

Stormwater 101

A decorative graphic featuring a yellow sun with rays on the left and two large, stylized leaves on the right. The leaves are light green with white veins. A light blue wave-like shape is positioned at the bottom of the graphic, partially overlapping the text below.

Care and feeding of your stormwater system



CHARLOTTE COUNTY
FLORIDA

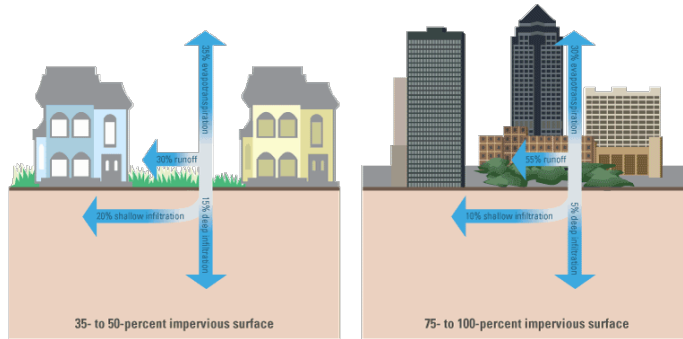
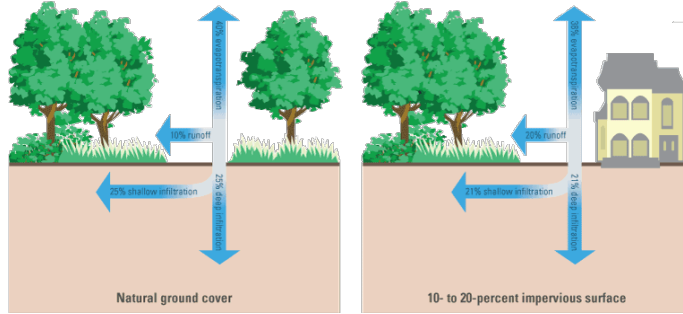
Why have a stormwater system

Stormwater systems are designed to treat and (sometimes) attenuate runoff from rain events.

- reduce flooding within the community and downstream areas
- provide some level of water quality improvement



