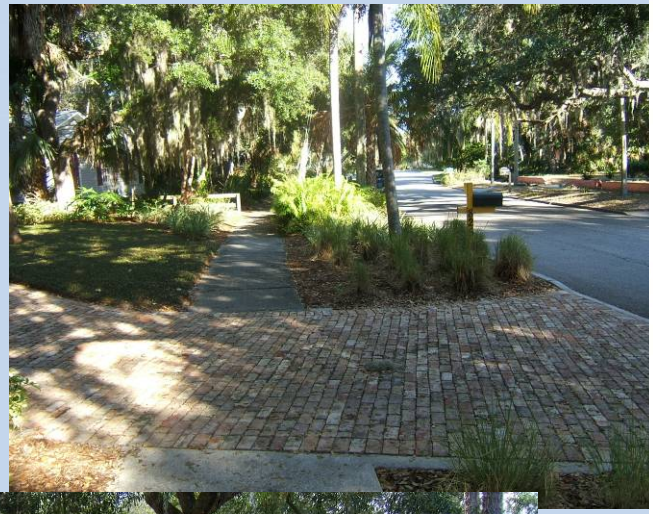


Figure 3.2-2 Typical Modular Paver Pervious Pavement System Cross-Sections

3.2.1.2 Applicability

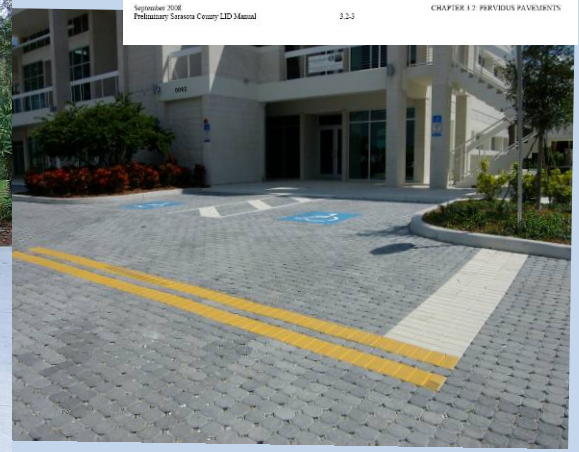
Typical Applications

Typically, pervious pavements are used for low-traffic loading and low-turning areas, such as parking areas; residential street parking; cart, bicycle, and pedestrian paths; driveways; and emergency-vehicle-access lanes (Figure 3.2-3).

(a) (b) (c)

Figure 3.2-3 Examples of Pervious Pavement (a: Parking Lot, b: Driveway, c: Walking Path)

Pervious pavements can be designed to support light traffic loads. However, certain pervious pavement materials (such as pervious concrete) are susceptible to structural failure due to shear stress on the surface. Caution should be used when designing pervious pavement in areas subjected to high volumes of vehicular traffic, frequent braking, or frequent turning. To address this concern, pervious pavements can be incorporated with impervious areas to provide a more durable surface in certain areas, while infiltrating runoff in other areas. For example, drive paths and turning areas in a parking lot could be impervious, while the parking spaces, the parking lot perimeter, and areas in front of parking stops could be pervious.



BIOSWALES

Bioswale at River Forest

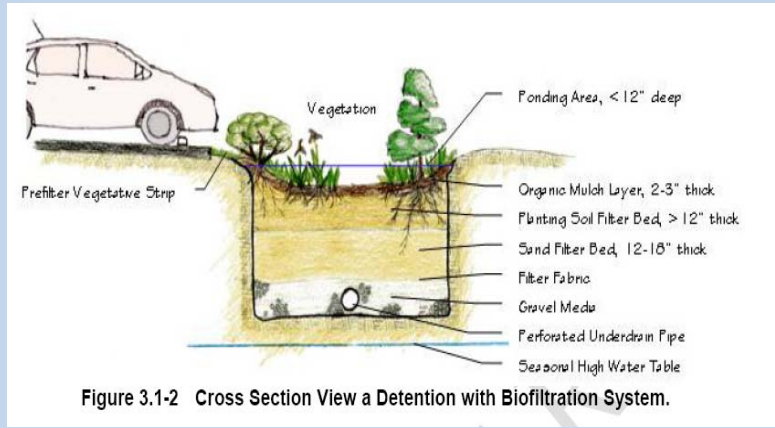


Figure 3.1-2 Cross Section View a Detention with Biofiltration System.

