GENESIS GROUP

FROM VISION TO REALITY

Community Planning

Community Redevelopment

Urban Design

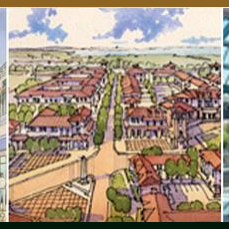
Landscape Architecture

Civil Engineering

Transportation Engineering

Applied Sciences

Market Economics

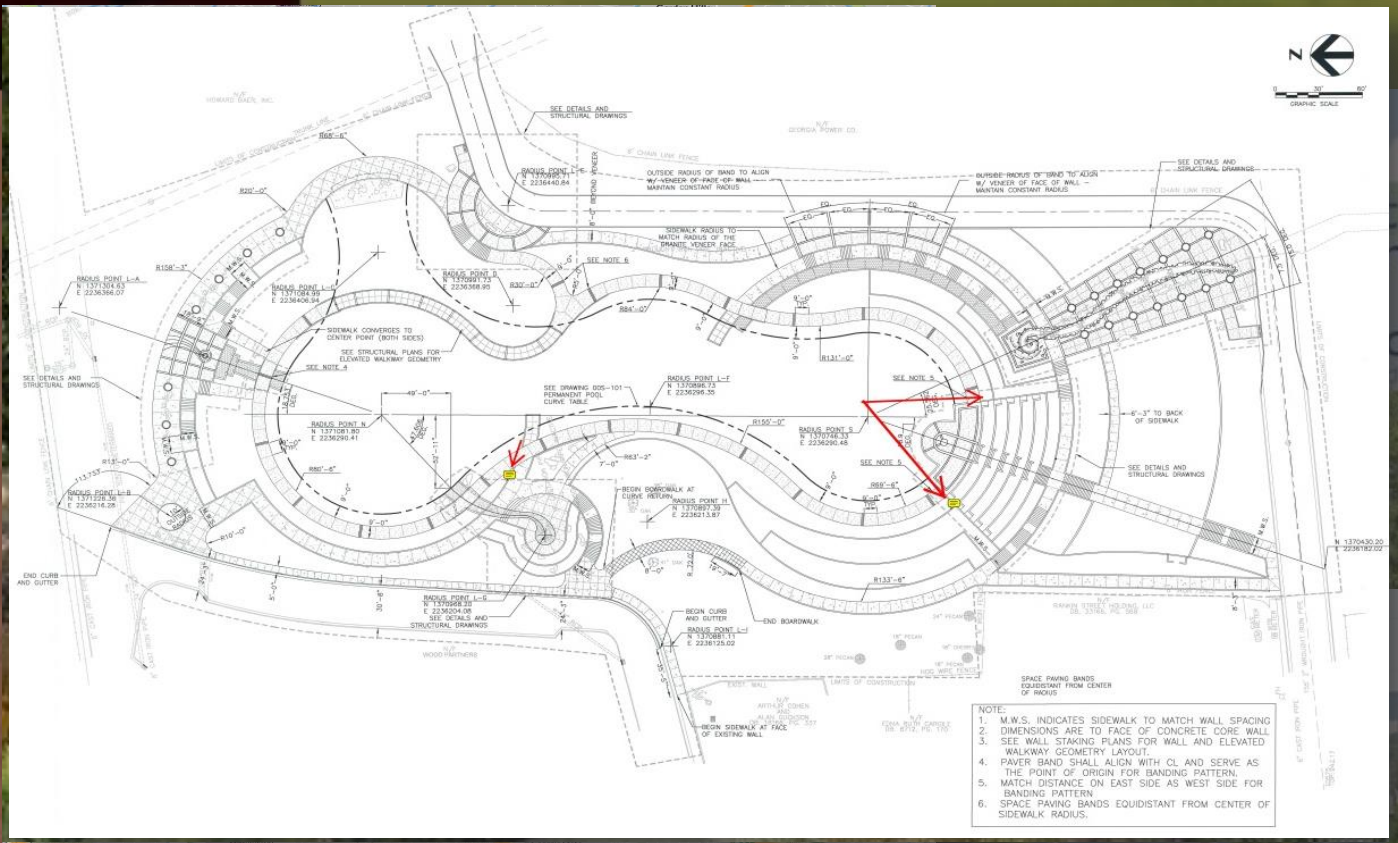



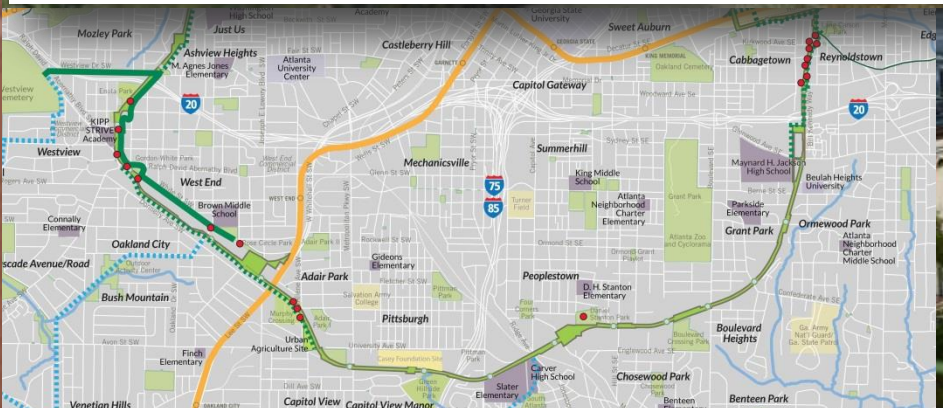





Surface Water – Urban Treatment Systems – Capital Cascades

Surface Water – Urban Treatment Systems – Atlanta Beltline





Surface Water – Urban Treatment Systems – Atlanta Beltline

Terrestrial Systems

Sandy Soil Backfill

Container Grown

Landscape BMP's

Irrigation w/ Sensor

Under Drainage

CMU Wall Systems

Aquatic Systems : BMP's

Stormwater Retention – Water Quality & Attenuation
Littoral Shelf Design & Aeriation Fountain
Continuing Aquatic Maintenance Contract

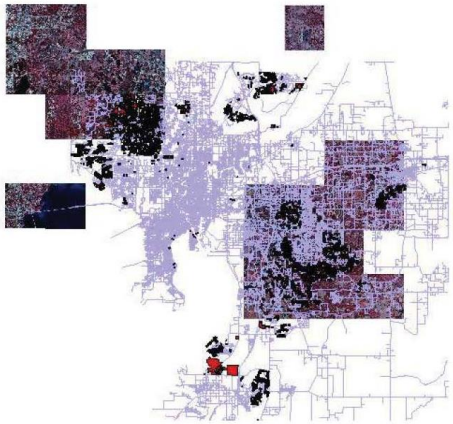
Continuing Maintenance Contract

Surface Water – Urban Treatment Systems – Atlanta Beltline

Community Surface Water Quality

Best Management Practices in Florida

The Community Benefits of Large-scale Development



Wayne Archer
Professor of Real Estate
University of Florida

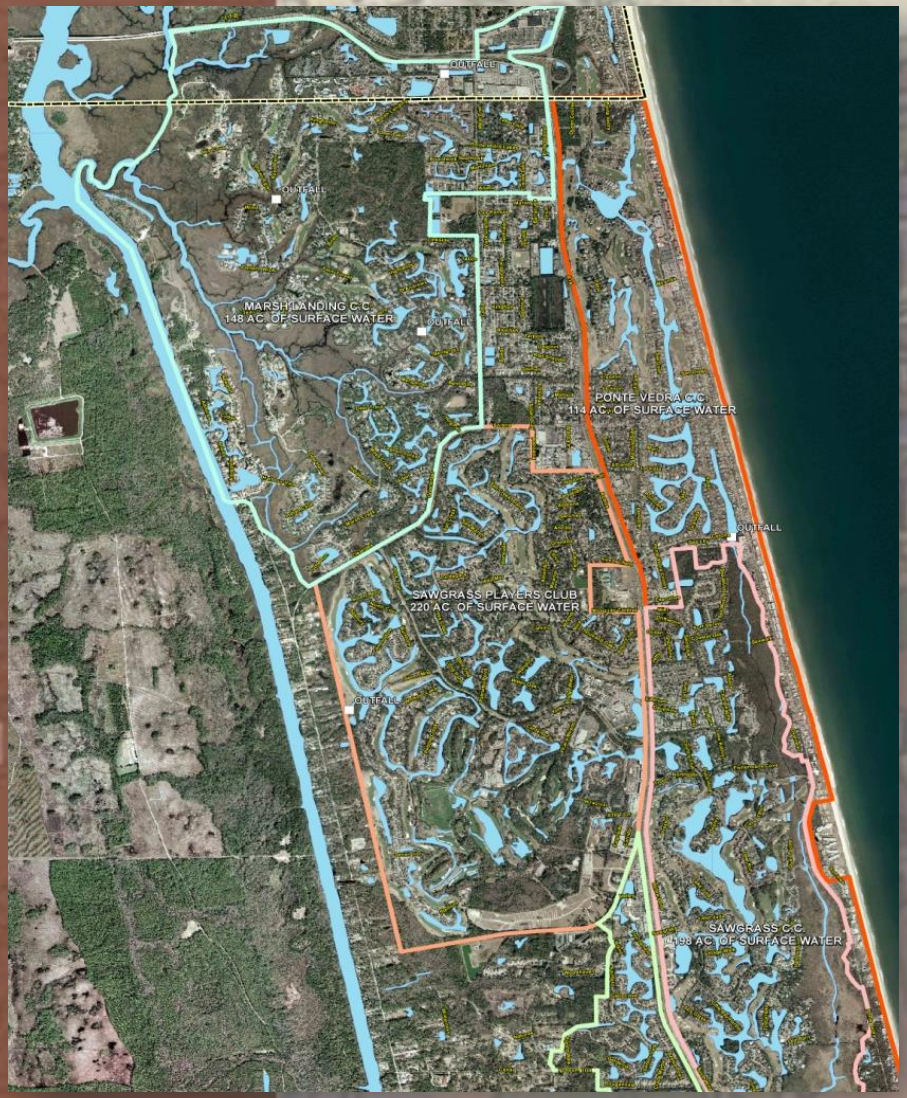
December 7, 2004

- Sophisticated and creative land planning techniques
- Purchasing advantages (scale) to enable higher quality construction practices
- Public permitting and controls are a fixed cost of the review process
- Effective management of storm water
- Efficient water conservation

Community Water Quality

Best Management Practices in Florida

Florida's First DRI - Caballos del Mar

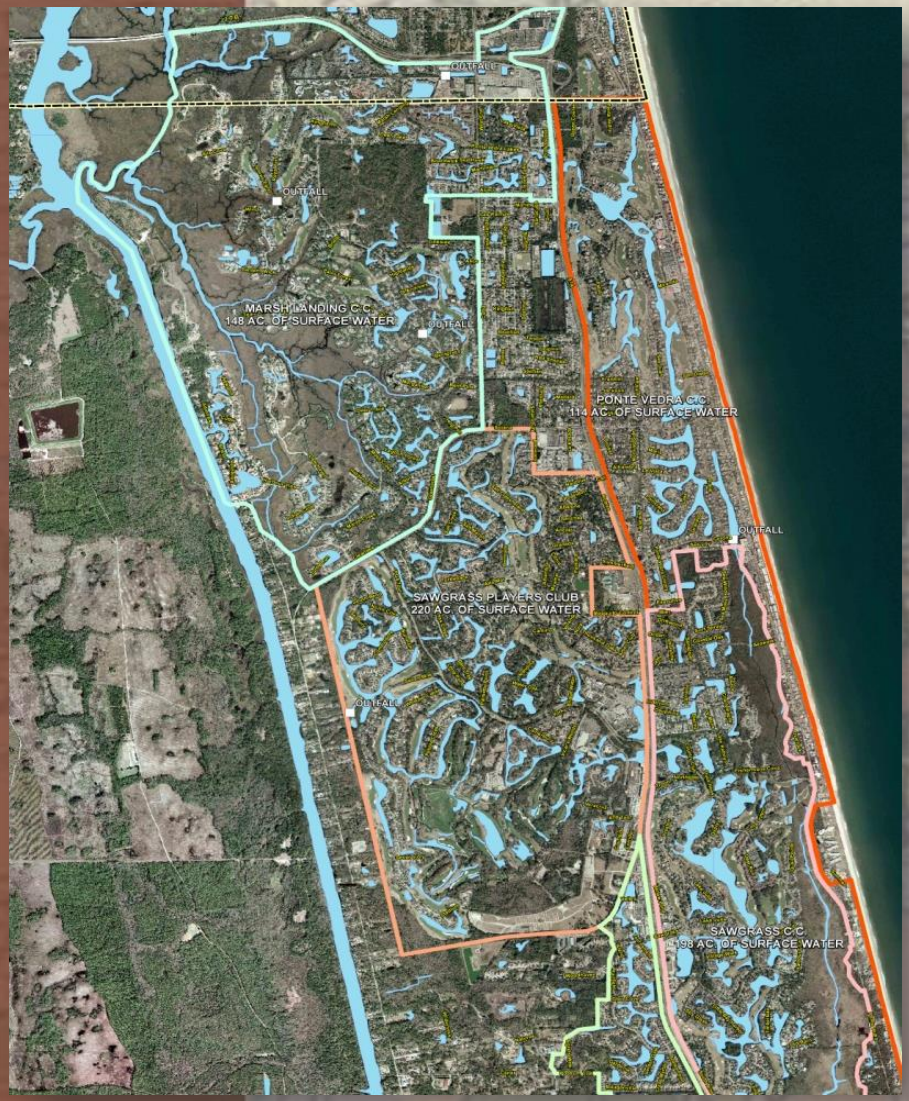


- The Original ADA (1975) states that a large network of surface storm water ponds will recycle runoff to provide irrigation water sources for Golf, and all Common Area Green Spaces.
- Although implemented, surface water fouling from algae & herbicides began to damage & kill street trees, shrubs & turf.
- All Irrigation surface water intake pumps were converted to wells via CUP.

