



A Natural Choice

Create a landscape that protects Seminole County Waterbodies

Taryn Sudol, Florida-Friendly Landscaping

UF | **IFAS Extension**
UNIVERSITY of FLORIDA


SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Outline

Water quality in suburbia

A light blue downward-pointing arrow indicating the flow from the first topic to the second.

Best practices in your yard

A light blue downward-pointing arrow indicating the flow from the second topic to the third.

How to fertilize appropriately

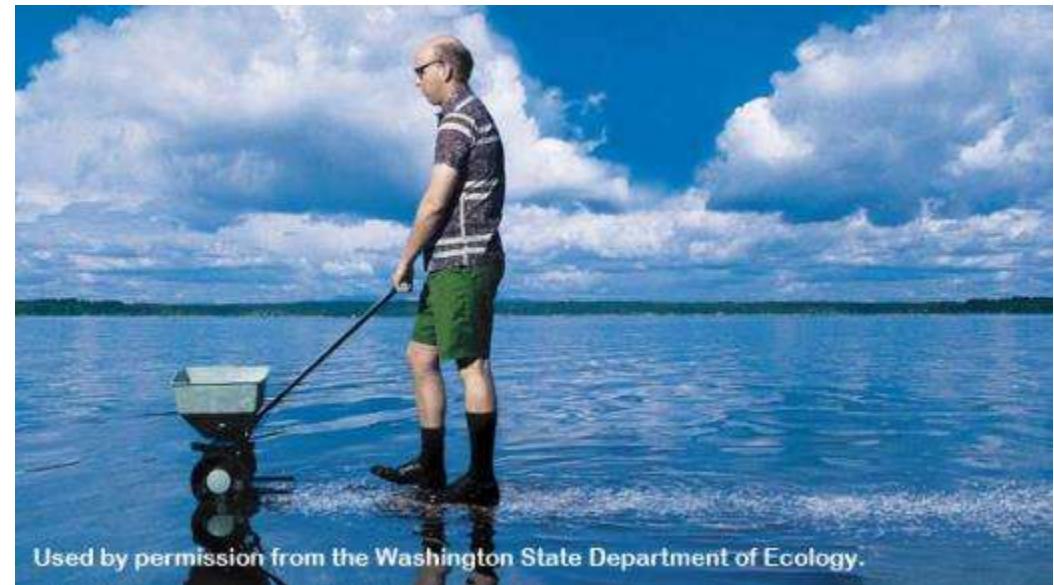
Goals

Protect our waterways

Make a difference

Determine your lawn care program

Creating beautiful lawns and protecting our waterways



Used by permission from the Washington State Department of Ecology.

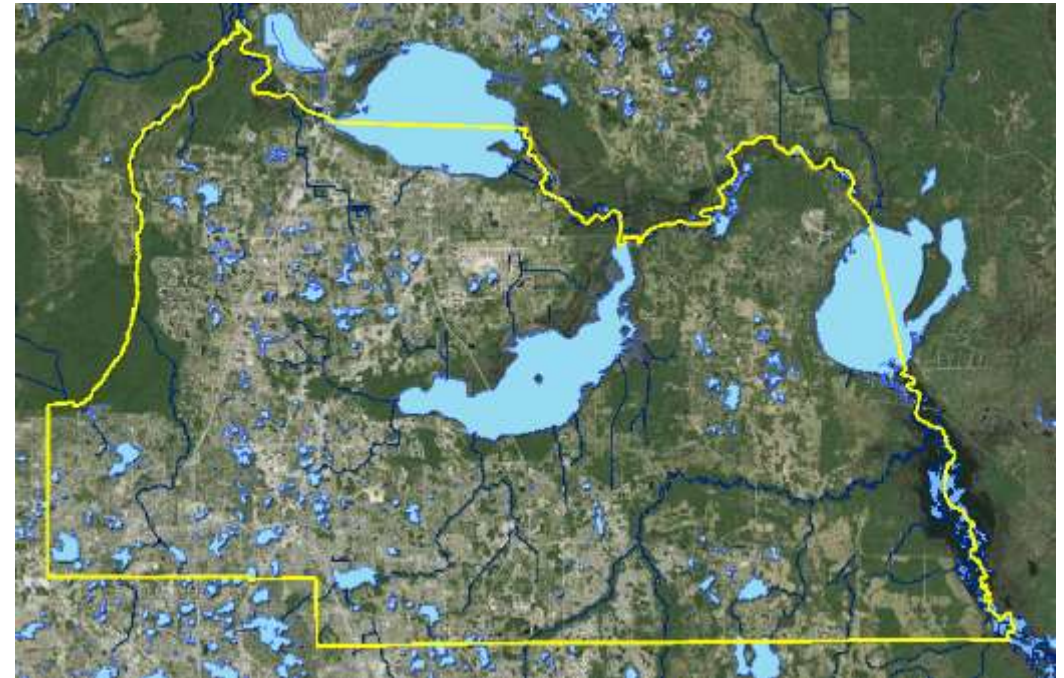
Seminole County waterways

We have 2081 lakes and ponds that fill 34,054 acres or 15% of the county

43 miles of rivers and streams, including the Wekiva River and St. Johns

We have 13 major springs

We have 220,000 + households within Seminole County



The importance of water quality

Human health

Wildlife value

Recreation

Florida-Friendly Landscaping™ PROGRAM



Protects Florida's unique natural resources by conserving water, reducing waste and pollution, creating wildlife habitat, preventing erosion. Any landscape can be Florida-Friendly if it is designed and cared for according to the nine principles. The 2009 Florida Legislature use of FFL is a compelling public interest and is essential to the state's efforts in water conservation and water quality protection and restoration.

The Nine Principles!



