

2016 Progress Report

for the St. Lucie River and Estuary Basin Management Action Plan

**prepared by the
Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection
Tallahassee, FL 32399**

**with participation from the St. Lucie River and Estuary
Technical Stakeholders**

January 2017

Acknowledgments

This 2016 Progress Report for the St. Lucie River and Estuary Basin Management Action Plan was prepared as part of a statewide watershed management approach to restore and protect Florida's water quality. It was prepared by the Florida Department of Environmental Protection in cooperation with the St. Lucie River and Estuary stakeholders.



North St. Lucie River Water Control District

Hobe St. Lucie Conservancy District
Pal Mar Water Control District
Troup-Indiantown Water Control District
Copper Creek Community Development District
Tradition Community Development District
Verano Community Development District

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List of Acronyms and Abbreviations

BMAP	Basin Management Action Plan
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CDS	Continuous Deflective Separation
CERP	Comprehensive Everglades Restoration Plan
DEP	Florida Department of Environmental Protection
DO	Dissolved Oxygen
EWIP	Eastern Watershed Improvement Project
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FYN	Florida Yards and Neighborhoods
F.S.	Florida Statutes
HWTT	Hybrid Wetland Treatment Technology
IRL-S	Indian River Lagoon-South
IWR	Impaired Surface Waters Rule
lbs	Pounds
lbs/yr	Pounds Per Year
MDL	Minimum Detection Limit
mg/L	Milligrams Per Liter
MS4	Municipal Separate Storm Sewer System
NE PPP	Northern Everglades Public-Private Partnership
NOI	Notice of Intent
OAWP	Office of Agricultural Water Policy
PQL	Practical Quantitation Limit
PSA	Public Service Announcement
PUD	Planned Unit Development
QA/QC	Quality Assurance/Quality Control
SFWMD	South Florida Water Management District
SLRIT	St. Lucie River Issues Team
SLWSD	St. Lucie West Services District
SR	State Road
STA	Stormwater Treatment Area
STORET	STORage and RETrieval
TIERS	Terrestrial Invasive Exotic Reporting System
TMDL	Total Maximum Daily Load
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TP	Total Phosphorus
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WCD	Water Control District
WCS	Water Control Structure

Section 1: Introduction

1.1 Purpose of the Report

This is the third annual progress report for the St. Lucie River and Estuary Basin Management Action Plan (BMAP). The BMAP and this report focus on restoration efforts in the St. Lucie Basin, as the upstream loads from Lake Okeechobee are being addressed separately in the [Lake Okeechobee BMAP](#), adopted in December 2014. **Section 3** describes the accomplishments during the reporting period from July 1, 2015, through June 30, 2016. **Section 3** includes the water quality evaluation and discusses progress towards achieving the total maximum daily load (TMDL). **Section 4** summarizes compliance with the BMAP.

1.2 TMDLs for the St. Lucie Basin

The Florida Department of Environmental Protection (DEP) identified the St. Lucie River and Estuary as impaired due to excessive amounts of total phosphorus (TP), total nitrogen (TN), and biochemical oxygen demand (BOD). In March 2009, DEP adopted the nutrient and dissolved oxygen (DO) TMDL for the St. Lucie Basin. The TMDLs and pollutant load allocations adopted by rule for the watershed are available on [the DEP Final TMDL Documents web page](#). The targets are as follows:

- TN target: 0.72 milligrams per liter (mg/L).
- TP target: 0.081 mg/L.
- BOD target: 2.0 mg/L.

1.3 St. Lucie River and Estuary Basin

The St. Lucie River and Estuary Basin is located in southeast Florida in Martin, St. Lucie, and Okeechobee Counties (**Figure 1**). The St. Lucie Estuary is a major tributary to the southern Indian River Lagoon.

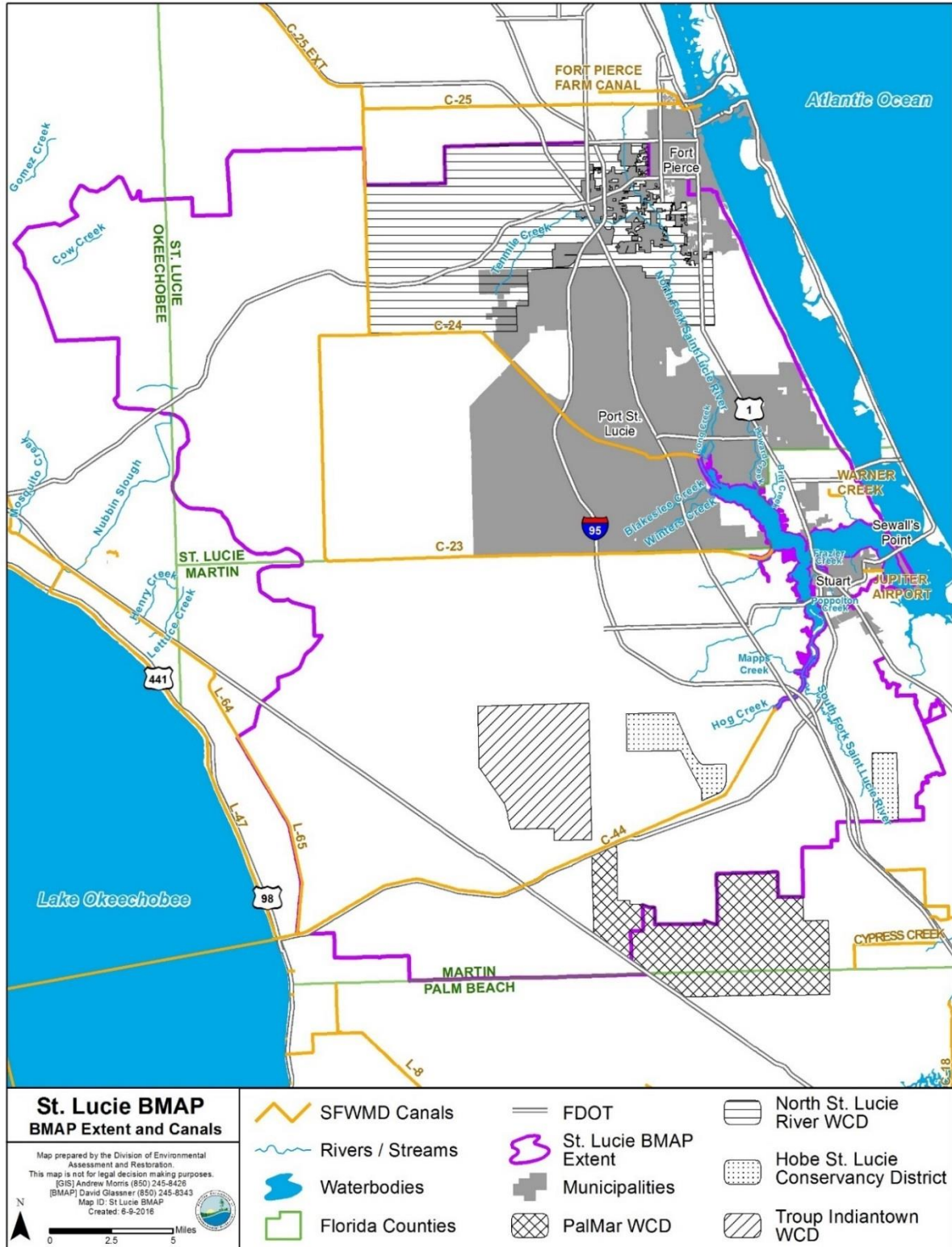


Figure 1: St. Lucie River and Estuary Basin

Section 2: Accomplishments During the Reporting Period

Section 2.1 and **Section 2.2** describe the accomplishments in the St. Lucie River and Estuary during the reporting year. New projects added to the individual project tables are described below, as are individual projects completed during the reporting period. Ongoing efforts such as street sweeping, ordinances, and public education efforts are not specifically described below but must continue each year for the project credit to remain effective. **0** contains the individual project tables.

The Florida Legislature directed DEP and the South Florida Water Management District (SFWMD) to implement projects on private agricultural lands to store and treat water in the Northern Everglades consistent with the legislative objectives in Sections 373.4595 and 373.4591, Florida Statutes (F.S.). DEP has identified six water quality improvement projects to implement these legislative objectives through the new Northern Everglades Public Private Partnership (NE PPP) Program. Three of these projects are within the St. Lucie River Basin.

Collectively, these projects will retain rainfall and store surface water from the regional system to help address nutrient loads in Lake Okeechobee and the Caloosahatchee and St. Lucie Rivers and Estuaries. As the lead agency of the Interagency Working Group, DEP selected the projects and tasked the SFWMD with developing and executing contracts for each of the NE PPP projects. The Florida Department of Agriculture and Consumer Services (FDACS) provided technical assistance and cost-share to the service provider during the planning, modeling, design, and permitting phases of the project as part of the Best Management Practice (BMP) Program with the intent of getting the projects ready for the construction phase. In 2016, the Florida Legislature appropriated funds for all six projects.

2.1 Activities by Entity

2.1.1 Agriculture

FDACS currently has eight field staff and three technicians in the SFWMD region who work with producers on BMP enrollment and implementation. Field staff and technician activities include initial enrollment, follow-up to provide technical assistance, BMP cost-share, BMP implementation assurance visits, management of water quality– and water supply–related projects and contracts, and coordination with the SFWMD on agriculture-related permitting questions.

