



Florida Department of Environmental Protection

Water Quality Restoration Program

St. Lucie River and Estuary Basin Management Action Plan (BMAP) Draft 5-Year Review Meeting

April 24, 2018

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Agenda

- Legislation Pertinent to St. Lucie River and Estuary BMAP
- 5-Year Review Development
- Overview of Draft 5-Year Review
- Next Steps



Pertinent Legislation

- Original BMAP adopted in June 2013
 - Five-Year Review finalized by end of June 2018
 - Review provided to the Governor, the President of the Senate, and the Speaker of the House of Representatives
- Review to include:
 - 5-year milestones towards meeting TMDL 20 years after adoption
 - Assessment of progress towards meeting the milestones
 - Determination of whether TMDL can be met in 20 years
 - If not, explanation of why
 - Identification of recommended revisions to the BMAP
 - Model revisions, monitoring network, etc.



Timeline

St. Lucie River and Estuary BMAP 5-Year Review

Timeline for Stakeholder Involvement	Deadline*	
1. Technical meeting – Review preliminary model results	1/16/2018	☒
2. Stakeholders submit comments on draft model report to DEP	1/31/2018	☒
3. Stakeholders submit 5-Year Review project updates and new projects to DEP (include updates through 12/31/2017)	1/31/2018	☒
4. Stakeholders provide water quality monitoring data via WIN (include data through 12/31/2017)	3/1/2018	☒
5. Public meeting – Discuss draft revised allocations	3/6/2018	☒
6. Public meeting – Draft 5-Year Review provided for comments	4/24/2018	☒
7. Stakeholders submit comments on Draft 5-Year Review document to DEP	5/8/2018	☐
8. Final BMAP 5-Year Review submitted to Governor/Legislature	6/30/2018	☐

* Dates are approximate



5-Year Review



- Chapter 1: Background Information

- Chapter 2: Assessing Progress



- Chapter 3: Recommendations



Chapter 1: Background

- Total Maximum Daily Loads (TMDLs) adopted in 2009

St. Lucie Estuary			
Parameter	Annual TMDL Target (Concentration in mg/L)	Wasteload Allocation (NPDES* Stormwater % Reduction)	Load Allocation (% Reduction)
TN	0.720	21.4%	21.4%
TP	0.081	41.3%	41.3%

Note: From Table 6.1 of *Nutrient and Dissolved Oxygen TMDL for the St. Lucie Basin*

*National Pollutant Discharge Elimination System (NPDES)

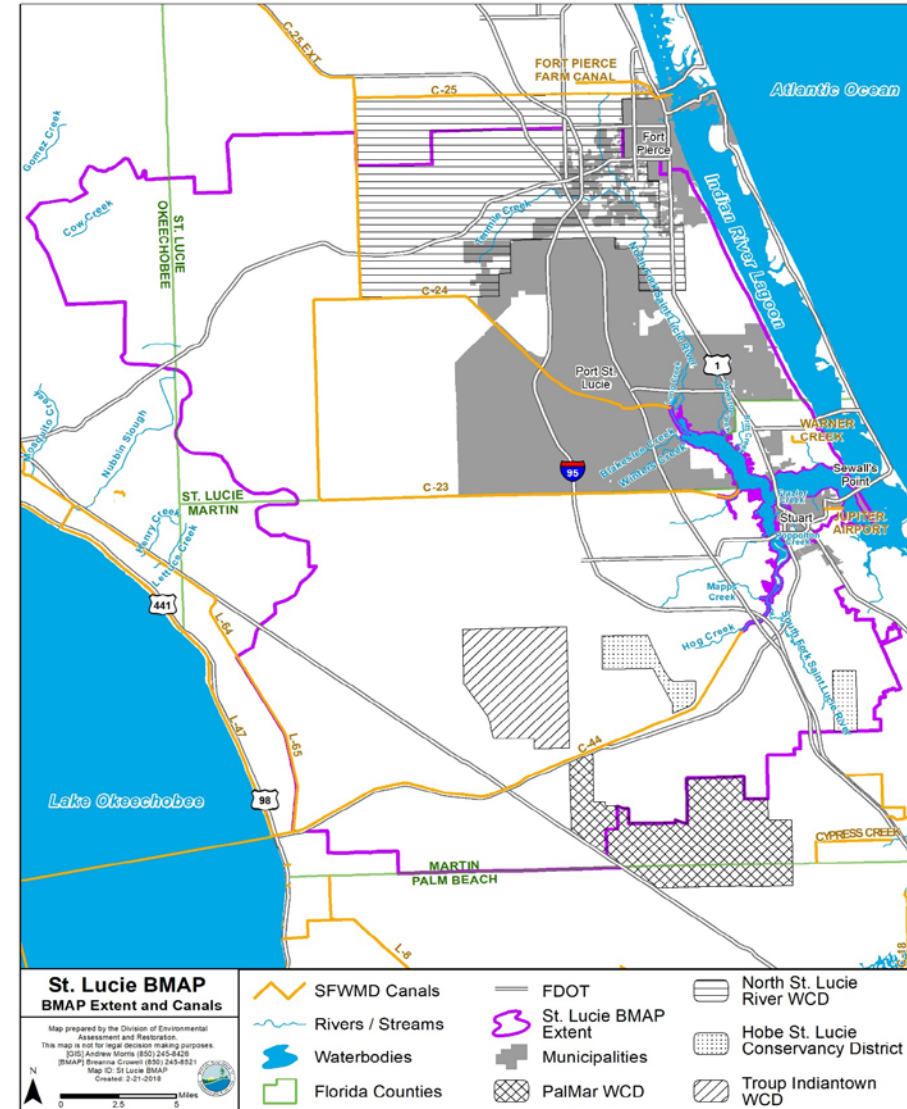
- The St. Lucie Estuary target concentrations were used to calculate TMDL loads at points upstream
- TN and TP concentrations are monitored at Roosevelt Bridge, the compliance point for the TMDLs
 - Sampled monthly by South Florida Water Management District (SFWMD)



St. Lucie River and Estuary BMAP

Stakeholders

- Agriculture/Florida Department of Agriculture and Consumer Services (FDACS)
- City of Fort Pierce
- City of Port St. Lucie
- City of Stuart
- Copper Creek CDD
- FDOT District 4
- Florida Turnpike
- Hobe St. Lucie Conservancy District
- Martin County
- North St. Lucie WCD
- Okeechobee County
- Pal Mar WCD
- St. Lucie County
- Town of Sewall's Point
- Tradition CDD
- Troup-Indiantown WCD
- Verano CDD





Chapter 2: Assessing Progress

Entity	Total Projects	Completed	Underway	Planned
Agriculture/FDACS*	2	2	0	0
City of Fort Pierce	13	13	0	0
City of Port St. Lucie	33	30	2	0
City of Stuart	24	22	2	0
FDOT	59	48	11	0
Hobe St. Lucie Conservancy District	3	3	0	0
Martin County	42	38	2	2
North St. Lucie River WCD	12	12	0	0
Pal Mar WCD	1	1	0	0
St. Lucie County MS4	9	9	0	0
St. Lucie County Non-MS4	8	6	2	0
Town of Sewall's Point	32	29	2	1
Troup-Indiantown WCD	5	3	2	0
Turnpike Authority	5	5	0	0
Total	248	221	23	3

* The FDACS projects are the BMP Program Enrollment and agricultural land use changes not accounted for in the adopted BMAP.



Assessing Progress, cont.

Entity	TN Reduction to Date* (lbs/yr)	% of Total TN Reduction Achieved	TP Reduction to Date* (lbs/yr)	% of Total TP Reduction Achieved
Agriculture/FDACS	305,569	38%	85,102	28%
City of Fort Pierce	2,300	36%	1,384	51%
City of Port St. Lucie	60,180	113%	9,329	40%
City of Stuart	6,735	141%	2,038	99%
FDOT District 4	2,108	41%	1,087	64%
Florida Turnpike**	167		13	
Hobe St. Lucie Conservancy District	10,288	109%	3,302	94%
Martin County	42,768	133%	8,351	57%
North St. Lucie River WCD	69,366	79%	19,134	57%
Pal Mar WCD**	926		92	
St. Lucie County MS4	5,277	78%	2,032	71%
St. Lucie County Non-MS4	4,175	43%	1,484	33%
Town of Sewall's Point**	277		179	
Troup-Indiantown WCD	25,055	100%	7,943	98%
Total	535,197	51%	141,477	35%

* Reductions to date include TN and TP reductions associated with projects completed as of December 31, 2017.

