Final

2016 Progress Report for the Everglades West Coast Basin Management Action Plan

Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection

with participation from the
Everglades West Coast Stakeholders

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Acknowledgments

This *2016 Progress Report for the Everglades West Coast 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 with participation from the Everglades West Coast stakeholders identified below.

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List of Acronyms and Abbreviations

AGM	Annual Geometric Mean
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CDD	Community Development District
CREW	Corkscrew Regional Ecosystem Watershed
CY	Calendar Year
DEP	Florida Department of Environmental Protection
DO	Dissolved Oxygen
ERP	Environmental Resource Permit
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FYN	Florida Yards and Neighborhoods (Program)
lbs/yr	Pounds Per Year
mg/L	Milligrams Per Liter
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAWP	FDACS Office of Agricultural Water Policy
POR	Period of Record
PSA	Public Service Announcement
ROC	Regional Operations Center
SFWMD	South Florida Water Management District
STORET	STOrage and RETrieval (Database)
TBD	To Be Determined
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
USACE	U.S. Army Corps of Engineers
WBID	Waterbody Identification
WY	Water Year

Summary

Total Maximum Daily Loads (TMDLs)

The Florida Department of Environmental Protection (DEP) adopted total nitrogen (TN) TMDLs for Hendry Creek and the Imperial River in August 2008 to address the dissolved oxygen (DO) impairments in these waterbodies. DEP adopted the Everglades West Coast Basin Management Action Plan (BMAP) in November 2012 to implement the TN TMDLs in the watersheds. This is the fourth annual Progress Report for the Everglades West Coast BMAP, and it describes the activities that occurred during the reporting period from December 1, 2015, through November 30, 2016.

Summary of Load Reductions

During the reporting period, in the Hendry Creek Basin, all entities continued their ongoing efforts. The total estimated reduction to date is 6,918 pounds per year (lbs/yr) of TN, or 67 % of the reductions needed to meet the TMDL. **Figure S-1** shows progress towards the Hendry Creek TN TMDL load reduction.

In the Imperial River Basin, local entities also continued their ongoing efforts, and the City of Bonita Springs completed two projects—downtown redevelopment drainage (BS-11) and septic system removal (BS-12)—that resulted in a reduction of 912 lbs/yr. In addition, the TN reductions from agricultural BMP implementation were updated, and enrollments during the reporting period resulted in a reduction of 197 lbs/yr TN. The reductions mentioned above are in addition to those projects given credit before BMAP adoption and in previous annual reports. Therefore, the total reduction to date is 15,738 lbs/yr of TN, or 26 % of the reductions needed to meet the TMDL. **Figure S-2** shows progress towards the Imperial River TN TMDL load reduction.

Water Quality Monitoring

Lee County continued monitoring at 14 water quality stations in the Hendry Creek Basin. At 4 of these stations, the DEP South Regional Operations Center (ROC) collected data quarterly. Lee County also continued monitoring at 5 water quality stations in the Imperial River Basin. In addition, Bonita Springs continued monitoring at 7 water quality stations in the Imperial River Basin.

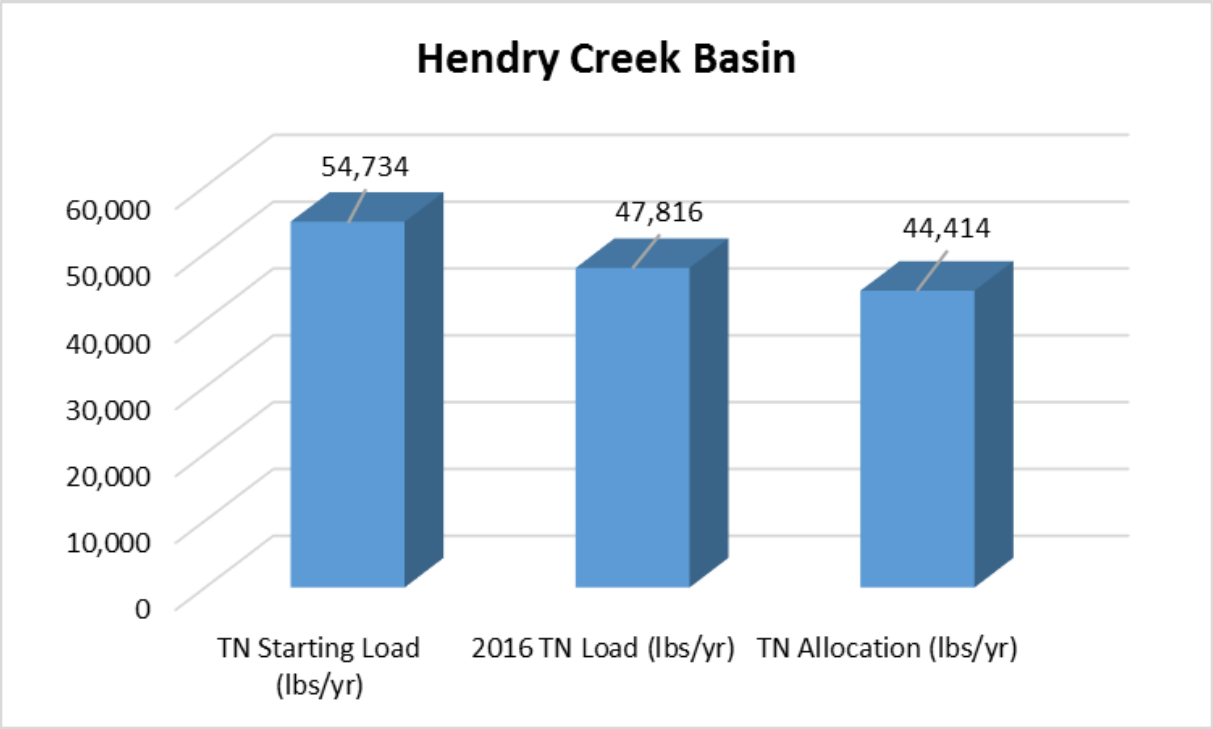

Figure S-1. Progress towards the Hendry Creek TN TMDL through November 30, 2016

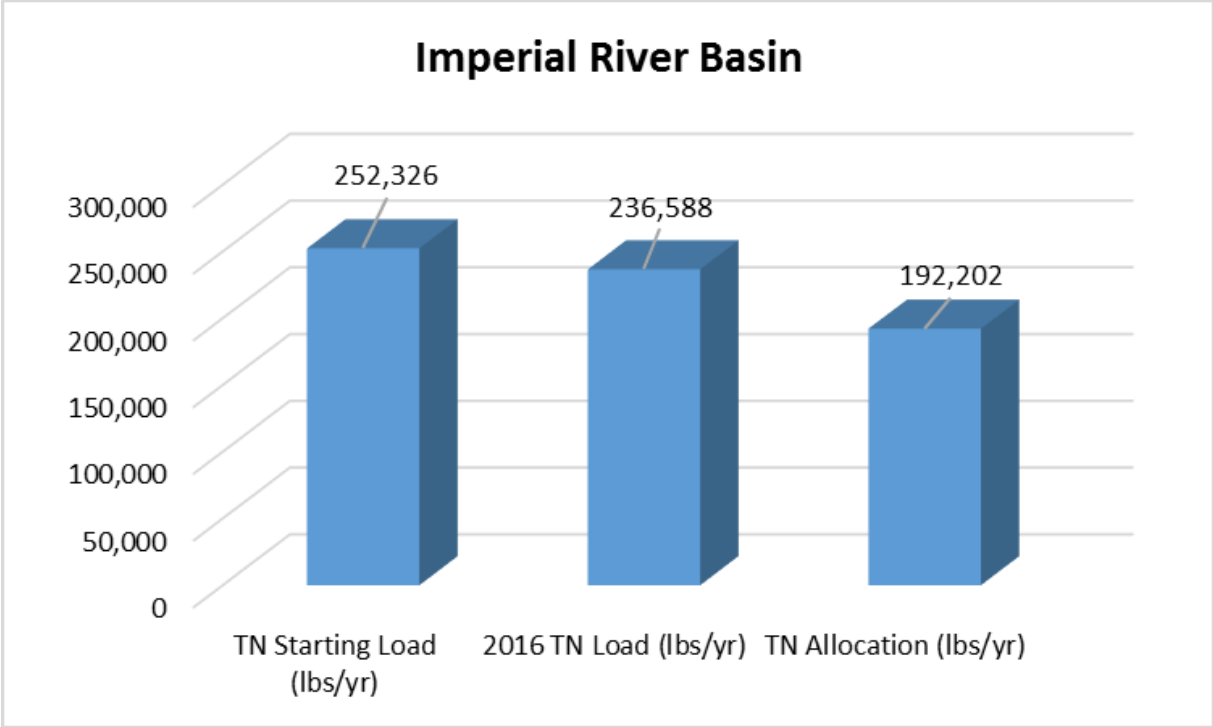

Figure S-2. Progress towards the Imperial River TN TMDL through November 30, 2016

Section 1: Introduction

1.1 Purpose of the Report

This is the fourth annual progress report for the Everglades West Coast Basin Management Action Plan (BMAP). **Section 2** and **Section 3** describe the activities that occurred during the reporting period (December 1, 2015, through November 30, 2016) for the Hendry Creek and Imperial River Basins, respectively. **Section 4** describes the water quality monitoring that occurred during the reporting period and outlines the methodology for the data evaluation conducted for the Everglades West Coast monitoring network. **Section 5** summarizes each entity's progress toward completing projects.

1.2 Total Maximum Daily Loads (TMDLs) for the Everglades West Coast Basin

Hendry Creek and the Imperial River (**Figure 1** and **Figure 2**) were determined to be impaired for low dissolved oxygen (DO) caused by high concentrations of total nitrogen (TN). The Florida Department of Environmental Protection (DEP) adopted the TN TMDLs for Hendry Creek and the Imperial River in August 2008 to address the DO impairments (**Table 1**). DEP adopted the Everglades West Coast BMAP in November 2012 to implement the TN TMDLs in the watersheds.

