

Florida Department of Environmental Protection



Lake Okeechobee Basin Management Action Plan (BMAP) Technical Meeting

March 19, 2014

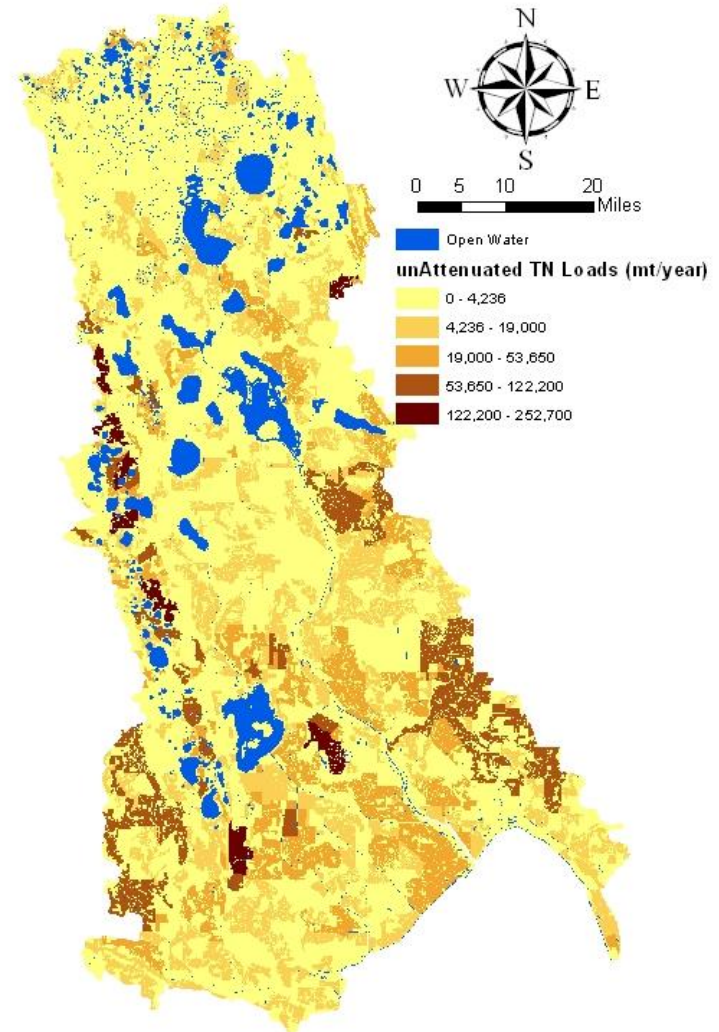
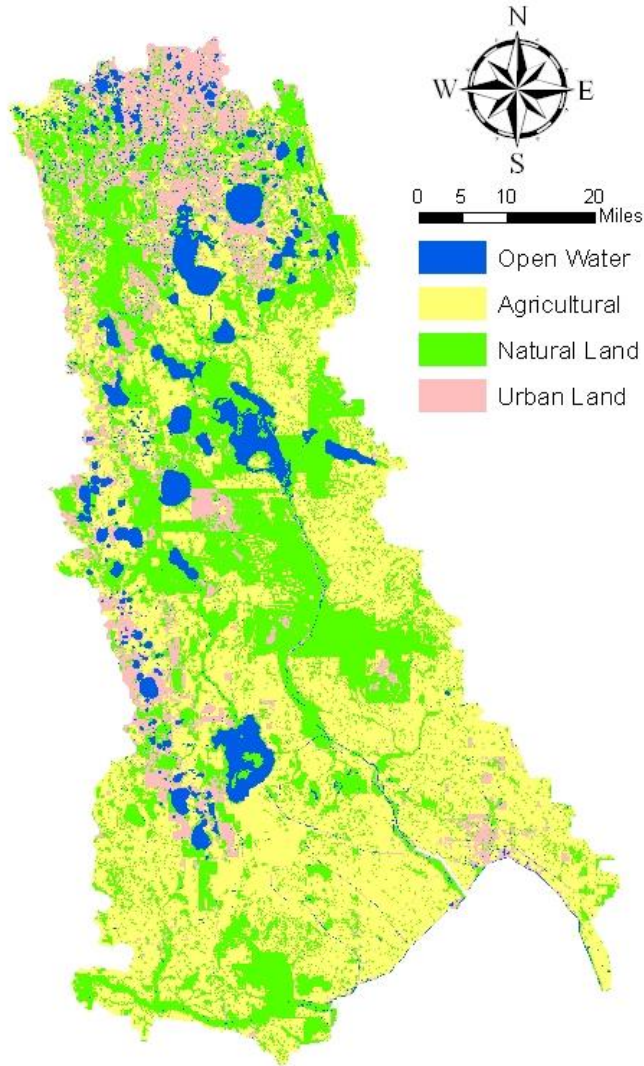




