



STORMWATER TREATMENT AREAS: Applied Studies and Evaluations

**Technical Oversight Committee Update
September 14, 2011**

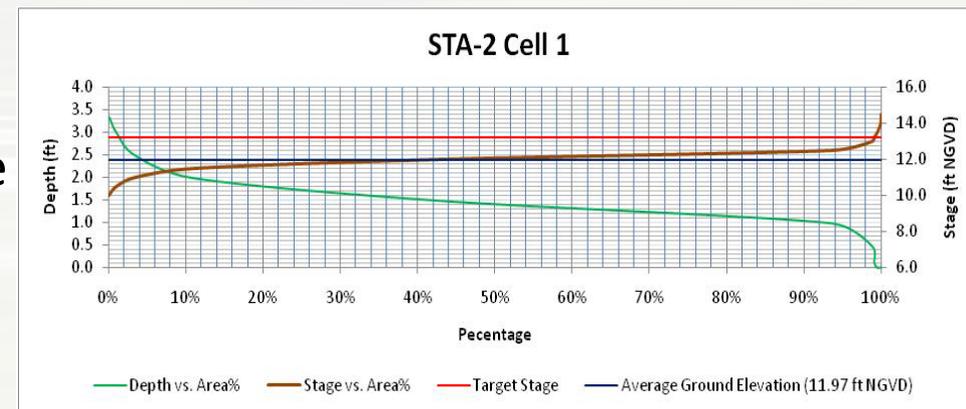
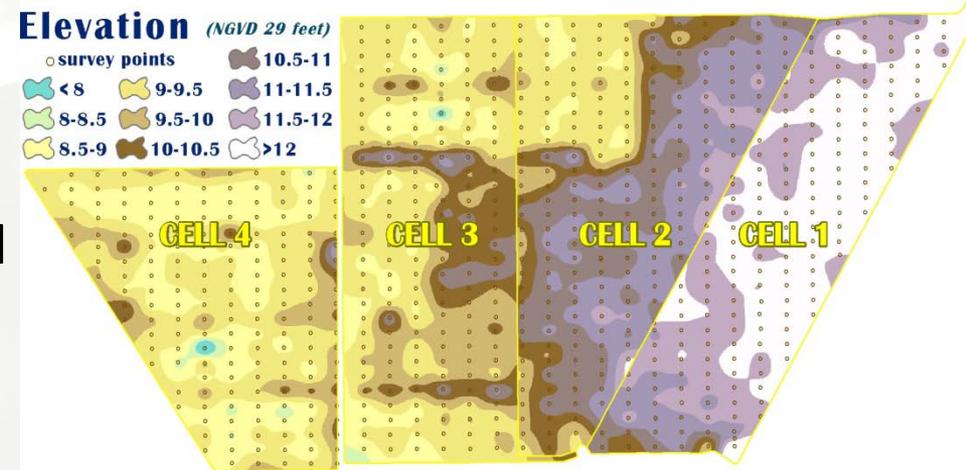
David Unsell, P.E.

Section Administrator

Water Quality Treatment Technologies

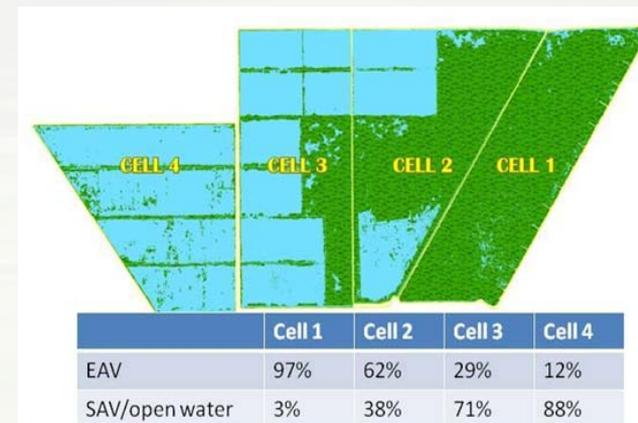
Topographic Surveys

- Survey results are used in setting the target stage levels for each cell, in identifying any areas with potential short circuiting issues, and in other hydraulic analyses
- Cells are surveyed during or after construction and all have been resurveyed after the cells were flooded
- In FY2010 topographic surveys were completed for STA-1W, STA-2, STA-5, and STA-6; final data analysis and report preparation are underway