Community Water Quality

Best Management Practices in Florida

Florida's First DRI - Caballos del Mar



- **Over 680 surface acres of storm water lakes were not enough to supply approximately 2400 acres of Suburban Neighborhood Common Arae due to degraded water quality.**

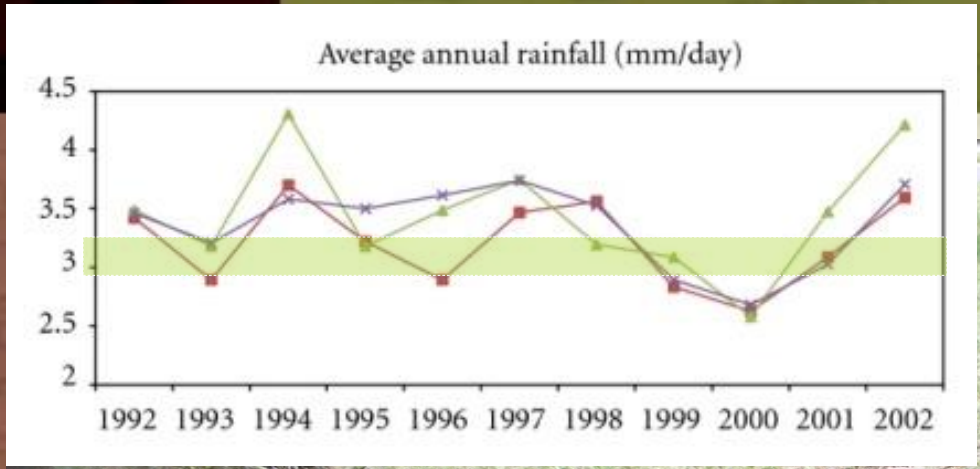
Community Water Quality

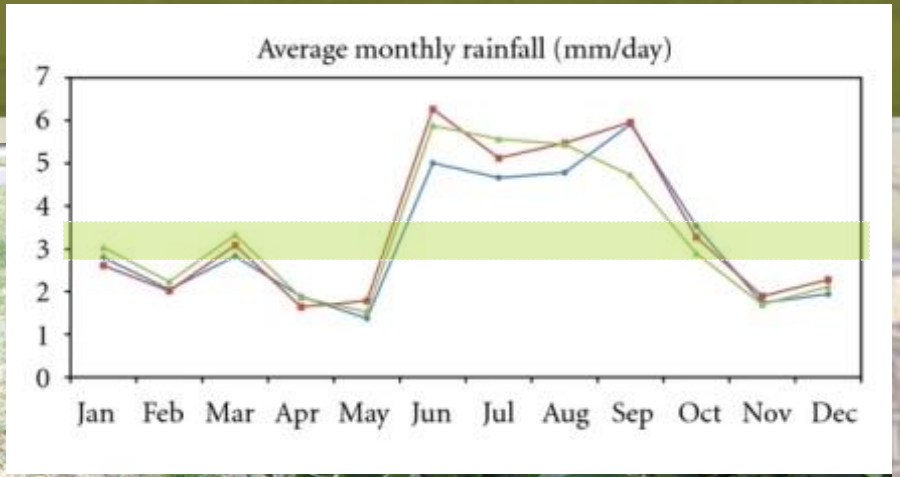
Ponds & Lakes - Best Management Practices : DESIGN

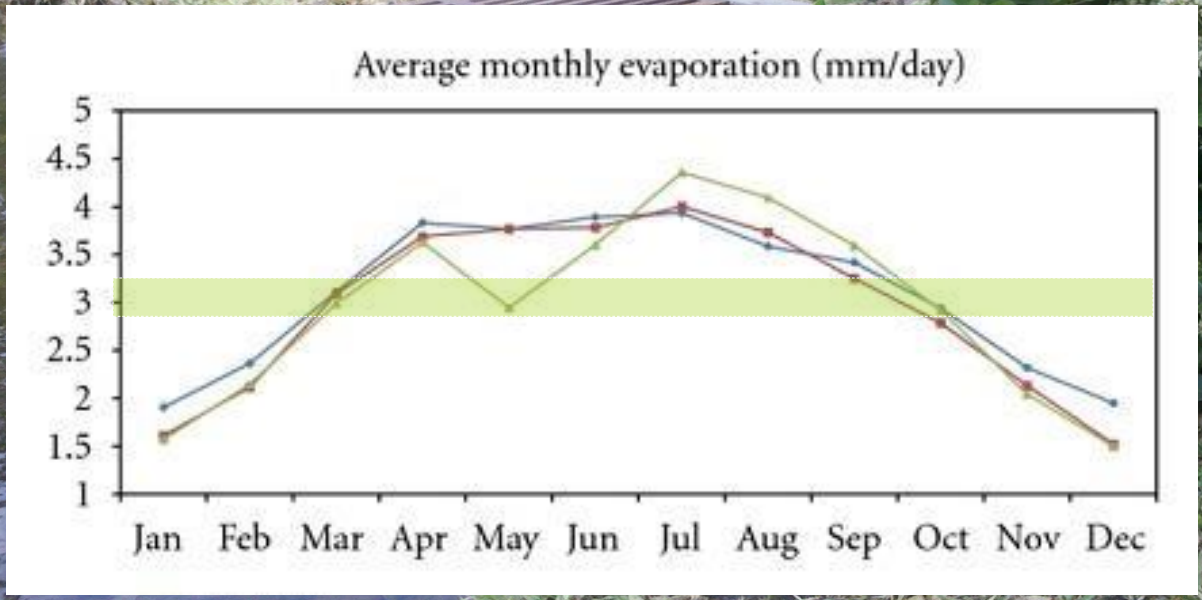
	A	B	C	D	E	F	G	H	I	J
1		0- 0.5"	0.5-1.0"	1"-2"	2"-3"	3-4"	4"+	total rain days/month	total inches/month	
2	Jan-00	7	0	1	0	0	0	8	2.77	
3	Feb-00	1	1	0	0	0	0	2	1.17	
4	Mar-00	7	1	0	0	2	0	10	8.48	
5	Apr-00	2	1	1	0	0	0	4	2.6	
6	May-00	6	0	1	0	0	0	7	1.15	
7	Jun-00	11	1	0	0	0	0	12	2.43	
8	Jul-00	7	0	3	0	0	0	10	5.69	
9	Aug-00	10	1	2	1	0	0	14	7.4	
10	Sep-00	8	5	2	0	0	1	16	11.64	
11	Oct-00	5	0	0	0	0	0	5	0.23	
12	Nov-00	4	1	0	0	0	0	5	1.55	
13	Dec-00	2	0	1	0	0	0	3	1.37	
14	Jan-01	7	0	0	0	0	0	7	0.91	
15	Feb-01	6	0	0	0	0	0	6	0.69	
16	Mar-01	10	2	1	0	0	0	13	5.48	
17	Apr-01	3	0	0	0	0	0	3	0.62	
18	May-01	2	1	1	0	0	0	4	2.56	
19	Jun-01	17	1	1	0	0	0	19	5.59	
20	Jul-01	10	2	3	1	0	0	16	8.31	
21	Aug-01	10	1	2	0	0	0	13	3.58	
22	Sep-01	10	5	2	1	0	1	19	16.06	
23	Oct-01	8	0	0	0	0	0	8	0.84	
24	Nov-01	9	0	1	0	0	0	10	1.49	
25	Dec-01	10	0	0	1	0	0	11	3.2	

1905 to present data - NOAA Jacksonville Station

Ponds & Lakes - Best Management Practices : DESIGN



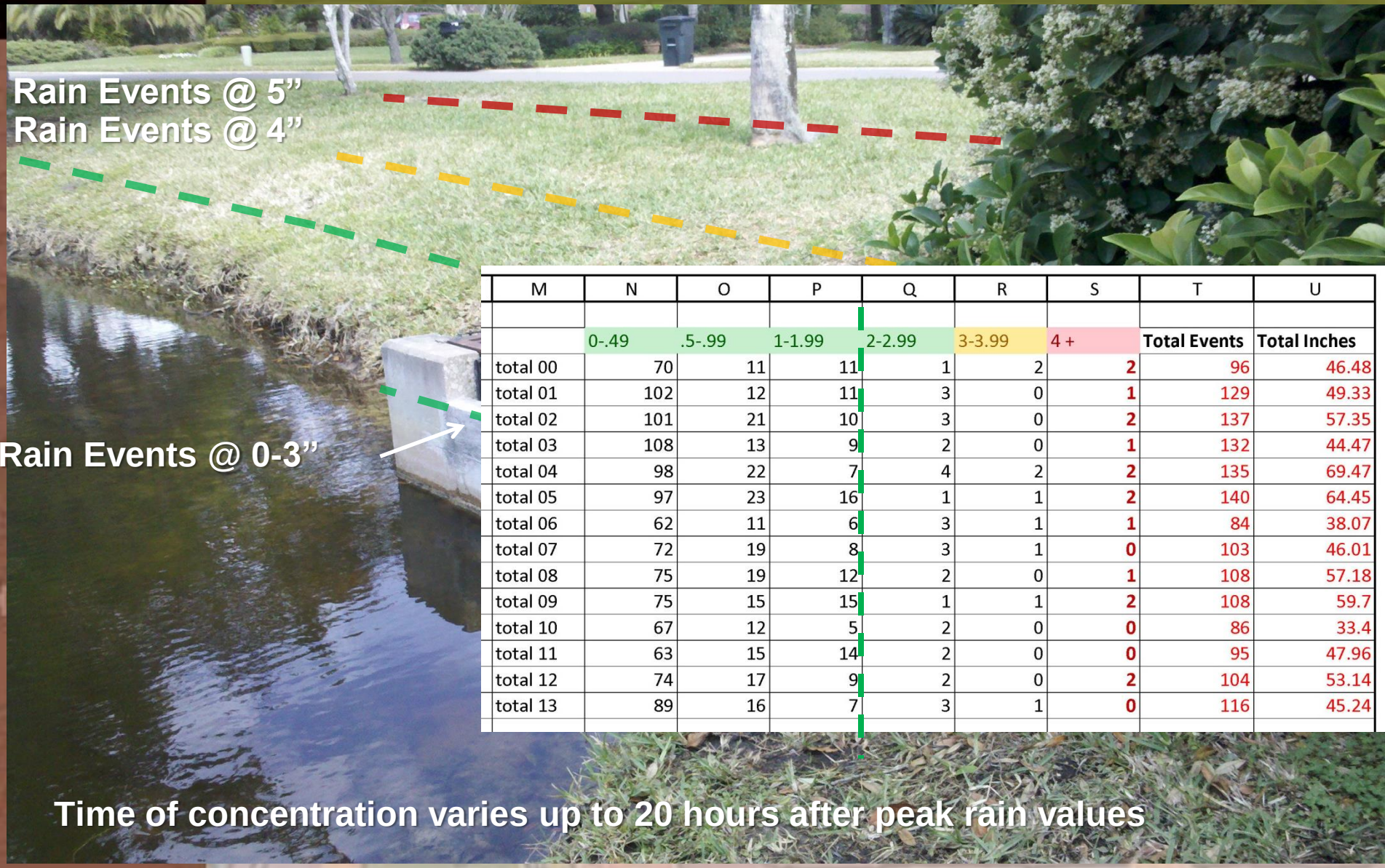




Average N.E. Florida Weather Stations

Community Water Quality

Ponds & Lakes - Best Management Practices : DESIGN

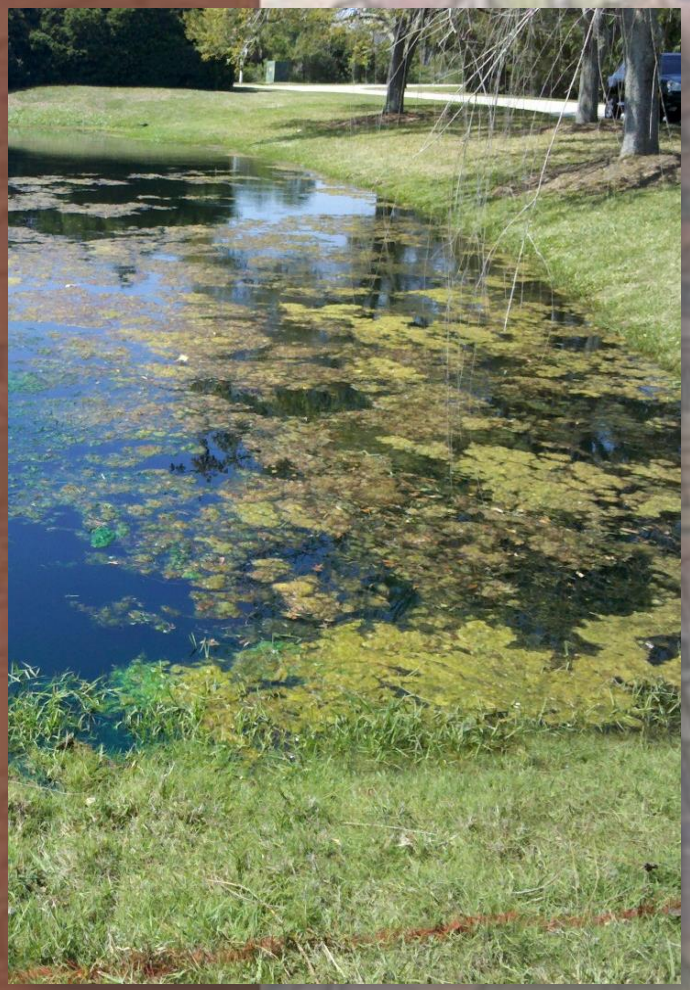


M	N	O	P	Q	R	S	T	U
	0-.49	.5-.99	1-1.99	2-2.99	3-3.99	4 +	Total Events	Total Inches
total 00	70	11	11	1	2	2	96	46.48
total 01	102	12	11	3	0	1	129	49.33
total 02	101	21	10	3	0	2	137	57.35
total 03	108	13	9	2	0	1	132	44.47
total 04	98	22	7	4	2	2	135	69.47
total 05	97	23	16	1	1	2	140	64.45
total 06	62	11	6	3	1	1	84	38.07
total 07	72	19	8	3	1	0	103	46.01
total 08	75	19	12	2	0	1	108	57.18
total 09	75	15	15	1	1	2	108	59.7
total 10	67	12	5	2	0	0	86	33.4
total 11	63	15	14	2	0	0	95	47.96
total 12	74	17	9	2	0	2	104	53.14
total 13	89	16	7	3	1	0	116	45.24

Time of concentration varies up to 20 hours after peak rain values

Community Surface Water – Sustainability

Aquatic Nutrient Loading



Terrestrial Sources :

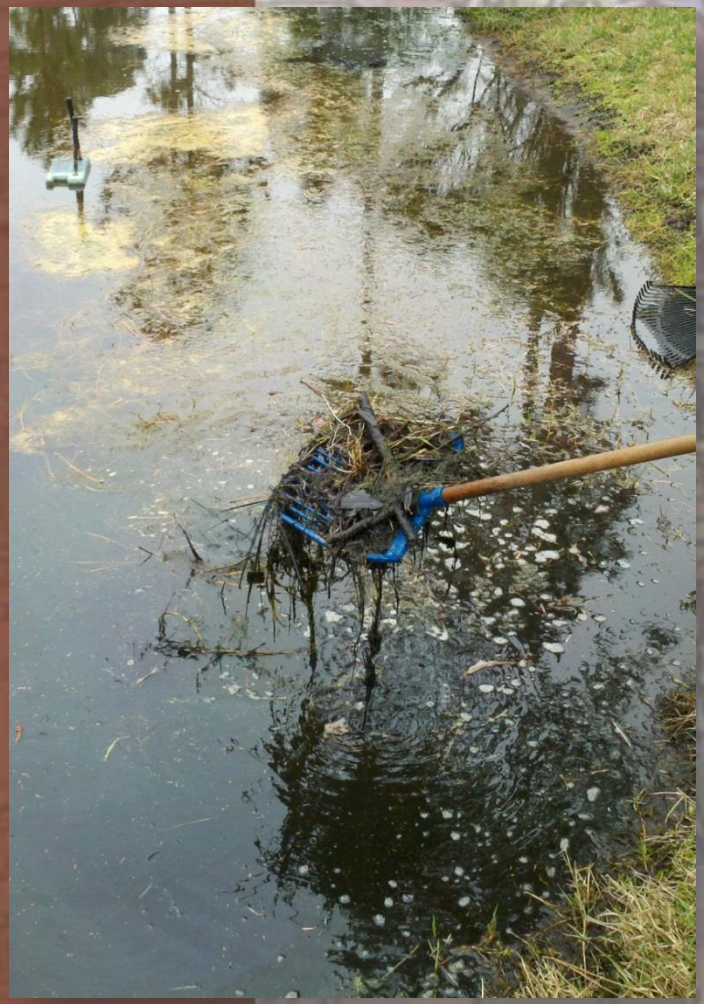
- Clippings & Leaf Drop
- Edge Zone Vegetation
- SAV (Submerged Aquatic Vegetation)
- Storm Water Quality
- Fertilizer Type & Application
- Conveyance Path to Lake

