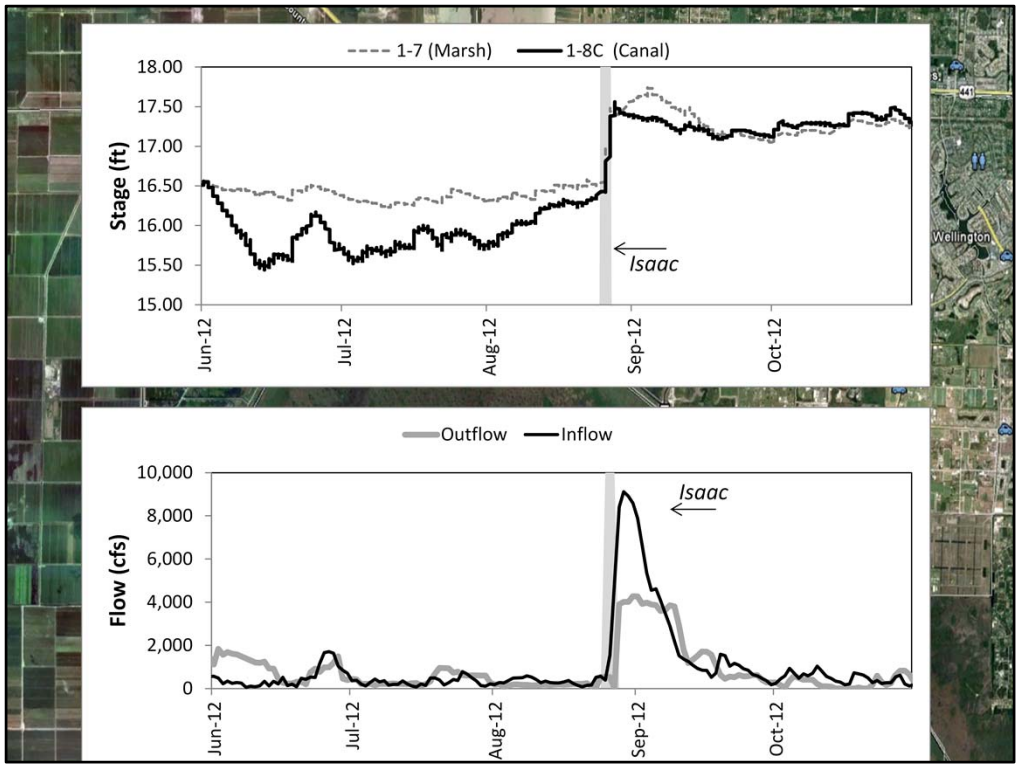
Tropical storm Isaac and resulting phosphorus impacts on the northern Refuge marsh

Donatto Surratt
Everglades National Park

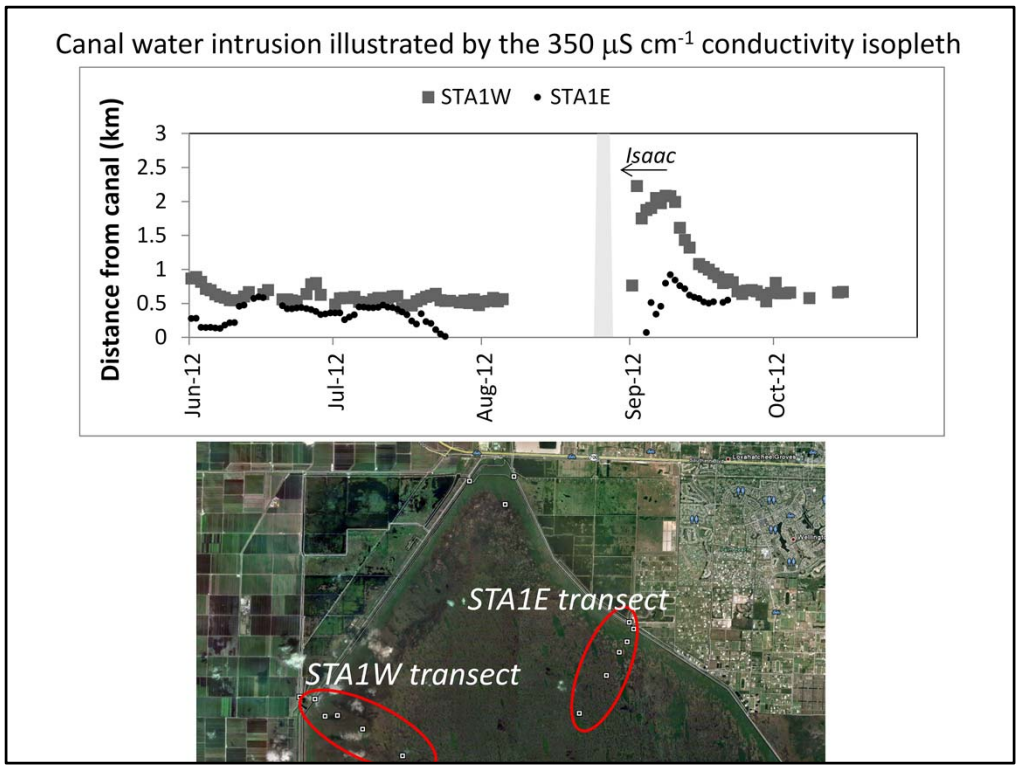
Data aggregated for the period from Aug 27th through Sep 4th

Station	Flow (kac-ft)	% of mean annual Refuge inflow since WY2005	FWM TP (ppb)	TP load (mt)	% of mean annual Refuge TP load since WY2005
G300	21.8	7.9	371	10.0	35.7
G301	6.0	2.2	421	3.1	11.1
ACME2 (G94D)	1.2	0.4	139	0.2	0.7
STA1W	52.3	19.0	22	1.4	5.0
STA1E	47.7	17.3	19	1.1	3.9

