

Keeping Stormwater Ponds Functional, Sustainable and Beautiful

FOR THE

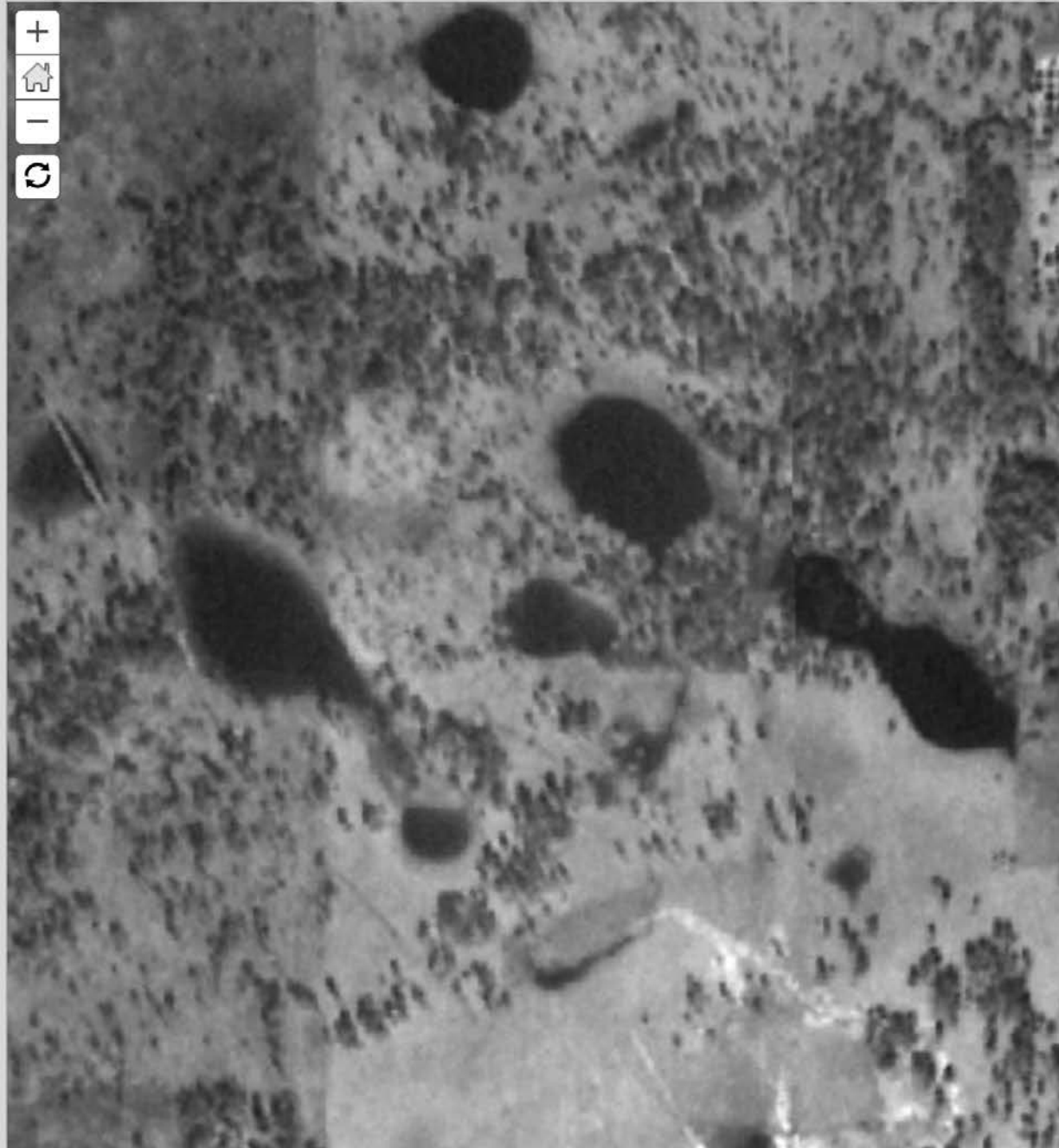
#GATORGOOD

Dr. Mary Lusk

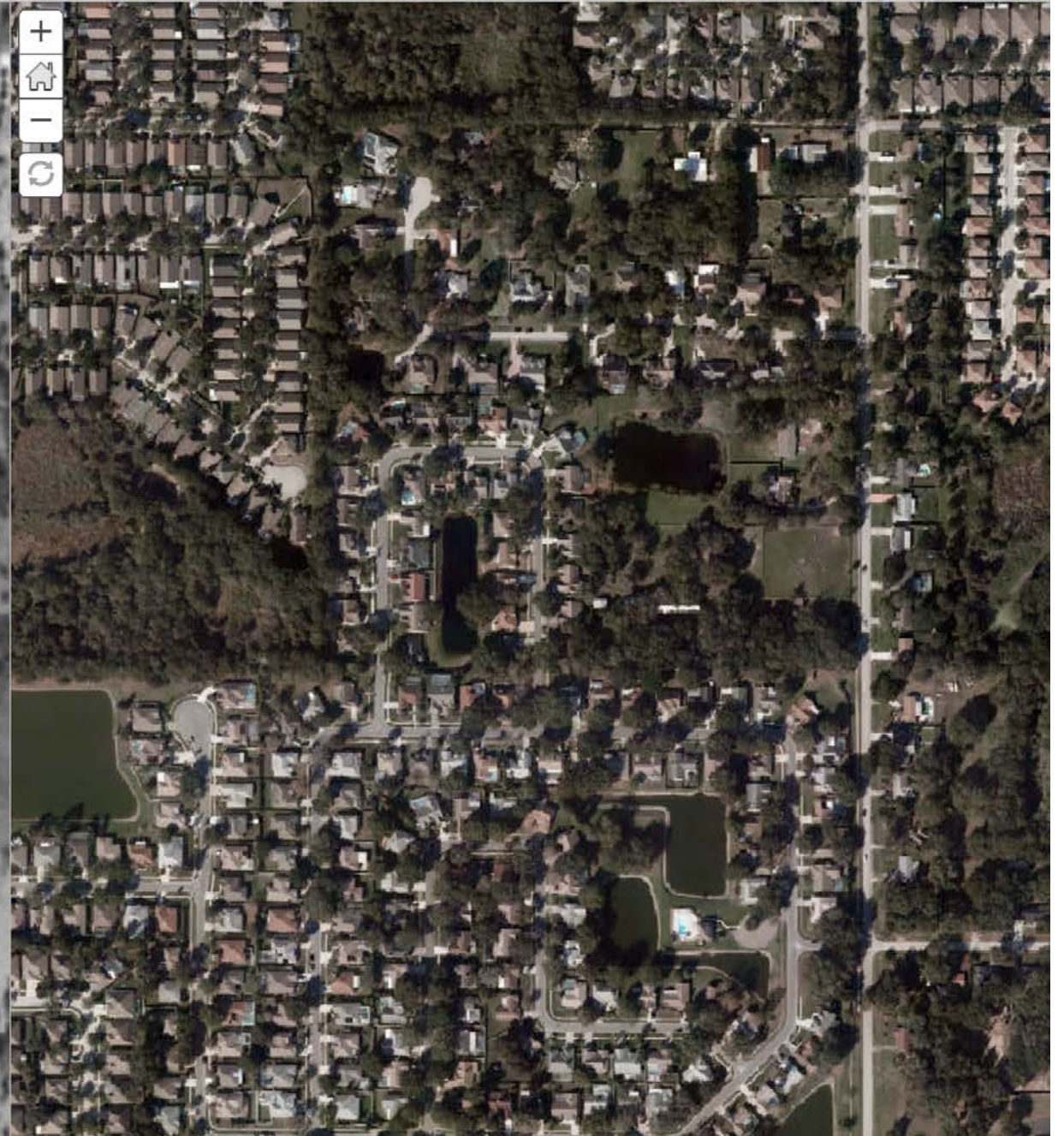
1. Stormwater Ponds: what they're doing for us

