

LOWER KISSIMMEE SUBWATERSHED TECHNICAL SHEET			
Subwatershed:	Lower Kissimmee		
Basins:	Contains NEEPP Priority Basins: S65D and S65E	Flow Issues ¹ : NO	Water Quality Issues ² : MAYBE

Monitored Structure(s):	S65E
Inflow loads:	Upper Kissimmee (S65)
Acreage:	429,188
Percentage of Subwatershed Acreage:	N/A
Percentage of Lake Okeechobee Watershed:	12.4%

¹Flow Issues:

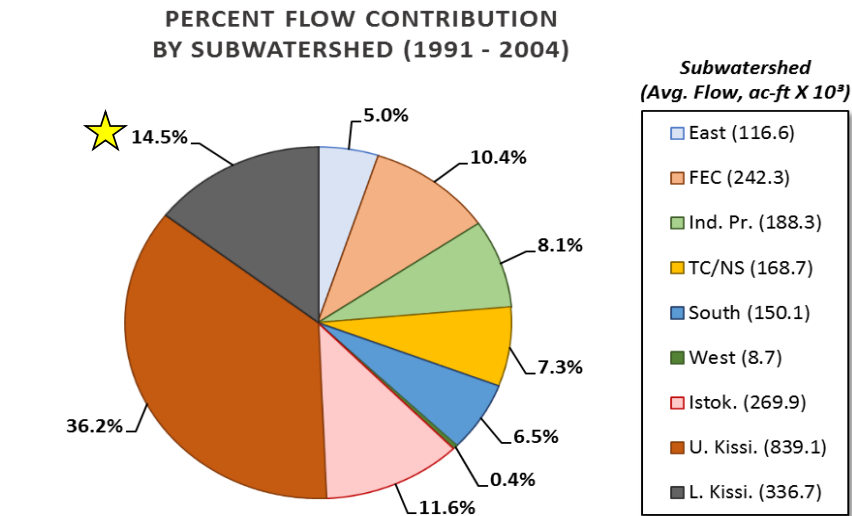
- The flows appeared to stay consistent; no significant difference between the pre and post protection-plan periods and there were no significant trends for flow within any of the periods.

²Water Quality Issues:

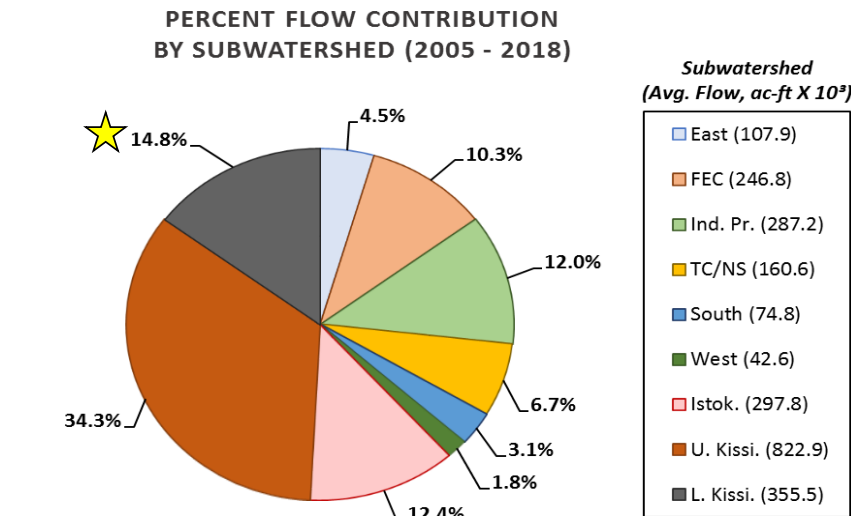
- This subwatershed contains two of the four Northern Everglades and Estuaries Protection Program priority basins, (S-65D and S-65E). These basins cannot be independently evaluated because the District does not have monitoring stations in the Old River run portions of the watershed and because of the Kissimmee River Restoration hydrologic changes.

- The total phosphorus (TP) loads had a statistically significant increasing trend during the post-protection plan period.
- The total phosphorus (TP) flow-weighted mean concentrations (FWMC) are twice as high as Upper Kissimmee (177 µg/L Lower vs. 89 µg/L Upper) in the post-protection plan period).
- The median FWMC are high in the post-protection plan period (216 µg/L).
- Because FWMC is calculated by subtraction of S-65 flows and flow-concentration products from those of S-65E, this occasionally yields numerical anomalies. For example, in a period where the Kissimmee River floodplain experienced a large increase in water stored, the “net” discharge through S-65E may be negative. Recommend looking at data S-65E flows and loads without subtraction of S-65 data and compare with S-65.
- Preliminary modeling estimates the Lower Kissimmee sub-watershed may have reduced TP loads to Lake Okeechobee after the KRR project is completed and the restored vegetation mosaic has returned to the floodplain.