Detention with Biofiltration

Figure 3.1-1 Plan View Illustrating a Detention System with Biofiltration

Possible Cross Section of Bioswale

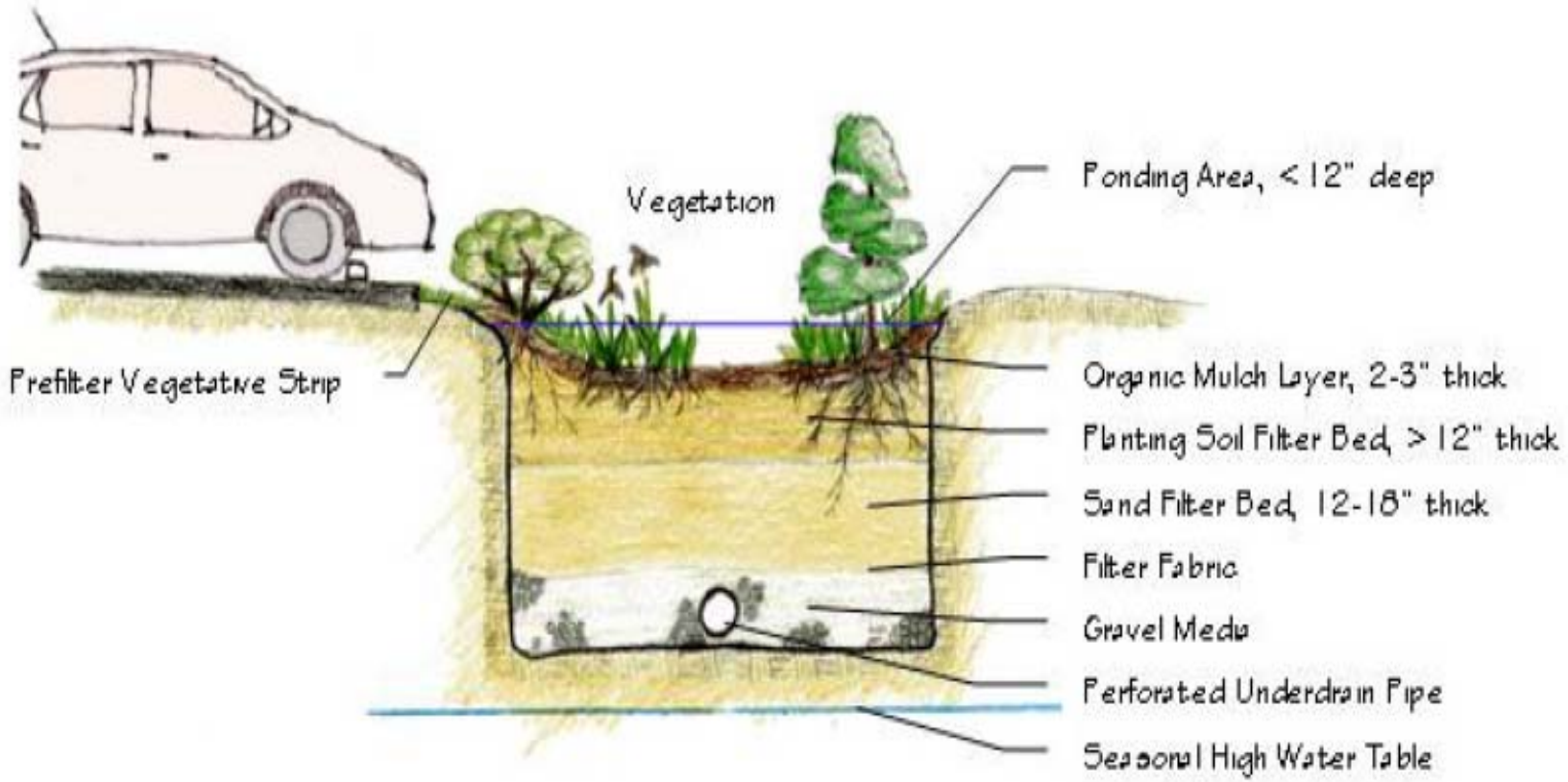


Figure 3.1-2 Cross Section View a Detention with Biofiltration System.

Proposed Retrofit Project

How Do We Succeed at Better Stormwater Management

- Improved local government regulations including LID.
- Compatibility with Water Management District regulations which allows credit for LID.
- Statewide Stormwater Rule which supports LID and Green Infrastructure.

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