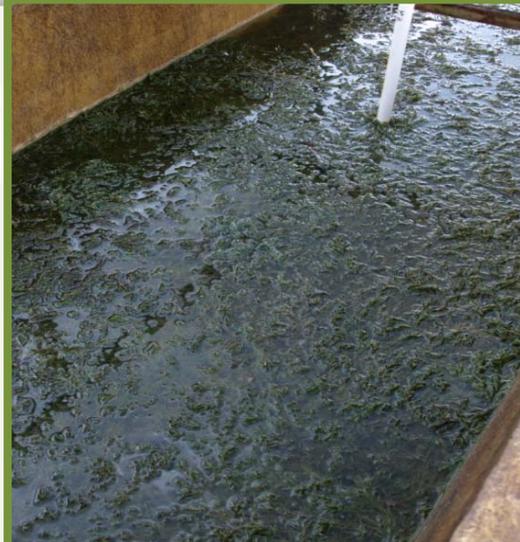
Vegetation Coverage Assessment Through Aerial Imagery

- In selected EAV cells, vegetation density analysis were done to assess temporal trend in cattail density
- 2010 aerial imagery – completed, analyzed, and included in 2012 SFER
- 2011 aerial imagery flight was completed in March, 2011; data analysis is underway
- Future goals include being able to relate coverage and density to STA performance, estimate phosphorus storage in biomass