During the reporting period, the FDACS Office of Agricultural Water Policy (OAWP) adopted two BMP manuals. The 2005 manual for vegetable and row crops was revised and adopted in late 2015. It includes specific nutrient and irrigation management BMPs for plastic mulch, bare ground, sugarcane, hay/silage, and greenhouse production systems. A dairy manual was also adopted and became effective on January 10, 2016. The manual includes a flow chart that directs

producers how to achieve nutrient balance, based on whether nitrogen or phosphorus is the limiting nutrient based on an operation's geographic location in a basin and proximity to a lake or impaired water. In summer 2016, FDACS adopted a manual for poultry operations. To date, FDACS has BMP manuals adopted for cow/calf, sod, citrus, vegetable and agronomic crops, nurseries, equine, dairy, specialty fruit and nut, and poultry operations. Once a BMP manual is adopted, field staff and technicians work to enroll eligible producers in the FDACS BMP Program.

Landowners who sign notices of intent (NOIs) are agreeing to implement applicable BMPs on their enrolled properties. In the St. Lucie River and Estuary Basin, agriculture has a 5-year Phase I enrollment goal of 193,305 acres (90 % of the land assigned to agricultural land uses), which includes acreage in the agricultural areas of the Hobe St. Lucie Conservancy District, North St. Lucie River Water Control District (WCD), Pal Mar WCD, and Troup-Indiantown WCD.

As of June 30, 2016, producers throughout the basin had submitted 228 NOIs representing 158,602 acres, or 74 % of the adjusted agricultural acreage (Table 1). The implementation of these BMPs will result in an estimated reduction of 30,910 pounds per year (lbs/yr) of TP and 133,793 lbs/yr of TN. FDACS staff will work to enroll the remaining 34,703 acres in the next 2 years to meet the 90 % enrollment goal (**Table 2**).

However, errors in land use data, changes in land use over time from agriculture to urban, agricultural lands not in production, and other factors may affect enrollment acreage. For example, citrus enrollment in the basin decreased by 10,856 acres during the first year of BMAP implementation, due to the loss of citrus production acreage. In the second year of BMAP implementation, citrus enrollment decreased by 27,742 acres. An additional 15,168 acres were enrolled in the vegetable and agronomic crop manual from March 31, 2015, through March 31, 2016. The number of acres enrolled in the Lake Okeechobee Protection Program enrollment will likely decrease as these acres are re-enrolled under the appropriate BMP manuals (e.g., dairy manual), which had not been adopted at the time of the initial enrollments. As re-enrollment continues, acreages will shift from the Lake Okeechobee Protection Program category to commodity-specific BMP programs.

It is also important to note that more acres are enrolled in FDACS agricultural BMPs than are reported in this document. This difference is because a significant number of enrolled acres (about 20,000) are not classified as agricultural land uses in the 2004 land use coverage for the BMAP area, even though they are part of a parcel where agricultural operations occur (e.g., lands classified as wetlands that are part of a ranch). Only enrolled lands that fall within the mapped areas of agricultural land uses are included in the BMAP-enrolled acres. The land use coverage will be updated to the most recent available in the second phase of BMAP implementation.

During the reporting period, the hybrid wetland treatment technology (HWTT) sites were inactive from December 1, 2015, through May 31, 2016. The Danforth Creek HWTT came online, and construction was completed during the reporting period. This site will be operational during the next BMAP reporting period.

2.1.2 City of Fort Pierce

Fort Pierce began the maintenance of the floating aquatic plant system at the Indian Hills (formerly Heathcote) Recreation Area (Project FP-01) in January 2016. Seven islands were harvested and replanted (1 island per month) at an annual cost of \$84,000. As a result of the harvesting, a total of 1,918 pounds (lbs) of nitrogen and 214 lbs of phosphorus were removed. This is an increase of 37 % and 120 %, respectively, over the estimated annual removal amount with 5 months of maintenance activities still remaining. The city also extended its street sweeping routes into newly annexed areas.

Phase II of the Indian Hills Recreation Area (Project FP-11) is under way and scheduled to be completed in August 2016. This project will hydrologically enhance 2.1 acres of wetlands and provide 2.5 acres of wetlands restoration.

The city is currently constructing 2 treatment trains to serve the Veteran's Memorial Park (Project FP-09) and associated drainage basin. The 44-acre drainage basin currently discharges untreated stormwater through 2 outfalls directly into the Indian River. The 2 treatment trains will consist of bioswales, floc-log systems, pervious paver parking, and a 0.5-acre wet detention pond with aeration fountains. The city has also begun the construction of 3 wet detention ponds associated with the North 2nd Street roadway improvements (Project FP-10).

Table 1: Agricultural acreage and BMP enrollment as of June 30, 2016, for the St. Lucie River and Estuary BMAP area

N/A = Not applicable

¹ FDACS staff-adjusted acreage for the purposes of enrollment is based on a review of more recent aerial imagery in the basin and local staff observations.

2004 SFWMD Land Use	2004 Acres	FDACS-Adjusted Acres ¹	Related FDACS BMP Programs	Acreage Enrolled	Related NOIs
Pasture and Mixed Rangeland	152,299.6	151,232.9	Cow/Calf; Vegetable and Agronomic Crops (Hay)	83,037.6	69
Row/Field/Mixed Crops	16,368.8	16,219.1	Vegetable/Agronomic Crops	9,954.9	13
Sod Farms	294.1	294.1	Statewide Sod	54.0	3
Horse Farm	784.4	814.2	Equine	28.8	2
Citrus	113,672.8	43,694.6	Statewide Citrus	64,884.4	104
Fruit Orchards/Other Groves	60.5	51.3	Specialty Fruit and Nut	17.1	1
Tree Nurseries	480.1	480.1	Statewide Nursery; Specialty Fruit and Nut	246.5	34
Ornamentals	1,252.1	1,251.7	Statewide Nursery	Captured in tree nurseries	Captured in tree nurseries
Specialty Farms	132.6	132.6	Conservation Plan Rule	7.6	1
Dairies	404.5	404.5	Lake Okeechobee Protection Program	387.8	1
Cattle Feeding Operations	100.9	100.9	Conservation Plan Rule	N/A	N/A
Poultry Feeding Operations	106.8	106.8	Conservation Plan Rule	N/A	N/A

Table 2: Agricultural future enrollment goals for the St. Lucie River and Estuary BMAP area
¹ See the discussion on BMP enrollment goals in Section 2.1.1.

Category	Acres
Total Adjusted Acres	214,783.8
Five-Year Enrollment Goal (90 %)	193,305
Acreage Enrolled (as of June 30, 2016)	158,602
Remaining Acres to Enroll To Meet the Phase I Enrollment Goal (90 %) ¹	34,703

2.1.3 City of Port St. Lucie

Port St. Lucie completed the wet detention system (Project PSL-30) associated with the St. Lucie West Services District (SLWSD) in December 2015, and began water quality sampling pursuant to the DEP Section 319(h) grant. The city also phased out an additional 342 septic systems.

The city submitted its DEP Section 319(h) grant application for the McCarty Ranch Extension Water Farming and Rain Capture Project (Project PSL-31). This new project will pump and store water from the SFWMD C-23 Canal onsite, and it will capture rainfall from the ranch property to reduce runoff back into the canal.

The city initiated two other new projects—the Veteran’s Memorial Stormwater Retrofit Project (Project PSL-32) and Lake Harvey Retention System Project (Project PSL-33). Project PSL-32 will include the construction of several detention ponds and 3 control structures to treat stormwater from an older part of the city constructed prior to stormwater quality regulations. Project PSL-33 will include the construction of a 4.4-acre wetland area and 2.3-acre flow-way to enhance water quality, storage, and hydraulic connectivity in SLWSD Basin 4E.

2.1.4 City of Stuart

Stuart obtained funding and completed the creation and restoration of the tidal wetlands associated with Poppleton Creek (Project S-22). Water quality monitoring for this project is expected to commence towards the end of 2016. City staff partnered with the Rivers Coalition RiverKidz to help with native vegetation planting along Poppleton Creek. The volunteers came out on June 18, 2016, and installed over 200 plants on an island that was later dedicated to the RiverKidz by the city.

The city also secured funding for the restoration of the East Heart of Haney Creek (Project S-23), and city staff are working on a partnership with the Terrestrial Invasive Exotic Reporting System (TIERS) Program to remove exotic vegetation from the West Heart of Haney Creek.

2.1.5 Florida Department of Transportation (FDOT) District 4

FDOT completed the construction of the wet detention ponds associated with the widening of County Road 714 (Projects FDOT-49 and FDOT-50), began the construction of one dry and five wet detention ponds associated with the widening of I-95 (Projects FDOT-51 through FDOT-56), and has planned and secured funding for treatment ponds associated with the widening of Midway Road (Projects FDOT-46 through FDOT-48).

2.1.6 Martin County

Martin County completed 2 projects in February 2016—the Manatee Pocket Southwest Prong Baffle Box Project (Project MC-35) and the Martin County Golf Course Project (MC-36). Project MC-35 included the installation of a baffle box within an existing 48-inch by 76-inch

storm pipe that serves a 200-acre basin of predominately multifamily residential and commercial properties prior to discharging into the Manatee Pocket. Project MC-36 included the installation of 3 weir plates with bleeders on existing flashboard riser outfall pipes for treatment within the existing golf course lakes. This project serves a 100-acre watershed and provides over 1 inch of treatment. Project MC-36 also included the desilting and reshaping of 1,850 linear feet of ditch and the renovation of an existing weir.

