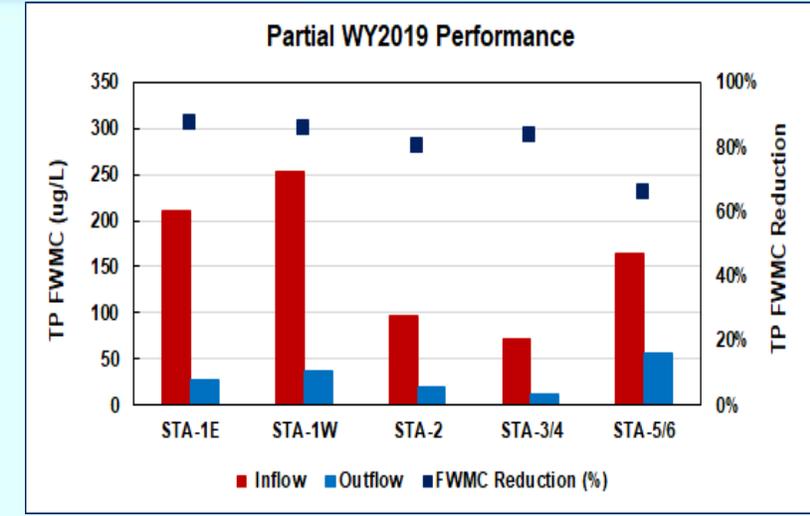
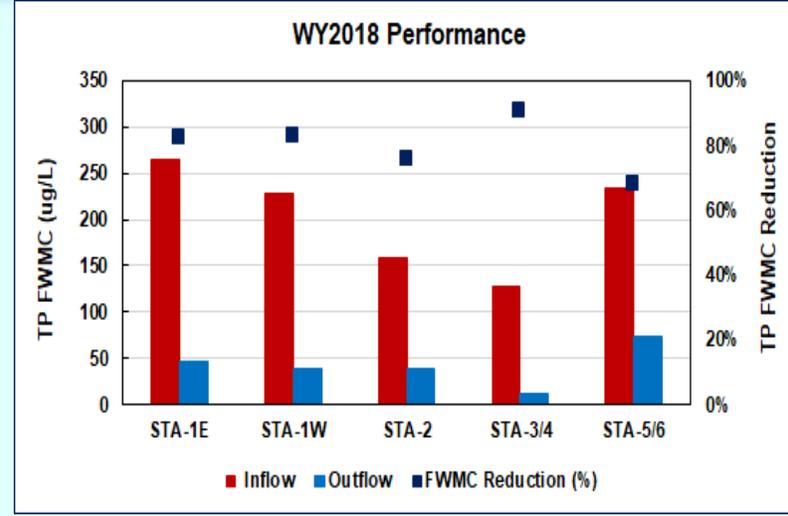
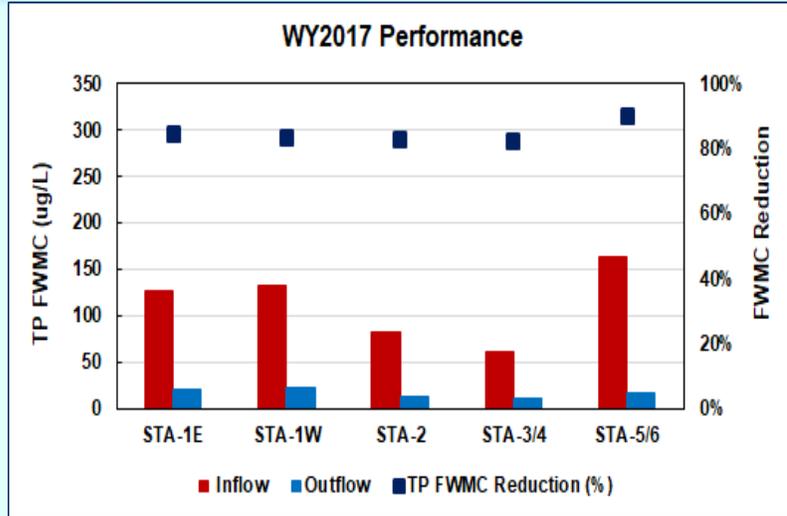


Everglades Stormwater Treatment Areas Performance Update

Hongying Zhao, Ph.D., PE
Lead Engineer
Water Resources Division

16th Annual Public Meeting on the Long-Term Plan
for Achieving Water Quality Goals for the
Everglades Protection Area Tributary Basins
February 25, 2019

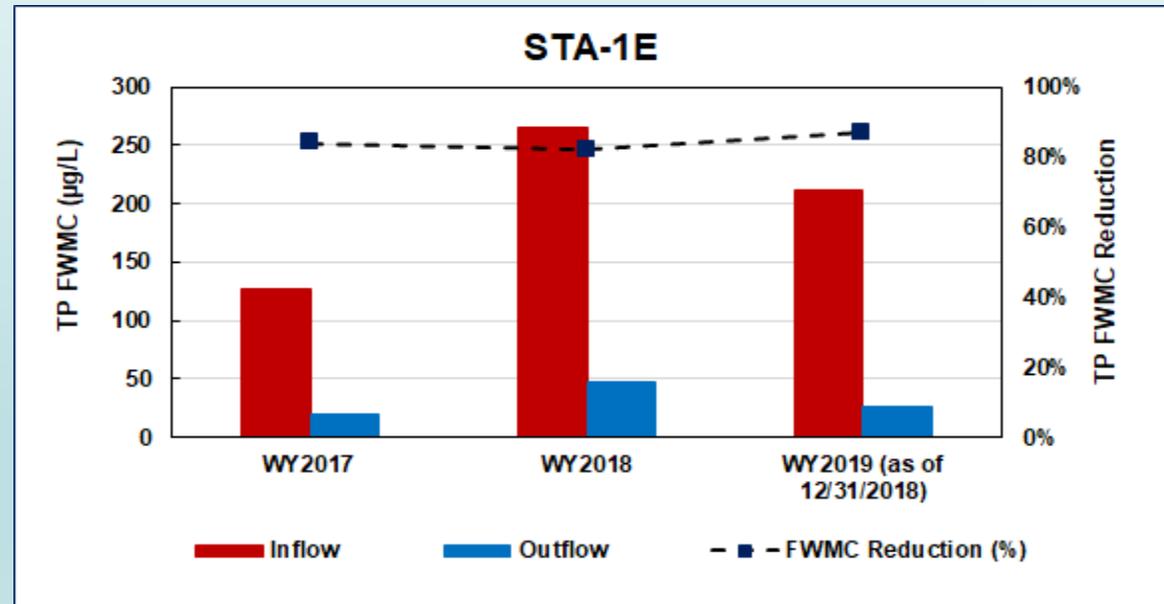
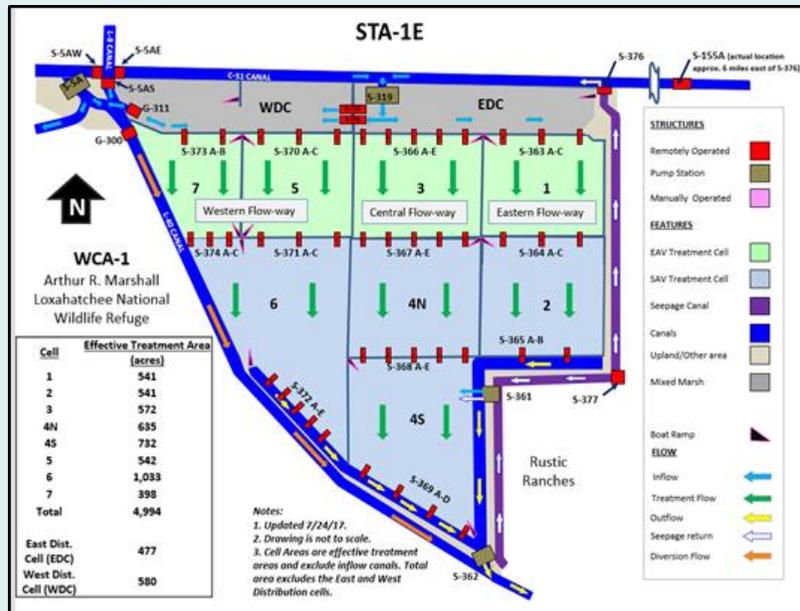
All STAs Performance Comparison by WY