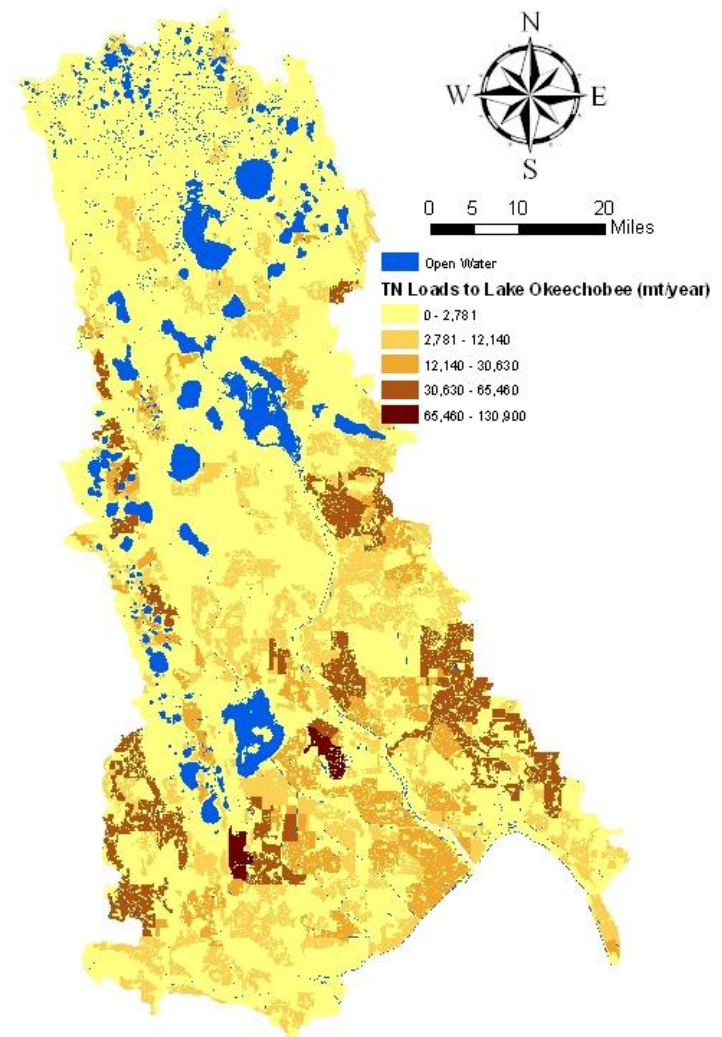
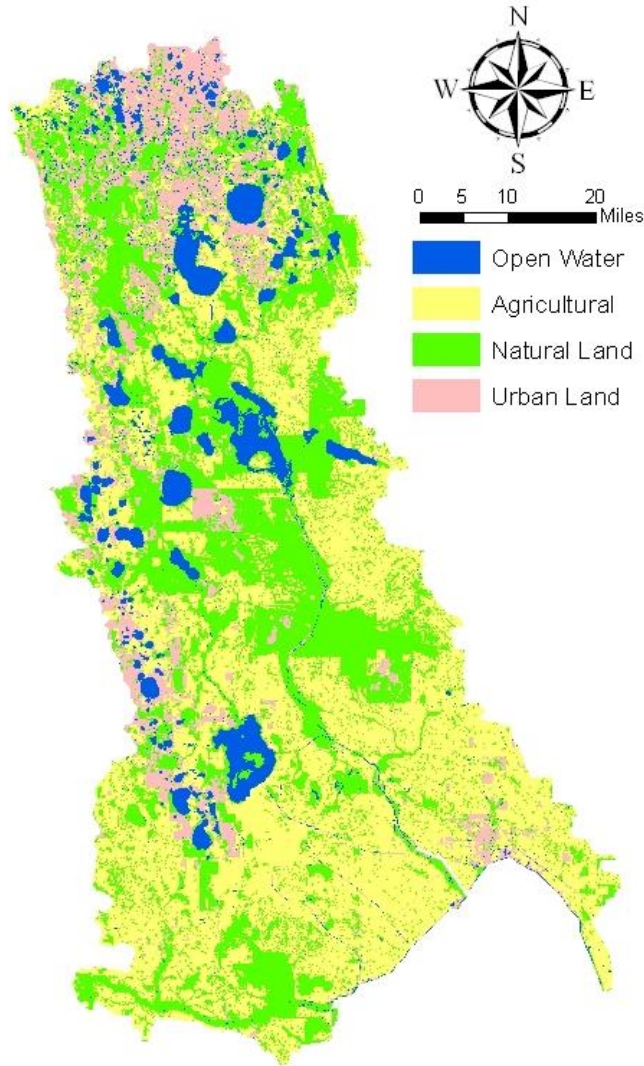
Meeting Overview

- **Results of the Watershed Loading Tool- Nitrogen Evaluation.**
- **Project Updates.**
- **Monitoring Plan Revisions.**
- **BMAP Document Organization.**
- **Questions, Comments, Discussion.**