Aquatic - Biologic Sources :

- Sludge & Sediment – Benthic Zone
- Resident Organic Life
- Algae Growth & Decay
- Leaching via Soil Strata
- Bacterial Processing – Food Chain

Community Surface Water – Sustainability

Aquatic Nutrient Loading



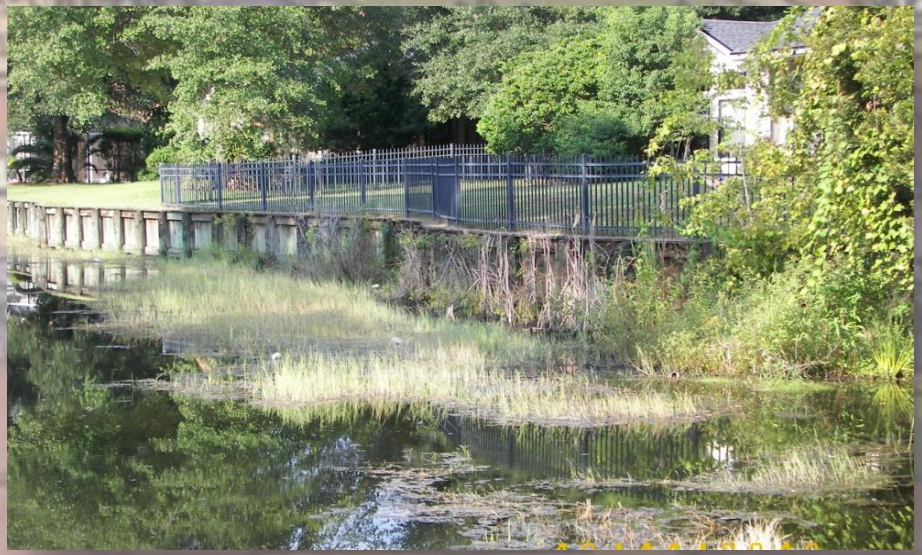
Annual Manual Removal

- Jan. 15th – Feb. 15th Ideal
- 2 workers = 800 to 1,200 l.f./hr.
- Split Responsibility - Frontage
- Golf Course by Force Account
- Golf Course by $ Contribution
- Common Areas by Landscape Management Contractor
- Residential Lot Frontage by :
  - Neighborhood/Unit HOA
  - Lot Owners
  - Aquatic Contractor
- Master Association Responsibility

Aquatic Nutrient Loading – Sediment & Benthic

Aquatic Treatments & Landscape Maintenance practices typically increase the rate of sludge & sedimentation.

Community Surface Water – Sedimentation Control & Treatment Systems



Community Surface Water

Aquatic Management - Treatment

Copper Sulfate: Temporary Cover-up

- Class I toxicity , Cu is a base metal element
- Leaches through sand and binds to sediment/clay
- Does not break down in environment
- Toxic to fish, snails, amphibians, Zooplankton,
- Kills beneficial microbes-normal pond Biology
- Disrupts cellular photosynthesis
- Algae strains are becoming resistant
- Dead Algae release nutrients to repeat cycle
- Allows Organic material to accumulate

Community Water Quality

Best Management Practices in Florida

- Storm Water Management Practices are outdated
- BMP's do not improve water quality
- BMP's do not address sediment reduction
- Commercial Treatment Practices treat symptoms

Ponds & Lakes - Best Management Practices : Materials

	Algaecide/Aquatic Herbacide	$ per Acre*	Trade Names
Active Treatment	Glyphosate	$300*	Roundup, Rodeo, AquaMaster, AquaPro
	Endothall	$650*	Aquathol K, Hydrothol 191
	2, 4-D	$300-600*	Navigate, Aquakleen
	Diquat	$300-400*	Reward
	Cu So 4	$85*	Copper, Komeen, Nautique
	Fluridone	$900-1000*	Sonar AS, WhiteCap SC
Reserve Treatment	Triclopyr-TEA	$875*	Renovate 3
	Imazapyr	$160-175	Habitat***
	Peroxygen**	$135**	GreenClean, Pak 27

Available Commercial Treatment Chemicals

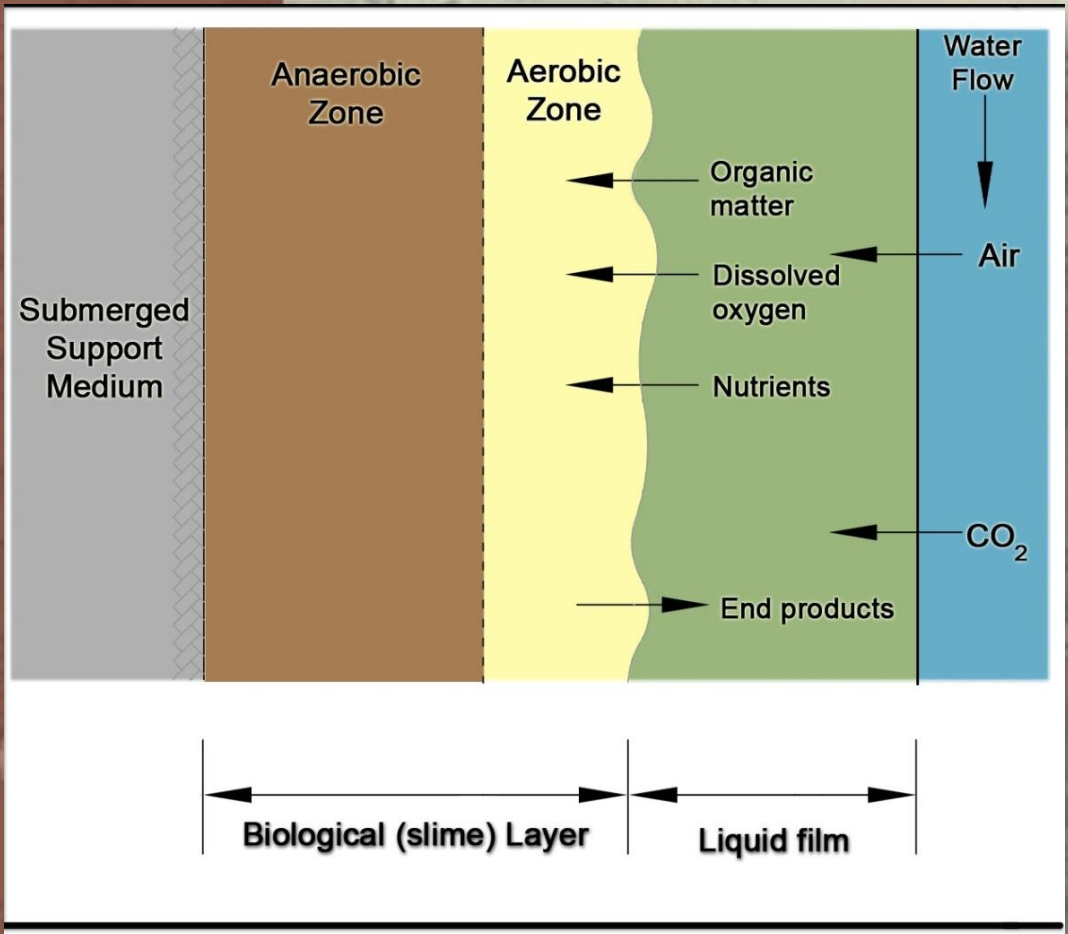
*Single treatment

** Needs weekly treatments to clear

*** 14 day draw down recommended for emergent littoral zone vegetation

Community Surface Water

Stormwater & Aquatic Management



Schematic diagram of attached-growth

Aquatic Bacteria Benefits

- Creates Bio-film
- Converts NPK
- Completes Carbon Cycle
- Completes Nitric Cycle
- Reduces Sedimentation

Secondary Benefits

- Pathogen Suppression
- Algae Suppression via competition
- Turbidity Reduction

Community Sustainability Programming & Management

Stormwater & Aquatic Management

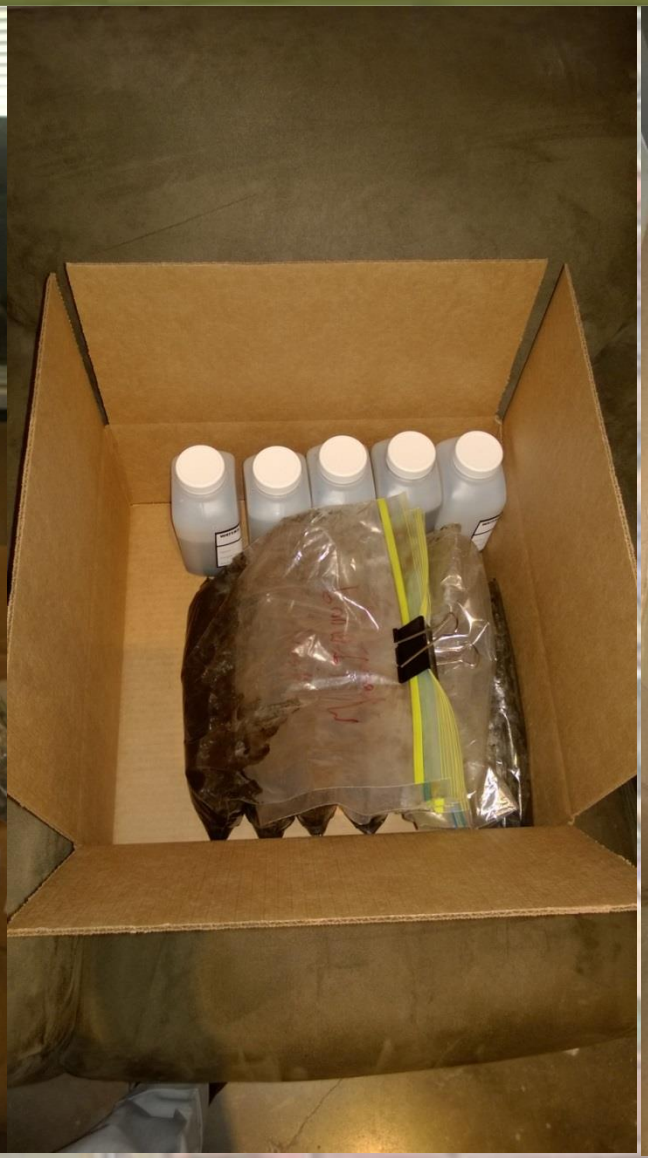
- Bacteria Dominant system vs Algae Dominance
- May be applied on a single drainage basin or Community Scale
- Bio-degradable (not heavy metals)
- Non-toxic, no application restrictions
- Causes algae to “off gas” cellular activity
- Loss of buoyancy causes algae to sink in water column
- Algae hydrolyzes on bottom with low light levels
- Introduce microbes to sediment layer & littoral zones
- Convert algae/nutrients
- NPK converted to cellular ATP & cellular proteins
- Move nutrients up food chain!

