Post-Storm Vegetation Assessment in the Everglades Stormwater Treatment Areas

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15th Annual Public Meeting on the Long-Term Plan for Achieving Water Quality Goals for Everglades Protection Area Tributary Basins

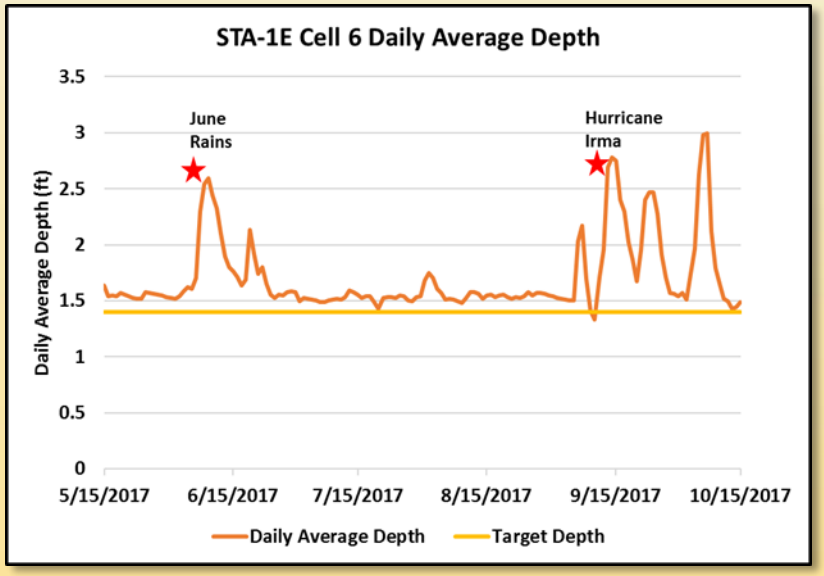
February 23, 2018

Events of 2017

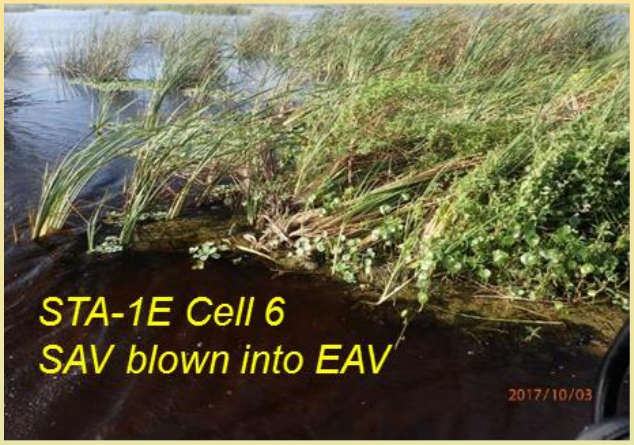
- Record Rainfall for June
  - Record rainfall of 44” for SFWMD’s 16-county region
- Hurricane Irma
  - 8.9” rainfall avg. week of Irma
- Post Storm Assessments
  - Aerial flights
  - Vegetation ground surveys
  - Overall health and coverage
  - Water depths
  - Turbidity measurements