More runoff from built environments

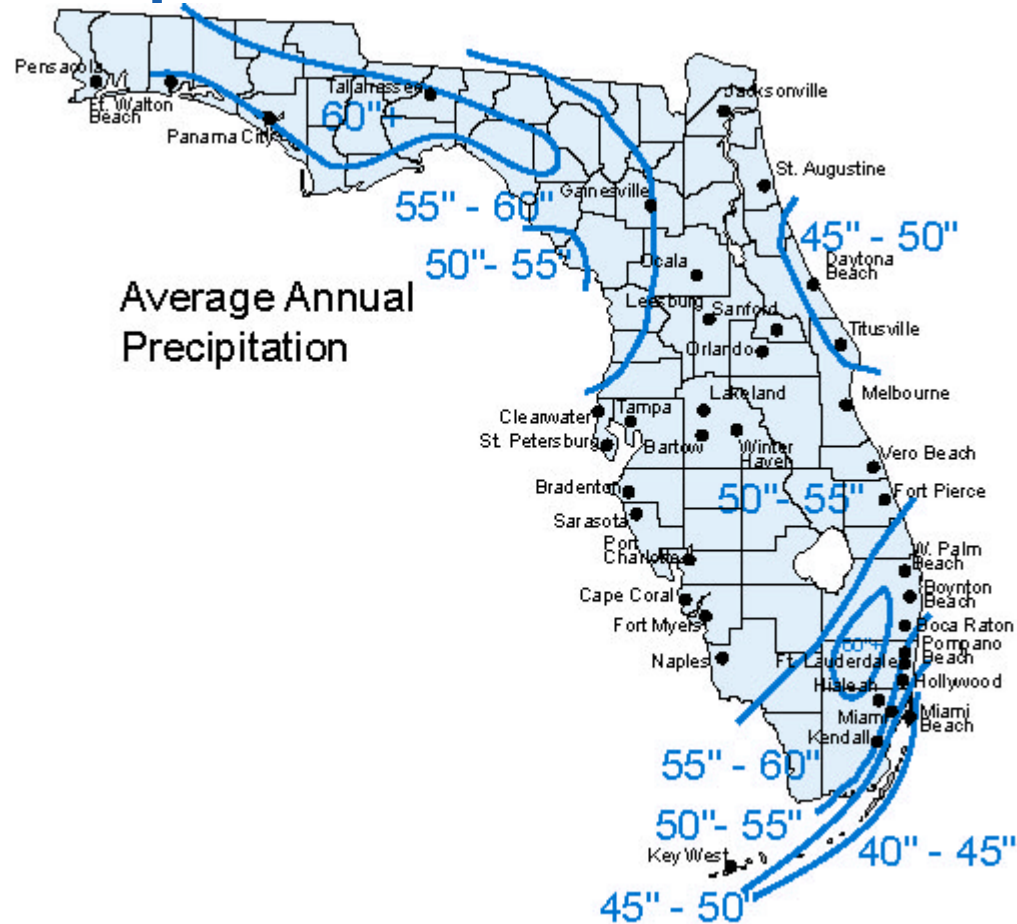


[%, percent]

Why is that important

Stormwater can be a lot to handle

- average 52" of rain a year from June - October
- Hot
- Has nutrients, pet waste, greases and oils, heavy metals, etc.

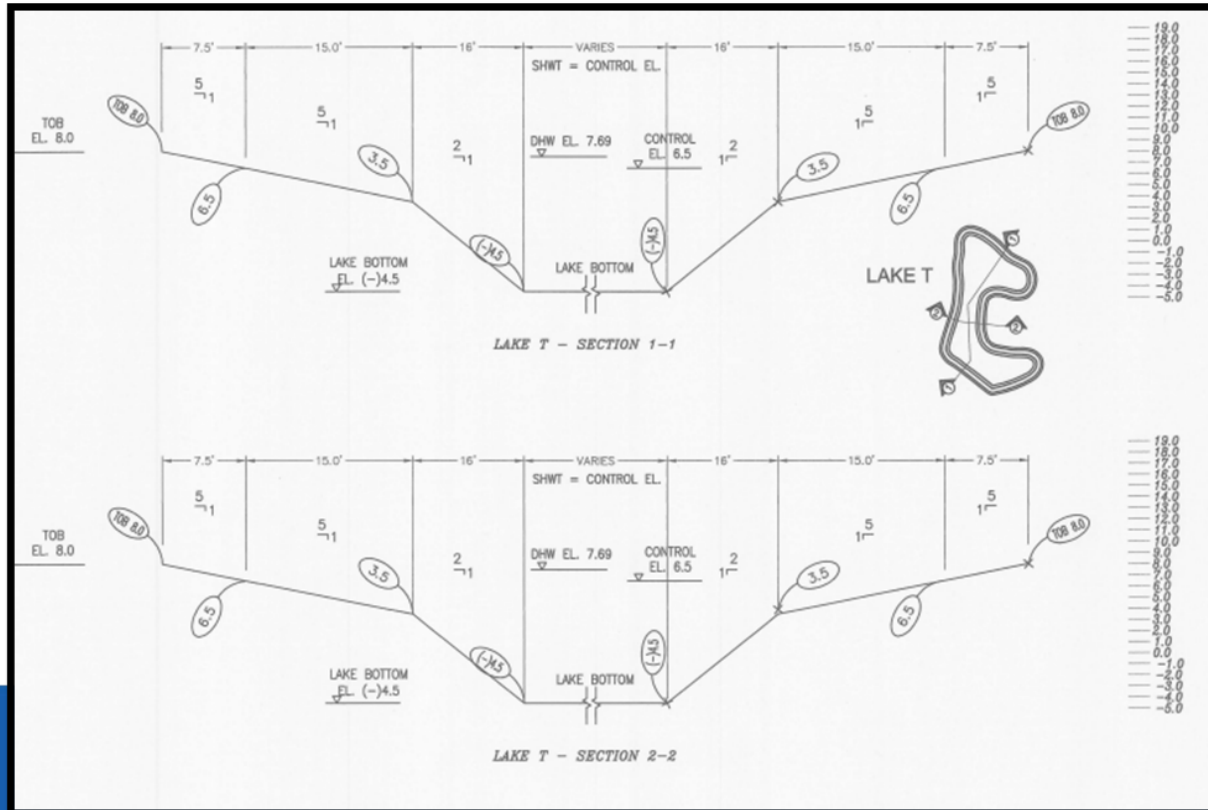


How ponds work

Stormwater systems are designed to mimic natural processes such as:

- Nutrient sequestration by plants and soils
- Ultraviolet and bacterial breakdown of chemicals
- Complicated pathways for energy (N) exchange

Stormwater Designs



Here is a cross section of one of the Community's ponds



Ponds do not perform as well as presumed for nitrogen removal.