** The entity was not given a reduction responsibility in the first phase of the BMAP due to their relatively low contribution to the overall load.



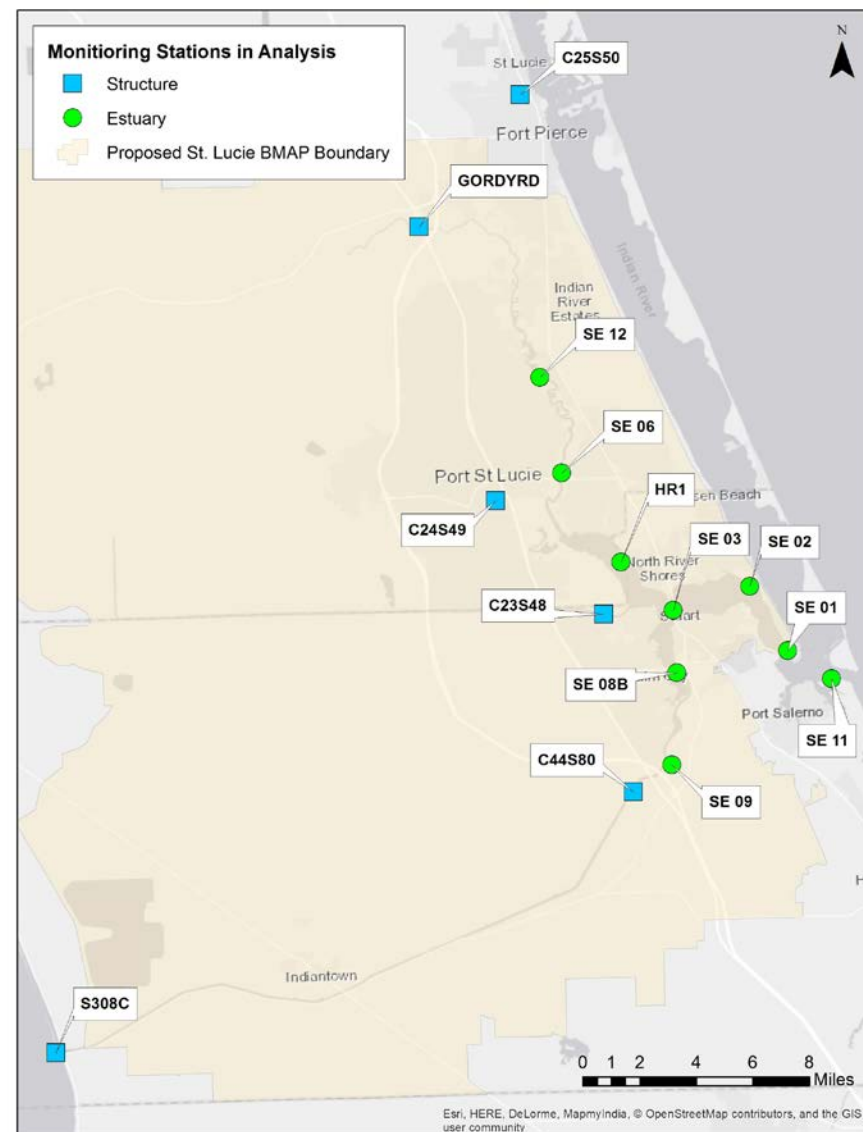
Coordinating Agencies

- FDACS
 - BMP Enrollment
 - Cost-share Assistance
- SFWMD
 - Indian River Lagoon – South (IRL-S) Project
 - C-44 Reservoir and Stormwater Treatment Area (STA)
 - C-23/24 North and South Reservoirs and STA
 - Allapattah Complex Natural Storage and Water Quality Area
 - Ten Mile Creek Project



Water Quality Monitoring and Evaluation

- Trend analyses were conducted on BMAP stations with the best data availability and sampling frequency
- Data analyzed at 6 structure stations and 9 estuary stations (15 stations total)
- Tested for trends in loads (at structures) and concentrations



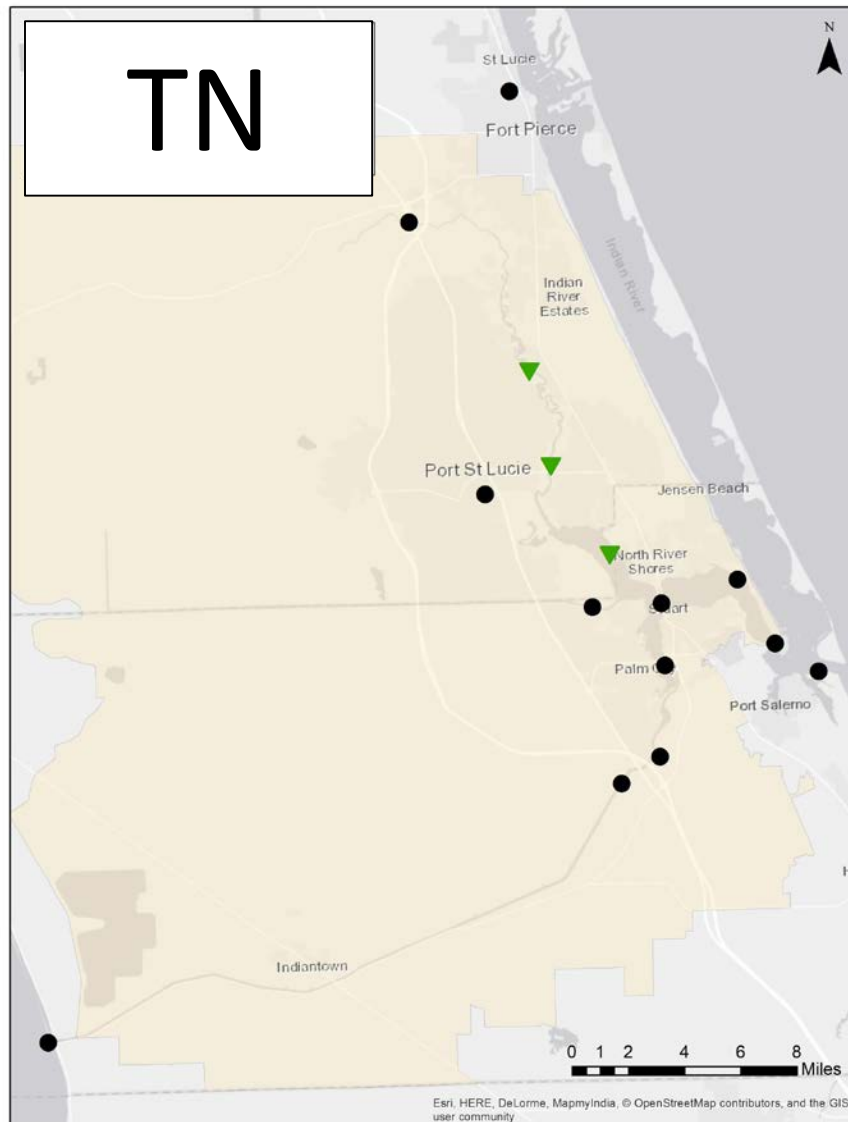


Water Quality Monitoring and Evaluation

- Data available in STORET and WIN
 - Period of record May 1, 2007 through April 30, 2017 (Water Year [WY] 2008 – WY 2017)
 - Flow data from DBHYDRO
- Nonparametric statistical technique used (Seasonal Kendall trend test)
 - Robust against outliers and large data gaps
 - Data not required to conform to a particular distribution for nonparametric analyses
 - Using this technique, identified monotonic trends