Right Plant, Right Place



Water Efficiently



Mulch



Fertilize Appropriately



Recycle



Attract Wildlife



Control yard pests responsibly



Reduce Water Runoff



Protect the Waterfront

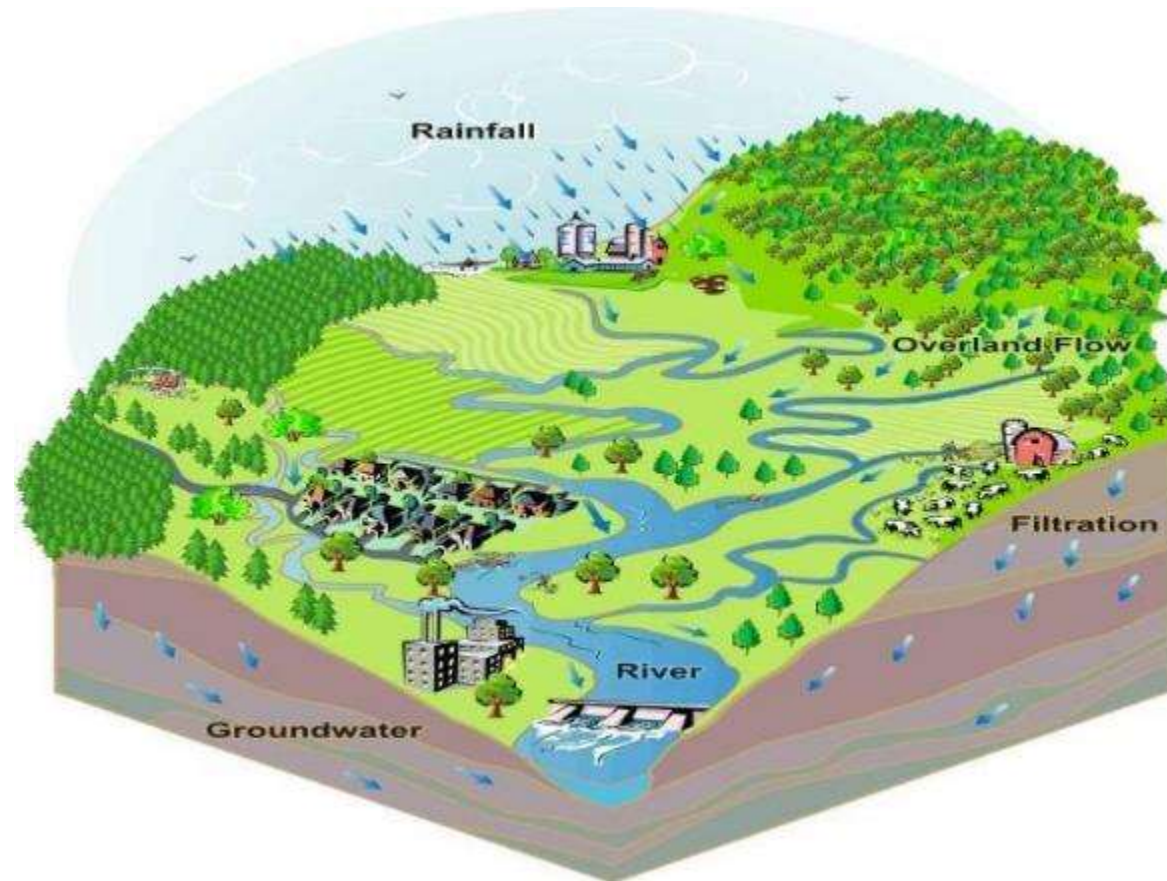


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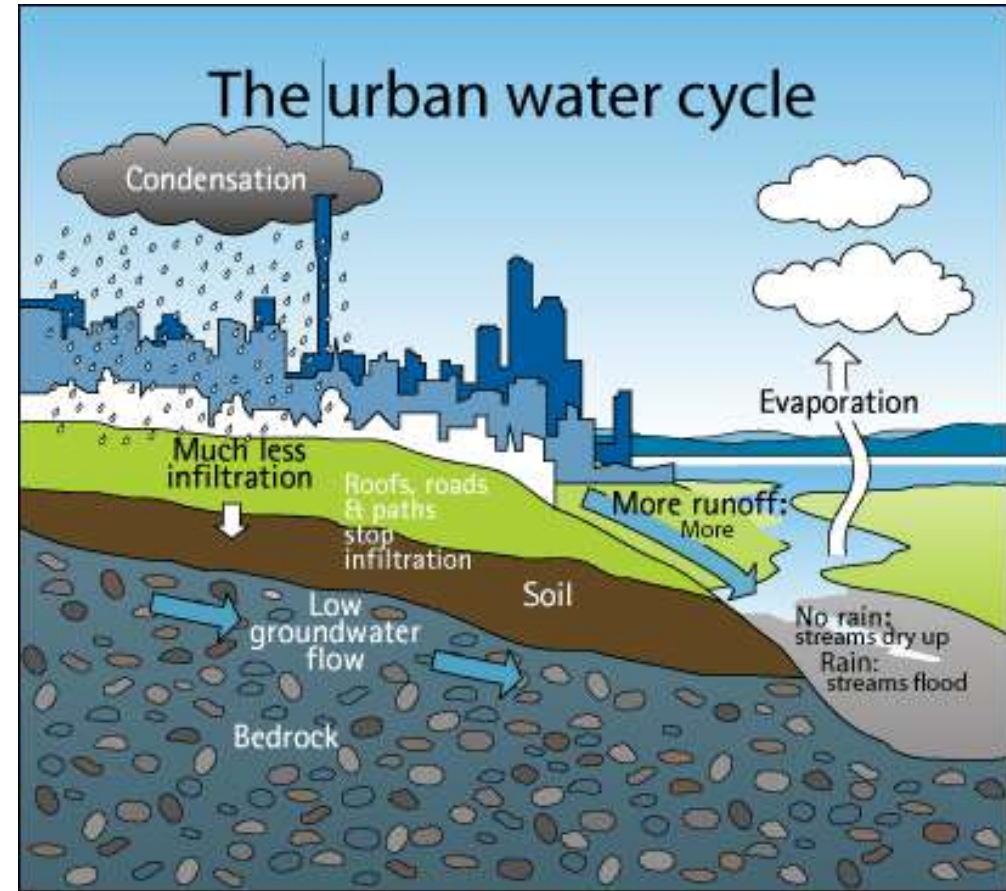
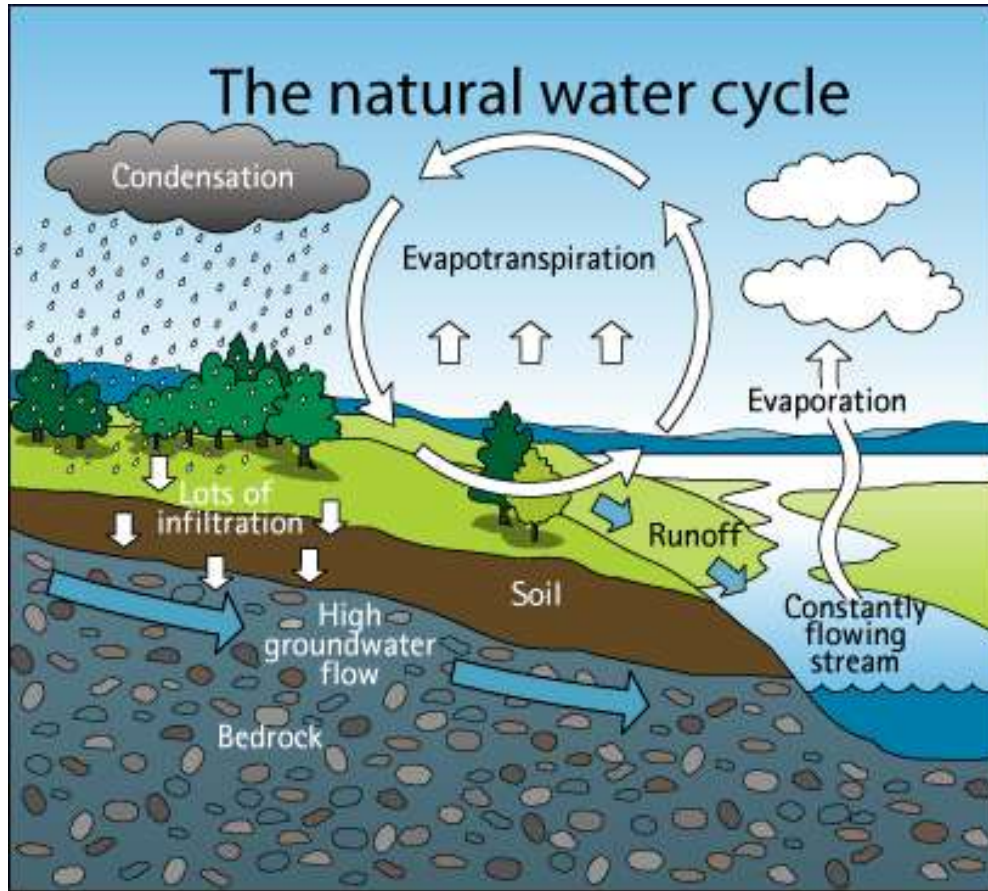
Water and Your Landscape

QUALITY AND CONSERVATION

What Happens in a Watershed



Pollution Problem's



Our soils contribute to the problem

Naturally low levels of organic matter

Organic matter increases water holding capacity

Organic matter increases nutrient holding capacity





Stormwater

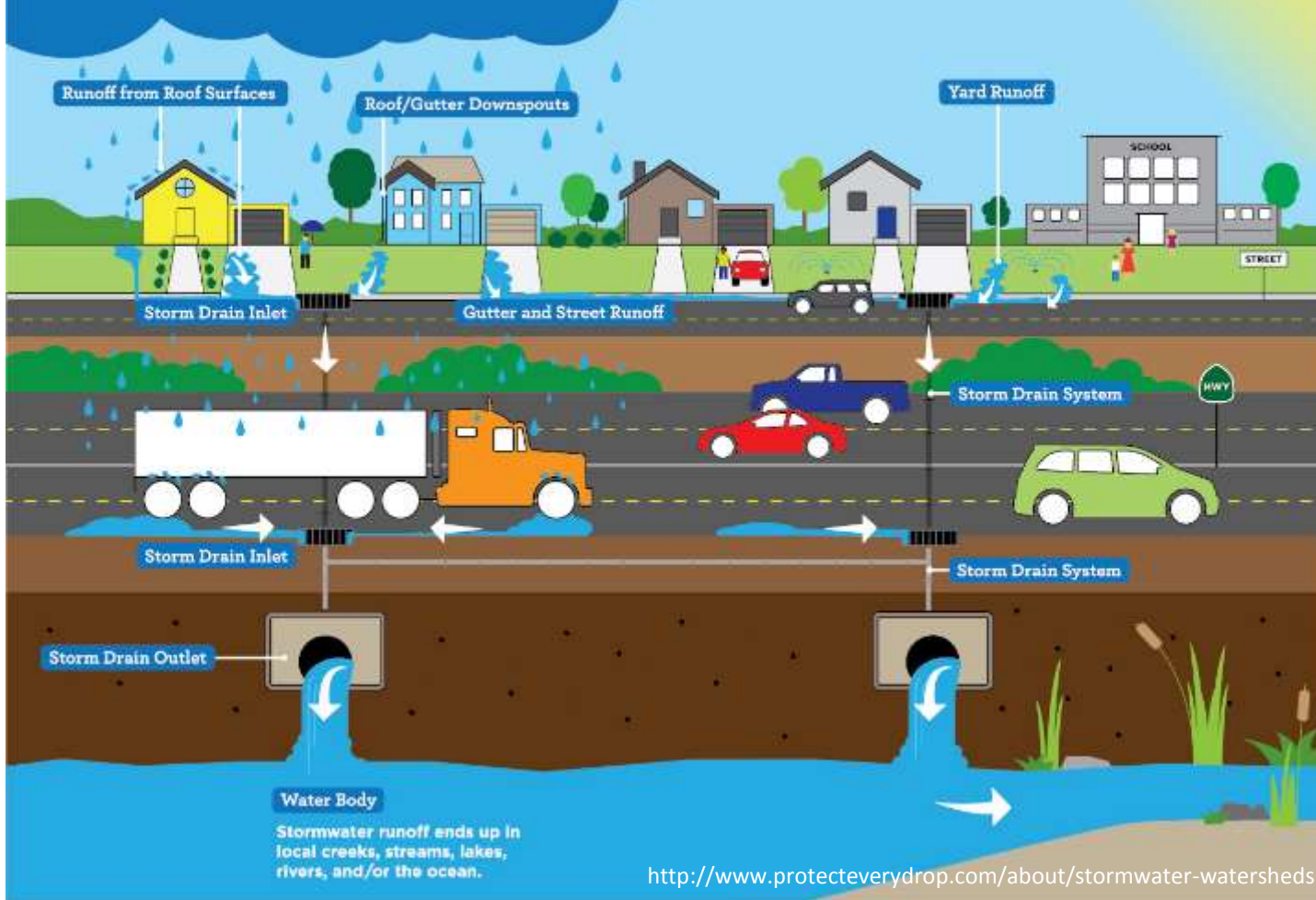
Water washes pollutants into storm drains and/or into surface water.

- Trash, grass clippings, pet wastes, pesticides, household chemicals, oil, fuel, septic tanks, and improperly applied fertilizer.

Stormwater can transfer nutrients

Stormwater is the most significant polluter of our surface water

Stormwater Runoff



Negative impacts of runoff

Stormwater pollution can harm aquatic life and make fish inedible.

Sediment and other debris clog drains and waterways causing flooding.

Polluted stormwater can pose a health risk to people.