Martin County also completed the construction of the Danforth Creek HWT Project (Project MC-32) in June 2016 in conjunction with FDACS, and funding for the operation of the project became available in July 2016.

The county is currently constructing the All American Ditch Stormwater Quality Retrofit Project (Project MC-37). The project includes the installation of water control structures and a pipe system that will capture and convey stormwater runoff from a 268-acre, predominately medium-density residential neighborhood, to a treatment train style facility that consists of a 3.9-acre lake and a 5.6-acre stormwater treatment area (STA). Construction commenced on August 1, 2016, and is scheduled to last for 15 months.

The Hilltop Street Improvement Project (MC-38) is currently under design. The project will consist of the installation of approximately 624 linear feet of a 4-foot by 6-foot exfiltration trench. The project will provide in excess of 1 inch of stormwater runoff treatment from a 15-acre, medium-density residential neighborhood.

2.1.7 St. Lucie County

St. Lucie County completed the White City–Citrus/Seager Stormwater Improvement Project (Project SLC-09), which included the construction of a wet detention system with polyacrylamide logs. The county implemented the “Be Floridian” educational campaign to highlight ordinances banning phosphorus-bearing fertilizer during the rainy season, and is working on a pilot project for solar-powered polyacrylamide dosing. The county also has planned and received funding for the newly identified Melville Road Master Drainage Plan Project (Project SLC-16), which includes a wet detention system.

2.1.8 Town of Sewall’s Point

Sewall’s Point completed the construction of an exfiltration system (treating 28.20 acres) and pervious pavers. The town has applied for grants for a dry detention stormwater retrofit in the Mandalay/Marguerita area (Project SP-28), and received a DEP grant for 50 % of the construction cost of installing baffle boxes along South Sewall’s Point Road (Project SP-29).

2.1.9 SFWMD

While the SFWMD is not the lead agency on any specific projects identified in the BMAP (DEP May 2013), various restoration activities in the St. Lucie River Basin moved forward in the past

year. Regional projects with both water storage and water quality benefits also progressed. The following lists agency highlights for advancements made in key SFWMD-related projects in the St. Lucie River Basin during the BMAP reporting period. Further information on this past year's progress is also reported in the [2016 South Florida Environmental Report – Volume I, Chapter 10](#).

The Indian River Lagoon-South (IRL-S) authorized plan includes a variety of storage features (reservoirs, STAs, and natural land restoration) intended to capture water from the primary basins (C-23, C-24, C-25, and C-44) that discharge to the St. Lucie River and southern Indian River Lagoon. Consistent with the U.S. Army Corps of Engineers (USACE) integrated delivery schedule, and contingent on future funding, the design of the C-23/24 North Reservoir will begin in 2018, and the design of the South Reservoir will commence in 2019, while the design of the STA is scheduled to start in 2026. Design efforts are expected to be completed after three years, with the construction of the first component (North Reservoir) to begin in 2021. During the reporting period, the construction of the C-44 STA and inflow pump station commenced, with completion expected in 2017 and 2018, respectively. Additionally, the SFWMD completed the construction of the communications tower and the system discharge canal and spillway associated with the C-44 project.

In August 2014, the SFWMD requested that USACE deauthorize the Ten Mile Creek Project, terminate the project cooperation agreements, and subsequently the SFWMD would take full ownership and responsibility for rehabilitating the project to provide necessary storage and water treatment options. In the interim (2014–16), the SFWMD obtained the proper authorizations to use the facility for low-level storage during the 2015 wet season, and pumping into the facility began in July 2015. During the BMAP reporting period, the design of a remediation project to allow up to four feet of reservoir filling was completed. A construction contract for the remediation project was awarded in July 2016, with completion planned prior to the 2017 wet season.

2.2 Summary of Accomplishments

Table 3 summarizes the projects completed during this reporting period. The projects that were quantified resulted in an estimated reduction of 23,680 lbs/yr of TN and 5,886 lbs/yr of TP.

Table 3: Summary of projects completed during the reporting period

N/A = Not applicable
TBD = To be determined

Entity	Project Number	Project Name	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Agriculture	N/A	Agricultural BMP Enrollment through March 31, 2016	22,642	5,327
City of Port St. Lucie	PSL-09	Water and Wastewater Expansion	TBD	TBD
City of Port St. Lucie	PSL-30	St. Lucie West Services District (SLWSD) Water Management Improvement Project	454	326
City of Stuart	S-17	Haney Creek Project-Phase I	513	207
City of Stuart	S-21	SW S. Carolina Dr. Drainage Project	TBD	TBD
FDOT	FDOT-49	230978-2 CR 714 Martin Highway Widening – Danforth Basin	TBD	TBD
FDOT	FDOT-50	230978-2 CR 714 Martin Highway Widening – Wetlands Basin	TBD	TBD
Martin County	MC-32	Danforth Creek Hybrid Wetland Treatment Technology	TBD	TBD
Martin County	MC-35	Manatee Pocket SW Prong Baffle Box	TBD	TBD
Martin County	MC-36	Martin County Golf Course WQ	TBD	TBD
St. Lucie County Nonmunicipal Separate Storm Sewer System (MS4)	SLC-09	White City – Citrus/Seager Stormwater Improvement	71	26
Town of Sewall's Point	SP-27	Extend Pedway/Greenway	TBD	TBD
Total Reductions in Reporting Period			23,680	5,886

Section 3: Water Quality Evaluation

The SFWMD and numerous stakeholders monitor water quality throughout the St. Lucie River and Estuary Basin. The SFWMD monitors water quality data at Roosevelt Bridge (Station SE 03) for TN and TP. This is the compliance point for the TMDL. The adopted BMAP outlines the monitoring efforts (including the SE 03 station) from stakeholders such as Port St. Lucie, North St. Lucie River WCD, U.S. Geological Survey (USGS), and others. All nonfederal entities outlined in the BMAP monitoring network, with the exception of the SFWMD, are required to upload their data to DEP's STORage and RETrieval (STORET) Database. The SFWMD uploads all data from its listed BMAP monitoring stations to its water quality database, DBHYDRO. The SFWMD provides data for its BMAP monitoring network stations routinely for inclusion in STORET.

Figure 2 and **Figure 3** show the TN and TP water quality data from Station SE 03 for the beginning of the period of record for the TMDL (January 1996) to the most recent available monitoring event (August 2016). While the yearly averages for both TN and TP display some reductions, it should be noted that DEP is not using these data for compliance assessment at this time. A compliance methodology will be agreed on before the fourth annual update, in accordance with the timeline established in the BMAP. **0** contains additional information describing the methodology used for the data analysis discussed in this report. Beginning in December 2015, the SFWMD changed from monthly sampling at the SE 03 site to bimonthly due to staffing shortages. SFWMD resumed monthly sampling in August 2016.

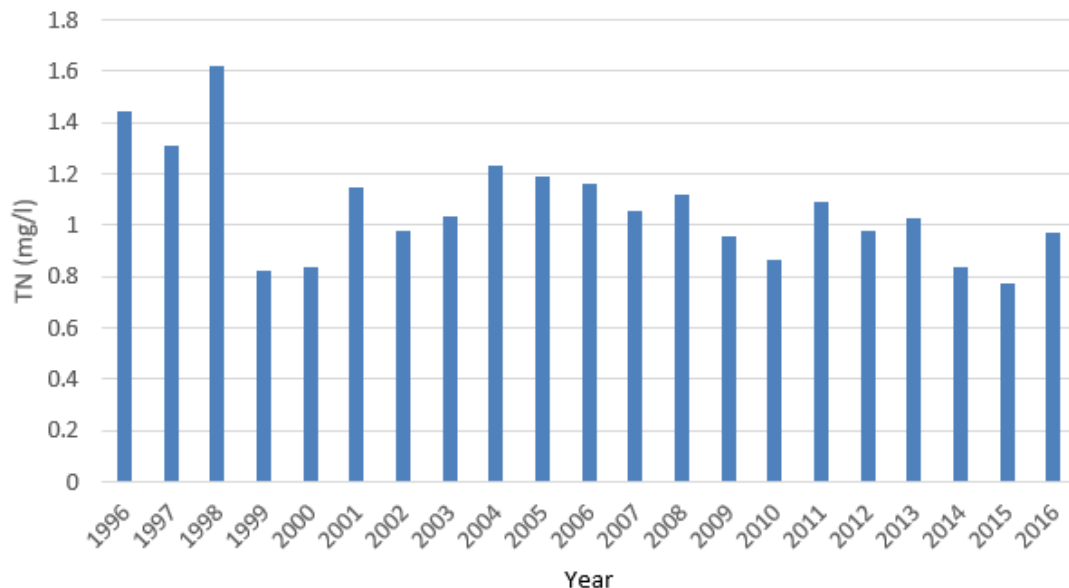


Figure 2: Yearly average TN concentration at Roosevelt Bridge (Station SE 03), January 1996– August 2016

