Florida Department of Environmental Protection

St. Lucie River and Estuary Basin Management Action Plan (BMAP) Public Meeting

April 10, 2013





Presentation Overview

- Overview of St. Lucie River and Estuary BMAP.
- Review March 2013 comments and changes to Draft St. Lucie River and Estuary BMAP.

Overview of St. Lucie River and Estuary BMAP

Total Maximum Daily Load (TMDL) Basin Rotation Schedule

- TMDLs are developed, allocated, and implemented through a watershed management approach.

- Florida's 52 major hydrologic basins have been separated into 5 groups on a rotating schedule.

FDEP District	Group 1 Basins	Group 2 Basins	Group 3 Basins	Group 4 Basins	Group 5 Basins
NW	Ochlockonee–St. Marks	Apalachicola–Chipola	Choctawhatchee–St. Andrews Bay	Pensacola Bay	Perdido Bay
NE	Caloosahatchee	Lower St. Johns	Not applicable	Nassau–St. Marys	Upper East Coast
Central	Ocklawaha	Middle St. Johns	Upper St. Johns	Kissimmee	Indian River Lagoon
SW	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay–Peace–Myakka	Withlacoochee	Springs Coast
S	Everglades West Coast	Charlotte Harbor	Caloosahatchee	Fisheating Creek	Florida Keys
SE	Lake Okeechobee	St. Lucie–Loxahatchee	Lake Worth Lagoon–Palm Beach Coast	Southeast Coast–Biscayne Bay	Everglades

TMDL Basin Rotation Schedule, Continued

- A cycle consists of 5 phases, and each group will undergo all of these phases on a rotating schedule:
  - **Phase 1**: Preliminary evaluation of water quality.
  - **Phase 2**: Strategic monitoring and assessment to verify water quality impairments.
  - **Phase 3**: Development and adoption of TMDLs for waters verified as impaired.
  - **Phase 4**: Development of BMAP to achieve the TMDL.
  - **Phase 5**: Implementation of the BMAP and monitoring of results.

TMDL Program

- Identify scientifically based quantitative goals for restoration of waterbodies that do not meet State of Florida water quality standards (Chapter 62-302, Florida Administrative Code).
- Implement a plan to achieve those goals.
- Local information and stakeholder involvement are the foundation of success.

What is a TMDL?

- **Formal definition:** A TMDL identifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

- **Informal definition:** A TMDL establishes numeric water quality goals to restore the health of a lake, river, stream, spring, or estuary.

TMDL Development

- Specific to a waterbody and a pollutant [e.g., total phosphorus (TP) in the C-23 Canal]

- Steps:
  - Determine “assimilative capacity” (i.e., water quality restoration target).
  - Specify current conditions.
  - Calculate pollutant reductions needed to meet the target.

TMDL Development

- The Florida Department of Environmental Protection (FDEP) identified 9 waterbody identification (WBID) numbers in the St. Lucie River and Estuary Basin as impaired for nutrients.

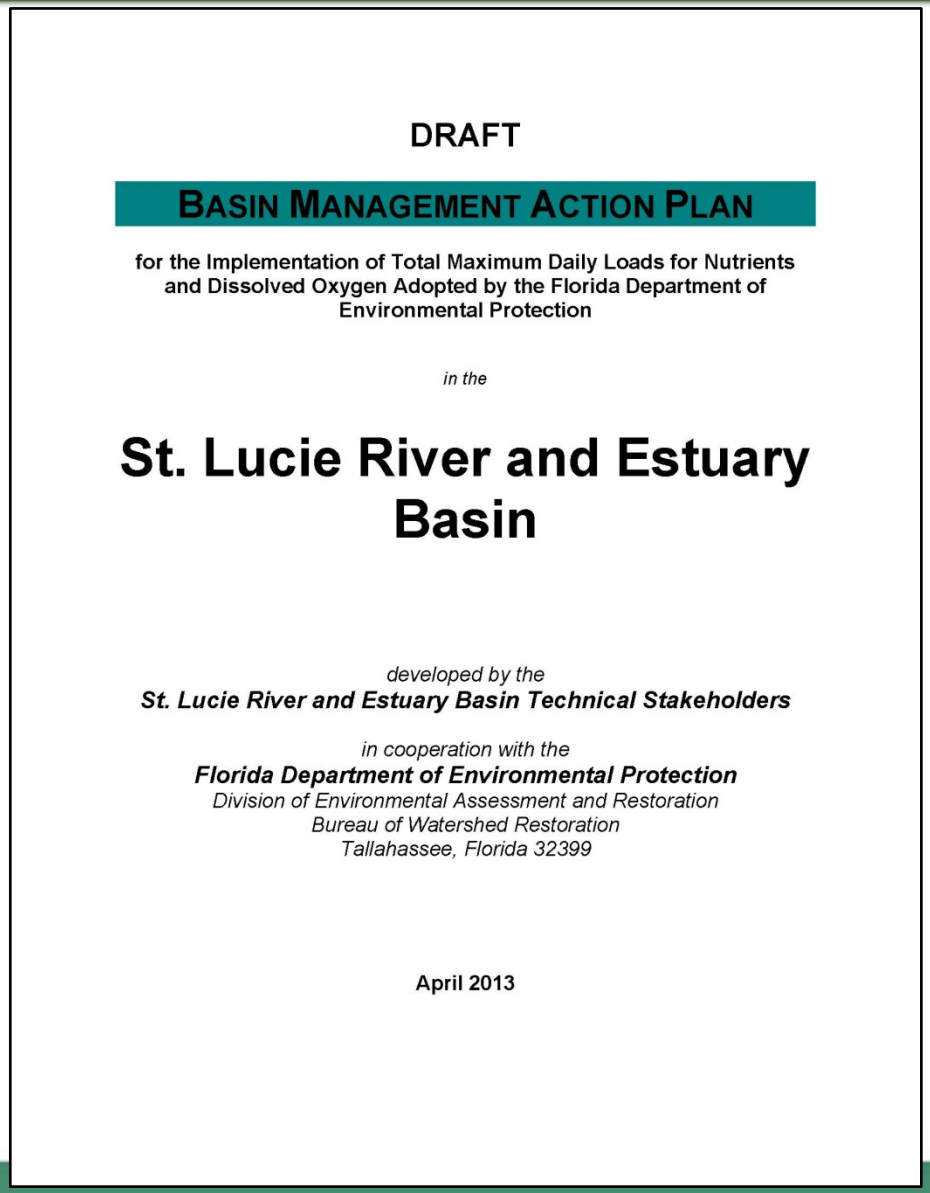
- In March 2009, FDEP adopted the St. Lucie Basin TMDL for total nitrogen (TN), TP, and biochemical oxygen demand (BOD).

- TMDL loads in upstream WBIDs were calculated based on achieving the same target concentrations (TN: 0.72 mg/L, TP: 0.081 mg/L).

BMAP Basics

- Identifies actions needed to achieve the TMDL and who is responsible for implementing those actions.
- Guided by provisions of Section 403.067(7), Florida Statutes (F.S.).
- Developed collaboratively with stakeholders.
- Integrates the best available scientific information.
- Includes completed and new projects.
- Involves critical evaluations, studies, and research.
- Includes an adaptive management component.
- Provides equity among stakeholders and sources.

Draft BMAP



DRAFT

BASIN MANAGEMENT ACTION PLAN

for the Implementation of Total Maximum Daily Loads for Nutrients and Dissolved Oxygen Adopted by the Florida Department of Environmental Protection

in the

St. Lucie River and Estuary Basin

developed by the
St. Lucie River and Estuary Basin Technical Stakeholders

in cooperation with the
Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration
Bureau of Watershed Restoration
Tallahassee, Florida 32399

April 2013

Draft BMAP Sections

- Acknowledgements Section
- Table of Contents
- List of Figures
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- Executive Summary
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Acknowledgements

Allocation Entities	Agencies	Other Interested Parties
Agricultural Producers	Florida Department of Agriculture and Consumer Services	Florida Fruit and Vegetable Association
Martin County	Florida Department of Environmental Protection	Florida Oceanographic Society
Okeechobee County	South Florida Water Management District	St. Lucie West Services District
St. Lucie County	-	-
City of Fort Pierce	-	-
City of Stuart	-	-
City of Port St. Lucie	-	-
Copper Creek Community Development District	-	-
Florida Department of Transportation-District 4	-	-
Turnpike	-	-
Hobe St. Lucie Conservancy District	-	-
North St. Lucie River Water Control District	-	-
Pal Mar Water Control District	-	-
Town of Sewall's Point	-	-
Tradition Community Development District	-	-
Troup-Indiantown Water Control District	-	-
Verano Community Development District	-	-

Executive Summary

- Summarizes report information on the following:
  - St. Lucie River and Estuary Basin;
  - St. Lucie River and Estuary TMDLs;
  - St. Lucie River and Estuary BMAP;
  - Key elements of the BMAP;
  - Anticipated outcomes of BMAP implementation;
  - BMAP cost;
  - BMAP follow-up; and
  - Commitment to plan implementation.