Common water pollutants in urban residential areas



Nutrients
(nitrogen &
phosphorus)



Bacteria

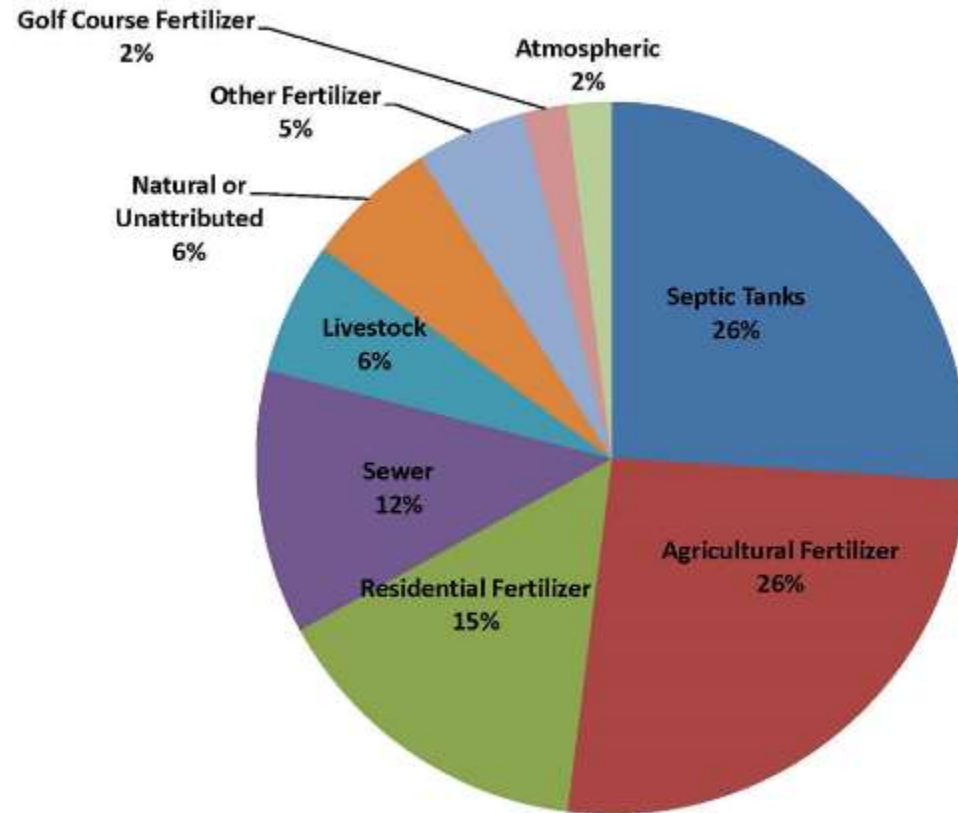


Sediment



Toxic
organics
(oil &
pesticides,
for example)

Nutrient sources



Nitrate Loading to the Wekiva Basin

- Lawn fertilizer
- Reclaimed water
- Grass clippings
- The atmosphere
- Pet waste left on the lawn
- Eroded soil particles
- Faulty septic system

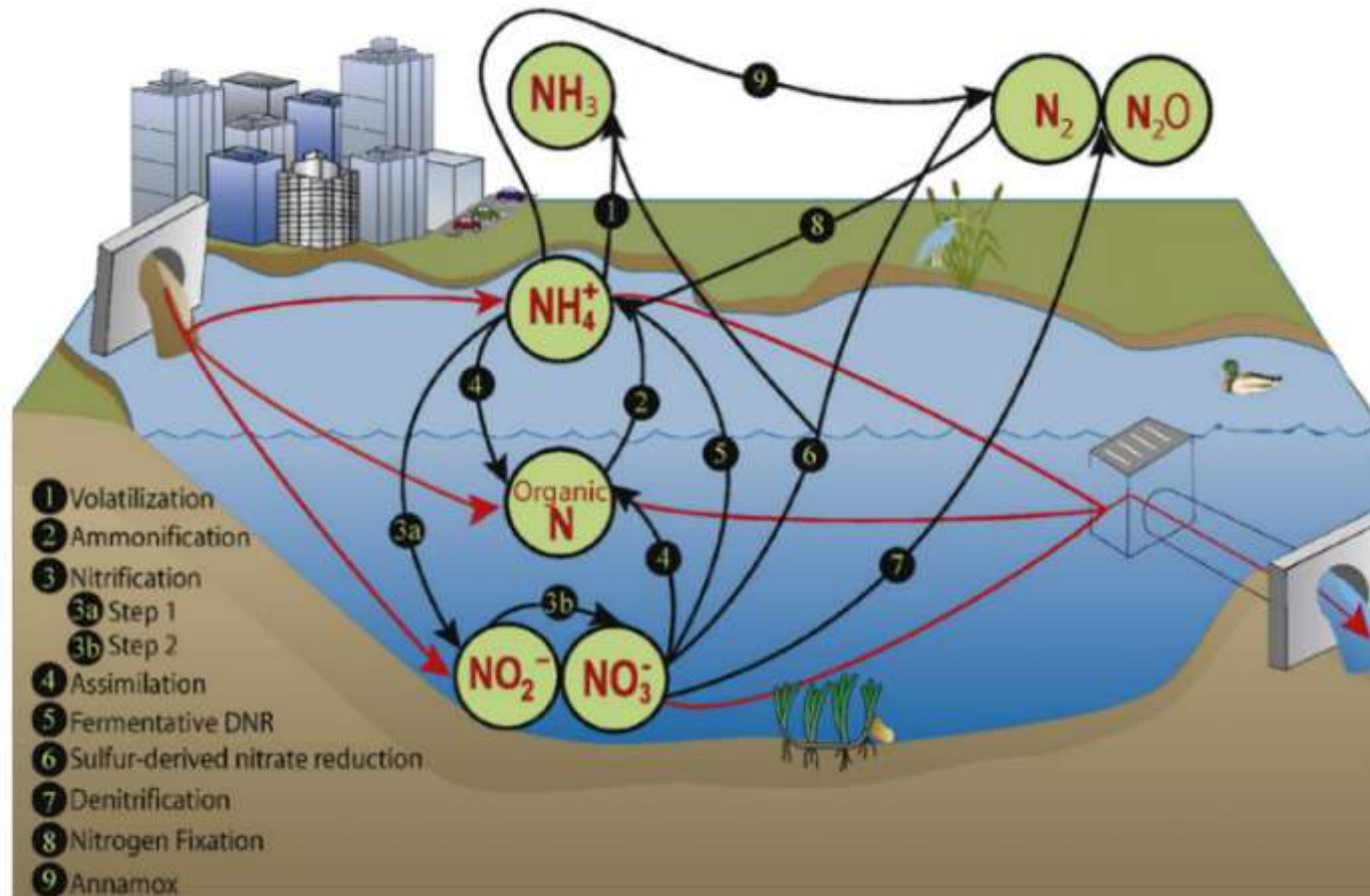
How we manage it

Wet retention ponds

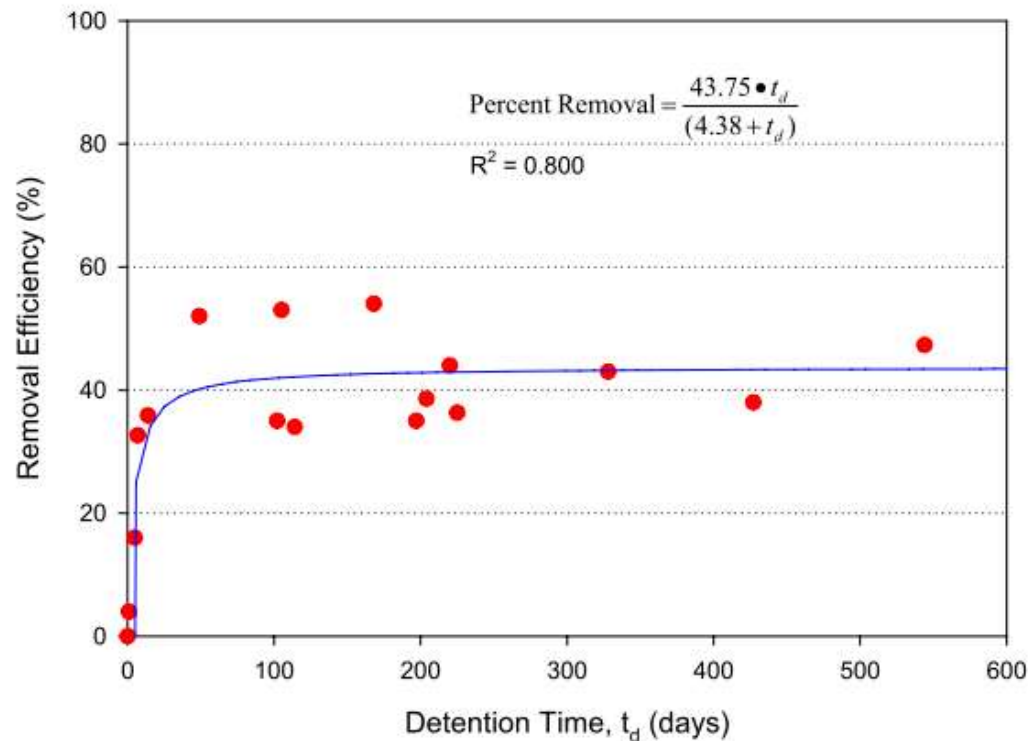
- Capture stormwater runoff from roof, lawn, driveway
- Suspended materials settle, littoral plants can absorb nutrients
- Water is gradually released to water bodies, like the Wekiva or St. John's River



Common pollutants and big issues



Your work matters!



Urban stormwater ponds only remove at best around 50% of incoming nitrogen

If structural solutions like an urban pond don't get the job done, what's the solution?