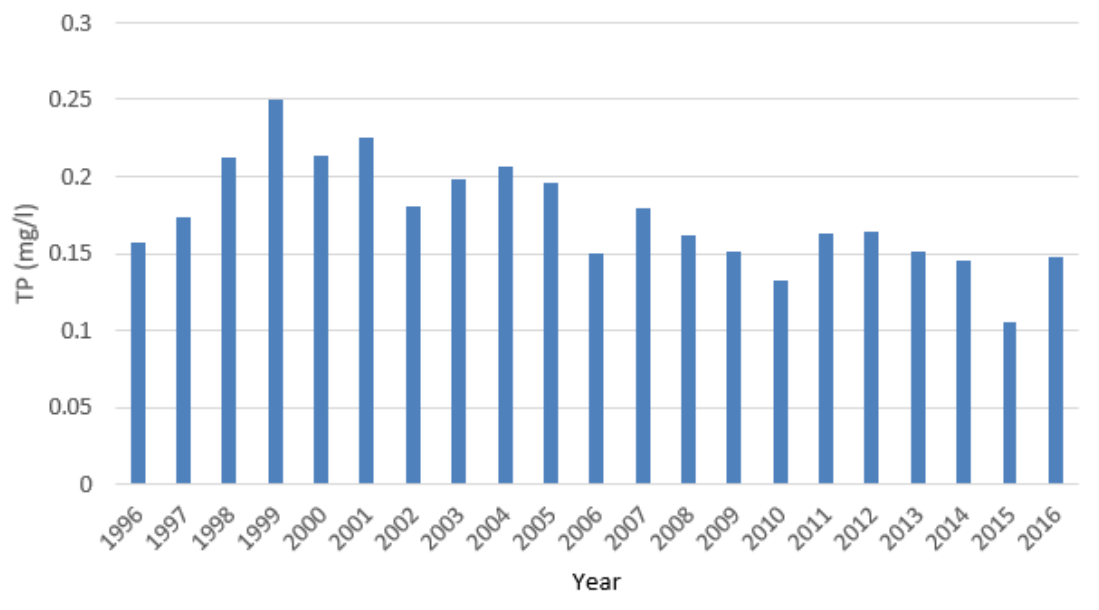


Figure 3: Yearly average TP concentration at Roosevelt Bridge (Station SE 03), January 1996–August 2016

Section 4: Compliance

Table 4 shows the number of projects that each entity committed to in the 2013 BMAP and the status of those projects.

Table 5 summarizes the allocations and reductions achieved to date by each entity in the BMAP.

Table 4: Summary of completed projects identified in the BMAP by entity

Entity	Projects Listed in 2013 BMAP	Completed	Cancelled	Under Way
City of Fort Pierce	6	6		
City of Port St. Lucie	26	25	1	
City of Stuart	15	15		
FDOT	40	38	2	
Hobe St. Lucie Conservancy District	3	3		
Martin County	28	28		
North St. Lucie River WCD	8	8		
Pal Mar WCD	1	1		
St. Lucie County MS4	8	8		
St. Lucie County Non-MS4	6	6		
Town of Sewall's Point	29	27		2
Troup-Indiantown WCD	2	2		
Turnpike Authority	3	3		
Total	179	174	3	2

Table 5: Summary of allocations and reduction status by entity

Entity	TN Allocation (lbs/yr)	Phase I TN Required Reduction (lbs/yr)	Current TN Reduction (lbs/yr)	TP Allocation (lbs/yr)	Phase I TP Required Reduction (lbs/yr)	Current TP Reduction (lbs/yr)
City of Fort Pierce	10,562	1,944	7,162	1,186	808	4,355
City of Port St. Lucie	103,380	15,930	63,675	11,585	7,029	9,329
City of Stuart	9,238	1,428	6,734	1,044	619	2,038
Agriculture	750,198	243,877	305,569	83,253	92,118	85,102
FDOT	7,408	1,532	2,108	833	513	1,087
Hobe St. Lucie Conservancy District	14,731	2,839	10,288	1,732	1,056	3,302
Martin County	68,655	9,647	36,258	7,779	4,377	6,646
North St. Lucie River WCD	109,557	26,354	69,128	12,250	10,090	19,088
Pal Mar WCD			926			92
St. Lucie County MS4	11,386	2,018	5,277	1,278	855	2,032
St. Lucie County Non-MS4	14,394	2,927	4,175	1,572	1,350	1,484
Town of Sewall's Point			261			70
Troup-Indiantown WCD	37,125	7,528	25,055	4,504	2,436	7,943
Turnpike Authority			23			3
Total	1,136,634	316,024	536,640	127,016	121,250	142,571

Figure 4 and **Figure 5** show the progress towards the TN and TP TMDLs load reductions. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current estimated loading based on those projects shown as completed in the BMAP, those completed as described in the 2014 and 2015 progress reports, and those listed in **Table 3**. The third bar shows the total allocation for stormwater runoff to meet the TMDL. The horizontal line shows the target (30 % of the total required reductions) for the first BMAP iteration. The TN and TP reductions from completed projects to date are 536,640 and 142,571 lbs/yr, respectively.

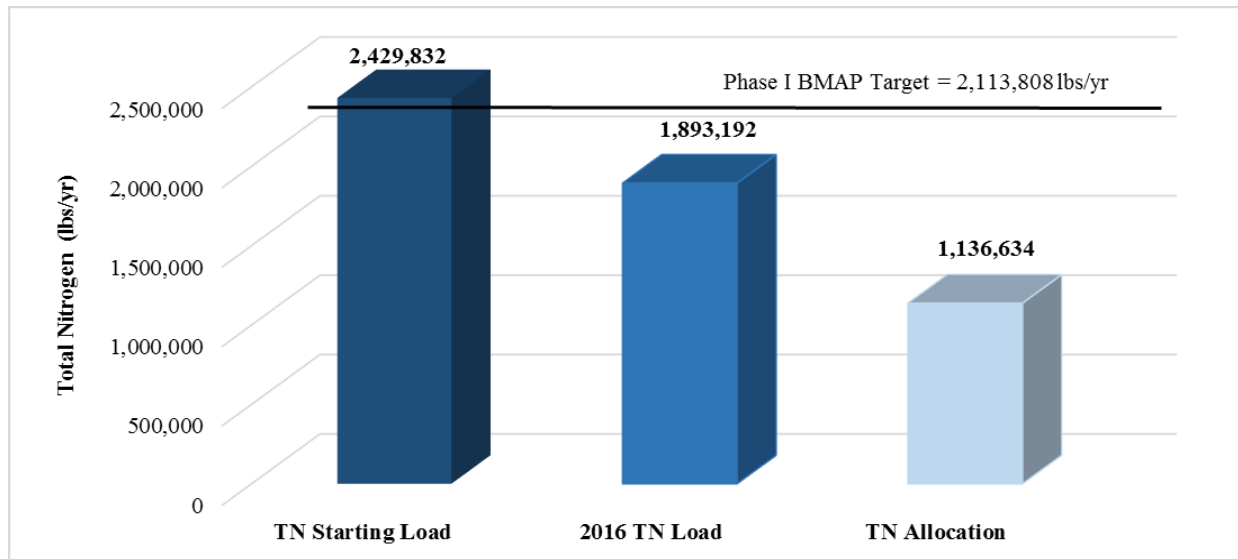


Figure 4: Progress towards the St. Lucie River and Estuary TN TMDL through June 30, 2016

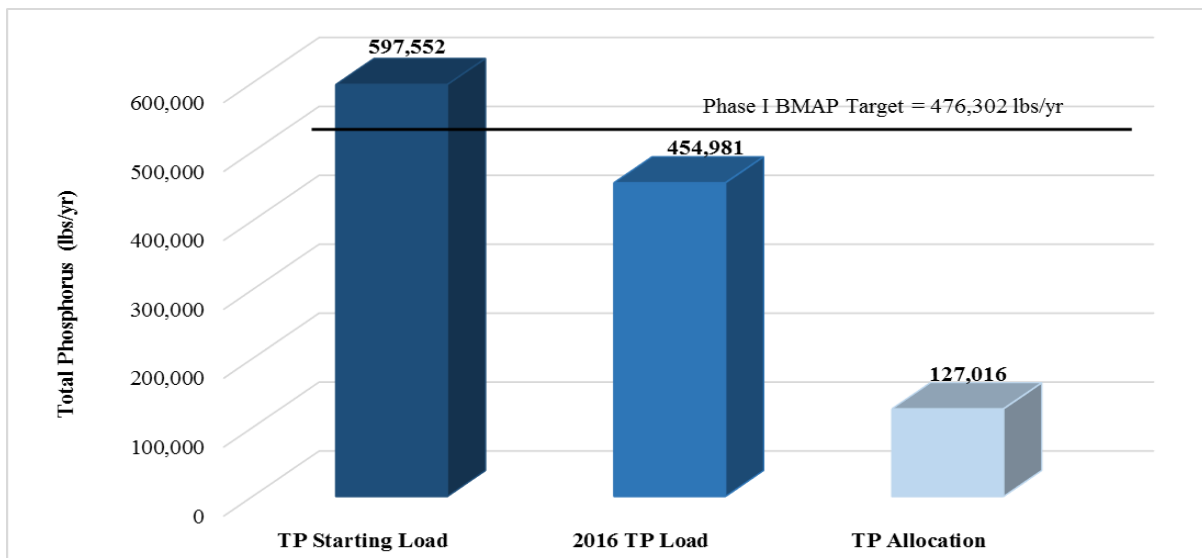


Figure 5: Progress towards the St. Lucie River and Estuary TP TMDL through June 30, 2016

Appendices

Appendix A: Projects To Achieve the TMDL

The BMAP project tables below show the implementation status of the BMAP projects as of June 30, 2016. The tables provide information on the nutrient reduction attributed to each individual project, listed in lbs/yr. These projects were submitted to provide reasonable assurance to DEP that each entity has a plan on how to meet its allocation. The projects are meant to be flexible enough to allow for changes that may occur over time, provided that the reduction is still achieved within the specified period.