Distribution of Unattenuated TN Loads

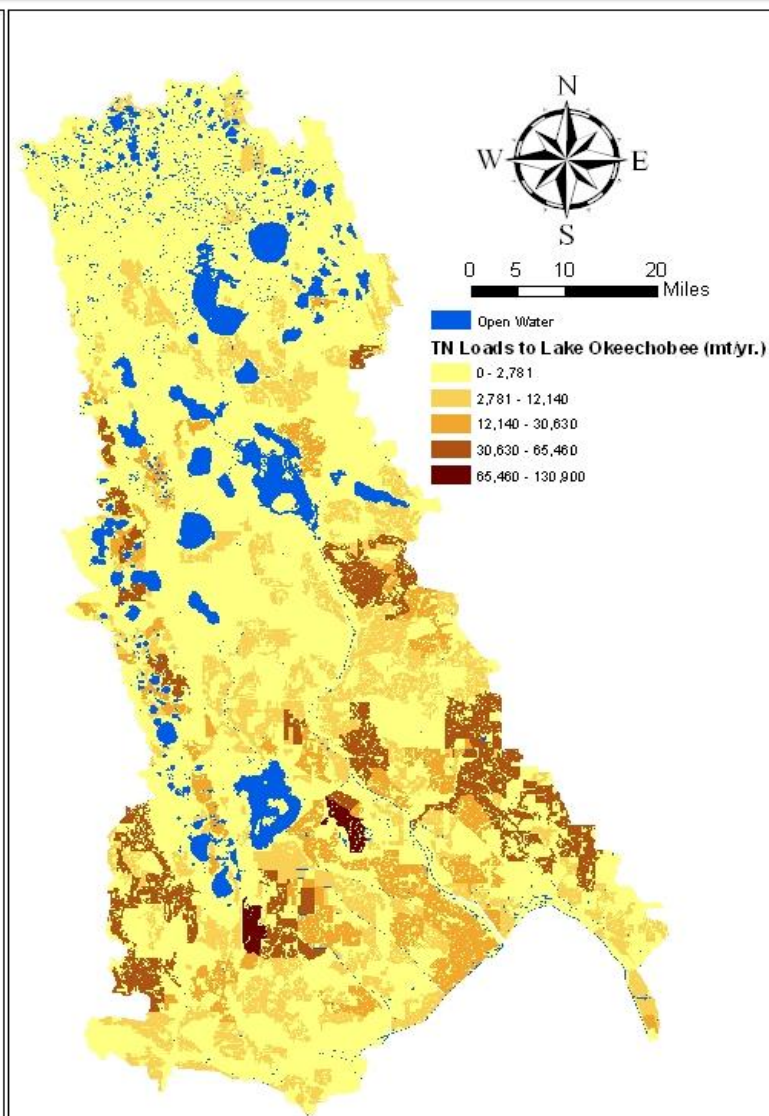
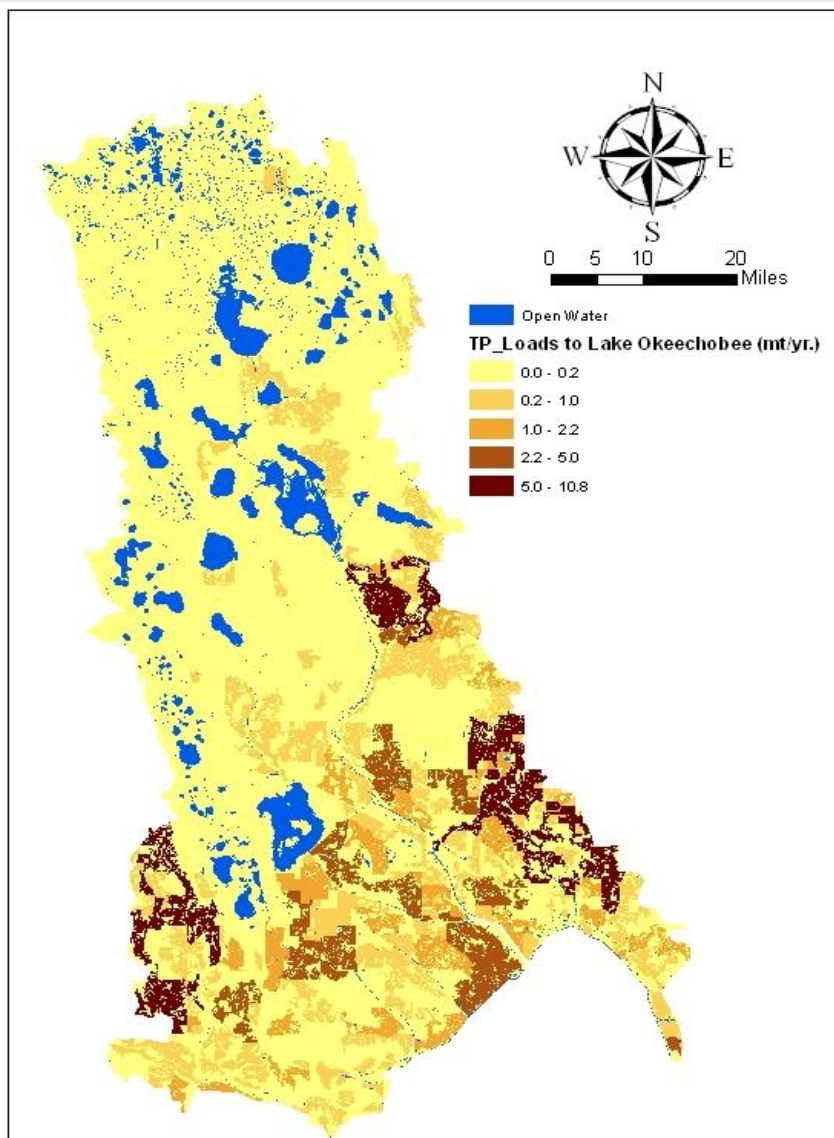


TN Loads Reaching Lake Okeechobee





TP and TN Loads Reaching Lake Okeechobee





Lake Okeechobee Sub-Watershed TN Loads Under Existing Condition (2008-2009 Land Use)

Row Labels	TN Loads (MT/yr)	Percent TN Loads
Fisheating Creek	692	10.9%
Indian Prairie	1,120	17.6%
Lake Istokpoga	1,045	16.4%
Lower Kissimmee	1,272	20.0%
Taylor Creek/Nubbin Slough	537	8.4%
Upper Kissimmee	1,709	26.8%
Total	6,375	100.0%



Lake Okeechobee Sub-Watershed TP Loads under Existing Condition (2008-2009 Land Use)

Sub-Watershed	Watershed TP Loads (MT/year)	Percent Loads
Fisheating Creek	79.0	19%
Indian Prairie	72.7	17%
Lake Istokpoga	18.3	4%
Lower Kissimmee	103.0	25%
Taylor Creek/Nubbin Slough	100.8	24%
Upper Kissimmee	46.4	11%
Total TP Loads from Northern Lake Okeechobee Watershed	420.2	100%