Table 1. Everglades West Coast TMDLs

WBID = Segment with waterbody identification number
mg/L = Milligrams per liter
NPDES = National Pollutant Discharge Elimination System

WBID	Waterbody	Parameter	TMDL (mg/L)	Wasteload Allocation for NPDES Stormwater (% Reduction)	Load Allocation (% Reduction)
3258B	Hendry Creek	TN	0.74	44	44
3258B1	Hendry Creek	TN	0.60	44	44
3258E	Imperial River	TN	0.74	24.87	24.87

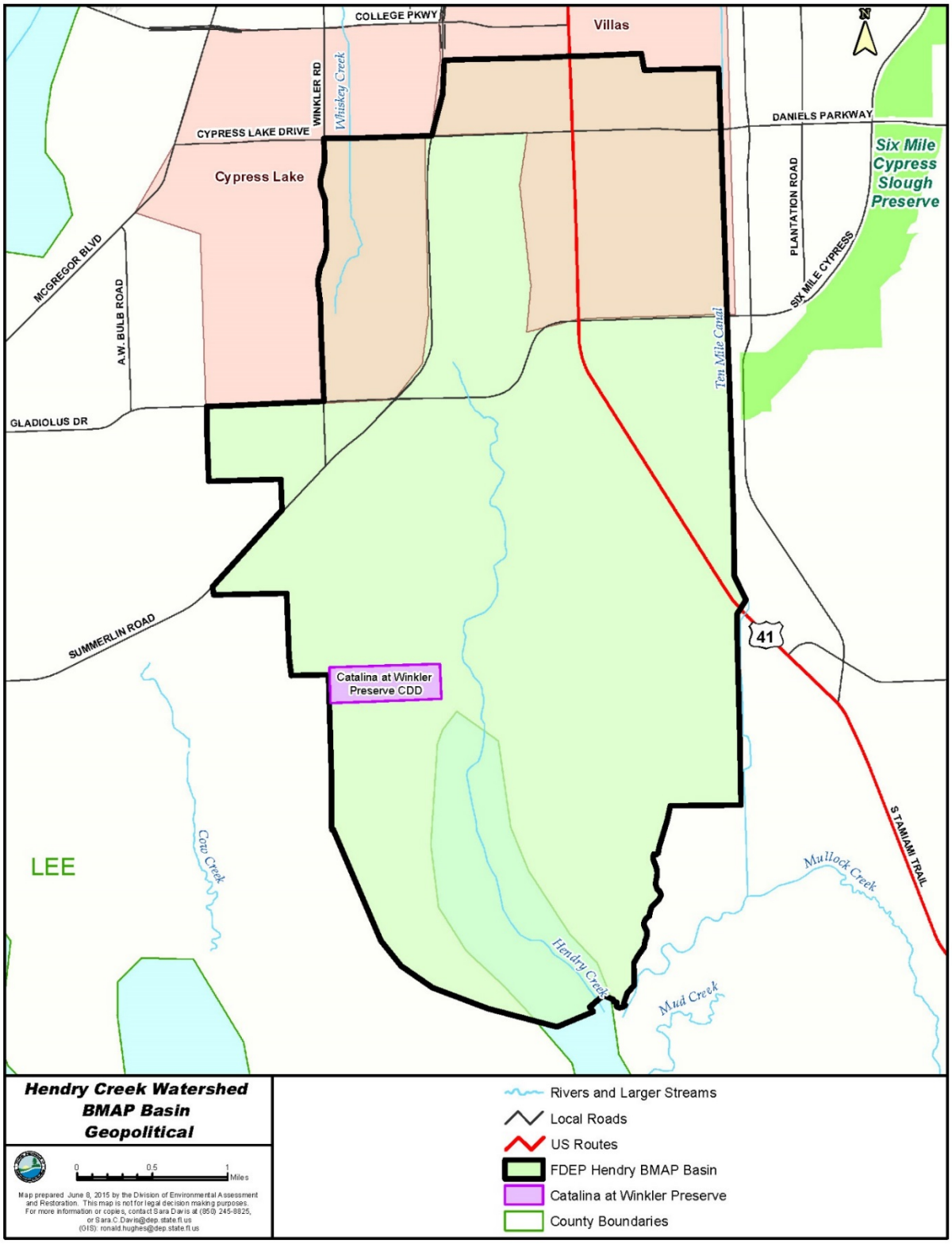

Figure 1. Hendry Creek Basin

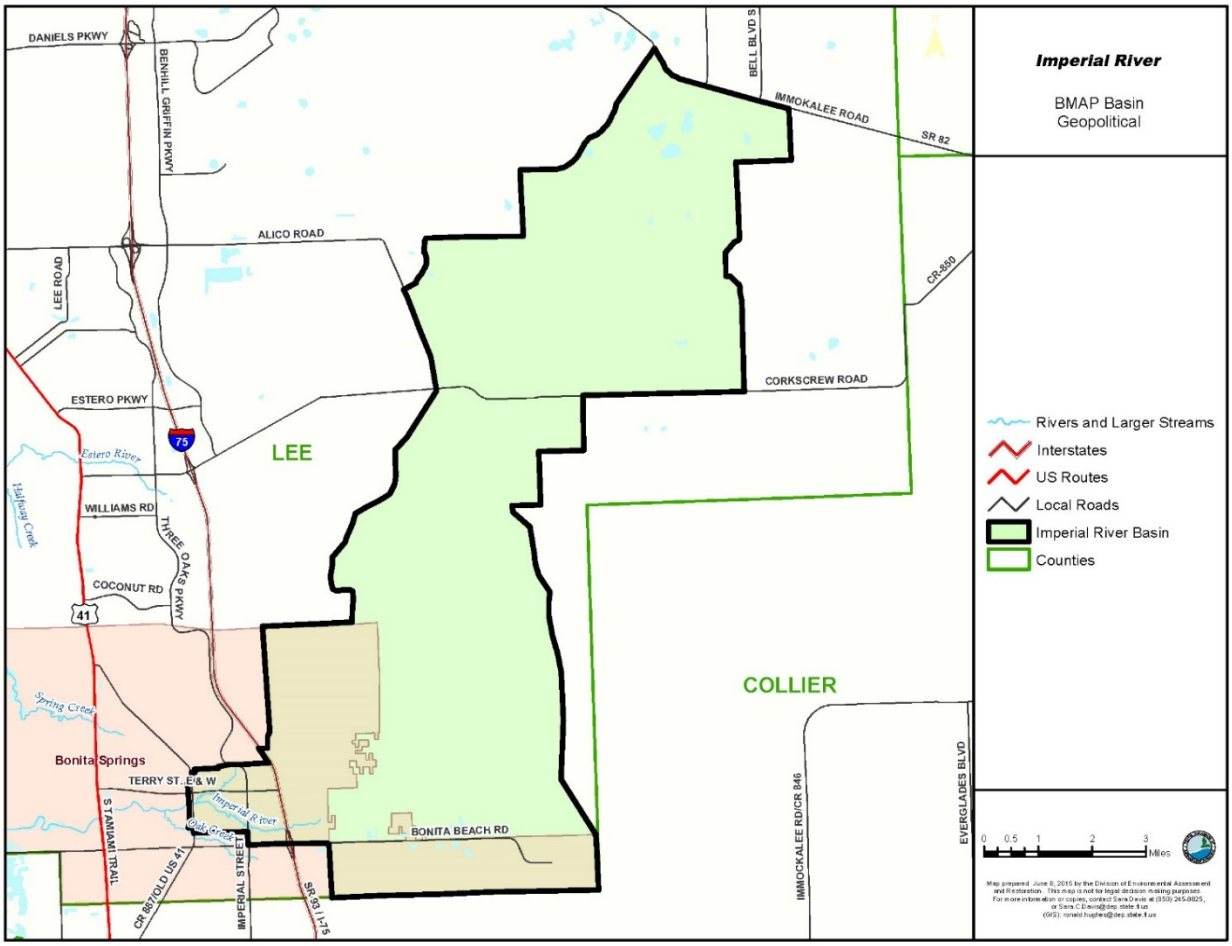

Figure 2. Imperial River Basin

1.3 Responsible Parties and Key Stakeholders

The following organizations and entities are key stakeholders with assigned load reductions in the Hendry Creek portion of the Everglades West Coast BMAP area:

- Agriculture.
- Catalina at Winkler Preserve Community Development District (CDD).
- Lee County.
- Florida Department of Transportation (FDOT) District 1.

The following organizations and entities are key stakeholders with assigned load reductions in the Imperial River portion of the Everglades West Coast BMAP area:

- Agriculture.
- City of Bonita Springs.
- Lee County.
- FDOT District 1.

In addition to these entities, the Florida Department of Agriculture and Consumer Services (FDACS), DEP, and South Florida Water Management District (SFWMD) are essential to the implementation of the BMAP activities.

Section 2: Hendry Creek Activities During the Reporting Year

Section 2.1 and **Section 2.2** describe the accomplishments in the Hendry Creek Basin 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, while not specifically described below, must continue each year for the project credit to remain effective. **Appendix A** contains the individual project tables.

2.1 Activities by Entity in the Hendry Creek Basin

2.1.1 FDOT District 1

FDOT continued its public education program and street sweeping program for arterial roads and bridges.

2.1.2 Lee County

Lee County is in the conceptual planning stage on two projects that are anticipated to be under way during the next reporting period. The first project, Lakes Park Littoral Zone, will result in the creation of littoral shelves with native plantings that will take up nutrients. The SFWMD authorized a letter modification to the existing Environmental Resource Permit (ERP) that will allow the reconfiguration of an existing spoil island, the removal of existing exotic vegetation, and the planting of native vegetation. The second project, Hendry Creek West Branch Restoration, will result in the creation of a filter marsh on an 11-acre site. Water quality monitoring is under way.

Lee County's updated "Fertilize Smart" campaign, entitled "Don't Feed the Monster," includes an updated website, social media site, brochure materials, and public service announcement (PSA) video featuring "The Slime Monster." "Fertilize Smart" billboards were in place at the following four locations in the county during the reporting period:

- U.S. Highway 41, 0.07 miles north of Brantley Road.
- Gladiolus Drive, 0.1 mile west of U.S. Highway 41.
- U.S. Highway 41, 0.05 mile south of Big Pine Way WS/FS (I).
- Business 41 at north side of Edison Bridge.

In November 2016, Lee County kicked off a new "call to action" by initiating a pet waste education campaign. Brochures, posters, and pet waste bags were distributed through veterinary clinics, pet stores, public education events, and included in Lee County Domestic Animal Services adoption kits. A campaign website was also created.

2.1.3 Agriculture

In 2015, the FDACS Office of Agricultural Water Policy (OAWP) adopted a revised vegetable and agronomic crop manual that includes specific nutrient and irrigation management best management practices (BMPs) for plastic mulch, bare ground, sugar cane, hay/silage, and greenhouse production systems. In early 2016, FDACS adopted a dairy manual that targets dairies that do not have DEP-issued NPDES permits. In June 2016, a poultry manual was adopted. To date, FDACS has developed BMP manuals for cow/calf, citrus, vegetable and agronomic crops, nurseries, equine, sod, dairy, poultry, and specialty fruit and nut operations. The FDACS BMP manuals can be found at this webpage.

Landowners who sign notices of intent (NOIs) agree to implement applicable BMPs on their enrolled properties. FDACS updates its enrollment database quarterly. These quarters do not necessarily align with the reporting periods for the various BMAPs. For example, this annual progress report covers the reporting period from December 1, 2015, through November 30, 2016. However, the enrollment reflected is through September 30, 2016. As of this date, 31 acres in the Hendry Creek Basin were covered by two NOIs issued by the OAWP (**Figure 3**).

Agricultural BMPs may or may not be implemented on all these acres because the NOIs may include nonproduction acres, such as buildings, parking lots, and fallow acres. Furthermore, this enrollment includes NOIs on lands not classified as agriculture. To estimate the actual agricultural acreage in the Hendry Creek Basin covered by the BMPs, FDACS used the 2004 SFWMD agricultural land use coverage, which was also used in the BMAP. Per this land use, 27 agricultural acres are enrolled in the FDACS BMP Program. This equates to enrollment of 29 % of the total agricultural acreage in the Hendry Creek Basin (according to the 2004 SFWMD land use coverage). **Table 2** lists the BMPs and the acreage covered by NOIs. **Table 3** summarizes BMP enrollment in the Hendry Creek Basin.