Your work matters far beyond the neighborhood

1948 Hillsborough County Aerials



2016 Hillsborough Aerial Imagery



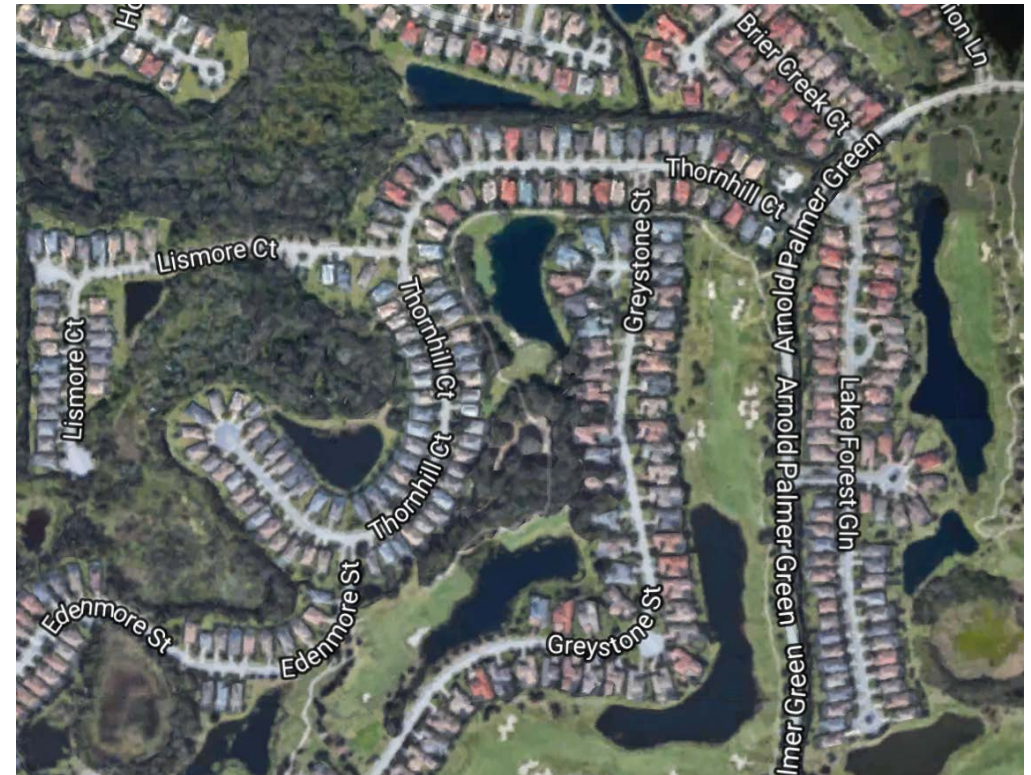
Pre-development vs. Development

The original stormwater treatment



Wetlands

Today's urban stormwater treatment



Man-made ponds

Pre-development vs. Development

Wetlands

- Control flooding
- Provide habitat for wildlife
- Improve water quality
- Aesthetic appeal