Deerwood Sustainable Community Programming & Management

Data Collection & Analysis – Field Sampling

Deerwood Sustainable Community Programming & Management

Data Collection & Analysis - Lab

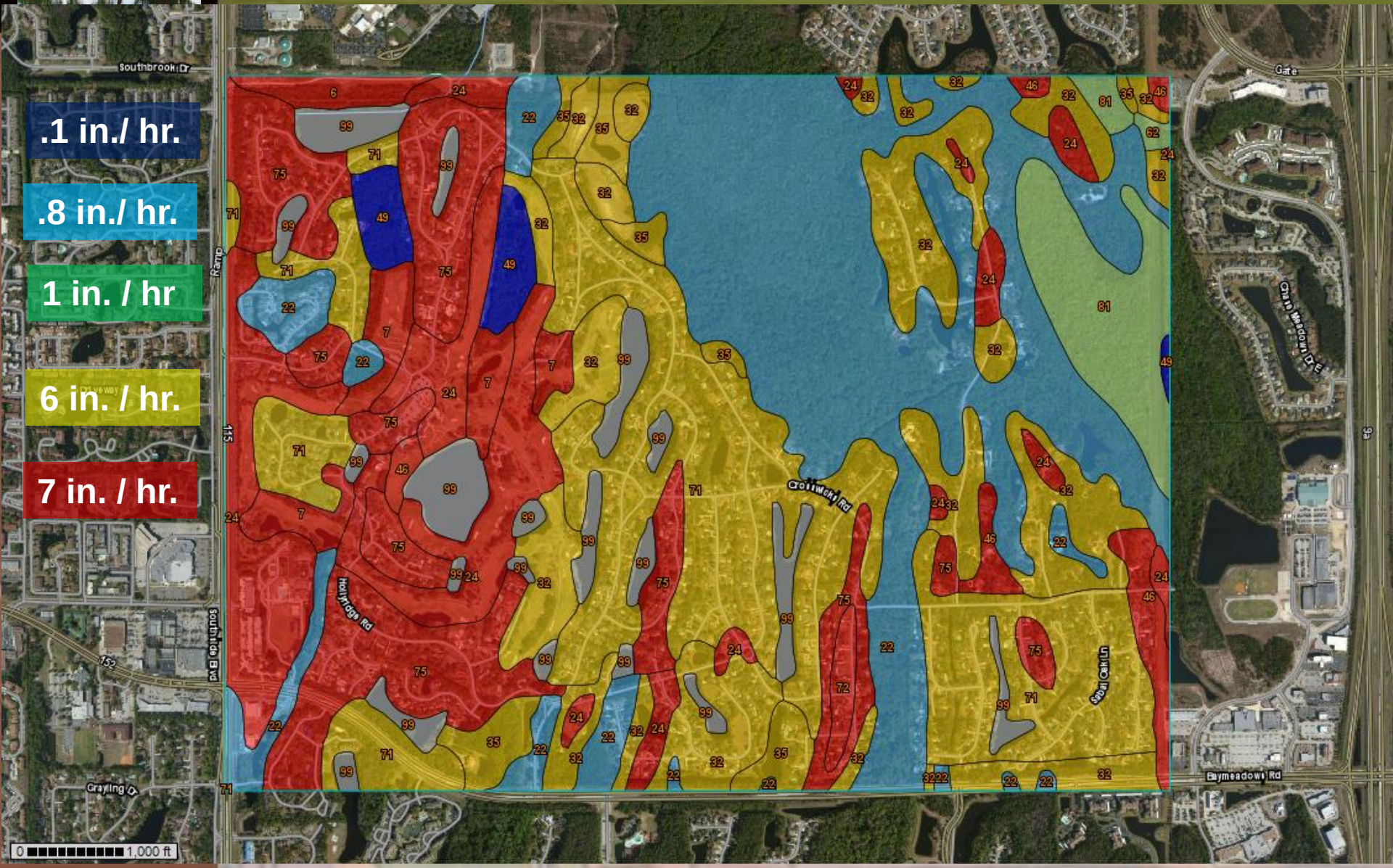


Deerwood Sustainable Community Programming & Management

Data Collection & Analysis – Soils & Hydrology

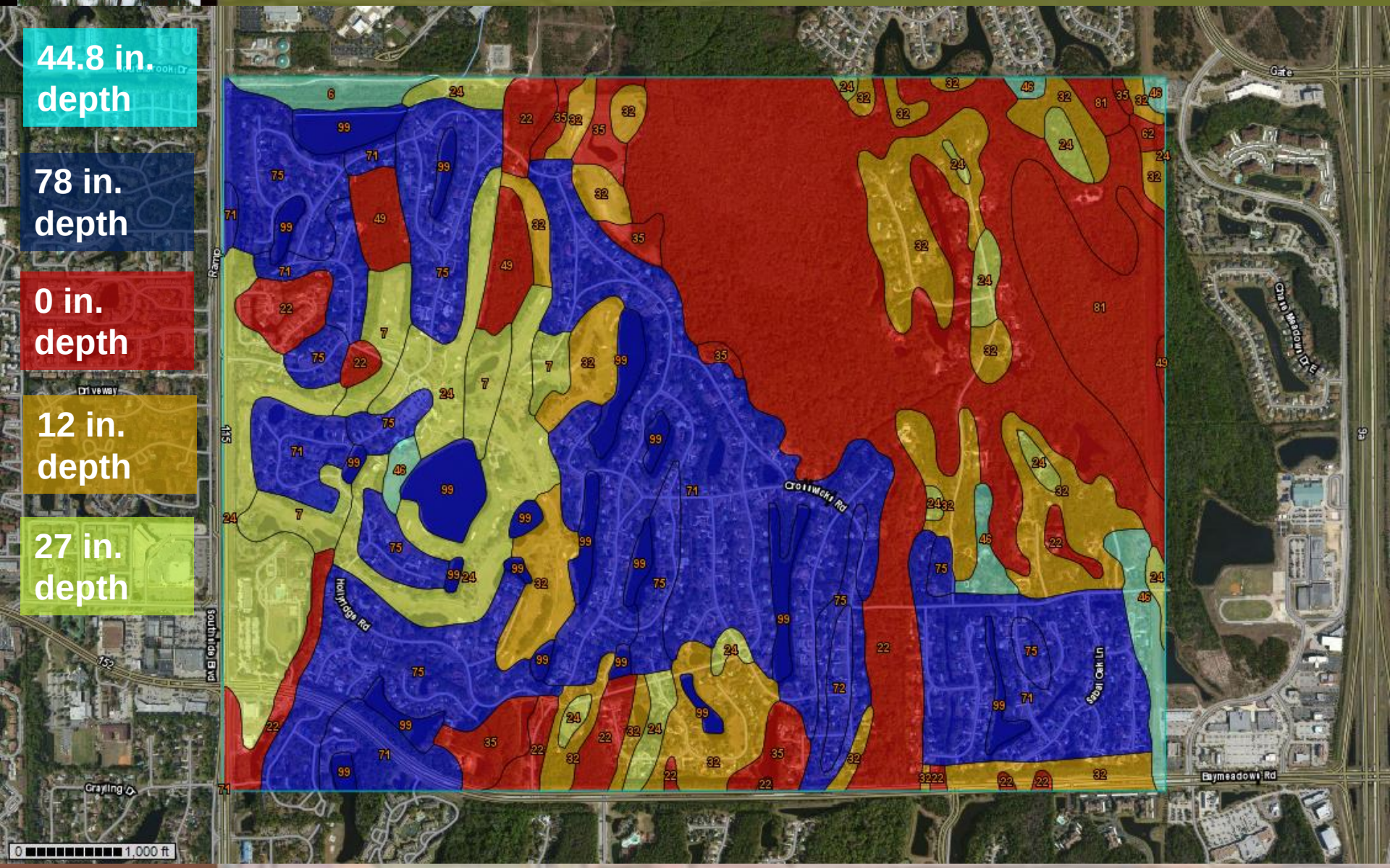
Deerwood Sustainable Community Programming & Management

Data Collection & Analysis – exfiltration rate



Deerwood Sustainable Community Programming & Management

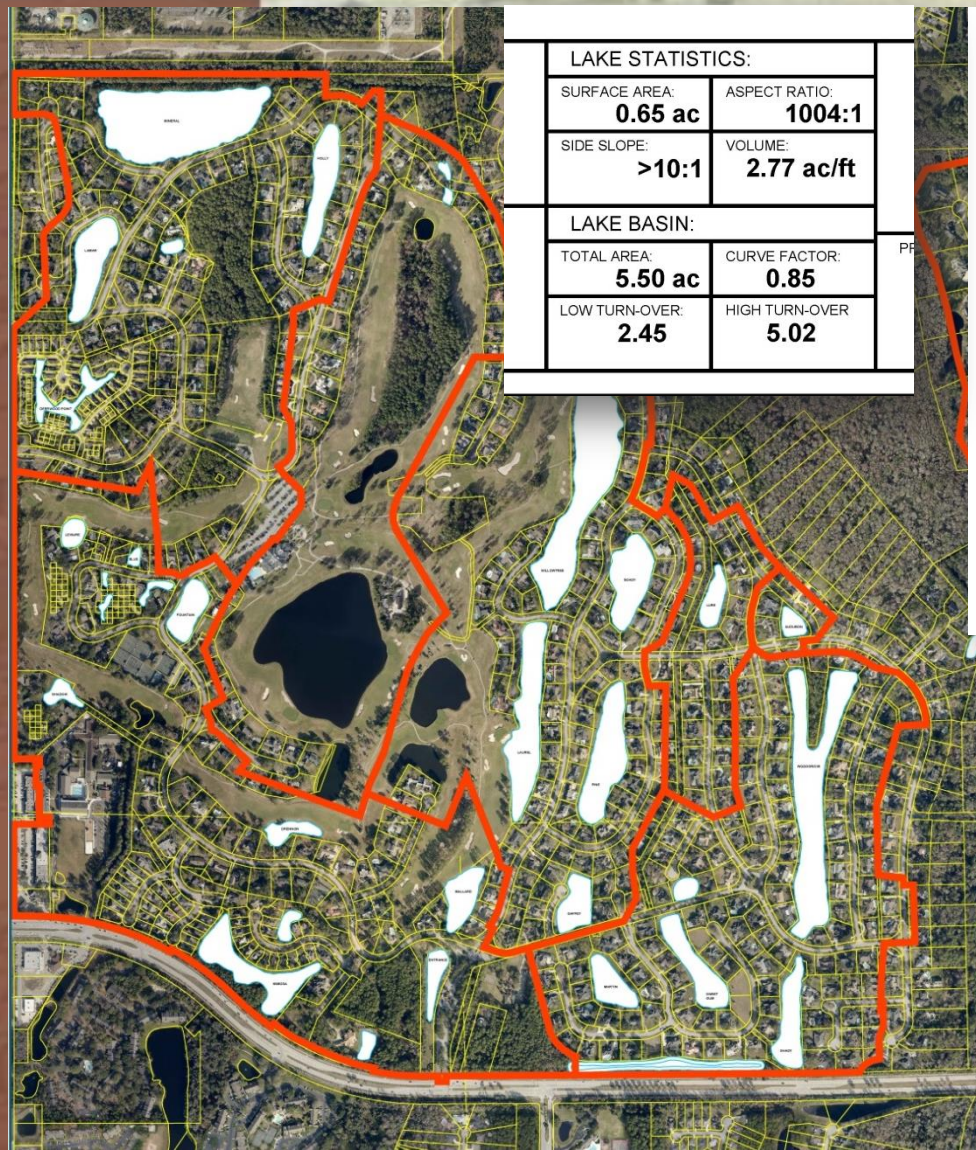
Data Collection & Analysis – Depth to Water

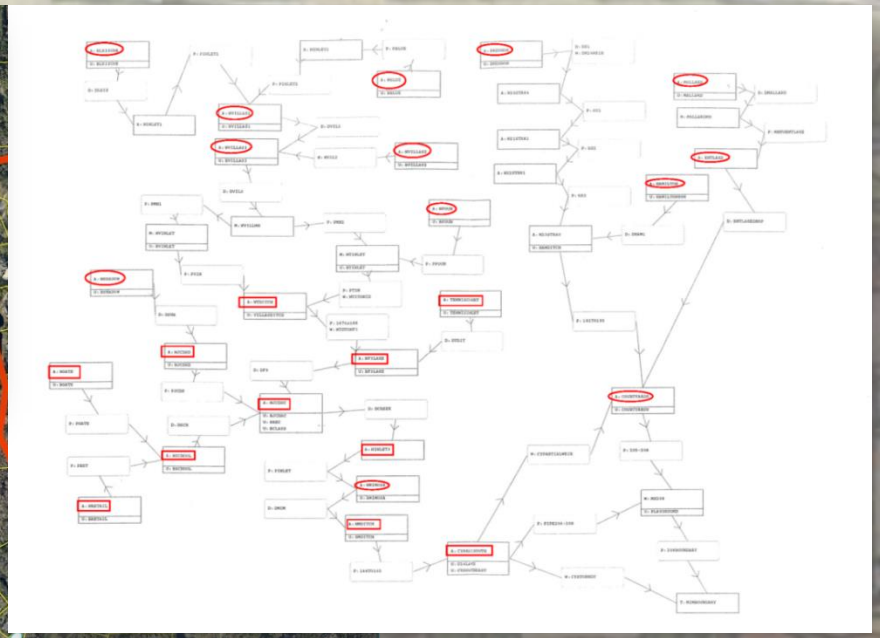


Deerwood Sustainable Community Programming & Management

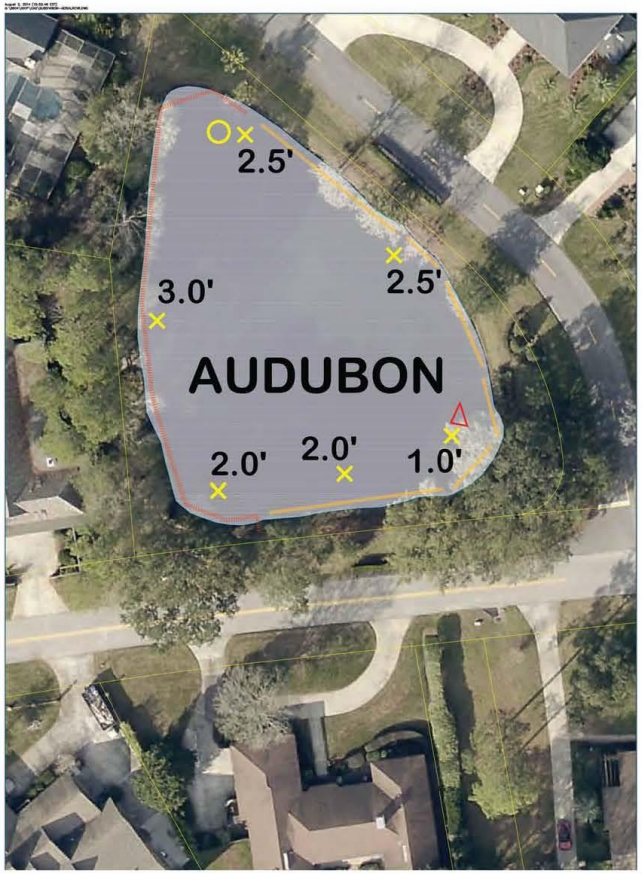
Data Collection & Analysis Mimosa Basin

LAKE STATISTICS:	
SURFACE AREA: 0.65 ac	ASPECT RATIO: 1004:1
SIDE SLOPE: >10:1	VOLUME: 2.77 ac/ft
LAKE BASIN:	
TOTAL AREA: 5.50 ac	CURVE FACTOR: 0.85
LOW TURN-OVER: 2.45	HIGH TURN-OVER 5.02



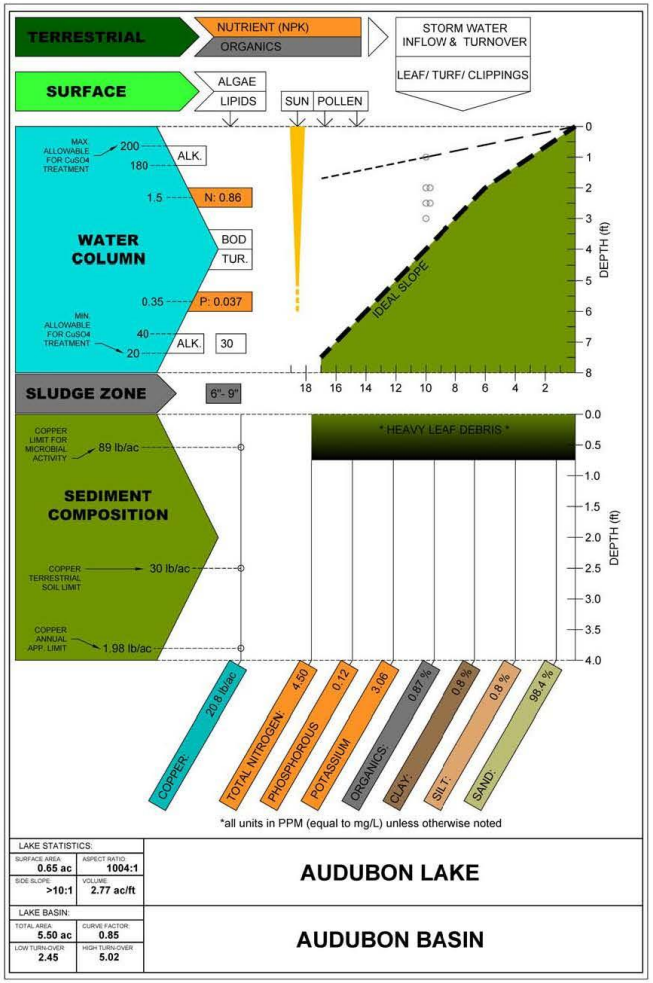


Data Collection & Analysis Audubon Lake



AUDOBON LAKE = D	
• Bulkhead addition • Slope excavate zones • Add clay layer • Add coquina shell	• Annual manual removal • Microbe program • Flocculant treatment (10 years)

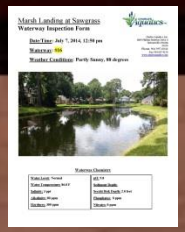
3.0' - SLOPE DEPTH CHECK POINT	- EXCAVATION ZONE
- SLUDGE SAMPLING POINT	- BULK HEAD INSTALLATION
- SEDIMENT SAMPLING POINT	- SPECIAL RECOMENDATION