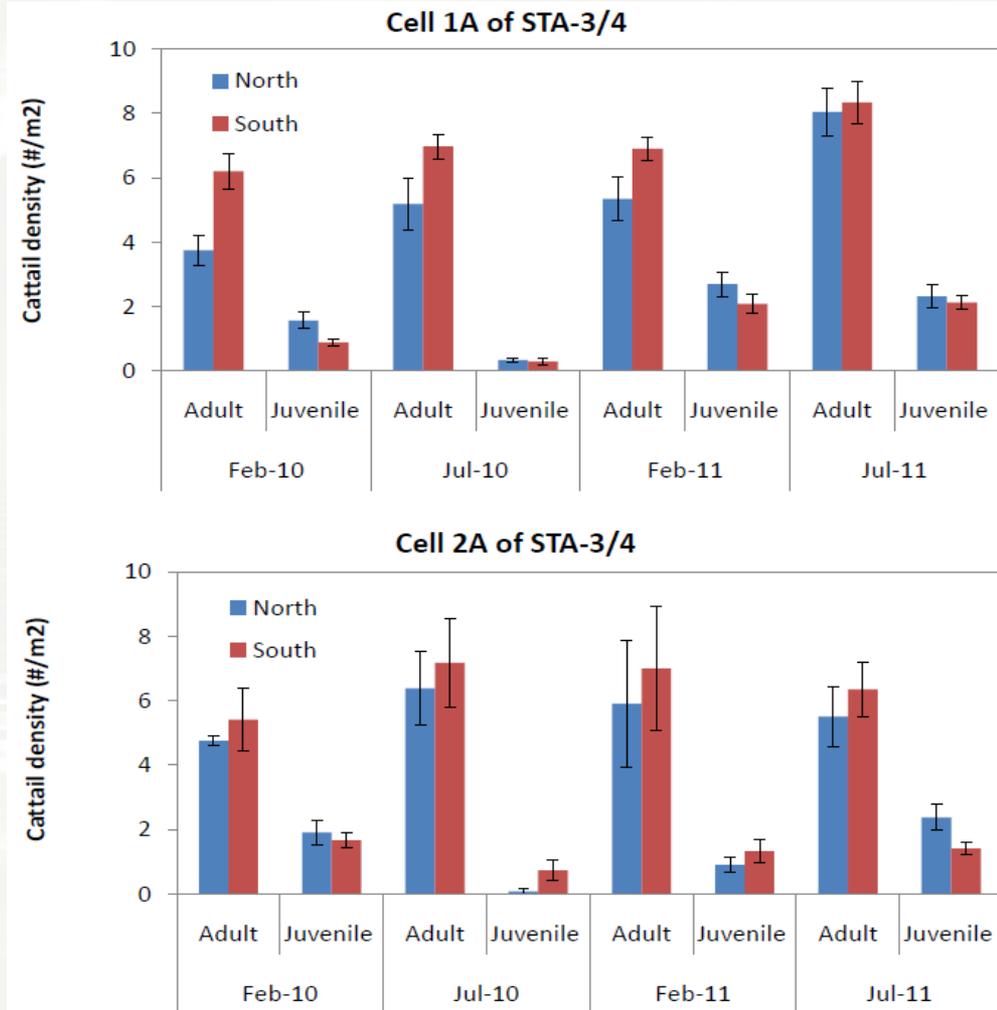
Evaluation of Optimal Plant Composition

- **A three year proof-of-concept study at a mesocosm scale**
- **Examines a variety of native aquatic macrophytes to further enhance the treatment performance of the STAs**
 - quantify P removal of water lily and sawgrass species and compare those with other common vegetation species in the STAs
 - determine the optimum water depth at which water lily and sawgrass achieve maximum P removal



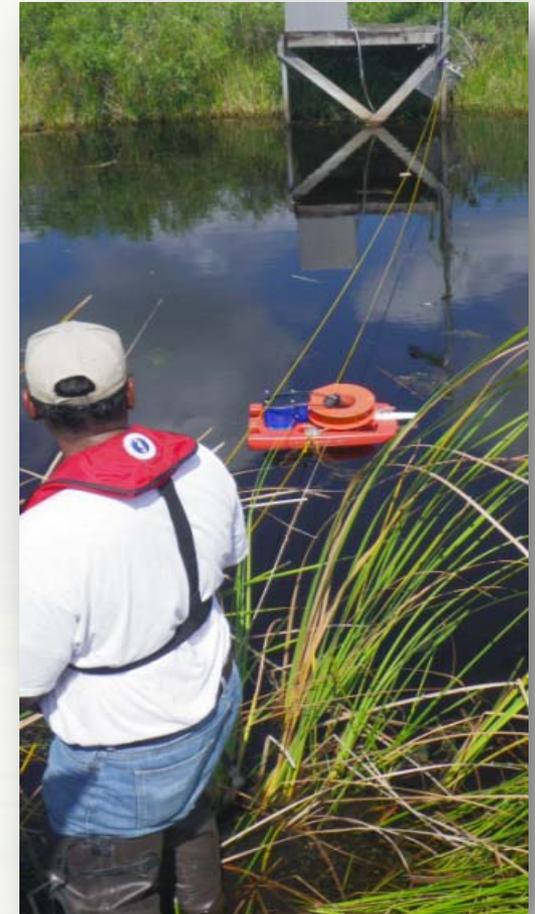
STA-3/4 Cattail Recovery

- Cattails impacted by chronic deep water condition
- Follow-up dewatering in March 2011, and continued until drought took its course
- Objective of study: assess the benefits of lowering water levels to recovery and re-establishment of cattail in an emergent cell
- Initial findings: Adult and juvenile cattail density is higher in July 2011 than in July 2010 in Cell 1A
 - Adult cattail density is slightly higher in Cell 1A than in Cell 2A in July 2011 but there was no big difference in juvenile density between those two cells



Evaluation of STA-1W Cell 3 Plug

- Background: Visual observations indicated short-circuiting via the remnant (ENR) canal
 - The canal was plugged with soil material just upstream of G-259 on the last week of April
 - The plug was then covered with sod to stabilize the soil
- Flow measurements indicate that the plug is effective in preventing any flow short circuiting through this canal
 - Before plug: approximately 1/2 of the outflow water is short circuited through the remnant canal
 - After plug: no measurable flow in the remnant canal