Neighborhood ponds

Hopefully do all the same things

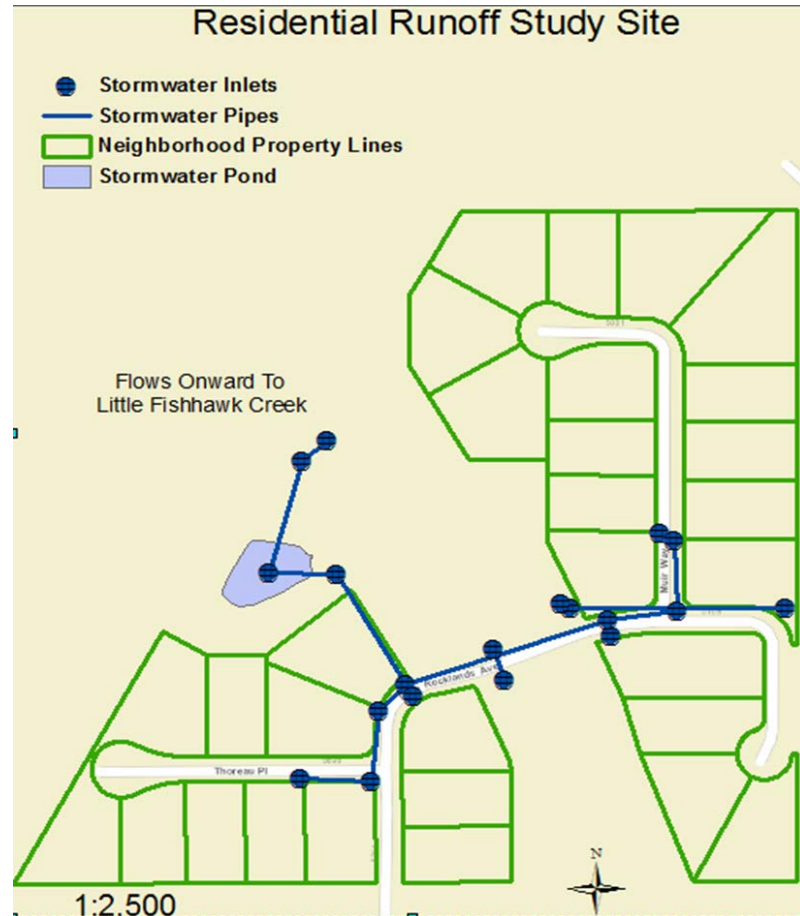


Neighborhood Stormwater Ponds: Simply put, they . . .

- Are tools for managing runoff from rainfall
- Collect rainwater that lands on rooftops, driveways, roads and other impervious surfaces
- Are designed to help prevent flooding
- May treat pollutants before the water flows onward to a stream, lake, or estuary



Neighborhood Stormwater Ponds



- The junction between the built environment and the natural environment

Stormwater



Natural
water body

Stormwater

Typical Stormwater Pollutants

- Litter
- Motor oil
- Nutrients
- Grass clippings
- Gasoline
- Pesticides
- Pet waste