Table A-1: City of Fort Pierce projects

N/A = Not applicable

TBD = To be determined

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
FP-1	Heathcote Botanical Gardens Treatment Train, also known as Indian Hills Recreation Area Stormwater Improvements	Treatment train	1,242	\$2,787,588	6/2015	Completed	233	99
FP-2	Moore's Creek Retrofit – Phases 3 and 4	Wet detention	71.9	\$825,000	3/2008	Completed	102	39
FP-3	Street Sweeping – 4,314 Cubic Yards	Street sweeping	N/A	N/A	Ongoing	Ongoing	6,158	3,949
FP-4	Inlet Cleaning – 2,762 Cubic Yards	Inlet cleaning	N/A	N/A	Ongoing	Ongoing	180	111
FP-5	Fertilizer Ordinance, Stormwater Education Shows, Pamphlets, Presentations, Storm Drain Stenciling, Illicit Discharge Program	Education and outreach	N/A	N/A	Ongoing	Ongoing	255	58
FP-6	Virginia Avenue Outfall Canal	Wet detention	161.4	\$3,462,572	02/2008	Completed	233	99
FP-7	Moore's Creek Retrofit Phase 2	Baffle boxes	1,680.00	\$1,480,437	2008	Completed	TBD	TBD
FP-8	South Beach Baffle Boxes	Baffle boxes	128.00	\$557,003	2005	Completed	TBD	TBD
FP-9	Veterans Park Stormwater Improvements	Treatment train	44.10	\$1,470,900	2016	Under construction	TBD	TBD
FP-10	North 2nd Street (Seaway Drive north to Taylor Creek Marina)	Wet detention	TBD	\$1,909,176	2017	Under construction	TBD	TBD
FP-11	Indian Hills Recreation Area Stormwater Improvements Phase II	Recreation of wetlands	61.00	\$2,240,705	2016	Near completion	TBD	TBD

Table A-2: City of Fort Pierce summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	7,162	4,355
Total BMAP I Required Reductions	1,944	808
Credit for Future BMAPs	5,218	3,547

Table A-3: City of Port St. Lucie MS4 projects

N/A = Not applicable
TBD = To be determined

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
PSL-1	Wood Stork Trail Design Districts 7, 8, and 9	First-generation baffle box	228.8	\$3,300,000	7/2007	Completed	3	4
PSL-2	Wood Stork Trail Design District 6	First-generation baffle box	81.0	\$825,500	11/2008	Completed	2	2
PSL-3	Howard Creek STA	Wet detention	435.8	Included in PSL-4	12/2010	Completed	523	212
PSL-4	Eastern Watershed Improvement Project (EWIP)	Wet detention ponds	849.5	\$36,000,000	12/2011	Completed	618	360
PSL-5	B-1 and B-2 Water Control Structures (WCSs)	Water control structure	1,747.5	\$1,800,000	5/2007	Completed	2,526	993
PSL-6	B-3 WCS	Water control structure	1,640.6	Included in PSL-5	5/2007	Completed	2,372	931
PSL-7	E-8 Waterway Phase 1 Water Quality Retrofit	Wet detention – STAs	1,610.2	\$400,000	11/2010	Completed	763	664
PSL-8	E-17 Canal WCS	Water control structure	983.6	\$437,000	7/2008	Completed	181	0
PSL-9	Water and Wastewater Expansion	Septic tank phaseout	N/A	\$91,075,666	Varies	Ongoing	37,698	TBD
PSL-10	Street Sweeping	Street sweeping	N/A	N/A	Ongoing	Ongoing	676	434
PSL-11	Swale Maintenance	Sediment removal	N/A	N/A	Ongoing	Ongoing	7,649	3,097
PSL-12	Catch Basin Cleaning	Catch basin cleaning	N/A	N/A	Ongoing	Ongoing	21	13
PSL-13	Florida Yards and Neighborhoods (FYN); Fertilizer, Landscaping, Irrigation, and Pet Waste Ordinances; Public Service Announcements (PSAs), Stormwater Educational Shows, Website, Outreach Programs, Stencil Program, Stormwater Pollution Hotline	Education and outreach	N/A	N/A	Ongoing	Ongoing	9,388	2,100
PSL-14	Tiffany Channel	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	33	7
PSL-15	Patio STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	11	2
PSL-16	Mary STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	8	2
PSL-17	Leithgow STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	7	2
PSL-18	Cane Slough 1/Elks STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	33	7
PSL-19	Cane Slough 2/Azzi STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	24	6
PSL-20	Loutus STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	23	5
PSL-21	Howard Creek STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	34	7

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
PSL-22	Bur St. STA	Stormwater reuse	N/A	N/A	Ongoing	Ongoing	1	0
PSL-23	SLWSD Aquatic Harvesting	Aquatic harvesting	N/A	\$669,600	Discontinued	Discontinued	N/A	N/A
PSL-24	SLWSD Catch Basin Cleaning	Catch basin cleaning	N/A	\$185,600	Ongoing	Ongoing	84	52
PSL-25	Atlantis Basin	Second-generation baffle box	115.8	\$628,000	11/2014	Completed	91	17
PSL-26	Evergreen Basin	Second-generation baffle box	241.4	Included in PSL-25 cost	11/2014	Completed	190	35
PSL-27	Lansdown Basin	Second-generation baffle box	115.2	Included in PSL-25 cost	11/2014	Completed	90	16
PSL-28	Streamlet/Manth Basin	Second-generation baffle box	41.7	Included in PSL-25 cost	11/2014	Completed	33	6
PSL-29	Walters Basin	Second-generation baffle box	179.5	Included in PSL-25 cost	11/2014	Completed	140	25
PSL-30	SLWSD Water Management Improvement Project	Wet detention pond	140	\$360,704	12/2015	Completed	454	326
PSL-31	McCarty Ranch Extension – Phases I through VI	Retention BMPs	Not quantified	\$5,139,494	TBD	Started	TBD	TBD
PSL-32	Veterans Memorial Water Quality Retrofit	Dry detention	1065	TBD	TBD	Started	TBD	TBD
PSL-33	Lake Harvey	Retention BMPs	140	Estimated \$585,000	2017	Permitting package being assembled	TBD	TBD

Table A-4: City of Port St. Lucie summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	63,675	9,329
Total BMAP I Required Reductions	15,930	7,029
Credit for Future BMAPs	47,744	2,300

Table A-5: City of Stuart projects

N/A = Not applicable
TBD = To be determined

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
S-1	Poppleton Creek – Phase II and III	Wet detention pond	629.1	\$4,371,250	10/2008	Completed	1,299	576
S-2	Airport Ditch Project	Retention/detention	893.7	\$766,756	8/2003	Completed	900	532
S-3	Crescent Basin Project	Stormwater retention	58.5	\$180,000	3/2003	Completed	198	42
S-4	Krueger Creek Project	First-generation baffle boxes	309.6	\$432,000	11/2001	Completed	7	7
S-5	Street Sweeping – 105 tons/yr	Street sweeping	N/A	Not quantified	Ongoing	Ongoing	111	71
S-6	Sediment Removal from Storm Systems – 103 tons/year	BMP cleanout	N/A	Not quantified	Ongoing	Ongoing	111	68
S-7	FYN; Landscaping, Irrigation, Fertilizer, Pet Waste Ordinances; Brochure, Website, Information Inserts, City Calendar, Doggie Pot Stations, Neighborhood Cleanup Program	Education and outreach	N/A	FYN agreement – \$17,028; city stormwater calendars – \$11,530	Ongoing	Ongoing	840	186
S-8	North Point CRA Drainage Basin	First-generation baffle box	1,083.8	Not quantified	2002	Completed	24	23
S-9	Anchorage Drainage Basin	First-generation baffle box	21.3	Not quantified	2002	Completed	1	0
S-10	Downtown Drainage Basin	First-generation baffle boxes	116.6	Not quantified	2002	Completed	2	2
S-11	Hildebrad Basin	Continuous deflective separation (CDS) unit	66.9	Not quantified	2009	Completed	0	6
S-12	Landfill Basin	Closed basin	71.0	Not quantified	N/A	Completed	167	26
S-13	South Fork Drainage Basin	First-generation baffle boxes	662.8	Not quantified	2002	Completed	16	16
S-14	Neighborhood Initiated Sewer Expansion Program	Removal of septic tanks	N/A	\$3,200,000	Ongoing	Ongoing	1,339	TBD
S-15	Eldorado Heights	Retention/closed basin	29.8	\$779,000	12/2012	Completed	134	27
S-16	Amerigo Avenue Drainage Improvements	Dry detention	9.9	\$772,000	4/2014	Completed	37	7
S-17	Haney Creek Project	Flow-through marsh, wetlands	626.4	\$4,831,411	2016	Completed	513	207
S-18	Nondischarge Areas	Nondischarge (8 areas)	217.6	N/A	2014	Completed	1,038	233
S-19	Baffle Boxes Throughout City	First-generation baffle boxes (22 total)	474.9	Unknown	2014	Completed	11	11

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
S-20	CDS Units Throughout City	CDS units (12 total)	65.9	Unknown	Various	Completed	0	6
S-21	SW South Carolina Dr. Drainage Project	Drainage improvement	2.8	\$28,390	2016	Completed	TBD	TBD
S-22	Poppleton Creek Tidal Wetlands Creation and Restoration Project-Phase IV	Tidal flow through mangrove forest	525	\$270,200	2018	Started	TBD	TBD
S-23	East Heart of Haney Creek Wetlands Restoration	Upland flow through wetlands	395	\$200,000	2019	Planned and funded	TBD	TBD

Table A-6: City of Stuart summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	6,735	2,038
Total BMAP I Required Reductions	1,428	619
Credit for Future BMAPs	5,307	1,420

Table A-7: FDOT District 4 projects

N/A = Not applicable

TBD = To be determined

¹ These projects are located in the South Coastal Subbasin, which is outside the current BMAP boundary. However, they will be considered for credit in the next BMAP iteration.² These projects are located in the Mid Coastal Subbasin, which is outside the current BMAP boundary. However, they will be considered for credit in the next BMAP iteration.³ FDOT-44 is a joint project between St Lucie County and FDOT. This portion of 68 (west of Interstate 95) is actually a county road, not a state road. The county and FDOT District 4 have agreed to split the credits 25 % to FDOT and 75 % to the county.⁴ FDOT calculated the total credits using the St. Lucie River and Estuary model and then split the credits, 40 % to the St. Lucie River and Estuary Basin and 60 % to the Indian River Lagoon Basin, based on the area of each basin within the boundary of the project. These projects were previously FDOT-45, a project ID that will no longer be used or attributed in the future.

