Vegetated Stormwater Treatment Areas (STAs)

By: Harvey H. Harper

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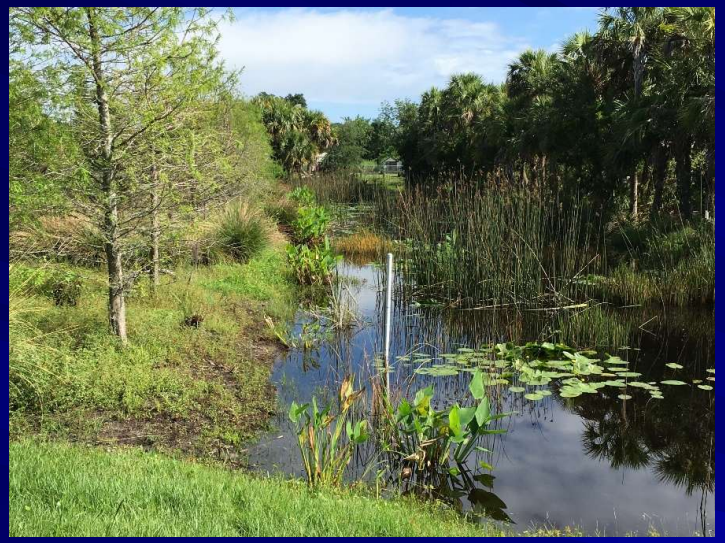
Vegetated Stormwater Treatment Areas



- Nutrient uptake occurs through 2 primary processes
  - Uptake through plant roots
  - Biological communities attached to plant stalks
- Typically add organic muck soils to aid plant growth
- Large evapo-transpiration losses reduce runoff volume

Vegetated Stormwater Treatment Areas – con't.

- Monitored 5 STA systems
  - Each imported muck soils to increase plant growth
- All exhibited net loss of runoff volume, but nutrient concentrations increased between inflow and outflow
- Mass removal effectiveness
  - 1 site had a net removal of TN but exported TP
  - 2 sites had net export of both TN and TP
  - 2 sites had net retention of TN and TP
    - TN ~ 25%
    - TP ~ 45%

- Organic soils released both TN and TP in excess of plant uptake
- Vegetated STAs should be constructed without supplemental organic soils

Vegetated Stormwater Treatment Areas – cont.

~ 1 yr.

- Runoff concentrations increased during movement through STA for:
  - Total N
  - SRP and total P
  - Color
- ERD has conducted long term monitoring for 4 different STAs
  - None exhibited significant nutrient removal
  - 3 of the 4 sites had a net export of TP
  - 2 of the 4 sites had a net export of TN
- Organic soils are releasing large amounts of nutrients which exceed uptake mechanisms by vegetation

Parameter	Mass Export (%)
NOx	78
Particulate N	75
Total N	3
SRP	3
Particulate P	98
Total P	16
TSS	316

STA Recommendations

- Eliminate import of organic soils
- Vegetation will grow on existing soils
  - Slower rate
  - Longer time required to reach complete coverage

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