Department and the Districts, pursuant to Section 373.418, F.S., shall, when adopting rules pertaining to stormwater management systems, specify design and performance criteria for new stormwater management systems which:

1. Achieve at least **80% reduction of the average annual load of pollutants that would cause or contribute to violations of State water quality standards**
2. Achieve at least 95% reduction of the average annual load of pollutants that would cause or contribute to violations of State water quality standards in Outstanding Florida Waters."

Evaluation of Current Stormwater Design Criteria within the State of Florida

Final Report

Prepared for:



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDEP Contract No. 50108

June 2007

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TABLE 5-2

TREATMENT EFFICIENCIES FOR WET DETENTION SYSTEMS BASED ON SELECTED RESEARCH STUDIES IN FLORIDA

REFERENCE	STUDY SITE/ LAND USE	TYPE OF EFFICIENCIES REPORTED	MEAN REMOVAL EFFICIENCIES (%)							
			Total N	Ortho-P	Total P	TSS	BOD	Total Cu	Total Pb	Total Zn
PBS&J (1982)	Brevard County/ Commercial	Surface Water	--	--	69	94	--	--	96	--
Collum (1984)	Boca Raton/ Residential	Surface Water Overall	12 15	93 82	55 60	68 64	--	--	--	--
Yousef, et al. (1986)	Maitland/ Highway	Surface Water	35	94	81	--	--	56	88	92
Yousef, et al. (1986)	EPCOT/ Highway	Surface Water	44	92	62	--	--	--	--	88
Martin & Miller (1987)	Orlando/ Urban	Surface Water	--	57	38	66	--	--	40	--
Harper (1988)	Orlando/ Residential	Surface Water	--	--	91	82	90	90	90	96
Harper & Har (1993)	DeBary/ Commercial & Residential	Overall	20	40	60	83	50	40	60	85
		a. $t_r=7$ days b. $t_r=14$ days	30	60	70	85	60	50	85	95
Rushon & Dye (1993)	Tampa/ Light Commercial	Surface Water	--	67	65	55	--	--	--	51
Rushon, et al. (1995)	Tampa/ Commercial	Overall	33	69	62	71	--	ND	ND	56
		a. $t_r=2$ days b. $t_r=5$ days	16	39	57	67	--	1	ND	32
		c. $t_r=14$ days	63	92	90	94	--	55	92	87
DB Environmental (2005)	Melbourne	a. $t_r=1$ day	4	56	20	--	--	32	41	--
		b. $t_r=7$ days	33	73	56	--	--	81	88	--
MEAN VALUES^a			37	79	69	77	75	69	84	85

1. Based on 14-day residence time, if applicable

Stormwater Maintenance

Stormwater Ponds

A Citizen's Guide to Their Purpose and Management

USDA Southwest Florida Water Management District Florida Day

STORMWATER MANAGEMENT

When rain falls on lawns, forests and fields, the water not absorbed by plants filters through the soil before reaching and replenishing Florida's groundwater supply. Ninety percent of the state's drinking water is supplied by groundwater.

When stormwater falls on pavement, buildings and other impermeable surfaces, the runoff flows quickly and can pick up trash, chemicals, silt and other pollutants. Historically, storm sewer systems were designed solely to allow runoff to drain quickly from developed areas and prevent flooding.

Modern stormwater management systems are designed not only to prevent flooding, but also to remove pollutants, protect waterbodies, capture rainfall to replenish groundwater, and prevent damage to property and wildlife habitat.

Stormwater management systems come in a variety of shapes, sizes and forms, but there are two basic types:

- **Retention systems** are designed to capture runoff and allow it to seep through the soil. Swales, a commonly used feature, resemble shallow ditches. The grassy slopes filter sediments as stormwater percolates into the ground.
- **Detention systems** – or ponds – are designed to allow material to settle and absorb before the stormwater is gradually released. Shoreline vegetation around the detention system helps filter sediments from the runoff.