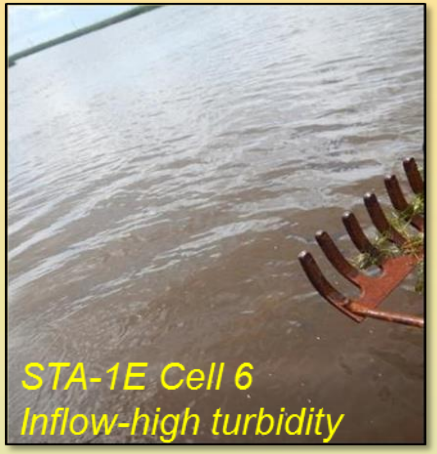
STA-2 FW 3 Outflow

STA-1E Cell 6 Water Depths and Conditions



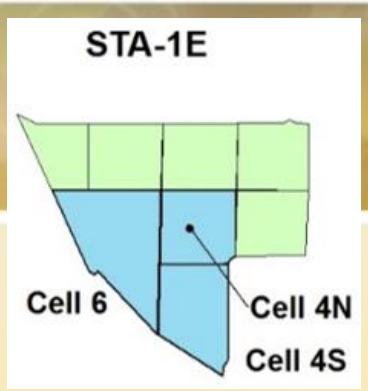
9/12/17

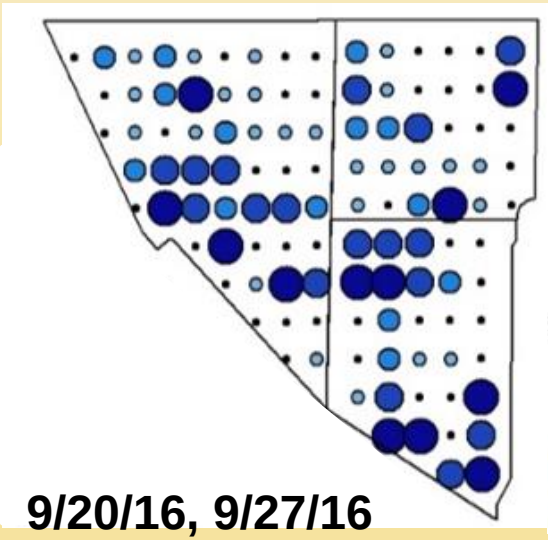




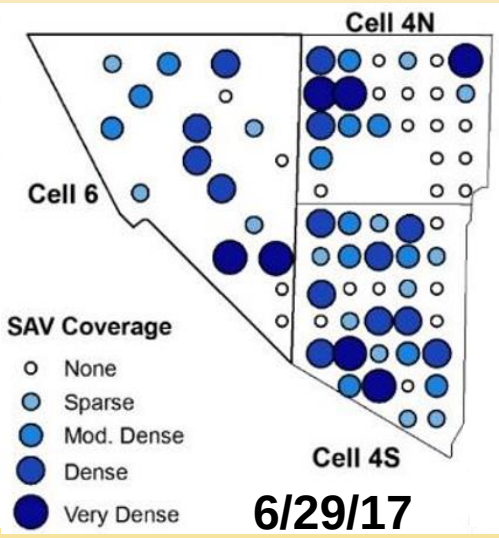
10/3/17

STA-1E Cells 4N, 4S, and 6 SAV Coverages

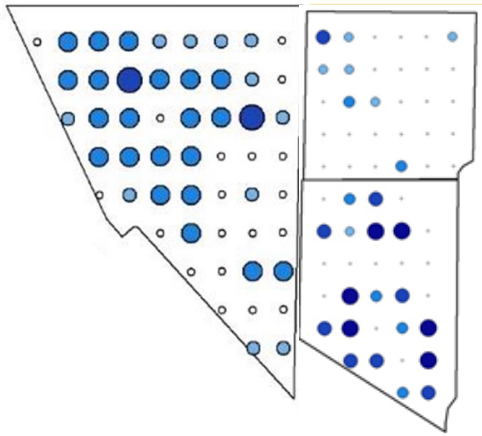




9/20/16, 9/27/16



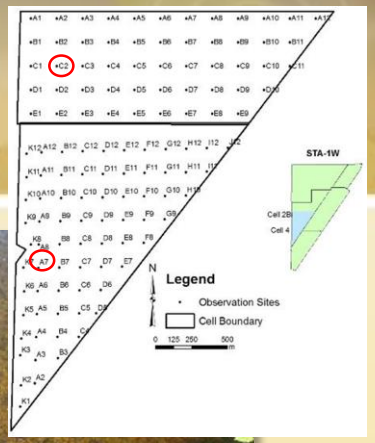
6/29/17



11/1/17, 11/3/17

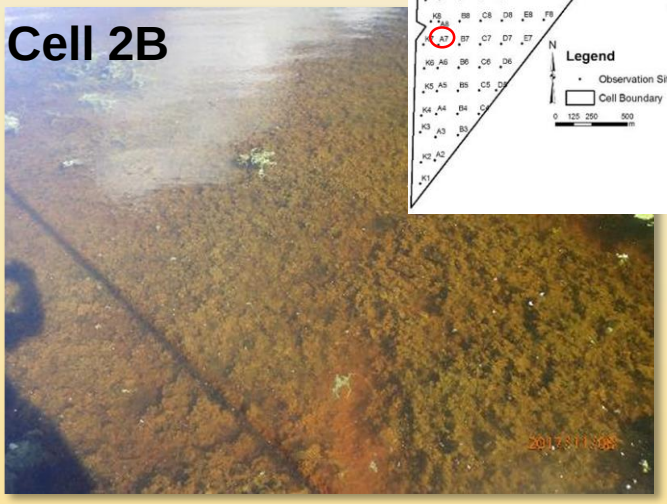
- Overall substantial decline of SAV over time
- Overall densities decreased over time