	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Total inflow (k acre-feet)	1,100	1,600	1,100
Lake releases (k acre-feet)	249	160	332
TP FWMC inflow / outflow (µg/L)	96 / 15	180 / 36	122 / 23
TP load inflow / outflow (tons)	129 / 20	358 / 83	169 / 33
Reduction in TP FWMC / load	84% / 84%	80% / 77%	81% / 80%

Includes preliminary data

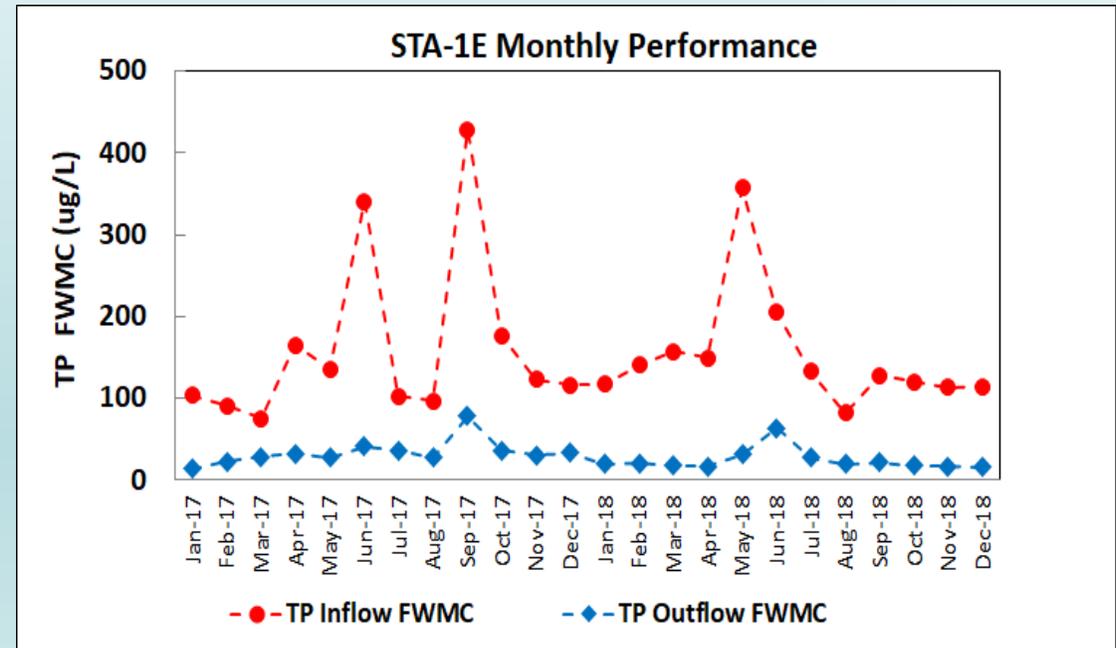
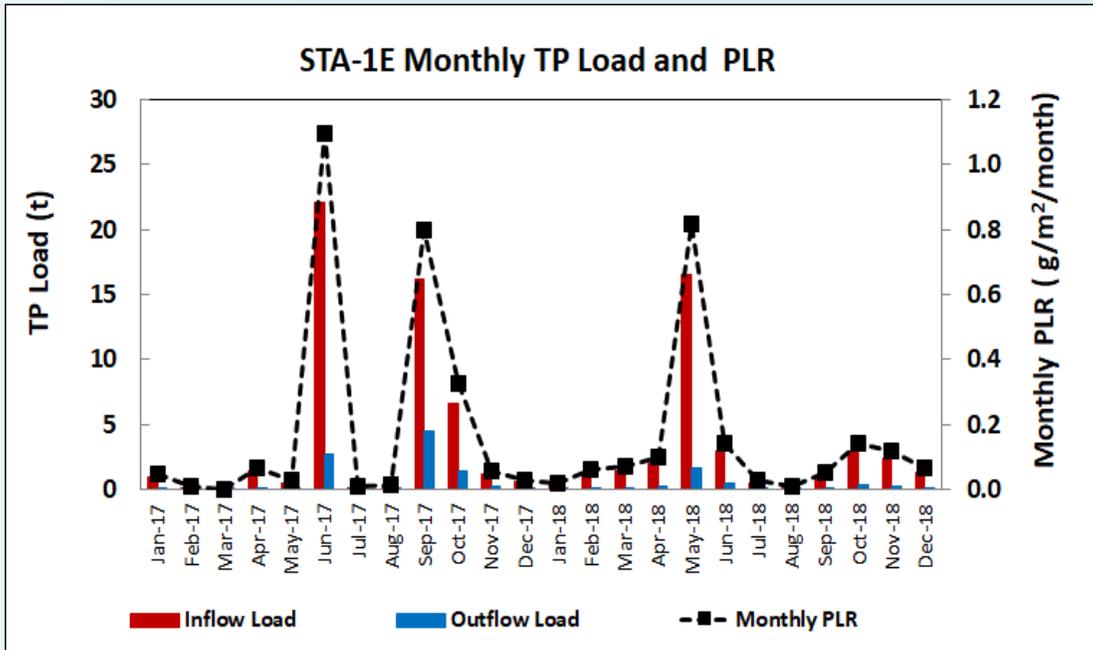
STA-1E Performance Comparison by WY



	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Total inflow (k acre-feet)	162	161	107
Lake releases (k acre-feet)	51	17	31
TP FWMC inflow / outflow (µg/L)	126 / 20	265 / 47	211 / 27
TP load inflow / outflow (tons)	25 / 3	53 / 10	28 / 3
Reduction in TP FWMC / load	84% / 87%	82% / 81%	87% / 88%

Includes preliminary data

STA-1E Monthly TP Load, Loading Rate (PLR), and FWM Concentration



- TP spikes due to three major storm events in June 2017, September 2017, and May 2018
- Decreasing trend in outflow monthly FWMs since May 2018

