



# IMPACT OF TROPICAL STORM ISAAC ON STORMWATER TREATMENT AREAS

**David Unsell**

Water Quality Treatment Technologies

**Lawrence Gerry**

Office of Everglades Policy & Coordination

Quarterly Communications Meeting on the Long-Term Plan for Achieving  
Water Quality Goals for Everglades Protection Area Tributary Basins

November 28, 2012

# Tropical Storm Isaac

August 26 – 27, 2012

- Record Rainfall Event (last 20 years)
  - 2<sup>nd</sup> largest 1-day rainfall event
  - 3<sup>rd</sup> largest 2-day rainfall event
- Heaviest rainfall in Palm Beach, Broward & Dade Counties
  - C-51 Basin: 1 in 100 year rainfall event
  - Almost 15 inches rain in 72 hr period



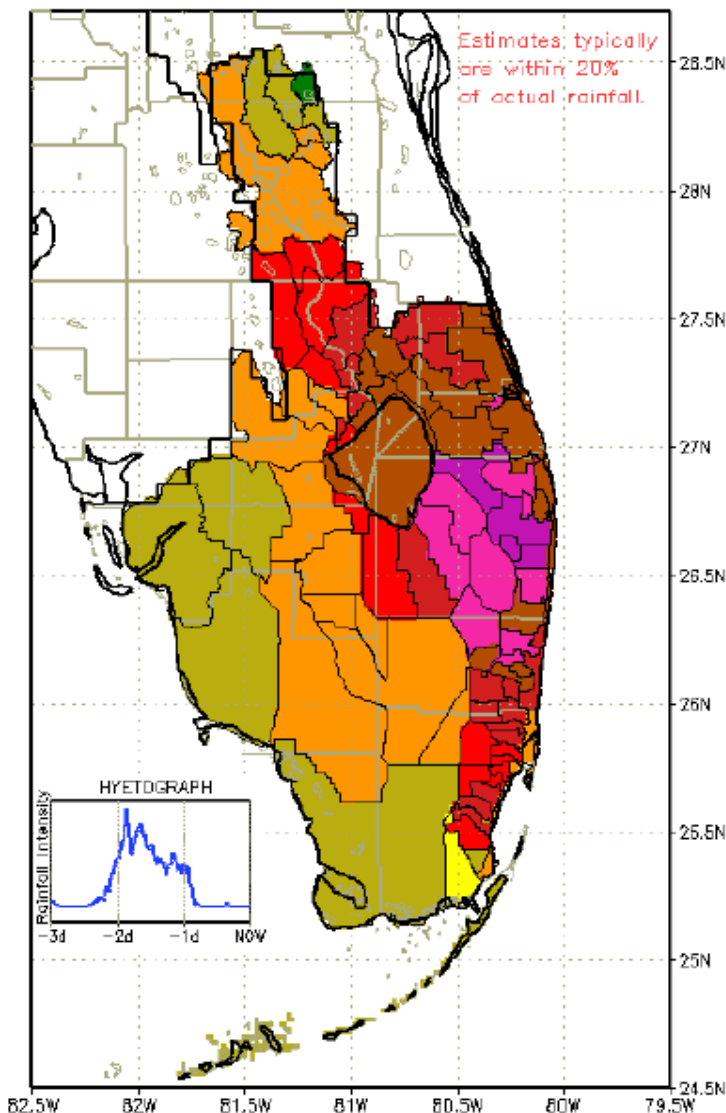
*STA-1W G-303 gated structure*

# 3-Day Rainfall Estimate



SFWMD RAINDAR 3-DAY BASIN RAINFALL ESTIMATES

FROM: 1200 EST, 08/25/2012 THROUGH: 1200 EST, 08/28/2012



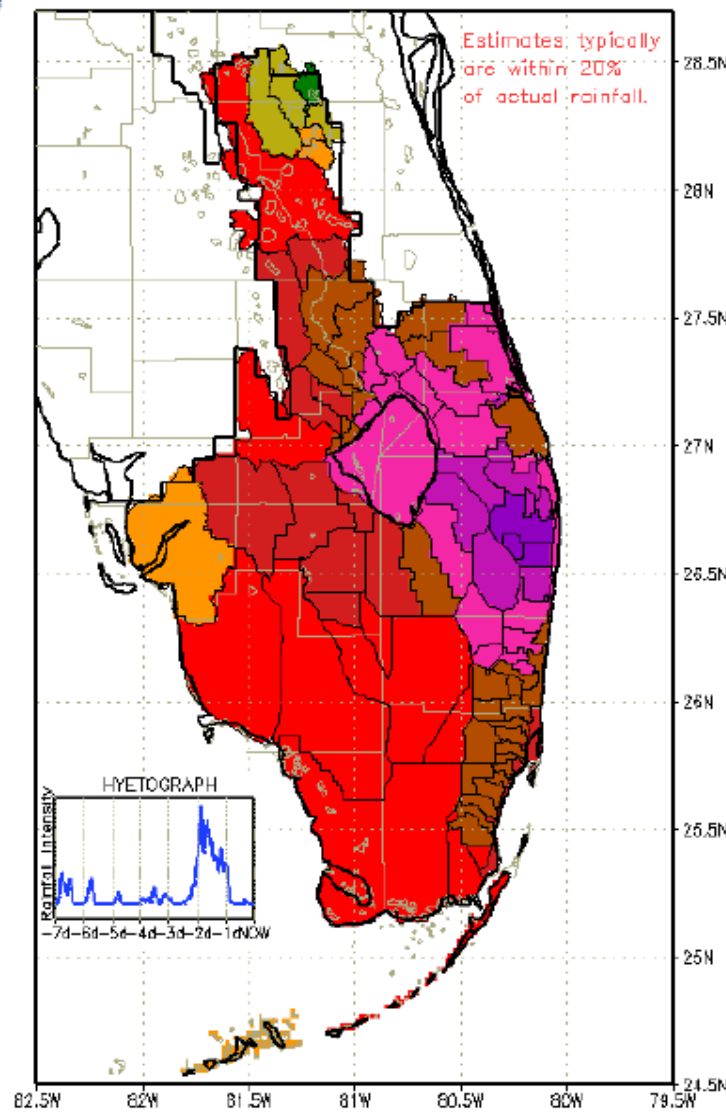
DISTRICT-WIDE RAINFALL ESTIMATE: 4.755"

# 7-Day Rainfall Estimate



SFWMD RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 1130 EST, 08/21/2012 THROUGH: 1130 EST, 08/28/2012



DISTRICT-WIDE RAINFALL ESTIMATE: 6.249"













# Impact on STAs

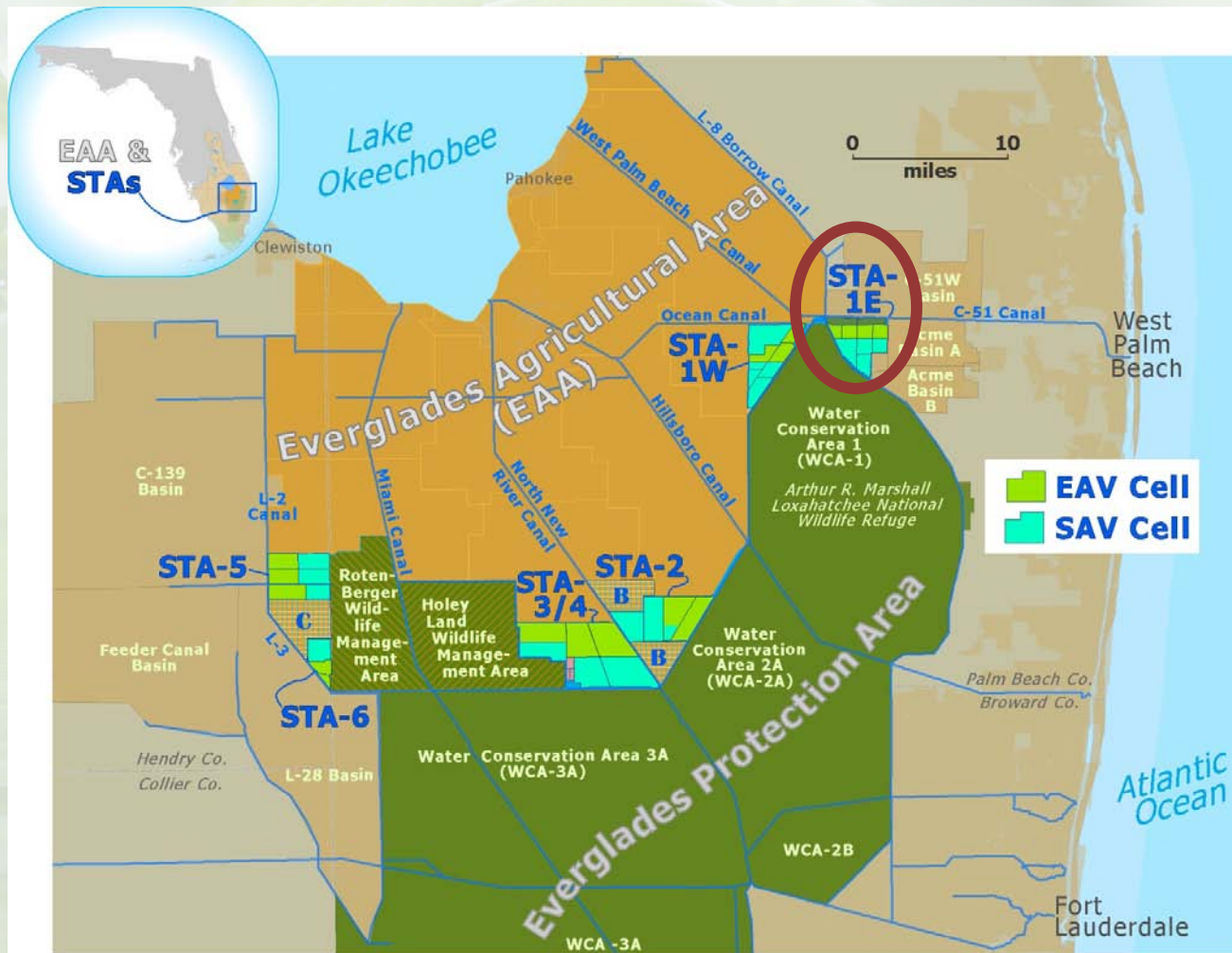
- Elevated Inflow flows, total phosphorus (TP) loads & concentrations
- 24 hr pumping @ STA-1E, STA-1W, STA-2 & STA-3/4
  - S-5A & S-319 maximum pumping rate
- Some STA-1E/STA-1W structures under repair
- Deep water depths
- Diversions into Water Conservation Area 1 (WCA-1)
- STA-5 & STA-6 unaffected