Table 2. Agricultural acreage and BMP enrollment for the Hendry Creek Basin as of September 30, 2016

[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.
N/A = Not applicable

2004 SFWMD Land Use	2004 Acres	FDACS-Adjusted Acres for Enrollment[1]	Related FDACS BMP Programs	Acreage Enrolled	Related NOIs
Pasture	0.2	N/A	Cow/Calf, Vegetable and Agronomic Crops (hay)	0.0	0
Row/Field/Mixed Crops	87.1	50.5	Vegetable/Agronomic Crops	0.0	0
Tree Nurseries	0.0	5.0	Statewide Nursery, Specialty Fruit and Nut	0.0	0
Ornamentals	10.6	35.6	Container Nursery	30.7	2
Total	**98**	**91**		**31**	**2**

Table 3. Summary of BMP enrollment in the Hendry Creek Basin as of September 30, 2016

Category	Acres
Total Agricultural Acres in BMAP	98
FDACS-Adjusted Agricultural Acres in BMAP	91
BMAP Phase I FDACS Enrollment Goal (50 %)	45
Enrolled Acres Used for TN Reduction Calculation	27
TN Reduction (lbs/yr)	78
BMAP Phase I Remaining Acres To Enroll	18
Total Remaining Acres To Enroll	64

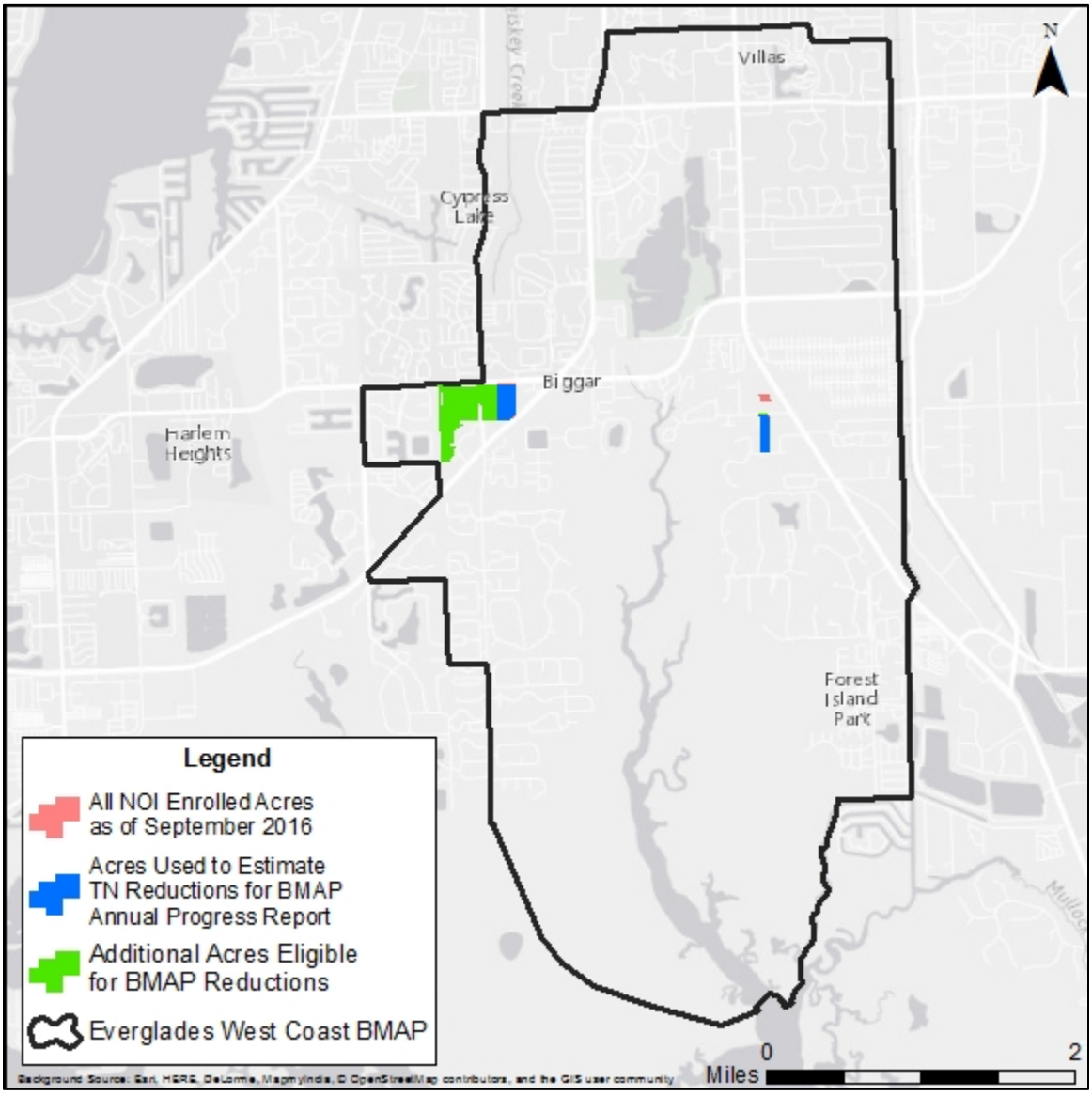

Figure 3. Agricultural acreage and BMP enrollment in the Hendry Creek Basin as of September 30, 2016

2.2 Summary of Load Reductions in the Hendry Creek Basin

No new projects were completed in the Hendry Creek Basin during the fourth annual BMAP reporting period. However, many ongoing efforts continued. The total reductions to date, including those projects given credit before BMAP adoption and listed in the 2013, 2014, and 2015 progress reports, are 6,918 lbs/yr of TN, or 67 % of the reductions needed to meet the TMDL.

Figure 4 shows progress towards the TN TMDL load reductions. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current loading based on those projects listed as completed in the BMAP, those completed as part of the 2013, 2014, and 2015 progress reports, and those listed above. The third bar shows the total allocation for stormwater runoff to meet the TMDL.

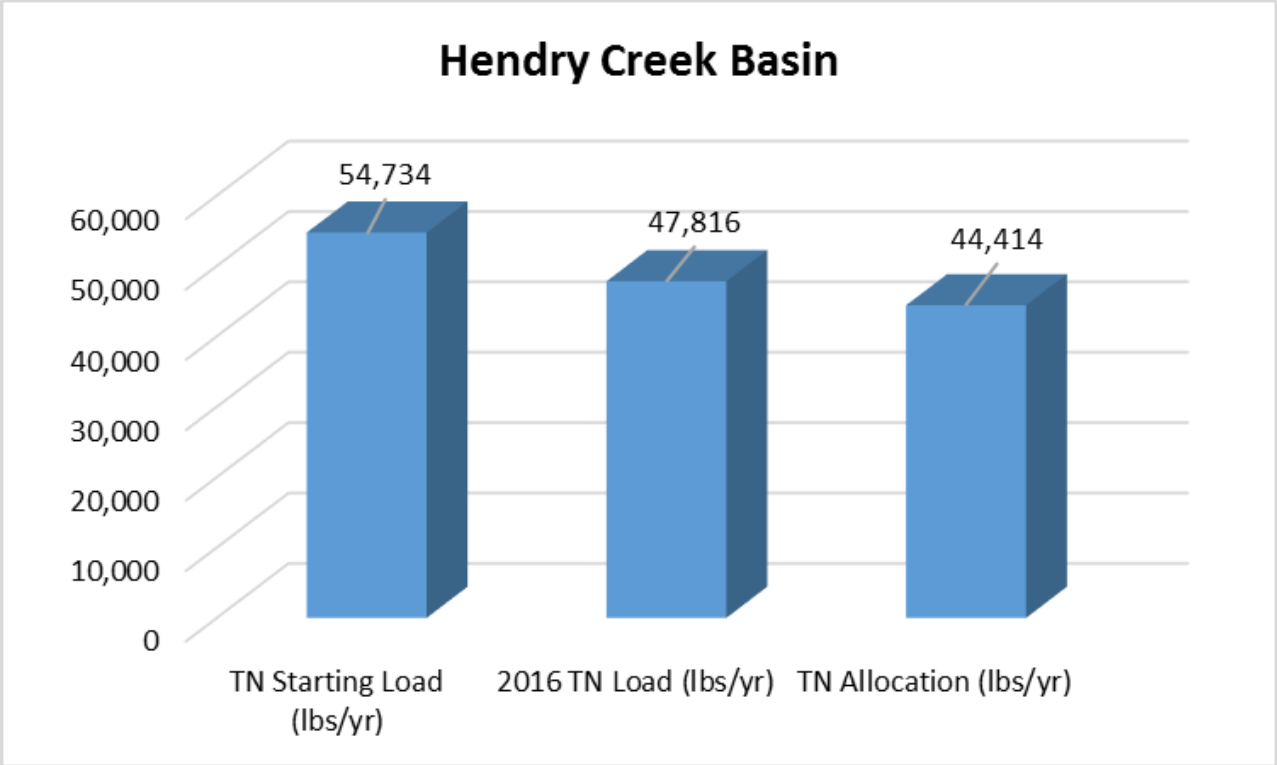

Figure 4. Progress towards the Hendry Creek TN TMDL through November 30, 2016

Section 3: Imperial River Activities During the Reporting Year

Section 3.1 and **Section 3.2** describe the accomplishments in the Imperial River Basin over the past year, and **Appendix A** contains the individual project tables.

3.1 Activities by Entity in the Imperial River Basin

3.1.1 City of Bonita Springs

Bonita Springs has two projects under way, as described below. These projects will be updated in future annual reports as "completed" once they are finished.

The Felts Avenue Bio-Reactor project (BS-9) will use wood chips in an anaerobic environment to strip nitrogen from incoming stormwater. The 40-acre watershed will be treated on a 2-acre site along Felts Avenue. This will be the first project of its type and size to be constructed in the southwest Florida region. Project design was completed in September 2016, and a construction contract was awarded in November 2016 for $596,382. Once construction is complete in 2017, the project will be comprehensively monitored at its inflow and outfalls to establish nutrient removal efficiencies.

The Pine Lake Preserve Rehydration project (BS-10, IR-LC-6) will rehydrate and re-establish hydraulic connectivity between the Imperial River and the undisturbed Corkscrew Regional Ecosystem Watershed (CREW) wetlands, which lie to the east of the preserve in the Corkscrew Swamp. Currently the 173-acre site, which has 2 shallow lakes onsite, is hydraulically disconnected from the wetlands situated to the north and east. The project will redirect flows south from a stormwater ditch on the northern boundary of the property, where the water will be routed through the 2 existing ponds on the property and then into the dry river tributary. In addition, a portion of the current flows from the Kehl Canal will be redirected into the natural flow-way.

This project is a joint venture between the Bonita Springs and Lee County. The Lee County Conservation 20/20 Program is overseeing the design and permitting of the project, as it lies on 20/20 conservation lands within city limits and the Imperial River BMAP area. Project design was completed in the summer of 2016. The project is currently in permitting with the SFWMD and U.S. Army Corps of Engineers (USACE). Construction is anticipated to begin in early fall of 2017.

3.1.2 Lee County

Lee County is undertaking the Pine Lake Preserve Rehydration Project with the City of Bonita Springs as described above.

Lee County rolled out an updated "Fertilize Smart" campaign entitled "Don't Feed the Monster" in 2014, and expanded this campaign in 2015. **Section 2.1.2** provides details on the campaign activity during the reporting period.

In November 2016, Lee County kicked off a new "call to action" by initiating a pet waste education campaign. Brochures, posters, and pet waste bags were distributed through veterinary clinics, pet stores, public education events, and included in Lee County Domestic Animal Services adoption kits. A campaign website was also created (see **Section 2.1.2**).

3.1.3 Agriculture

Based on the enrollment through September 30, 2016, 6,793 acres of the Imperial River Basin were covered by 15 NOIs issued by the OAWP (**Figure 5**).