Chapter 1: Context, Purpose, and Scope of the Plan

Background

- The BMAP represents the joint efforts of multiple stakeholders to prepare a water-quality restoration plan for the St. Lucie River and Estuary to work towards achieving TMDLs in the basin.

- The BMAP includes projects that reduce watershed nutrient loading and a monitoring plan to guide effective long-term restoration efforts.

Stakeholder Involvement

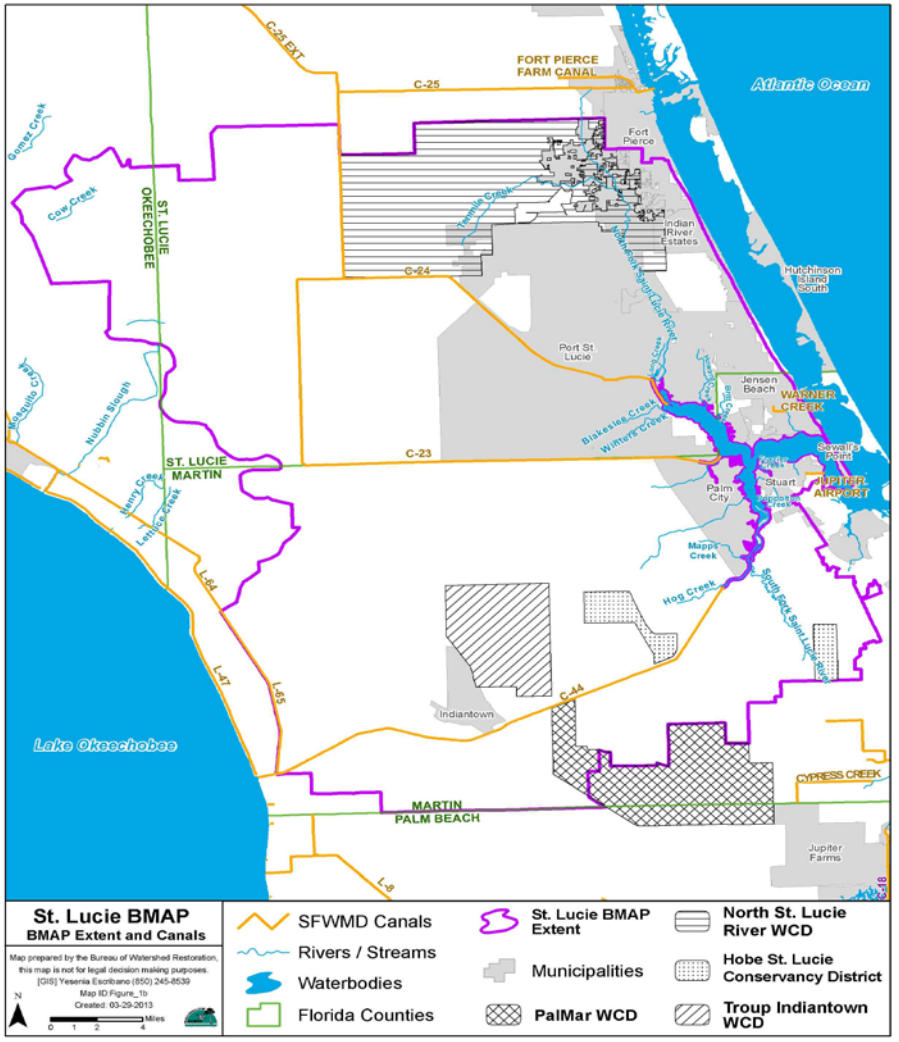
- Starting with the July 21, 2009 meeting, 12 technical meetings were held regularly throughout the BMAP development process.
- FDEP also met with stakeholders in one-on-one meetings to discuss project-specific information with stakeholders.
- All technical meetings were open to the public and noticed in the *Florida Administrative Weekly*, now known as the *Florida Administrative Register*.

BMAP Basin

Figure 1: St. Lucie River and Estuary Basin

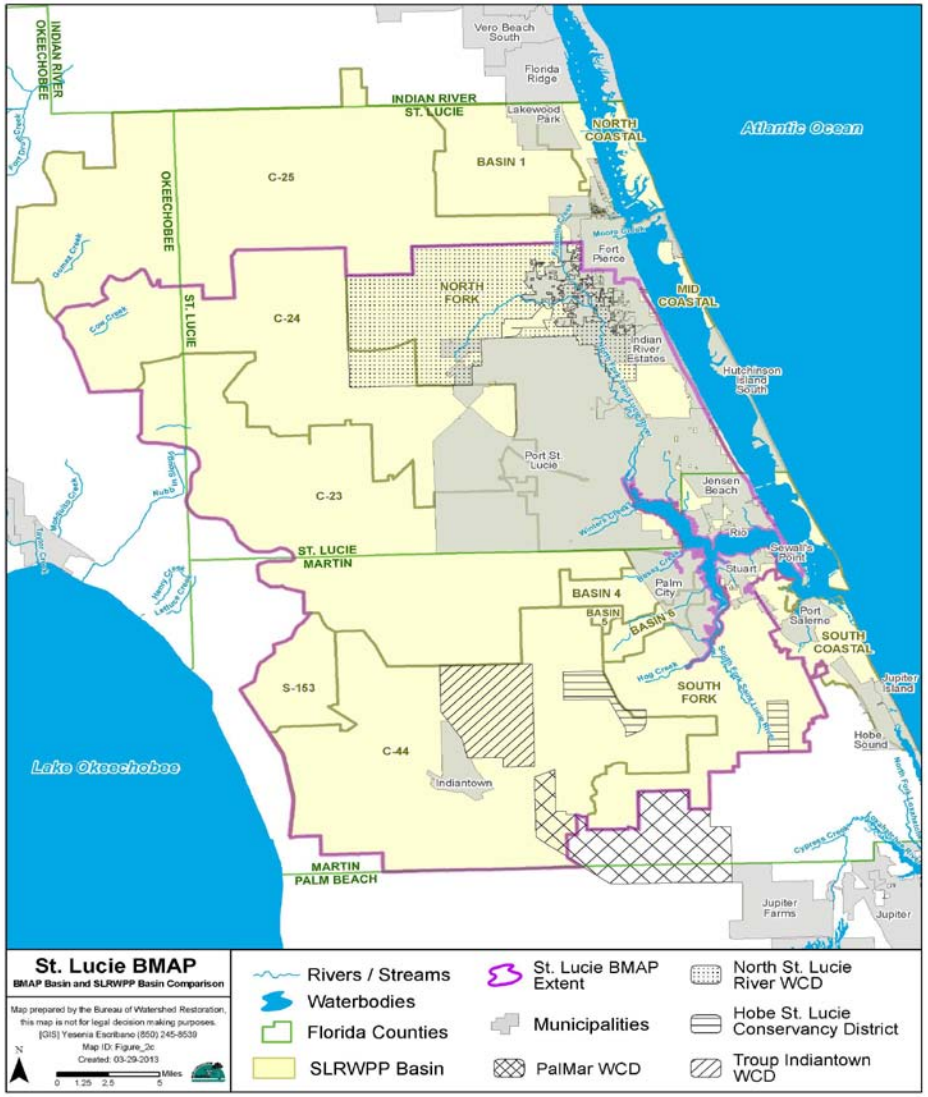
Includes 6 sub-basins:

- Basins 4, 5, and 6;
- C-23;
- C-24;
- C-44 and S-153;
- North Fork; and
- South Fork.



BMAP Basin, Continued

Figure 2: St. Lucie River and Estuary Basin Compared to SLRWPP Basin



- In order to align the BMAP process with the St. Lucie River Watershed Protection Plan (SLRWPP) process, boundary alignments were performed.

- SLRWPP includes South Coastal Sub-basin, which will be included in the next iteration of the BMAP.

Plan Purpose and Scope

- The purpose of this BMAP is to implement TN, TP, and the related BOD reductions to achieve the St. Lucie River and Estuary TMDLs.
- The TMDL reductions will be achieved over a 15-year period.
- The first iteration of the BMAP will cover a 5-year period.
  - Approximately mid-2013 through mid-2018.
- Each entity is required to achieve 30% of its TN and TP reductions in this first iteration.