*STA-1E Cell 3 outflow structure S-367A vegetation TuffBoom® buckled due to high flows. Vegetation remaining on the railing on left indicates elevated water levels.*

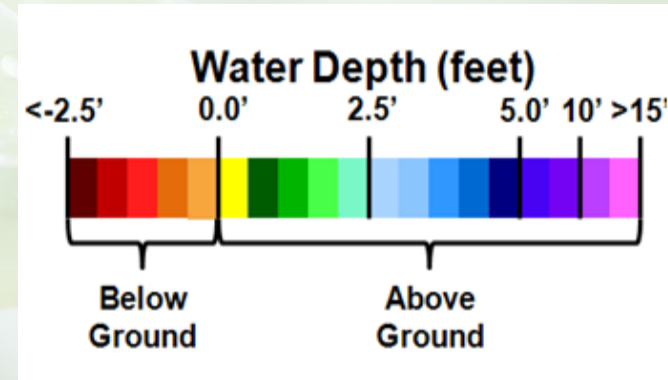
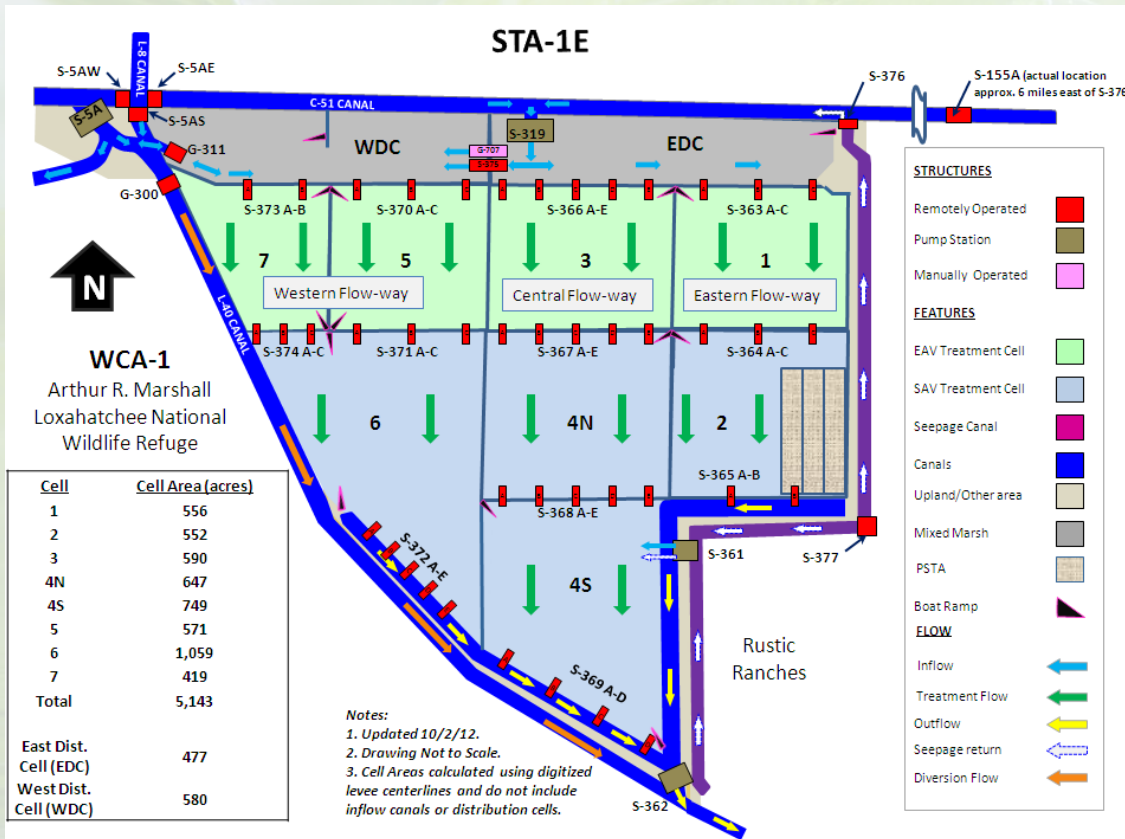


# STA-1E



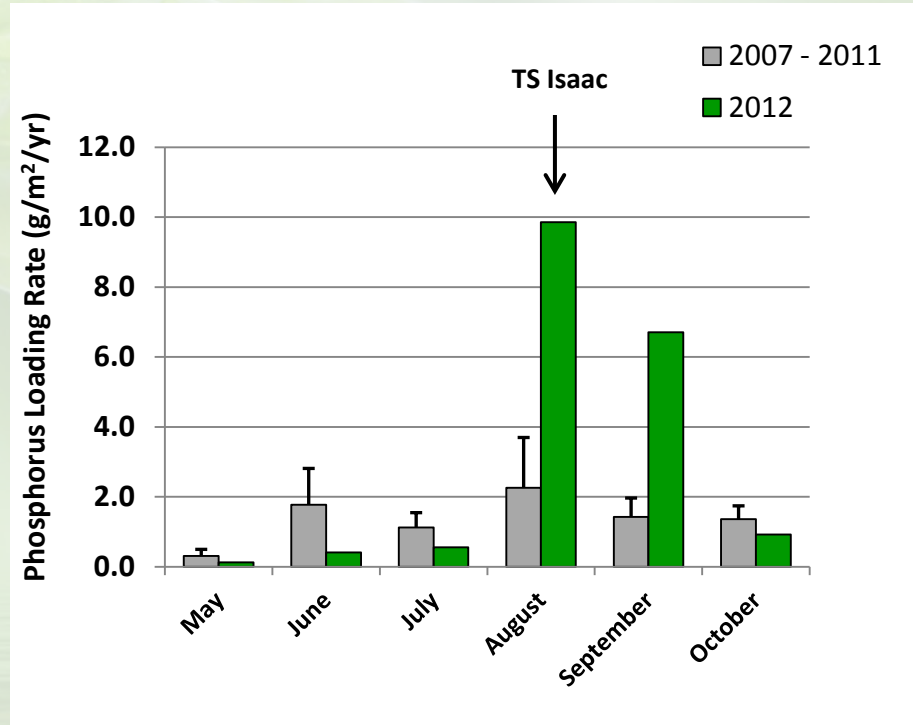
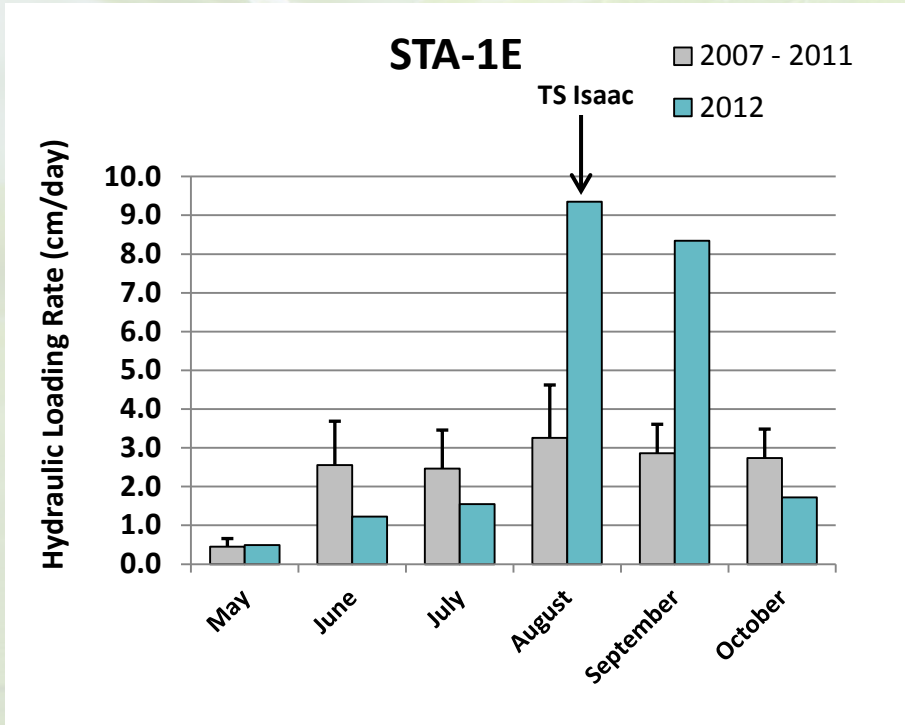


# STA-1E Water Depths



[STA-1E Animation](#)