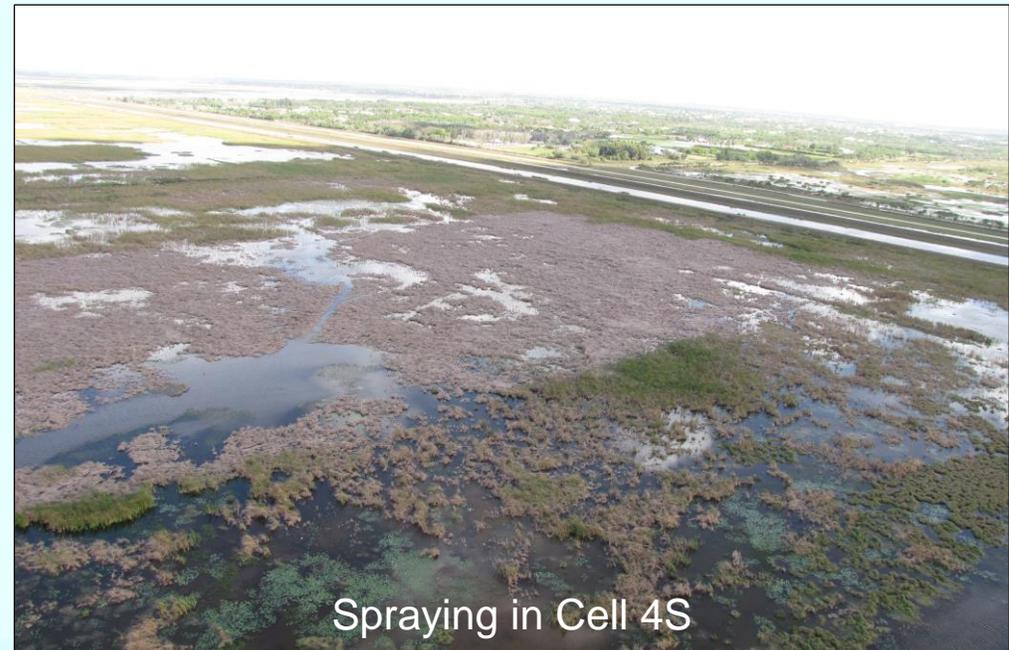
STA-1E Highlights

(May 1, 2017 - Dec. 31, 2018)

- All three flow-ways were operational
- Periodic restrictions in all three flow-ways
 - Vegetation management activities: spraying, harvesting, and planting
 - Snail kites nested in Cell 4N and Black-necked stilts nested in Cells 2 and 5
 - Construction/repair work at S-363B, S-375, S-366B, and G-716 completed

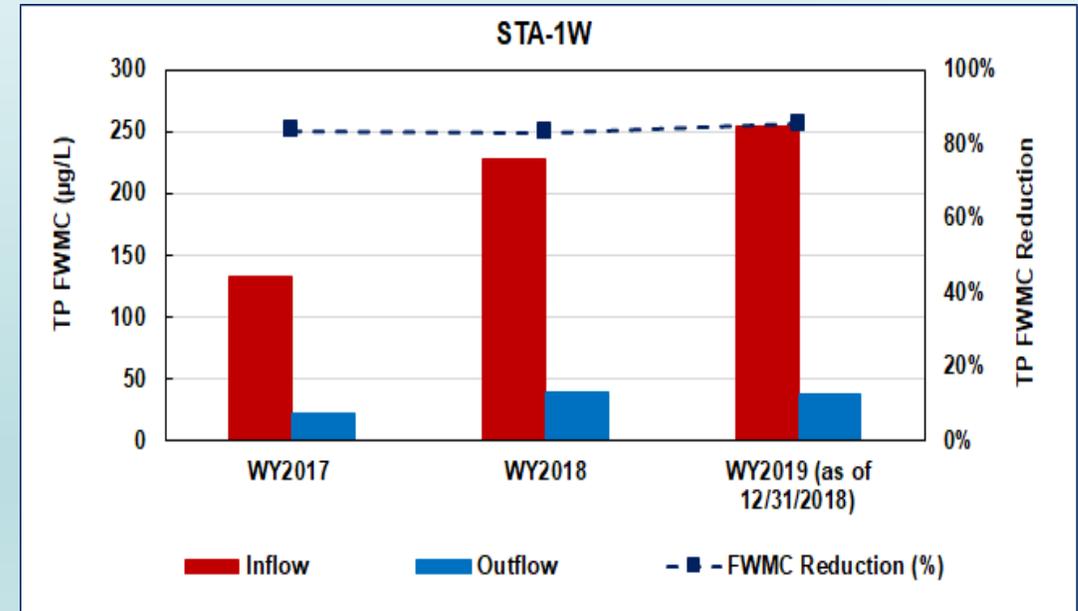
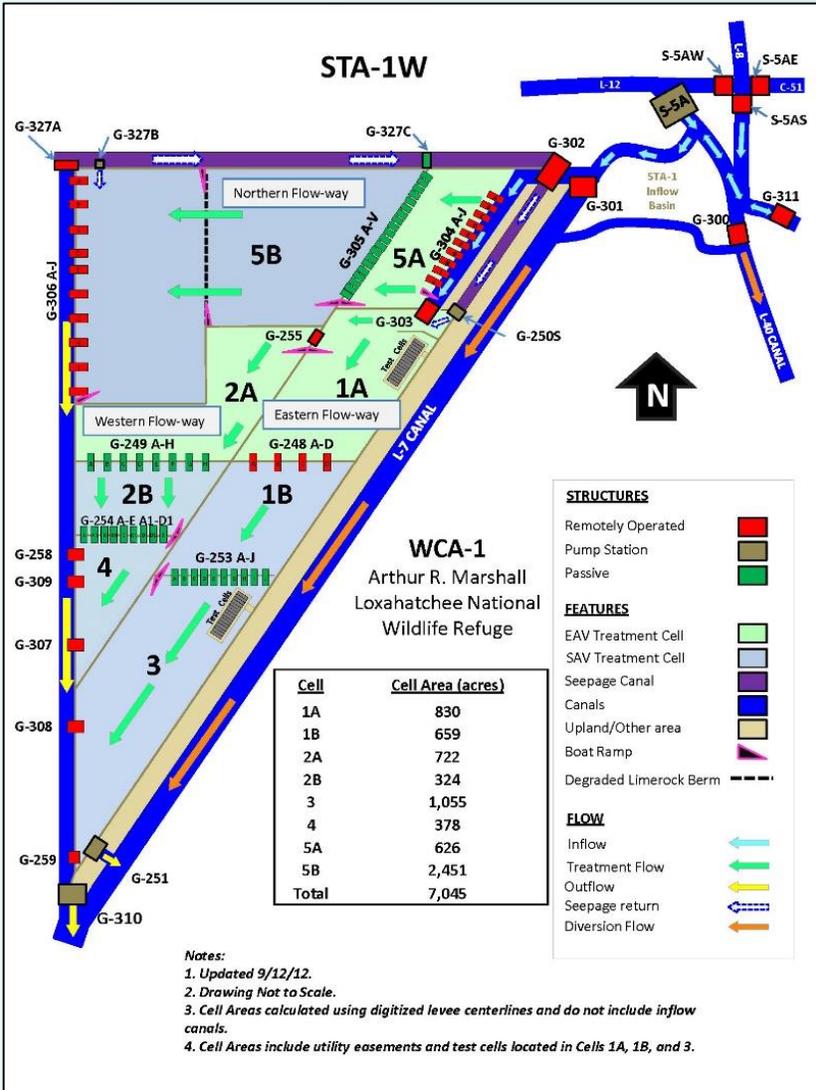