STA-1W Cell 2B and 4



STA-1W Cell 2B

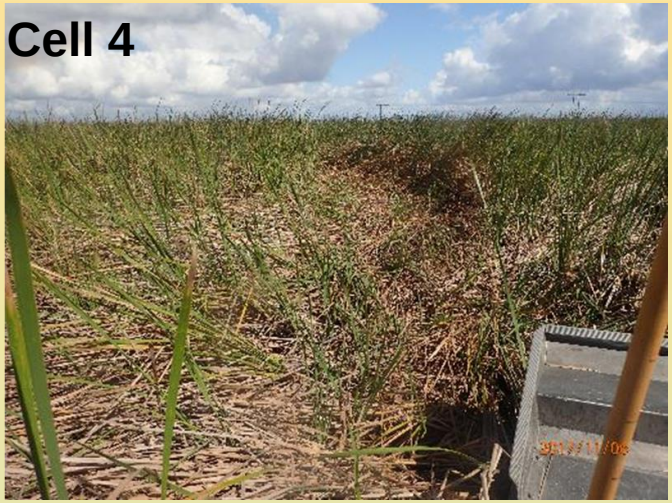
6/27/17



11/8/17

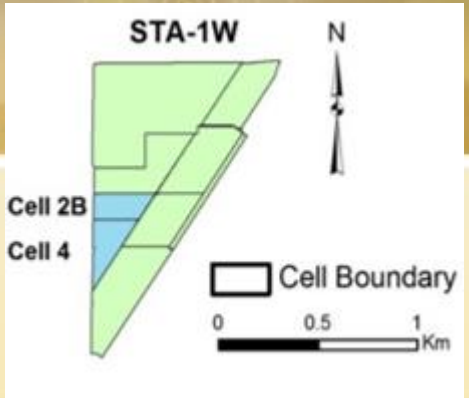
STA-1W Cell 4

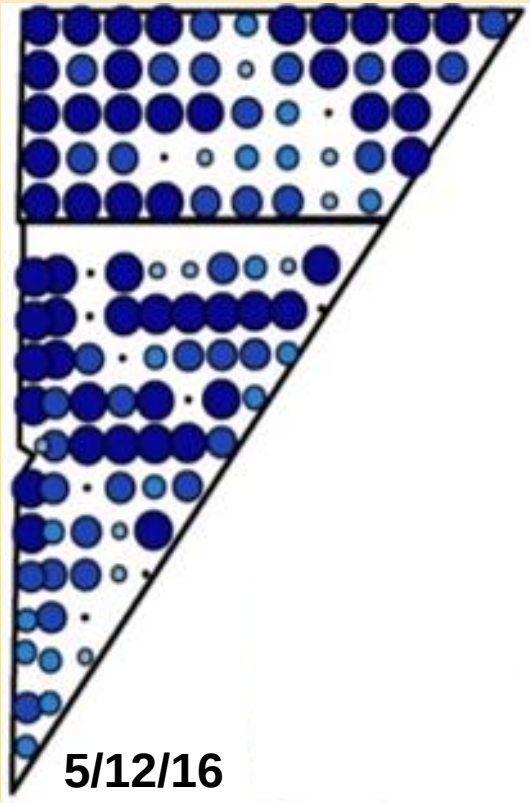
6/28/17

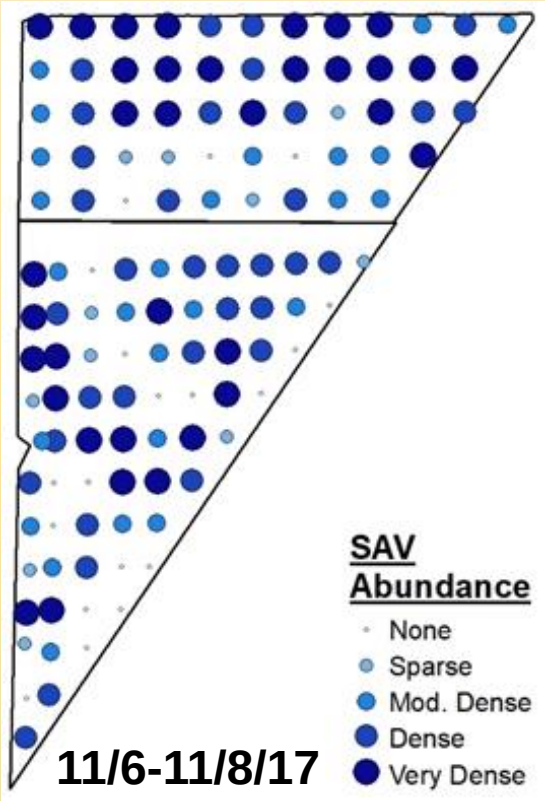


11/6/17

STA-1W Cells 2B and 4 SAV Coverages

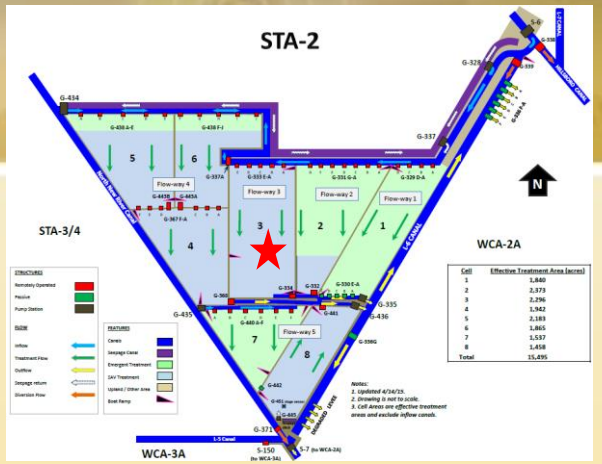




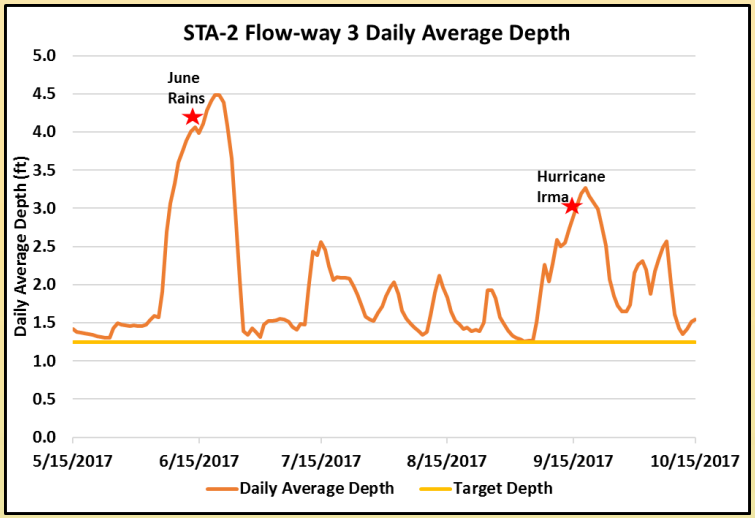


- Overall decline of SAV
- Overall densities decreased
- Predominant species include *Chara* and *Ceratophyllum* spp.

STA-2 Flow-way 3



- Post June rain effects-
  - High water and highly turbid conditions
  - Further declines in SAV
- Post Irma effects-
  - High water and highly turbid conditions
  - Further declines in SAV
  - Impacts on vegetation strips