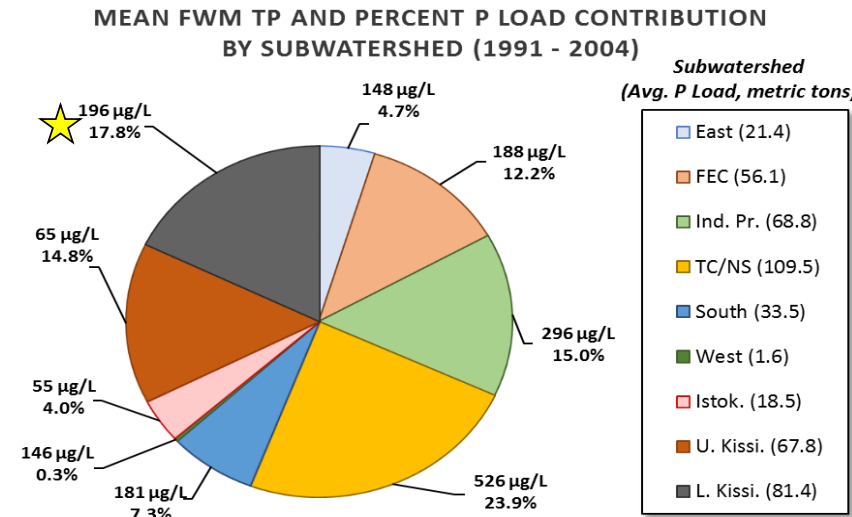
Pre-Protection Plan Flows



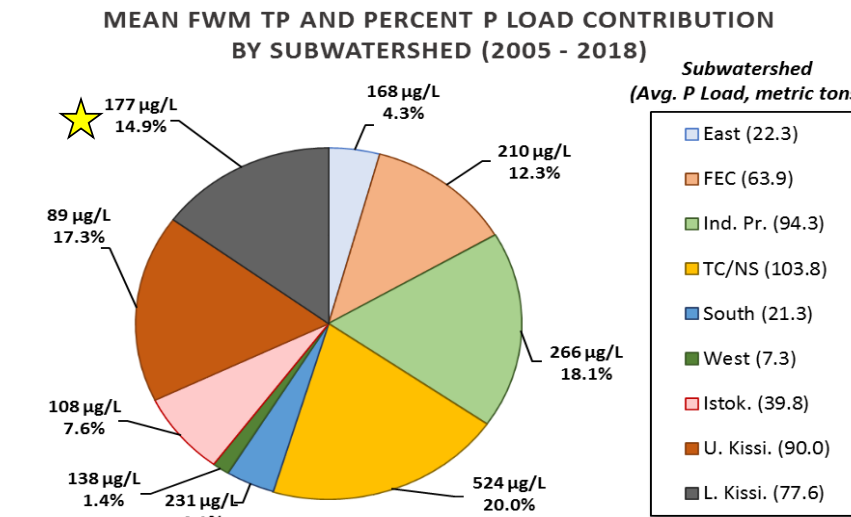
Post-Protection Plan Flows



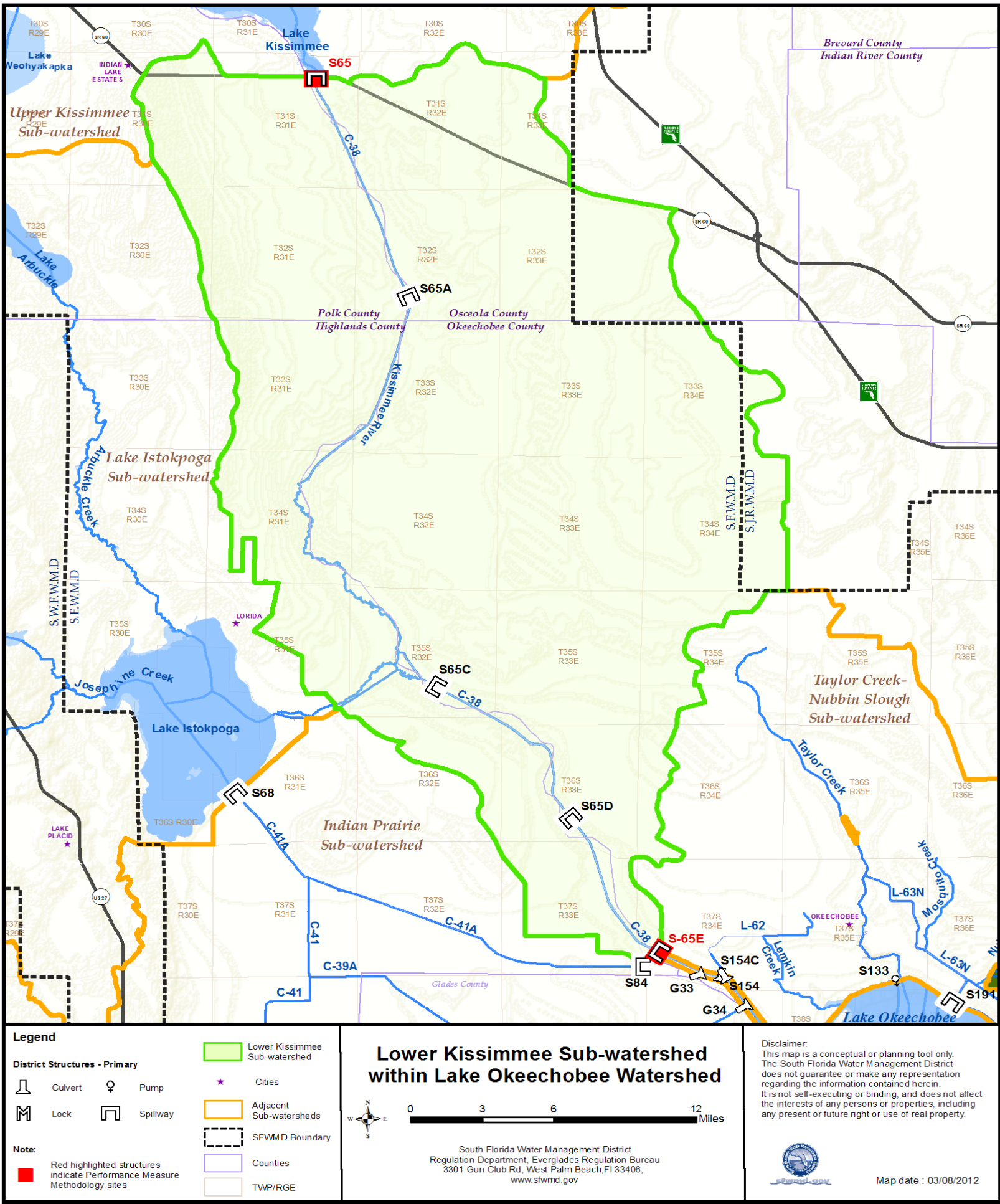
Pre-Protection Plan Loads



Post-Protection Plan Loads



LOWER KISSIMMEE SUBWATERSHED - MAP



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LOWER KISSIMMEE SUBWATERSHED - STATISTICS

Summary Statistics				
	Period of Record	Pre-Protection Plan	Post-Protection Plan	
	WY1991-WY2018	WY1991-WY2004	WY2005-WY2018	
Averages				
Avg. Flow (acft/yr)	346,100	336,729	355,471	
Avg. Load (mt/yr)	79.49	81.38	77.59	
FWMC (ug/L)	186	196	177	
Avg. UAL (lbs/acre/yr)	0.41	0.42	0.40	
Medians				Mann-Whitney Results p-values ³
Median Flow (acft/yr)	391,231	323,791	433,796	0.6792
Median Load (mt/yr)	70.39	78.97	61.40	0.4347
Median FWMC (ug/L)	178.29	170	216	0.4080
Median UAL (lbs/acre/yr)	0.36	0.41	0.32	
Highlighted cells indicate statistical significance				

³The Mann-Whitney test is a non-parametric test alternative to the two sample t-test. It is used to test the equality around the central tendency of two data sets (pre-protection plan period and post-protection plan period). A p-value of less than 0.05 indicates that a significant difference between pre-protection plan period and post-protection plan period exists. A comparison of the median values identifies which period is higher. A median is a value at the mid-point of a distribution of observed data.

Seasonal Kendall τ Results for Total Monthly Flow (ac-ft) by Sub-watershed over Three Water Year Ranges															