Trend Analysis – TN Concentrations



- Results for TN Concentration Data
 - 0 stations had statistically significant increasing trends
 - 3 stations had decreasing trends
 - 12 stations did not show any statistically significant trends

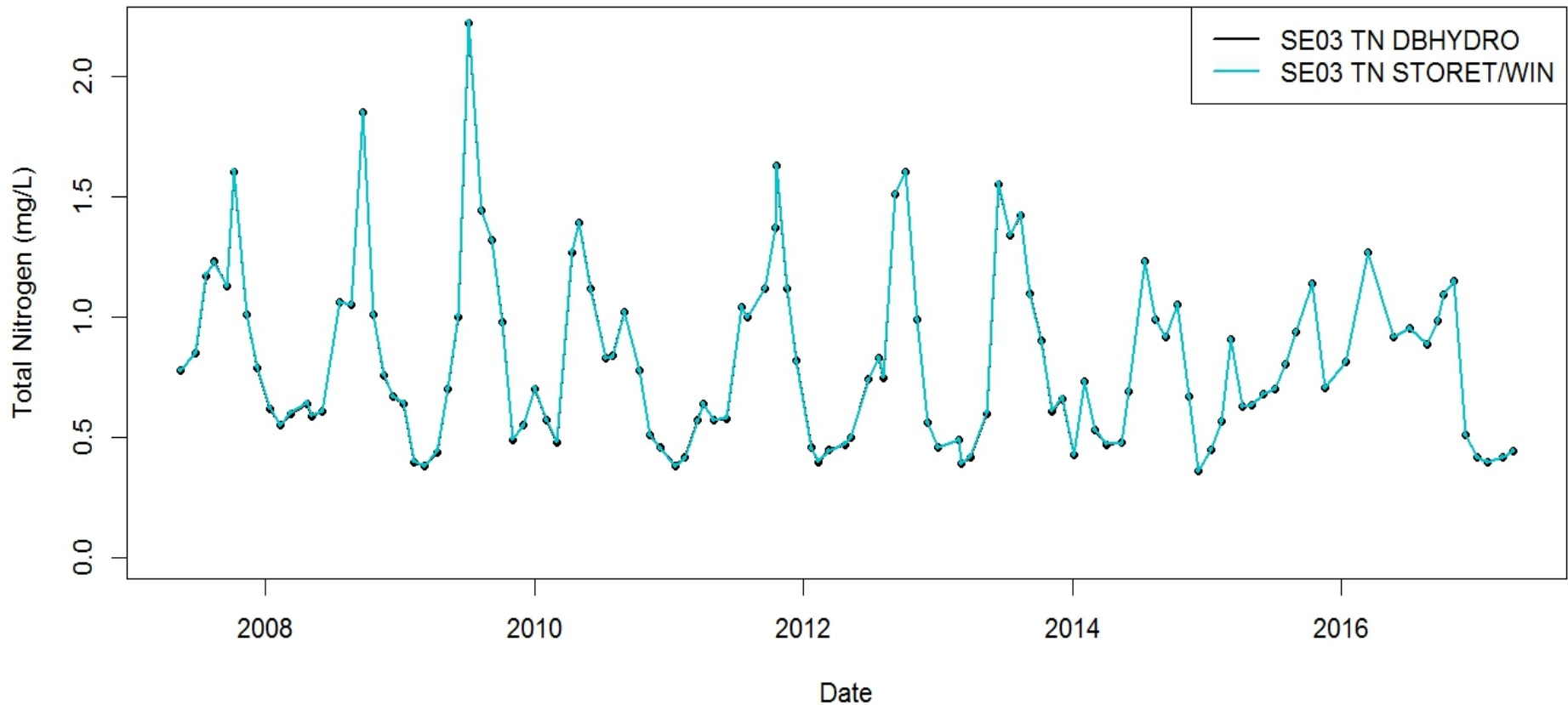
Statistical Trend Test Interpretation

- ▲ Significant Increasing Trend
- No Significant Trend
- ▼ Significant Decreasing Trend
- St. Lucie BMAP Boundary



TN Concentrations – Compliance Point (SE 03)

TN Concentration (mg/L) Time Series



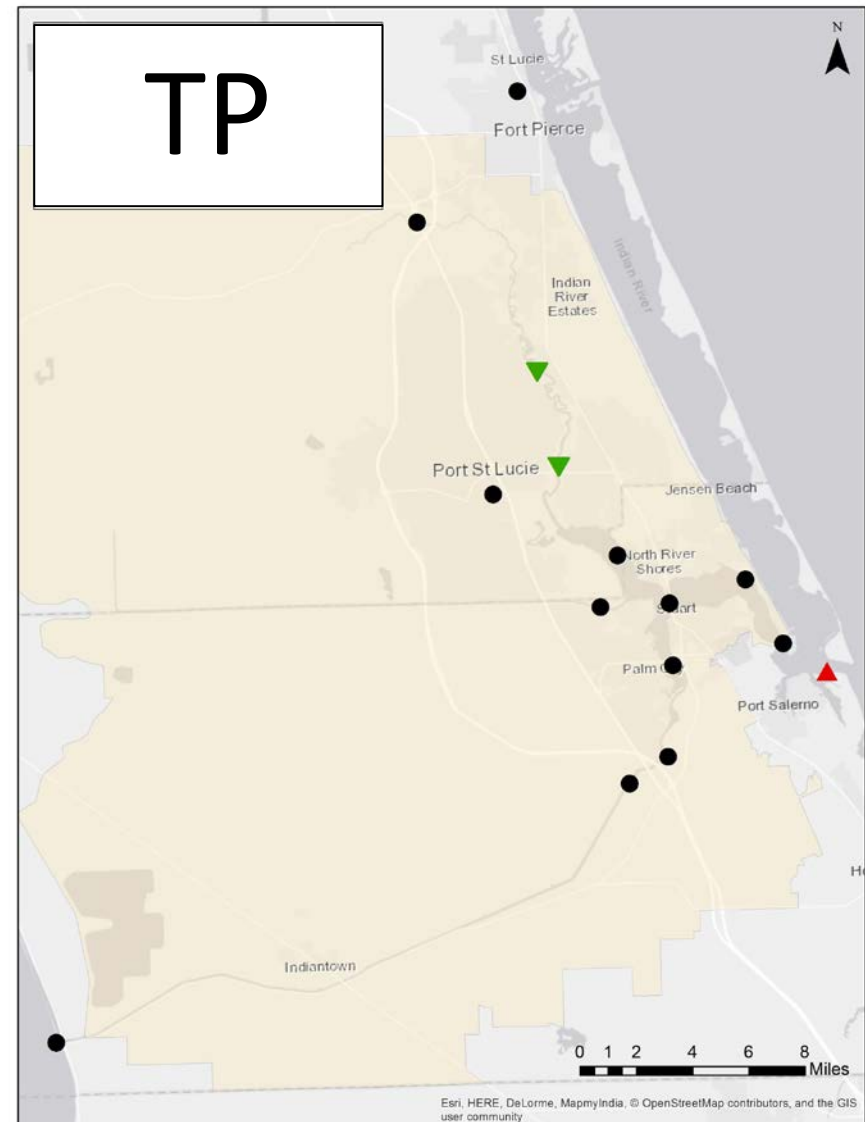


Trend Analysis – TP Concentrations

- Results for TP Concentration Data
 - 1 station had statistically significant increasing trend
 - 2 stations had statistically significant decreasing trends
 - 12 stations did not show any statistically significant trends