Permits

The Florida Department of Environmental Protection (DEP) regulates activities that generate stormwater runoff. Projects that alter the natural flow of water or increase the amount of stormwater runoff are regulated by the department's Environmental Resource Permit (ERP) program. DEP also regulates activities that have the potential to increase pollutant loads to water bodies or to municipal separate storm sewer systems (MS4s) as covered by the National Pollutant Discharge Elimination System (NPDES).

ERP stormwater permits:

- Are required for projects that alter land topography to the extent that there is a significant increase in the site's stormwater runoff;
- Authorize the construction of a stormwater management system; and
- Require the owner of the management system to maintain it in perpetuity.

Florida Department of Environmental Protection - Stormwater Management

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Stormwater Systems in Your Neighborhood

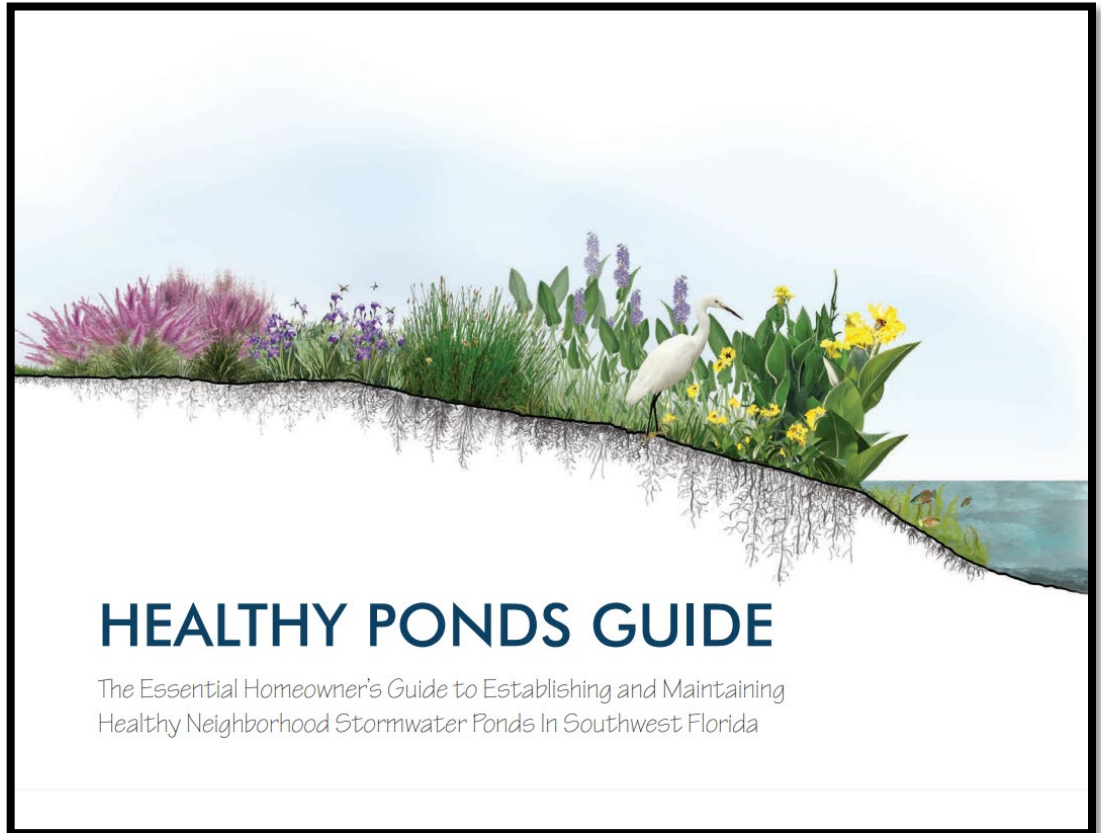
Maintaining, landscaping and improving stormwater ponds



Stormwater Maintenance

One guide that strives to enhance your maintenance activities to improve performance and create a more balanced and healthier pond. Goals are:

- Increase resilience
- Reduce erosion
- Create an aesthetically pleasing amenity
- Increase property values
- Decrease overall maintenance costs long term





New theories in Stormwater maintenance

More often than not, having a healthy pond depends more on what you don't do:

- Expect your pond to be a perfectly clear pool
- Broad applications of herbicide and algaecide
- Manage your landscape and ponds separately – remember your community is your ponds' watershed
- Use a lot of fertilizers on the property. Over-fertilization costs you money twice



Proper care and feeding of your pond?