EAV planting in Cell 5



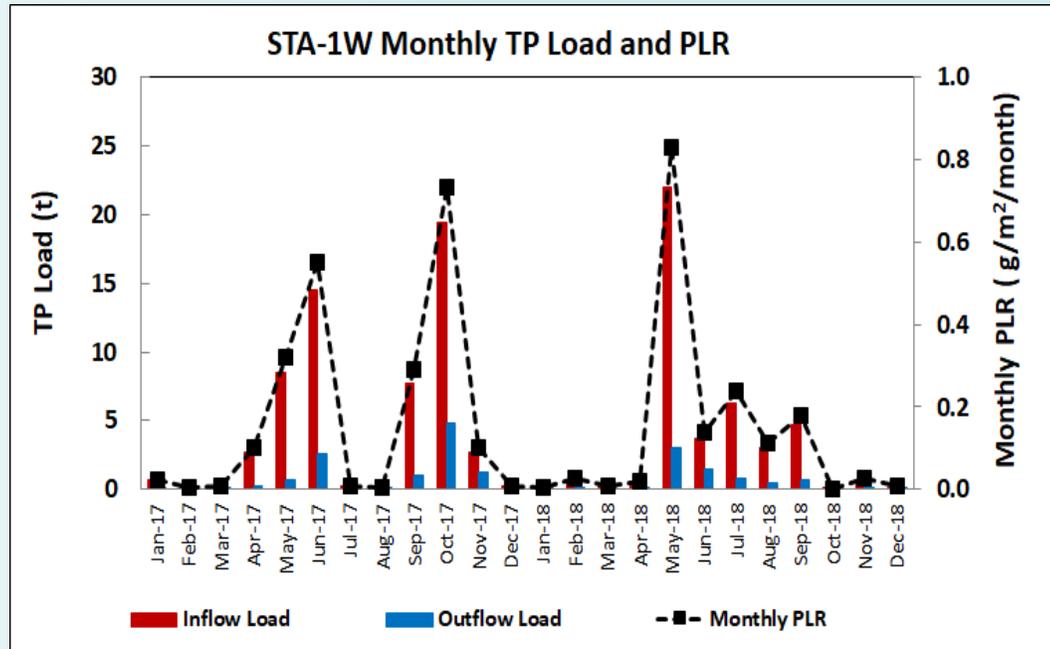
Spraying in Cell 4S

STA-1W Performance Comparison by WY

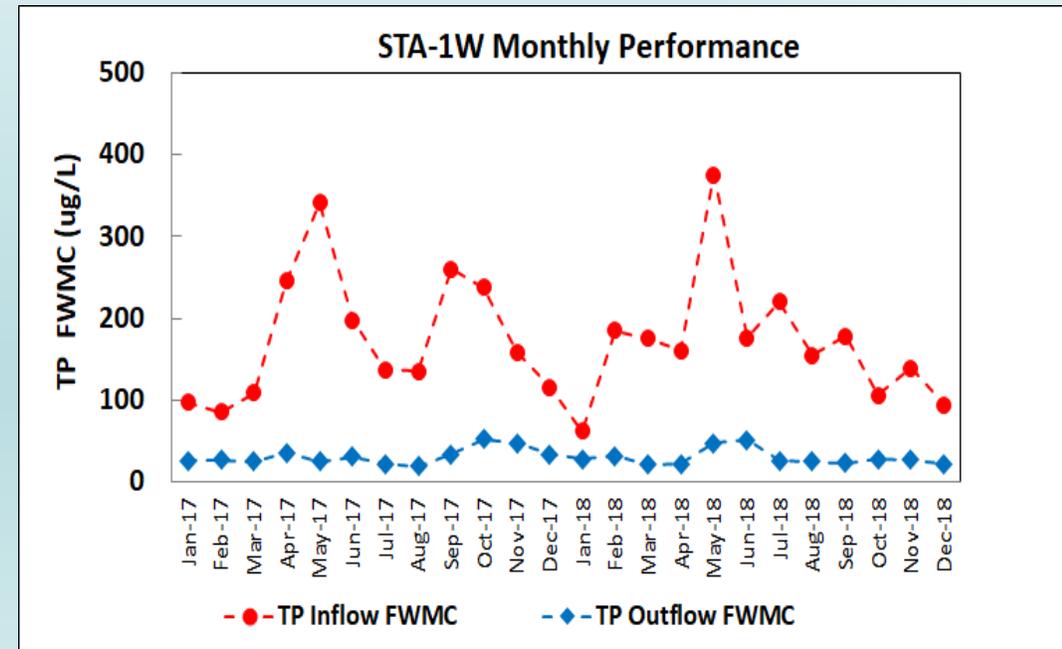


	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Total inflow (k acre-feet)	108	195	128
Lake releases (k acre-feet)	31	7	11
TP FWMC inflow / outflow (µg/L)	136 / 23	228 / 39	254 / 37
TP load inflow / outflow (tons)	18 / 3	55 / 11	40 / 7
Reduction in TP FWMC / load	83% / 84%	83% / 80%	85% / 83%

STA-1W Monthly TP Load, Loading Rate (PLR), and FWM Concentration



Includes preliminary data



Includes preliminary data

- TP spikes due to three major storm events in June 2017, September 2017 and May 2018
- Decreasing trend in outflow monthly FWMs since May 2018

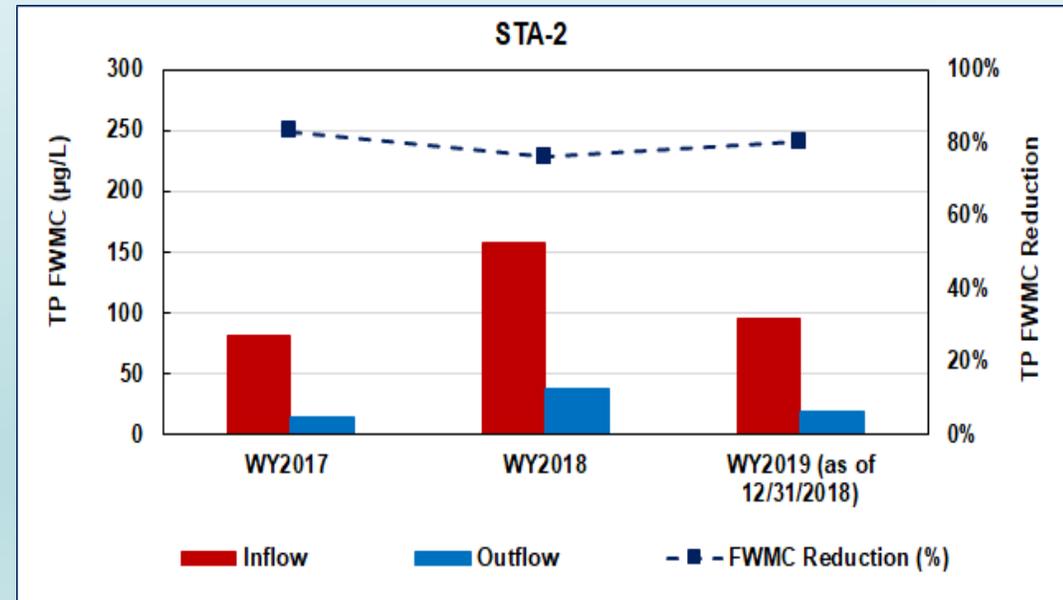
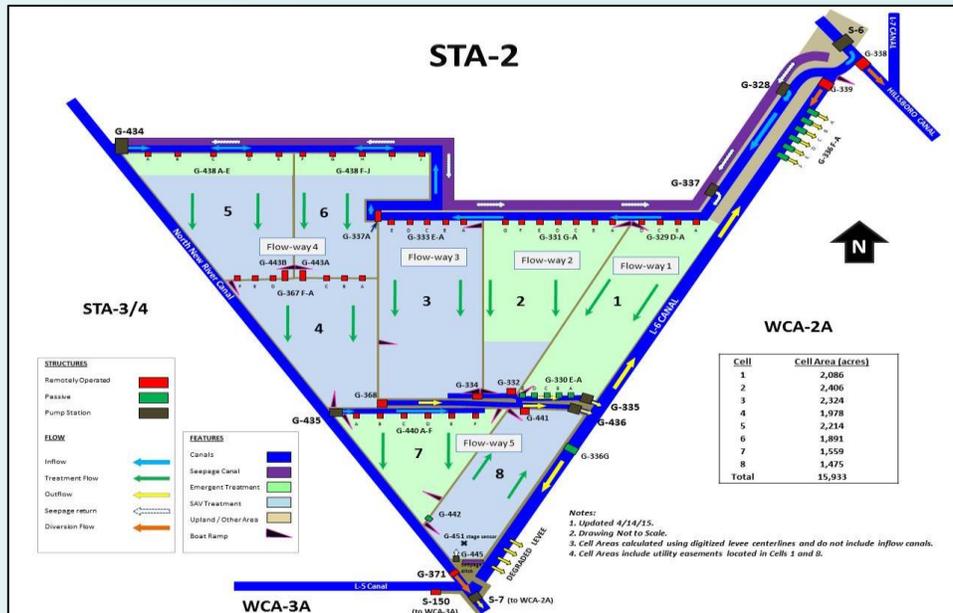
STA-1W Highlights