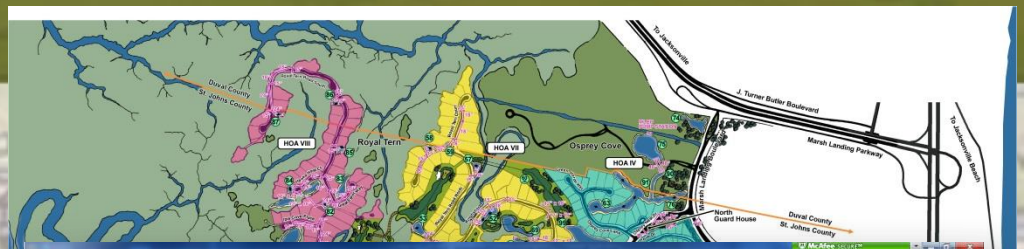


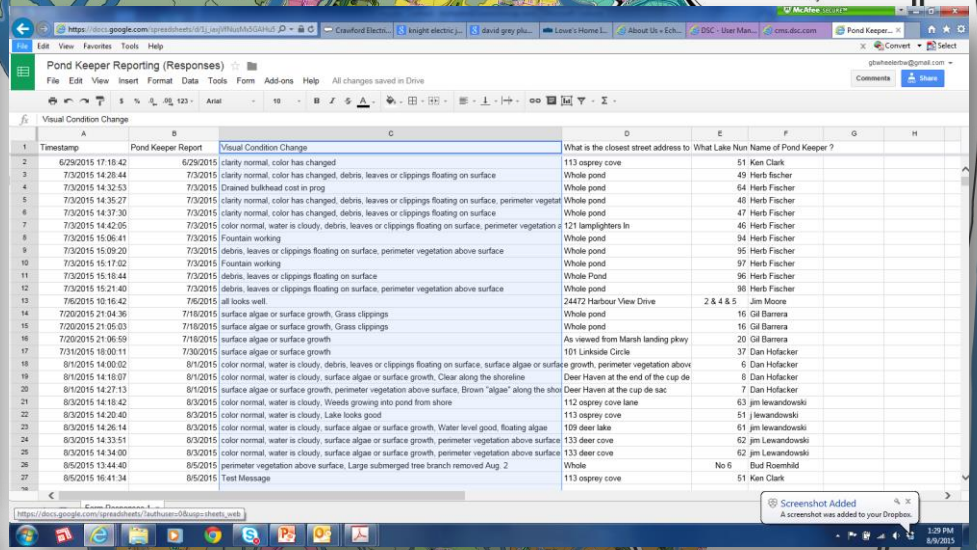
MARSH LANDING at Sawgrass

Marsh Landing Sustainable Community Program & Management

Treatment & Remediation Program



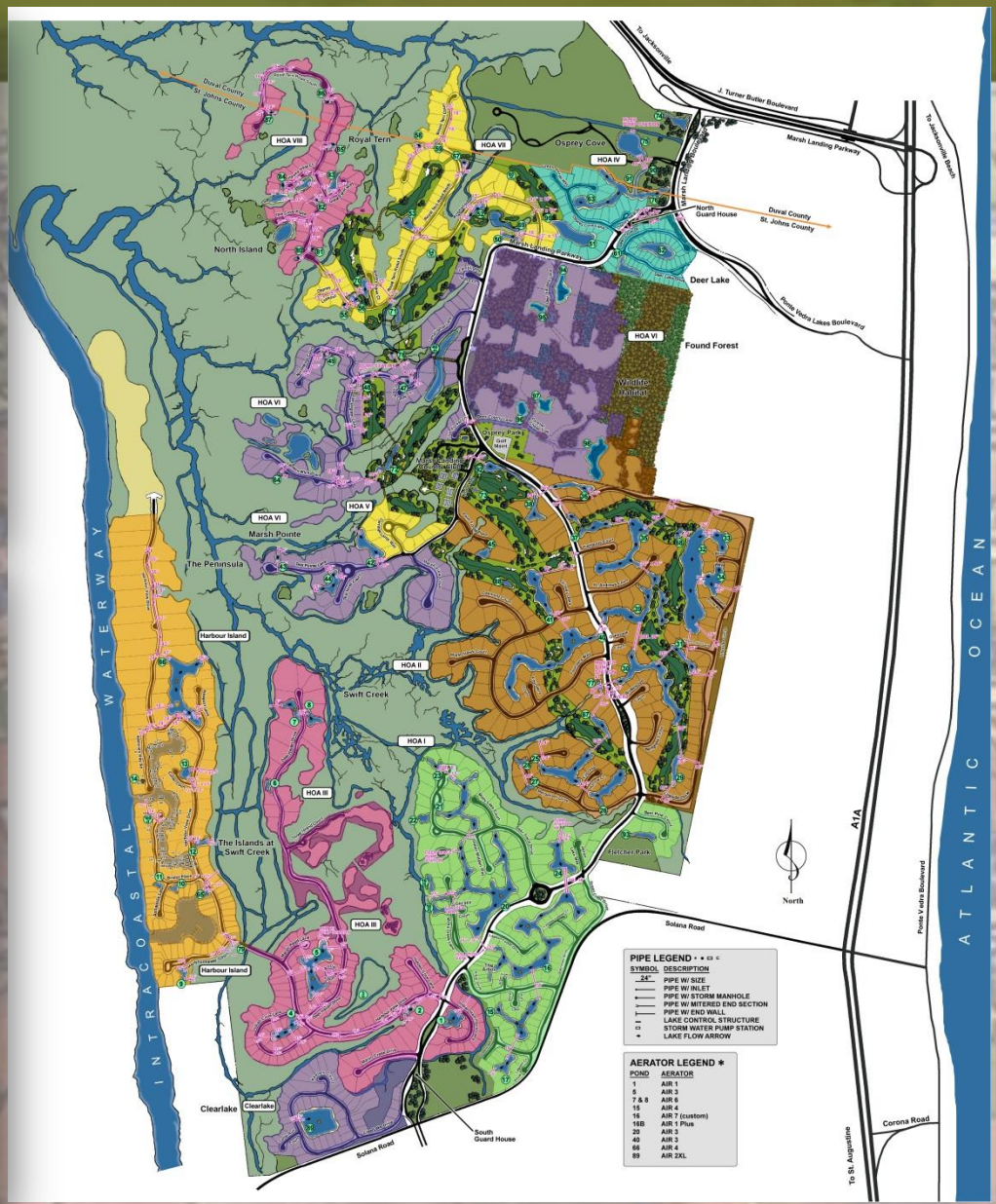


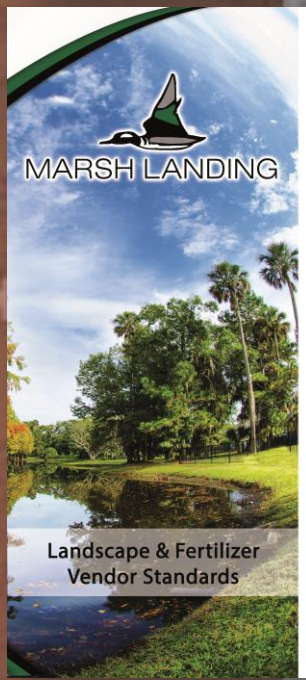


MARSH LANDING at Sawgrass

Marsh Landing Sustainable Community Program & Management

Resident & Vendor Education Program





As a commercial fertilizer/pesticide technician or lawn care specialist, many of you have noticed the many ponds that wind their way through Marsh Landing. What is not readily apparent is that these ponds have been under stress caused by excess pollutants in the form of fertilizer and yard waste entering the water. The most visible effect of this nutrient loading is algal blooms that lead to other serious issues within our pond system.

To address this growing problem, the Marsh Landing Master Association has established community landscape and fertilizer standards for residents and vendors. Your compliance is essential to the success of our enhanced pond maintenance and rehabilitation project. This is especially important when working on properties adjacent to a pond.

To ensure compliance with these standards, a Pond Keeper program has been established to actively monitor the system of ponds within Marsh Landing. The responsibilities of the Pond Keeper volunteers include reporting issues with pond appearance and non-compliance with landscaping maintenance practices.

We ask that you take the time to become familiar with these standards and that you adhere to and comply with them. Your efforts will be greatly appreciated by all of our residents!

Landscape & Fertilizer Vendor Standards

- Do not allow grass clippings or any yard debris to fall into the ponds; any debris falling into the ponds must be promptly removed and disposed of properly.
- Do not dispose of or allow yard debris to fall into storm drains or yard drains.
- Do not apply Fertilizers, herbicides, or pesticides within ten feet of the water's edge.
- Do not allow fertilizers to remain on non-permeable surface such as driveways, roads, or sidewalks. Blow remaining fertilizer back onto the grass.
- Exercise caution when applying fertilizers or pesticides near storm drains or yard drains to ensure they are not introduced into the pond system.
- Do not place yard trash or tree debris next to the street. Marsh Landing rules prohibit the curbside placement of yard trash no earlier than Sunday.
- Landscape vendors must follow the adopted Model Ordinance for Florida-Friendly Fertilizer Use on Urban Landscapes http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/dep-fert-modelord.pdf
- Consider the use of Bio-fertilization practices utilizing non-chemical biochar and microbial soil inoculants as an alternative to conventional fertilization and pesticide protocol.

Community Water Quality

Best Management Practices in Florida

Florida's First DRI - Caballos del Mar

- The annual budget for herbicide, pesticide, & fertilizer for 114 acres of lakes, 80 acres of common area and 220 acres of golf turf is $1,200,000.

Community Surface Water Quality

Best Management Practices in Florida

- **Lawn & Vegetation Treatment is indiscriminate**
- **Lawn & Vegetation Treatment is also targeted**
- **Lawn & Vegetation Treatment is big business $$$**

Community Surface Water Quality

Best Management Practices in Florida

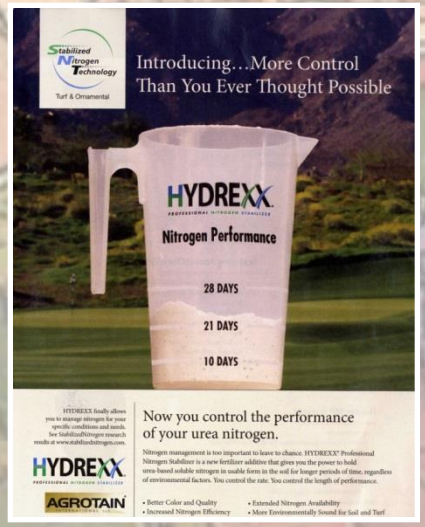
By Pieter Johnson, AP

A leg up: Nitrogen and phosphorous cause infections in tadpoles, resulting in deformities such as extra legs.

Report blames runoff for deformed frogs

The growing number of deformed frogs in recent years is caused at least partly by runoff from farming and ranching, new research indicates. Nitrogen and phosphorous in the runoff fuel lead to a parasitic infection of tadpoles, resulting in loss of legs, extra legs or other deformities, report researchers led by Pieter Johnson of the University of Colorado-Boulder, in the online edition of *Proceedings of the National Academy of Sciences*. The deformed frogs have been a puzzle for more than a decade, since a group of Minnesota children discovered a pond where more than half the leopard frogs had missing or extra limbs.

- **NPK fertilization methods exceed plant nutrient uptake**
- **Various "release" & control agents exist but have limits**
- **Water Resource Treatment Costs Big Public $$$ while attempts at consumer regulation are met with resistance**



Community Surface Water

Terrestrial + Stormwater + Aquatic Management

Community Surface Water

Terrestrial + Stormwater & Aquatic Management

Photosynthetic Micro-organisms + Nutrient Storage & Transfer = Bio-Fertilization

- The Old Collier Golf Course in Naples, FL is The First Audubon Gold Course
- Paspalum turf watered with Brackish water

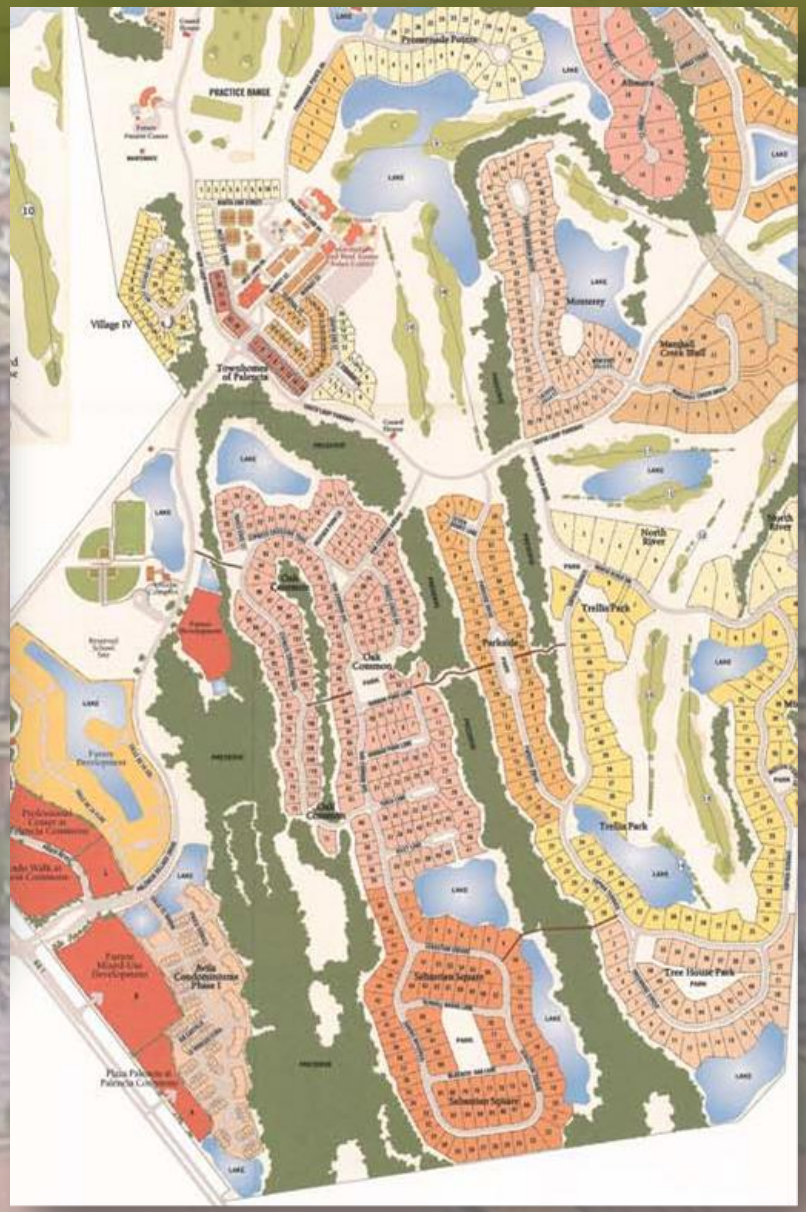
- Turf on the left is: "Control" USGA "best practice" @ 7-12 lbs. NPK / 1000 s.f. + H-P Protocols
- Turf on the right is: inoculated with photosynthetic bacteria + 1 lb. NPK / 1000 s.f. No Herbicide or Pesticide