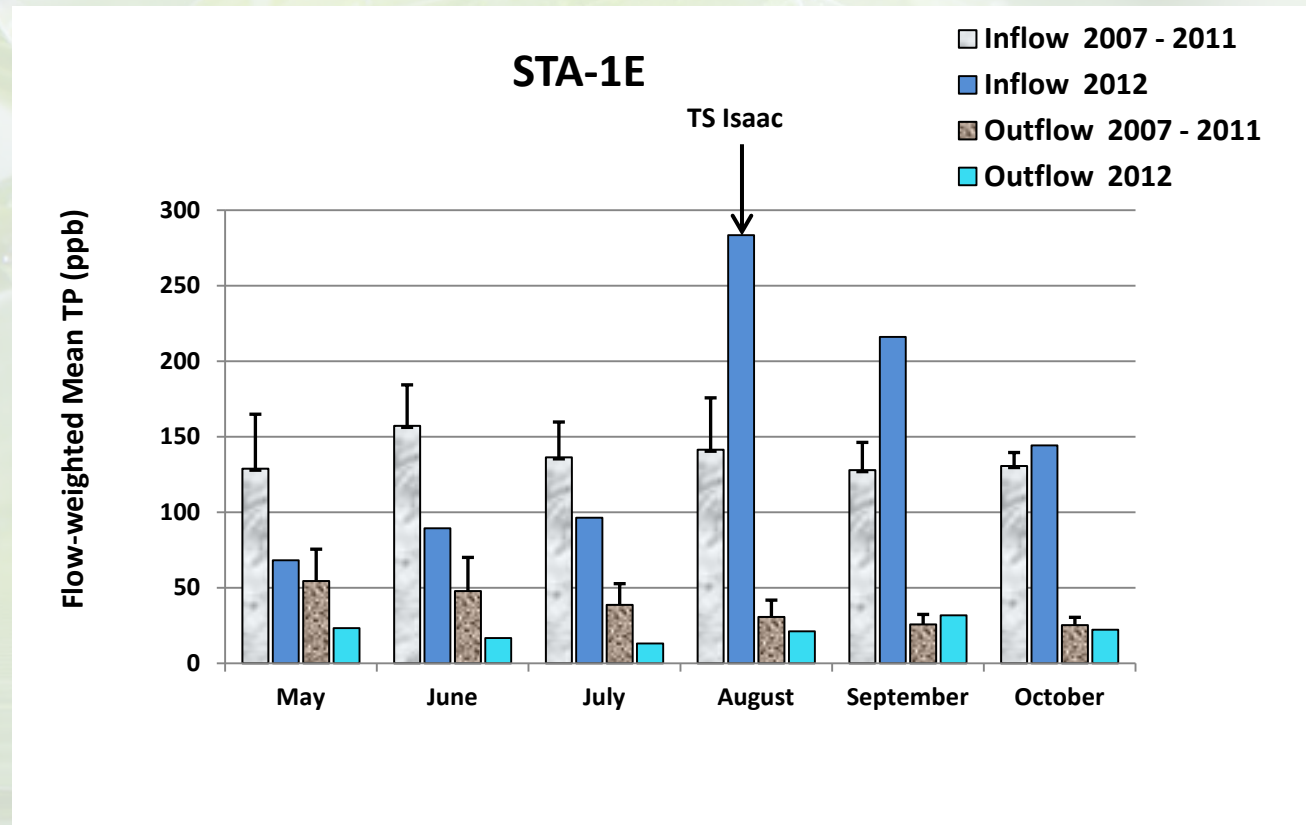
# Water Quality Impacts



Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.

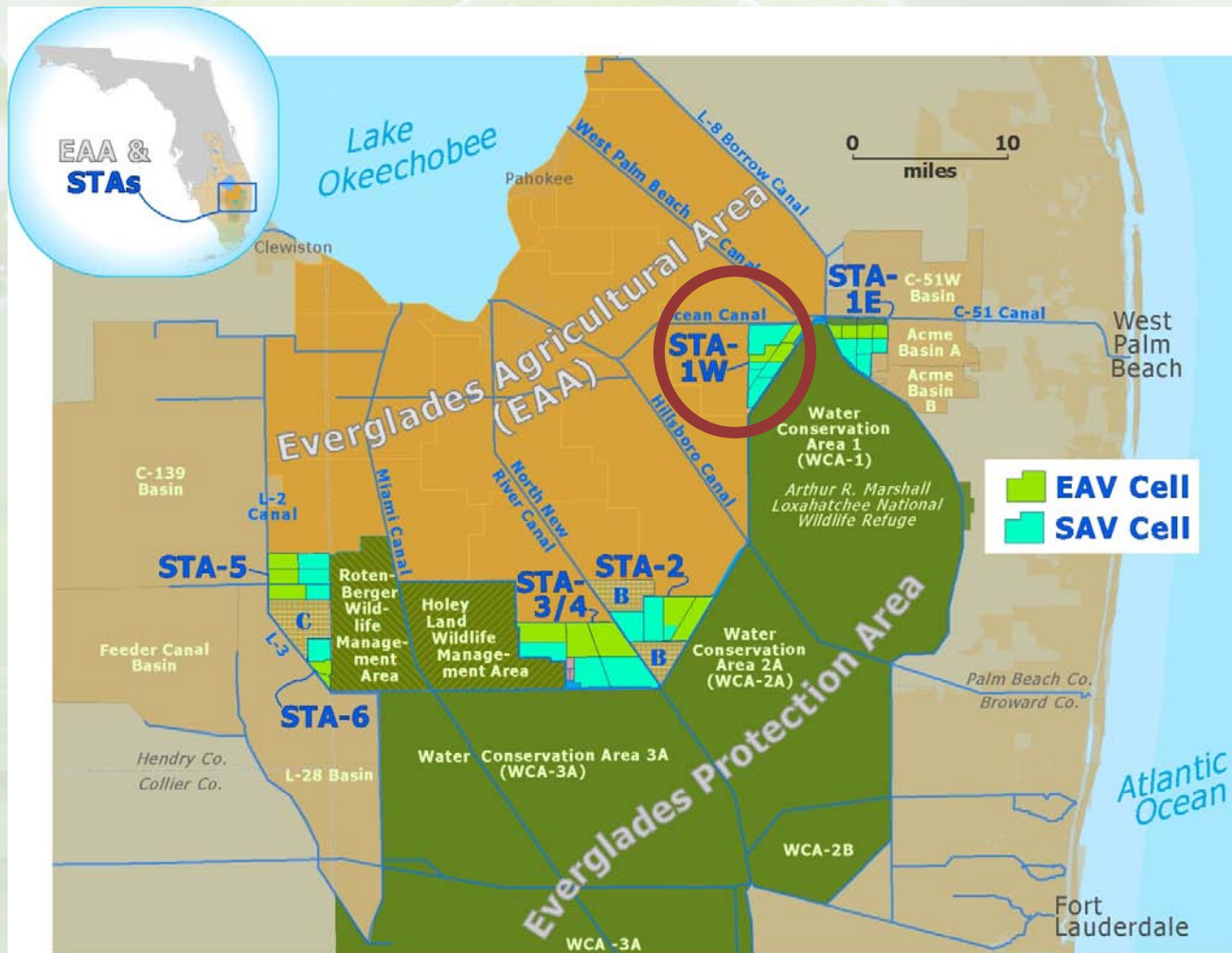


# Water Quality Impacts



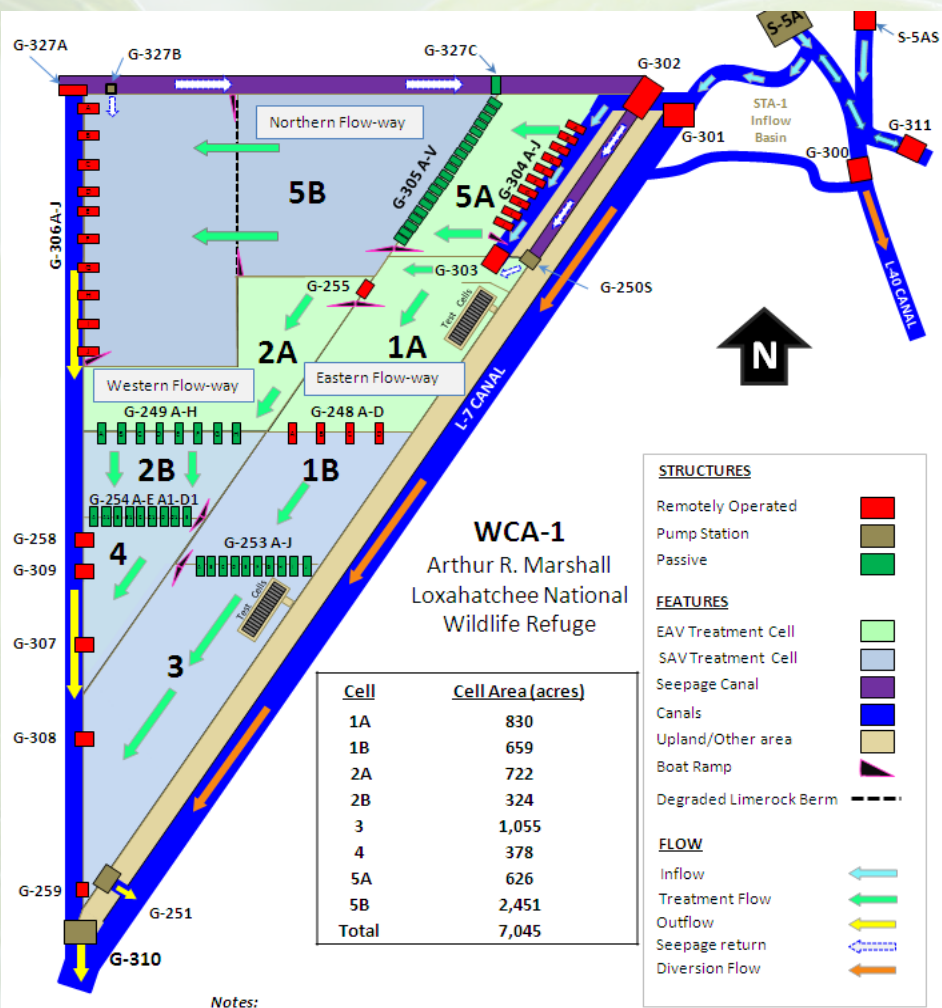
Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.