(May 1, 2017 - Dec. 31, 2018)



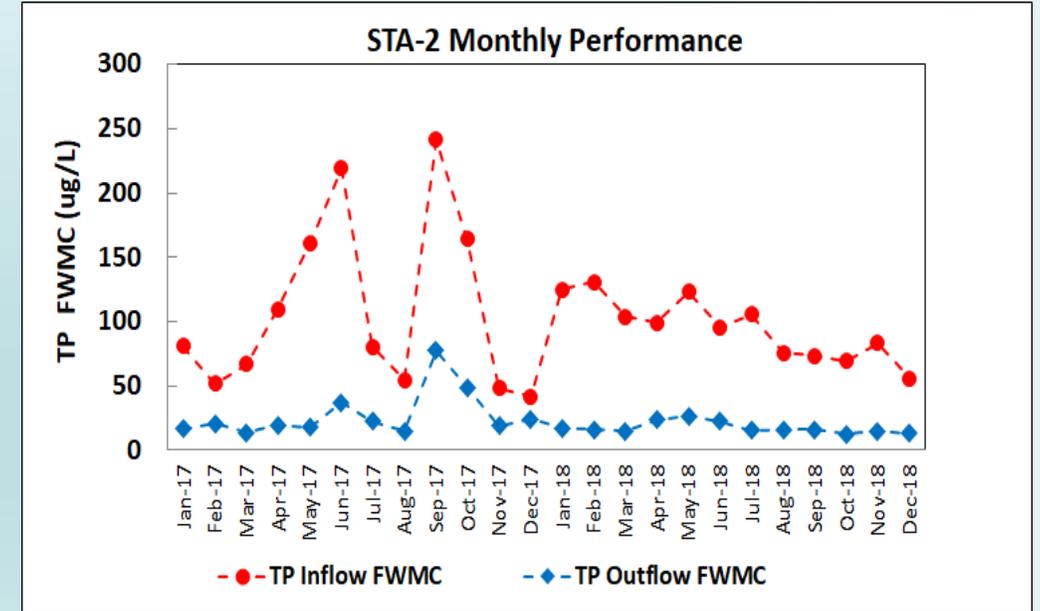
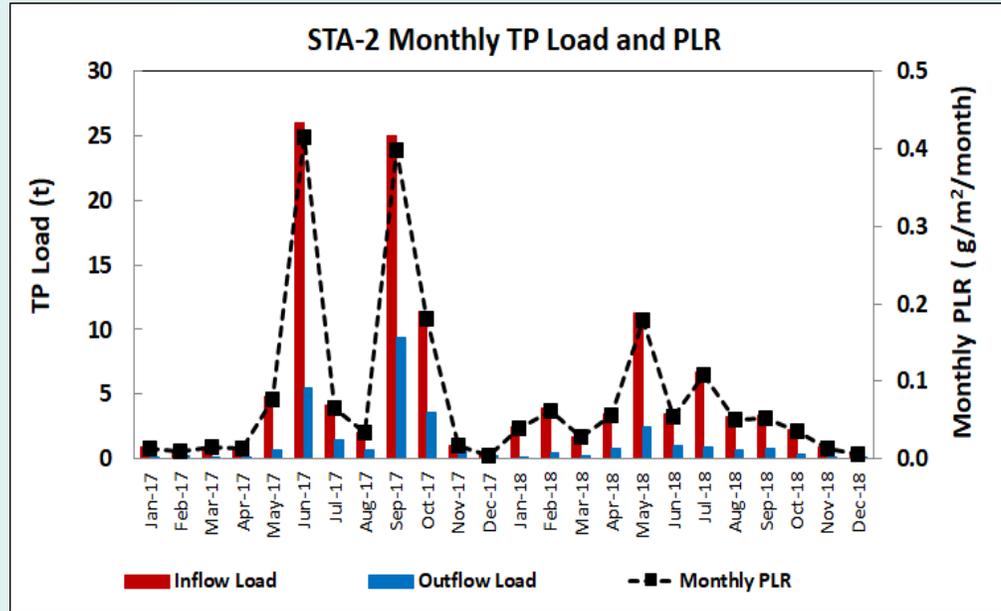
- Periodic restrictions in all three flow-ways
 - Construction activities related to the STA-1W Expansion #1
 - Northern flow-way offline starting from November 2018
 - Various vegetation management activities: harvesting and planting
 - Black-necked stilts nested in Cells 1B, 4, and 5B
 - G-310 roof repair (Hurricane Irma damage)

STA-2 Performance Comparison by WY



	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Total Inflow (k acre-feet)	325	445	267
Lake releases (k acre-feet)	34	59	90
TP FWMC inflow / outflow (µg/L)	82 / 14	158 / 38	96 / 19
TP load inflow / outflow (tons)	33 / 6	87 / 24	31 / 7
Reduction in TP FWMC / load	83% / 83%	76% / 73%	80% / 79%

STA-2 Monthly TP Load, Loading Rate (PLR), and FWM Concentration



- TP spikes due to three major storm events in June 2017, September 2017 and May 2018
- Decreasing trend in both inflow and outflow monthly FWMs since May 2018