Assumptions

- The following **assumptions** were used in the BMAP process:
  - TN and TP reductions will increase DO concentrations and reduce chlorophyll-*a*.
  - The allocations do not include required load reductions from natural land use areas.
  - Achieving the St. Lucie River and Estuary TMDLs is contingent on the Lake Okeechobee Basin meeting its own TMDL (a separate BMAP is under development for the Lake Okeechobee Basin).
  - C-44/S-153 Sub-basin Runoff – The SLRWPP and the BMAP acknowledge that only 76.5% of the runoff in the C-44/S-153 sub-basin runoff flows to the St. Lucie Estuary, while the remaining 23.5% of the runoff flows to Lake Okeechobee.
  - Certain best management practices (BMPs) were assigned provisional credit for load reductions in this iteration of the BMAP.

Considerations

- Several items were identified that should be addressed in future iterations:
  - Updated land uses.
  - Modified basin boundaries, including the South Coastal Sub-basin and adjustments to the C-25 East Sub-basin.
  - Adjustments to jurisdictional boundaries, including Martin County/Stuart and the Beau Rivage neighborhood (Martin County/St. Lucie County).
  - Amendments to Community Development District (CDD) responsibilities and possible future revisions to the City of Port St. Lucie's allocations and boundaries.

Considerations, Continued

- Adjustments to event mean concentrations (EMCs) and runoff coefficients (ROCs).
- Water quality standards modifications related to changes to the state's DO criteria.
- Consideration of legacy loads where information is available.
- Consideration of loads from atmospheric deposition where information is available.
- Acknowledgement of some retention of C-23 and C-24 sub-basin runoff.

Future Growth

- Section 403.067(7)(a)(2), Florida Statutes, requires: BMAPs to consider the following:

  "…identify the mechanisms by which potential future increases in pollutant loading will be addressed."

- The BMAP will not include an allocation for new development.

- New discharges cannot increase existing loads and must meet "net environmental improvement" for the Environmental Resource Permit (ERP) program requirements.

Comments and Questions on Chapter 1

Chapter 2: St. Lucie River and Estuary Basin Setting

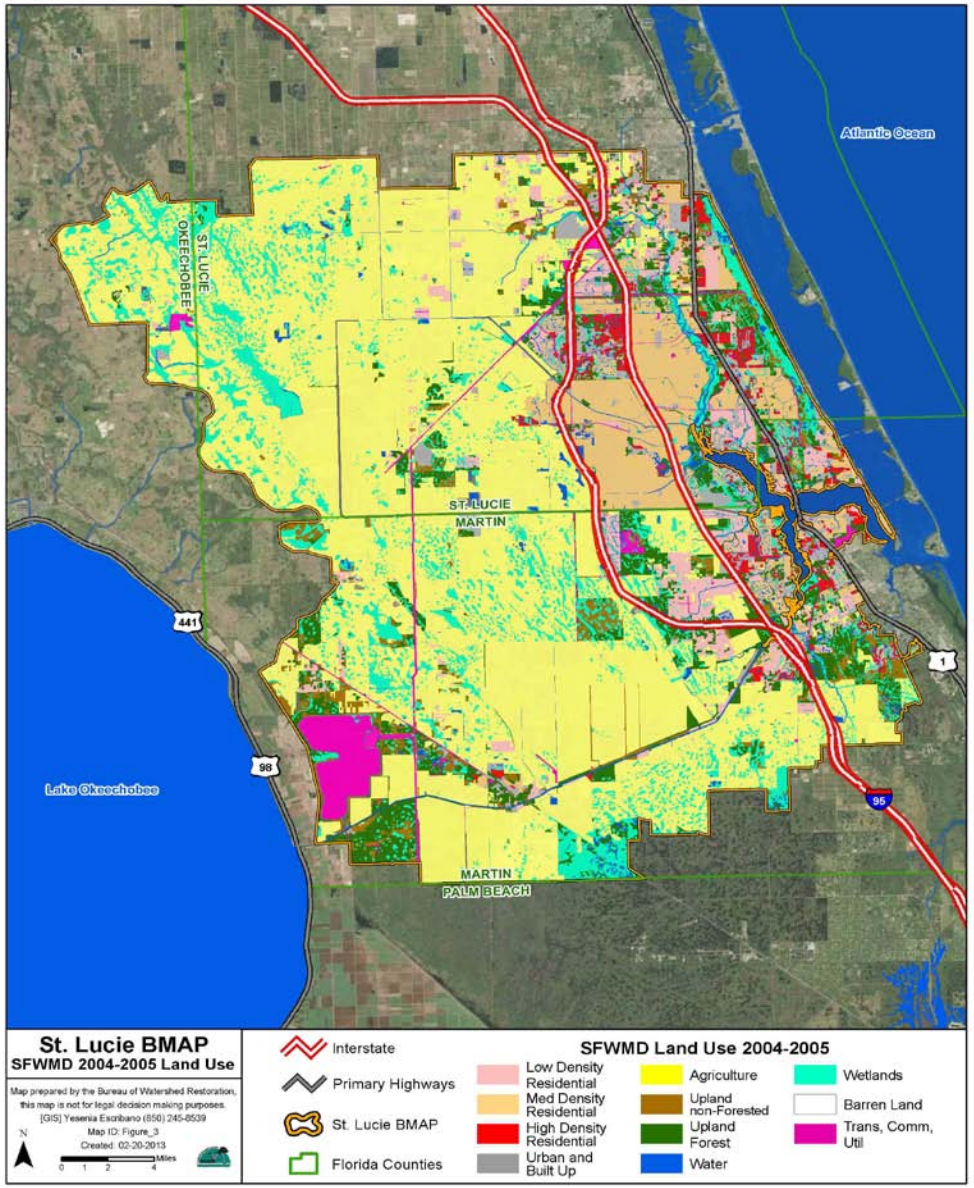
Land Uses

- Land uses for the St. Lucie River and Estuary Basin were aggregated using simplified Level 1 codes.
- 2004 land uses:
  - Agriculture (55.6%)
  - Natural Land Uses (27.0%)
  - Urban and Built Up (14.3%)
  - Transportation, Communication, Utilities (14.3%)
  - Barren Land (0.3%)

Land Use Code	Land Use	Acres	Percent Total
1000	Urban and Built Up	73,474.8	14.3%
2000	Agriculture	286,184.2	55.6%
3000	Upland Non-Forested	22,834.1	4.4%
4000	Upland Forests	43,709.2	8.5%
5000	Water	11,389.9	2.2%
6000	Wetlands	61,283.2	11.9%
7000	Barren Land	1,311.3	0.3%
8000	Transportation, Communication and Utilities	14,462.1	2.8%
N/A	**Total**	**514,648.8**	**100.0%**

Land Uses

Figure 3: 2004 Land Uses in the St. Lucie River and Estuary Basin



Water Quality Trends

- Overall, most TN and TP concentrations at the structures were higher than the TMDL targets.
- TP decreased in all segments except the South Fork, where no significant change was detected.
- Chlorophyll *a* decreased in the Middle and Lower estuarine segments but not in the South Fork or North Fork, where concentrations did not differ between the 2 time periods (2006-2010 and 1995-2005).
- Bottom DO decreased in the South Fork but increased in the other 3 segments.

Comments and Questions on Chapter 2

Chapter 3: Pollutant Sources and Anticipated Outcomes

Sources in the TMDL

- Urban stormwater
  - Municipal separate storm sewer systems (MS4s) and nonpoint sources.
- Agricultural stormwater
- Lake Okeechobee (based on loading calculated in TMDL)
  - Addressed in a separate BMAP.
- Groundwater

MS4s

- The MS4s are all Phase II:
  - Martin County;
  - Okeechobee County;
  - St. Lucie County;
  - City of Fort Pierce;
  - City of Stuart;
  - City of Port St. Lucie;
  - FDOT District 4;
  - Florida Turnpike; and
  - Town of Sewall's Point.

- Permit includes self-implementing clause for BMAP load reduction responsibilities.

Table 5: Local Governments in the St. Lucie River and Estuary Basin Designated as MS4s

Permittee	Permit Number
Martin County	FLR04E013
Okeechobee County	FLR04E140
St. Lucie County	FLR04E029
City of Fort Pierce	FLR04E065
City of Stuart	FLR04E083
City of Port St. Lucie	FLR04E001
FDOT District 4	FLR04E083
Florida Turnpike	FLR04E049
Town of Sewall's Point	FLR04E044

Nonpoint Sources

- The non-MS4s include:
  - Copper Creek CDD;
  - Hobe St. Lucie Conservancy District;
  - North St. Lucie River Water Control District (WCD);
  - Pal Mar WCD;
  - St. Lucie County non-MS4;
  - Tradition CDD;
  - Troup-Indiantown WCD; and
  - Verano CDD.