Project Number	Project Name	Project Type	Acres Treated	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
FDOT-1⁴	FM# 230108-1 (Pond 3)	Wet detention	N/A	N/A	Completed	1	0
FDOT-2⁴	FM# 230108-1 (Pond 4)	Wet detention	N/A	N/A	Completed	1	0
FDOT-3	FM# 230262-4	Dry detention	102.0	7/2008	Completed	69	18
FDOT-4	FM# 230262-5	Dry detention	123.7	4/2010	Completed	60	15
FDOT-5	FM# 230262-3	Dry detention	195.1	5/2012	Completed	168	38
FDOT-6	FM# 230262-2	Dry detention	238.4	6/2014	Completed	110	36
FDOT-7	FM# 230295-1	Dry detention	17.1	3/2003	Completed	9	2
FDOT-8	SPN 99004-1585	Dry detention	30.8	1/2003	Completed	16	3
FDOT-9	SPN 99004-1585 (Lake 3)	Wet detention	13.1	1/2003	Completed	14	5
FDOT-10	FM# 228819-1 (Basin A and B)	Wet detention	2.0	5/2007	Completed	0	0
FDOT-11	FM# 228821-1 (West 1 A)	Exfiltration trench	2.2	4/2001	Completed	5	1
FDOT-12	FM# 228821-1 (East)	Exfiltration trench	1.0	4/2001	Completed	2	0
FDOT-13	FM# 228831-1	Dry detention	9.1	3/2000	Completed	3	1
FDOT-14	FM# 228801-1	Dry detention	2.0	11/2003	Completed	1	0
FDOT-15	FM# 405504-1	Dry detention	53.6	2/2005	Completed	24	5
FDOT-16	FM# 230288-2	Wet detention	44.4	5/2009	Completed	63	22
FDOT-17	FM# 419890-1	Wet and dry detention	42.0	1/2010	Completed	2	2
FDOT-18	Street Sweeping	Street sweeping	N/A	Ongoing	Ongoing	1,419	910
FDOT-19	Pamphlets	Education	N/A	Ongoing	Ongoing	31	6
FDOT-20	FM# 230978-1 Indian Street Bridge (Pond East)	Dry detention	20.7	1/2014	Completed	2	0
FDOT-21	FM# 230978-1 Indian Street Bridge (Pond West)	Wet detention	33.6	1/2014	Completed	0	0
FDOT-22	State Road (SR) 615 Midway Road to Edwards Road (Basin B-1)	Wet detention	7.8	10/2009	Completed	5	2
FDOT-23	SR 615 Midway Road to Edwards Road (Basin E)	Wet detention	9.3	10/2009	Completed	6	2

Project Number	Project Name	Project Type	Acres Treated	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
FDOT-24	FM# 410717-1 SR 70 Widening Kings Highway to Jenkins Road (West Basin)	Dry detention	6.2	11/2012	Completed	3	1
FDOT-25	SR 713 (King's Highway) Turn Lanes	Swales	0.6	Unknown	Completed	0	0
FDOT-26	Johnson Honda of Stuart Turn Lane (Basin A and B)	Exfiltration trench	0.1	10/2010	Completed	0	0
FDOT-27	FM# 228852-1 SR 76 Drainage Improvements at Cabana Point (Pond 9A)	Wet detention	4.8	1/2006	Completed	10	3
FDOT-28	FM# 228852-1 Osprey Ridge Planned Unit Development (PUD) – SR 76 Improvements	Exfiltration trench	0.1	2/2007	Completed	0	0
FDOT-29	FM# 228852-1 SR 76 Improvements – Kanner Professional Center	Exfiltration trench	0.4	3/2009	Completed	0	0
FDOT-30¹	FM# 228851-1 (Basin A)	Dry detention	14.12	11/2004	Completed	Not quantified	Not quantified
FDOT-31¹	FM# 228851-1	Dry detention	25.72	11/2004	Completed	Not quantified	Not quantified
FDOT-32²	FM# 230132-1 (System No. 1)	Dry detention	2.8	5/2001	Completed	Not quantified	Not quantified
FDOT-33²	FM# 228758-1	Dry detention	18.55	1/2006	Completed	Not quantified	Not quantified
FDOT-34²	FM# 228819-1 (Basin C)	Dry detention	16.2	5/2007	Completed	Not quantified	Not quantified
FDOT-35²	FM# 228819-1 (Basin D)	Exfiltration trench	4.41	5/2007	Completed	Not quantified	Not quantified
FDOT-36²	FM# 228819-1 (Basin E)	Exfiltration trench	4.79	5/2007	Completed	Not quantified	Not quantified
FDOT-37²	FM# 405167-1	Dry retention	30.07	4/2005	Completed	Not quantified	Not quantified
FDOT-38²	FM# 230296-1	Dry swales	88.91	3/2009	Completed	Not quantified	Not quantified
FDOT-39²	FM# 230297-1 SR A1A Roadway Improvements Phase 3	Exfiltration trench	6.38	8/2010	Completed	Not quantified	Not quantified
FDOT-40²	FM# 228758-1 SR 702 Jensen Beach Causeway	Dry detention	33.60	1/2008	Completed	Not quantified	Not quantified
FDOT-41	FM# 419250-2 SR 710 Bridge Replacement – 100A, 100B, and 200	Dry detention	17.4	7/2014	Completed	3	0
FDOT-42	FM# 419250-2 SR 710 Bridge Replacement – 300 and 500	Dry detention	28.4	7/2014	Completed	7	1
FDOT-43	FM# 413046-1 SR 9 Widening	Dry retention	152.0	10/2014	Completed	75	14
FDOT-44³	FM# 423022-1 CR 68 Orange Avenue	Dry detention	5.62	2/2015	Completed	Not quantified	Not quantified
FDOT-46	231440-2 Midway Rd Widening, 25th St. to US 1 (Pond 1 and 2)	Wet detention	17.08	TBD	Planned and funded	TBD	TBD
FDOT-47	231440-2 Midway Rd Widening, 25th St. to US 1 (Pond 3 and 4)	Wet detention	14.19	TBD	Planned and funded	TBD	TBD
FDOT-48	231440-2 Midway Rd Widening, 25th St. to US 1 (Pond 5)	Wet detention	11.01	TBD	Planned and funded	TBD	TBD

Project Number	Project Name	Project Type	Acres Treated	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
FDOT-49	230978-2 CR 714 Martin Highway Widening – Danforth Basin	Wet detention	16.56	2016	Completed	TBD	TBD
FDOT-50	230978-2 CR 714 Martin Highway Widening – Wetlands Basin	Wet detention	12.11	2016	Completed	TBD	TBD
FDOT-51	422641-3 SR 76 Widening from I-95 to Monterey Rd Pond 1	Dry detention	4.65	2018	Started	TBD	TBD
FDOT-52	422641-3 SR 76 Widening from I-95 to Monterey Rd Pond 2A	Wet detention	7.22	2018	Started	TBD	TBD
FDOT-53	422641-3 SR 76 Widening from I-95 to Monterey Rd Pond 2B	Wet detention	14.58	2018	Started	TBD	TBD
FDOT-54	422641-3 SR 76 Widening from I-95 to Monterey Rd. Pond 3	Wet detention	24.75	2018	Started	TBD	TBD
FDOT-55	422641-3 SR 76 Widening from I-95 to Monterey Rd. Pond 4	Wet detention	11.98	2018	Started	TBD	TBD
FDOT-56	422641-3 SR 76 Widening from I-95 to Monterey Rd. Pond 8	Wet detention	10.58	2018	Started	TBD	TBD
FDOT-57	Fertilizer Application Cessation	Fertilizer cessation		Ongoing	Ongoing	TBD	TBD

Table A-8: FDOT District 4 summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	2,108	1,088
Total BMAP I Required Reductions	1,532	513
Credit for Future BMAPs	577	575

Table A-9: Hobe St. Lucie Conservancy District projects

N/A = Not applicable

Project Number	Project Name	Project Type	Acres Treated	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
HSL-1	Hobe Sound Polo Club	Wet detention, dry detention	1,736.3	Completed	3,097	1,013
HSL-2	Changes in Agricultural Land Uses	Land use change	N/A	Completed	7,000	2,258
HSL-3	90 % Implementation Agricultural BMPs	Agricultural BMPs	N/A	Ongoing	191	29

Table A-10: Hobe St. Lucie Conservancy District summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	10,288	3,302
Total BMAP I Required Reductions	2,839	1,056
Credit for Future BMAPs	7,450	2,246

Table A-11: Martin County projects

N/A = Not applicable

TBD = To be determined

* These projects are located in the South Coastal Subbasin, which is outside the current BMAP boundary. However, they will be considered for credit in the next BMAP iteration.