Questions



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Lake Okeechobee BMAP Project Overview





Projects Overview

- **Revisions to Previously Estimated Project Benefits(TP).**
- **Estimated TN Reduction Benefits.**
- **Additional Projects.**
- **Next Steps.**

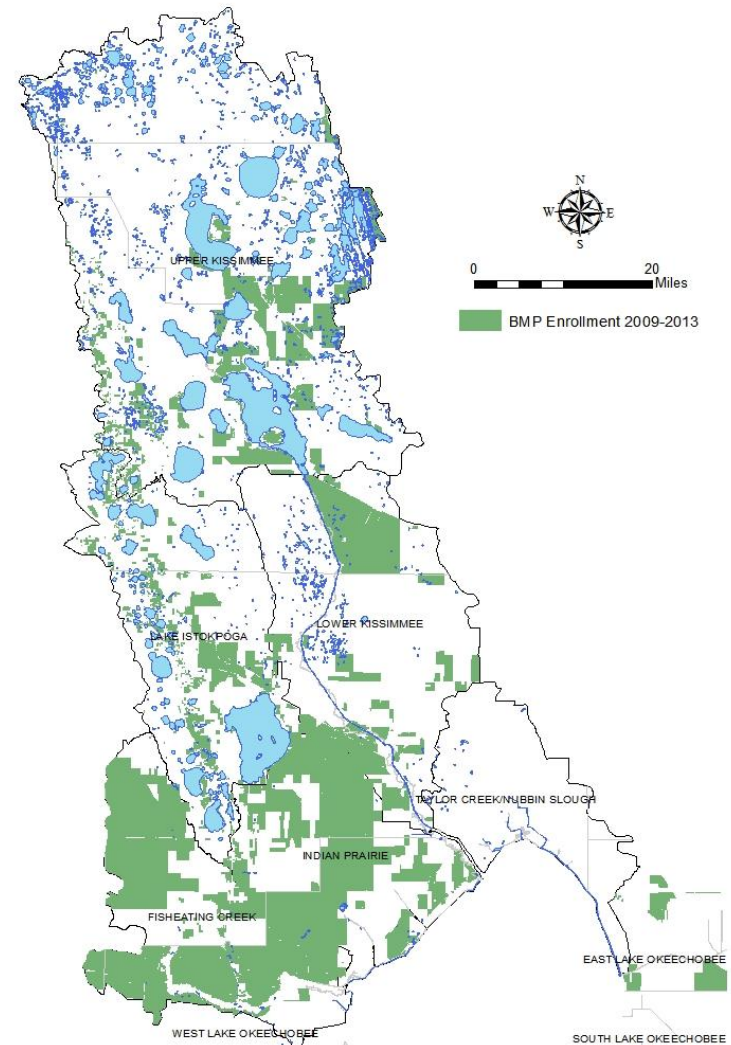
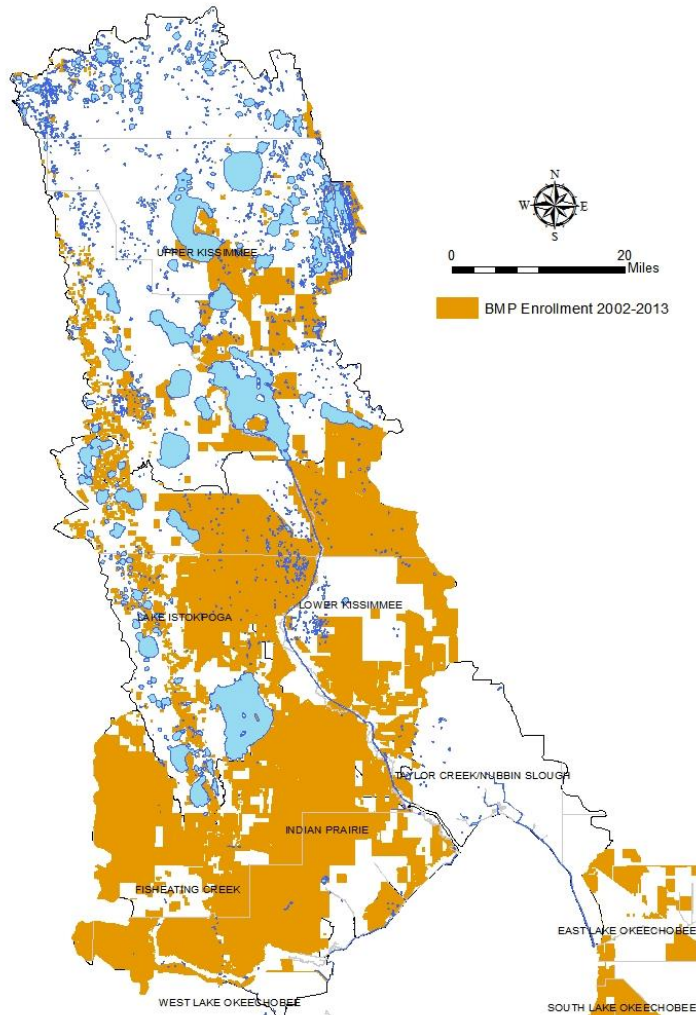


Nutrient Reduction Benefit Revisions

- **Adjusted agricultural BMP values to reflect 2009-2013 NOIs, plus future BMP implementation on the remainder of agricultural lands.**
- **Applied sub-watershed attenuation factor to street sweeping, cleanout BMPs, and projects with design estimate reductions.**
- **Removed certain projects based on stakeholder feedback.**
- **Added projects for which additional information was provided.**



Nutrient Reduction Benefit Revisions- Agricultural BMPs





Nutrient Reduction Benefit Revisions- Agricultural BMPs (cont.)