- The reductions for these sources are enforceable through the BMAP itself.

Agriculture

- The primary agricultural land uses in the watershed are cow/calf operations (pasture) and citrus.

- Due to urban encroachment, citrus health issues (freeze/disease), and the downturn in the economy, a large number of citrus operations have been destroyed or abandoned or have significantly lowered their production acreage.

- Agricultural producers must implement appropriate BMPs or water quality monitoring to show their runoff is not having an impact.

Anticipated Outcomes

- Modest improvement in water quality trends in the watershed tributaries and the St. Lucie River and Estuary;
- Decreased loading of the target pollutants (TN, TP, and BOD);
- Increased coordination among state and local governments and within divisions of local governments in problem solving for surface water quality restoration;
- Determination of effective projects through the stakeholder decision-making and priority-setting processes;
- Enhanced public awareness of pollutant sources, pollutant impacts on water quality, and corresponding corrective actions; and
- Enhanced understanding of basin hydrology, water quality, and pollutant sources.

Comments and Questions on Chapter 3

Chapter 4: Detailed Allocations

Allocations

- Includes information reviewed at past meetings:
  - Collaboration with SLRWPP efforts;
  - Calculation of starting loads;
  - Natural land uses and Florida Power and Light (FPL) pond;
  - *De minimus* determination;
  - Target load per acre;
  - Allocations and required reductions; and
  - Allocations by source.

MS4 Allocations

Table 15: TN and TP Reductions for the MS4s

Entity	30% TN Reductions (lbs/yr)	30% TN Reductions (MT/yr)	30% TP Reductions (lbs/yr)	30% TP Reductions (MT/yr)
FDOT District 4 MS4	1,531.8	0.69	512.7	0.23
Fort Pierce MS4	1,943.7	0.88	807.9	0.37
Martin County MS4	9,647.4	4.38	4,377.0	1.99
Port St. Lucie MS4	15,930.3	7.23	7,029.3	3.19
St. Lucie County MS4	2,018.4	0.92	854.7	0.39
Stuart MS4	1,428.0	0.65	618.6	0.28

Nonpoint Source Allocations

Table 16: TN and TP Reductions for the Nonpoint Sources

Entity	30% TN Reductions (lbs/yr)	30% TN Reductions (MT/yr)	30% TP Reductions (lbs/yr)	30% TP Reductions (MT/yr)
Hobe St. Lucie Conservancy District	2,838.6	1.29	1,056.0	0.48
North St. Lucie River WCD	26,353.8	11.95	10,090.2	4.58
St. Lucie County Non-MS4	2,926.8	1.33	1,350.3	0.61
Troup-Indiantown WCD	7,528.2	3.41	2,435.7	1.10

Agriculture Allocations

- This table combines the required reductions for agriculture as an entity (243,877.2 lbs/yr of TN and 92,117.7 lbs/yr of TP) and for agricultural lands within the special districts.

- The special districts include:
  - Hobe St. Lucie Conservancy District;
  - North St. Lucie River WCD;
  - Pal Mar WCD;
  - Troup-Indiantown WCD.

Table 17: TN and TP Reductions for Agriculture

Entity	30% TN Reductions (lbs/yr)	30% TN Reductions (MT/yr)	30% TP Reductions (lbs/yr)	30% TP Reductions (MT/yr)
Agriculture	270,733.4	122.80	102,396.5	46.44

Comments and Questions on Chapter 4

Chapter 5: Management Actions

Project Collection

- Stormwater management focused.
- Stakeholders submitted projects that were completed or planned to achieve TN and TP reductions.
- Projects completed since January 1, 2000 and later were eligible for credit.
- Credit only counted for treatment above and beyond any permitted requirements.

MS4 TN Projects Summary

Table 18: Summary of MS4 Load Reductions for TN by Project Type

Entity	Structural Stormwater	Nonstructural Stormwater	Public Education	Street Sweeping	Total (lbs/yr)	Credit for Future BMAPs (lbs/yr)
FDOT District 4 MS4	577.7	N/A	31.3	1,419.0	**2,028.0**	**496.2**
Fort Pierce MS4	685.2	4,300.0	170.4	5,569.0	**10,724.6**	**8,780.9**
Martin County MS4	8,075.5	397.0	6,048.7	108.0	**14,629.2**	**4,981.8**
Port St. Lucie MS4	6,991.6	7,927.4	9,388.9	676.0	**24,983.9**	**9,053.6**
Sewall's Point MS4	165.0	N/A	8.9	25.0	**198.9**	**198.9**
St. Lucie County MS4	2,628.0	1,351.9	1,086.8	210.6	**5,277.3**	**3,258.9**
Stuart MS4	2,580.1	221.3	839.9	275.0	**3,916.3**	**2,488.3**
Turnpike MS4	23.2	N/A	N/A	N/A	**23.2**	**23.2**
Total	**21,726.3**	**14,197.6**	**17,574.9**	**8,282.6**	**61,781.4**	**29,281.8**

MS4 TP Projects Summary

Table 19: Summary of MS4 Load Reductions for TP by Project Type

Entity	Structural Stormwater	Nonstructural Stormwater	Public Education	Street Sweeping	Total (lbs/yr)	Credit for Future BMAPs (lbs/yr)
FDOT District 4 MS4	158.1	N/A	6.4	910.0	**1,074.5**	**561.8**
Fort Pierce MS4	282.0	2,641.0	38.8	3,571.0	**6,532.8**	**5,724.9**
Port St. Lucie MS4	3,168.9	3,200.1	2,100.9	434.0	**8,903.9**	**1,874.6**
Martin County MS4	3,564.9	161.0	1,342.1	69.0	**5,137.0**	**760.0**
Sewall's Point MS4	44.7	N/A	1.9	16.0	**62.6**	**62.6**
St. Lucie County MS4	1,033.2	616.1	247.6	135.2	**2,032.1**	**1,177.4**
Stuart MS4	1,231.4	58.9	186.4	176.0	**1,652.7**	**1,034.1**
Turnpike MS4	3.4	N/A	N/A	N/A	**3.4**	**3.4**
Total	**9,486.6**	**6,677.1**	**3,924.1**	**5,311.2**	**25,399.0**	**11,198.8**

Nonpoint TN Projects Summary

Table 20: Summary of Nonpoint Source Load Reductions for TN by Project Type

Entity	Structural Stormwater	Nonstructural Stormwater	Public Education	Street Sweeping	Total (lbs/yr)	Agricultural BMPs/ Land Use Change	Credit for Future BMAPs (lbs/yr)
Hobe St. Lucie Conservancy District	N/A	N/A	N/A	N/A	10,288.2	**10,288.2**	**7,449.6**
North St. Lucie River WCD	5,770.8	N/A	N/A	N/A	63,440.2	**69,211.0**	**42,857.2**
Pal Mar WCD	N/A	N/A	N/A	N/A	962.2	**962.2**	**962.2**
St. Lucie County Non-MS4	997.9	1,658.1	1,425.7	113.4	N/A	**4,175.1**	**1,248.3**
Troup-Indiantown WCD	N/A	N/A	N/A	N/A	25,055.3	**25,055.3**	**17,527.1**
Total	**6,768.7**	**1,658.1**	**1,425.7**	**113.4**	**99,745.9**	**109,691.8**	**70,044.4**

Nonpoint TP Projects Summary

Table 21: Summary of Nonpoint Source Load Reductions for TP by Project Type

Entity	Structural Stormwater	Nonstructural Stormwater	Public Education	Street Sweeping	Total (lbs/yr)	Agricultural BMPs/ Land Use Change	Credit for Future BMAPs (lbs/yr)
Hobe St. Lucie Conservancy District	N/A	N/A	N/A	N/A	3,302.1	**3,302.1**	**2,246.1**
North St. Lucie River WCD	0.0	N/A	N/A	N/A	18,166.1	**18,166.1**	**8,075.9**
Pal Mar WCD	N/A	N/A	N/A	N/A	91.7	**91.7**	**91.7**
St. Lucie County Non-MS4	390.3	656.9	364.3	72.8	N/A	**1,484.3**	**134.3**
Troup-Indiantown WCD	N/A	N/A	N/A	N/A	7,942.5	**7,942.5**	**5,506.8**
Total	**390.3**	**656.9**	**364.3**	**72.8**	**29,502.4**	**30,986.7**	**16,054.8**

Agriculture Allocation

Table 24: Agricultural TN and TP Load Reduction Allocations and Estimated Reductions in TN and TP in the First 5 Years