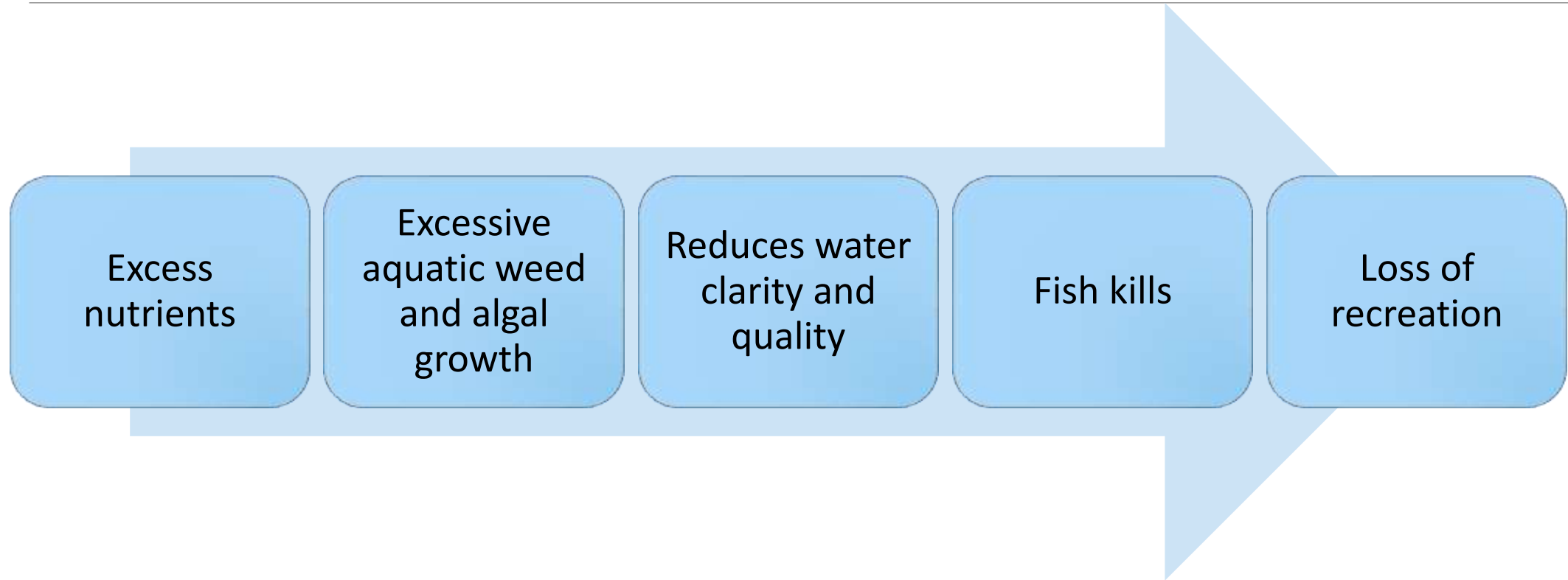
We've got to get to the source!
(Your work matters!)



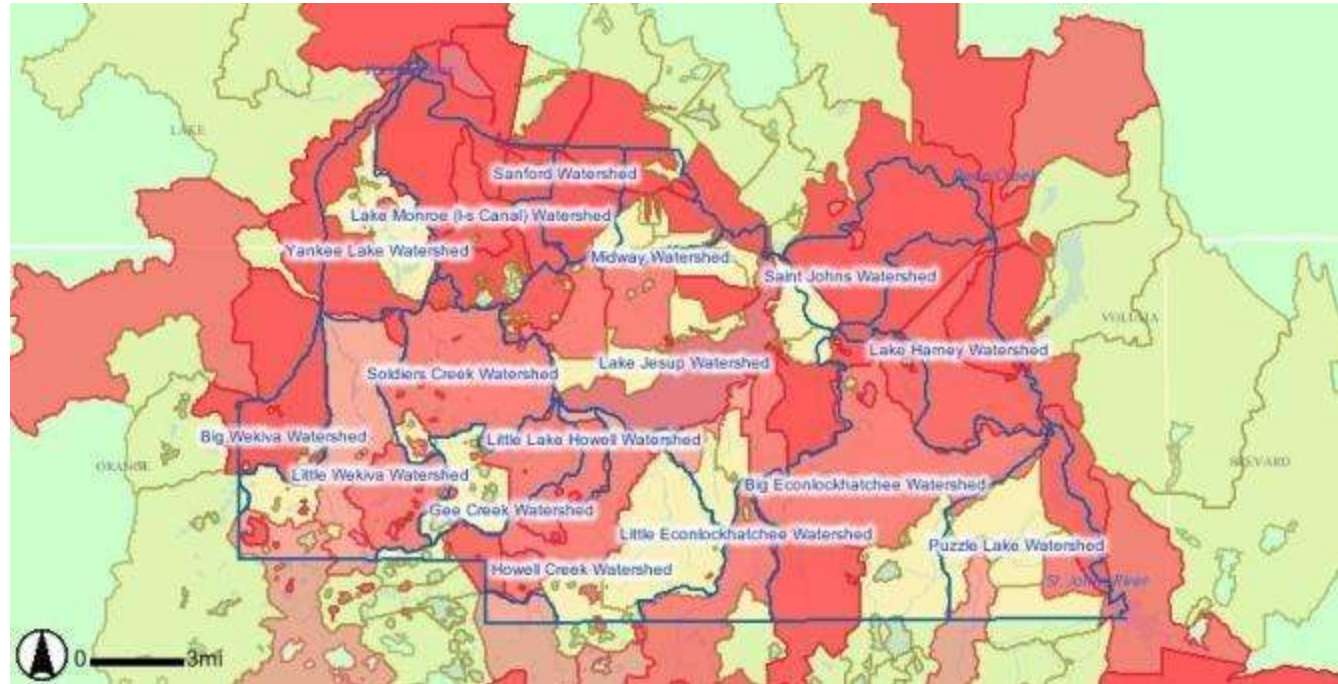
Impaired stormwater pond

Algae and nuisance weeds grow with nutrient-rich water

Waterbody impairment



Our Water Bodies Are In Danger



The shades of red indicates areas in Seminole County with impaired waterbodies. These become impaired from too many pollutants, such as Nitrogen and Phosphorus and certain bacteria.

Common pollutants and big issues

Keep ponds working by:

- Clear or clean inflow/outflow structures
- Repair eroded slopes by planting shoreline vegetation
- Clean up trash and yard waste on individual properties
- Clean around storm drains
- Use Florida Friendly Landscaping principles to reduce the need for chemicals and fertilizers

Improve your waterfronts

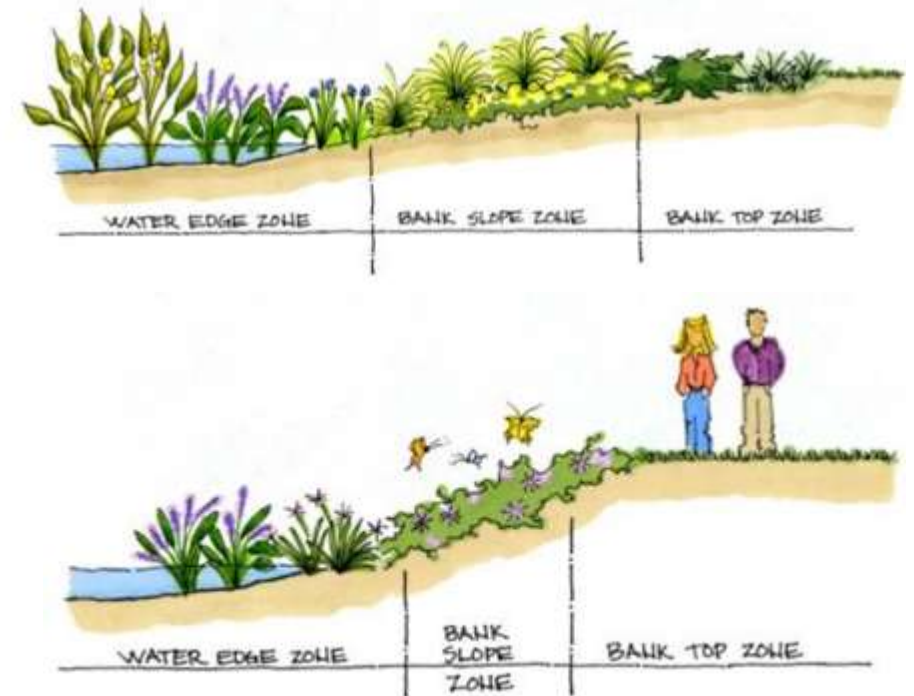
No fertilizer within 15 ft of the water

10 ft (or more) low maintenance zone

- No mowing
- No pesticides or herbicides
- Plant shoreline and aquatic plants

A vegetated shoreline

- Helps erosion control
- Provides habitat
- Absorbs nutrients
- Reduces temperature



Remember the slope of your shoreline influences runoff, erosion, and plantings

A quick word on snakes

There are no “aggressive snakes”.

Snakes play an important role in the ecosystem

If you need a snake removed, call in a professional

Remember, besides snakes, you get wonderful waterfowl, butterflies and other wildlife at the waterbody



How can we help?



Reduce nutrients
and pollutants

Have a healthy
landscape



Keep it on the
ground

And reduce nutrients & pollutants



Fertilize appropriately



Maintain grass clippings and yard trimmings



Add plants to absorb nutrients

Keep a healthy landscape

Select plants best suited for your yard

Water efficiently

- Wasting water puts a strain on our waterways
- Too much water will stress your plants

A healthy plant is most at effective at absorbing stormwater runoff and excess nutrients



Improve your soil

Top dress with compost

- Compost is not considered fertilizer
- Apply $\frac{1}{4}$ - $\frac{1}{2}$ inch layer of organic matter over the lawn every 6 months

Remineralize with rock dust

- Rock dust (e.g., Azomite) an aluminum silicate clay mixed with over 50 minerals, from marine deposits (2.5% potassium)

Liquid seaweed

- Liquid seaweed has over 60 trace elements, growth hormones, etc.
- Helps plants reduce stress from flood, drought, cold, etc.
- Remedy for pH problems and excess nutrients



Remove bare patches

Bare dirt lawns: water quality impairment waiting to happen

Cover with vegetation, such as selections from Florida Friendly Landscaping guidelines



Managing Soil Erosion



Mondo Grass
Shade



Perennial Peanut
Full Sun

Soil erosion carries
sediment and
possibly N & P

Mulch

Reduces erosion

Holds in soil moisture

- More effective irrigation

Reduces weeds

Apply 2-3 inches

Allow for circulation. No volcano mulching



Keep It On The Ground



Downspouts



Rain Barrels



Swale and Berm



Rain Gardens

Down spouts



What can we do about nitrogen in atmospheric deposition?