Pollutants in the Urban Coastal Watershed



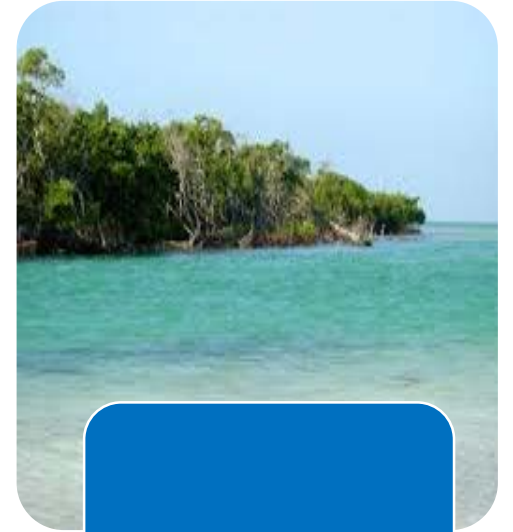
Lawns



Stormwater
and
Stormwater
Ponds

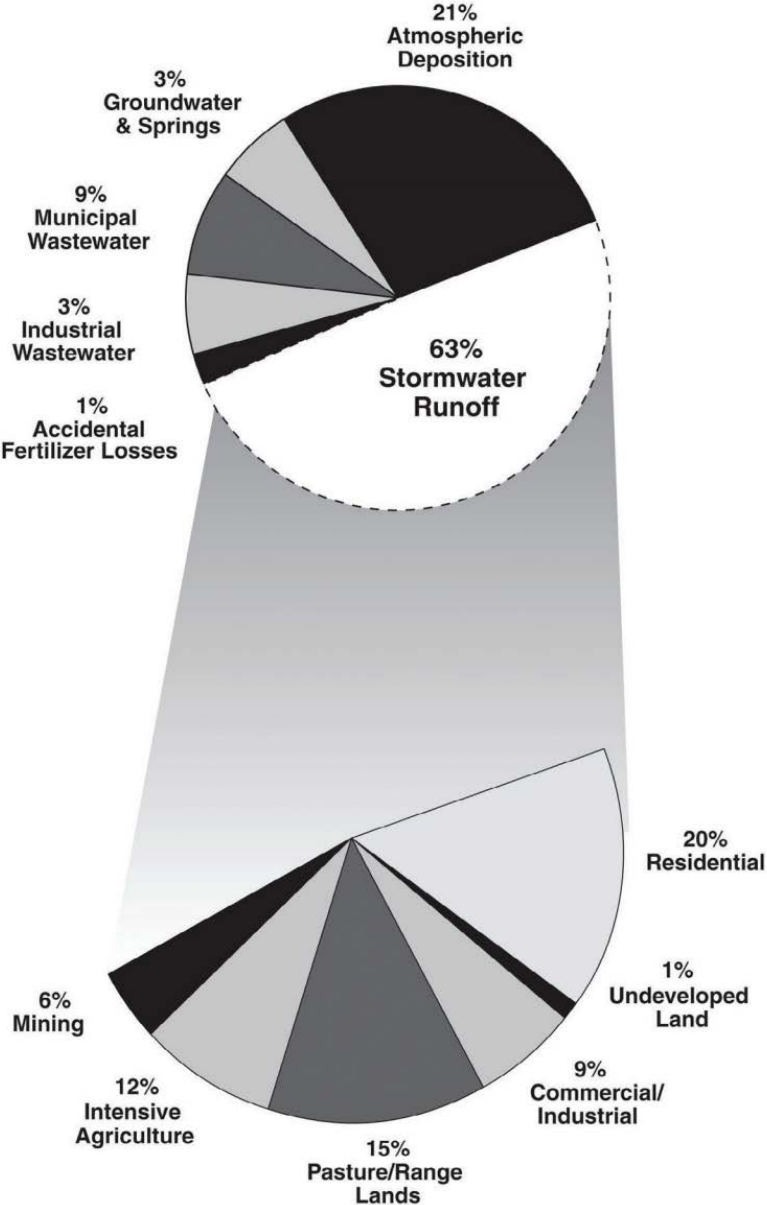


Streams



Estuary

Sources of Nitrogen in Tampa Bay



2. Stormwater Ponds

They're really important. Let's keep them functional, sustainable and beautiful