Estimated Loads	TN (lbs/yr)	TP (lbs/yr)
Agricultural Starting Load	1,563,122.0	390,312.0
Agricultural Required Reduction	812,924.0	307,059.0
Required Reduction for First Phase of BMAP	243,877.2	92,117.7
Estimated Load Reductions via BMPs, 90% Target Enrollment*	197,216.6	40,442.0
Estimated Load Reduction Credit for Land Use Changes*	171,776.4	54,191.1
Total Estimated Reductions	***368,993.0***	***94,663.1***
Remaining Load Reductions Needed for First Phase of BMAP	-125,115.8 (credit)	-2,515.4 (credit)

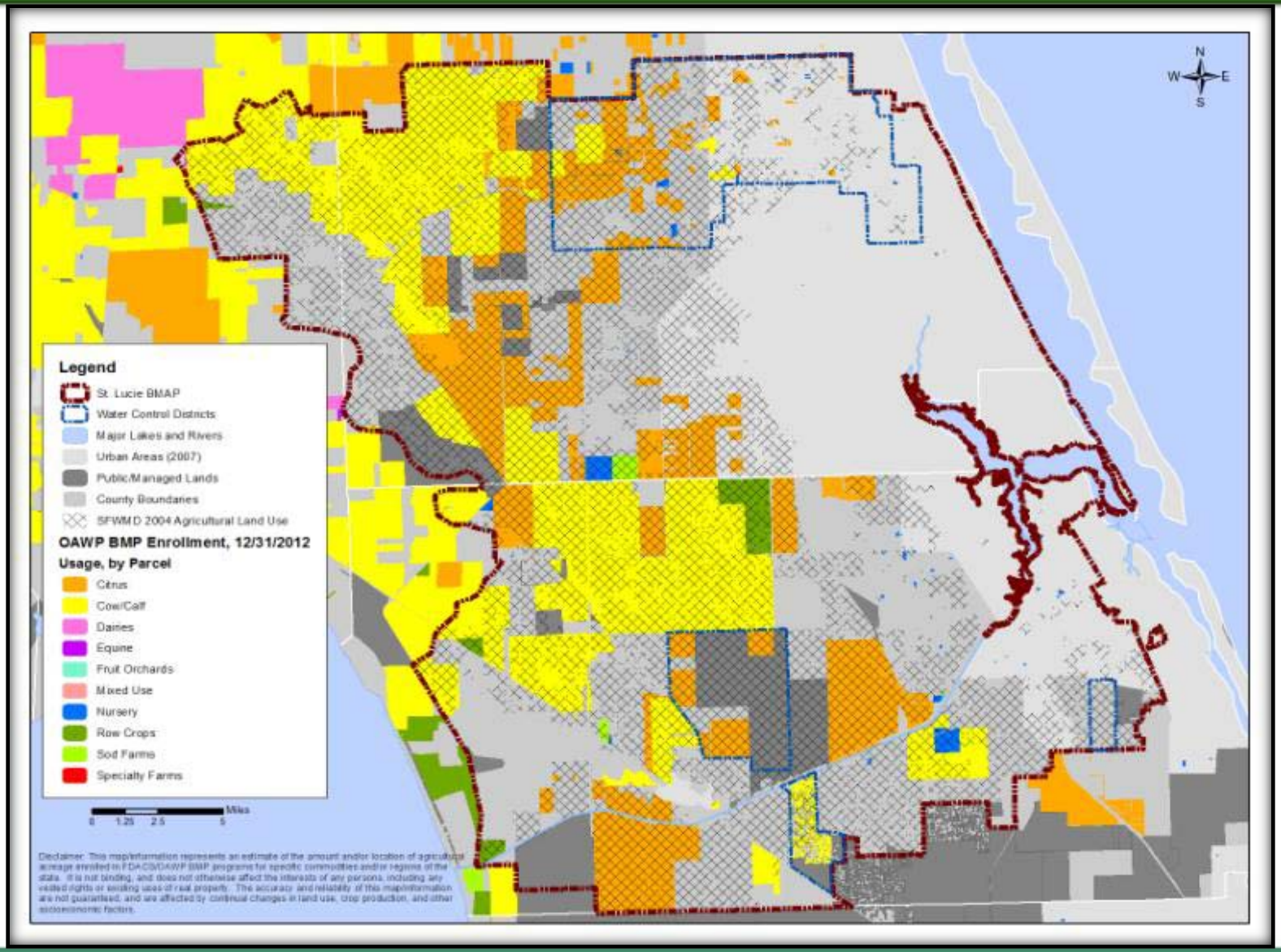
Note: These numbers are only for the agricultural allocation and do not include lands within special districts.

All Agriculture

Table 25: All Agricultural Lands TN and TP Load Reduction Allocations and Estimated Credits in TN and TP in the First 5 Years

Estimated Loads	TN (lbs/yr)	TP (lbs/yr)
Total Required Reduction for All Agricultural Lands	925,029.1	348,389.8
Total Required Reduction for First Phase of BMAP	277,508.7	104,516.9
Estimated Load Reductions via BMPs, 90% Target Enrollment	217,170.0	44,522.4
Credit for Land Use Change to Less Intensive/Fallow Agriculture	223,775.9	71,920.9
Credit for Land Use Change to Urban Development	27,757.0	7,692.2
Total Estimated Reduction Credits	***468,702.9***	***124,135.5***
Remaining Load Reductions Needed for First Phase of BMAP	-191,194.2 (credit)	-19,618.6 (credit)

Figure 5: BMP Enrollment in the St. Lucie River and Estuary Basin as of December 31, 2012



Comments and Questions on Chapter 5

Chapter 6: Assessing Progress and Making Changes

Tracking Implementation

- FDEP will work with the stakeholders to organize the monitoring data and track project implementation.
- This information will be organized into annual progress reports.
- The stakeholders will meet at least annually to review progress and modify project lists and the monitoring plan, as needed.

Objective and Network

- **Primary Objective –** Track trends in TN and TP loads in the major canals and tributaries, as well as the St. Lucie River and Estuary.

- Will be determined through the existing network:
  - Hobe St. Lucie Conservancy District – 1 annual station.
  - North St. Lucie River WCD – 9 quarterly stations.
  - Port St. Lucie – 21 stations sampled 1 or 2 times/year.
  - SFWMD – 51 stations at various frequencies.
  - St. Lucie County – 4 tri-weekly stations.
  - St. Lucie West Services District – 8 stations.
  - U.S. Geological Survey – 8 daily flow gages.

Figure 6: Water Quality Monitoring Network for the Southern Part of the St. Lucie River and Estuary