Agricultural BMPs may or may not be implemented on all these acres because the NOIs may include nonproduction acres, such as buildings, parking lots, and fallow acres. Furthermore, this enrollment includes NOIs on lands not classified as agriculture. To estimate the actual agricultural acreage in the Imperial River Basin covered by the BMPs, FDACS used the 2004 SFWMD agricultural land use coverage, which was also used in the BMAP. Per this land use, 4,466 agricultural acres are enrolled in the FDACS BMP Program. This equates to enrollment of 68 % of the total agricultural acreage in the Imperial River Basin (according to the 2004 SFWMD land use coverage). **Table 4** lists the BMPs and the acreage covered by NOIs. **Table 5** summarizes BMP enrollment in the Imperial River Basin.

Table 4. Agricultural acreage, BMP enrollment, and future enrollment goals for the Imperial River Basin as of September 30, 2016

[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.
N/A = Not applicable

2004 SFWMD Land Use	2004 Acres	FDACS-Adjusted Acres for Enrollment[1]	Related FDACS BMP Programs	Acreage Enrolled	Related NOIs
Pasture	5,076.5	3,245.9	Cow/Calf, Vegetable and Agronomic Crops (hay)	88	2
Row/Field/Mixed Crops	5,098.8	2,535.3	Vegetable/Agronomic Crops	5,860.3	6
Fallow Cropland	319.4	N/A	N/A	N/A	N/A
Citrus	944.0	717.8	Statewide Citrus	756.1	2
Tree Nurseries	68.5	23.3	Future Nursery, Specialty Fruit and Nut	0.0	0
Ornamentals	67.7	51.7	Container Nursery	88.3	5
Specialty Farms	29.7	12.1	Conservation Plan Rule	N/A	N/A
Total	**11,605**	**6,586**		**6,793**	**15**

Table 5. Summary of BMP enrollment in the Imperial River Basin as of September 30, 2016

Category	Acres
Total Agricultural Acres in BMAP	11,605
FDACS-Adjusted Acres for Enrollment	6,586
BMAP Phase I FDACS Enrollment Goal (50%)	3,293
Enrolled Acres Used for TN Reduction Calculation	4,466
TN Reduction (lbs/yr)	11,034
BMAP Phase I Remaining Acres To Enroll	0
Total Remaining Acres To Enroll	**2,120**

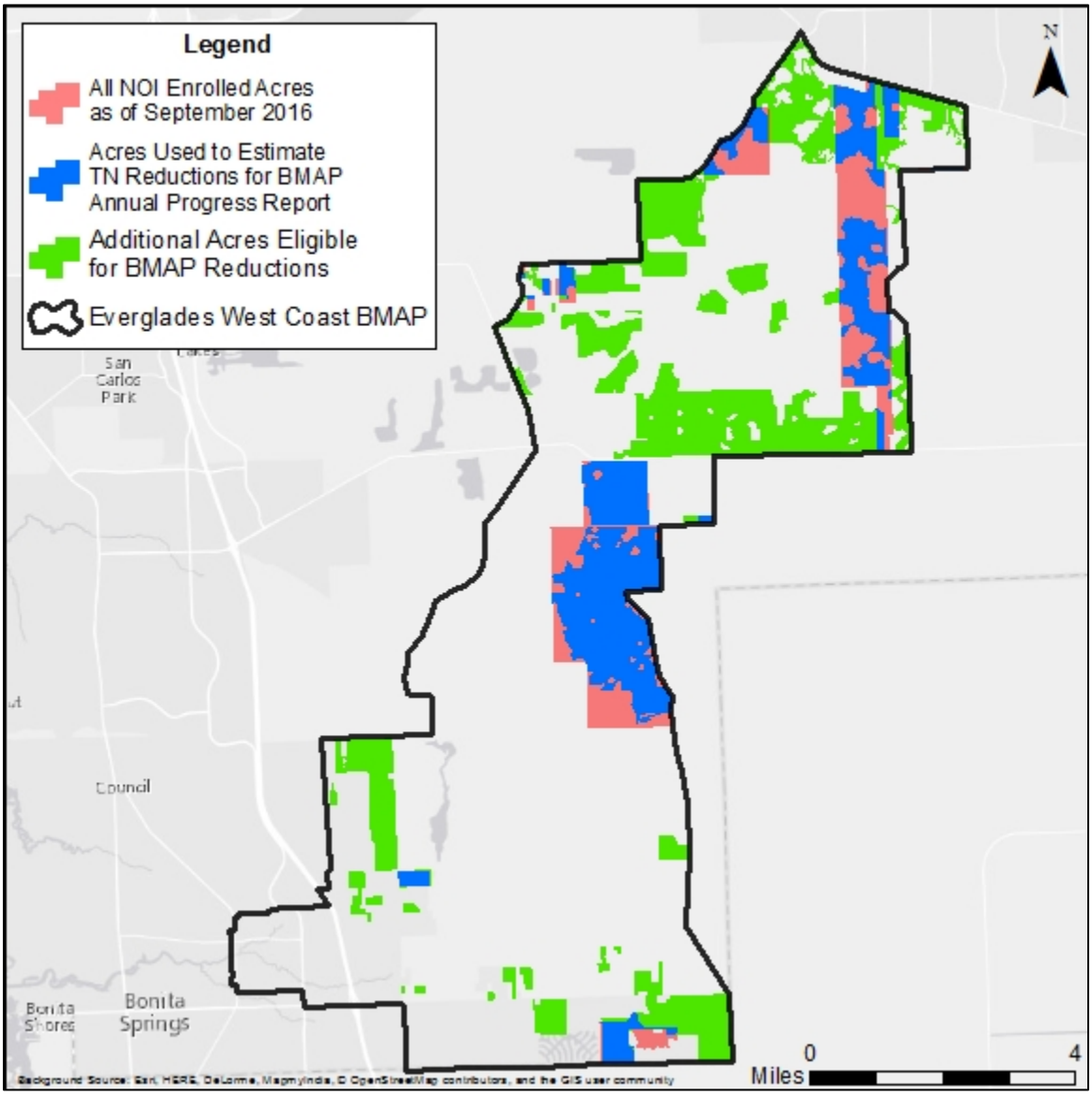

Figure 5. Agricultural acreage and BMP enrollment in the Imperial River Basin as of September 30, 2016

3.2 Summary of Load Reductions in the Imperial River Basin

Table 6 summarizes the projects completed in the Imperial River Basin during the fourth annual BMAP reporting period. The reduction credits associated with the City of Bonita Springs downtown drainage project are still being determined. The city's septic system removal project resulted in a reduction of 912 lbs/yr. The reductions are in addition to those projects given credit before BMAP adoption and listed in the 2013, 2014, and 2015 progress reports. Therefore, the total reductions to date are 15,738 lbs/yr of TN, or 26 % of the reductions needed to meet the TMDL.

Table 6. Summary of projects completed in the reporting period (December 1, 2015–November 30, 2016) in the Imperial River Basin

Entity	Project Number	Project Name	TN Reduction (lbs/yr)
City of Bonita Springs	BS-11	Downtown Redevelopment Drainage Project	To be determined
City of Bonita Springs	BS-12	Septic System Removal	912
		Total Reductions in Reporting Period	**912**

Figure 6 shows progress towards the TN TMDL load reductions. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current loading based on those projects listed as completed in the BMAP, those completed as part of the 2013, 2014, and 2015 Progress Reports, and those listed above. The third bar shows the total allocation for stormwater runoff to meet the TMDL.

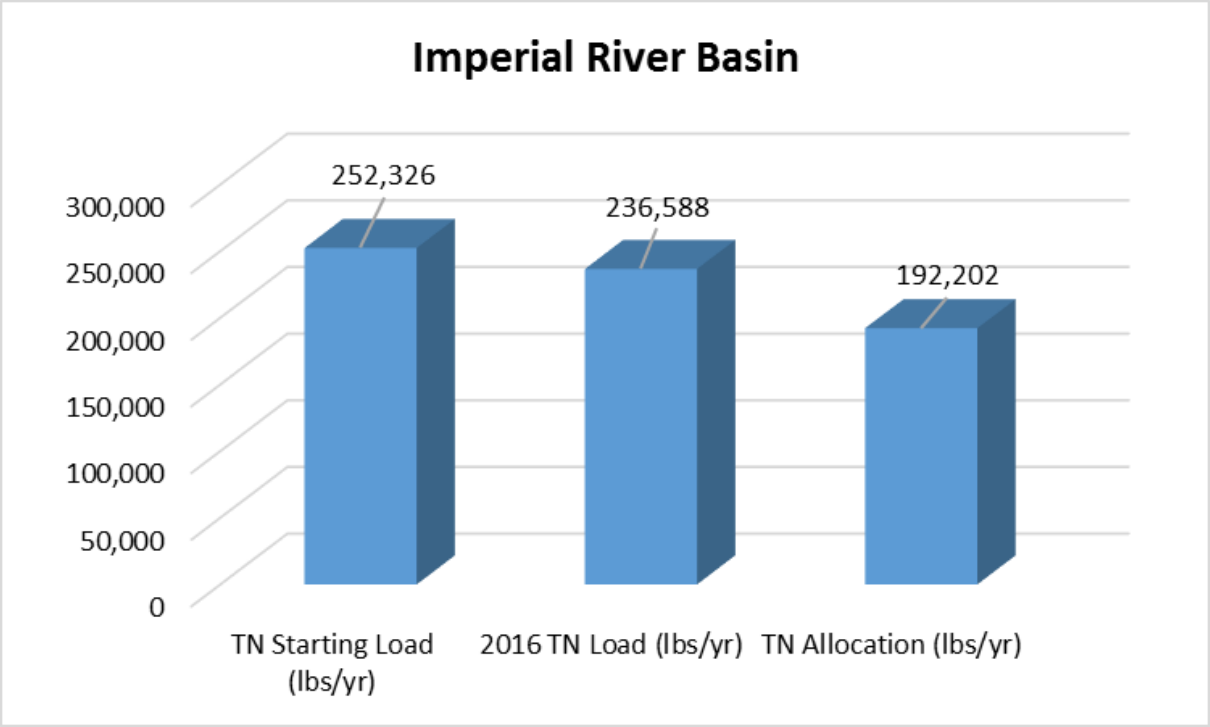

Figure 6. Progress towards the Imperial River TN TMDL through November 30, 2016

Section 4: Water Quality Monitoring

The Everglades West Coast BMAP monitoring plan was designed to enhance the understanding of basin loads, identify areas with high nutrient concentrations, and track water quality trends. The information gathered through the monitoring plan will measure progress towards achieving the TMDL and provide a better understanding of watershed loading. All responsible stakeholders participated in the monitoring plan in the fourth year of BMAP implementation.

In addition, Lee County, Catalina at Winkler Preserve CDD, Bonita Springs, and FDOT District 1 are regulated under Phase I municipal separate storm sewer system (MS4) permits. The Lee County Environmental Lab performs the ambient water quality monitoring program to support the Lee County Division of Natural Resources Surface Water Master Plan and for NPDES MS4 permit and BMAP compliance. The data are available to the Lee County NPDES co-permittees to use in their respective annual reports. A few highlights of the BMAP monitoring efforts are described below.