# STA-1W

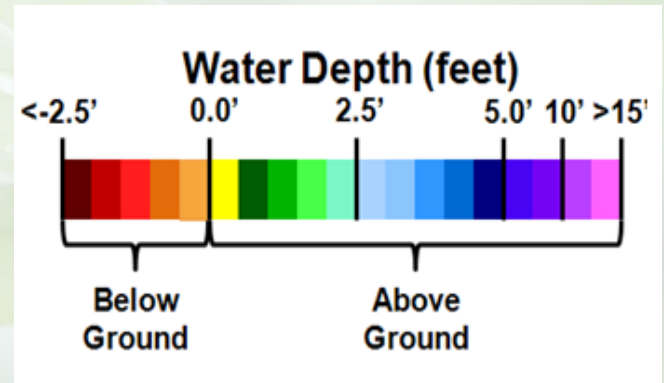




# STA-1W Water Depths

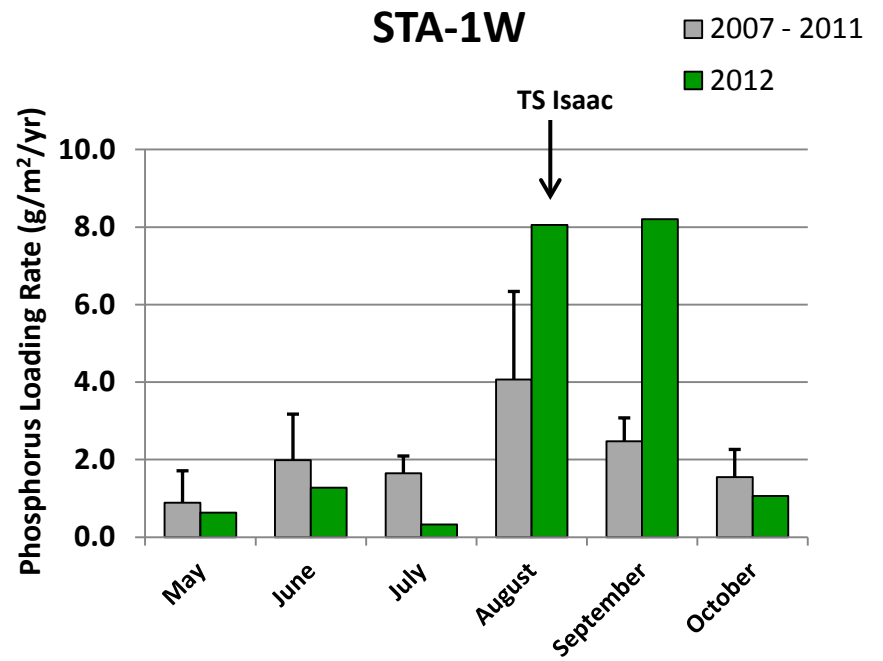
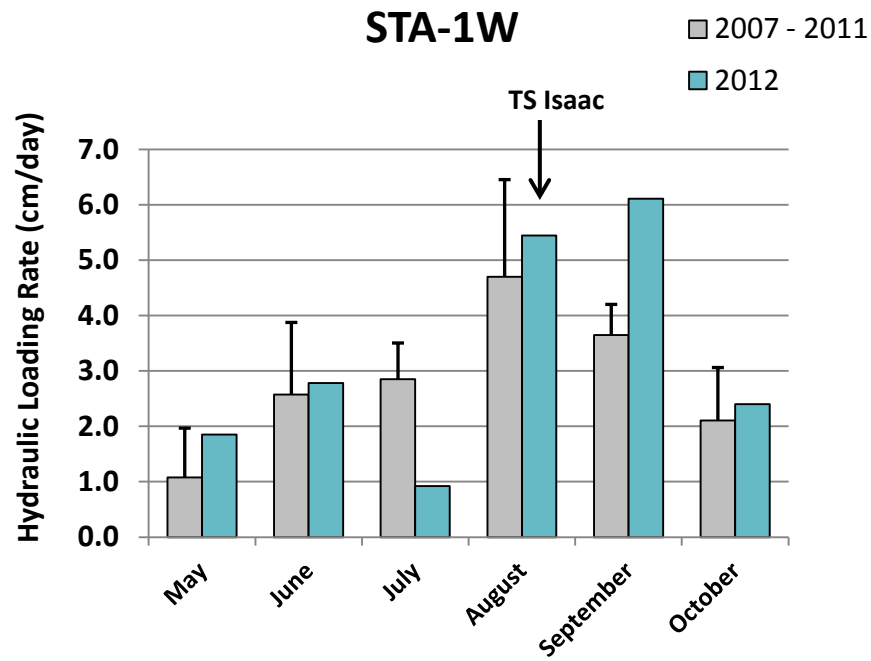


Notes:  
1. Updated 9/12/12.



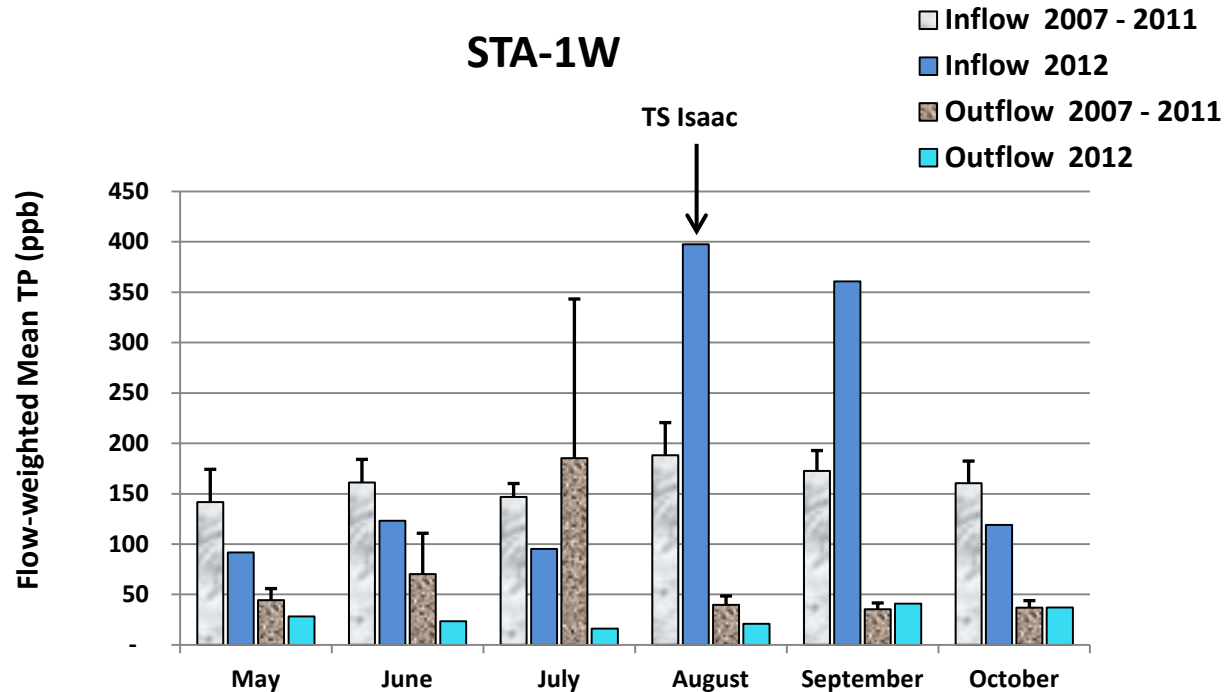
[STA-1W Animation](#)

# Water Quality Impacts



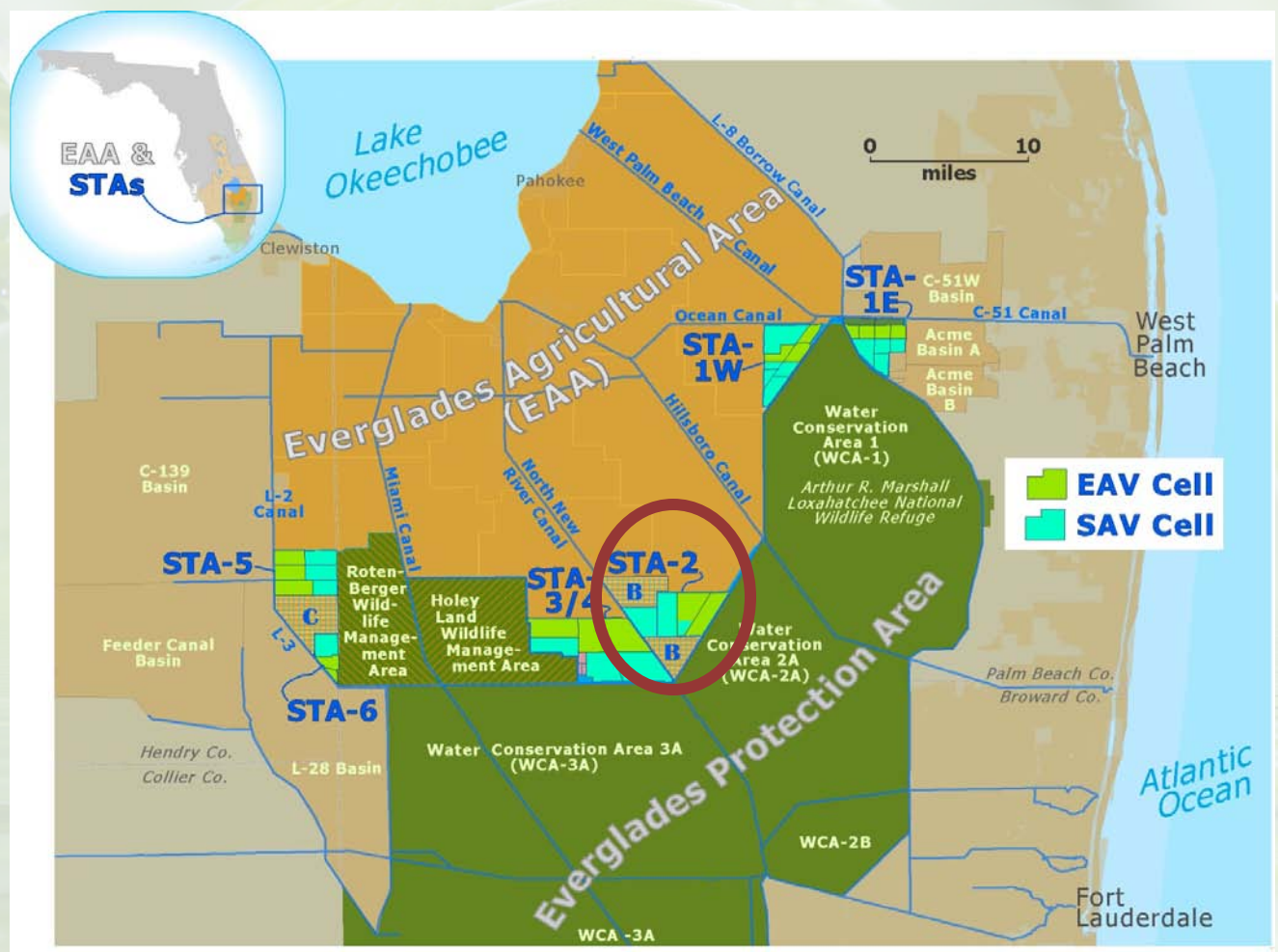


# Water Quality Impacts



Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.