Sub-Watershed	TP Reductions Total (MT/yr)	TP Reductions 2009-2013 (MT/yr)
Fisheating Creek	7.16	5.98
Indian Prairie	7.01	5.50
Lake Istokpoga	1.47	1.12
Lower Kissimmee	9.56	4.50
Taylor Creek/Nubbin Slough	10.32	10.33
Upper Kissimmee	2.64	2.51
TOTAL	38.20	29.95



Additional Refinements

- **Revised urban BMPs to account for attenuation.**
- **Project removal total impact (aquifer storage and recovery [ASR], hybrid wetland treatment technology [HWTT], etc.):**
 - **Removed ASR Project (-0.10MT).**
 - **Removed 2 HWTT Projects, added 1 (net 3) (-8.8MT).**
- **Project additions total impact:**
 - **Kissimmee River Restoration Project (+14MT).**
 - **Additional municipal stormwater projects**



Revised Estimated Nutrient Reduction Benefits

Sub-Watershed	TP Reductions Total (MT/yr)
Fisheating Creek	6.01
Indian Prairie	6.22
Lake Istokpoga	1.32
Lower Kissimmee	19.06
Taylor Creek/Nubbin Slough	22.06
Upper Kissimmee	4.32
TOTAL	59.00



Outstanding Project Calculations

- **Dispersed Water Storage:**
 - 14 projects identified.
 - Determining how to calculate based on operational practices for each project.
- **HWTT:**
 - Use actual data to estimate reductions.
- **Hydrologic restoration projects.**
- **Cost-share BMPs.**
- **Owner implemented BMPs.**
- **A few remaining municipal BMPs.**



Agricultural BMP Estimates

BMPs for Cow/Calf Production in the Okeechobee Watershed

Description	P Reduction		N Reduction	
	Range %	Typical %	Range %	Typical %
Improved Pastures (3 ac/cow, 500ac avg, 3lbs P, 120lbs N)				
Owner/Cost-Share BMP Program				
P reduced, better N management, Rotational Grazing, New Water Facilities, Retention Basin by Working Pens, Improved Grass Management, Feed Placement, Critical Area Fencing, Moderate Wetland Restoration/Retention	10 - 50	30	10 - 50	27
Owner BMP Program				
P reduced, better N management, better Grass Management, Feeder/Minerals and Water Placement	0 - 25	11	0 - 25	17
Cost Share BMP Program				
Rotational Grazing, New Water Facilities, Retention Basin by Working Pens, Critical Area Fencing, Moderate Wetland Restoration/Retention	10 - 50	19	10 - 50	10
Alternative BMP Program				
Provide alternative shade to move cattle from streams and Edge-of-Farm Stormwater R/D and Chemical Treatment	20 - 90	49	5 - 60	30



Agricultural BMP Estimates

BMPs for Citrus Production in the Lake Okeechobee Watershed

Description	P Reduction		N Reduction	
	Range %	Typical %	Range %	Typical %
Citrus (200 ac avg, microjet, no N/P assumptions listed)				
Owner/Cost-Share BMP Program				
Reduced P Fertilization, Better N Management, Grass Management between Trees, additional Stormwater Retention, and limited Wetland Restoration/Retention	10 - 50	17	10 - 50	15
Owner BMP Program				
Reduced P Fertilization, Better N Management, Grass Management between Trees	0 - 25	12	0 - 25	10
Cost Share BMP Program				
Water Management (irrigation and drainage)	0 - 20	5	0 - 20	5
Alternative BMP Program				
Fertigation, Grassed Waterways, and Edge-of-Farm Stormwater R/D with Chemical Treatment	20 - 90	52	5 - 70	52



Continuing Efforts

- **Stakeholder outreach.**
- **Identify regional projects.**
- **Identify municipal/local projects that have not yet been included.**
- **Revisit viable projects.**

Questions



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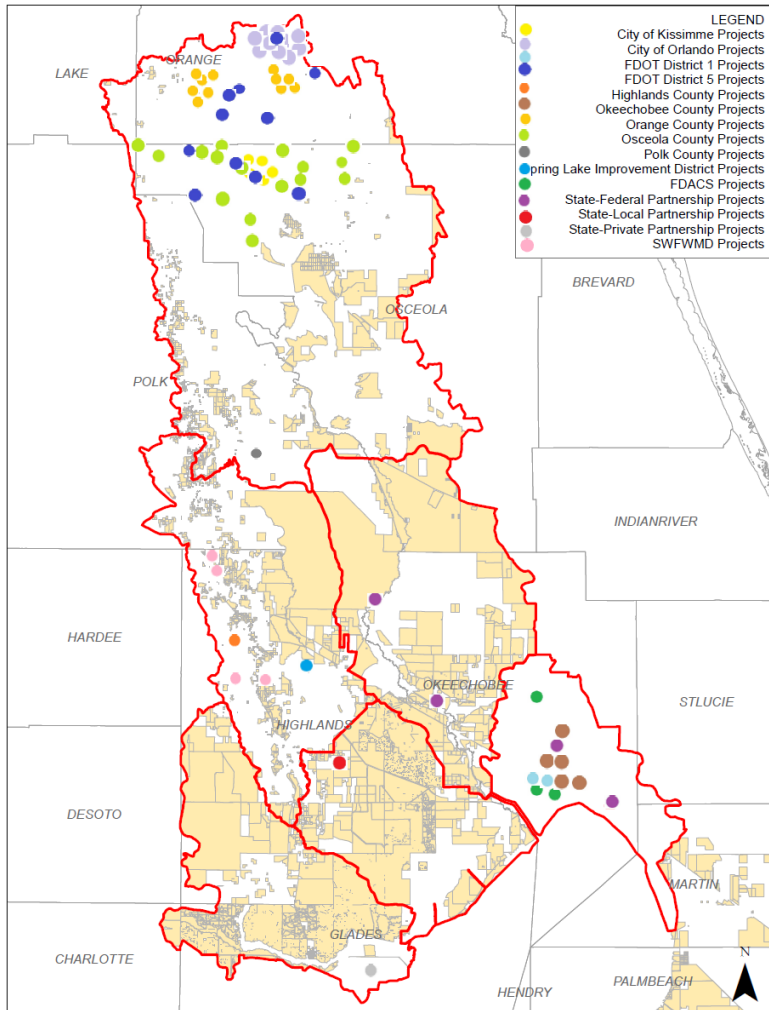