Sub-Watershed Name	1991-2018					1991-2004					2005-2018				
	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value
Lower Kissimmee	0.9%	-0.024	-72.19	10795	0.742	0.6%	0.136	953.36	7782	0.225	1.2%	0.113	856.18	-1286	0.303

Seasonal Kendall τ Results for Total Monthly P Load (kg) by Sub-watershed over Three Water Year Ranges															
Sub-Watershed Name	1991-2018					1991-2004					2005-2018				
	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value
Lower Kissimmee	0.9%	-0.063	-27.17	1868	0.393	0.6%	-0.021	-18.85	2637	0.859	1.2%	0.276	256.87	-1471	0.002

Seasonal Kendall τ Results for Monthly FWM TP ($\mu\text{g/L}$) by Sub-watershed over Three Water Year Ranges															
Sub-Watershed Name	1991-2018					1991-2004					2005-2018				
	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value	% Missing Months	Kendall's τ	Sen Slope	Intercept	p-value
Lower Kissimmee	39.3%	0.008	0	149	0.923	27.4%	-0.064	-2	161	0.570	51.2%	0.091	3	141	0.347

Italic red font cells indicate statistical significance

Note: The Seasonal Kendall Tau analyzes data for monotonic trends (consistent upward or downward trend) and accounts for seasonality. Typically monthly data are used to identify seasons. Probability values (p-values) are derived from the tau-statistic which identifies the direction of the trend. A p-value less than 0.05 detects statistically significant trends for a period of interest. The Sen Slope provides an indication of the magnitude of the observed trend.

LOWER KISSIMMEE SUBWATERSHED - MONTHLY DATA AND SKT TRENDS