4.1 Hendry Creek Water Quality Monitoring

Lee County continued monitoring at 14 water quality stations in the basin, and data through October 31, 2016, are available in the Florida Storage and Retrieval (STORET) Database. At 4 of these stations, with the assistance of Estero Bay Aquatic Preserve staff and the Lee County Environmental Lab, the DEP South ROC collected data every other month. For these 4 stations, Lee County Environmental Lab analyzes the samples and uploads the data to STORET. **Table C-1** describes the monitoring network.

4.2 Imperial River Water Quality Monitoring

Lee County continued monitoring at five water quality stations in the basin, and data through October 2016 are available in the STORET database. Bonita Springs continued monitoring at seven water quality stations in the basin, and the data through August 2016 are uploaded to STORET. **Table C-2** describes the monitoring network.

4.3 Water Quality Data Evaluation

This section summarizes the data evaluation methodology used by DEP for the Everglades West Coast monitoring network, and summarizes some of the results from the evaluation. **Appendix D** contains further details on the data processing and trend analysis methodology.

This methodology may be the basis for future monitoring data evaluations and is intended to measure progress towards achieving the TMDL and provide a better understanding of watershed loading. Trend analyses were conducted on TN concentration data from stations within the Hendry and Imperial River Basin BMAP boundaries, using a variation of temporal and spatial attributes from the overall period of record (POR) of January 1, 2000, to January 1, 2017. **Table 7** lists the stations used for the analyses.

Trend analyses were conducted using three different approaches, as follows, based on the entire processed POR dataset:

- For each individual station and incorporating season (attributed to the month when the sample was collected) as a factor.
- Incorporating region as a factor (i.e., Hendry or Imperial as regions).
- Using data aggregated into annual geometric means (AGMs) and then analyzed with region as a factor.

Subsections 4.3.1 and **4.3.2** describe some results from the evaluation for Hendry Creek and Imperial River, respectively.

Table 7. Stations and data availability in STORET for Hendry Creek and Imperial River

Basin	Station	Tier	Period of Record
Hendry	HENDGR01	1	6/10/2010 – 2/16/2016
Hendry	HENDGR02	1	3/4/2003 – 2/16/2016
Hendry	HENDGR11A	1	7/22/2008 – 3/21/2016
Hendry	HENDGR30	1	1/13/2000 – 3/21/2016
Hendry	HENDGR40	1	8/14/2007 – 3/21/2016
Hendry	HENDGR41	1	10/19/2011 – 3/21/2016

Basin	Station	Tier	Period of Record
Imperial	IMPRGR80	1	1/15/2004 – 3/10/2016
Imperial	CBS 11	1	8/18/2009 – 3/17/2016
Imperial	CBS 18	1	10/26/2011 – 3/17/2016
Imperial	IMPRGR51	1	10/12/2011 – 3/10/2016
Imperial	IMPRGR90	1	8/30/2000 – 3/7/2016

4.3.1 Hendry Creek

Individual stations were analyzed for trends using Seasonal Mann-Kendall trend analysis. For the Hendry Creek BMAP stations, no significant trends in TN were found for Stations HENDGR01, HENDGR11A, HENDGR40, and HENDGR41. However, increasing trends were found for Stations HENDGR02and HENDGR30. **Table 8** summarizes the trend results on an individual station basis, and **Appendix D** provides more detailed results.

BMAP stations were also compiled into regions, and data were analyzed for trends using Regional Mann-Kendall trend analysis by assigning the data to either the Hendry Creek or Imperial River regions. For the Hendry Creek region, **Figure 7** shows the results of Regional Mann-Kendall trend analysis results using all data in their original collection frequency. The Hendry Creek data show an increasing trend for the region.

The Regional Mann-Kendall trend analysis was also performed using the data aggregated into AGMs on a calendar year (CY) and water year (WY) basis. Again, the data were assigned to either the Hendry Creek or Imperial River regions. Based on both CY and WY, an increasing trend was found for the Hendry Creek region. **Table 10** summarizes all the Regional Mann-Kendall trend results for Hendry Creek.

4.3.2 Imperial River

Based on the Imperial River BMAP stations' seasonal trend analysis results, Station IMPRGR51 had a statistically significant decreasing trend. However, Stations IMPRGR80, IMPRGR90, CBS 11, and CBS 18 all had increasing trends. **Table 9** summarizes the trend results for Imperial River on an individual station basis.

When all data were analyzed for trends in their original collection frequency using Regional Mann-Kendall trend analysis, no significant trend was found for the Imperial River region (**Figure 8**). The Regional Mann-Kendall trend analysis was also performed using the data aggregated into AGMs on a CY and WY basis. No significant trend was found for Imperial River based on CY. However, an increasing trend was found for Imperial River based on WY. **Table 11** summarizes the Regional Mann-Kendall trend results for Imperial River.

Table 8. Seasonal Mann-Kendall TN trend analysis results for Hendry Creek individual stations

* P-values for significant trends are indicated by a shaded cell and boldface type.

Assigned WBID	Station	POR Start	POR End	N (# of Samples)	Tau	P-value*	Slope	Trend Test Interpretation
3258B2	HENDGR01	6/10/2010	2/16/2016	25	-0.150	0.512	-0.000054	No significant trend
3258B2	HENDGR02	3/4/2003	2/16/2016	115	0.185	**0.021**	0.000062	Increasing trend
3258B2	HENDGR11A	7/22/2008	3/21/2016	64	-0.165	0.161	-0.000107	No significant trend
3258B2	HENDGR30	1/13/2000	3/21/2016	202	0.151	**0.004**	0.000047	Increasing trend
3258B2	HENDGR40	8/14/2007	3/21/2016	102	-0.117	0.144	-0.000065	No significant trend
Not assigned	HENDGR41	10/19/2011	3/21/2016	52	-0.261	0.055	-0.000175	No significant trend

Table 9. Seasonal Mann-Kendall TN trend analysis results for Imperial River individual stations

* P-values for significant trends are indicated by a shaded cell and boldface type.

Assigned WBID	Station	POR Start	POR End	N (# of Samples)	Tau	P-value*	Slope	Trend Test Interpretation
3258EA	IMPRGR51	10/12/2011	3/10/2016	53	-0.413	**0.002**	-0.000385	Decreasing trend
3258EA	IMPRGR80	1/15/2004	3/10/2016	147	0.305	**<0.00001**	0.000154	Increasing trend
3258EA	IMPRGR90	8/30/2000	3/7/2016	83	0.317	**0.0005**	0.000126	Increasing trend
3258EA	CBS 11	8/18/2009	3/17/2016	67	0.261	**0.019**	0.000052	Increasing trend
3258EA	CBS 18	10/26/2011	3/17/2016	41	0.379	**0.021**	0.000089	Increasing trend

Table 10. Regional Mann-Kendall TN trend analysis results for Hendry Creek

* P-values for significant trends are indicated by a shaded cell and boldface type.

Data Type	Period	Region	POR Start	POR End	N (# of Samples)	Tau	P-value*	Slope	Trend Test Interpretation
All Points	Varying Frequencies	Hendry	1/13/2000	3/21/2016	759	0.188	**<0.00001**	0.000071	Increasing trend overall
AGM	CY	Hendry	1/13/2000	3/21/2016	17	0.515	**0.005**	0.032702	Increasing trend overall
AGM	WY	Hendry	1/13/2000	3/21/2016	17	0.603	**0.0008**	0.047761	Increasing trend overall

Table 11. Regional Mann-Kendall TN trend analysis results for Imperial River

* P-values for significant trends are indicated by a shaded cell and boldface type.

Data Type	Period	Region	POR Start	POR End	N (# of Samples)	Tau	P-value*	Slope	Trend Test Interpretation
All Points	Varying Frequencies	Imperial	8/30/2000	3/17/2016	547	0.039	0.171	0.000010	No significant trend overall
AGM	CY	Imperial	8/30/2000	3/17/2016	17	0.279	0.128	0.025399	No significant trend overall
AGM	WY	Imperial	8/30/2000	3/17/2016	16	0.383	**0.049**	0.028500	Increasing trend overall

4.4 Groundwater Nutrient Study

A study was completed to help understand the sources of nitrogen in the basin, including groundwater contribution and source identification. A network of 30 shallow water wells was established throughout 4 basins, 2 of which are in the Everglades West Coast BMAP area. Nine quarterly samples were collected for 15 different parameters.

The results were compiled into a report by the DEP Site Investigation Section. Based on the results of these nine sampling events, DEP will determine whether sampling should continue using the same network of sites, whether the network should be revised and sampling should continue, or whether enough information is currently available and the sampling can be discontinued.