Total Nitrogen Reduction Estimates





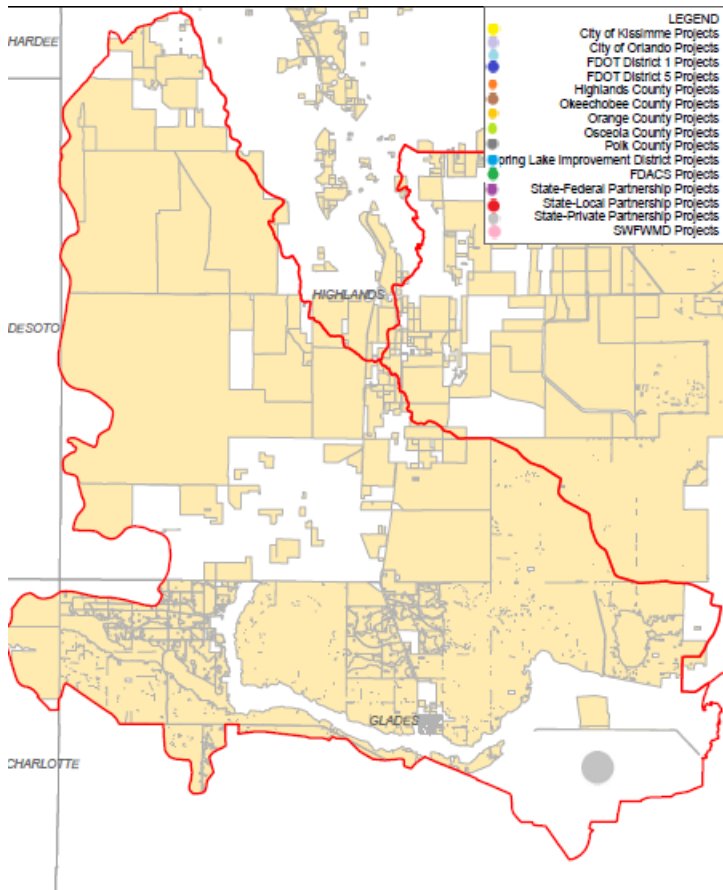
Project TN Load Reductions



Sub-Watershed	TN Reductions Total (MT/yr)
Fisheating Creek	58.23
Indian Prairie	97.6
Lake Istokpoga	77.22
Lower Kissimmee	59.95
Taylor Creek/Nubbin Slough	70.06
Upper Kissimmee	146.18
TOTAL	509.19



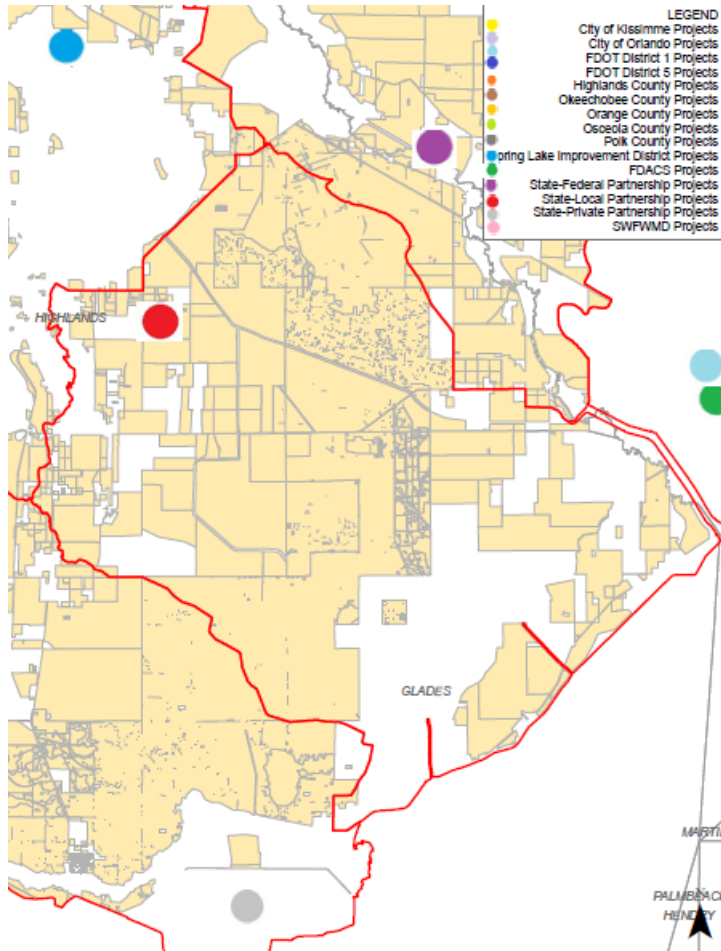
Fisheating Creek



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	57.87	BMP Enrollment 2009-2013
Highlands County	0.362	Public Education
SUB-WATERSHED TOTAL (MT/YR)	58.23	