Good Housekeeping in the Neighborhood

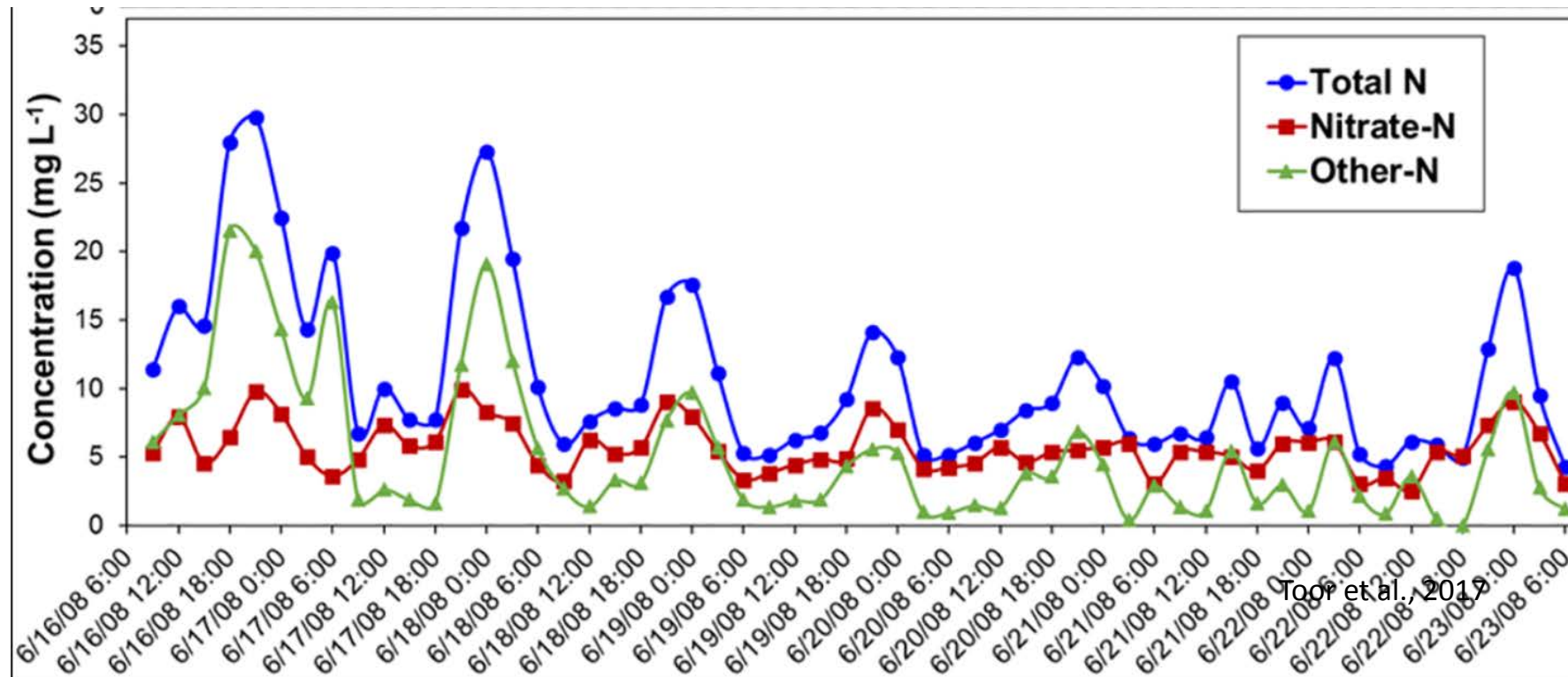
- Follow the county fertilizer BMPs
 - Skip fertilizer June 1 to Sept 30
- Have fertilizer free zones around the pond, down street, and around storm drains
- Blow grass clippings and leaves back in the yard
- Plant Florida native aquatic plants around the pond