Statistical Trend Test Interpretation

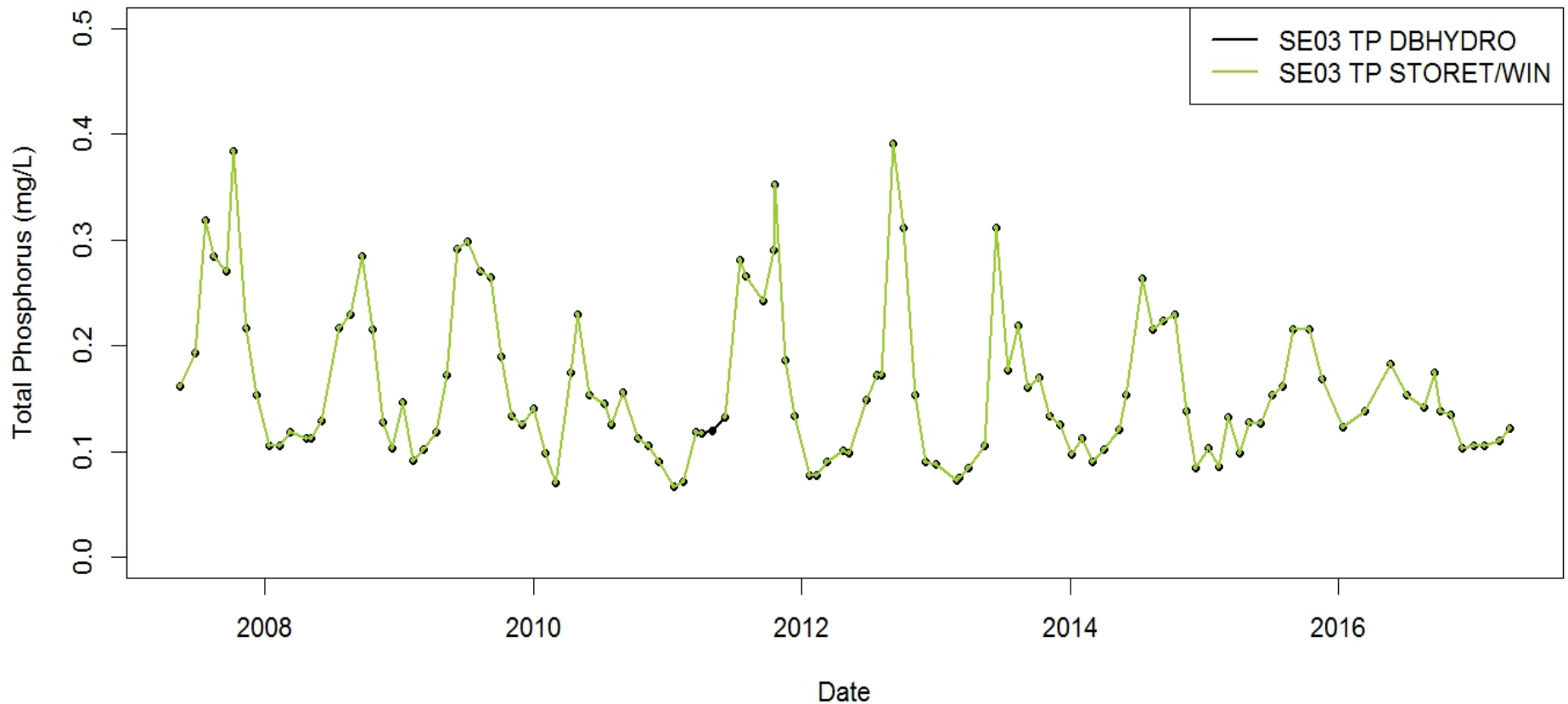
- ▲ Significant Increasing Trend
- No Significant Trend
- ▼ Significant Decreasing Trend
- St. Lucie BMAP Boundary





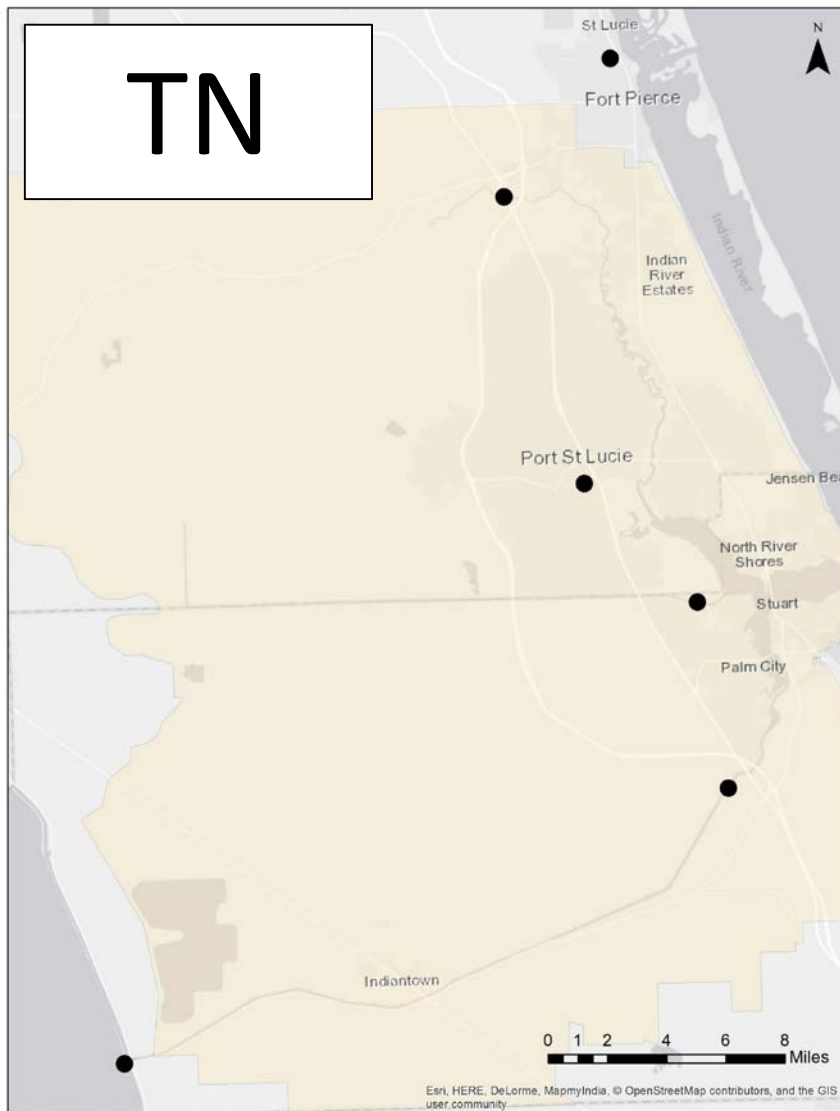
TP Concentrations – Compliance Point (SE 03)

TP Concentration (mg/L) Time Series





Trend Analysis - Loads



- Results for TN Load Data
 - All 6 stations did not show any statistically significant trends

Statistical Trend Test Interpretation

- ▲ Significant Increasing Trend
- No Significant Trend
- ▼ Significant Decreasing Trend
- St. Lucie BMAP Boundary