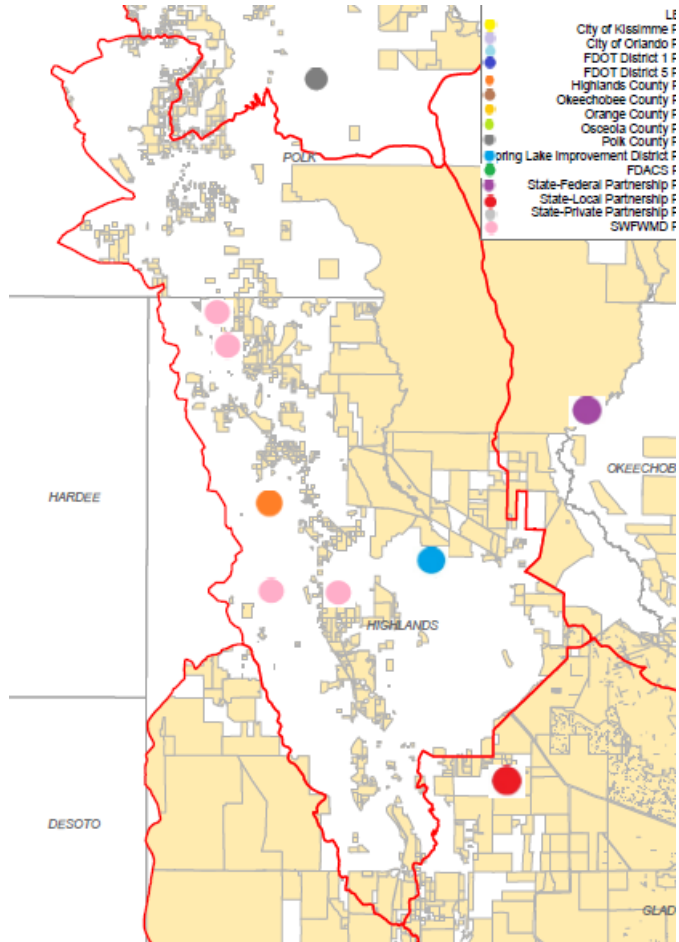
Indian Prairie



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	97.13	BMP Enrollment 2009-2013
Highlands County	0.42	Public Education, Wet Detention
SUB-WATERSHED TOTAL (MT/YR)	97.55	



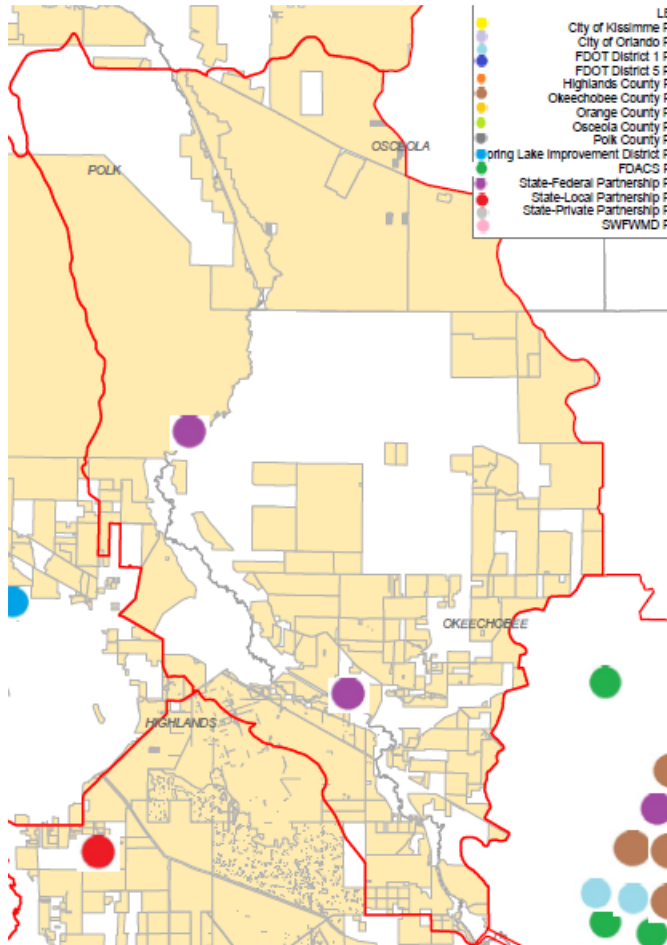
Lake Istokpoga



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	71.61	BMP Enrollment 2009-2013
Highlands County	4.62	Wet Detention, Public Education, Street Sweeping, Online Retention, Alum Treatment
Polk County	0.76	Education and Outreach
Spring Lake Improvement District	0.089	Stormwater Treatment Area
SUB-WATERSHED TOTAL (MT/YR)	77.21	