# STA-2

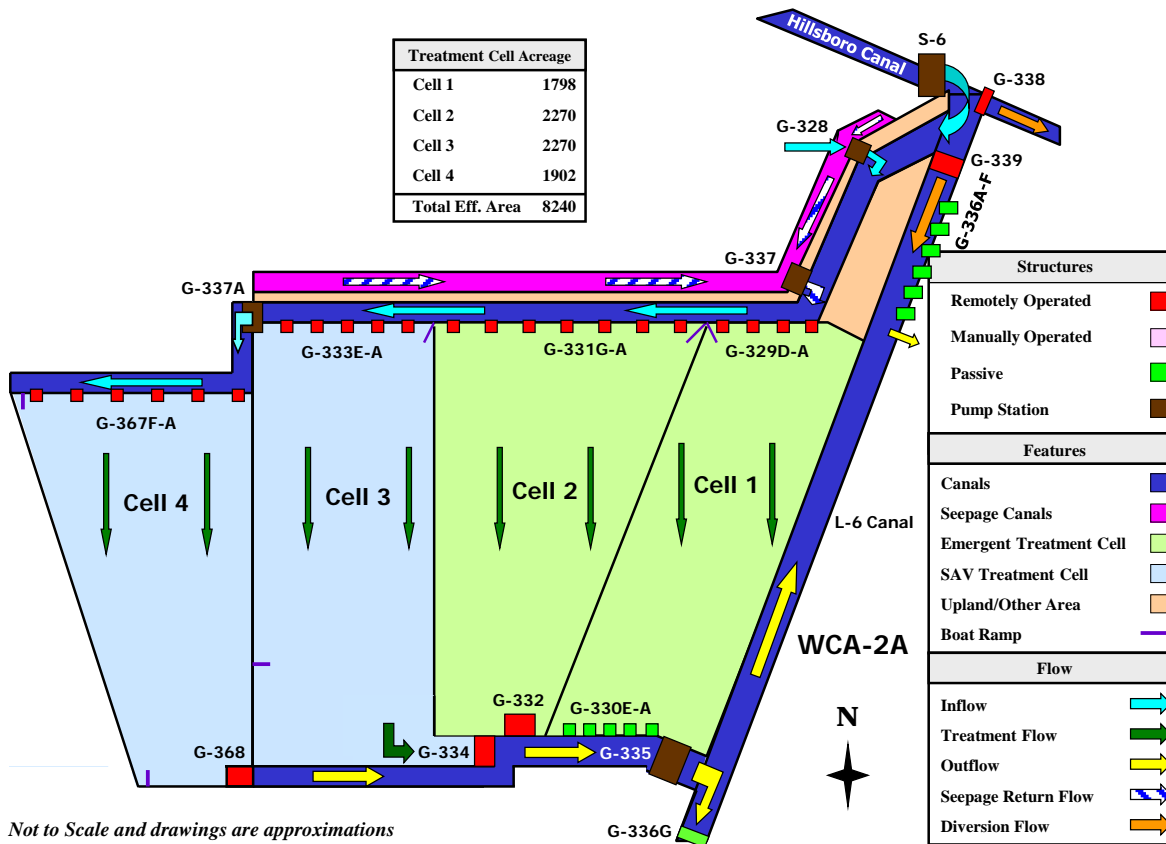




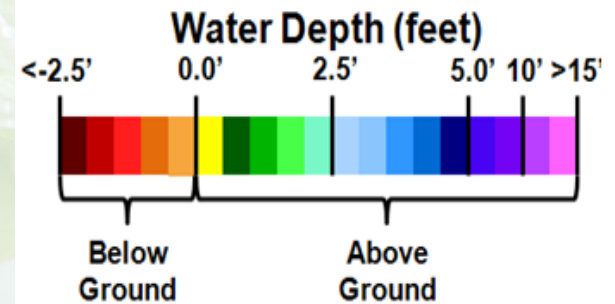
# STA-2 Water Depths

## STA-2

Treatment Cell Acreage	
Cell 1	1798
Cell 2	2270
Cell 3	2270
Cell 4	1902
<b>Total Eff. Area</b>	<b>8240</b>

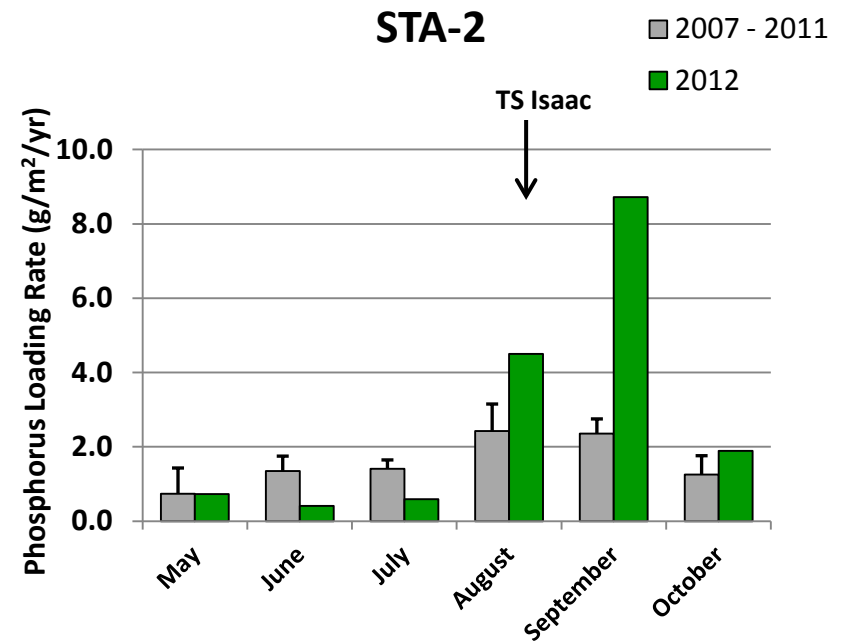
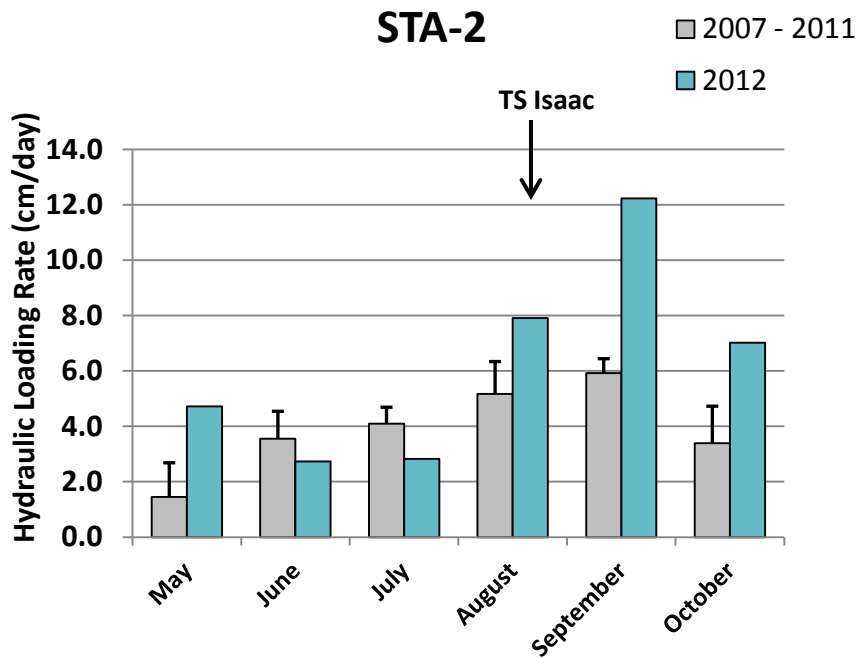


Not to Scale and drawings are approximations



[STA-2 Animation](#)

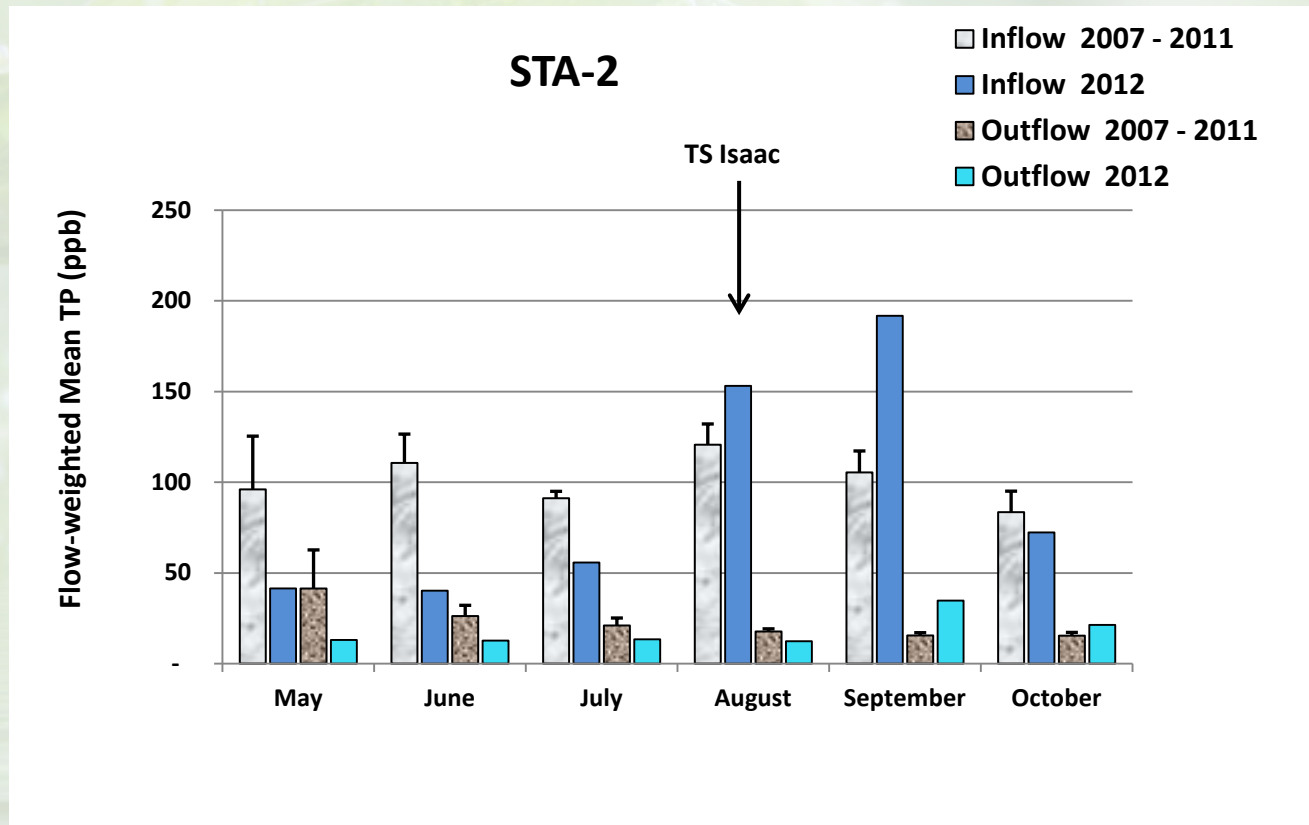
# Water Quality Impacts



Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.