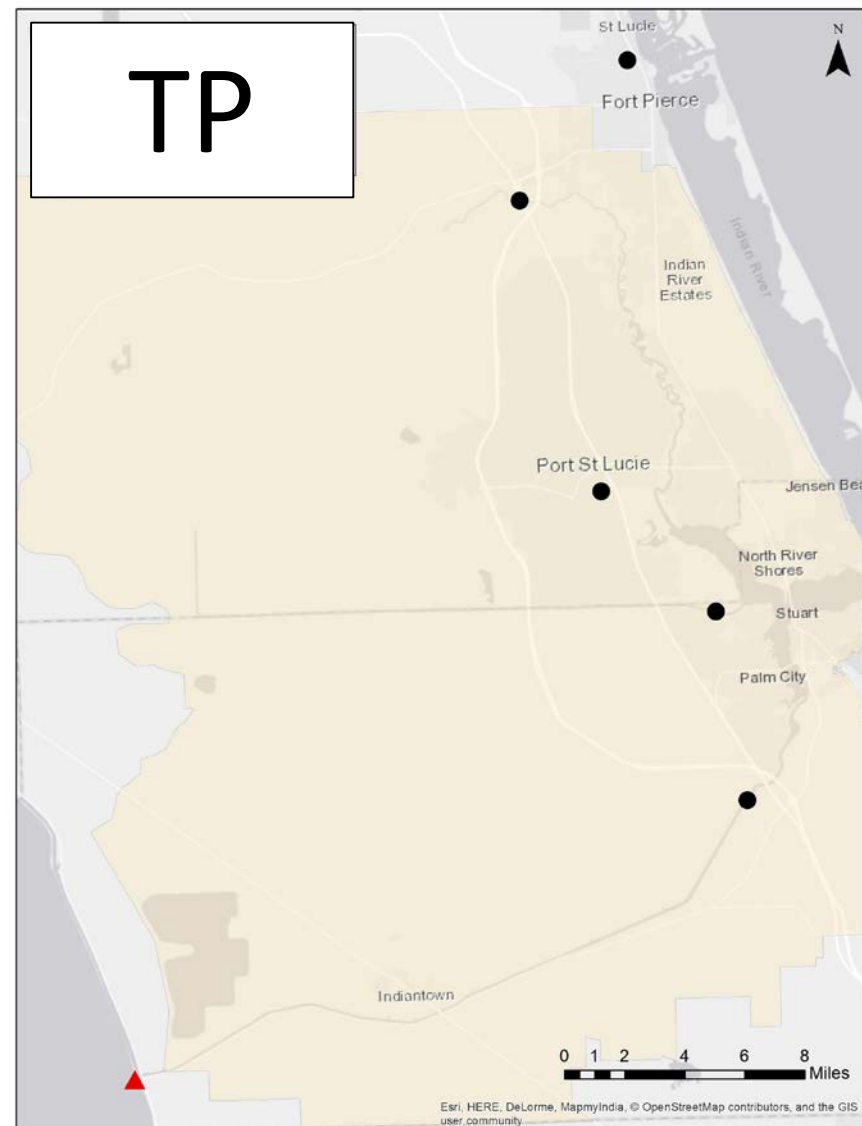


Trend Analysis - Loads

- Results for TP Load Data
 - 1 station had statistically significant increasing trend
 - 5 stations did not show any statistically significant trends

Statistical Trend Test Interpretation

- ▲ Significant Increasing Trend
- No Significant Trend
- ▼ Significant Decreasing Trend
- St. Lucie BMAP Boundary