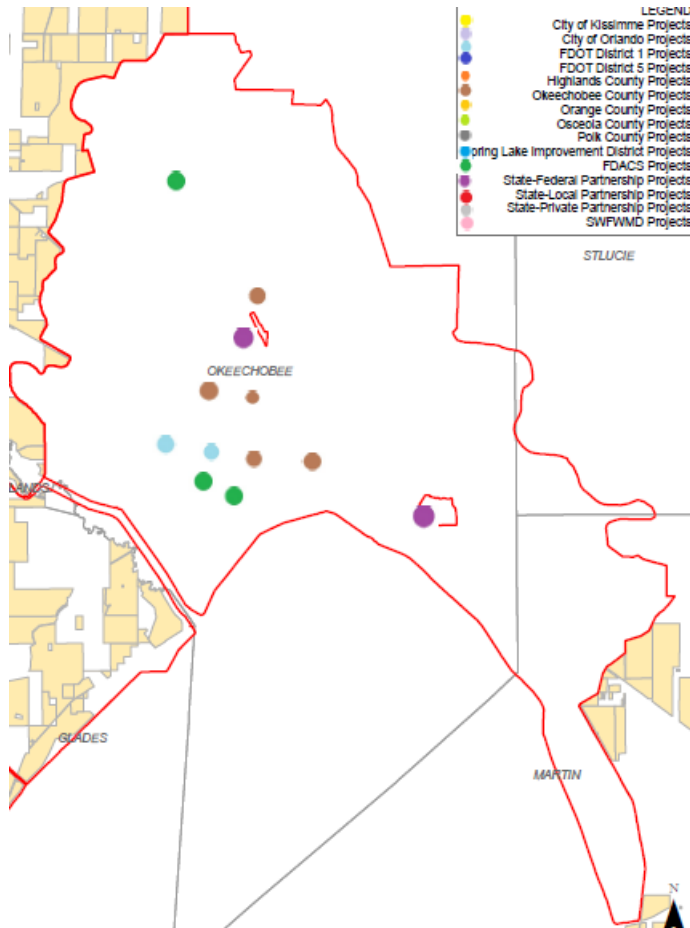
Lower Kissimmee



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	58.98	Assumes 100% BMP Enrollment
Highlands County	0.54	Public Education
Osceola County	0.02	Public Education
Polk County	0.41	Public Education
SFWMD		Restoration
SUB-WATERSHED TOTAL (MT/YR)		59.96



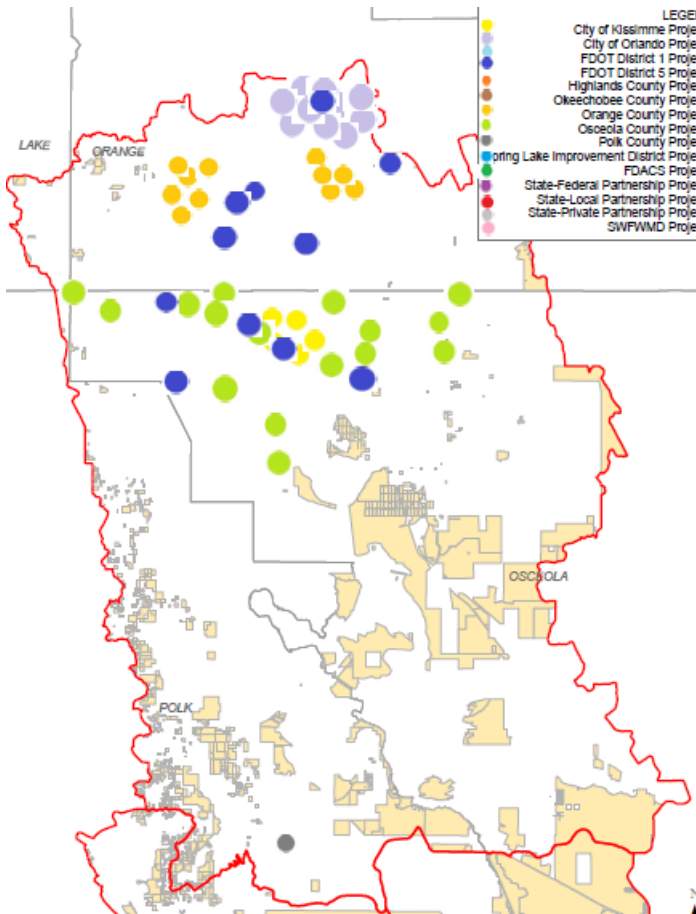
Taylor Creek/Nubbin Slough



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	69.92	BMP Enrollment 2009-2013
FDOT D1	0.14	Wet Detention, Street Sweeping, STA
SFWMD	TBD	STA, HWTT
SUB-WATERSHED TOTAL (MT/YR)		70.06



Upper Kissimmee



Stakeholder	Calculated Nutrient Reduction Benefit (MT/YR)	Project Types
Agriculture	110.11	BMP Enrollment 2009-2013
City of Edgewood	0.01	Wet Detention, Public Education
City of Kissimmee	0.35	Wet Detention, Public Education, Street Sweeping, Dry Detention, Baffle Boxes, Stormwater Reuse
City of Orlando	3.06	Wet Detention, Public Education, Street Sweeping, Catch Basin Inserts/Filters, Baffle Boxes
FDOT D5	0.16	Wet and Dry Detention, Street Sweeping
Orange County*	9.74	Wet Detention, Public Education, Street Sweeping, Dry Detention, Baffle Boxes, Alum Injection, CDS Unit, Sediment Inactivation
Osceola County	19.64	Wet Detention, Public Education, Street Sweeping, Stormwater Reuse
Polk County	3.12	Wet Detention, Public Education
SUB-WATERSHED TOTAL (MT/YR)	146.18	

Questions