Community Surface Water

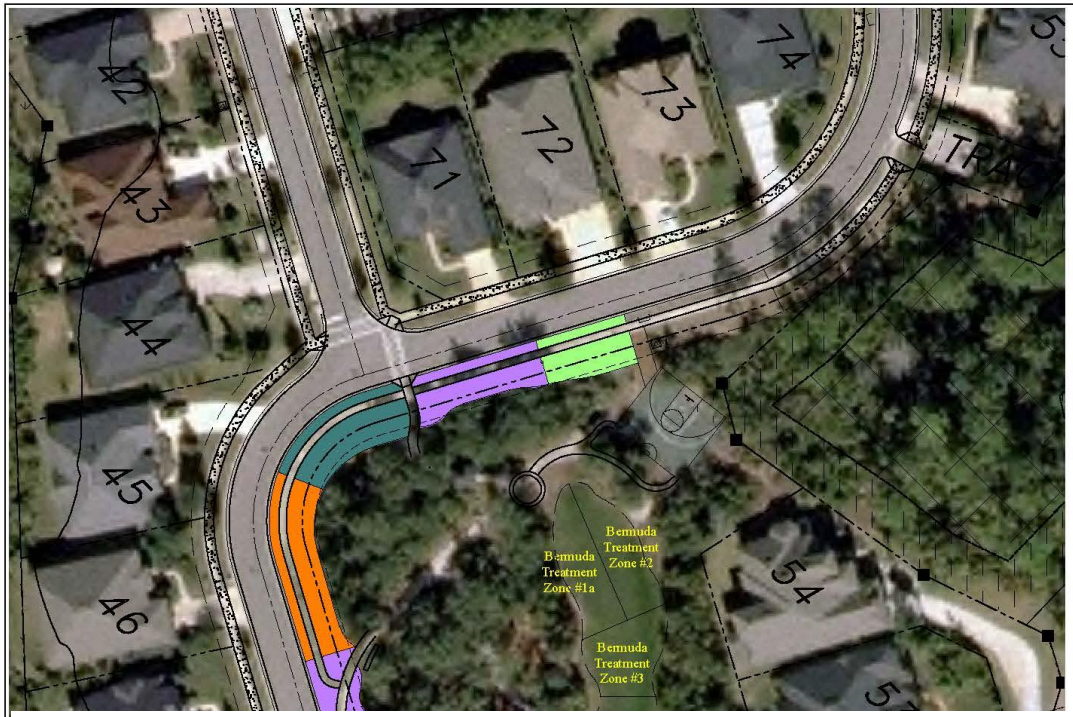
Stormwater & Aquatic Management

Photosynthetic Microbe Matrix + Nutrient Storage & Transfer = Bio-Fertilization

Community Sustainability Pilot
Palencia St. Augustine, Florida



Community Sustainability Pilot
Palencia St. Augustine, Florida



Community Sustainability Pilot Program

Oak Common St. Augustine Protocol:

Treatment Zone #1:
- One Bio-Char Application at .1 lbs per square foot
- Broadcast with Rake/Roller at installation
- Photosynthetic microbe matrix applied at a rate of 64 oz. / acre - dillution rate not to exceed 4 oz. / gal.
  - 2010 Application: Sept. 15, Oct. 15, Nov. 15
  - 2011 Application: Feb. 15, April 15, June 15
  - 2012 Application: April 15, Aug. 15
- Irrigation:
  - 2010 -- 100% Control
  - 2011 / 2012 -- 75% Control
- No fertilizer, no herbicide, no pre-emergent
- Spot treat with Nature's Avenger Weed Killer (or Approved Equal) as required.

Treatment Zone #2:
- One Application of Lignin-Glyserol 6% Solution at the rate of 40 gal. / acre
- ELI Photosynthetic microbe matrix applied at a rate of 64 oz. / acre - dillution rate not to exceed 4 oz. / gal.
  - 2010 Application: Sept. 15, Oct. 15
  - 2011 Application: April 15, July 15
  - 2012 Application: Apply one application of Osmocote Plus 15-9-12 Southern Stock 90330 fertilizer at rate of 2 lbs. per 1000 square ft.
- Irrigation:
  - Adjust to 75% of Control for 2011 and 2012
- No herbicide, pesticide
- Spot treat with Nature's Avenger Weed Killer (or Approved Equal) as required.

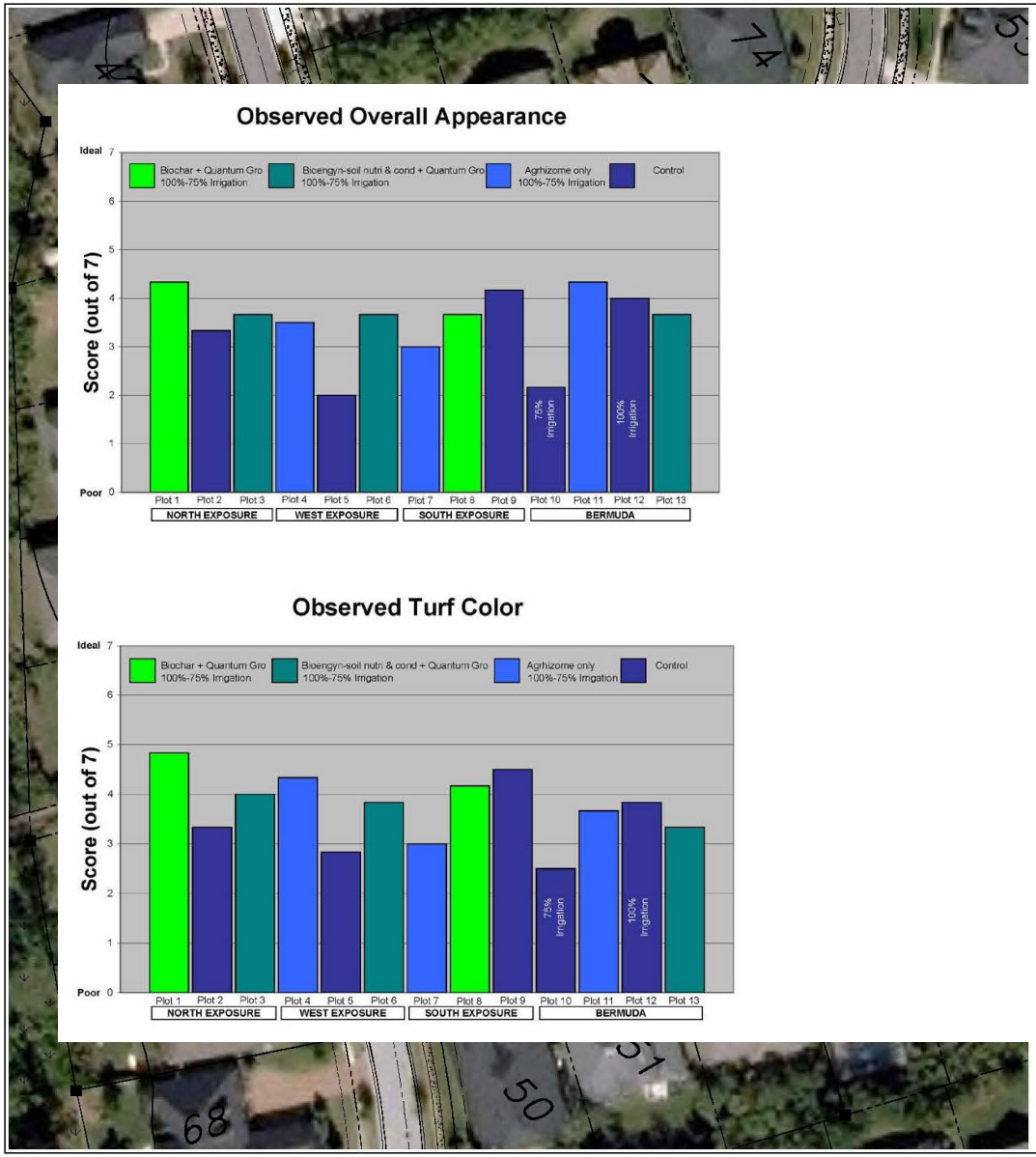
Treatment Zone #3:
- Similar to Treatment #2
- No Lignin-Glyserol
- Use Michigan State microbe matrix applied at a rate of 32 oz. / acre - dillution rate not to exceed 4 oz. / gal.
- No fertilizer

Treatment Zone #4:
- Control treatment to match existing Palencia turf treatment standards

Oak Common Amendment Volumes

	Area (sf)	Bio-Char App. Rate (lbs/sf)	Net Vol. Bio-Char (lbs)	Microbe App. Rate (oz/ac)	Vol. Microbes per Treatment (oz)	Number of Treatments	Net Vol. Microbes (oz)	Lignin-Glyserol 6% Sol. App. Rate (gal/ac)		Vol. Lignin-Glyserol per Treatment (gal)		Number of Treatments	Net Vol. Lignin-Glyserol (gal)		Fertilizer App. Rate (lbs/1000sf)	Vol. Fertilizer per Treatment (lbs)	Number of Treatments	Net Vol. Fertilizer (lbs)
								Lignin	Glyserol	Lignin	Glyserol		Lignin	Glyserol				
St. Augustine Turf																		
Treatment Zone #1	3016	0.1	301.6	64	4.4	8	35.4											
Treatment Zone #2	3172			64	4.7	4	18.6	40	40	0.2	0.2	1	0.2	0.2	2	6.3	1	6.3
Treatment Zone #3	3162			32	2.3	4	9.3											
Treatment Zone #4	3173																	
Bermuda Turf																		
Treatment Zone #1a	1512																	
Treatment Zone #1b	1512																	
Treatment Zone #2	1512			64	2.2	4	8.9	40	40	0.1	0.1	1	0.1	0.1	2	3.0	1	3.0
Treatment Zone #3	1512			32	1.1	4	4.4											
Bioswales																		
	1728	0.2	345.6	64	2.5	8	20.3											
Total:			**647.2**										**0.3**	**0.3**				**9.4**

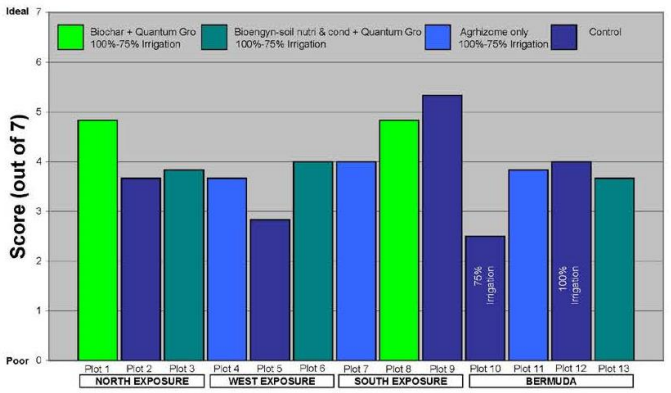
Community Sustainability Pilot
Palencia St. Augustine, Florida