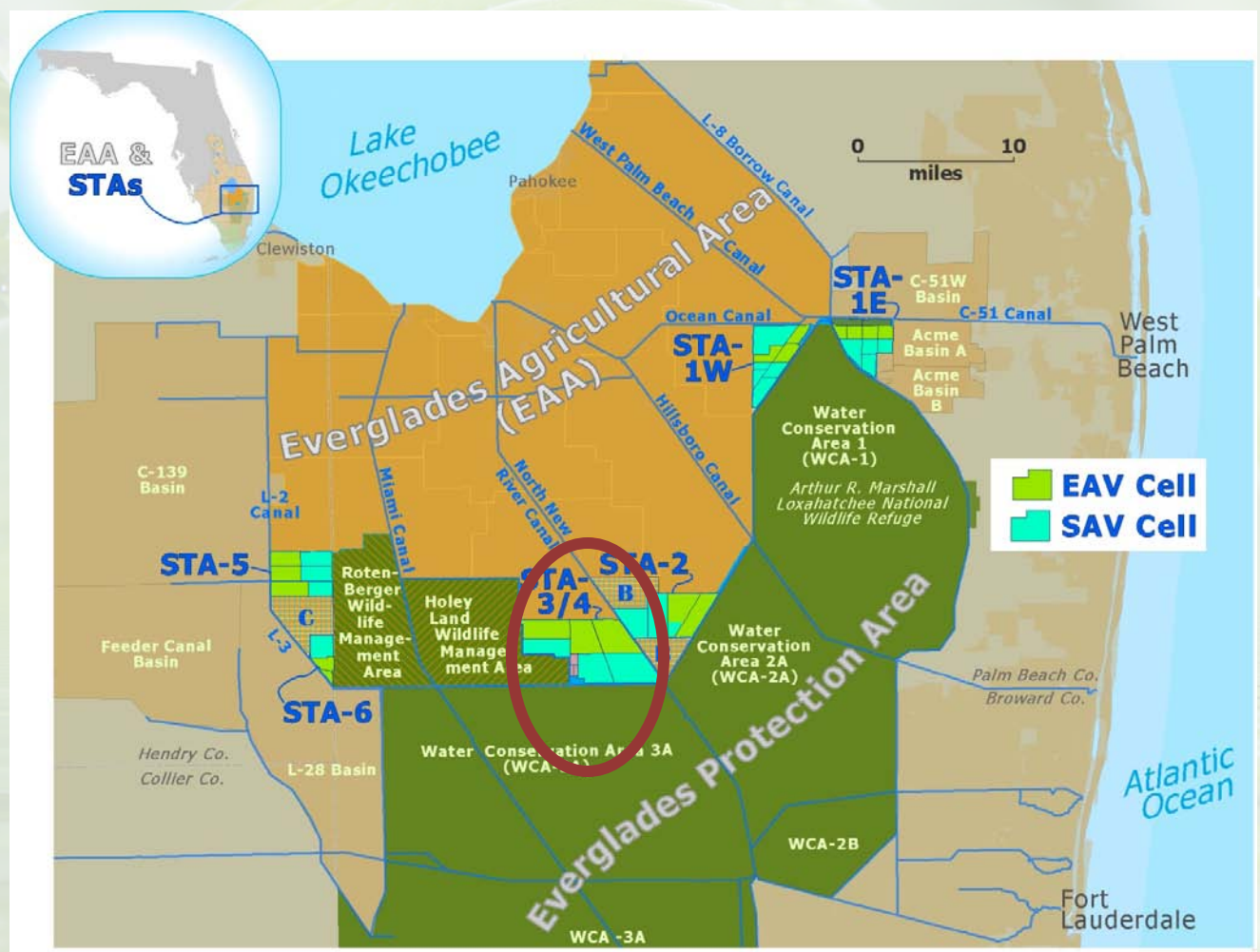


# Water Quality Impacts



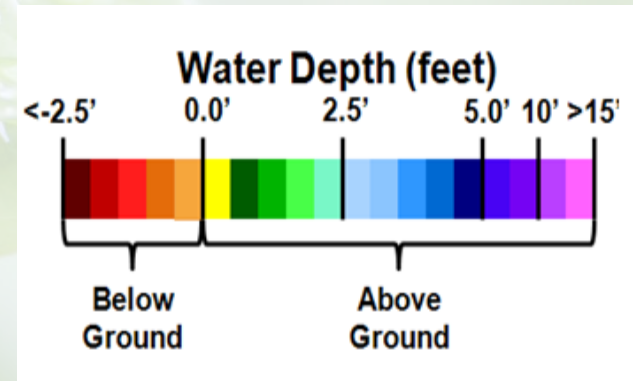
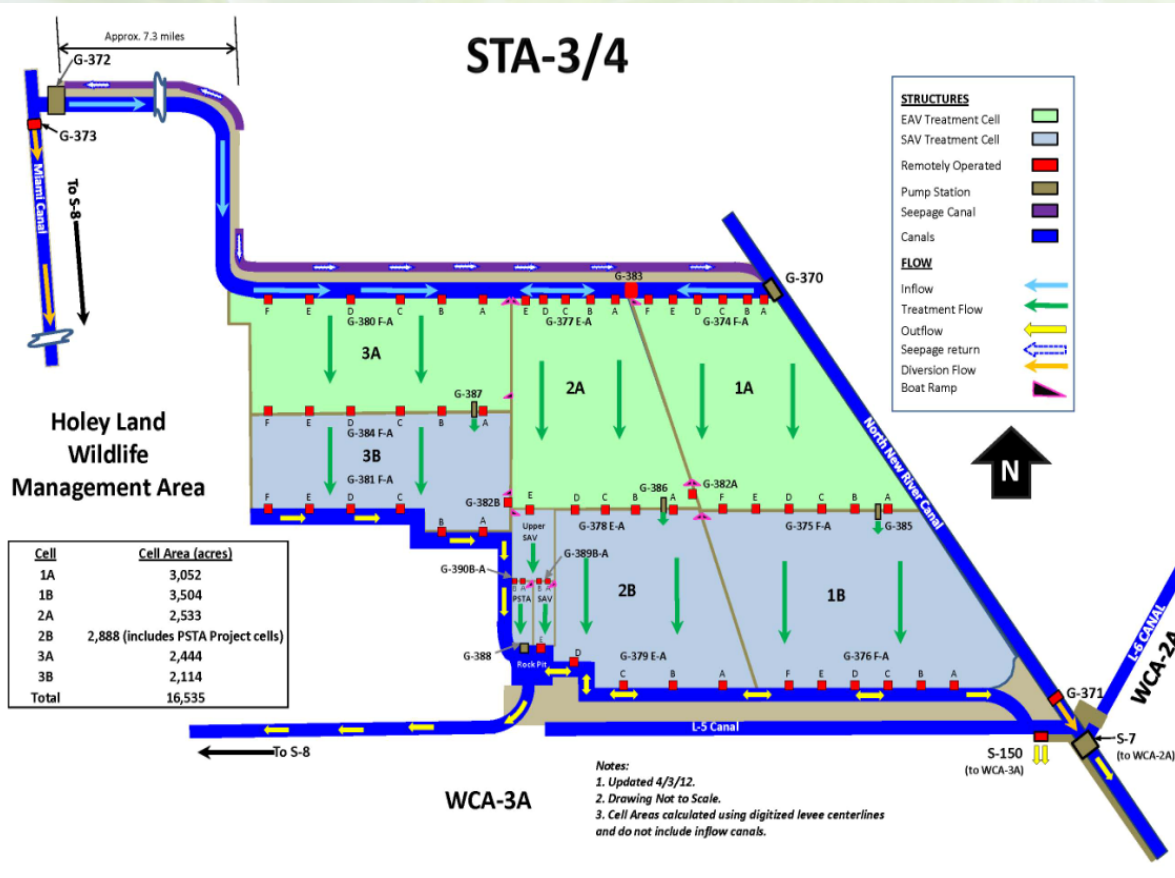
Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.