Chapter 3: Recommendations

3.1 Milestones

3.2 BMAP Boundary Change

3.3 Modeling Revisions

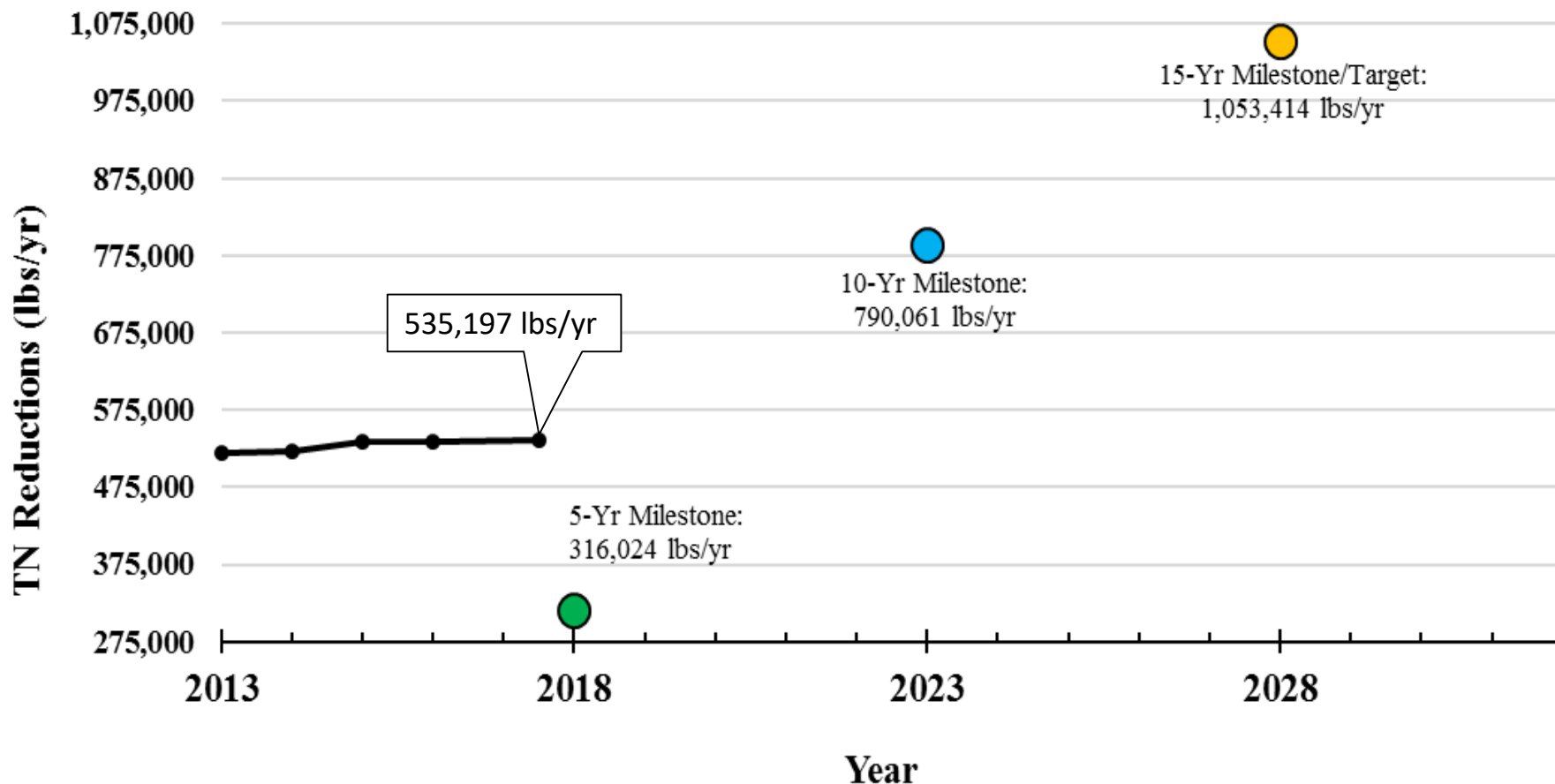
3.4 Revised Allocations

3.5 Water Quality Monitoring Revisions





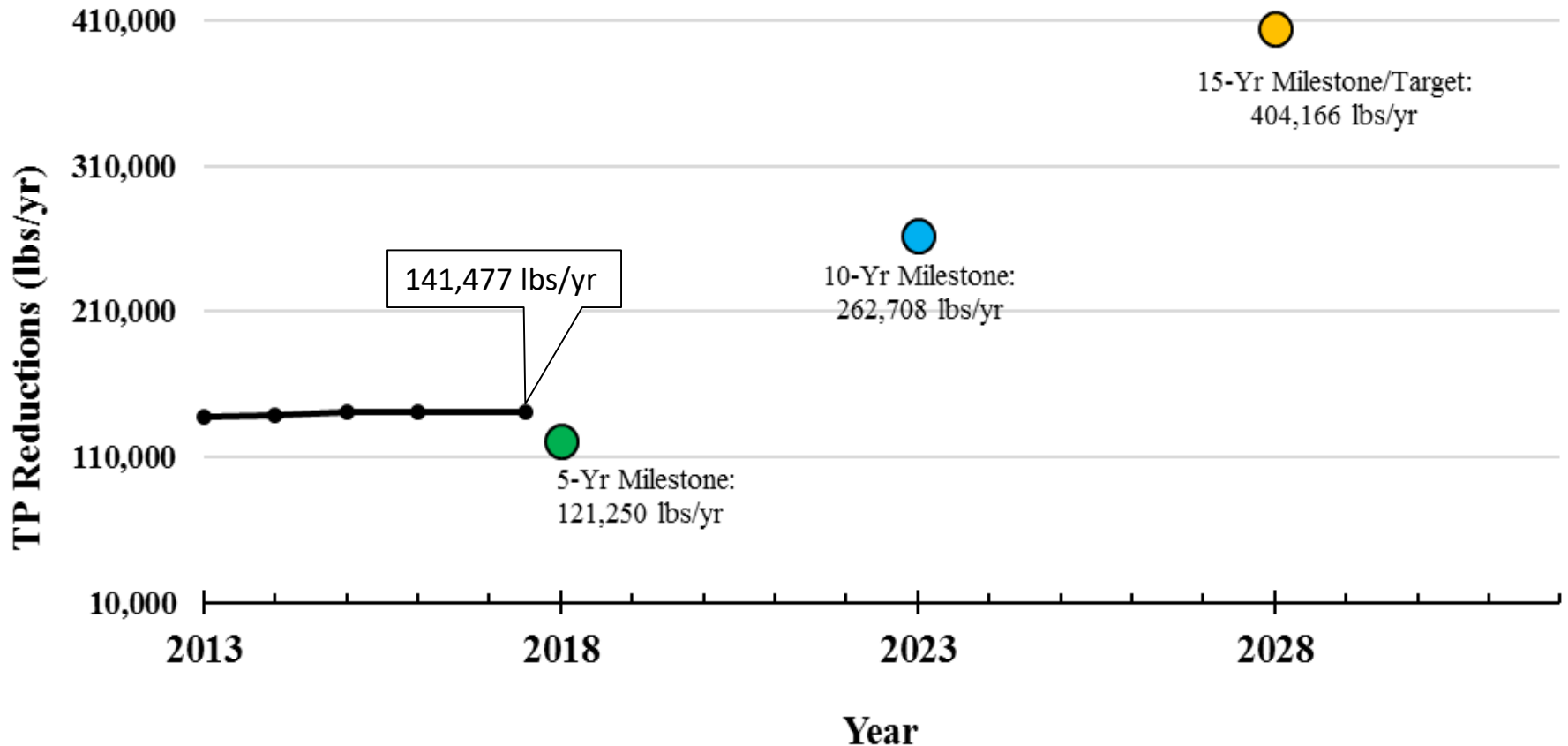
3.1 Milestones - TN



- 5-year milestone (Years 1 to 5): 30 % or 316,024 lbs/yr TN
- 10-year milestone (Years 6 to 10): 75 % or 790,061 lbs/yr TN
- 15-year milestone (Years 11 to 15): 100 % or 1,053,414 lbs/yr TN



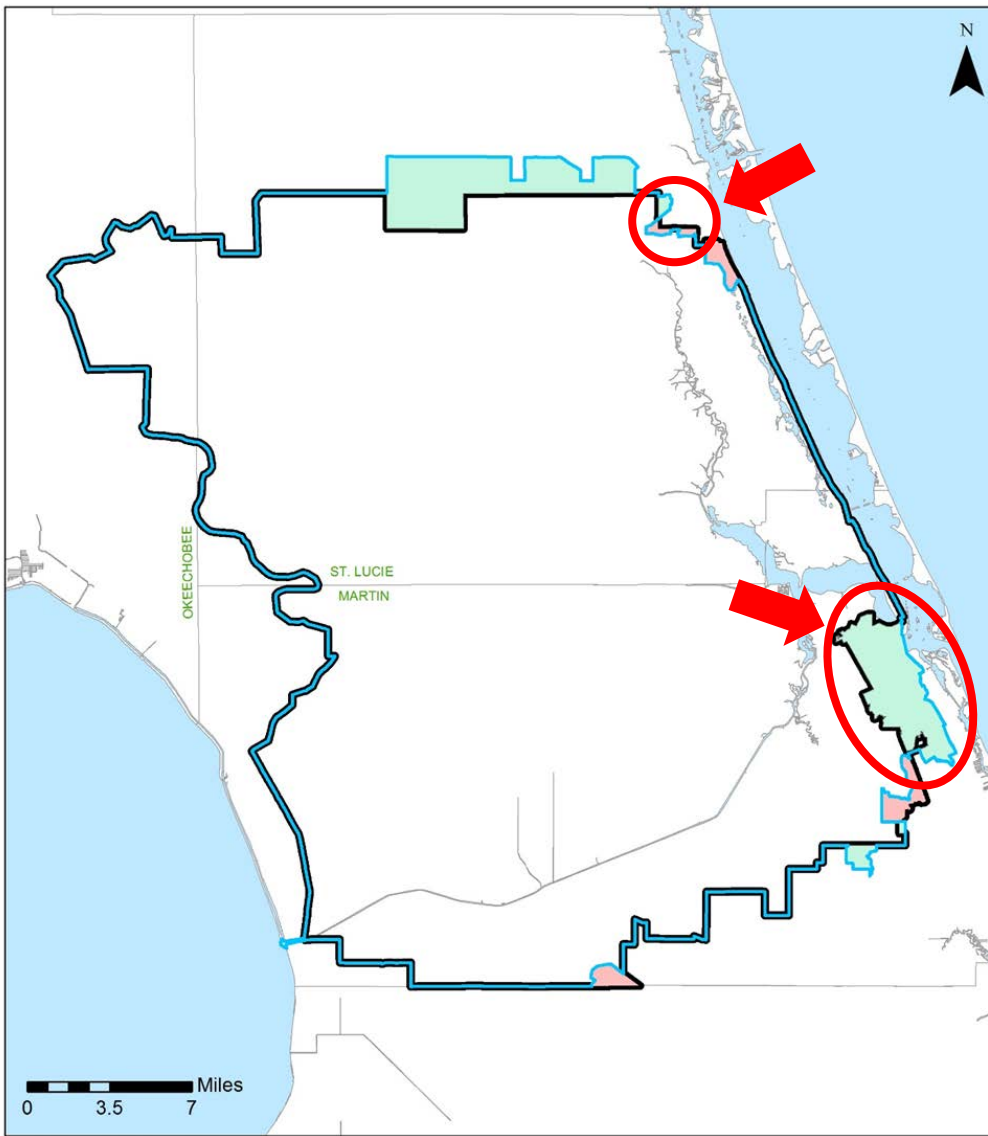
3.1 Milestones - TP



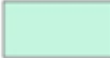
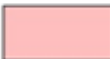
- 5-year milestone (Years 1 to 5): 30 % or 121,250 lbs/yr TP
- 10-year milestone (Years 6 to 10): 65 % or 262,708 lbs/yr TP
- 15-year milestone (Years 11 to 15): 100 % or 404,166 lbs/yr TP



3.2 BMAP Boundary Change



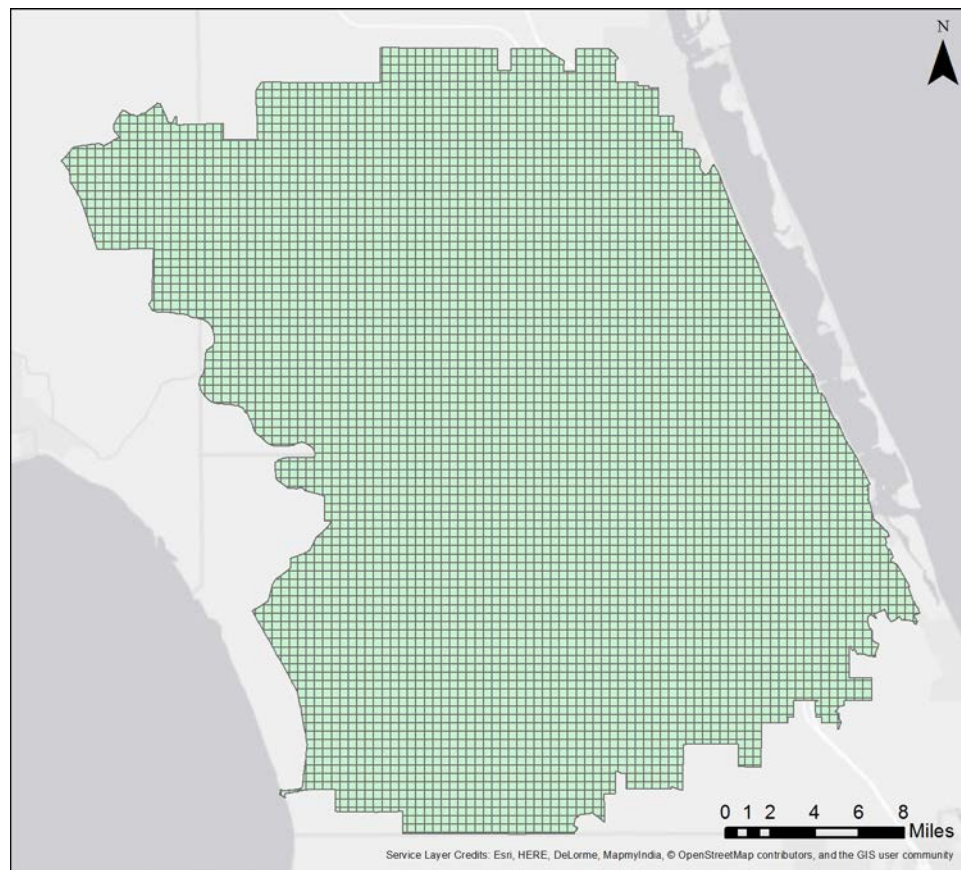
Legend

-  Proposed BMAP Boundary
-  Current BMAP Boundary
-  BMAP Area To Be Added
-  BMAP Area To Be Removed