Community Sustainability Pilot Program

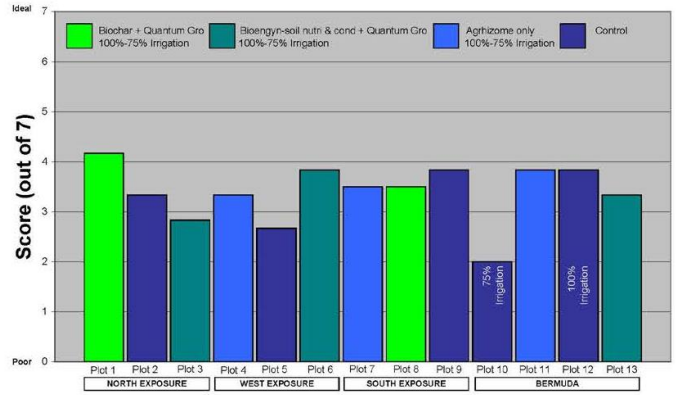
Observed Overall Appearance

Obeserved Growth Consistancy



Observed Turf Color

Observed Turf Hardiness



Oak Common Turf Treatment Protocols

PALENCIA
A Story of Discovery, Exploration, and Settlement

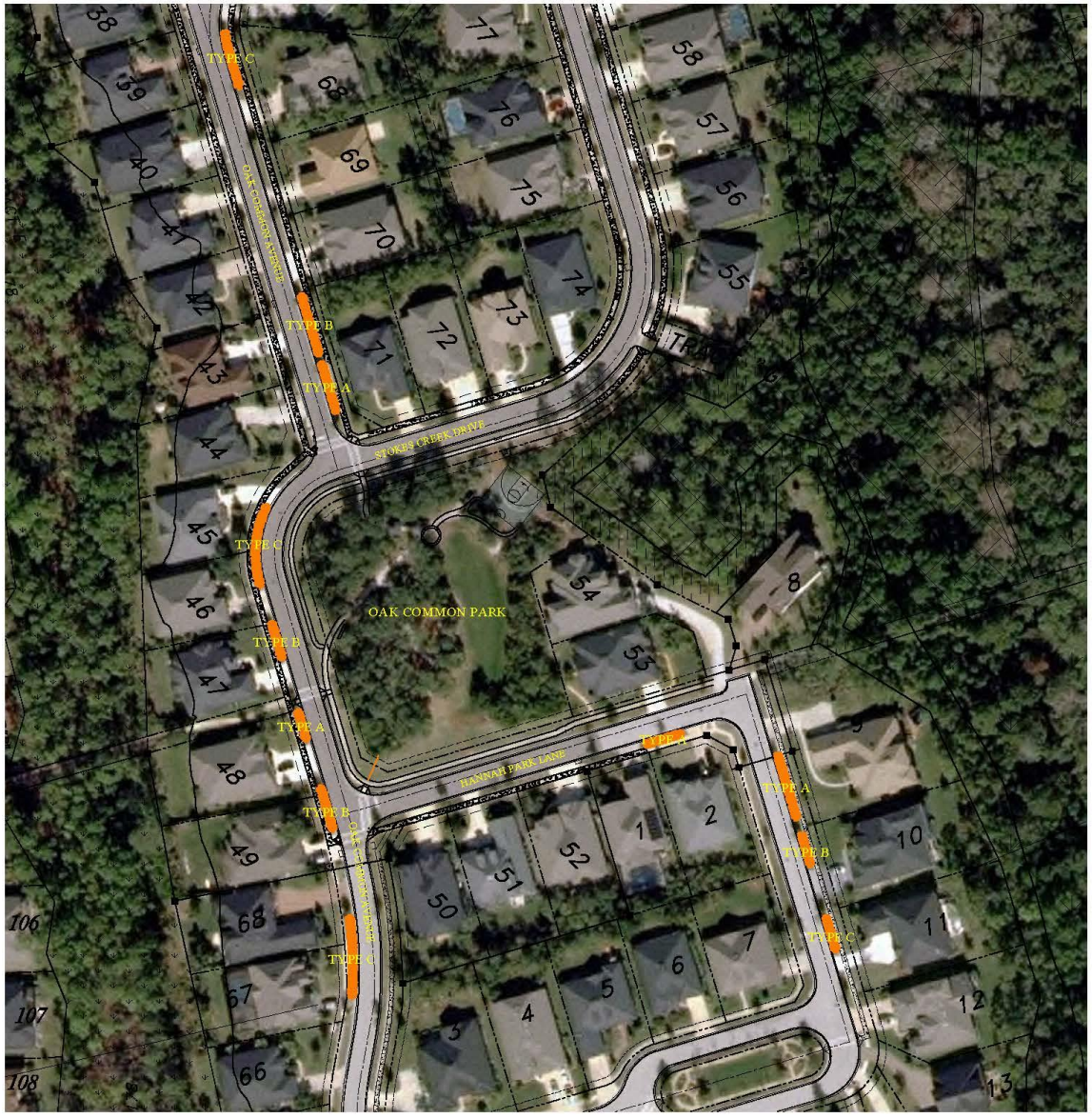
DATE: 06/01/10

0 30' 60'
SCALE IN FEET

NORTH

GENESIS GROUP
Engineering • Landscape Architecture • Planning • Survey • GIS

Community Sustainability Pilot
Palencia St. Augustine, Florida



Community Sustainability Pilot Program

BioSwale {Photos}

Typical Before Condition

Bioswale Landscape Installation

Typical Completed Bioswale – 60 Days After Planting

Proposed Bioswale Locations

PALENCIA
A Story of Discovery, Exploration, and Settlement

DATE: 06/11/10

0 50' 100'
SCALE IN FEET

NORTH

GENESIS GROUP
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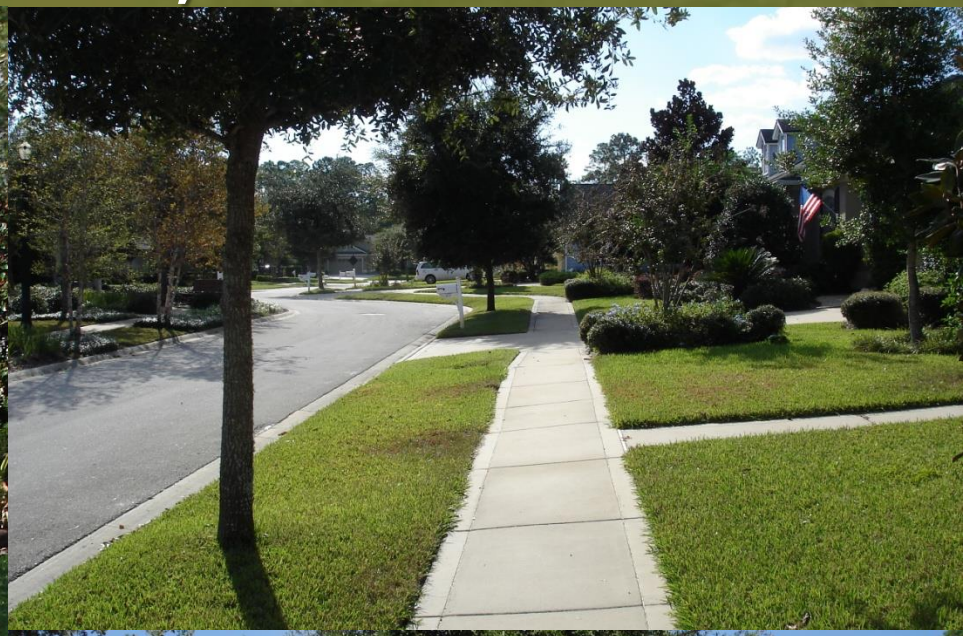
Community Sustainability Pilot

Palencia St. Augustine, Florida



Community Sustainability Pilot
Palencia St. Augustine, Florida

Community Sustainability Pilot Program

PALENCIA COMMUNITY - Terrestrial Management Using Bioswales

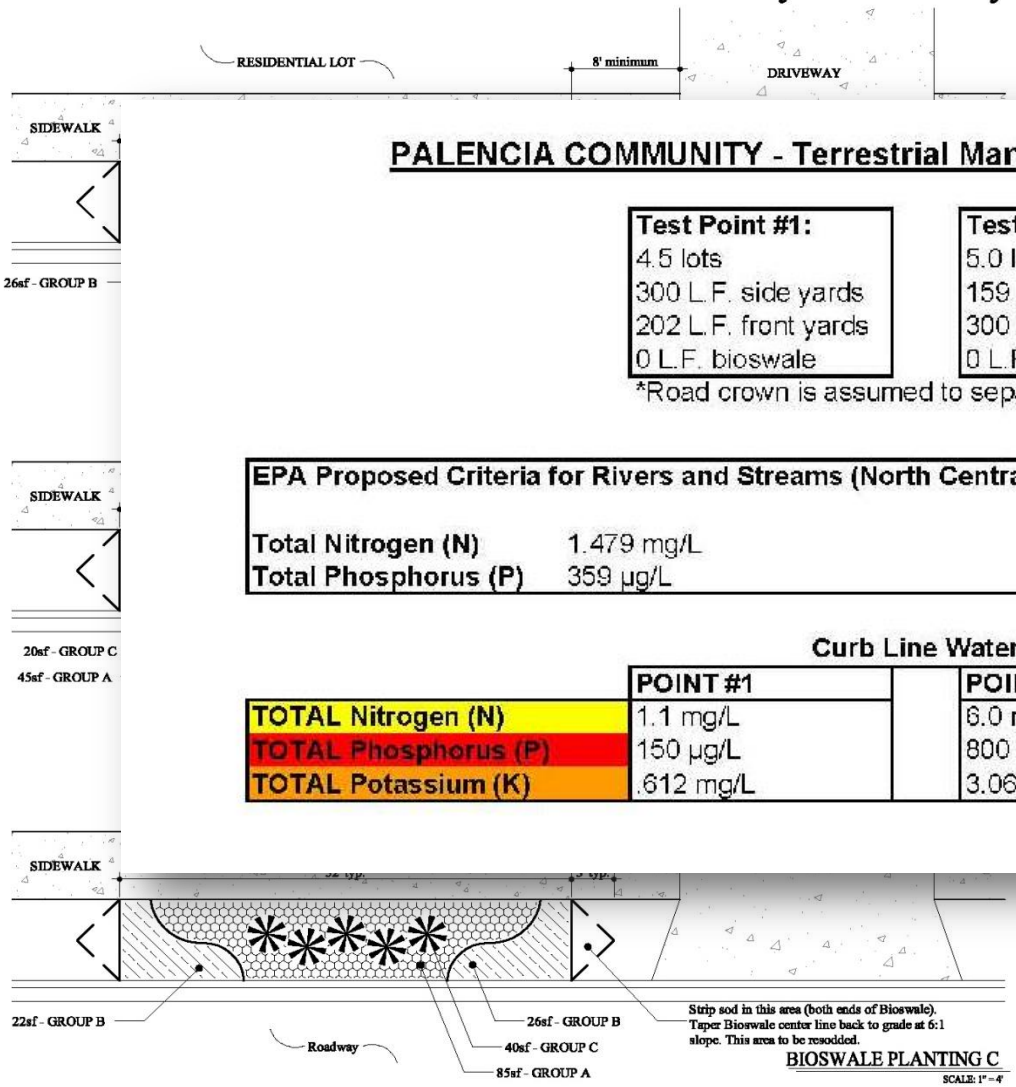
Test Point #1:	Test Point #2:	Test Point #3:
4.5 lots	5.0 lots	7.0 lots
300 L.F. side yards	159 L.F. side yards	0 L.F. side yards
202 L.F. front yards	300 L.F. Front yards	495 L.F. front yards
0 L.F. bioswale	0 L.F. bioswales	266 L.F. bioswales

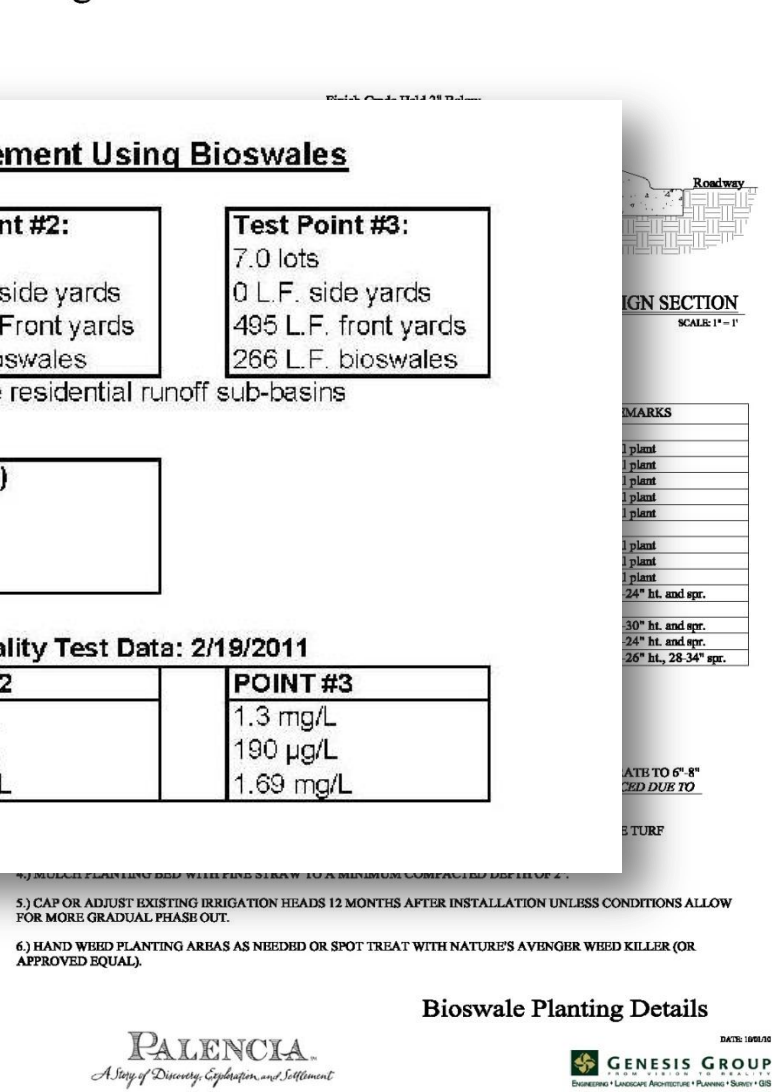
*Road crown is assumed to separate residential runoff sub-basins

EPA Proposed Criteria for Rivers and Streams (North Central FL)	
Total Nitrogen (N)	1.479 mg/L
Total Phosphorus (P)	359 µg/L

Curb Line Water Quality Test Data: 2/19/2011

	POINT #1	POINT #2	POINT #3
TOTAL Nitrogen (N)	1.1 mg/L	6.0 mg/L	1.3 mg/L
TOTAL Phosphorus (P)	150 µg/L	800 µg/L	190 µg/L
TOTAL Potassium (K)	.612 mg/L	3.06 mg/L	1.69 mg/L

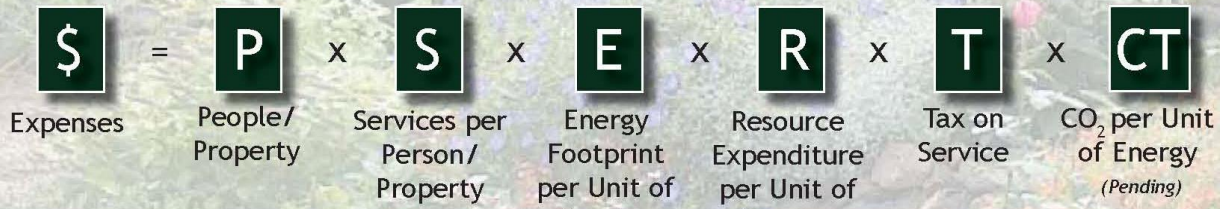




Sustainable Community Programming & Management

Best Management Practices

Community Sustainability Expense Formula



Saves CDD/HOA/Residents Unproductive Aquatic/Terrestrial Expenses

Conserves Energy Usage & Associated Material & Labor Expense

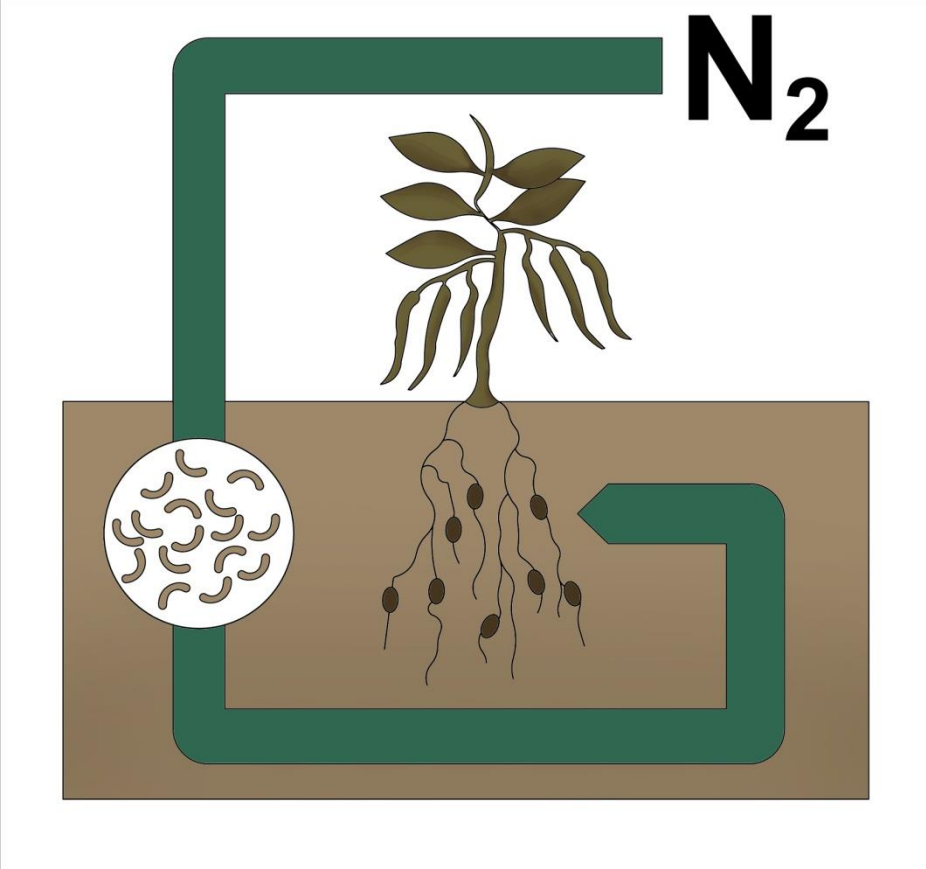
Reduces Health Risks to Residents, Recreational Users, Workers