# STA-3/4



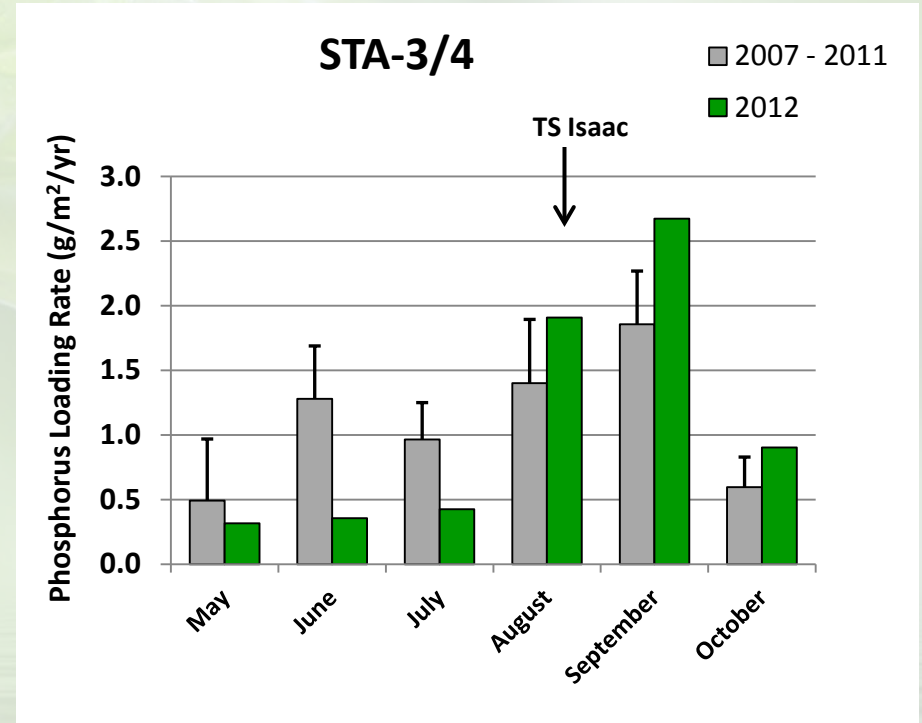
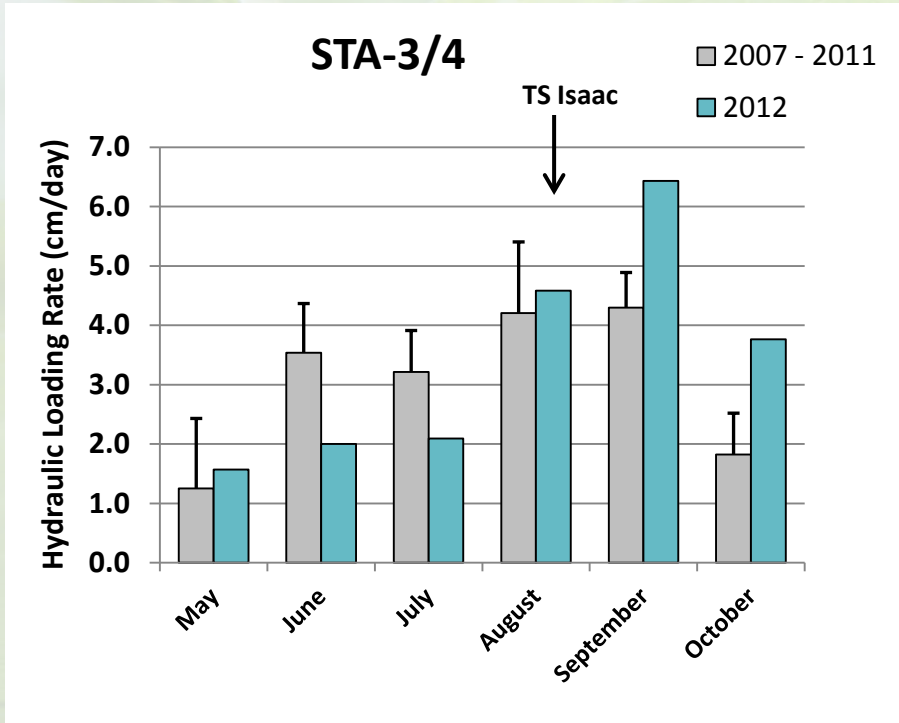


# STA-3/4 Water Depths



[STA-3/4 Animation](#)

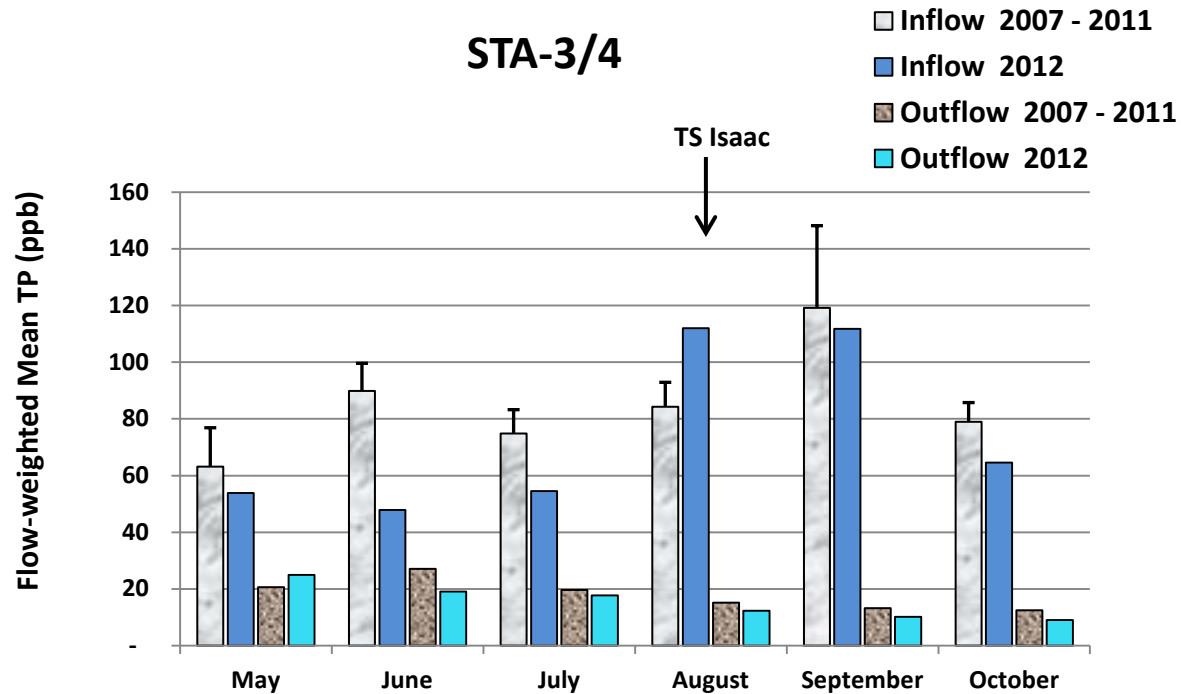
# Water Quality Impacts



Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.



# Water Quality Impacts

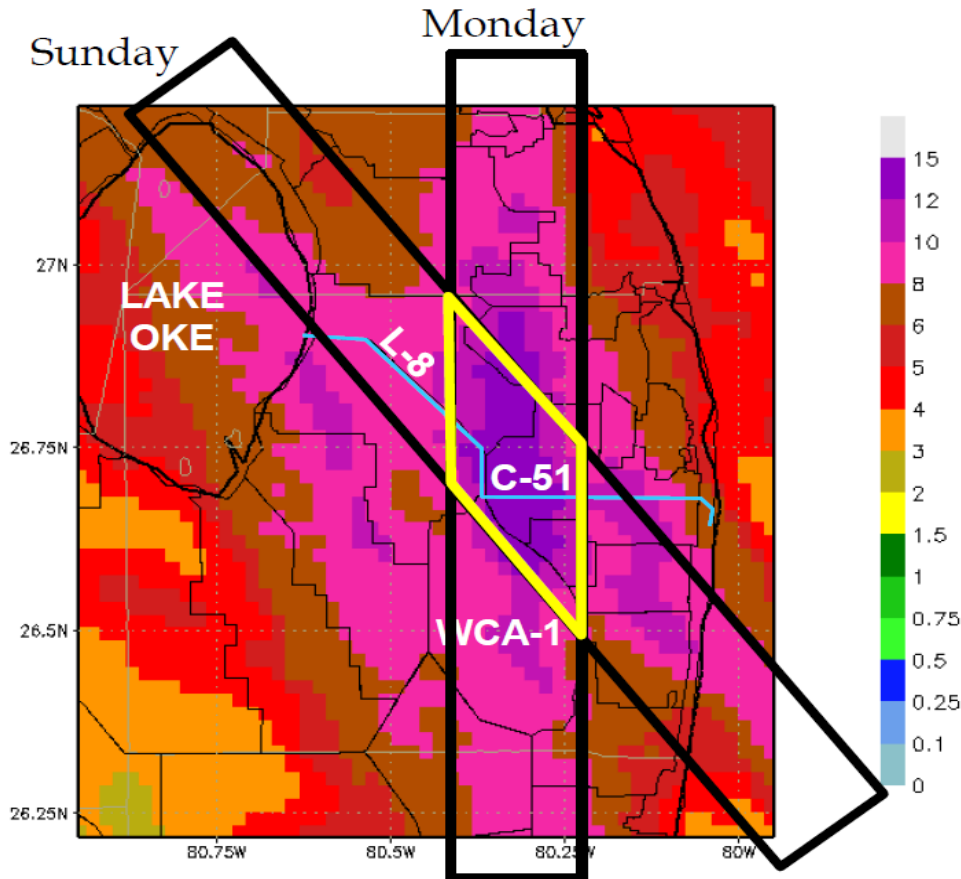


Standard error bars shown. Graph contains preliminary data.

*Average values and standard error bars are shown for 2007 - 2011. Graph contains preliminary data.*

# STA-1E/STA-1W Diversion

48-Hour Isaac Estimated Rainfall Amounts  
8pm Saturday – 8pm Monday (Aug 25-27)