STA-2 Flow-way 3: Mid Flow-way

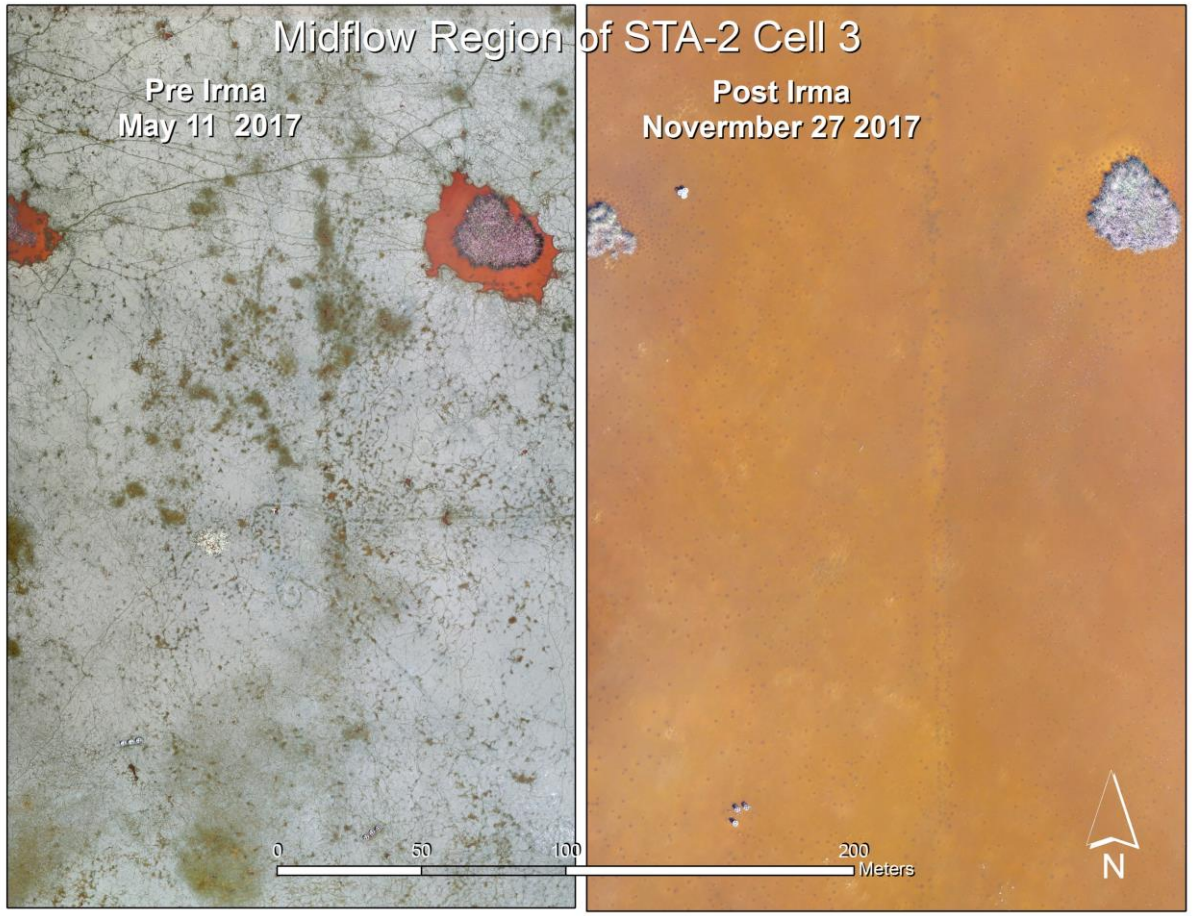
Pre-storm conditions

Post-storm conditions

- SAV coverages excellent pre-storm events
- Primarily *Chara* and *Najas marina*

- Post-storm conditions-cell wide loss of SAV

STA-2 Flow-way 3: Mid Flow-way



STA-2 Flow-way 3-Outflow

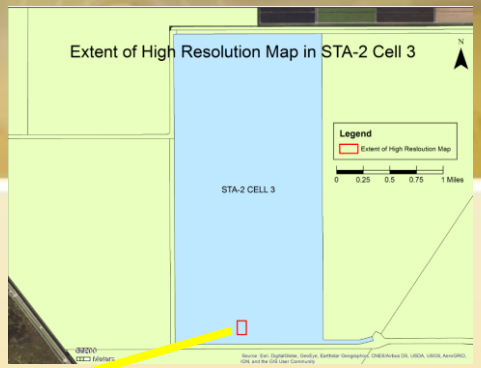
Pre-storm conditions

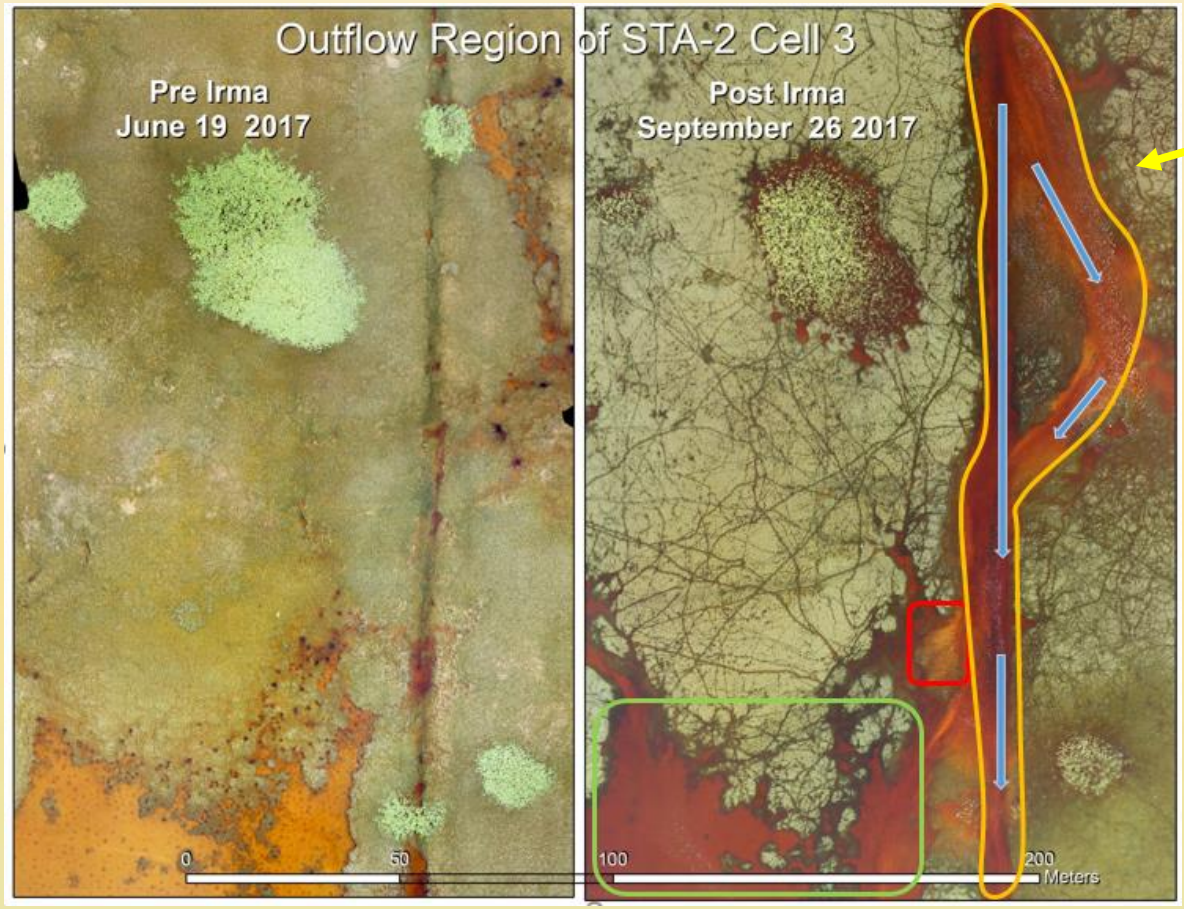
- Pre-storm conditions- higher coverages/densities and diversity of species