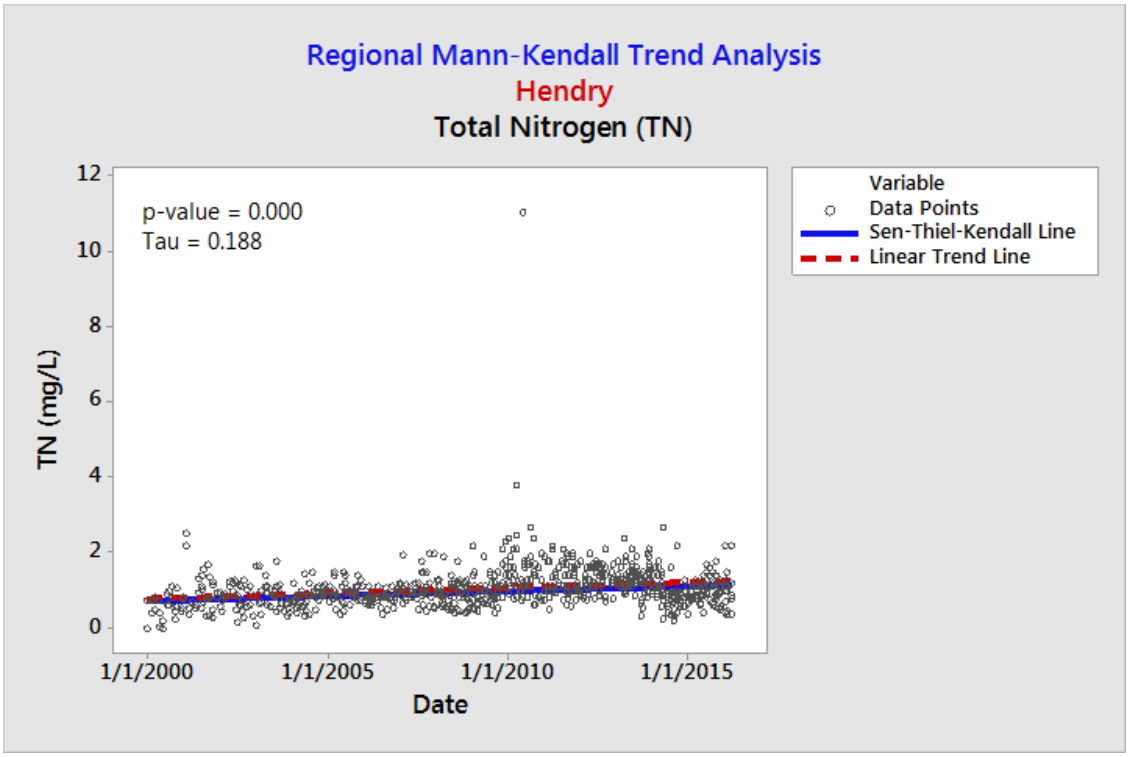

Figure 7. Regional Mann-Kendall TN trend analysis for the Hendry region

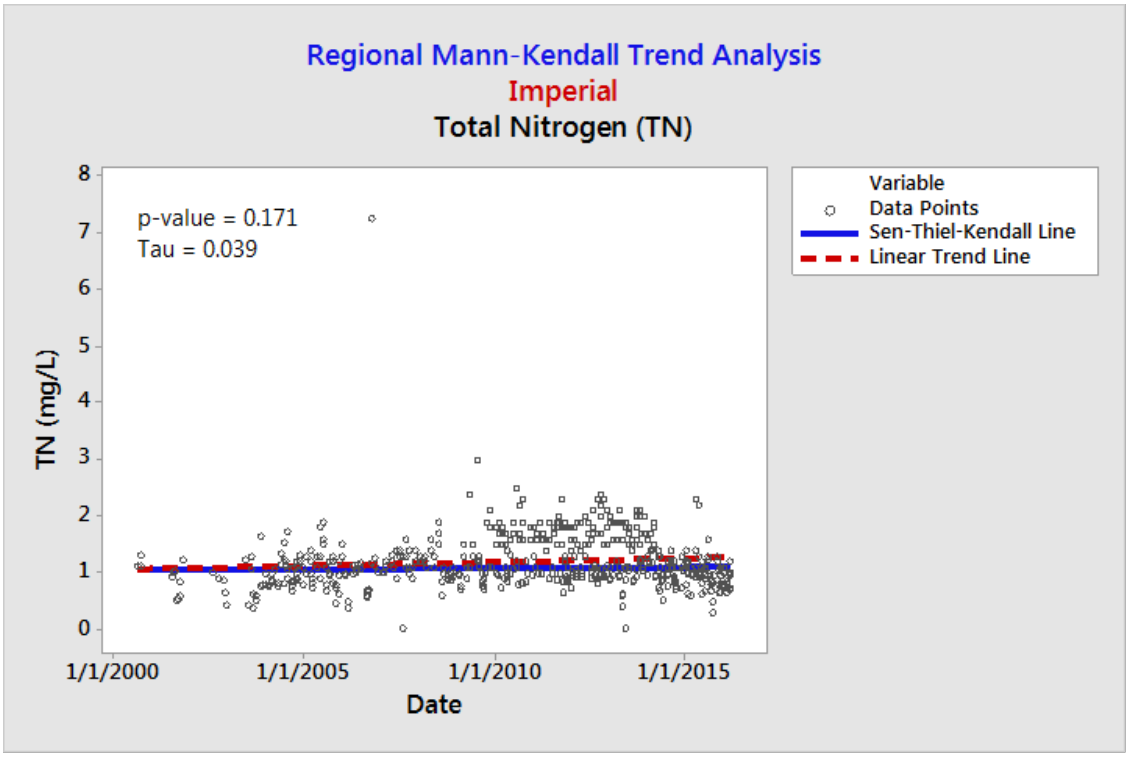

Figure 8. Regional Mann-Kendall TN trend analysis for the Imperial region

Section 5: Compliance

DEP annually reviews each entity's progress towards completing projects in the BMAP and achieving the assigned allocations. **Table 12** and **Table 13** outline the number of projects that each entity has committed to in the BMAP and annual reports, along with the status of those projects. and **Table 14** and **Table 15** summarize the allocations and reductions achieved by each entity in the BMAP.

Table 12. Projects to achieve the TMDL in the Hendry Creek Basin

Lead Entity	Projects	Completed	Underway	Planned
FDACS	1	1		
FDOT	4	4		
Lee County	6	4		2
Total	**11**	**9**	**0**	**2**

Table 13. Projects to achieve the TMDL in the Imperial River Basin

Lead Entity	Projects	Completed	Underway	Planned
City of Bonita Springs	12	10	2	
FDACS	1	1		
FDOT	3	3		
Lee County	6	5	1	
Total	**22**	**19**	**3**	**0**

Table 14. Reductions towards the TMDL in the Hendry Creek Basin

* Reduction to date only includes TN reductions associated with projects completed as of the end of the reporting period (November 30, 2016).

Lead Entity	Required TN Reduction (lbs/yr)	TN Reduction to Date* (lbs/yr)	% of Required Reduction Achieved
FDACS	173	78	45
FDOT	63	160	254
Lee County	10,084	6,680	66
Total	**10,320**	**6,918**	**67**

Table 15. Reductions towards the TMDL in the Imperial Basin

* Reduction to date only includes TN reductions associated with projects completed as of the end of the reporting period (November 30, 2016).

Lead Entity	Required TN Reduction (lbs/yr)	TN Reduction to Date* (lbs/yr)	% of Required Reduction Achieved
City of Bonita Springs	9,903	3,086	22
FDACS	48,570	11,034	23
FDOT	95	21	22
Lee County	1,556	1,597	103
Total	**60,124**	**15,738**	**26**

Appendices

Appendix A: BMAP Projects

The BMAP project tables in this appendix show the implementation status as of November 30, 2016. The tables provide information on the nutrient reduction attributed to each individual project 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. However, this list of projects is meant to be flexible enough to allow for changes that may occur over time, provided the reduction is still met within the specified period.

Table A-1. Lee County projects in the Hendry Creek Basin

N/A = Not applicable

Project Number	Project Name	Description	Project Type	Project Status	Acres Treated	TN Reduction (lbs/yr)
HC-LC-1	Lakes Park Water Quality Restoration	Retrofit Lakes Park to improve water quality of stormwater runoff by routing flows through created filter marsh system.	Filter Marsh	Completed	1,749	4,533
HC-LC-2	Street Sweeping	Street sweeping.	Street Sweeping	Ongoing	N/A	167
HC-LC-3	Education/ Fertilizer Ordinance	Public education on implementation of adopted fertilizer ordinance.	Public Education	Ongoing	N/A	1,980
HC-LC-4	Island Park Filter Marsh	Wetland creation and enhancement that included exotics removal, filter marsh creation, and native replanting.	Filter Marsh	Completed	160	TBD
HC-LC-5	Lakes Park Littoral Zone Project	Creation of littoral shelves with native plantings for nutrient uptake.	Filter Marsh	Planned	37.1	TBD
HC-LC-6	Hendry Creek West Branch Restoration	Create filter marsh on 11-acre site.	Filter Marsh	Planned	9.3	TBD

Total TN Reduction = 6,680 lbs/yr

Total TN Reduction Required = 10,084 lbs/yr

Table A-2. FDOT projects in the Hendry Creek Basin

N/A = Not applicable

Project Number	Project Name	Description	Project Type	Project Status	Acres Treated	TN Reduction (lbs/yr)
HC-FDOT-1	Wet Detention Ponds (1, 2, and 3)	Wet detention.	Wet Detention Pond	Completed	89	105
HC-FDOT-2	Roadside Swales	Swale with ditch blocks.	Grass Swales With Swale Blocks	Completed	N/A	TBD
HC-FDOT-3	Street Sweeping	Arterial road and bridge sweeping.	Street Sweeping	Ongoing	N/A	52
HC-FDOT-4	Education Efforts	Pamphlets, PSAs, illicit discharge program.	Public Education	Ongoing	N/A	3

Total TN Reduction = 160 lbs/yr
Total TN Reduction Required = 63 lbs/yr

Table A-3. FDACS NOI enrollment reduction in the Hendry Creek Basin as of September 2016

2004 SFWMD Land Use Acres with NOIs	Acreage	TN Load Delivered (lbs/yr)	TN Reduction (%)	TN Reduction (lbs/yr)
Nurseries	27	276	28	78
Total	**27**	**276**	**28**	**78**

Total TN Reduction Required = 173 lbs/yr

Table A-4. Lee County projects in the Imperial River Basin

N/A = Not applicable

Project Number	Project Name	Description	Project Type	Project Status	Acres Treated	TN Reduction (lbs/yr)
IR-LC-1	CREW	Land purchase and conversion to conservation land use.	Land Acquisition	Completed	15	0
IR-LC-2	Pine Lake Preserve	Land purchase and conversion to conservation land use.	Land Acquisition	Completed	129	1
IR-LC-3	Street Sweeping	Street sweeping.	Street Sweeping	Ongoing	N/A	150
IR-LC-4	Imperial Marsh	Land purchase and conversion to conservation land use.	Land Acquisition	Completed	477	1,440
IR-LC-5	Education/Fertilizer Ordinance	Public education on implementation of adopted fertilizer ordinance.	Public Education	Ongoing	N/A	6
IR-LC-6	Pine Lake Preserve Rehydration	Joint project with Bonita Springs to rehydrate and re-establish hydraulic connectivity between Imperial River and undisturbed CREW wetlands that lie east of preserve in Corkscrew Swamp.	Hydrologic Restoration	Underway	173	TBD

Total TN Reduction = 1,597 lbs/yr

Total TN Reduction Required = 1,556 lbs/yr

Table A-5. Bonita Springs projects in the Imperial River Basin

N/A = Not applicable
TBD = To be determined

Project Number	Project Name	Description	Project Type	Project Status	Acres Treated	TN Reduction (lbs/yr)
BS-1	Fertilizer Ordinance	Fertilizer ordinance.	Ordinance	Ongoing	N/A	696
BS-2	Florida Yards and Neighborhoods (FYN) Program	Education program using FYN Program.	Public Education	Ongoing	N/A	835
BS-3	Old 41 Catch Basin Inserts	Catch basin inserts.	Catch Basin Inserts	Completed	21	5
BS-4	Residential Dry Detention	Dry detention.	Dry Detention Pond	Completed	4	1
BS-5	Morton Avenue Swales	Dry retention.	Grass Swales With Swale Blocks	Completed	26	212
BS-6	Marni Fields	Dry detention.	Dry Detention Pond	Completed	16	6
BS-7	Felts Avenue Stormwater Treatment	Dry detention.	Dry Detention Pond	Completed	31	258
BS-8	Street Sweeping	Monthly street sweeping.	Street Sweeping	Ongoing	N/A	161
BS-9	Felts Avenue Bioreactor Project	Use wood chips in anaerobic environment to strip nitrogen from incoming stormwater.	Stormwater System Upgrade	Underway	40	TBD
BS-10	Pine Lake Preserve Rehydration Project	Joint project with Lee County to rehydrate and re-establish hydraulic connectivity between Imperial River and undisturbed CREW wetlands that lie east of preserve in Corkscrew Swamp.	Hydrologic Restoration	Underway	173	TBD
BS-11	Downtown Redevelopment Drainage	Created two miles of interconnected drainage infrastructure to improve water quality through use of exfiltration trenches.	BMP Treatment Train	Completed	83.3	TBD
BS-12	Septic System Removal	Conversion of septic systems to central sewer.	Wastewater Service Area Expansion	Completed	N/A	912

Total TN Reduction = 3,086 lbs/yr
Total TN Reduction Required = 9,903 lbs/yr

Table A-6. FDOT projects in the Imperial River Basin

N/A = Not applicable

Project Number	Project Name	Description	Project Type	Project Status	Acres Treated	TN Reduction (lbs/yr)
IR-FDOT-1	Wet Detention Ponds (5D, 7C, and 9B)	Wet detention.	Wet Detention Pond	Completed	96	18
IR-FDOT-2	Roadside Swales	Swale with ditch blocks.	Grass Swales With Swale Blocks	Completed	N/A	TBD
IR-FDOT-3	Education Efforts	Pamphlets, PSAs, illicit discharge program.	Public Education	Ongoing	N/A	3

Total TN Reduction = 21 lbs/yr

Total TN Reduction Required = 95 lbs/yr

Table A-7. FDACS NOI enrollment reduction in the Imperial River Basin as of September 2016

2004 SFWMD Land Use Acres with NOIs	Acreage	TN Load Delivered (lbs/yr)	TN Reduction (%)	TN Reduction (lbs/yr)
Citrus	587	6,074	10	607
Row/Field/Mixed Crops	2,762	28,595	30	8,517
Pasture	1,073	11,105	16	1,797
Ornamentals	26	266	25	66
Tree Nurseries	18	185	25	46
Total	**4,466**	**46,225**	**24 %**	**11,034**

Total TN Reduction Required = 48,570 lbs/yr

Appendix B: Future BMAP Projects

In accordance with Chapter 2016-1, Laws of Florida, every new and revised BMAP will be required to include more detailed project information than is currently included in BMAPs and annual updates. The new and revised BMAPs will include the following:

- A ranked list of projects with a planning-level cost estimate and estimated date of completion for each project.
- The source and amount of financial assistance to be made available by DEP, a water management district, or other entity for each project, if applicable.
- A planning-level estimate of each project's expected load reduction, if applicable.