For starters, this is not the answer!

Disconnect downspouts, use rain barrels, and increase pervious surface!

Rain Barrels

\$3,500 to remove just one pound nitrogen from stormwater if we rely on large scale infrastructure like ponds and all the pipes that flow in and out of them



Or. . .20 rain barrels (55 gallons) can capture one pound of nitrogen

Rain Gardens

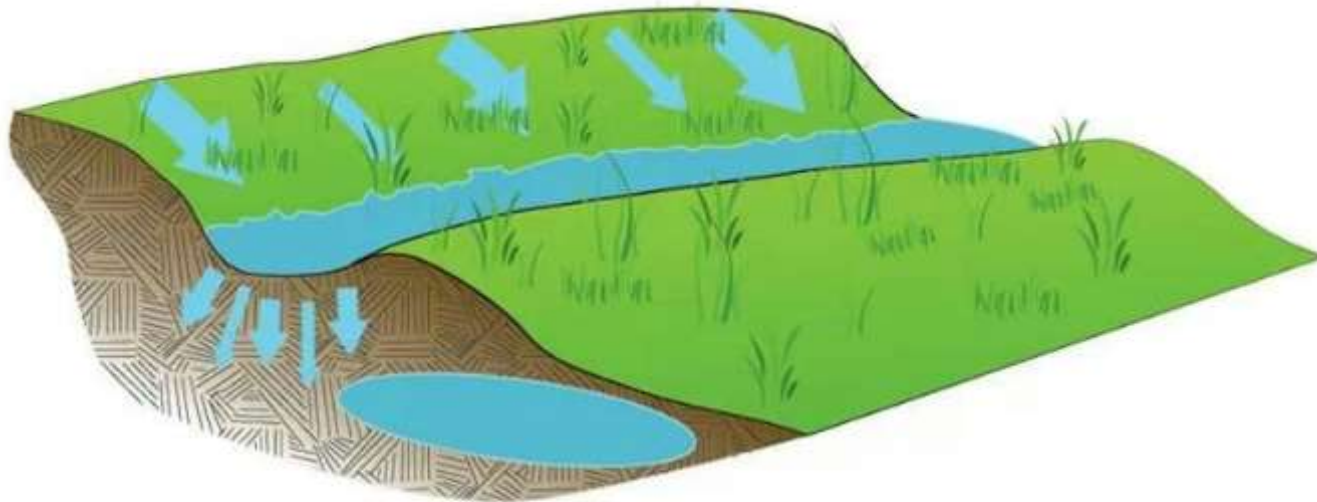
A landscaped area designed to catch and soak up rain water from a roof or impervious surface

Rain gardens filter approximately 40% of metal pollutants from roof shingles, automobile fluids and soil

Approximately 15% of nitrogen from fertilizers, pet waste and organic matter can be filtered by rain gardens



Swale and berm



Shaping land to retain water in swale

Berm prevents outflow

Allows for absorption into ground

Pervious surfaces

Allows stormwater runoff to soak into the ground

Several materials

Good for walkways, driveways and lower traffic areas



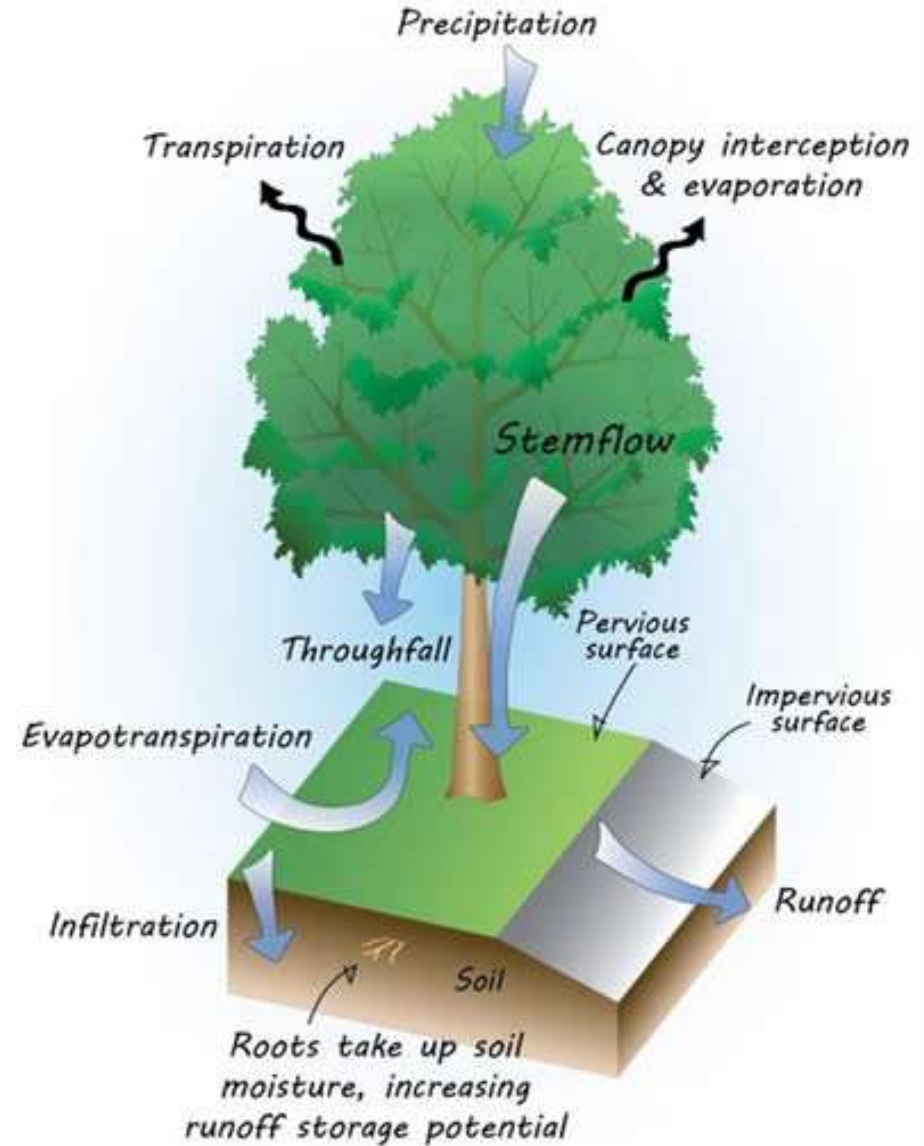
Add trees

Trees are awesome at reducing runoff!

- Canopy retention
- Stem flow
- Root mass allows more infiltration
- Transpiration allows more storage in soil

Keep big trees

Add more trees!



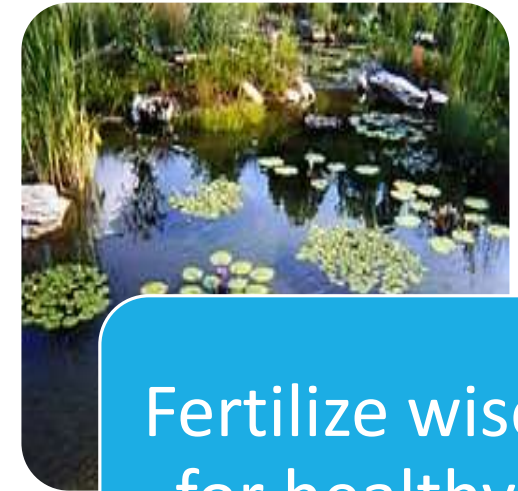
We all have to protect our waterways



What happens in our yards...



Ends up in our water



Fertilize wise for healthy grass and clean water

The new fertilizer ordinance instructs when, with what, and how much to fertilize



Linda Seals ©

Lawn Care

BEST MANAGEMENT PRACTICES

But first! A quick note about landscape plants

The Seminole County Fertilizer Ordinance applies to all landscape areas

But some plants have additional nutrient requirements

Landscape plants can receive supplemental nutrients according to UF IFAS recommendations

Look for signs of nutrient deficiency. Consult with our Master Gardener Plant Clinic!



Palms



Citrus



Azalea



Roses

And a note on Weed'n'Feeds

Not recommended by UF IFAS

Generally application times different for nutrient needs and weed needs

Consider a pre-emergent herbicide before Feb 15

Spot treat with herbicides after they have emerged depending on weed type



Healthy turf helps reduce NPS pollution

Slows runoff

Filters

Reduces leaching

Reduces erosion

Protects groundwater

Produces oxygen

A healthy lawn

Irrigate

Mow

Fertilize

Top Two Turf Stressors

1. Improper water amounts
2. Mowing too short



Linda Seals ©



Irrigation

Why do we irrigate?

- To keep plants healthy
- Water as needed
- Look for signs of drought stress
- DO NOT water beyond plant requirements

Consequences of too little/much water

Root systems compromised

Pest problems increase

Thatch increases

Drought tolerance decreases

Weeds increase



Weed Indicators of Over-watering



Linda Seals ©

Nutsedge



Linda Seals ©

Dollarweed

Irrigation systems



Pop-up sprayer



Rotor



Micro

Pop-up sprayers will apply more water in a shorter time than rotary heads

How much irrigation?

1/2" to 3/4" per application

Address	Nov – Mar	April - Oct
EVEN	Sundays	Thursdays/Sundays
ODD	Saturdays	Wednesdays/Saturdays



Linda Seals ©

During the cooler months, when grass is not actively growing, water every 10 to 14 days

Calibration: Catch-can method

Place evenly-sized cans around irrigation zone and turn on the system

Measure the amount of water in each can

- Are the amounts in each can similar?
- Is there $\frac{1}{2}$ to $\frac{3}{4}$ of an inch of water in each can?
- If not, increase the run time





Creativecommons.org

Manage rainfall

Since 2009, Florida Law requires a *functioning* rain shutoff device.

Set at $\frac{3}{4}$ of an inch.