3.3 Modeling Revisions

- Through the BMAP development process, stakeholders and DEP determined that a more detailed scientific model would be necessary for the development of refined BMAP allocations
- DEP coordinated with SFWMD to revise, enhance, and update the St. Lucie Estuary Watershed (WaSh) Model
- Model was well calibrated and verified for baseline scenario period, indicating that it can closely reproduce flow patterns and capture nutrient dynamic variation



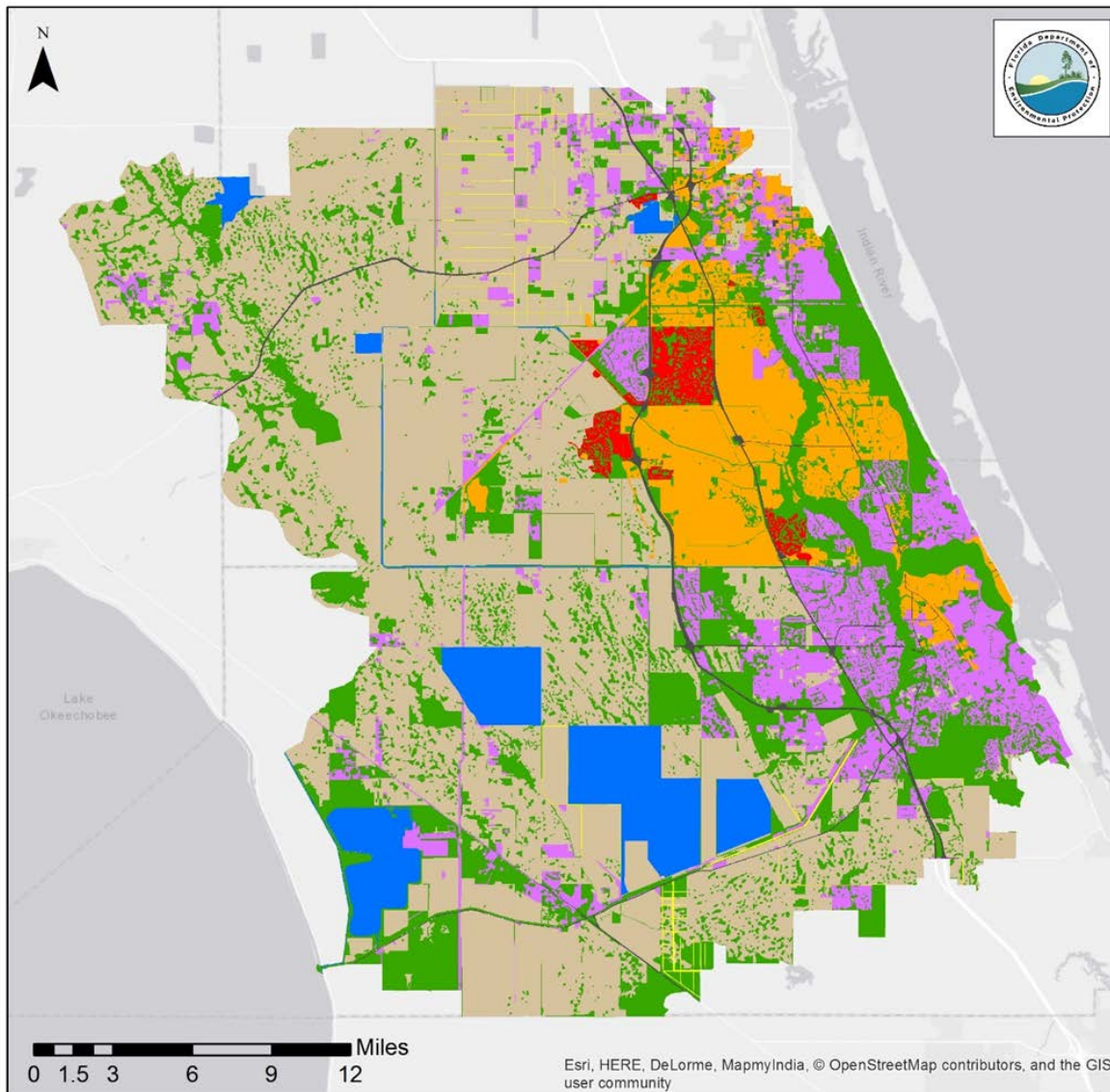


3.3 Modeling Revisions, cont.

- Two alternative scenarios are also being evaluated with WaSh model:
 - Removal of septic tanks
 - Impact of select large-scale BMAP projects
- Results of these scenarios may be used in the future as the BMAP is updated
- Additional information can be found in the updated modeling report, available on the FTP site



3.4 Revised Allocations



Legend

- Agriculture
- Municipalities
- Counties
- Community Development Districts
- Roads
- Water Control Districts
- Natural Lands
- Water Management Areas



3.4 Revised Allocations, cont.

- Required reductions calculated using percent reductions by subbasin, similar to original BMAP

Category	Basins 4,5,6	C-23	C-24	C-44, S-153	North Fork	North Mid- Estuary	South Fork	South Mid- Estuary/ South Coastal	Ten Mile Creek
Average* TN Concentration (mg/L)	0.92	1.71	1.69	1.08	1.18	0.95	1.06	0.69	1.00
TN Target Concentration (mg/L)	0.72								
TN Reduction Required (%)	22%	58%	57%	33%	39%	24%	32%	0%	28%
Average* TP Concentration (mg/L)	0.192	0.350	0.279	0.153	0.231	0.187	0.195	0.120	0.201
TP Target Concentration (mg/L)	0.081								
TP Reduction Required (%)	58%	77%	71%	47%	65%	57%	58%	33%	60%

* Average concentrations from modeled outputs 2007 through 2016.