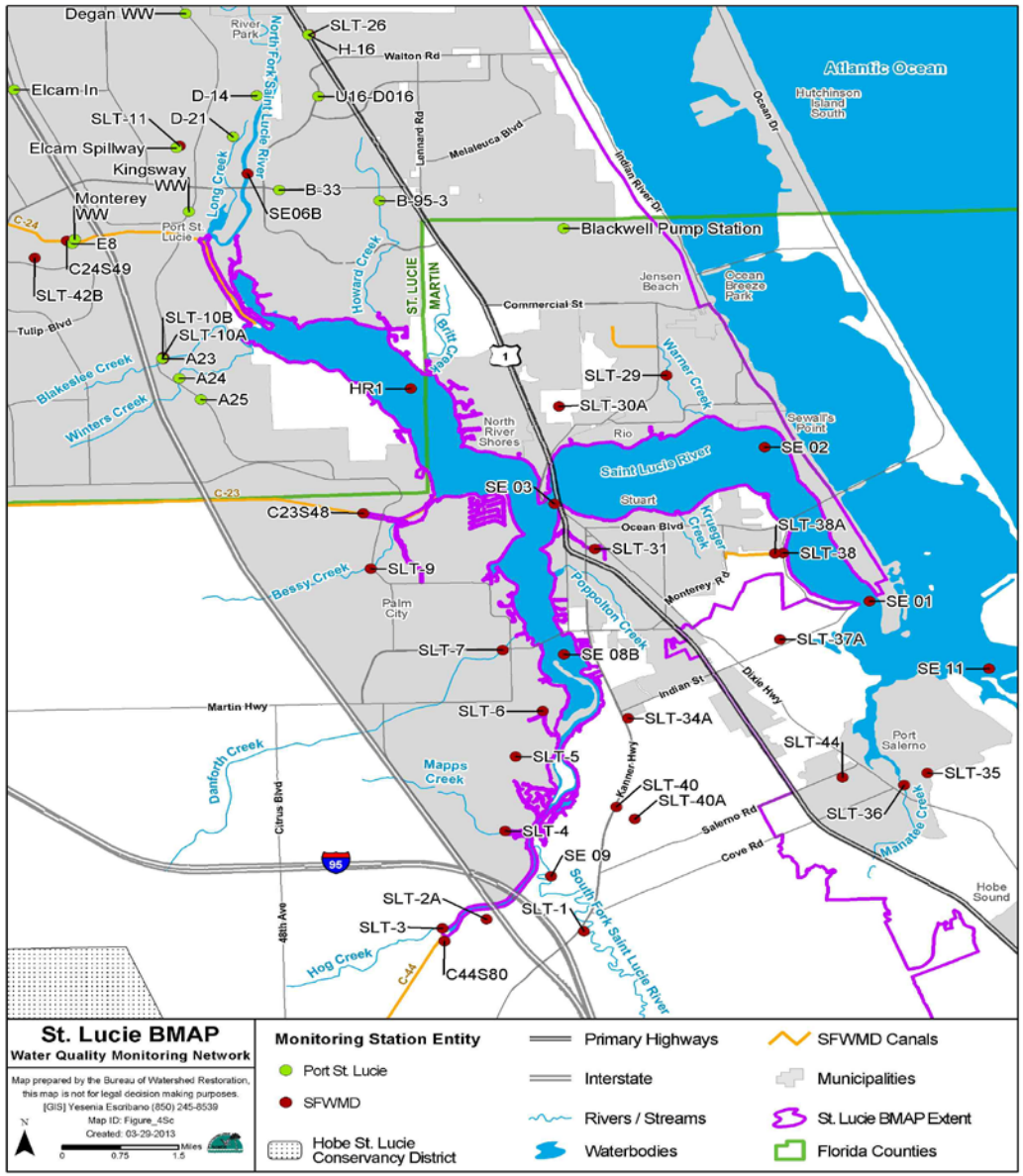


Figure 7: Water Quality Monitoring Network for the Northern Part of the St. Lucie River and Estuary

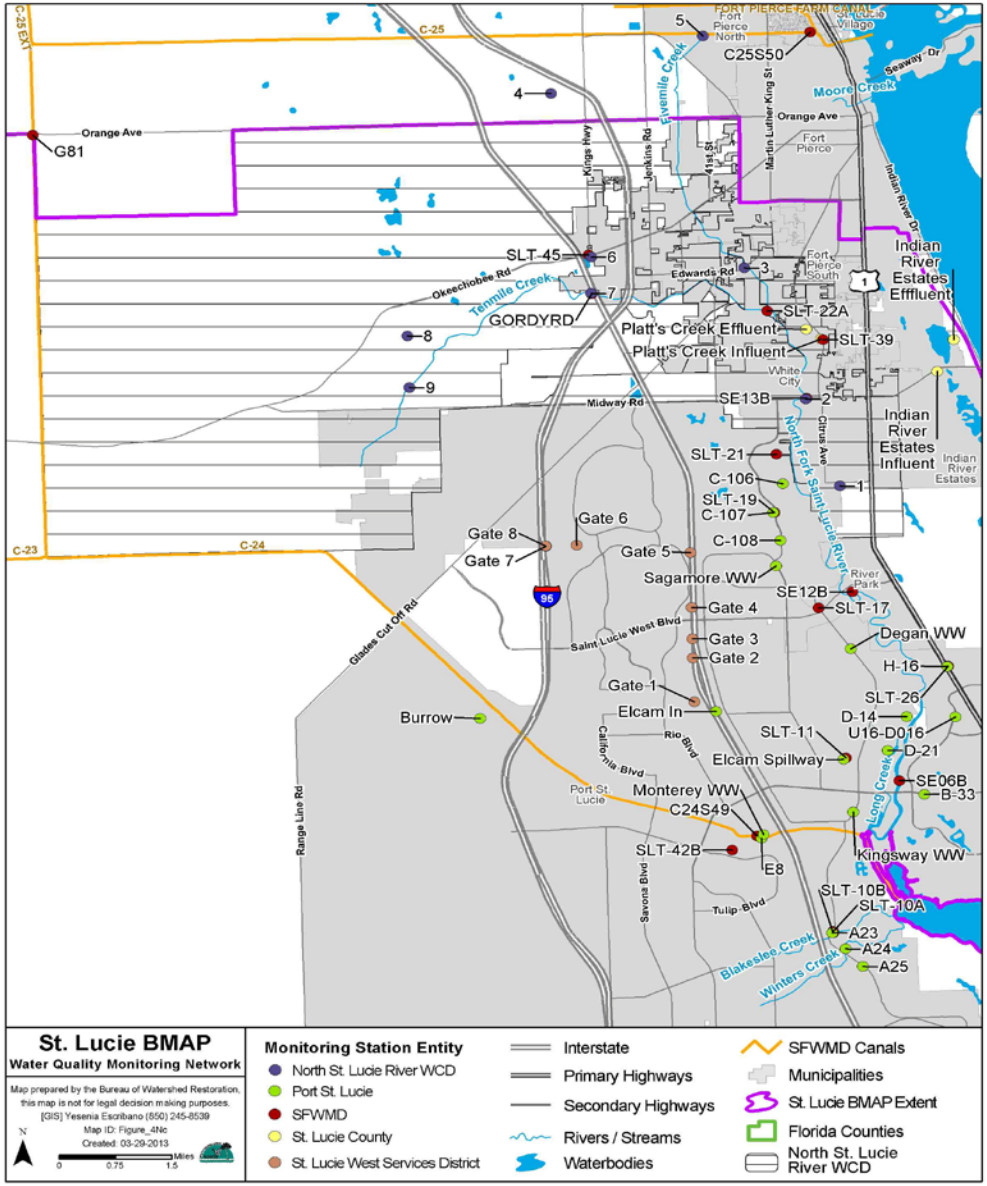
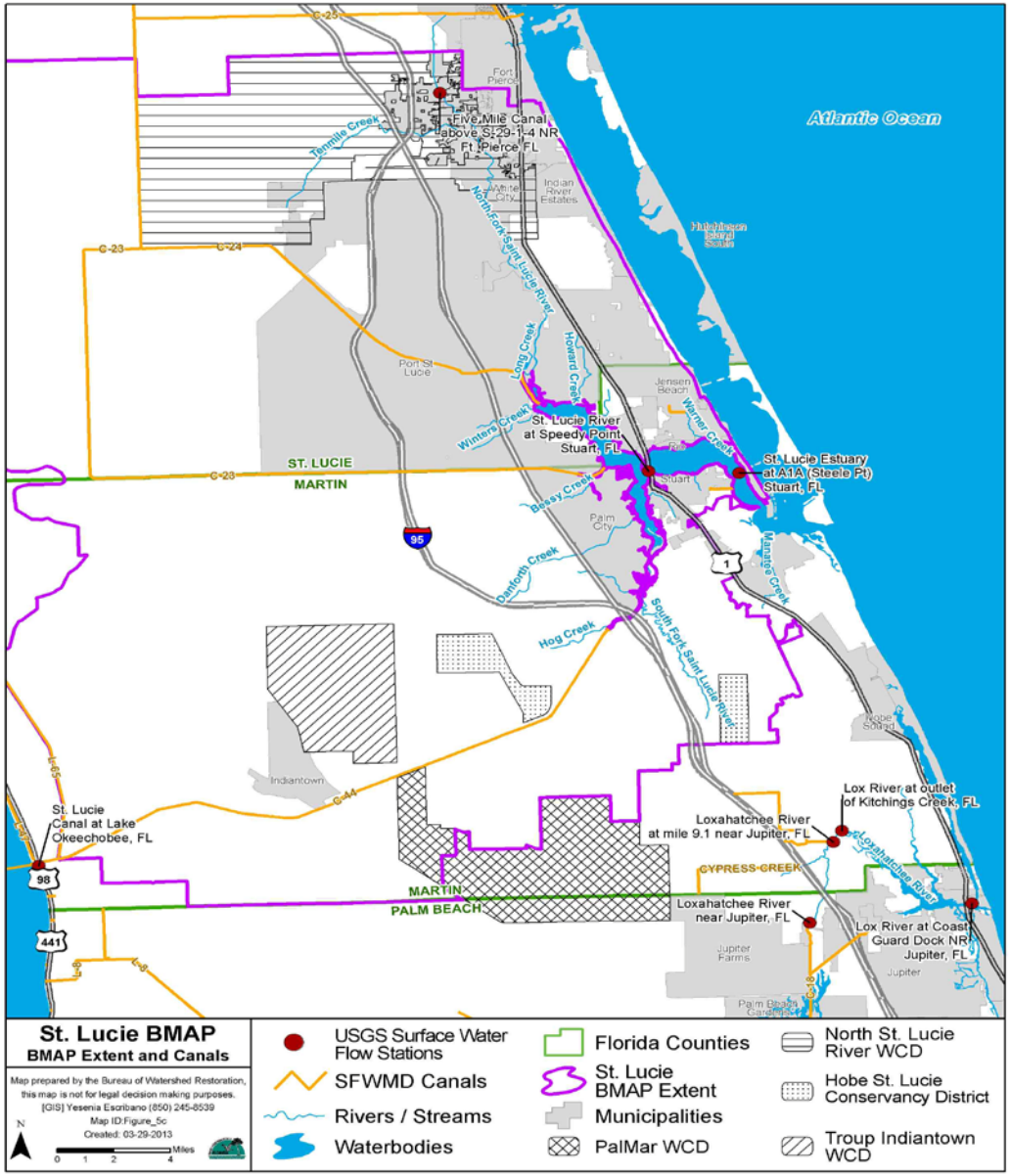