As a first step towards compiling these project lists, DEP is requesting information from stakeholders on future projects with the potential for additional load reductions in the basin. Funding has not yet been identified for many of these future projects, and the continued funding of projects is a key part of meeting reductions required to achieve the TMDL. A table of these projects will be included in this appendix as project collection and verification efforts are refined.

Appendix C: BMAP Monitoring Network

The monitoring stations listed in this appendix are separated into a tiered sampling design, as follows:

- **Tier 1:** Stations listed in the BMAP monitoring plan as essential and mandatory for tracking water quality trends in Hendry Creek and stations that document watershed reductions. Stations should be sampled monthly for all core parameters. Sampling stations, parameters, frequency, and other elements of this strategy may be modified as appropriate to match changing environmental conditions and funding resources. However, any modifications made must not affect the ability of the monitoring network to fulfill its objectives.

- **Tier 2:** Stations that are currently sampled either in the BMAP basin or in a tributary contributing to the overall load. These stations will help in the understanding of the total load in the watershed, and DEP supports the continued monitoring.

Table C-1. Hendry Creek Basin BMAP monitoring network

* Station currently listed as an NPDES outfall station; the station data will not be included in any ambient monitoring analysis.
** Station will continue to be sampled only every other month.

Agency	Tier	NPDES Outfall*	Type	Station ID	Latitude	Longitude
DEP and Lee County	1	No	River	HENDGR01**	26.487611	-81.882200
DEP and Lee County	1	No	River	HENDGR02**	26.513306	-81.879472
Lee County	1	No	Watershed	ISPARK02	26.487800	-81.868667
Lee County	1	No	Watershed	ISPARK01	26.495382	-81.868251
Lee County	1	No	River	HENDGR30	26.521056	-81.883313
Lee County	1	No	Watershed	HENDGR11A	26.520320	-81.868830
Lee County	1	No	Watershed	HENDGR40	26.524912	-81.889642
Lee County	1	No	Watershed	HENDGR41	26.527736	-81.887210
DEP and Lee County	2	No	River-Mullock	MULLGR01**	26.464722	-81.865778
DEP and Lee County	2	No	River-Mullock	MULLGR02**	26.470583	-81.855917
Lee County	2	No	River-Ten Mile	10MIGR10	26.481002	-81.854534
Lee County	2	No	Watershed-Mullock	46B-9GR	26.475382	-81.836718
Lee County	2	No	Estero Bay	EB-12	26.450780	-81.870810

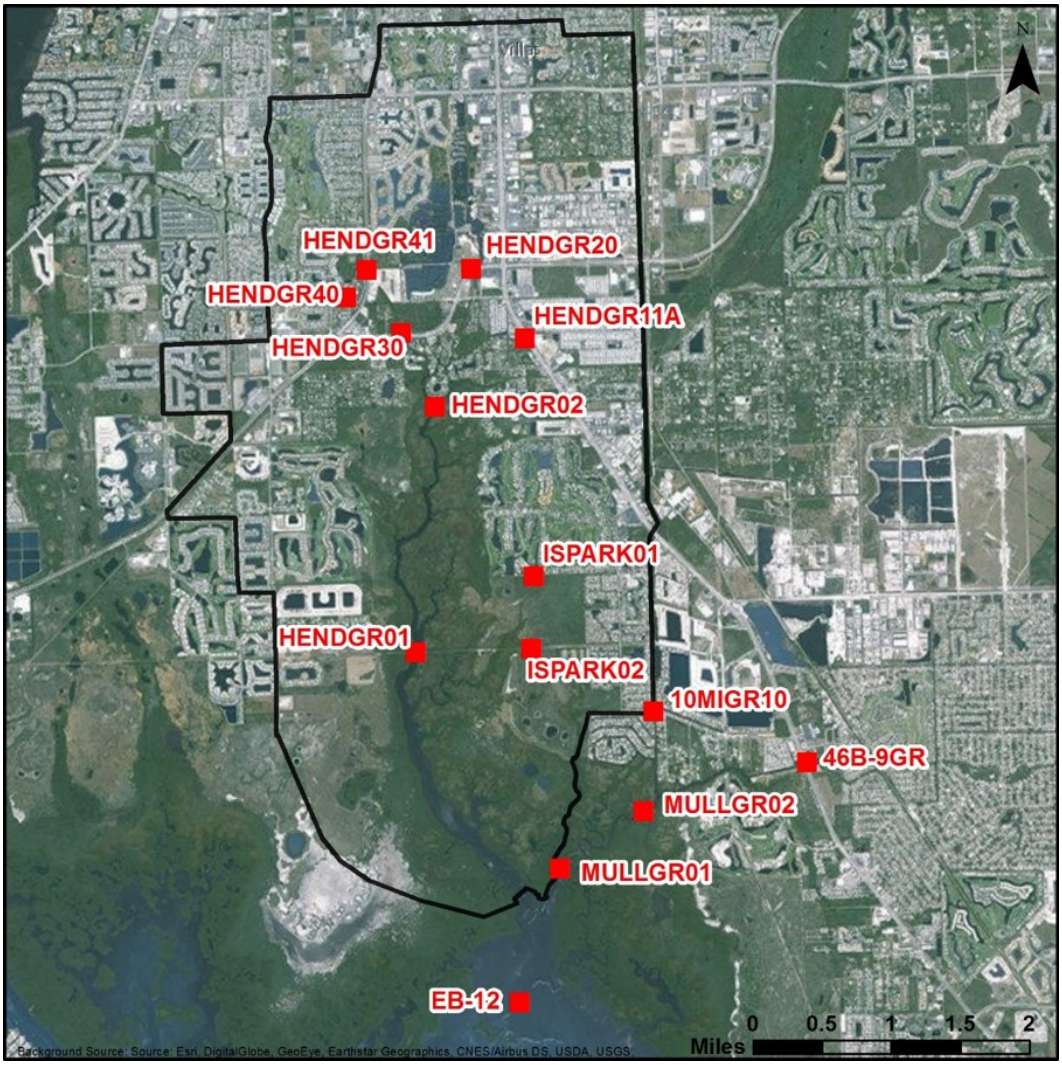

Figure C-1. Hendry Creek Basin monitoring network

Table C-2. Imperial River Basin BMAP monitoring network

* Station currently listed as an NPDES outfall station. The station data will not be included in any ambient monitoring analysis.
** Station will continue to be sampled only bimonthly.

Agency	Tier	NPDES Outfall*	Type	Station ID	Latitude	Longitude
Bonita Springs	1	No	River	CBS 11	26.340214	-81.771017
Bonita Springs	1	Yes	Watershed	CBS 14*	26.342506	-81.777969
Bonita Springs	1	No	River	CBS 18	26.342829	-81.778696
Lee County	1	No	Watershed	IMPRGR90**	26.451321	-81.691111
Lee County	1	No	River -Leitner Creek	IMPRGR51	26.343744	-81.777744
Lee County	1	No	River	IMPRGR80	26.335865	-81.749360
Bonita Springs	2	No	River- Marine	CBS 9	26.344014	-81.780656
Lee County	2	No	River -Oak Creek	IMPRGR41	26.338919	-81.786250

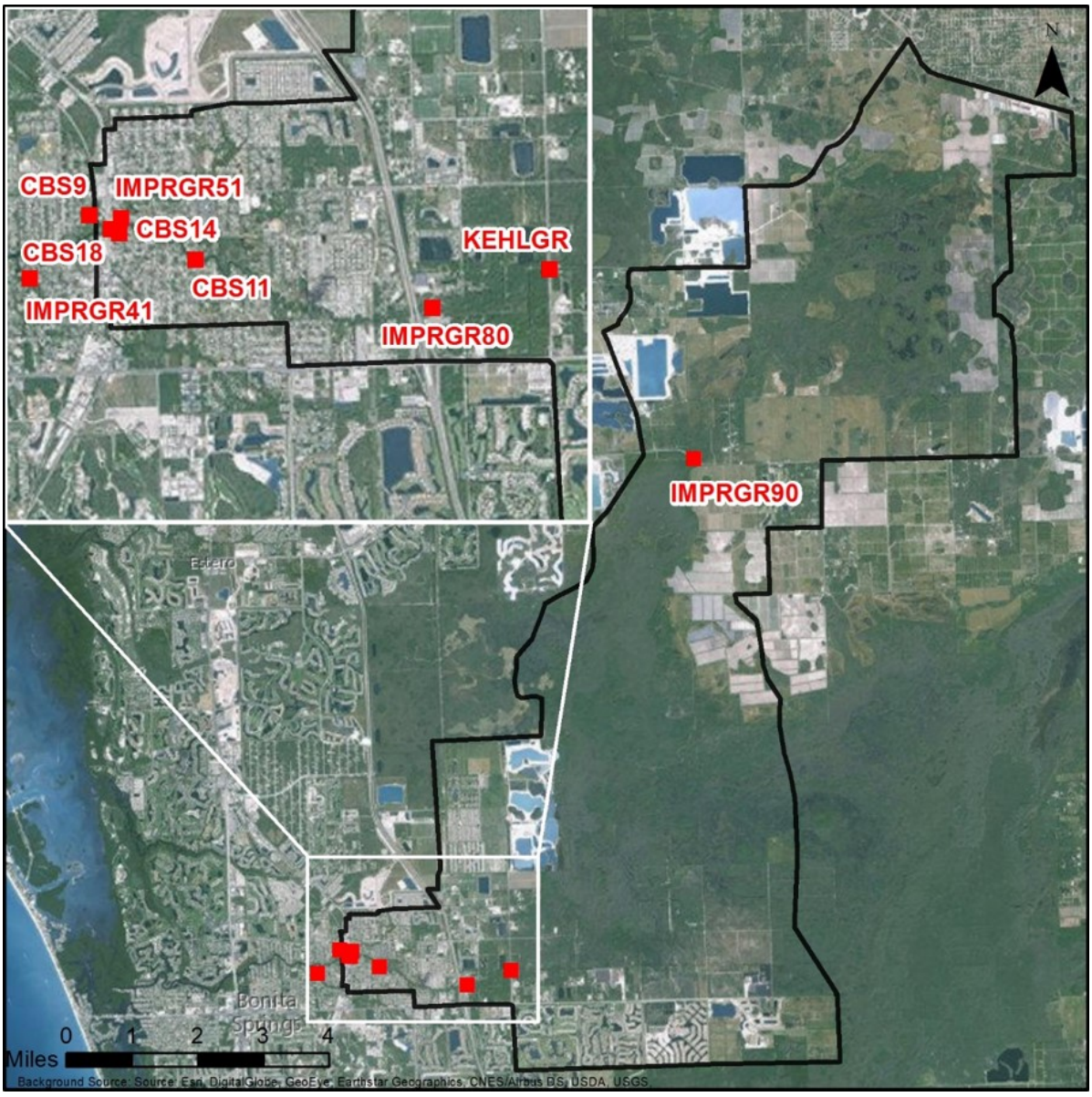

Figure C-2. Imperial River Basin monitoring network

Appendix D: Water Quality Data Evaluation

Methodology

This appendix describes the methodology for a data evaluation conducted by DEP for the Everglades West Coast monitoring network, and describes the results of the evaluation. This methodology may be the basis for future monitoring data evaluations and is intended to measure progress towards achieving the TMDL and provide a better understanding of watershed loading.