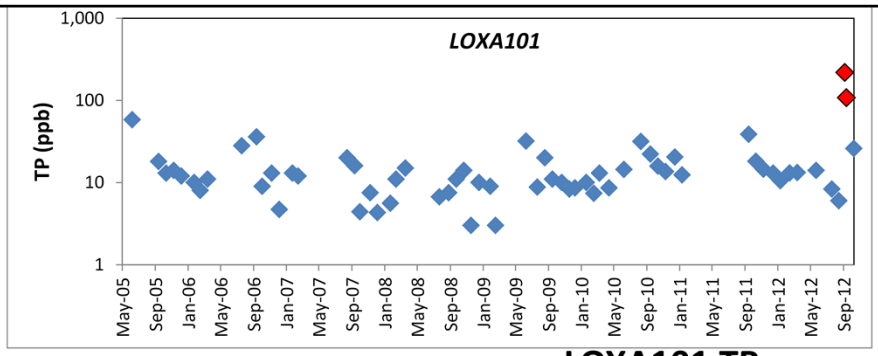
Isaac passed through south Florida beginning on Aug 25th

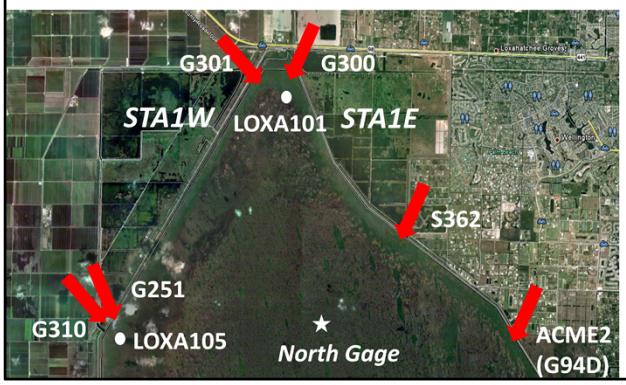


- Marsh stage was maintained higher than canal stage during the two months leading to Isaac
- Inflows resulting from Isaac-related operations rapidly increased canal and marsh stage
- Canal stage exceeded marsh stage for a short period
- Outflows started later than inflows and at less than half the rate of inflows
- Continued outflows reduced canal stages over the two weeks following Isaac



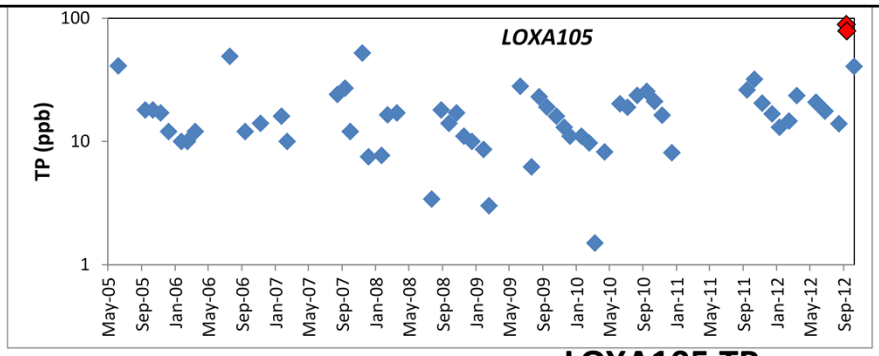
- Canal water intrusion was limited to 0.5 km or less during the month preceding Isaac
- Inflows from STA1W resulted in canal water rapidly intruding 2.4 km into the marsh interior
- Outflows and continued rainfall reduced intrusion over the two weeks following Isaac
- Methods for determining canal water intrusion and the explanation of the conductivity isopleth can be found at http://sofia.usgs.gov/lox_monitor_model/reports/2nd_annual_07.html

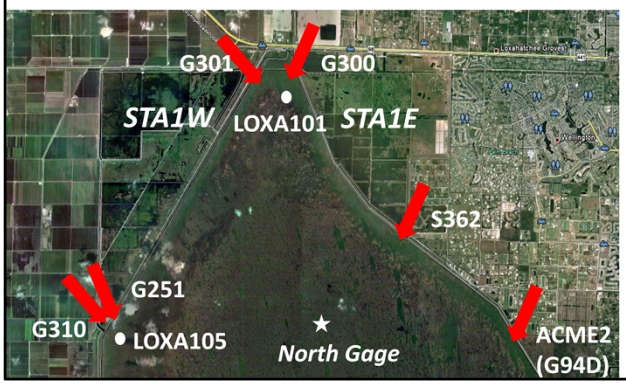




LOXA101 TP

- WY06-12 annual:
  - mean = 15.4 ppb
  - median 16.7 ppb
- Prior to Isaac
  - max = 58 ppb
- Post Isaac
  - 9/5/12 = 219 ppb
  - 9/11/12 = 108 ppb





LOXA105 TP

- WY06-12 annual:
  - mean = 17.4 ppb
  - median 19.1 ppb
- Prior to Isaac
  - max = 52 ppb
- Post Isaac
  - 9/10/12 = 89 ppb
  - 9/12/12 = 79 ppb

Take home points

- Over the 8 days following Isaac,
  - untreated inflows from G300 and G301 were more than 10% of the total annual Refuge inflow since 2005
  - TP load from G300 and G301 was more than 45% of the total annual load to the Refuge since 2005, and TP concentrations were substantially higher than observed since 2005
  - Waters from all inflows intruded up to 2.4 km into the marsh
- These flows increased phosphorus concentrations in the marsh immediately downstream from the STA1W and G300 discharges