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
MC-1	Cedar Point Water Quality Retrofit	Wet detention and swales	31.4	\$398,027	10/2004	Completed	72	34
MC-2	Indian River Drive Baffle Boxes	Second-generation baffle boxes	39.1	\$741,827	5/2010	Completed	31	6
MC-3	Warner Creek/Leilani Heights Water Quality Retrofit Phase I	Exfiltration trenches and swales	69.8	\$541,854	8/2011	Completed	230	49
MC-4	Warner Creek Phase II	Dry detention	15.1	\$1,750,338	7/2012	Completed	6	1
MC-5	Warner Creek Phase III – Beacon 21	Wet detention	1,353.8	\$2,122,935	7/2012	Completed	1,291	597
MC-6	Manatee Creek Water Quality Retrofit Phases I, II, and III	Wet detention	16.0	\$419,948	7/2012	Completed	6	4
MC-7	Rio/St. Lucie Water Quality Retrofit – Phase 1	Exfiltration trenches and swales	8.1	\$354,161	9/2006	Completed	41	11
MC-8	Rio/St. Lucie Water Quality Retrofit – Phase 2	Wet detention	119.8	\$998,170	9/2008	Completed	190	74
MC-9	Salerno Creek Water Quality Retrofit	Wet detention	207.9	\$4,715,074	6/2003	Completed	408	134
MC-10	Coral Gardens Water Quality Retrofit	Wet detention	2,008.0	\$2,321,860	5/2005	Completed	1,376	936
MC-11	Fern Creek Water Quality Retrofit	Wet detention	607.1	\$2,660,200	4/2005	Completed	685	258
MC-12	Old Palm City Water Quality Retrofit Phases I, II, and III	Wet detention, swales	141.4	\$1,544,600	3/2004	Completed	244	96
MC-13	North River Shores Baffle Boxes	First-generation baffle boxes	187.3	\$1,310,000	3/2002	Completed	4	4
MC-14	Palm Lake Park Water Quality Retrofit	Wet detention	80.1	\$1,741,098	2/2003	Completed	108	42
MC-15	Tropical Farms Water Quality Retrofit	Wet detention	469.8	\$4,045,470	12/2010	Completed	945	309
MC-16	Septic to Central Sewer Conversions	Septic to sewer conversion	N/A	\$28,678,946	Varies	Completed	15,369	Not quantified
MC-17	Danforth Creek – Phase 1	Wet detention	2,459.3	\$1,981,799	4/2013	Completed	2,434	1,010
MC-18	Street Sweeping	Street sweeping	N/A	N/A	Ongoing	Ongoing	108	69
MC-19	Baffle Box and Structure Cleanout	Clean out	N/A	N/A	Ongoing	Ongoing	397	161
MC-20	FYN; Landscaping, Irrigation, Fertilizer, and Pet Waste Ordinances; PSAs, Pamphlets, Website, Illicit Discharge Program	Education and outreach	N/A	N/A	Ongoing	Ongoing	6,049	1,342

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
MC-21	FM# 230978-1 Indian Street Bridge (Pond East)	Dry detention	20.7	Unknown	1/2014	Completed	5	1
MC-22	FM# 230978-1 Indian Street Bridge (Pond West)	Wet detention	33.6	Unknown	1/2014	Completed	0	0
MC-23*	Golden Gate Water Quality Retrofit Phases I, II	Dry detention	202	\$2,046,145	10/2003	Completed	Not quantified	Not quantified
MC-24*	Golden Gate Water Quality Retrofit Phase III	Second-generation baffle boxes and wet detention	27	\$584,371	3/2004	Completed	Not quantified	Not quantified
MC-25*	Hibiscus Park Water Quality Retrofit Phases I and II	Wet detention	4.5	\$757,085	7/2007	Completed	Not quantified	Not quantified
MC-26*	Poinciana Gardens Water Quality Retrofit Phases I and II	Wet detention	188	\$2,960,547	7/2003	Completed	Not quantified	Not quantified
MC-27*	Willoughby Creek Muck Dredging	Muck removal	N/A	\$13,200,000	7/2012	Completed	Not quantified	Not quantified
MC-28*	Manatee Pocket Dredging	Muck removal	N/A	\$1,000,000	7/2012	Completed	Not quantified	Not quantified
MC-29	Rio Water Quality Retrofit	Exfiltration and second-generation baffle boxes	45	\$696,800	5/19/14	Completed	162	36
MC-30	Old Palm City Bee Mats	Floating wetland vegetation islands	N/A	\$21, 996	9/26/13	Completed	Not quantified	Not quantified
MC-31	Bessey Creek Hybrid Wetland Treatment Technology	Stormwater treatment	2,675	\$3,000,000	May 2015	Completed	6,081	1,473
MC-32	Danforth Creek Hybrid Wetland Treatment Technology	Stormwater treatment	2,419	\$3,000,000	12/2015	Completed	TBD	TBD
MC-33	Hoke Library Rain Garden	Rain garden	N/A	\$4,372	9/2014	Completed	Not quantified	Not quantified
MC-34	Halpatiokee Park Rain Garden	Rain garden	N/A	\$1,500	2/2015	Completed	Not quantified	Not quantified
MC-35	Manatee Pocket SW Prong Baffle Box	Second-generation baffle box	207.3	\$232,505	2016	Completed	TBD	TBD
MC-36	Martin County Golf Course WQ	Wet detention	206.7	\$156,255	2016	Completed	TBD	TBD
MC-37	All American Ditch	Wet detention	267.7	\$4,160,500	2016	Ongoing	TBD	TBD
MC-38	Hilltop Street Exfiltration Trench	Exfiltration trenches and swales	15.4	\$375,000	2016	Ongoing	TBD	TBD

Table A-12: Martin County summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	36,258	6,646
Total BMAP I Required Reductions	9,647	4,377
Credit for Future BMAPs	26,611	2,269

Table A-13: North St. Lucie River WCD projects

N/A = Not applicable

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
NSLRWCD-1	St. Lucie River Issues Team (SLRIT) Grant 2000–01: Vegetation Control and Bank Restoration	Control structures	4,173	\$929,000	05/2003	Completed	983	0
NSLRWCD-2	SLRIT Grant 2007–08: Water Control Structure Retrofits	Control structure	4,701	\$77,000	03/2010	Completed	1,372	0
NSLRWCD-3	Canals 23 and 28 Retrofit for Stormwater Treatment and Attenuation	Control structure	44	Unknown	05/2009	Completed	11	0
NSLRWCD-4	Canal Maintenance Program	Vegetation harvesting	66,225	\$4,200,000	Ongoing	Ongoing	Not quantified	Not quantified
NSLRWCD-5	Changes in Agricultural Land Uses	Land use change	N/A	N/A	N/A	Completed	45,621	14,445
NSLRWCD-6	90 % Implementation Agricultural BMPs	Agricultural BMPs	N/A	Unknown	Ongoing	Ongoing	19,972	4,308
NSLRWCD-7	Change from Agricultural to Urban	Land use change	N/A	N/A	N/A	Completed	839	208
NSLRWCD-8	Ideal Grove HWT	Wetlands, chemical treatment	238	\$217,929	Ongoing	Ongoing	330	127

Table A-14: North St. Lucie River WCD summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	69,128	19,088
Total BMAP I Required Reductions	26,354	10,090
Credit for Future BMAPs	42,774	8,998

Table A-15: Pal Mar WCD projects

Project Number	Project Name	Project Type	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
PM-1	90 % Implementation Agricultural BMPs	Agricultural BMPs	Ongoing	Ongoing	926	92

Table A-16: Pal Mar WCD summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	926	92
Total BMAP I Required Reductions	0	0
Credit for Future BMAPs	926	92

Table A-17: St. Lucie County MS4 projects

N/A = Not applicable

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
SLC-1	Platt's Creek Stormwater Treatment Facility	Wet detention with alum injection	311.0	\$3,539,475	6/2008	Completed	676	306
SLC-2	Indian River Estates Stormwater Improvements (Phase I and II)	Wet detention with alum injection	1,004.4	\$4,471,114	1/2009	Completed	1,841	706
SLC-3	Prima Vista	Second-generation baffle box	96.8	\$323,483	11/2006	Completed	76	13
SLC-4	Bay Street	Second-generation baffle box	44.3	Included in SLC-3	11/2006	Completed	34	6
SLC-5	FYN; Pet Waste, Landscape, Irrigation, and Fertilizer Ordinances; PSAs, Website, Illicit Discharge Program, Eco-Center, Clean Stormwater – Clean River Program	Education and outreach	N/A	N/A	Ongoing	Ongoing	1,086	247
SLC-6	Street Sweeping	Street sweeping	N/A	N/A	Ongoing	Ongoing	210	135
SLC-7	Catch Basin Cleanout	Clean out	N/A	N/A	Ongoing	Ongoing	170	104
SLC-8	Platt's Creek Sump Cleanout	Clean out	N/A	N/A	Ongoing	Ongoing	1,181	511
SLC-14	Platt's Creek Wetland Compensatory Project	Floodplain restoration	311.0	\$2,600,000	7/2015	Completed	Not quantified	Not quantified