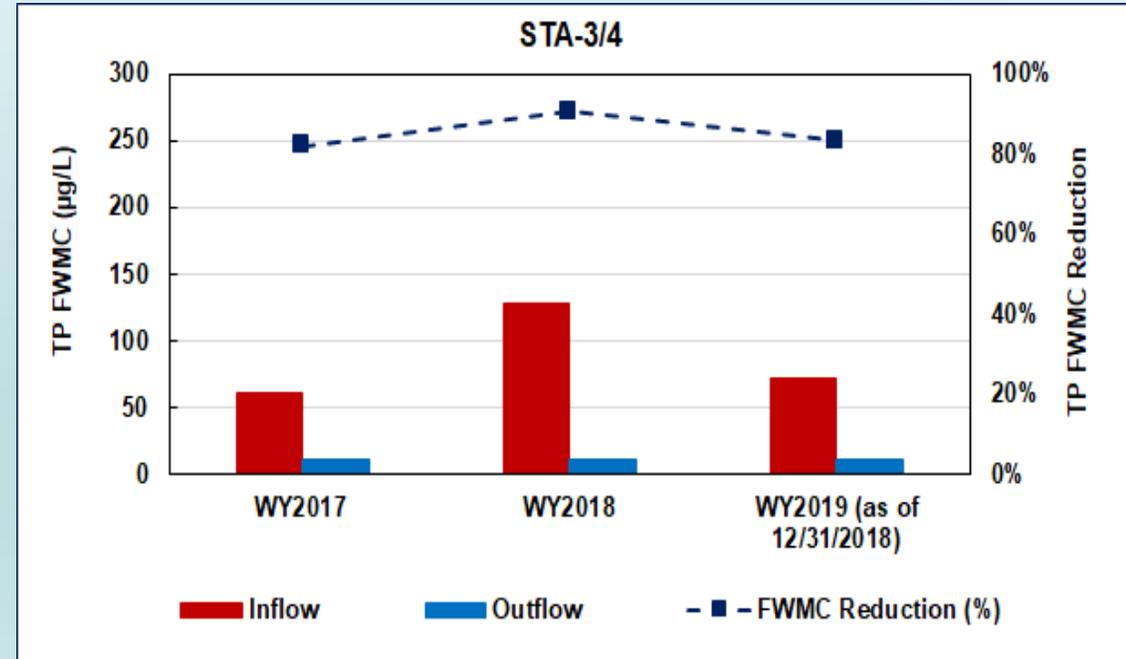
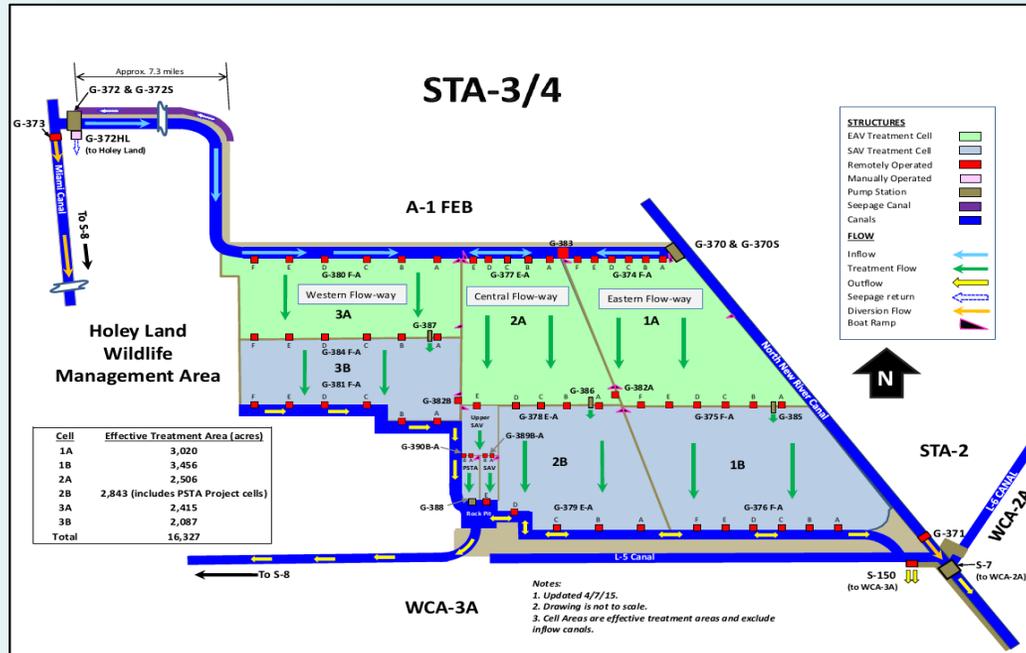
STA-2 Highlights

(May 1, 2017 - Dec. 31, 2018)



- All flow-ways were operational
- Periodic restrictions
 - Vegetation management activities: tussocks removal, inoculations, planting
 - Implemented dry season stage reduction in Cell 3
 - Black-necked stilts nested in Cells 3, 6 and 8
 - Special operations for Science Plan studies
 - G-434 pump station roof repair (damage from Hurricane Irma)
 - G-434 diesel engine driven pumps repair

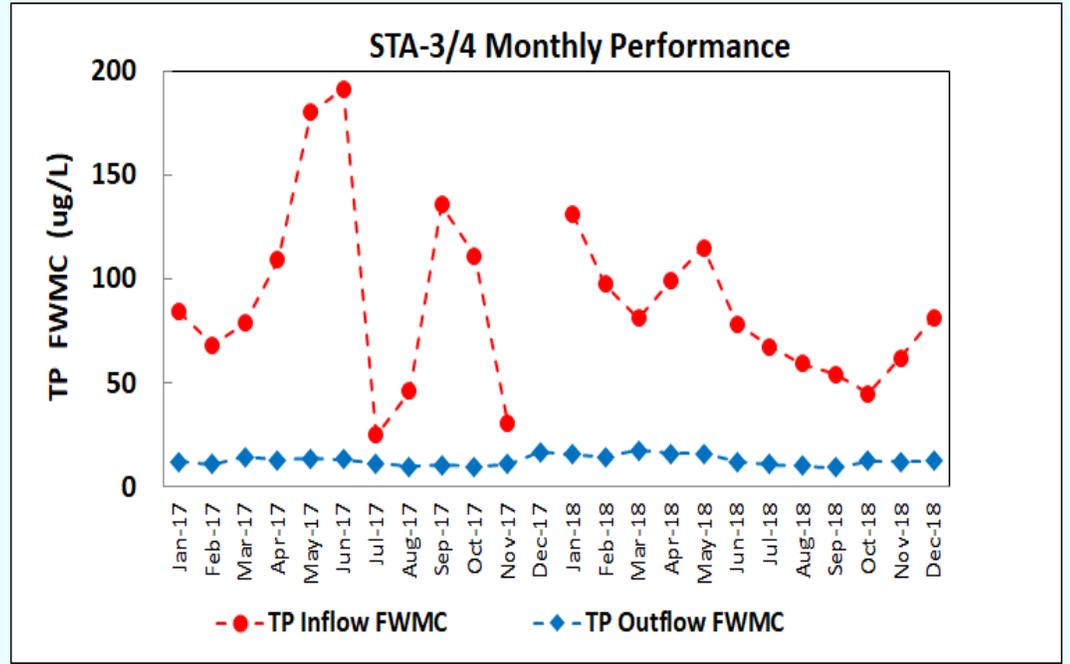
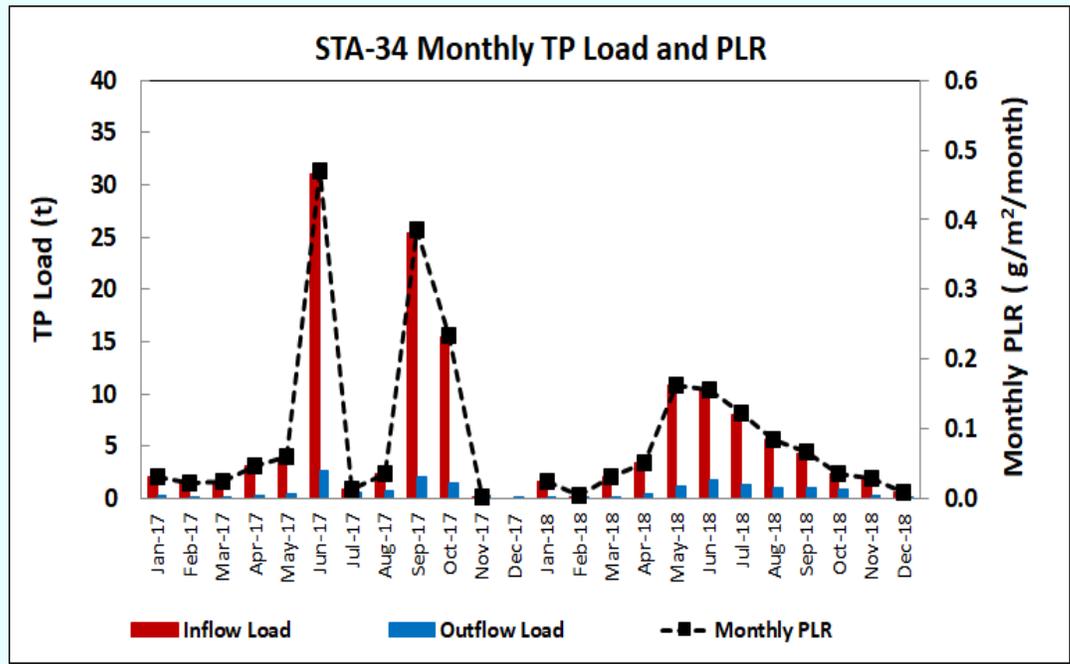
STA-3/4 Performance Comparison by WY