Post-storm conditions

- Post-storm conditions- coverages/densities substantially reduced

STA-2 Flow-way 3 Outflow

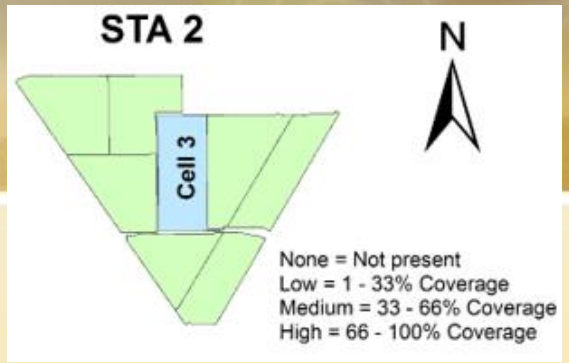


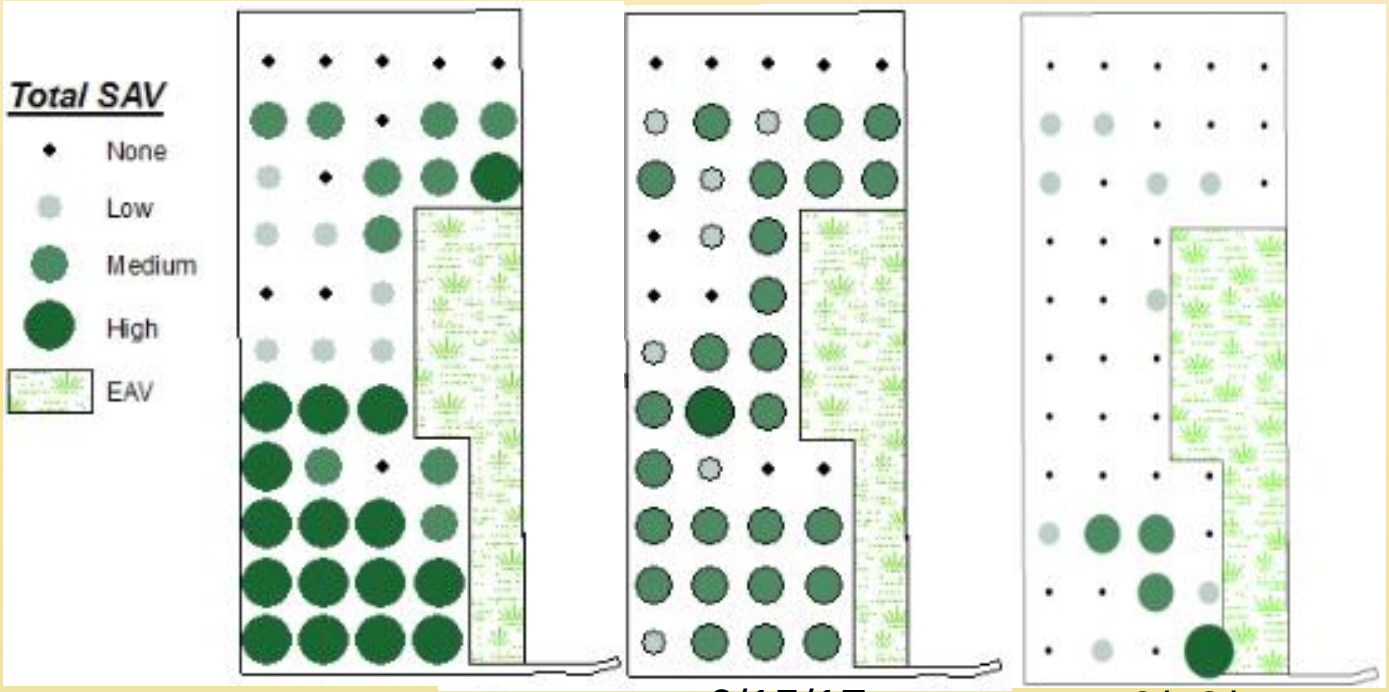


Storm Effects

- Preferential Flow Path
- Vegetation Loss *Chara, Nymphaea odorata*
- Floc scoured
- Floc accumulated in *Chara* areas