Table A-18: St. Lucie County MS4 summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	5,277	2,032
Total BMAP I Required Reductions	2,018	855
Credit for Future BMAPs	3,259	1,177

Table A-19: St. Lucie County non-MS4 projects

N/A = Not applicable
 TBD = To be determined

Project Number	Project Name	Project Type	Acres Treated	Project Cost	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
SLC-1	Platt's Creek Stormwater Treatment Facility	Wet detention with alum injection	563.5	Included in MS4 table	6/2008	Completed	907	365
SLC-9	White City – Citrus/Seager Stormwater Improvement	Wet detention with polyacrylamide logs	38.9	\$1,862,859	2016	Completed	71	26
SLC-10	FYN; Pet Waste, Landscape, Irrigation, and Fertilizer Ordinances; PSAs, Website, Illicit Discharge Program, Eco-Center, Clean Stormwater–Clean River Program	Education and outreach	N/A	N/A	Ongoing	Ongoing	1,426	364
SLC-11	Street Sweeping	Street sweeping	N/A	N/A	Ongoing	Ongoing	113	73
SLC-12	Catch Basin Cleanout	Clean out	N/A	N/A	Ongoing	Ongoing	92	56
SLC-13	Platt's Creek Sump Cleanout	Clean out	N/A	N/A	Ongoing	Ongoing	1,566	601
SLC-15	Indian River Lagoon South C23/C24 Comprehensive Everglades Restoration Plan (CERP) Buffer – Teague Preserve Rewatering Project	Restoration	TBD	\$400,000	4/2017	Under way	TBD	TBD
SLC-16	Melville Rd. Master Drainage Plan	Wet detention	175	TBD	2019	Planned and funded	TBD	TBD

Table A-20: St. Lucie County non-MS4 summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	4,175	1,484
Total BMAP I Required Reductions	2,927	1,350
Credit for Future BMAPs	1,248	134

Table A-21: Town of Sewall's Point projects

N/A = Not applicable

TBD = To be determined

* These projects are located in the Mid Coastal Subbasin, which is outside the current BMAP boundary. However, they will be considered for credit in the next BMAP iteration.

Project Number	Project Name	Project Type	Acres Treated	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
SP-1	Ridgeland Court Retrofit	Baffle box	5.9	10/2002	Completed	0	0
SP-2	Palm Court/Knowles	Baffle box	12.9	9/2000	Completed	0	0
SP-3	Captain Cove	Baffle box	4.9	9/2000	Completed	0	0
SP-4	Quail Run Park	Dry detention	0.4	9/2000	Completed	0	0
SP-5	Heritage Park	Dry retention	5.2	9/2000	Completed	7	2
SP-6	Via Lucindia	Exfiltration	2.7	9/2000	Completed	8	2
SP-7	Rio Vista Park	Baffle box	24.2	1/2002	Completed	1	1
SP-8	Indialucie	Wet retention	31.1	9/2003	Completed	44	18
SP-9	Indialucie	Baffle box	5.6	9/2006	Completed	0	0
SP-10	Periwinkle	Baffle box	15.7	9/2000	Completed	0	0
SP-11	Palm Road	Swales	0.8	12/2008	Completed	1	0
SP-12	Riverview	Baffle box	9.6	1/2002	Completed	0	0
SP-13	Pineapple Lane	Exfiltration	5.5	1/2002	Completed	0	0
SP-14	Copaire	Baffle box	1.8	10/2002	Completed	0	0
SP-15	Homewood Park/Sewall's Point Road	Retention	13.9	6/2009	Completed	46	10
SP-16	Pedway/Greenway	Exfiltration/pervious paver	1.6	6/2013	Completed	6	1
SP-17	SR A1A	Exfiltration	12.1	1/2012	Completed	52	10
SP-18	Fertilizer Ordinance	Education	N/A	Ongoing	Ongoing	9	2
SP-19	Street Sweeping – 19 Cubic Yards	Street sweeping	N/A	Ongoing	Ongoing	25	16
SP-20*	Delano Lane	Exfiltration	1.2	8/2000	Completed	Not quantified	Not quantified
SP-21*	Town Commons Park	Dry detention	1.0	1/2002	Completed	Not quantified	Not quantified
SP-22*	Island Road	Baffle box	4.9	1/2002	Completed	Not quantified	Not quantified
SP-23*	Highpoint West	Baffle box	7.9	9/2000	Completed	Not quantified	Not quantified
SP-24*	Mandalay (Marguerita)	Baffle box	15.4	9/2000	Completed	Not quantified	Not quantified
SP-25*	Highpoint East	Baffle box	15.6	9/2000	Completed	Not quantified	Not quantified
SP-26*	High Point Exfiltration	Exfiltration/swales	6.4	4/2014	Completed	Not quantified	Not quantified
SP-27*	Extend Pedway/Greenway	Exfiltration/pervious paver	28.2	2016	Completed	TBD	TBD
SP-28*	Mandalay (Marguerita)	Dry detention	15.4	Unknown	Under way	TBD	TBD

Project Number	Project Name	Project Type	Acres Treated	End Date	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
SP-29*	Baffle Boxes	First- and second-generation baffle boxes	18.0	Unknown	Under way	TBD	TBD
SP-30	Indialucie	Exfiltration	31.1	2014	Completed	62	8
SP-31	Quail Run Subdivision	Exfiltration and baffle box	3.5	4/2015	Completed	Not quantified	Not quantified

Table A-22: Town of Sewall's Point summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	261	70
Total BMAP I Required Reductions	0	0
Credit for Future BMAPs	261	70

Table A-23: Troup-Indiantown WCD projects

N/A = Not applicable

Project Number	Project Name	Project Type	Acres Treated	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
TI-1	C-44 Conservation Area	Conservation	9,135.1	Completed	23,199	7,496
TI-2	90 % Implementation Agricultural BMPs	Agricultural BMPs	N/A	Ongoing	1,856	445

Table A-24: Troup-Indiantown WCD summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	25,055	7,943
Total BMAP I Required Reductions	7,528	2,436
Credit for Future BMAPs	17,527	5,507

Table A-25: Turnpike Authority projects

Project Number	Project Name	Project Type	Acres Treated	Status	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
T-1	Project 420735-1 Port St. Lucie Interchange Pond A	Dry detention	3.6	Completed	1	0
T-2	Project 420735-1 Port St. Lucie Interchange Pond B	Wet retention	20.6	Completed	16	2
T-3	Thomas B. Manuel Bridge North Pond	Dry detention	9.8	Completed	5	1

Table A-26: Turnpike Authority summary of reductions

Category	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)
Total Completed Project Reductions	23	3
Total BMAP I Required Reductions	0	0
Credit for Future BMAPs	23	3

Appendix B: Water Quality Data Evaluation Methodology

The following outlines the data evaluation methodology conducted for the SE 03 monitoring station. This methodology may be the basis for future monitoring data evaluations at other stations in the basin. A data request from DBHYDRO was initiated for Station SE 03 to cover the period from January 1996 to August 2016. The analyte parameters used from DBHYDRO were as follows:

- Total Kjeldahl nitrogen (TKN).
- Nitrite + nitrate-N.
- TN.
- TP.

The three parameters of nitrogen analyte are necessary to capture the available data through the time series needed. The most current method of nitrogen analysis stored in DBHYDRO is TN. For earlier data periods where TN values were not directly reported in DBHYDRO, TN was calculated by adding the concentrations of TKN and nitrite + nitrate. For water quality samples where TN, TKN, and/or nitrite + nitrate were all reported, the TN value was used to represent TN. For the TP analysis, all the available data used the same analysis method over the period of record, and therefore the reported TP concentration was used.

Data uploaded from stations to DBHYDRO are processed through a quality assurance and quality control (QA/QC) method before use by the SFWMD. The analyte-specific samples can be flagged with qualifiers to denote data that should be further examined before being used in the analysis. The list of qualifiers can be found on the [DBHYDRO web page](#). This data analysis method for Station SE 03 follows a similar method of dealing with these qualifiers as the SFWMD and DEP's Impaired Surface Waters Rule (IWR). Data with no qualifiers as well as data tagged with the following qualifiers were included in the analysis; !, A, D, PMF, PMR, T, and/or U. All other qualified data were excluded from this analysis.

The DBHYDRO qualifiers T and U denote that the measured analyte was below the laboratory method detection limit (MDL) or was analyzed for but not detected, respectively. For results that included these two qualifiers, the analysis used the MDL and practical quantitation limit (PQL) values provided by the SFWMD. MDL and PQL values were provided by the SFWMD historical lab records methodology. Using a method that is a widely accepted scientific practice for values below the MDL, DEP divided the values by 2 and used that value for this statistical analysis. Roughly 12 % of the TN data used in this analysis, and less than 1 % of the TP data had a T or U qualifier.

Appendix C: Important Links

Lake Okeechobee BMAP:

<http://www.dep.state.fl.us/water/watersheds/docs/bmap/LakeOkeechobeeBMAP.pdf>

DEP Final TMDL Documents web page:

http://www.dep.state.fl.us/water/tmdl/final_tmdl.htm

2016 South Florida Environmental Report:

<https://www.sfwmd.gov/science-data/sfer>

DBHYDRO web page:

http://my.sfwmd.gov/dbhydroplsql/water_quality_data.show_flag_info