	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Total Inflow (k acre-feet)	377	543	493
Lake releases (k acre-feet)	89	46	170
TP FWMC inflow / outflow (µg/L)	61 / 11	128 / 12	72 / 12
TP load inflow / outflow (tons)	28 / 6	86 / 9	44 / 8
Reduction in TP FWMC / load	82% / 80%	91% / 90%	84% / 82%

Includes preliminary data

STA-3/4 Monthly TP Load, Loading Rate (PLR), and FWM Concentration



- TP spikes due to three major storm events in June 2017, September 2017 and May 2018
- Stable outflow TP monthly FWMCs



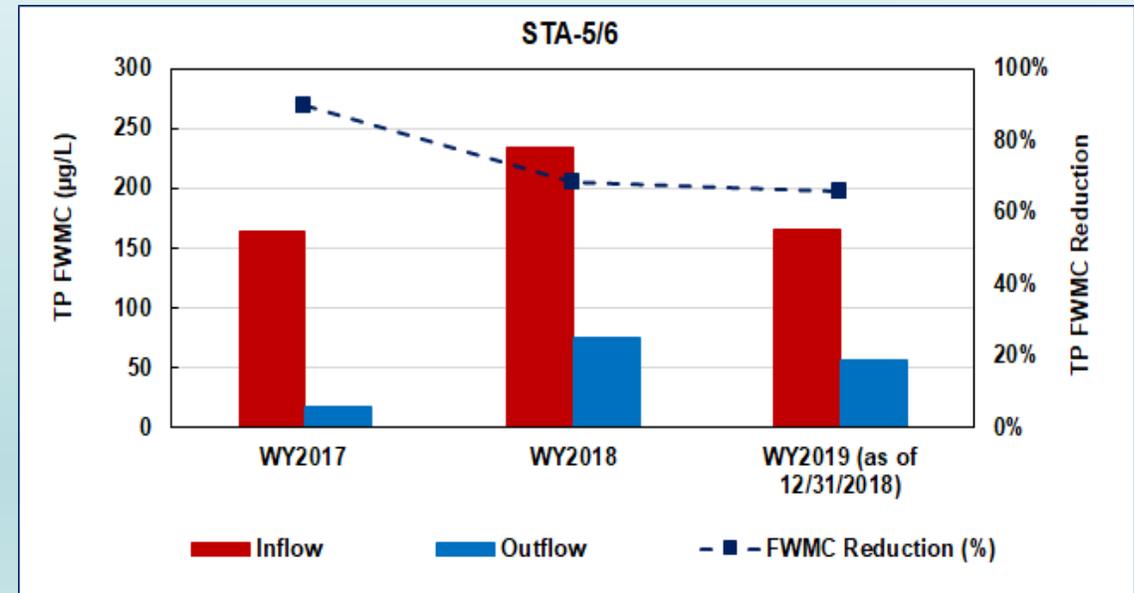
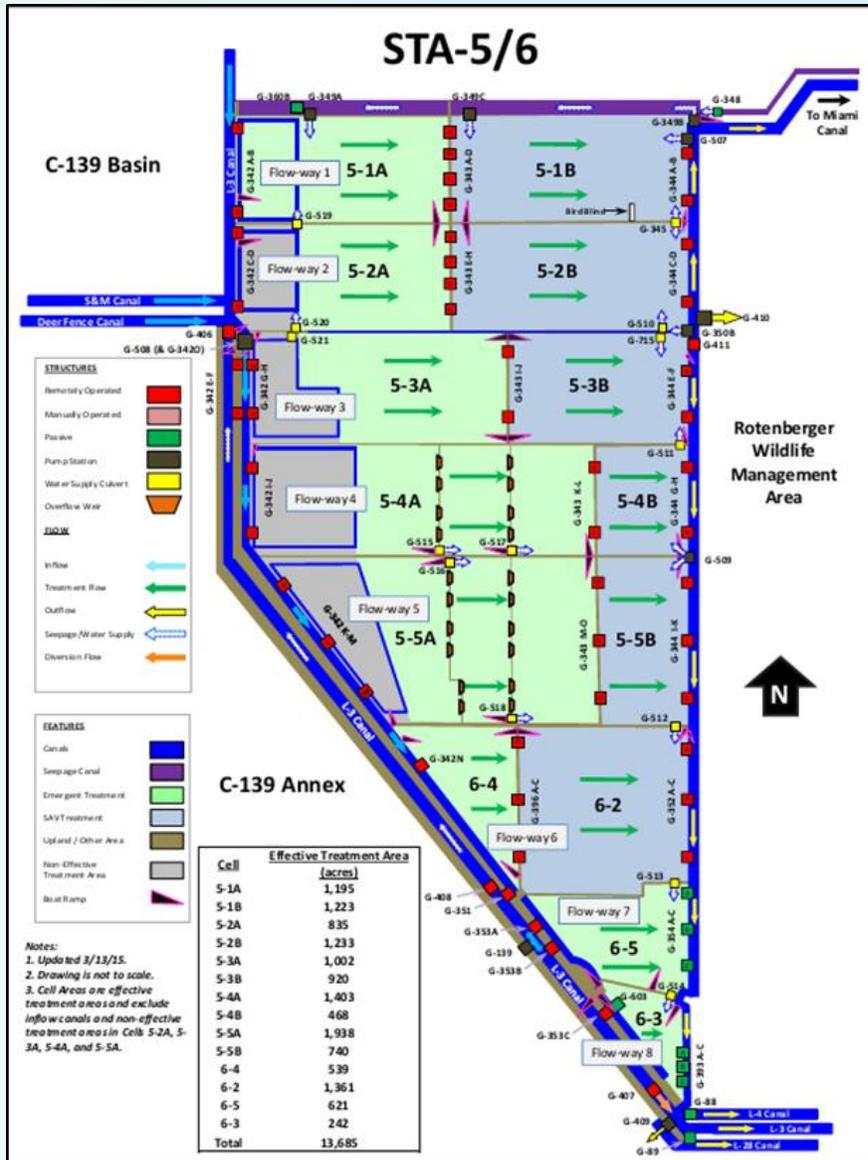
STA-3/4 Highlights