STA-2 Flow-way 3 SAV Coverages

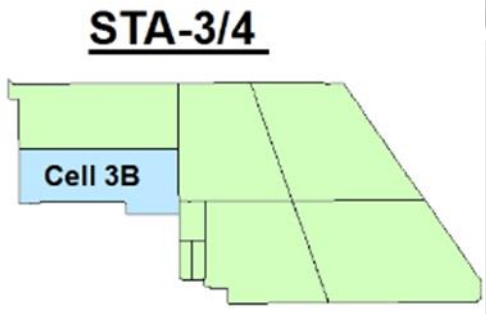




2/9/17 6/15/17 10/12/17

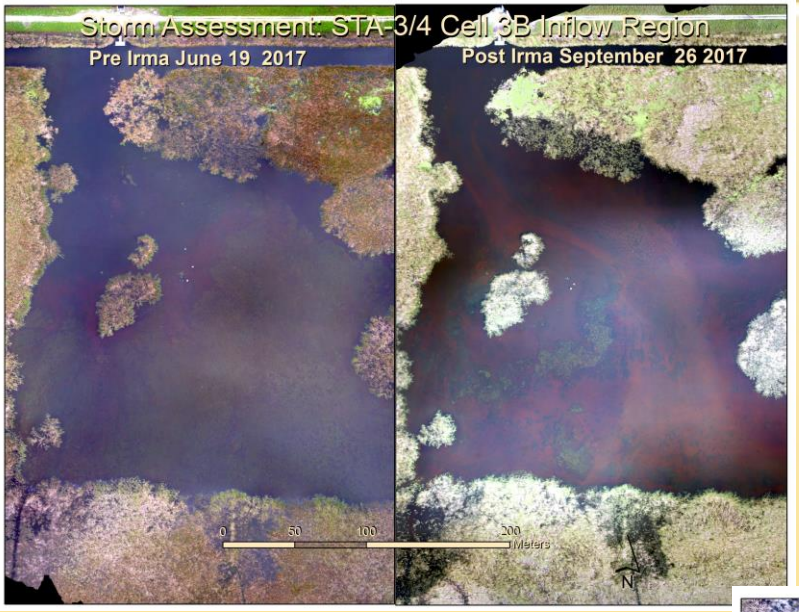
- Overall decline of SAV cover/density
- Predominant species include *Chara* and *Ceratophyllum* spp.

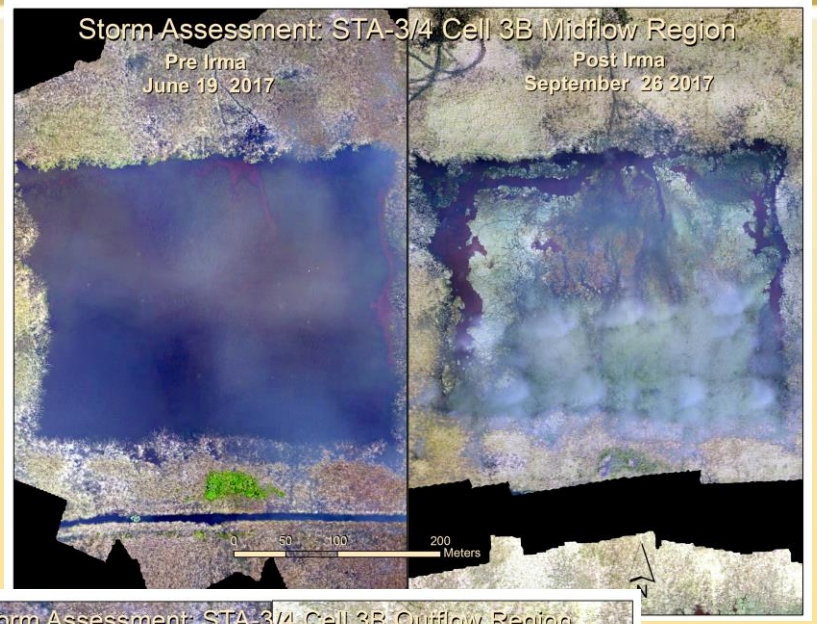
STA-3/4 Cell 3B

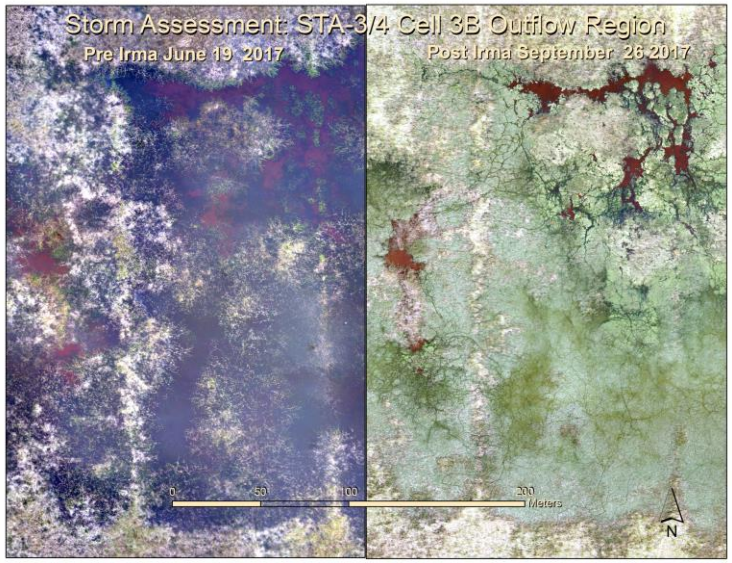


- SAV cell
- Dominant species: *Chara, Najas guadalupensis*
- Other species present: *Najas marina, Ceratophyllum, Utricularia*
- Historically high coverage of *Chara* throughout cell