Improves Landscape Resilience & Environmental Balance over time

Reduces Major Repair Reserves related to Landscape/Irrigation/Sediment

Provides Solutions to New Environmental Regulations & Restrictions

Overview – Photosynthetic Micro-organisms



Primary Benefits

1. Nitrogen Fixation
2. Oxygen Release
3. Carbon Sequestration
4. Nutrient Transformation
5. Bio-films at root zone

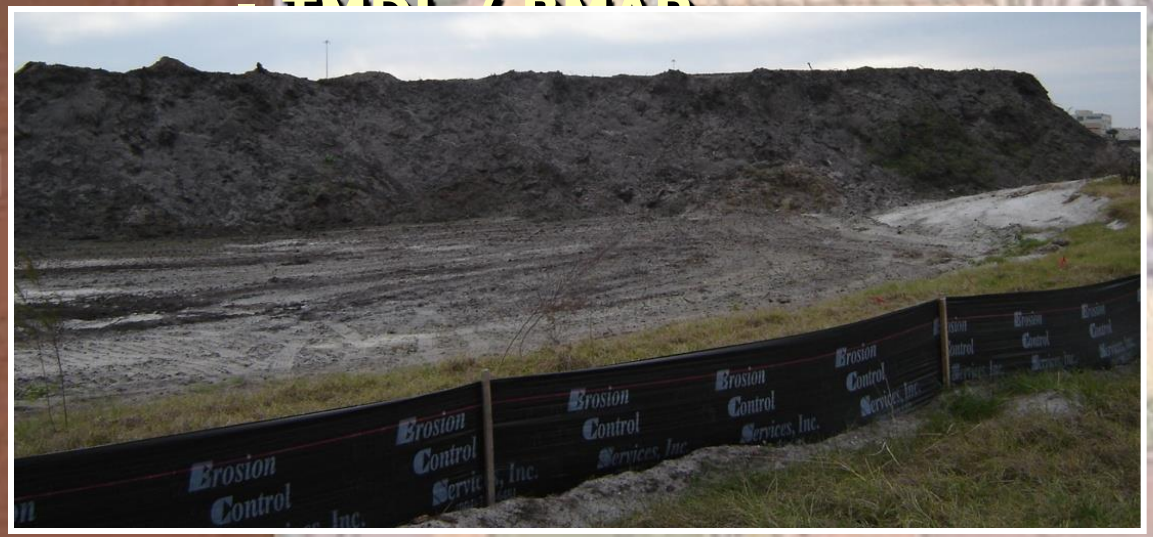
Secondary Benefits

6. Pathogen Suppression
7. Fertilizer Elimination
8. Irrigation Reduction

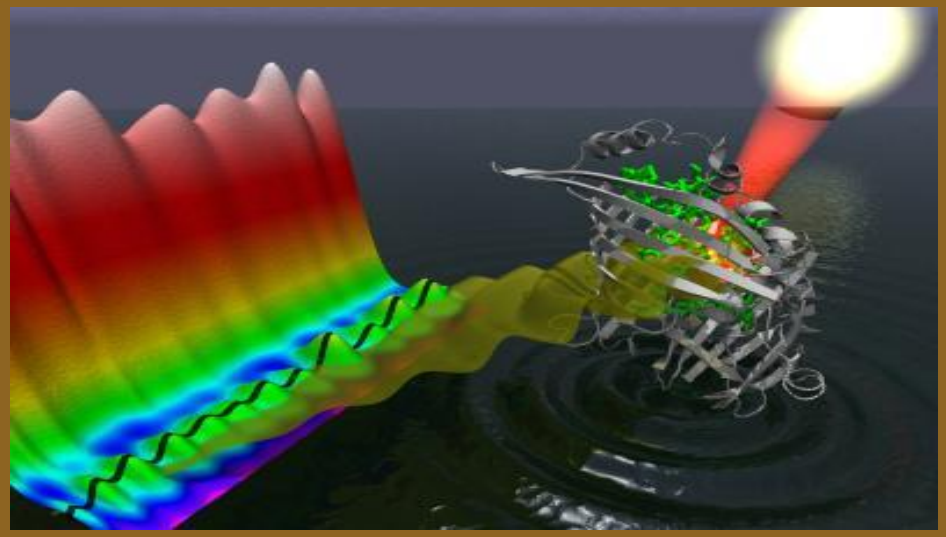
Community Surface Water

Retrofit Techniques: Building Healthy Soil

- Reduced fertilizer needs
- Enhanced water retention
- Bio-diverse soil profile
- Reduced nutrient loading
- Erosion control

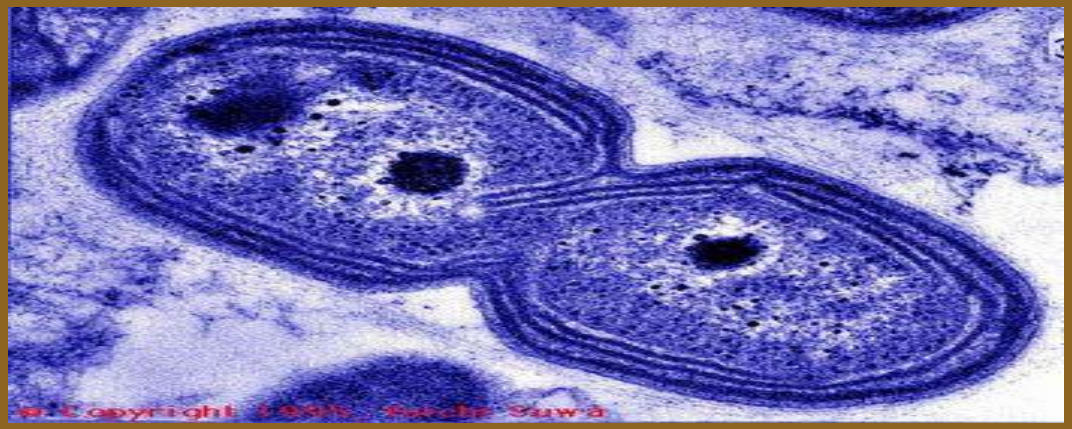


Photosynthetic Micro-organisms = Light to Energy



- Micro-organism absorbing a photon @ 95% efficiency.
- Applied Physics
- Plants require energy, not just food.
- Bio-remediation requires energy at many levels.

Photosynthetic Micro-organisms = Reproduction



- Reproduction via Mitosis is a significant benefit.
- The microorganisms double in population approximately every five minutes.
- Many pathogens double in population every 48 to 72 hours.
- Photosynthetic microorganisms and pathogens desire the same growing conditions. Many times, photosynthetic microorganisms prevail which eliminates the need for Herbicides & Pesticides.

Photosynthetic Micro-organisms = Nutrient Transfer & Storage

- These microorganisms consume organic pollutants, CO_2 and atmospheric nitrogen.
- The microorganisms degrade and aid in detoxifying many pollutants.
- The microorganisms store CO_2 and nitrogen in the form of sugar , ATP and protein.
- Photosynthetic microorganisms are the foundation of a natural food chain.

Photosynthetic Micro-organisms = Nutrient Transfer & Storage

Rhodospirillum rubum

“Purple Sulfur Photosynthetic Bacteria

Have been unequivocally established as Nitrogen fixing organisms.”

E.E.Lindstrom PhD

Study funded by The Rockefeller Foundation and the United States Atomic Energy Commission. Data provided by The University of Wisconsin. Nitrogen fixation, Confirmed via: Kjeldahl and Radioactive Isotope Assays

Photosynthetic Micro-organisms = Oxygen Release & Carbon Sequestration

Rhodospirillum rubum

"Purple Sulfur Photosynthetic Bacteria constitute a group of versatile organisms, that can grow as photoheterotrophs or photoautotrophs, chemoheterotrophs - switching from one mode to another, dependant on conditions."

Bacteriology 102

"Photosynthetic bacteria

are known to carry out the reaction:

$2H_2 + CO_2 (CH_2O) + H_2O$

$CO_2 + 2H_2O = CH_2O + H_2O + O_2$"

John Lindstrom PhD

Photosynthetic Micro-organisms + Nutrient Storage & Transfer = Bio-Fertilization

0 ppm 40 ppm 80 ppm 0 ppm 40 ppm 80 ppm

Nitrogen Only (N)

N + Photosynthetic Microorganisms

Photosynthetic Micro-organisms + Nutrient Storage & Transfer = Bio-Fertilization

- Seedlings treated at a commercial nursery in Georgia.
- Seedling on right treated with photosynthetic microorganisms.
- The visual evidence would indicate root mass increase on photosynthetic microorganism treated tree is greater than 50%
- Numerical quantification and qualification of these effects are being validated at Auburn University, and North Carolina State University.

Photosynthetic Micro-organisms = Pathogen Suppression

Gause's Law of Competitive Exclusion

"Two species competing for the same resources, can not stably coexist. Either of the two competitors will always take over the other, which leads to the extinction of one of the competitors."

G.F. Gause, M.D.

Nematode Population

Control	December	February	March	April	May	June
Spiral	1069	0	0	0	839	989
Lance	53	117	113	149	54	146
Sting	0	11	12	38	61	5
Root knot	0	0	0	0	0	0
Ring	0	0	0	0	0	142
Sheathoid	0	0	0	0	0	239
Stubby root	0	133	68	163	106	11

Photosynthetic Micro-organisms = Pathogen Suppression

The Old Collier Golf Course Assays provided by Dr. Crow, University of Florida

Control – Std. Treatment	December	February	March	April	May	June
Spiral	1069	0	0	0	839	989
Lance	53	117	113	149	54	146
Sting	0	11	12	38	61	5
Root knot	0	0	0	0	0	0
Ring	0	0	0	0	0	142
Sheathoid	0	0	0	0	0	239
Stubby root	0	133	68	163	106	11

Photosynthetic Microorganisms only	December	February	March	April	May	June
Spiral	1069	0	0	0	922	1195
Lance	53	0	0	0	0	0
Sting	0	0	26	0	15	0
Root knot	0	0	0	0	0	0
Ring	0	0	0	0	0	63
Sheathoid	0	0	0	0	0	296
Stubby root	0	0	49	0	0	0

Photosynthetic Micro-organisms
Soybean Crop Tissue Analysis

Acres Research, Inc.

PLANT ANALYSIS

SAMPLE ID	REPORT OF ANALYSIS-PERCENT							REPORT OF ANALYSIS - PARTS PER MILLION					
	N NITRO-GEN	P PHOS-PHORUS	K POTAS-SIUM	Mg MAG-NESIUM	Ca CALCIUM	S SULFUR	Na SODIUM	Fe IRON	Mn MANGA-NESE	B BORON	Cu COPPER	Zn ZINC	
200946-101	6.50	0.45	2.38	0.58	1.39	0.43	0.006	178	69	64	21	62	
BEANS-2	E	H-E	H	H-E	H	H-E	S	H-E	H	E	E	E	
3111802 NORMS	4.40	0.32	1.87	0.42	1.02	0.30	0.017	80	49	35	11	33	
200946-102	7.08	0.51	2.62	0.57	1.25	0.46	0.004	215	98	55	17	57	
BEANS-2	E	E	H-E	H-E	S-H	H-E	S	E	E	H-E	H-E	E	
3111803 NORMS	4.40	0.32	1.87	0.42	1.02	0.30	0.017	80	49	35	11	33	
200946-103	6.89	0.50	2.50	0.60	1.20	0.47	0.003	322	71	62	15	54	
BEANS-2	E	E	H	H-E	S	H-E	S	E	H	E	H	E	
3111804 NORMS	4.40	0.32	1.87	0.42	1.02	0.30	0.017	80	49	35	11	33	

D or Deficient L or Low S or Sufficient H or High E or Excessive

Micro-organisms / Humic Matrix
General Crop Yield Analysis

Michigan State University

	Plant height(inches)			Chlorophyll content			Total yield(g)		
CROP	T1	T2	T3	T1	T2	T3	T1	T2	T3
CORN	90*	56.3	96.25*	40.3	33.8	47.4	384.9*	119	563*
SOYBEAN	38	40	42	42	40	47	71.2*	44.4	71*
GARDEN BEAN	83.3*	54.5	104*	39.6	35.2	46.13	299*	192.8	504.5*
TOMATO	31.5	31.2	42	42	34	47	400*	140	720*
CLOVER	23.2	18	23.7	43.1	37.3	46.7	133*	107	159*

MEAN OF 4 REPLICATIONS * significant, P = 0.022 Clover=Shoot biomass

T1 -> F2 with NPK 50% (20-20-20)

T2 -> NPK 50% (20-20-20)50% ©

T3 -> F2 ONLY

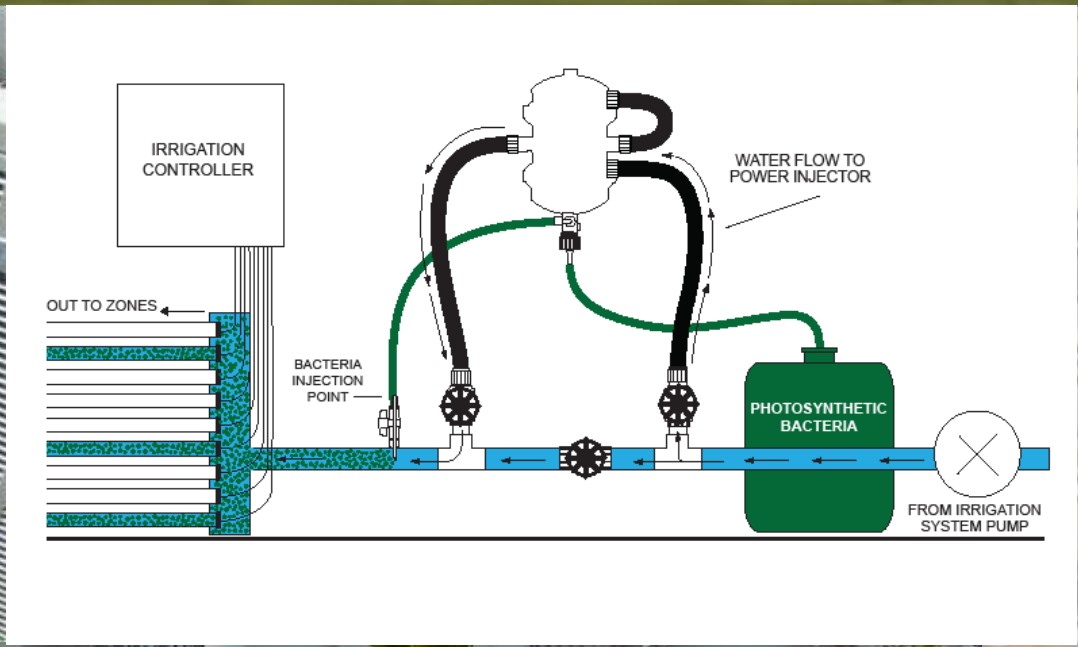
Photosynthetic Micro-organisms = Irrigation Reduction

The Vinca on the right was given water and photosynthetic bacteria. The Vinca on the left received just water.

(6 Days Later) With No additional water or photosynthetic microorganisms for either plant.

Community Water Quality

Microbial Inoculant Treatment – Suburban Retrofit



GENESIS GROUP

FROM VISION TO REALITY

Community Planning

Community Redevelopment

Urban Design

Landscape Architecture

Civil Engineering

Transportation Engineering

Applied Sciences

Market Economics