Nitrogen mobilization to stormwater from urban “lawns”





Reclaimed Water Irrigation-



Buffer zones – at least 10 feet between pond and lawn



Optimal



Poor

Common Problem: Algae and Aquatic Weeds



Planktonic algae



Filamentous algae



Floating plants



Submerged plants

Planktonic algae



- Water doesn't necessarily have to be crystal clear
- A little green color is an indication that a growing algae population is capturing the nutrients
- But. . .algal levels can grow to excess (like this picture) and some species are toxic

Planktonic algae: what to do



- Good housekeeping
- Cultural practices in the community that reduce nutrients going in to the pond
- 10-ft maintenance free buffer around the shoreline
- Comply with fertilizer ordinance
- Mulch grass clippings and leaf litter
- Take care of pet waste properly

Planktonic algae: what to do



- Inspect infrastructure at least once a year
- Vacuum or clean out inlets and pipes
- Maintain littoral zone plantings
- Aeration to increase oxygenation
 - Also helps control odor, if that's an issue
 - Promote nitrogen cycling
 - Should be run 24 hr/day
 - Remember that fountain does not necessarily equal aeration

Filamentous algae: what to do



- Colonies of microscopic plants that link together
- Produce oxygen and food for animals that live in the pond
- But. . .when they begin to cover more than 20% of pond surface, it's a sign that you have excess nutrients; can lead to decreased oxygen and fish kills

Filamentous algae: what to do



- First and foremost: same advice as for planktonic algae:
- Good housekeeping and reducing nutrient flows into the pond
- Aquatic dyes can be used to suppress growth
- Harvesting (temporary fix)
- Use chemical controls as a last resort

Submerged aquatic vegetation: what to do



- Same story, not all bad, in fact some SAV is good because it helps maintain adequate oxygen levels and provides forage for fish
- But. . .it should be restricted primarily to the littoral zone and not cover more than 20% of pond surface

Submerged aquatic vegetation: what to do



- Stock pond with grass carp
 - 2 fish per acre of vegetation
 - May need to restock every 5-10 years
 - Use fish guards to keep them from making their way out of the pond
- Harvesting
- Aquatic dyes
- Good housekeeping!
- Chemical controls as last resort

Common Problem: Erosion and Bank Destabilization



Causes

wave action

Fountains near the shore

Very sandy soils

Wildlife (ducks!)