Can shut the system off during a rainstorm and/or keep it off if it has rained recently.

Micro-irrigation –Landscape Plants



Micro-irrigation delivers water x10 more efficiently to plants

Less water, less runoff

Easy to install. Only appropriate for landscape beds

Micro-irrigation and runoff

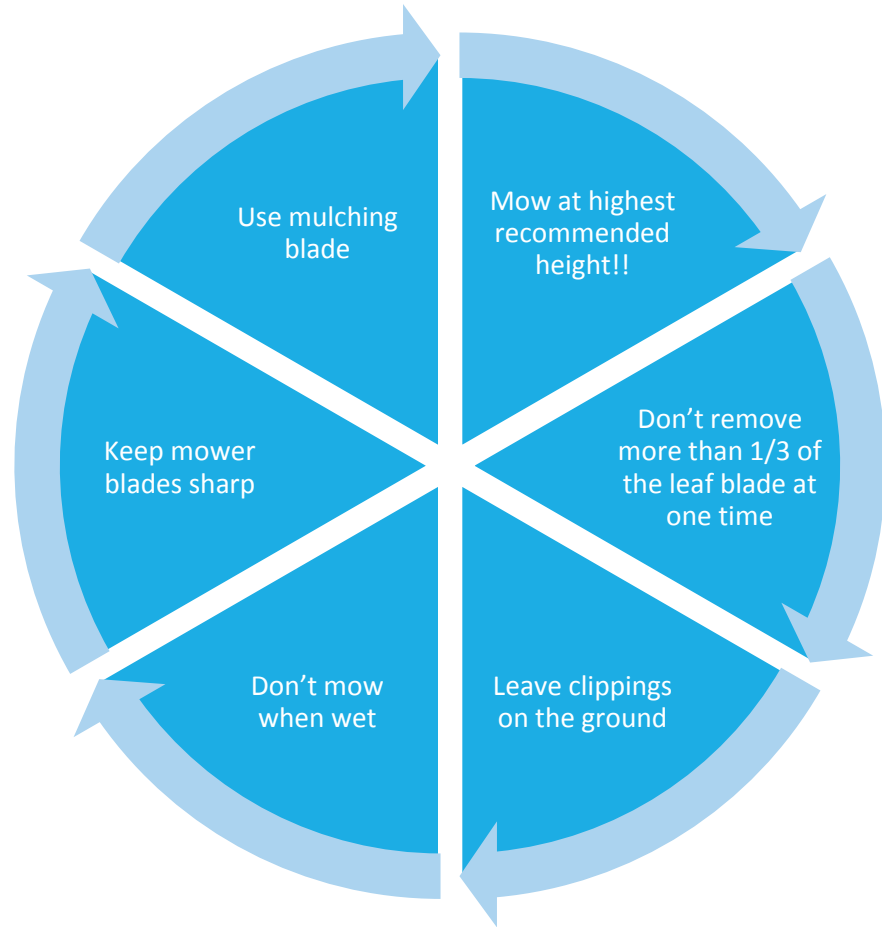
MICRO-IRRIGATION IN LANDSCAPE BEDS:
VIRTUALLY NO RUNOFF



NOT MICRO-IRRIGATION: LARGE DROPS OF
WATER DISLodge SOIL PARTICLES AND CARRY
SOIL AND FERTILIZER TO RUNOFF



Best Mowing Practices





Correct Mowing Heights

St. Augustine: 3.5 -4 inches

Zoysia: 1.5 – 2.5 inches

Bahiagrass: 3-4 inches

The taller the leaf blades, the longer the roots grow & the more photosynthesis occurs

Grass clippings on the street

Never leave on paved
surfaces

Never let them get into
storm drains



Managing grass clippings. Grass-cycle!

We make a lot of grass clippings. The average home generates 400 lbs in one year!

Grass clippings decompose into nitrogen and phosphorus

Leave grass clippings on your yard. It helps fertilize your lawn.

If grass clippings decompose in the water, they release nutrients and increase algae.



Grass clippings and fecal coliform



Wet grass clippings grew fecal coliform. Keep grass clippings out of the storm drain!

SERV --Stormdrain marking

Improves and protects water quality

Increases public awareness / outreach

- Preventative and proactive
- Educates about cause & effect



Fertilize Appropriately!

What do use

When to use it

How much

Plant Nutrients

Environment

- Carbon
- Hydrogen
- Oxygen

Macronutrients

- Nitrogen
- Phosphorus
- Potassium
- Calcium
- Magnesium
- Sulfur

Micronutrients

- Iron
- Manganese
- Boron
- Copper
- Molybdenum
- Zinc

Essential Macronutrients

*Nitrogen

- Nitrogen promotes plant growth and makes up part of the chlorophyll

*Phosphorus

- Should only be applied if a soil test indicates deficiency. Promotes flowering and fruiting

Potassium

- Strengthens roots; increases disease resistance and cold tolerance

*Potential pollutants

Soil Testing

The first step to creating a beautiful lawn!



Determines soil pH and macronutrient levels

Phosphorus testing is particularly important

Also measures levels of potassium and magnesium

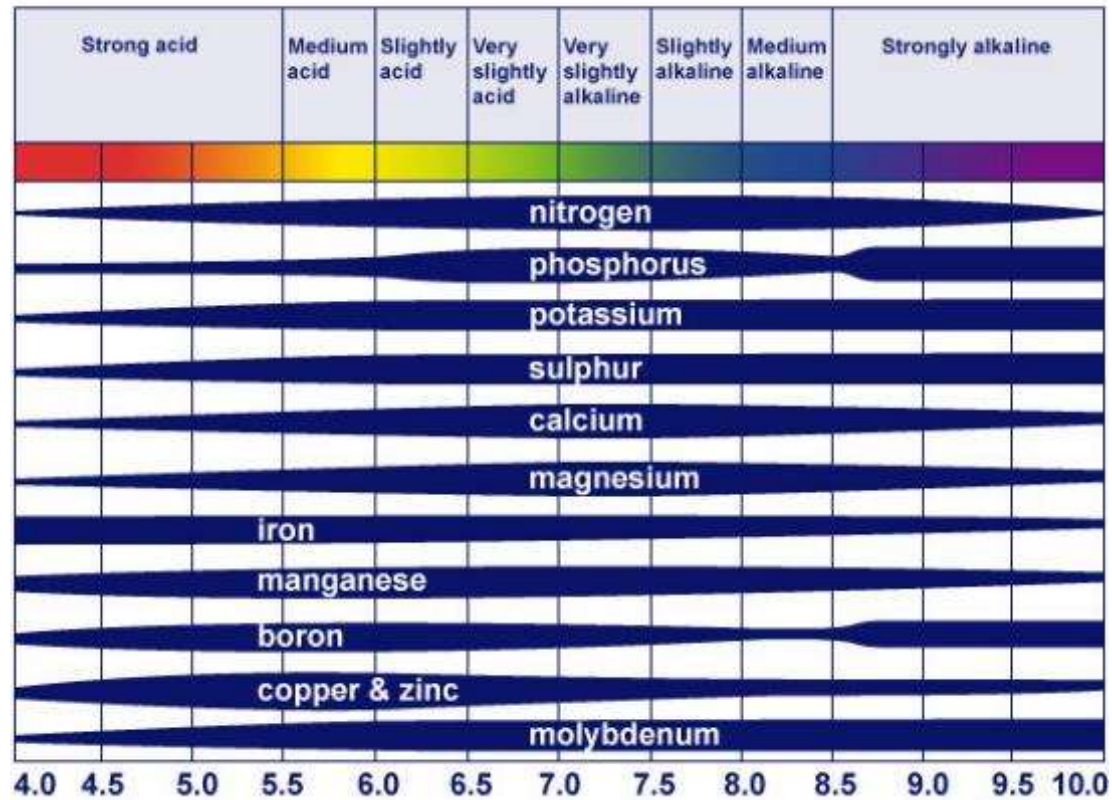


Linda Seals ©

How to collect a soil sample

[HTTP://EDIS.IFAS.UFL.EDU/SS494](http://edis.ifas.ufl.edu/ss494)

Soil pH and Nutrient Availability



Quick-release nitrogen

Several forms: Urea, ammonium sulfate, ammonium nitrate

Immediately available to plants... so you see a response faster

But also quick to gas off or dissolve and wash away. Does not last in your yard.



Use 50% or more slow-release Nitrogen and Phosphorus-free products

What's slow-release?

- A type of material that has its nitrogen stored so that it's not immediately available. The nitrogen gets released to the environment over a longer period of time.
- Plants can only take up so much nitrogen at once! Slow-release nitrogen is on pace with nature. A slow-release product should last through the summer restrictions.
- You get extended availability and more efficient use of nitrogen
- Less nitrogen enters our lakes if it's slow-release rather than quick release. YAY!

Nitrogen Fertilizers

Slow Release

Also “controlled release” (CR) or “water insoluble” (WIN)

Recommended Rate

Maximum of 1 lb. (N) / 1,000 ft² / Application

All fertilizer ordinances require a least 50% slow release N

Phosphorus-free fertilizer

Don't plants need phosphorus?

Our soils naturally have all the phosphorus plants need.

A soil test can show if your yard is low in phosphorus and you're an exception to the rule.



Phosphorus –A limiting factor

Phosphorus is often the limiting nutrient in our lakes.

If we end our phosphorus use, then we limit algae growth.

Overall Trophic State Index

"Trophic" means "relating to nutrition." The Trophic State Index (TSI) takes into account chlorophyll, nitrogen, and phosphorus, which are nutrients required by plant life. The Florida Department of Environmental Protection (FDEP) uses this information to determine a rating for the waterbody. [Learn more about the Trophic State Index »](#)



Latest Value	Limiting Nutrient	Historic Range	Additional Information
33 (GOOD) 1/9/2017 Source: Seminole County Water Quality Data	PHOSPHORUS	13 (GOOD) - 49 (GOOD) 11/30/1991 - 1/9/2017 1243 samples	10 Year Graph Seasonal Variation Graph Download this data

Legend:

Water Quality	Trophic State Index	Trophic State Classification
GOOD	0 - 59	Oligotrophic through Mid-Eutrophic
FAIR	60 - 69	Mid-Eutrophic through Eutrophic
POOR	70 - 100	Hypereutrophic

What about other nutrients like potassium or iron?