Figure 8: Flow Monitoring Network for the St. Lucie River and Estuary



Biological Monitoring

Sampling Entity	Project	Number of Stations	Location	Frequency	Project Start Date
SFWMD	Seagrass Monitoring and Mapping	20	Transects in all lagoon segments	Semiannually	1994
SFWMD	Seagrass Monitoring and Mapping	Lagoon-wide maps	Entire lagoon from St. Lucie Estuary upstream to Roosevelt Bridge (US 1)	Every 2-5 years	1986
SFWMD	Seagrass Monitoring and Mapping	10	IRL-S	Bi-monthly (3 sites near the St. Lucie Estuary monitored monthly)	2008
SFWMD	Oyster Monitoring and Mapping	9	St. Lucie Estuary	Semiannually	2005

**Currently working on developing a figure of these stations.

Data Management

- All ambient water quality data included in the BMAP monitoring must be collected following FDEP's standard operating procedures and should be uploaded to Florida STORET or its replacement.
  - SFWMD data will be stored in DBHYDRO.
- Any biological data collected will be maintained by the entity collecting the data.
- Water quality data will be evaluated in year 4 of the BMAP.

Research Priorities

- During the BMAP process, the stakeholders identified research priorities they would like to pursue, if funding becomes available.

- These research topics, which are also identified in the 2012 SLRWPP Update, include:
  - Nutrient Budget
  - DO Dynamics

Comments and Questions on Chapter 6

Chapter 7: Commitment to Plan Implementation

Commitment

- The stakeholders have worked collaboratively to develop the BMAP.
- The stakeholders have committed to the activities included in the BMAP.
- The stakeholders will continue to confer with and support each other in their BMAP efforts.

Comments and Questions on Chapter 7

Appendices

Appendices

- Appendix A: TMDL Basin Rotation Schedule
  - Explains the FDEP watershed assessment cycle.
- Appendix B: Summary of Statutory Provisions Guiding BMAP Development and Implementation
  - Includes excerpts from Sections 403.067(6) and (7) in Florida Statutes.
- Appendix C: Summary of EPA Recommended Elements of a Comprehensive Watershed Plan
  - Outlines key elements in a watershed plan; necessary to obtain certain types of funding.

Appendices, Continued

- Appendix D: BMP Efficiencies and Projects to Achieve the TMDL
  - Includes project tables for each stakeholder.
  - ***Please review the information in your project tables carefully.***
- Appendix E: Glossary of Terms
- Appendix F: Bibliography of Key References and Websites

Comments and Questions on Appendices

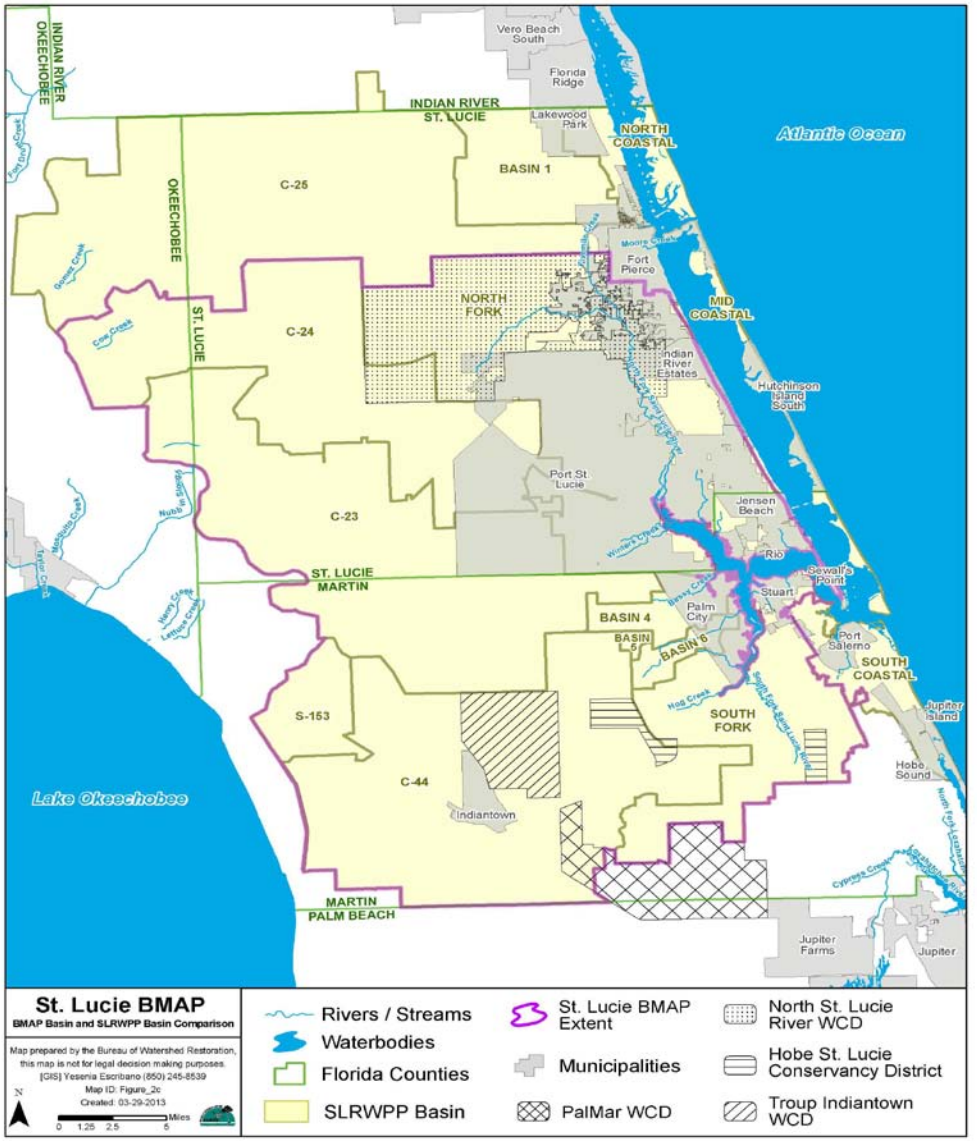
Review March 2013 Comments and Changes to Draft St. Lucie River and Estuary BMAP

Executive Summary

- **BMAP Cost Section (page xiii)**
  - Costs were provided for approximately 35.0% of the activities identified in the BMAP, which had an estimated total cost of more than $242.7 million. Of this figure, $230,031,331 has been spent on completed projects in the basin since 2000, and $7,254,928 has been spent and will be expended over the course of this first iteration on ongoing projects. It is estimated that $5,432,525 is projected to be spent on planned projects in the basin during the first 5-year iteration. It is important to note that many BMAP projects were built to achieve multiple objectives, not just nutrient reductions; therefore, multiple objectives should be acknowledged when estimating a cost per pound of nutrient removal from these projects. Some of these cost estimates may include operations and maintenances costs. The funding sources for the projects range from local contributions to legislative appropriations. Stakeholders will continue to explore new opportunities for funding assistance to ensure that the activities listed in this BMAP can be maintained at the necessary level of effort.

Chapter 1

- **Figure 2 (page 8):**
  - Added sub-basins.



Chapter 1, Continued

- **1.3.4-BMAP Approach (pages 5-6):**
  - The following text was added: Projects implemented during this first 5-year iteration count toward the total required reductions. For entities that have exceeded 30% of the required reductions in the first iteration, the additional reductions achieved will be credited toward the overall required reductions. In addition, projects in the South Coastal Sub-basin will receive credits in the second iteration of the BMAP as the BMAP boundary is expanded to include this area. At the time of this BMAP, any projects in this sub-basin are included in Appendix D, but project credits have not been calculated.

  - The following text was added: For the first BMAP iteration, projects that have been completed since 2000 or are expected to be completed within the first 5-year iteration were given project credits.