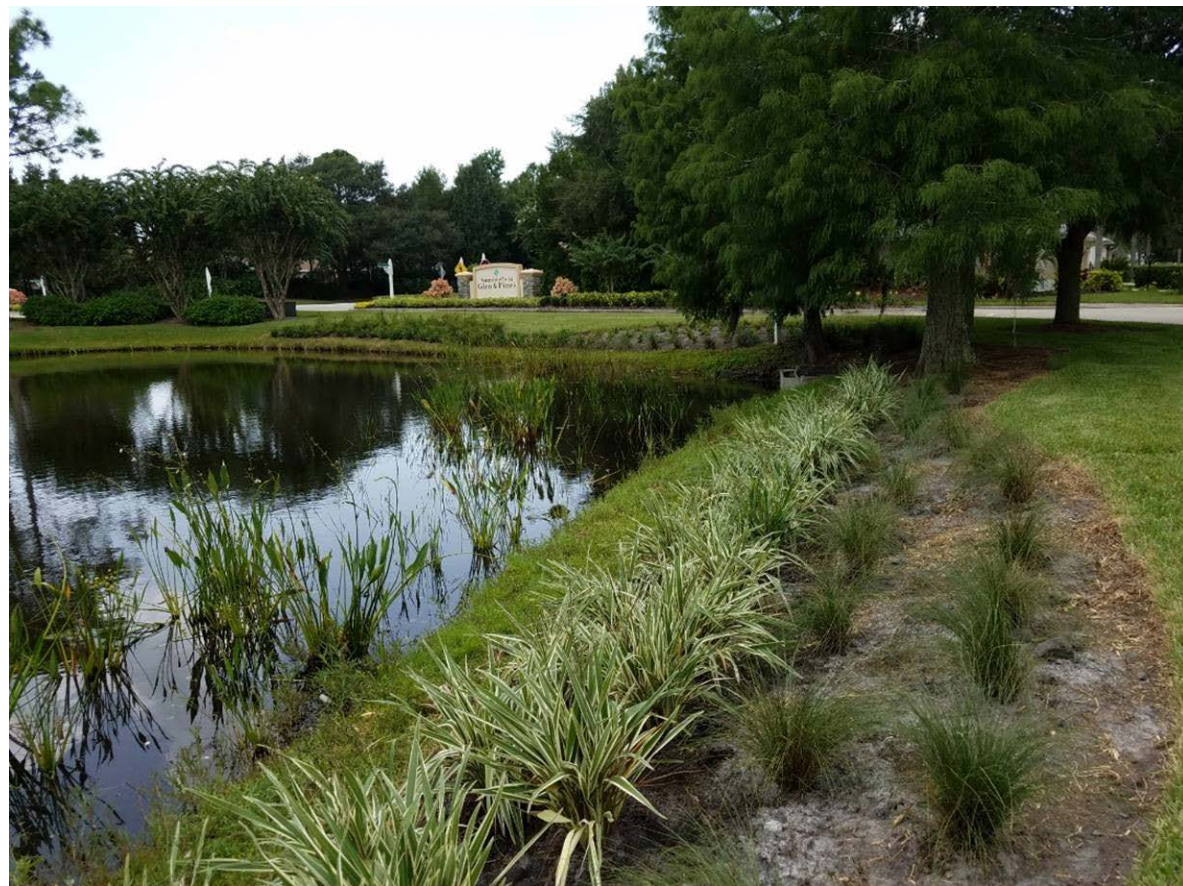
Lack of vegetative protection

Common Problem: Erosion and Bank Destabilization



Solutions

- Fountains in center of pond
- Control nuisance wildlife to extent possible
- Use plants
 - *Not* turf- no extensive root system
 - Yes to wetland plants- deep robust root system



Common Problem: Fish Kills



- Remember that having fish in the pond is a secondary benefit
- A few dead fish is not necessarily cause for alarm
- Low oxygen is the most often cause
- If just the small fish: may be a toxin in the water
- Use pond aeration and circulation to increase oxygen and teach residents about the importance of preventing illicit discharges of toxic materials

Common Question: Wildlife



Image source: Abbey Tyrna

Wildlife is desirable and an indication of a healthy pond

But. ..large numbers of waterfowl can become problematic

- erosion
- fecal matter
- pathogens

On average, 2 waterfowl per acre are okay; above that not so much so

Alligators: prefer open areas to bask, so plantings around a pond are a natural deterrent

Thank You!

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