PSTA Cell Improvements



G-390B



G-390A

3960 feet



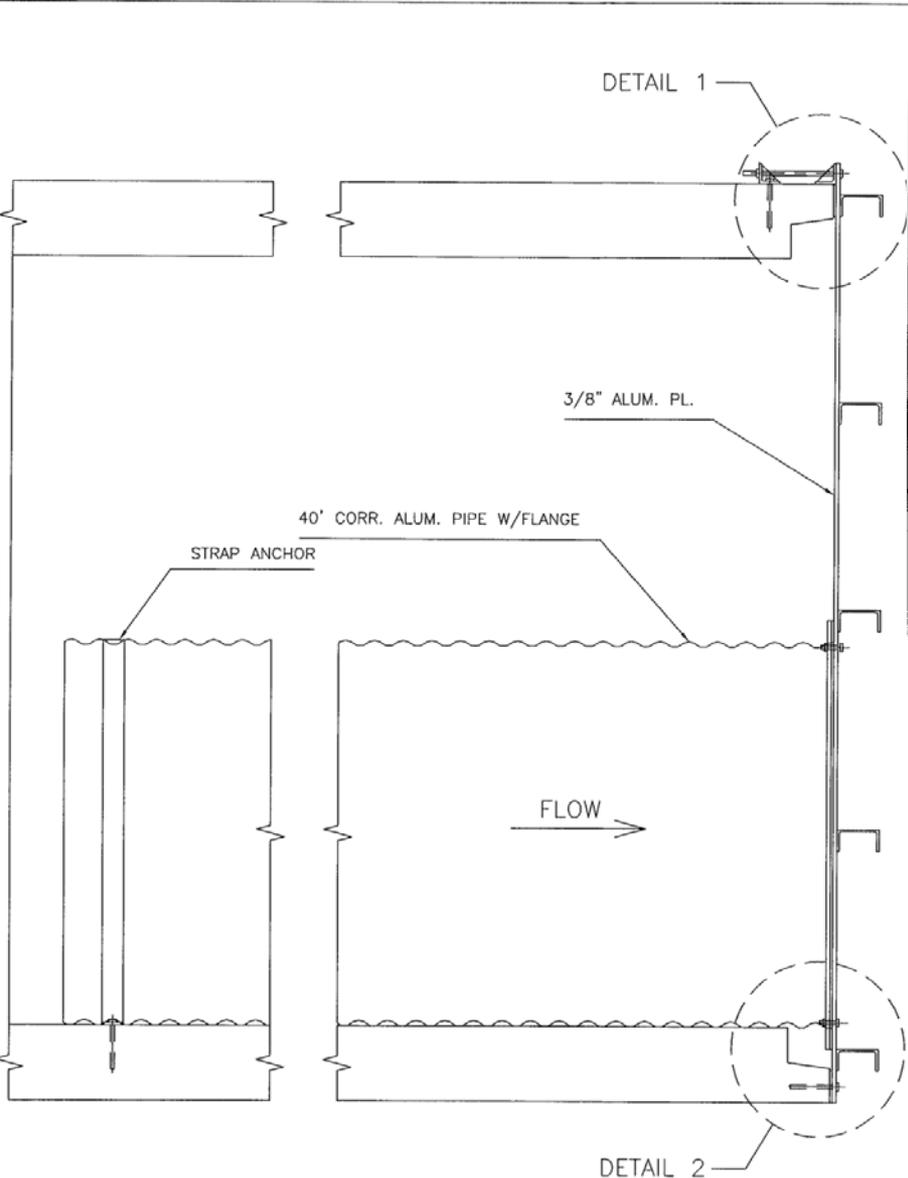
1240 feet

G-388



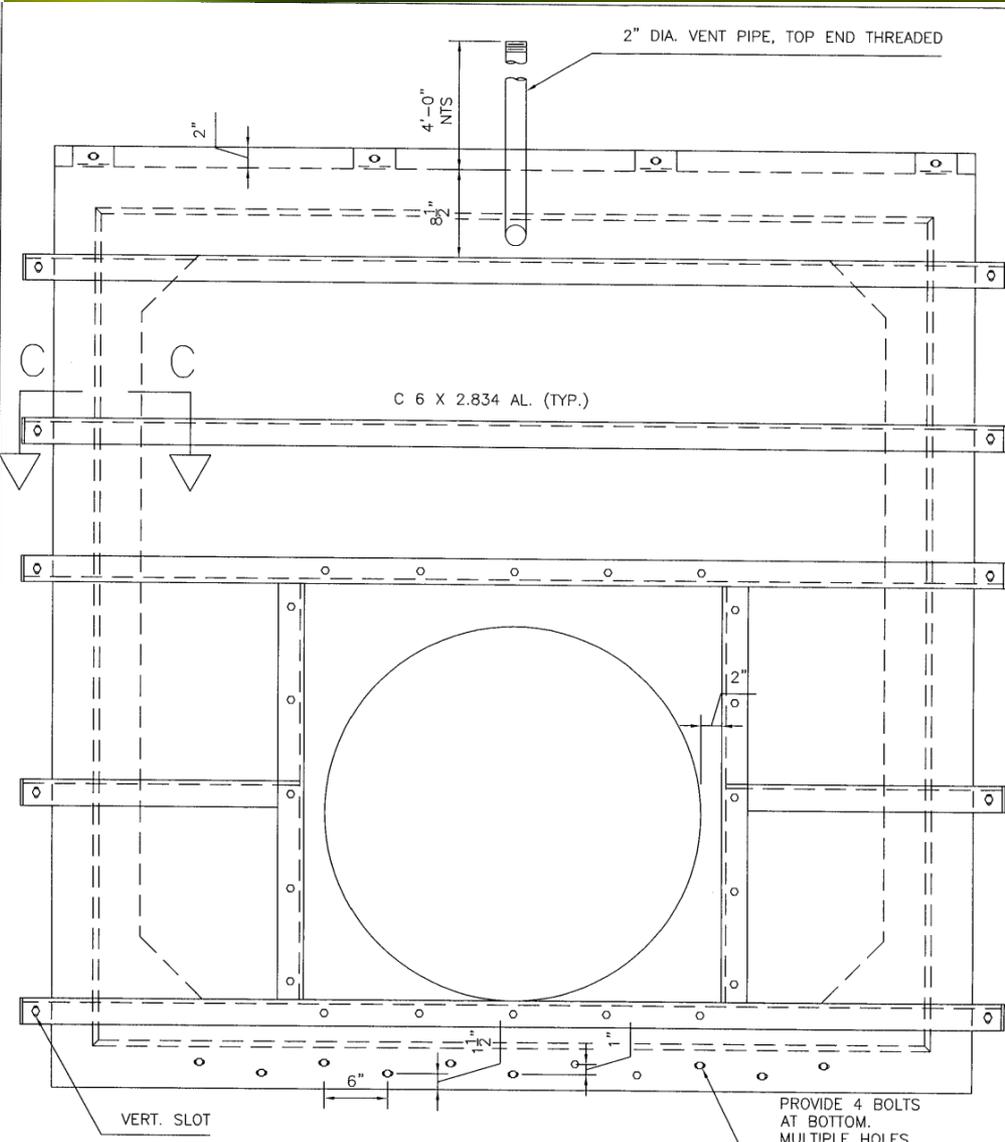
STA 3/4 PSTA Cell Modifications

- Objective: Flow/load measurement improvements
- Modify G-390B to improve flow measurements
- Modify one pump at G-388 to reduce pump flow rate
- Resurvey all stage sensors in the flow path in a single loop
- Refurbish existing wells/piezometers on east and west levees
- Other future work to include is improved gauging at S378 and S389 structures



SECTION A-A

DWG. G-390A SHEET 1
 PROJECT: G-390A FLOW MOD.
 DRAWN BY: V. LOEHRLEIN
 DWG. DATE: 5/23/11



SECTION A-A

DWG. G-390B SHEET 2
 PROJECT: G-390B FLOW MOD.
 DRAWN BY: V. LOEHRLEIN
 DWG. DATE: 9/1/11

PROVIDE 4 BOLTS
 AT BOTTOM.
 MULTIPLE HOLES
 PROVIDED IN CASE
 REBAR ENCOUNTERED

PSTA Modifications

Start Up Options

- Start using most recent flow/stage criteria
- Will move to higher stage and/or flow rates after vegetation has stabilized/recovered from dry down
- Soil/vegetation monitoring/analysis
 - Explore results from periphyton consumptions vs lack of reflux from removed peat soils
 - Will attempt to determine the stability of P sequestration

Thank You