Chapter 1, Continued

- **1.3.6-St. Lucie River and Estuary Basin TMDLs (pages 9-10):**
  - Changed the adoption date for the TMDLs to March 2009.
  - Added clarifying text: TMDL loads in upstream WBIDs were calculated based on achieving the same target concentrations (0.72 mg/L for TN and 0.081 mg/L for TP) as in the St. Lucie Estuary.

Chapter 1, Continued

- **1.4.1-Assumptions (pages 10-11)**
  - C-44/S-153 Sub-basin Runoff – The SLRWPP and the BMAP acknowledge that only 76.5% of the runoff in the C-44/S-153 sub-basin runoff flows to the St. Lucie Estuary, while the remaining 23.5% of the runoff flows to Lake Okeechobee. Therefore, only 76.5% of the C-44/S-153 sub-basin runoff was applied in the St. Lucie River and Estuary BMAP allocations.

Chapter 1, Continued

- **1.4.2-Considerations (pages 111-12)**
  - Atmospheric Deposition – Similar to legacy loads, atmospheric deposition of TN and TP is an additional source of nutrients in the St. Lucie River and Estuary Basin. Changes in the amounts of atmospheric deposition, as well as the relative importance of air sources compared to local nutrient sources, may be considered in future BMAPs.

  - C-23 and C-24 Sub-basin Runoff – Not all of the water in these sub-basins enters the North Fork of the St. Lucie Estuary. Some of the water enters the C-25 or is held and used for agricultural purposes. In the next BMAP iteration, the actual runoff that enters the St. Lucie Estuary from these 2 sub-basins should be calculated and a factor added into the model similar to what was done for the C-44/S-153 sub-basin.

Chapter 2

- **2.2-Hydrology and Topography (page 16):**
  - Added descriptive language about the C-24 connection to C-25: There is occasional transfer between the C-25 sub-basin and the C-24 sub-basin, mostly from the C-25 to the C-24.

- **2.3-Water Quality Trends (pages 16-17):**
  - Added the following language: As previously mentioned, this BMAP and the management measures it contains are designed to improve the water quality of the St. Lucie River and Estuary Basin. To accurately track the impacts of BMAP implementation, it is necessary analyze the water-quality trends over time.

  - Added the following language to the end of the second paragraph in this section: From the rainfall analysis, all sub-basins and Lake Okeechobee had significantly lower flows to the St. Lucie Estuary during 2006–2010 than 1995–2005, which is why the TN and TP loads were lower even though the concentrations remained the same in both time periods.

Chapter 3

- **3.1.2-Nonpoint Sources (page 20)**
  - Added list of nonpoint sources in the St. Lucie River and Estuary Basin:
    - Copper Creek CDD;
    - Hobe St. Lucie Conservancy District;
    - North St. Lucie River WCD;
    - Pal Mar WCD;
    - St. Lucie County non-MS4;
    - Tradition CDD;
    - Troup-Indiantown WCD; and
    - Verano CDD.
- **3.1.3-Agriculture (page 20):**
  - Added the following language: The FWRA states that nonpoint source dischargers who fail either to implement the appropriate BMPs or conduct water quality monitoring prescribed by FDEP or a water management district may be subject to enforcement action by either of those agencies.

Chapter 4

- **4.3-Natural Land Uses and FPL Cooling Pond (page 27)**
  - In addition, the acreage and loading associated with the FPL cooling pond were set aside in the allocations. FPL withdraws water from the C-44 canal for facility cooling processes, and the water is then discharged to the cooling pond for circulation and reuse. During the circulation and storage process within the cooling pond, seepage is directed through portions of the west berm of the cooling pond and is discharged to the L-65 canal which then returns to the C-44 canal. The cooling pond is directly discharged to the C-44 canal only when necessary after excessive rain events and twice per year during the spillway gate tests. Additional nutrient reductions are not required in the cooling pond.

Chapter 4

Table 17: TN and TP Reductions for Agriculture

Entity	30% TN Reductions (Lbs/Yr)	30% TN Reductions (MT/Yr)	30% TP Reductions (Lbs/Yr)	30% TP Reductions (MT/Yr)
Agriculture	277,508.7	125.9	104,516.9	47.4

Chapter 5

- **5.4-Regional Projects (page 34)**
  - The C-44 Reservoir and Stormwater Treatment Area (STA), which is located north of the C-44 canal in the C-44 and S-153 Sub-basin, includes construction of a 3,400-acre reservoir and an adjacent 6,300-acre STA in southern Martin County (SFWMD, 2012a). The U.S. Army Corps of Engineers is responsible for construction of the project. Design and construction of the reservoir and STA are being implemented in phases. Currently, construction of the first phase, which includes some of the infrastructure necessary to complete the reservoir, is not scheduled for completion until 2014. Project credits will be assigned to this project in future iterations of the BMAP.

Chapter 5, Continued

Table 25: All Agricultural Lands TN and TP Load Reduction Allocations and Estimated Credits in TN and TP in the First 5 Years

Estimated Loads	TN (lbs/yr)	TP (lbs/yr)
Total Required Reduction for All Agricultural Lands	925,029.1	348,389.8
Total Required Reduction for First Phase of BMAP	277,508.7	104,516.9
Estimated Load Reductions via BMPs, 90% Target Enrollment	217,170.0	44,522.4
Credit for Land Use Change to Less Intensive/Fallow Agriculture	223,775.9	71,920.9
Credit for Land Use Change to Urban Development	27,757.0	7,692.2
Total Estimated Reduction Credits	***468,702.9***	***124,135.5***
Remaining Load Reductions Needed for First Phase of BMAP	-191,194.2 (credit)	-19,618.6 (credit)

Chapter 5, Continued

- **New Section 5.6-SFWMD Pollutant Source Control Program (pages 46-47)**
  - SFWMD is amending its existing 40E-61 Works of the District Regulatory Source Control Program (Chapter 40E-61, F.A.C.) to include source controls for nitrogen and phosphorus in the St. Lucie watershed.
  - Requirements under the Regulatory Source Control Program will be complementary to those being implemented by the coordinating agencies, including BMPs, on-site treatment technologies, stormwater and wastewater infrastructure upgrades, and master planning, and regulatory programs focused on water quality and quantity.
  - The goal of the Regulatory Source Control Program is to assure full implementation of source controls including success indicators and schedules for implementation.
  - The SFWMD is proposing to modify Chapter 40E-61, F.A.C., to be compatible with the amendments to NEEPP.
  - The rule development process will be closely coordinated with stakeholders via technical and regulatory workshops with the goal of having a regulatory program in place within 5 years.
  - SFWMD will continue to annually report progress.

Chapter 6

- **Table 26: BMAP Monitoring Network (pages 50-52)**
  - Added additional information.
- **Table 27: Biological Monitoring (page 55)**
  - Added sampling entity.
- Map depicting biological monitoring is currently under development.

Miscellaneous Changes

- Header in Appendices C-F was corrected.
- Table numbering was corrected throughout.
- Tables from Appendix D were added to the List of Tables.
- Maps revised to correct Hobe St. Lucie Conservancy District and renamed “Places” to “Municipalities.”
- Additional projects added from:
  - FDOT;
  - Martin County; and
  - North St. Lucie River WCD.

BMAP Review Process

Completed	Action	Responsible Party	Date
Yes	Draft BMAP to stakeholders for review	FDEP (draft BMAP), Technical Stakeholders (review BMAP)	March 6, 2013
Yes	Technical meeting to discuss Draft BMAP	FDEP and Technical Stakeholders	March 13, 2013
Yes	Comments on Draft BMAP due to FDEP	Technical Stakeholders	March 27, 2013
In Progress	Revised Draft BMAP for stakeholder and public review	FDEP	April 3, 2013
In Progress	Public meeting on BMAP	Public/FDEP	April 10, 2013 (today)
	Public comment period closes (30 days)	FDEP	***May 2, 2013***

FDEP Adoption Process

Action	Date
Brief FDEP Division of Environmental Assessment and Restoration (DEAR) management on BMAP	Mid-May 2013
Brief FDEP Deputy Secretary on BMAP	Mid-May 2013
Brief FDEP Secretary on BMAP and obtain Secretarial approval	End-May 2013
Notify interested parties and place FAR notice	End-May 2013
End of challenge period (21-days after notice)	End-June 2013
BMAP adopted and enforceable (if there are no challenges)	End-June 2013

Stakeholder Action Items

- **By May 2nd:**
  - Please send comments to Katie Hallas (Katie.Hallas@dep.state.fl.us).
  - Please provide any missing information on the monitoring or projects to Katie Hallas (Katie.Hallas@dep.state.fl.us).

Questions