STA-3/4 Cell 3B

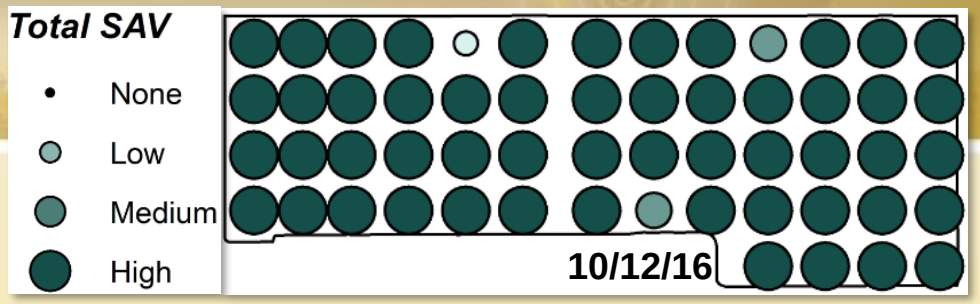


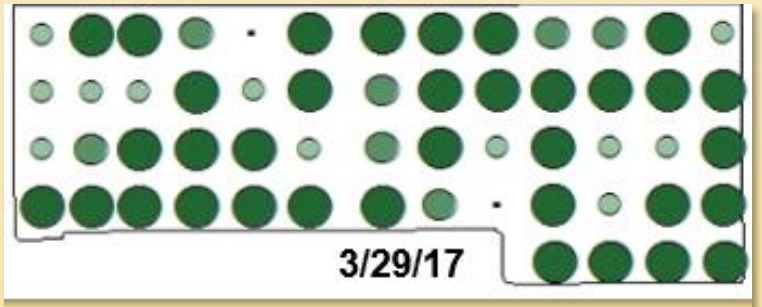


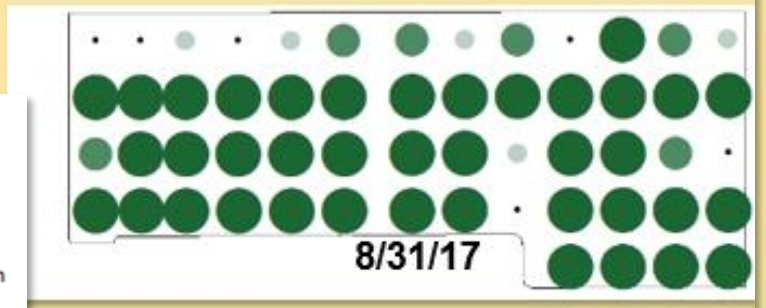


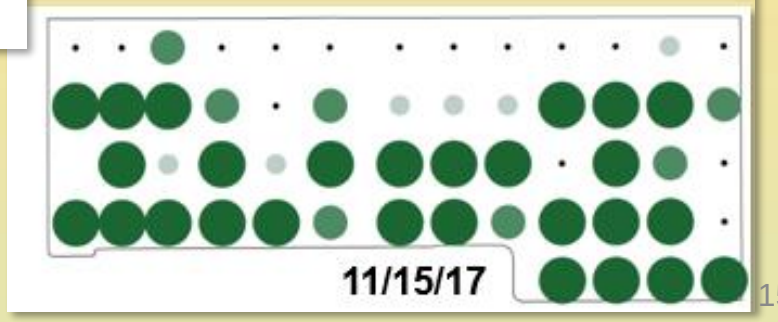
STA-3/4 Cell 3B

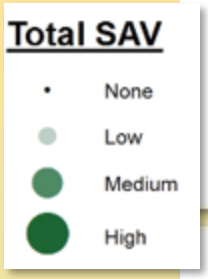
- Gradual decline of overall coverage from Oct 2016 to March 2017
- Most significant decline after rains and after Irma
- Front end impacts
- Other species only found in one place and low coverage

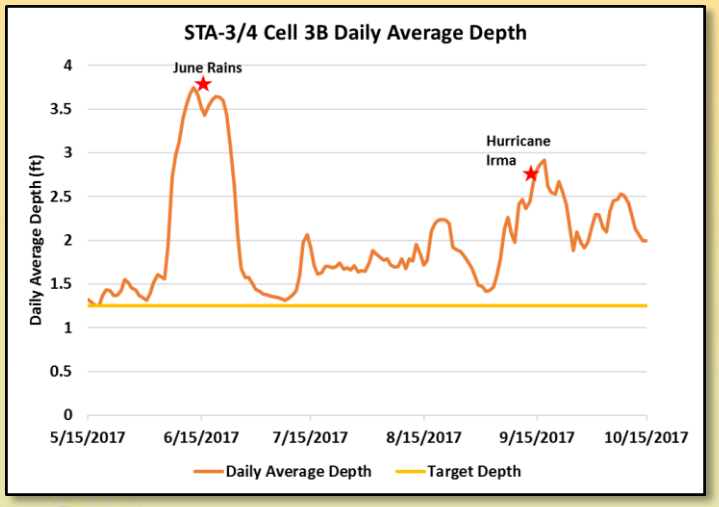




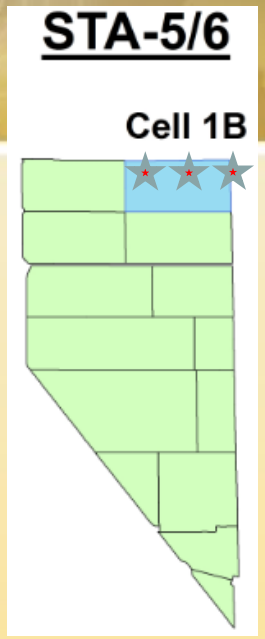








STA-5/6 Cell 1B



- SAV Cell
- Historically dominant SAV species: *Hydrilla*
- High to medium coverages of SAV throughout cell
- Other species: *Ceratophyllum, Najas, Chara*
- Photos from Sept. 2016 Survey