We know excess nitrogen and phosphorus are pollutants, but we have not observed other nutrients in excess harming our lakes.

Potassium

- Makes roots stronger and your grass more resilient.
- You may want to apply potassium in the fall to strengthen the roots through the winter.

Iron

- Helps your grass stay green.
- You may want to apply iron in the summer so that your grass is green but does not grow faster.

It's Not just about N, P, K

Balancing the Calcium & Magnesium is important, especially edible plants.

Balanced Ca:Mg creates a soil that builds it's own organic matter!



Fertilizer Timing

Do not apply fertilizer when rain is forecast!

Fertilizing is prohibited under Flood/Tropical Storm/Hurricane Watch or Warning

Prohibited when soils are saturated

Do not let fertilizers wash away with rainfall

Never fertilize within 24 hours of a rain event

Because it rains (and rains hard!) frequently in the summer, Seminole County now has a restricted season on fertilizers with nitrogen and phosphorus

June 1 – September 30.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
-----	-----	-----	-----	-----	-----	-----	-----	------	-----	-----	-----

WARM SEASON GRASSES

winter

spring

summer

fall

winter

SHOOT GROWTH

American-Lawns.com

ROOT GROWTH

Give grass nutrients when grass is growing

If you want to fertilize your lawn, do it in April and October

Your grass wants fertilizer when it's growing, not when it's sleeping!

Give it a boost in April

Help it last through the winter in October



What about new sod?

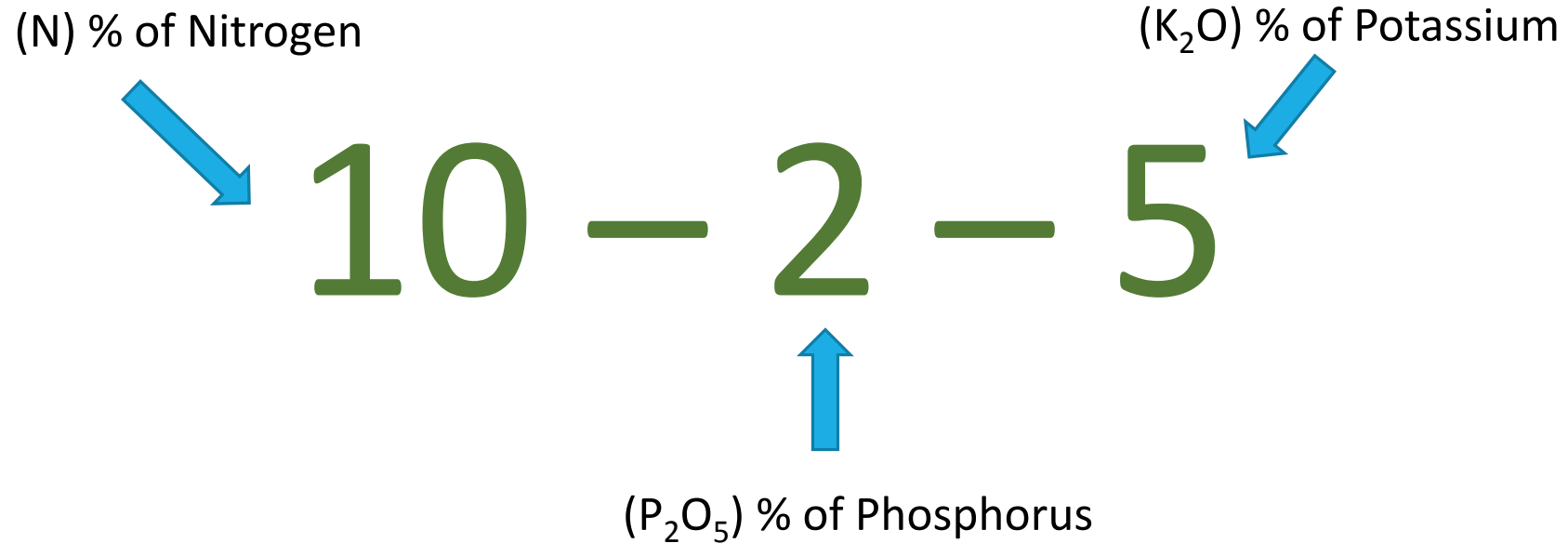
Fertilizing new sod within the first 30 days is PROHIBITED

Root system is underdeveloped and cannot absorb the added nutrients

Generally the sod farm fertilizers prior to selling



Fertilizer Analysis



The Label

GUARANTEED ANALYSIS

16-0-8

TOTAL NITROGEN (N).....16.00%
16.00 % Urea Nitrogen (N)*
SOLUBLE POTASH (K₂O).....8.00%
SULFUR (S) Total.....3.5%
IRON (Fe) Total.....0.96%
MANGANESE (Mn) Total.....0.48%

DERIVED FROM: Polymer Coated Sulfur,
Coated Urea, Sulfate of Potash, Iron
sulfate, Manganese sulfate.

*8.00% Slowly Available Urea Nitrogen
from Polymer Coated Sulfur Coated Urea

This shows that
50% of the N is slow
release because it is
polymer coated.

Are you choosing the right fertilizer?

Use a fertilizer that is 50% or more slow release

- Find the total percent nitrogen and slow release nitrogen percentage
- Divide the percent slow release by the total nitrogen. Is it 0.50 or greater?
- $7\% \text{ slow release} / 14\% \text{ total nitrogen} = 0.50$

GUARANTEED ANALYSIS	
TOTAL NITROGEN (N).....	14.00%
14.0% Urea Nitrogen (N)*	
SOLUBLE POTASH (K ₂ O).....	26.00%
SULFUR (S) Total.....	19.70%
10.50% Free sulfur (S)	
9.20% Combined sulfur (S)	
IRON (Fe) Total.....	0.96%
0.19% Water Soluble Iron (Fe)	
MANGANESE (Mn) Total.....	0.48%
0.1% Water Soluble Manganese (Mn)	
DERIVED FROM: Polymer Coated Sulfur Coated Urea, Sulfate of Potash, Iron Oxide, Manganese Oxide.	
*7.00% Slowly Available Urea Nitrogen from Polymer Coated Sulfur Coated Urea.	

How much
fertilizer do
you need?

Turf Species	Pounds of N per year	Plan for this many applications
St. Augustine	2	2
Zoysia	2	2
Bahia	0-1	0-1

How much fertilizer do you need?

You can put down 1 pound of slow release nitrogen fertilizer per every 1000 square feet.

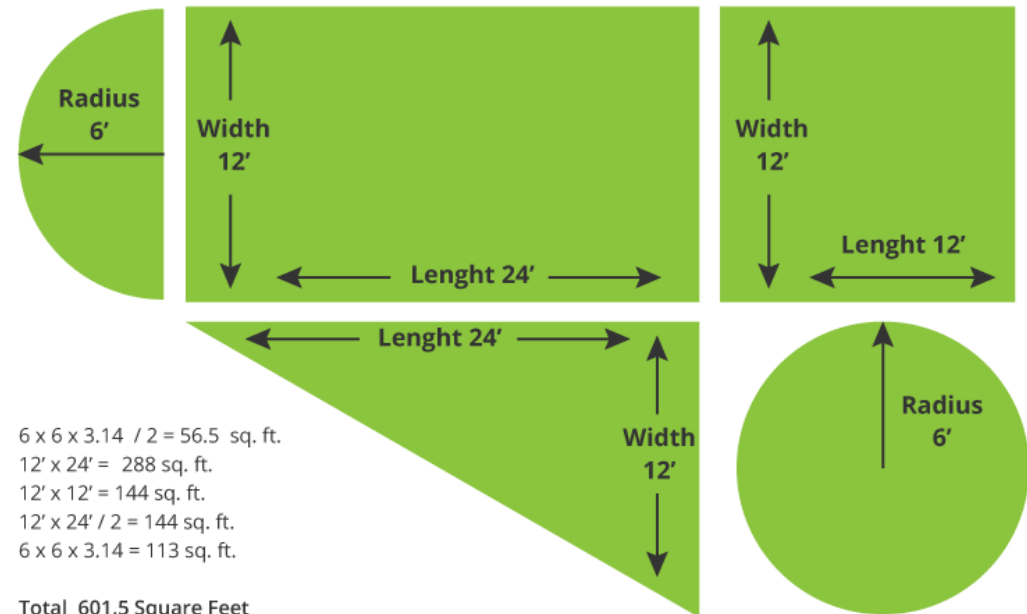
How much fertilizer do you need to put down to get 1 pound of nitrogen?

- Divide the total percent nitrogen into 100
- $100 \div \text{Total percent nitrogen} = \text{pounds of fertilizer you need}$

How big is your yard?

How big is your yard?

Divide by 1000. Multiply that by pounds of fertilizer.



$6 \times 6 \times 3.14 / 2 = 56.5$ sq. ft.
 $12' \times 24' = 288$ sq. ft.
 $12' \times 12' = 144$ sq. ft.
 $12' \times 24' / 2 = 144$ sq. ft.
 $6 \times 6 \times 3.14 = 113$ sq. ft.