1. Break down the cycle of a chemically dependent pond
2. Increase the complexity of the pond's ecosystem
3. Wholistic approach to community stormwater management

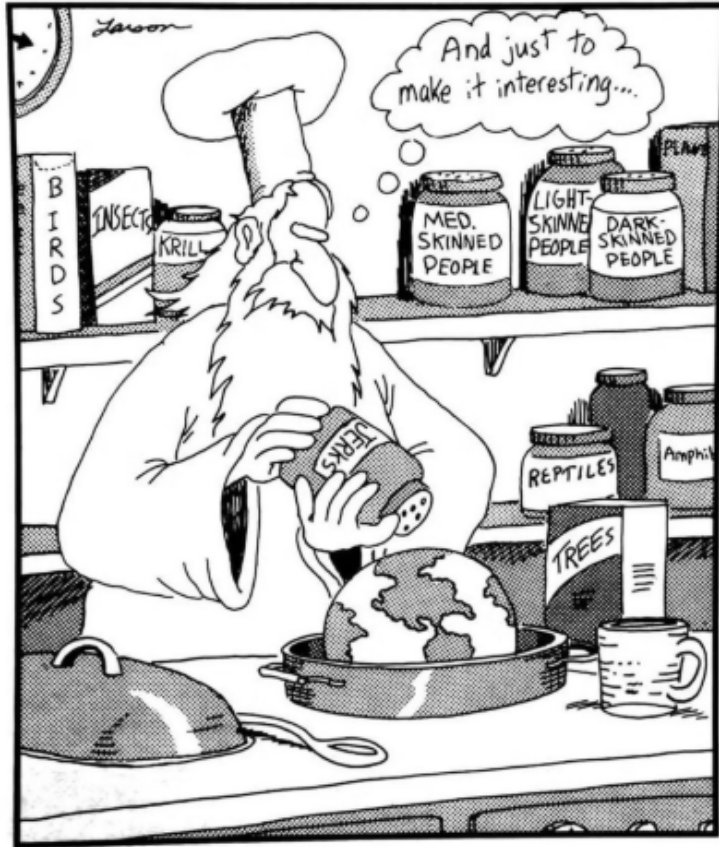


Breaking the cycle of maintenance practices that short circuit the pond

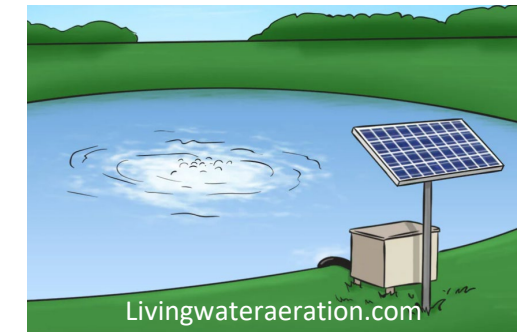
- Understanding the seasons of a pond
- Allowing for variations in water clarity – algae blooms, lake turnover, etc.
- Using a combination of mechanical removal and chemical applications



Increasing the complexity



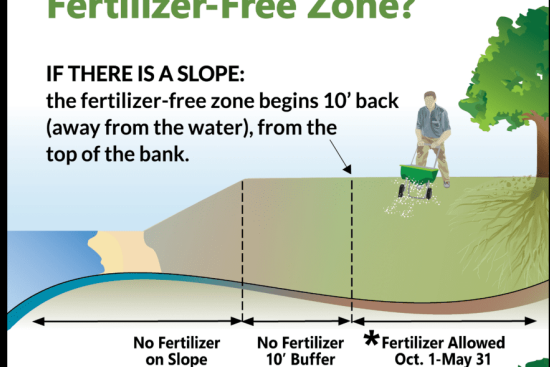
- Adding structure in the pond
- Adding plants along the shoreline
- Increasing opportunities for additional nutrient cycling



What is a Fertilizer-Free Zone?

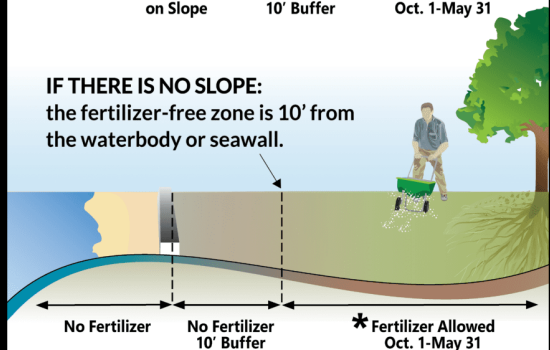
IF THERE IS A SLOPE:

the fertilizer-free zone begins 10' back (away from the water), from the top of the bank.