3.4 Revised Allocations, cont.

- Starting loads for each entity by sub-basin are currently being processed in the model
- Starting load multiplied by percent reduction will determine the required reduction in each sub-basin
 - One total reduction for TN and TP will be provided for each entity
- Results will be discussed with stakeholders prior to adopting revised BMAP

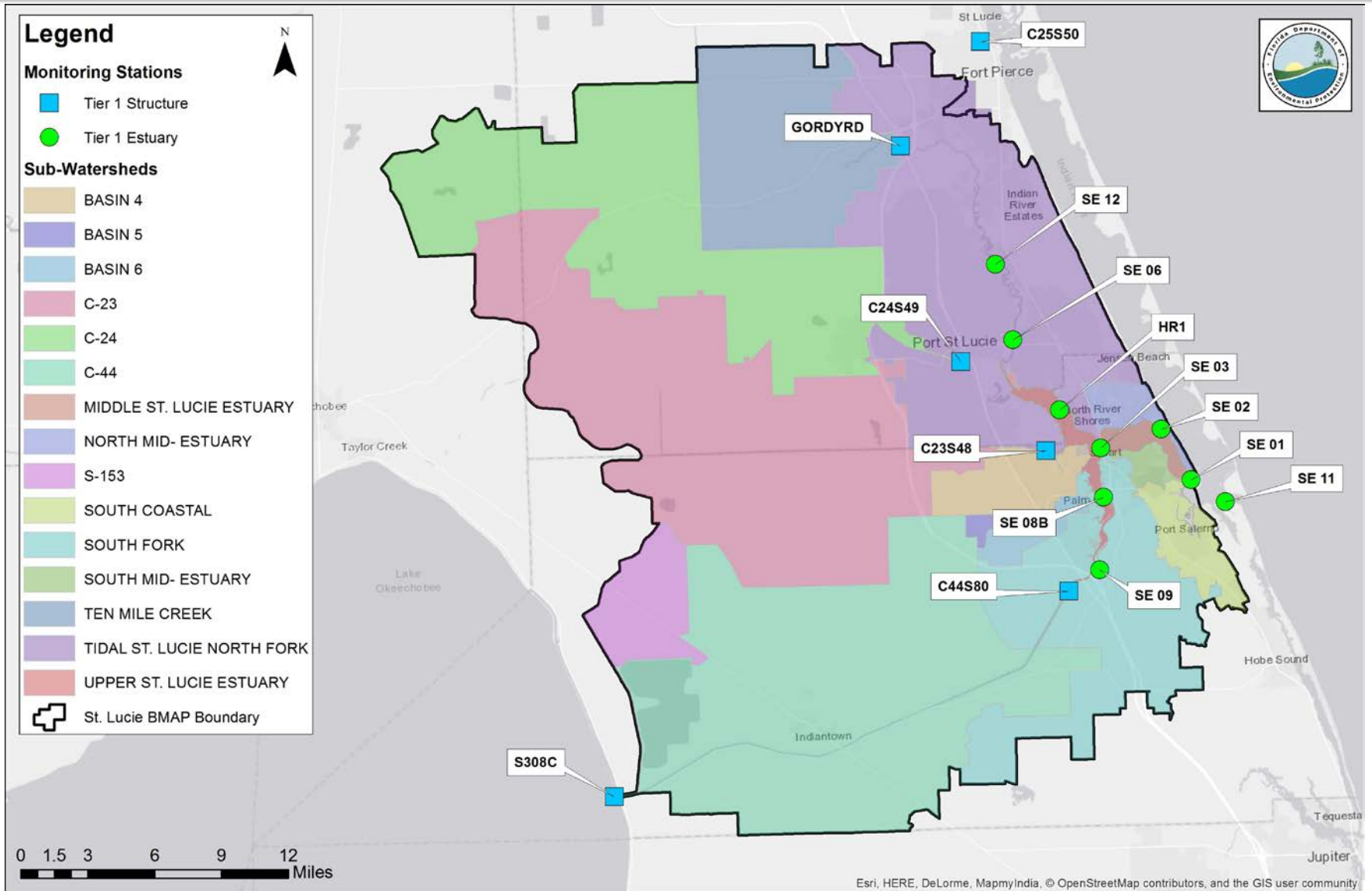


3.5 Water Quality Monitoring

- Proposed revisions aim to prioritize monitoring and best track BMAP progress
- Network will be reduced from 94 stations to 61 stations
- Tiered system proposed
 - **Tier 1:** Primary/priority stations used to track BMAP progress over the long term; if at any point it is necessary to reduce efforts in the basin, these stations should be the last stations impacted
 - **Tier 2:** Stations will provide secondary information that can be used to help focus and adaptively manage implementation efforts
 - **Tier 3:** U.S. Geological Survey gages where flow and/or stage are monitored

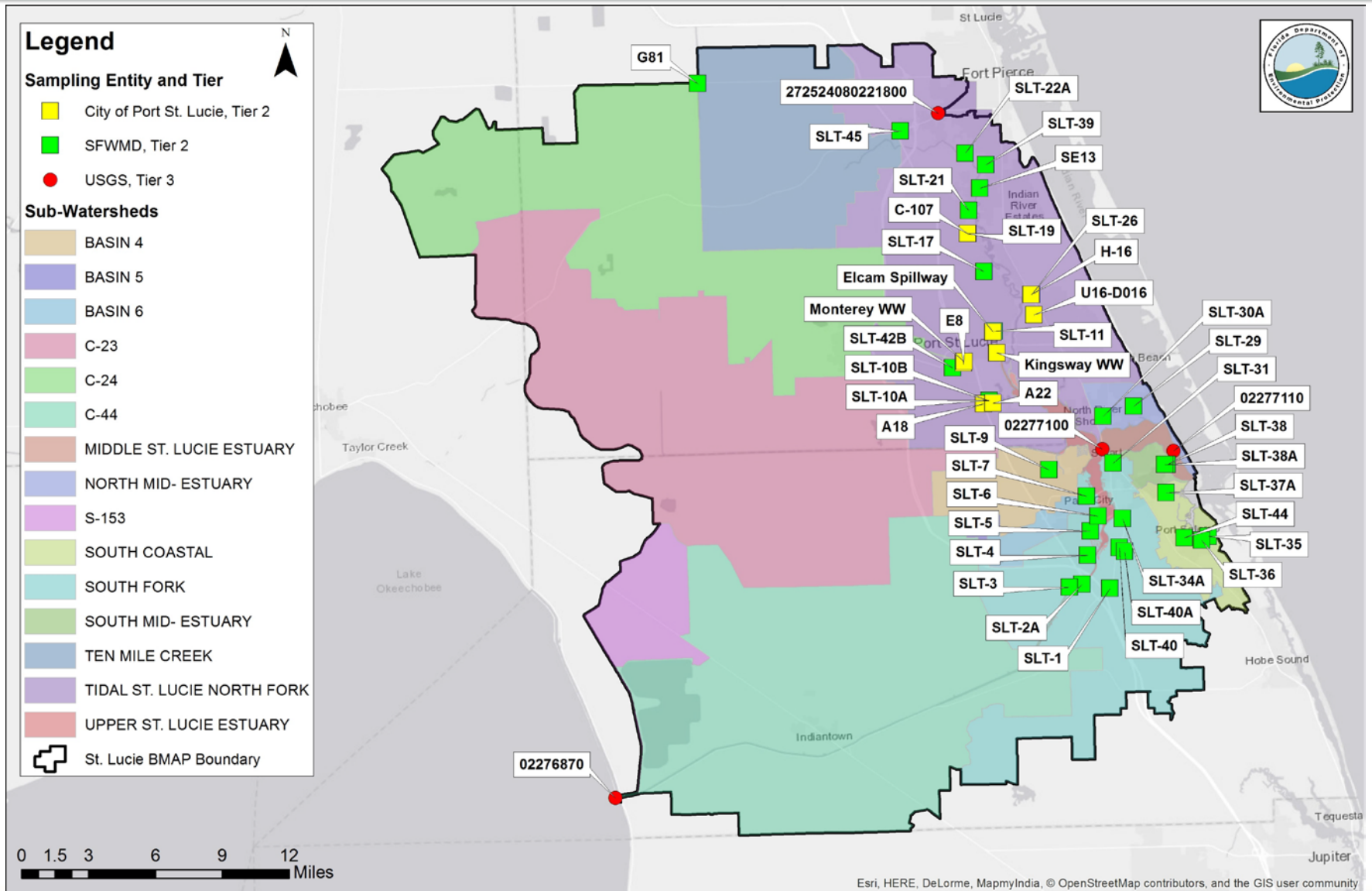


BMAP Monitoring Network – Recommended Tier 1 Stations





BMAP Monitoring Network – Recommended Tier 2 and 3 Stations





Next Steps

Please submit comments on the draft
5-Year Review by

Tuesday, May 8, 2018

Timeline for Stakeholder Involvement	Deadline
Public meeting – Draft 5-Year Review provided for comments	4/24/2018
Stakeholders submit comments on Draft 5-Year Review document to DEP	5/8/2018
Final BMAP 5-Year Review submitted to Governor/Legislature	6/30/2018





Contact Information

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Questions & Comments