Inflow-Hydrilla


Mid cell-Hydrilla, Chara


Outflow-Najas

STA-5/6 Cell 1B

Facing SW Taken 9/13/17

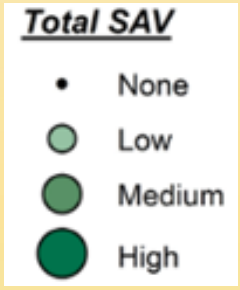
- Post Irma Conditions
  - Turbid conditions
  - Cattail laid down
  - Substantial loss of SAV
  - Post-Irma survey 9/14/17

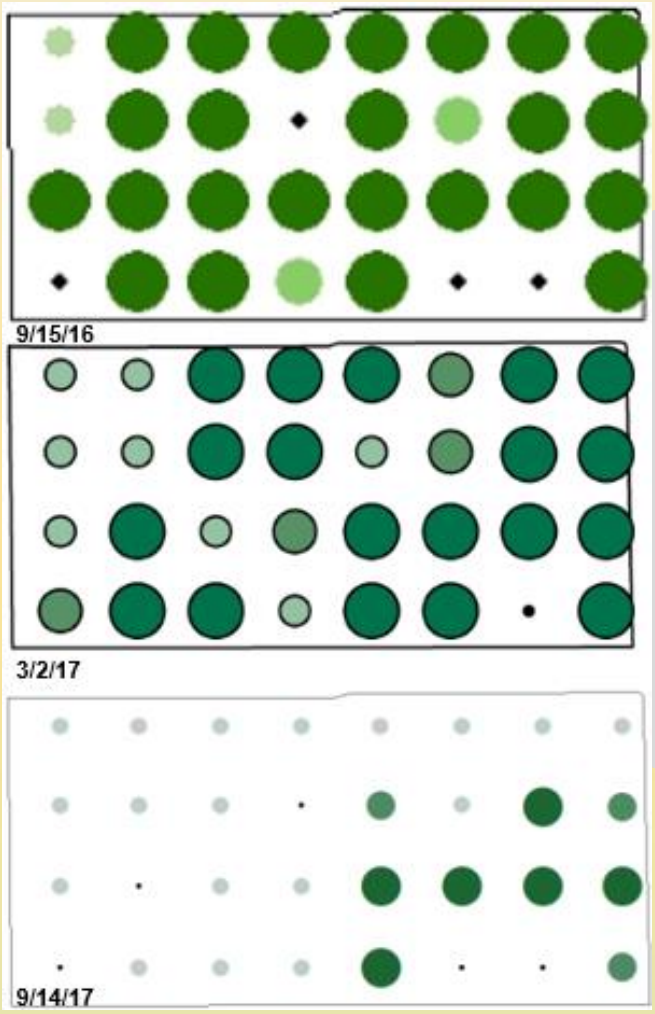

Inflow-No SAV

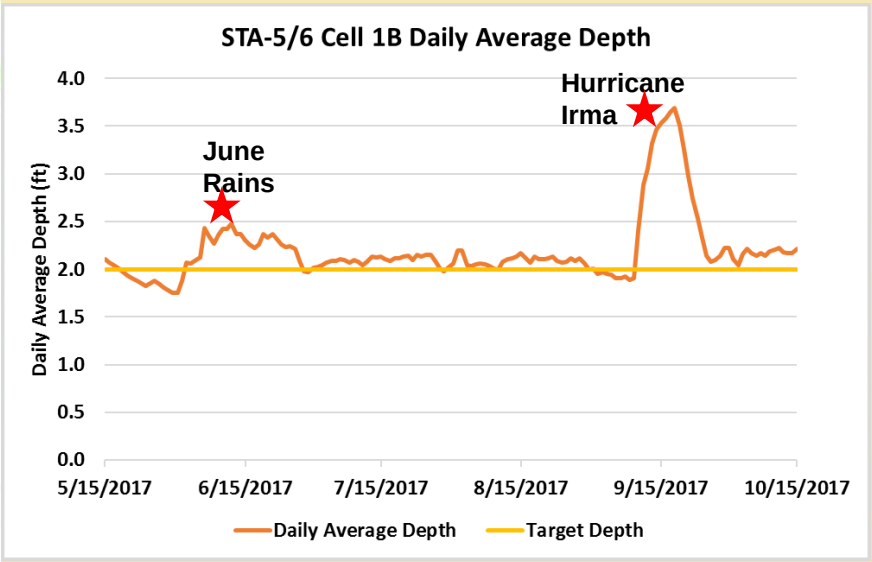

Mid cell-Hydrilla, Ceratophyllum


Outflow-Hydrilla, Najas

STA-5/6 Cell 1B SAV Coverages and Water Depths







Summary

- Flow-ways experienced high flows, deep water conditions, high turbidity, and high nutrient loading
- EAV blown/laid down from Irma
- EAV stress observed post June rainfall event
- SAV decline in several of the cells; long-term effects need to be monitored
- Large open SAV areas (STA-2 FW 3) experienced total loss of SAV as a result of storm impacts
- EAV strips within SAV cells reduced impacts (lower turbidity and less loss of overall SAV coverages)
- STA cells continue to be monitored

THANK YOU!

Vegetation Management
Matt Powers
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Kelsey Pollack, GPI