IF THERE IS NO SLOPE:

the fertilizer-free zone is 10' from the waterbody or seawall.



* In areas where fertilizer is allowed, never apply more than 1 lb. of nitrogen in granular form, or no more than 1/2 lb. of nitrogen in liquid form, per 1,000 sq. ft.

Don't be your own nemesis

Florida law and County Ordinances have outlined rules that will ensure basic Best Management Practices are followed which allow for lawn and landscapes to remain healthy while attempting to limit the potential for water quality degradation in our local waterways. Elements of the ordinance are outlined below. This ordinance applies to both residents and Commercial applicators.

Seasonal Restrictions on Application

June 1 through Sept. 30 — No fertilizer containing nitrogen or phosphorus can be applied to lawn/landscape areas.

Fertilizer Free Zones

Fertilizer may not be applied within 10 feet of any water body or wetland (or 3 feet if a deflector shield is used). No fertilizer may be applied to impervious (non-porous) surfaces, and any spillage must be removed.

Deflector Shields

If fertilizing within 3-10 feet from a water body (ditch, swale, canal or wetland) a deflector shield must be used on all broadcast spreaders. Fertilizer must not be applied within 3 feet of the water body.



Grass Clippings

No grass clippings, vegetative material, or vegetative debris may be deposited in stormwater drains, ditches, conveyances, water bodies or roadways.

Low Maintenance Zones (LMZ)

A 6 foot LMZ of landscape plants appropriate to prevent fertilizer runoff is recommended for any water body or wetland.

General Application Limitations

Phosphorus shall not exceed .25 lbs. per 1,000 sq ft per year. Nitrogen applications must be at least 50% slow-release nitrogen. State rules allow a max of .7 lbs. of water soluble or 1 lb. of total nitrogen per 1,000 sq ft per application.

What To Look For On Your Fertilizer Label

% of Total N as Slow-Release Nitrogen (SRN) = $\frac{7}{14} \times 100 = 50\%$

(Meets 50% SRN Charlotte County Requirement)

GUARANTEED ANALYSIS	
TOTAL NITROGEN (N) Total	14.00 %
14.00% Slow Release Nitrogen (SRN)	14.00 %
SOLUBLE PHOSPHORUS (P ₂ O ₅) Total	0.750 %
0.750% Slow Release Phosphate	0.750 %
0.750% Combined Soluble	0.000 %
IRON (Fe) Total	0.100 %
0.100% Water Soluble Iron	0.100 %
MANGANESE (Mn) Total	0.400 %
0.400% Water Soluble Manganese	0.400 %
DERIVED FROM Polymer Coated Sulfur Coated Iron, Sulfur of Borax, Iron Oxide, Magnesium Oxide.	
Potash (K ₂ O) Total	0.800 %
0.800% Slowly Available Iron Nitrogen from Polymer Coated Sulfur Coated Iron.	

Certification Required

Commercial fertilizer applicators must receive training and certification in a Charlotte County-approved BMP training program. Once achieved, the certification can proudly be displayed showing potential customers that you have received the most up to date information in caring for lawn and landscapes in Florida, and know how to help keep our local waterways clean.

The certification is a 2-step process requiring the successful completion of the Green Industries Best Management Practices Program (GI-BMPs), and the Limited Fertilizer (LF) Certification through the Florida Department of Agricultural and Consumer Services (FDACS).

For GI-BMPs training opportunities, contact Charlotte County Extension Service

Call: 941.764.4340

Or visit: <https://sfyl.ifas.ufl.edu/charlotte>
Keywords: green industries

For FDACS program information, visit: <https://www.fdacs.gov>



CHARLOTTE COUNTY
FLORIDA

You are the key to good water quality

Good water quality in the ponds

- Decreases maintenance costs
- Decrease in the likelihood of harmful algae blooms
- Decreases the number and severity of fish kills
- Increases wildlife utilization

Good water quality downstream

- Decreases in harmful algae blooms
- Better water clarity – more seagrass
- Increased diversity in the Harbor

Any questions?

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