Total 601.5 Square Feet

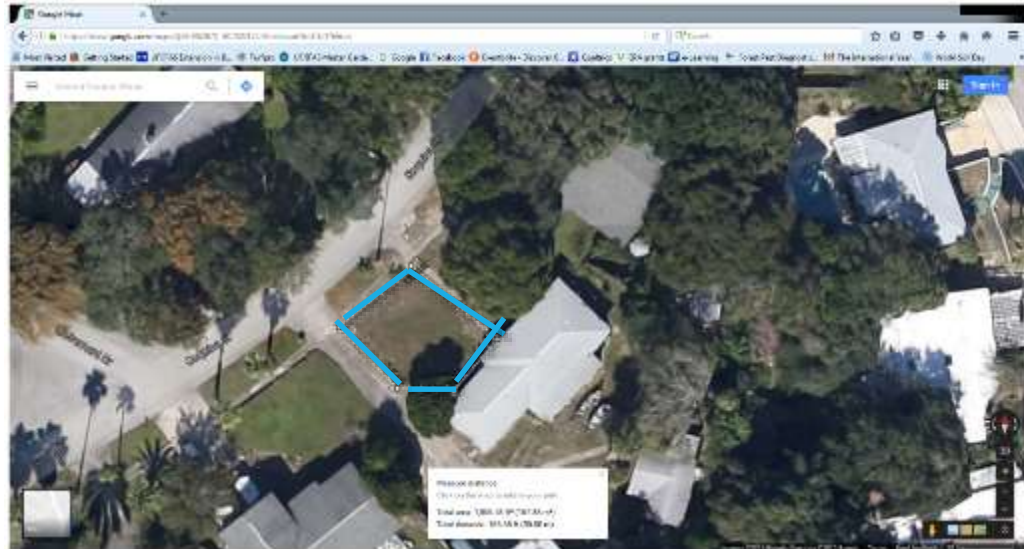
How big is your yard?

Measure the square footage of a yard using Google maps (if there aren't too many trees!)

Click on the satellite image in the lower left corner and zoom in.

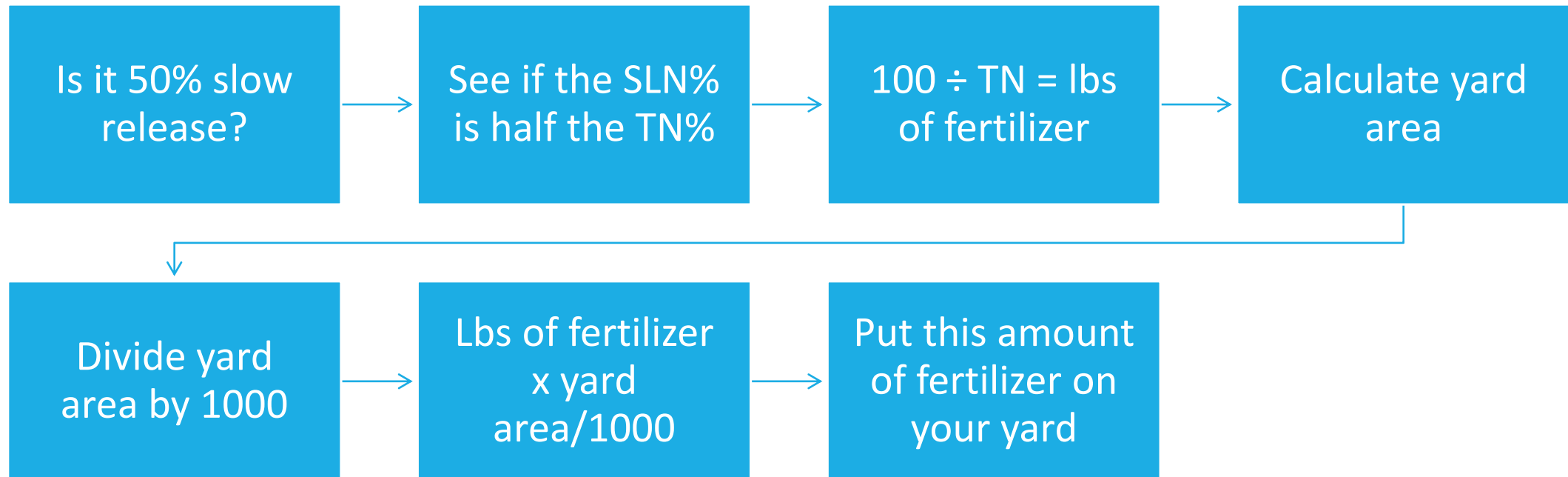
Place the cursor where you want to begin measure and right click. Click on "Measure distance" and then left click on each spot you want to include.

End up back on the spot you started at and it will total everything!




lawn area $\text{ft}^2 = \text{length} \times \text{width}$
Google measured the blue
lines at $1,806.53 \text{ ft}^2$

Pulling it all together



Fertilizer Calculator	
Look at the fertilizer bag for the Total Nitrogen. This is on the front of the bag, the first of the three large numbers, or on the back of the bag on the label.	
Enter Total Nitrogen: <input type="text" value="15"/> %	
Also on the label, sometimes beneath the total nitrogen or at the bottom of the label, is the percent of slow release nitrogen.	
Enter Slow-Release Nitrogen: <input type="text" value="10"/> %	
Seminole County requires your fertilizers be 50% slow-release nitrogen. This fertilizer is a slow-release product. You can apply up to 1 pound of Nitrogen per 1000 sq ft.	
Slow-Release Nitrogen Percentage: <input type="text" value="66.67"/> %	
This is the pounds of fertilizer you need in order to apply 1 pound of Nitrogen per 1000 sq ft.	
Fertilizer per 1,000 sq ft: <input type="text" value="6.7"/> lbs	
Calculate length x width or try to visualize how many parking spaces or volleyball courts would fill your yard. A parking space is about 100 square feet and half a volley ball court is 1000 square feet.	
Enter sq ft of yard: <input type="text" value="1600"/> sq ft	
This is how many pounds of fertilizer you need for your yard. Measure out the pounds with a scale or take the portion of fertilizer you need based on how many pounds are in one bag.	
Amount of Fertilizer to apply: <input type="text" value="11"/> lbs	



GUARANTEED ANALYSIS

TOTAL NITROGEN (N).....	14.00%
14.0% Urea Nitrogen (N)	
SOLUBLE POTASH (K ₂ O).....	26.00%
SULFUR (S) Total.....	18.70%
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8.20% Combined sulfur (S)	
IRON (Fe) Total.....	0.88%
0.19% Water Soluble Iron (Fe)	
MANGANESE (Mn) Total.....	0.48%
0.1% Water Soluble Manganese (Mn)	

DERIVED FROM: Polymer Coated Sulfur Coated Urea, Sulfate of Potash, Iron Oxide, Manganese Oxide.

1.00% Slowly Available Urea Nitrogen from Polymer Coated Sulfur Coated Urea.

Click Image above for additional examples.



What if you have reclaimed water?

Reclaimed water reuses waste water from the water treatment plant back into the landscape

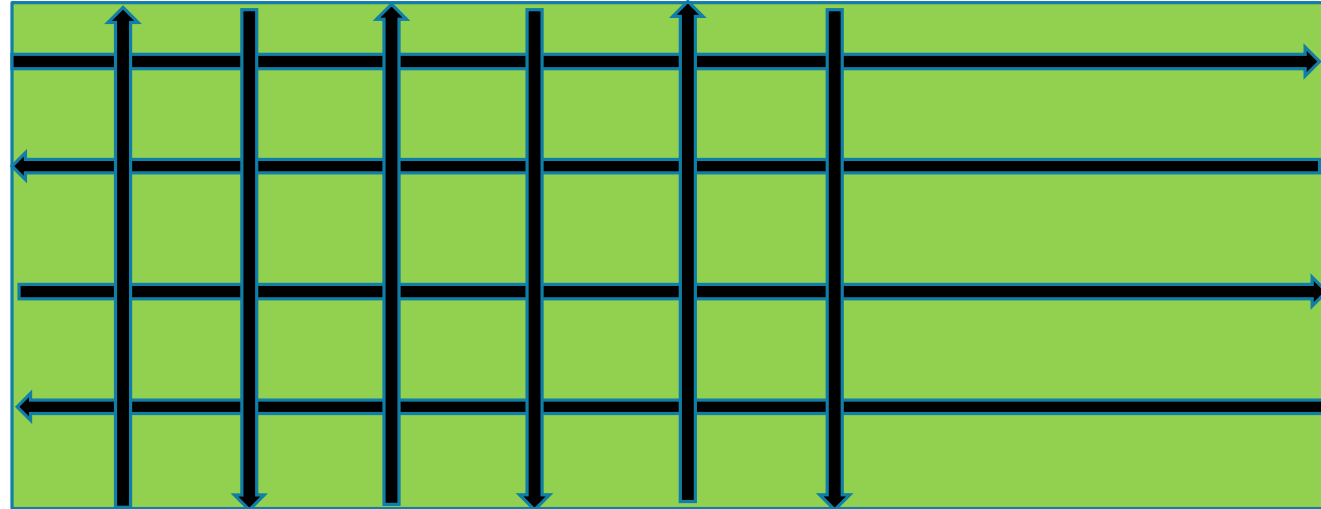
DO NOT DRINK. Look for signage.

Levels of nitrogen and phosphorus change depending on treatment plant and time of year

You need less fertilizer depending on your watering, your turf, and the nitrogen levels



Applying fertilizer



Take half of the fertilizer you need and place it in the spreader.

Walk at a steady pace in vertical rows about 4 ft apart.

When you run out of fertilizer, stop.

Take the remaining fertilizer and walk in horizontal rows, walking faster or slower to use the remaining fertilizer.



Fotolia

Calibrate Fertilizer Spreader

LET'S GO OUTSIDE!

Applying Fertilizer

Apply $\frac{1}{4}$ " of water after spreading fertilizer



Keep the fertilizer where it belongs!

Use a **deflector shield** near water, sidewalks, etc.



Leave at least a 15'-free maintenance zone next to waterfront



Image Courtesy UF / IFAS Extension FYN Program

**Did you know..... fertilizer spreaders
are calibrated for a walking speed of 3 mph**

Summary

N and P are
pollutants in
waterbodies

Soil testing is the first
step to fertilizing
correctly

Apply a maximum of
1 lb. of
N/1000ft²/application

Water in the fertilizer
 $\frac{1}{4}$ " to prevent
leaching

Keep the fertilizer and
grass clippings on the
lawn

Thank you! Any Questions? Let's try it!



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