(May 1, 2017 - Dec. 31, 2018)



- All three flow-ways were operational
- Periodic restrictions
 - Vegetation management activities: planting and seeding
 - Special operations for Science Plan studies

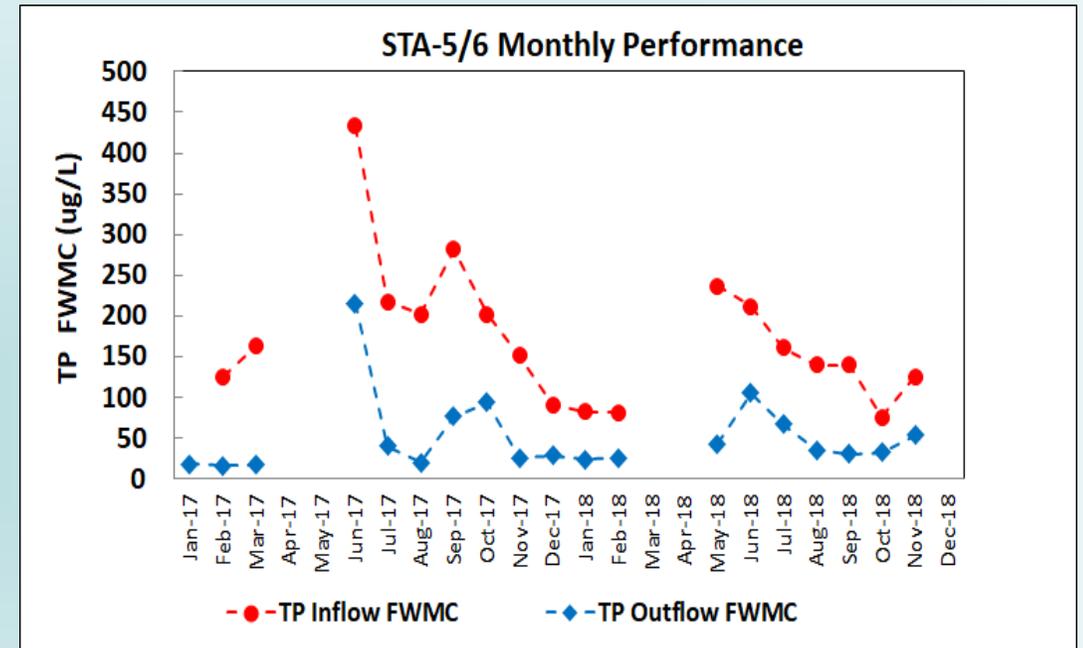
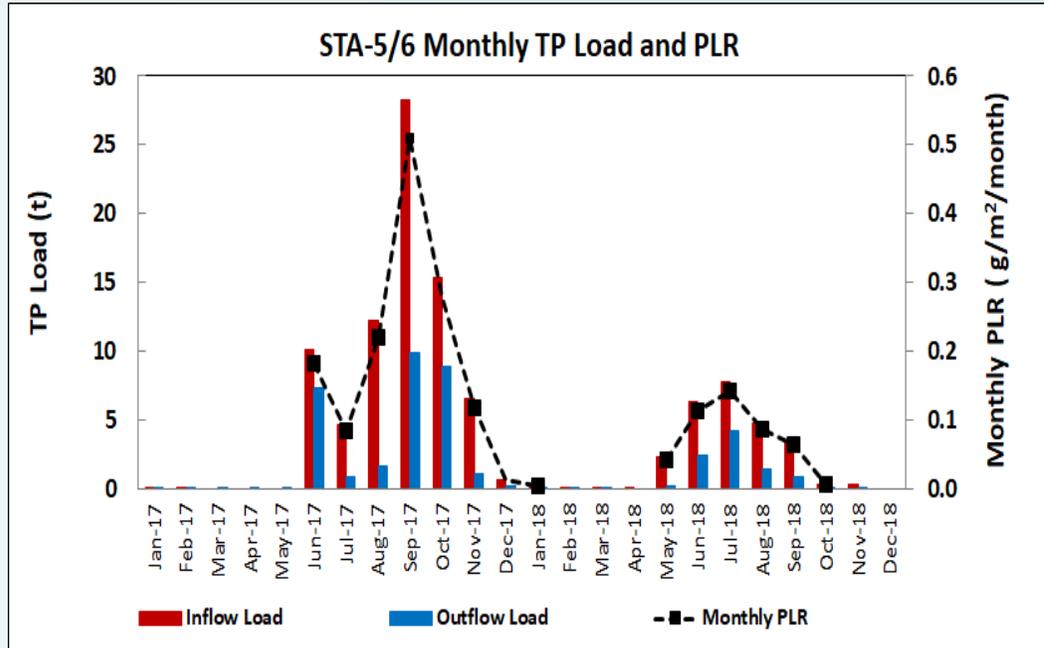
STA-5/6 Performance Comparison



	WY2017	WY2018	Partial WY2019 (05/01/2018 - 12/31/2018)
Inflow (k acre-feet)	118	271	124
TP FWMC inflow / outflow (µg/L)	164 / 17	234 / 74	165 / 57
TP load inflow / outflow (tons)	24 / 3	78 / 30	25 / 9
Reduction in TP FWMC / load	89% / 87%	68% / 62%	65% / 64%

Includes preliminary data

STA-5/6 Monthly TP Load, Loading Rate (PLR), and FWM Concentration



Includes preliminary data

- TP spikes due to three major storm events in June 2017, September 2017 and May 2018
- Frequent dry-out conditions during the dry seasons

STA-5/6 Highlights

(May 1, 2017 - Dec. 31, 2018)

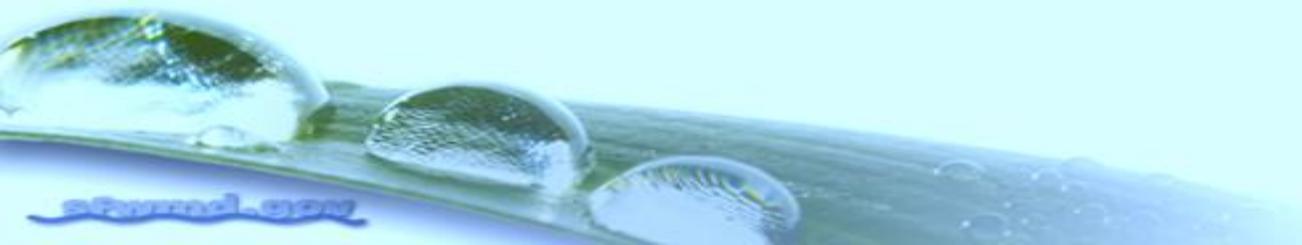


- Periodic restrictions
 - Flow-ways 2 and 3 offline since July 2018 for Restoration Strategies earthwork project
 - Snail kites nested in Cell 5A and black-necked stilts nested in Cells 3A, 3B, 4B 5B and Flow-way 6
- EAV cells in Flow-ways 5 through 8 experienced dry out conditions



Summary

- STA performance was impacted by high inflow volumes and TP loads associated with major storm events
- STA outflow TP concentrations are generally improving but have not returned to WY2017 levels



Questions

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