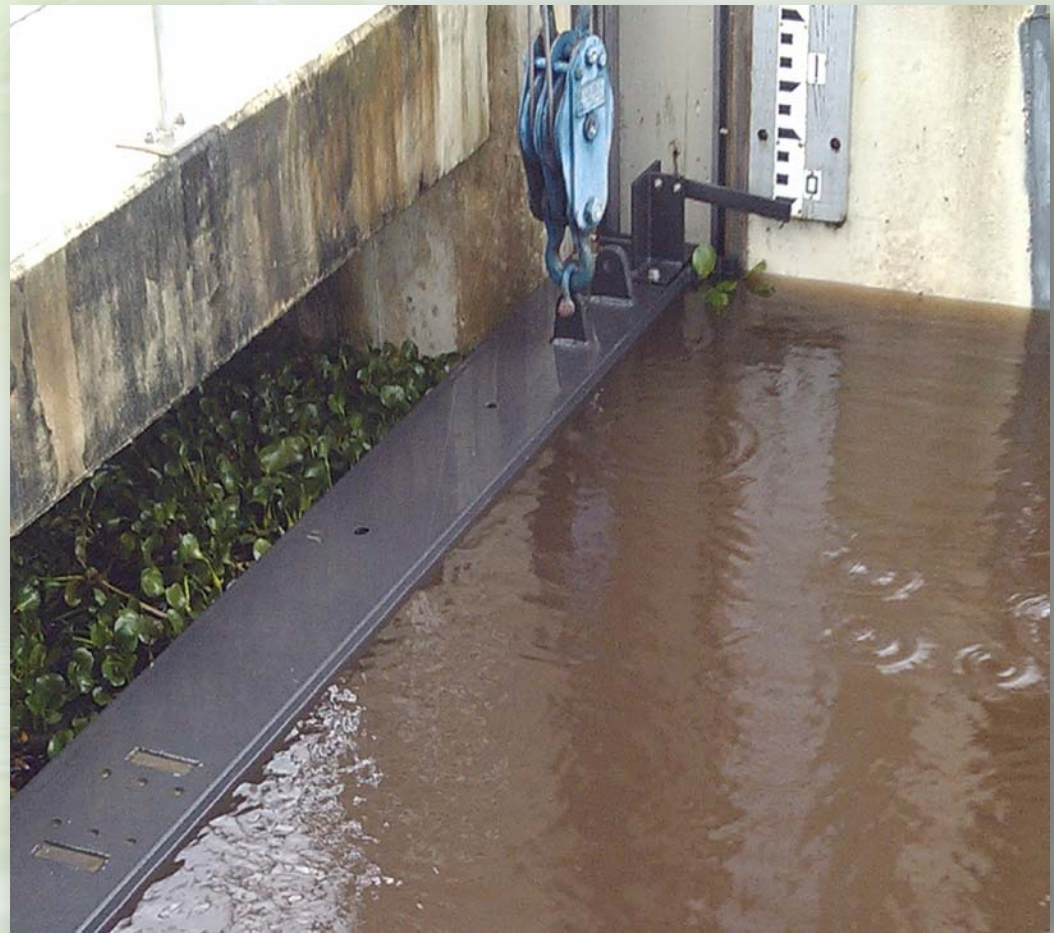


2012-09-05



# STA-1E & STA-1W Diversion

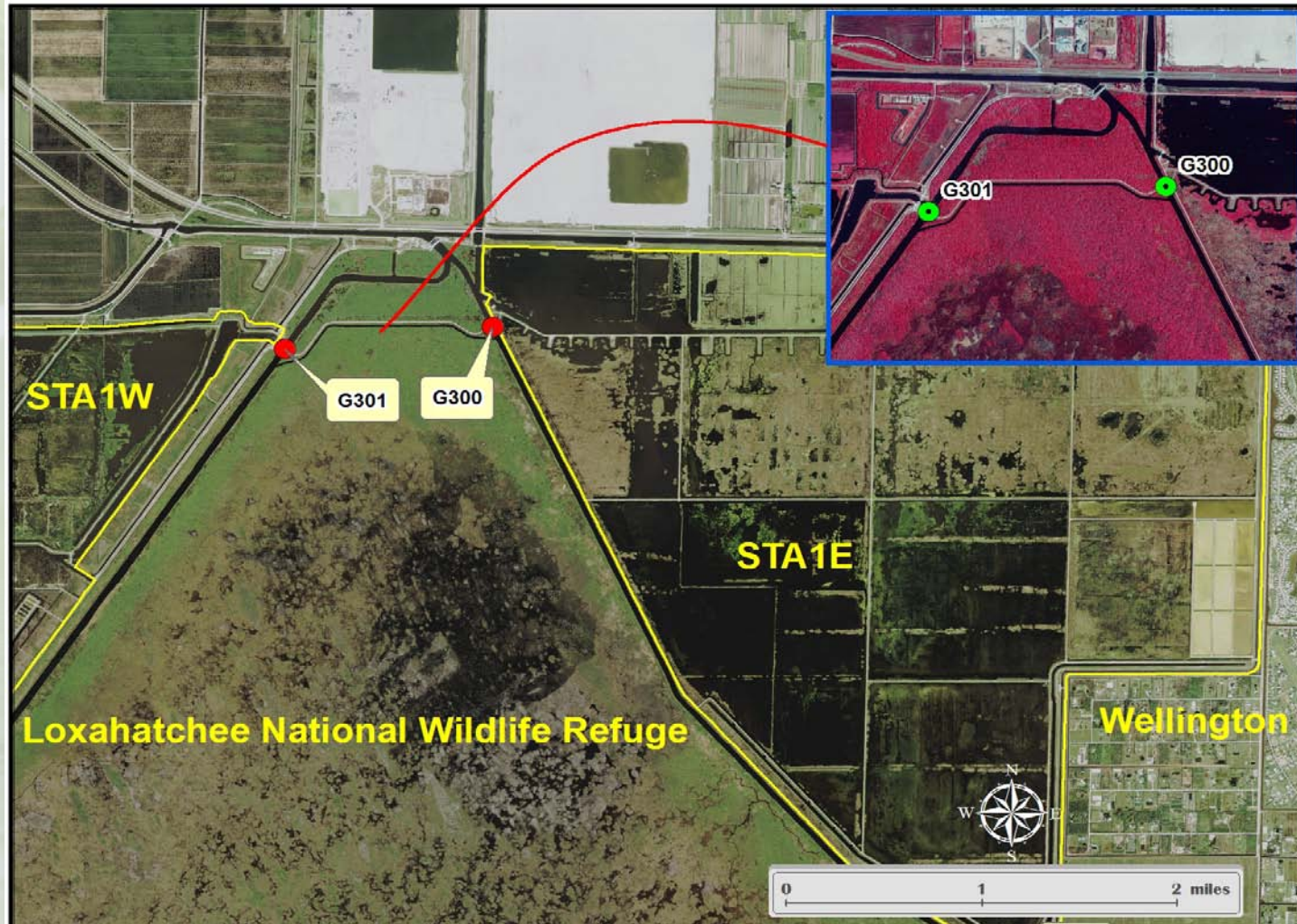
- Maximum discharges to Lake Okeechobee
- Maximum discharges to Lake Worth Lagoon
- Maximum discharges to STA-1E and STA-1W
- Rising stages in STA-1 Inflow Basin and upstream canals



*Water levels at the top of the inflow gate.*



# STA-1E/STA-1W Diversion Structures





# Upstream Gauges Prior to Diversion



# Diversion Structure Average Daily Flows

Date	G-300 (STA-1E)	G-301 (STA-1W)
	Flow, cfs	Flow, cfs
8/27/2012	372	445
8/28/2012	1,500	734
8/29/2012	1,221	740
8/30/2012	1,653	609
8/31/2012	2,039	359
9/1/2012	2,046	118
9/2/2012	1,517	34
9/3/2012	669	0

cfs = cubic feet per second



# Summary of Flow Volume, TP Load & TP Concentrations August 27 – September 3, 2012

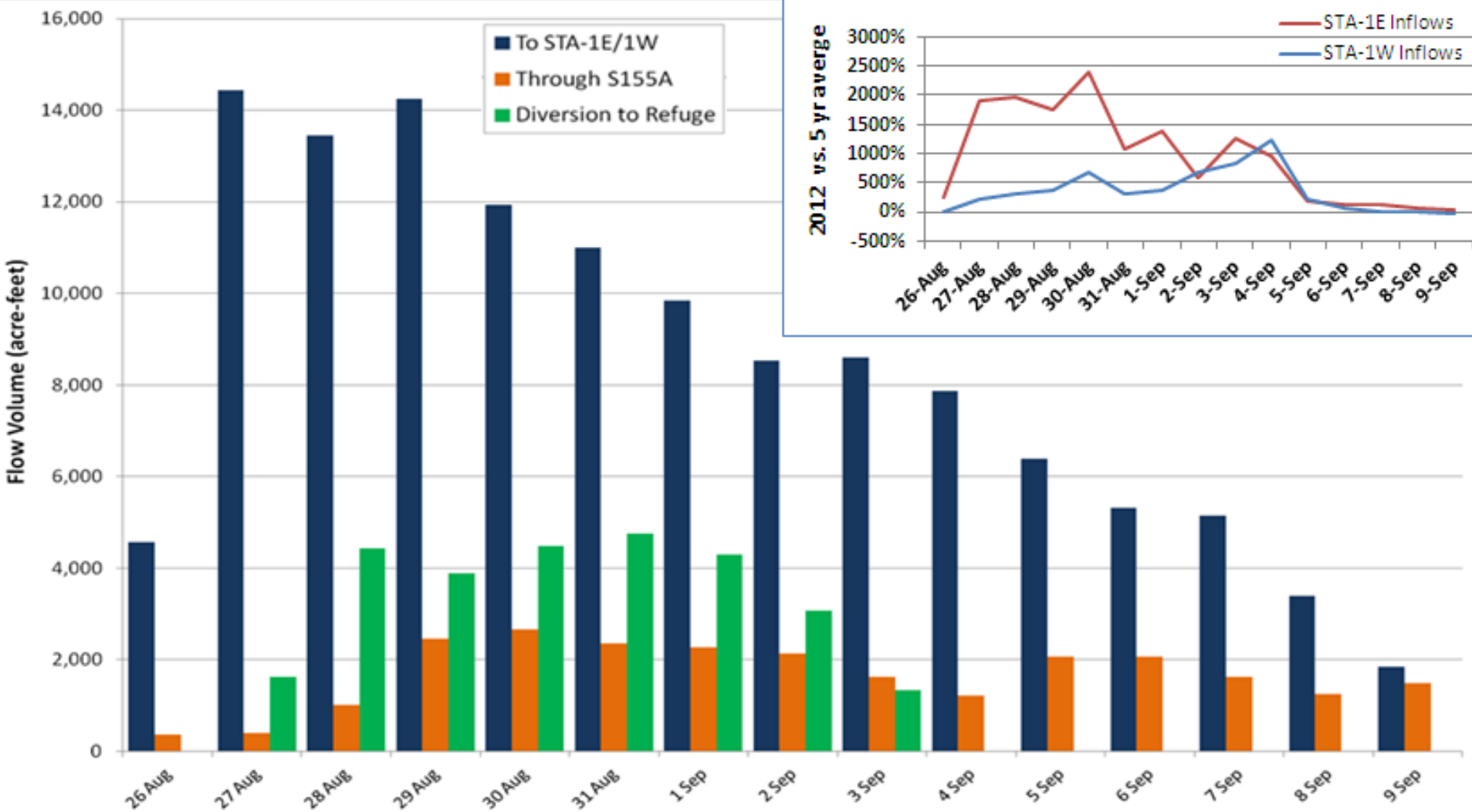
STA Diversion Structure	Flow Volume (Acre-feet)	Total Phosphorus	
		Load (metric tons) <sup>1</sup>	Flow-Weighted Mean Concentration <sup>2</sup> , (mg/L)
G-300	21,850	10.0	0.371
G-301	6,026	3.1	0.421

<sup>1</sup>Note: one metric ton equals 1,000 kilograms.

<sup>2</sup>Based on flow-proportionate composite samples collected 9/4/2012

# Flows to STA-1E and STA-1W

## Diversions to Loxahatchee National Wildlife Refuge & Transfers to Eastern C-51 Basin





# Questions?