Trend analyses were conducted on available nitrogen data from stations within the Hendry Creek and Imperial River Basin BMAP boundaries using a variation of temporal and spatial attributes from the overall POR of January 1, 2000, to January 1, 2017. **Table 7** lists the stations that were used for analyses with their respective PORs of data availability in STORET. TN concentration data were downloaded from STORET and processed for trend analyses.

Nonparametric statistical techniques were used to identify monotonic trend analyses in a statistically rigorous way with the Seasonal Mann-Kendall and Regional Mann-Kendall trend tests. Data are not required to conform to a particular distribution for nonparametric analyses. Nonparametric tests are also robust against outliers and large data gaps, which were evident in some of the datasets.

Trend analyses were conducted using (1) the entire processed POR dataset for each individual station incorporating season (attributed to the month that the sample was collected) as a factor, (2) the entire processed POR dataset for each basin incorporating region as a factor (i.e., Hendry or Imperial as regions), and (3) the entire processed POR dataset using data aggregated into AGMs and then analyzed with region as a factor.

Stations were defined as one of two regions, either Hendry Creek or Imperial River. AGMs were calculated and analyzed using both CY and WY. For all Mann-Kendall tests, statistical results were considered significant if the p-value was less than 0.05 ($p\text{-value} < 0.05$). The strength of the trend analysis result is described as the correlation coefficient, or tau for the Mann-Kendall test, which represents how TN concentration and time tend to change together over the established POR. If the result is statistically significant ($p\text{-value} < 0.05$), then a negative value of tau represents a downward or decreasing trend indicating improvement, and a positive tau value suggests an increasing or upward trend, or a continuing decline in water quality conditions.

Data Distribution To Assess Seasonal Variation

Upon examination of the data retrieved from STORET that were used for seasonal trend analyses, it was found that the available data were unevenly distributed. While some sites had regular data collection frequencies over the entire POR, others had irregular frequencies that led to issues with performing the seasonal trend analyses. A minimum of three data points per season (or month in this case) must be included in the overall POR dataset for the test to be valid. If this requirement is not met, then these data must be removed from the dataset and not used in the analysis.

Figure D-1 shows an example of the uneven distribution of data collection. Station IMPRGR90 dataset records were dominated by samples collected during the wet season between July and October. In this case, sufficient samples were not available in each month to meet the test requirements. Therefore, it was necessary to shift the seasonal assignment for months that did not have enough data points to another season to obtain a minimum of three data points per season to run the analysis.

In addition, the majority of the data points were collected during the wet season, underrepresenting the dry season months and causing the dataset to be overweighted by the wet season. This type of data distribution is not representative of the annual cycle of ambient conditions and could skew the data and bias the results.

Figure D-2 depicts an even distribution in each season over the POR but with gaps every other month, creating only six seasons for the analyses, which is appropriate and meets the requirements of seasonal trend analyses.

Figure D-3 shows an even distribution of data across all seasons (months), representing the variability of each season within the overall POR, which is an important aspect for seasonal trend analyses.

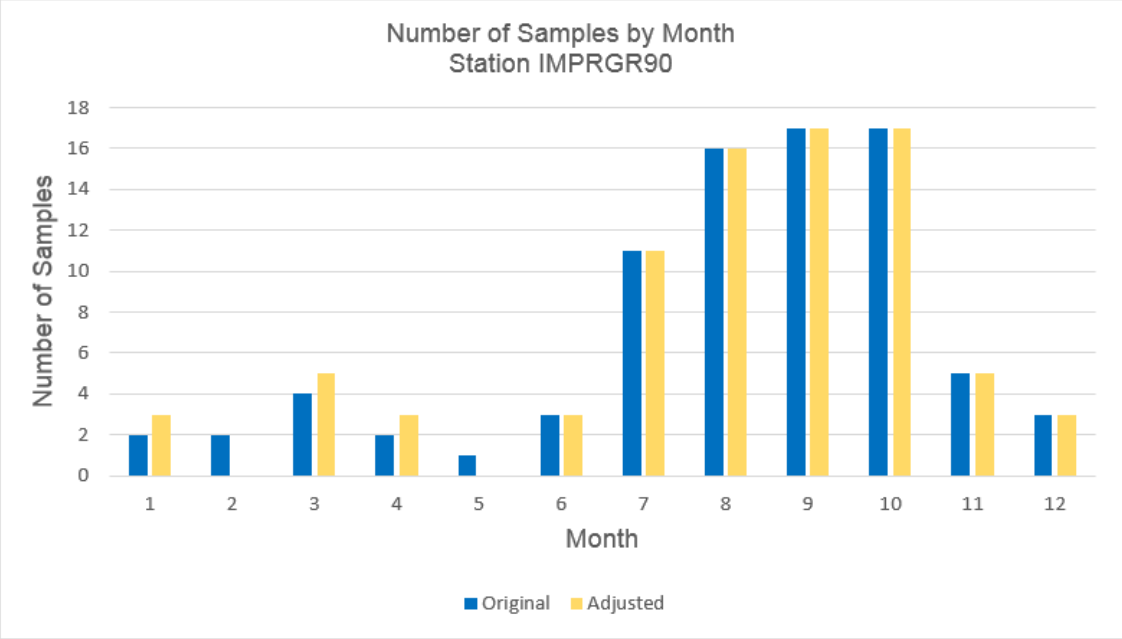

Figure D-1. Example of uneven distribution of samples per season (month) for Station IMPRGR90

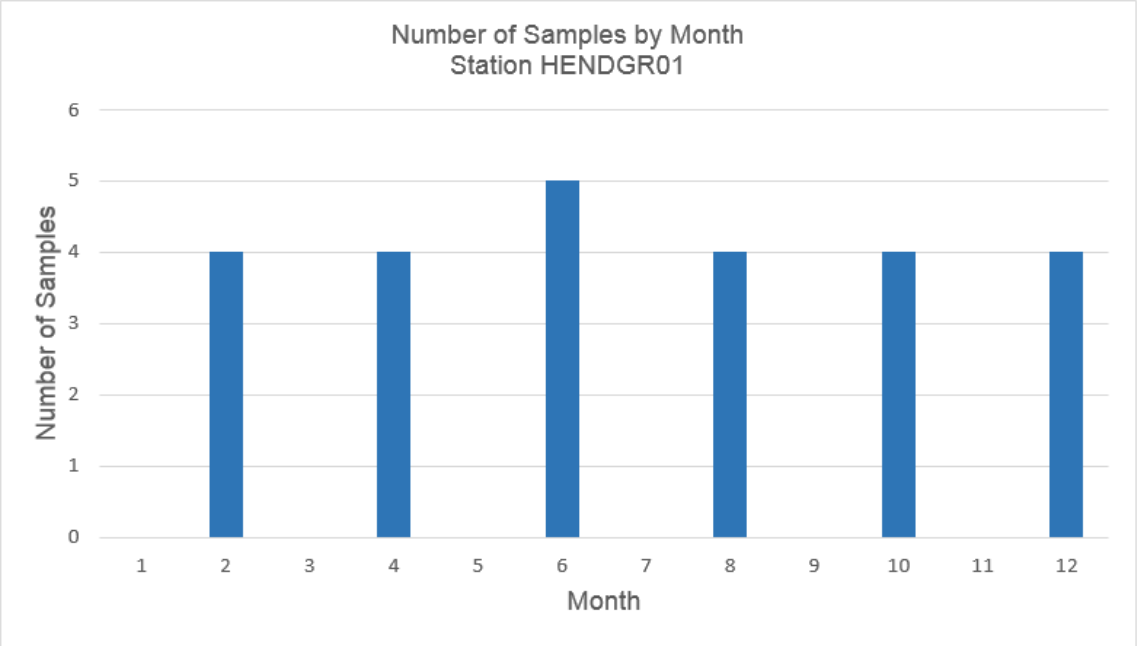

Figure D-2. Example of even distribution of samples per season (month) for Station HENDGR01

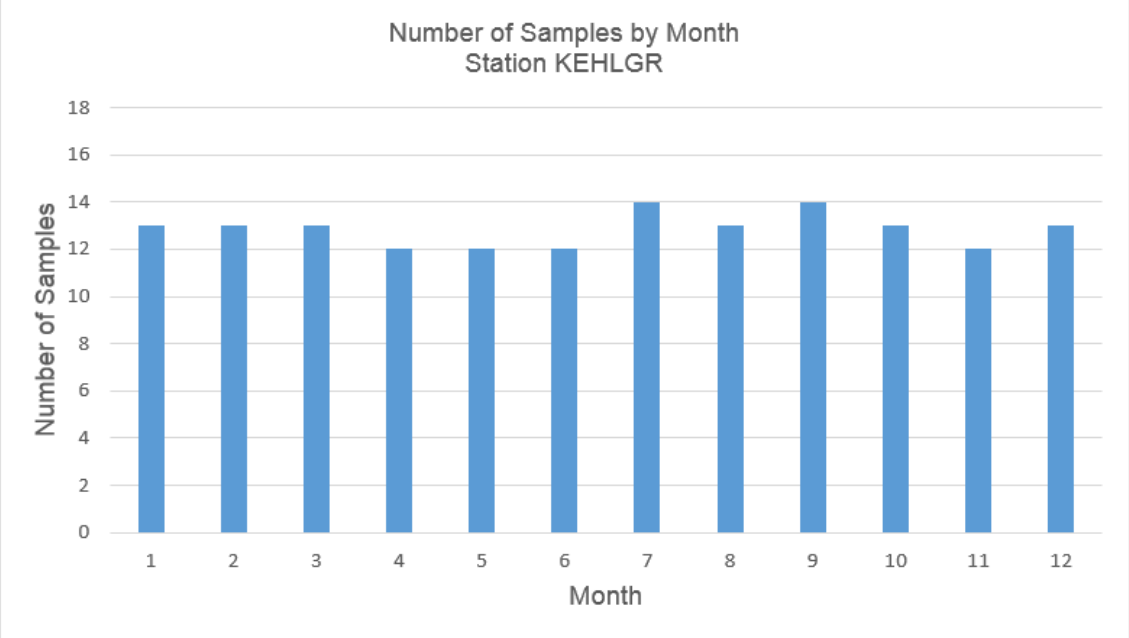

Figure D-3. Example of even distribution of samples per season (month) for Station KEHLGR

Individual Station Seasonal Mann-Kendall Trend Results

Individual stations were first analyzed for trends using Seasonal Mann-Kendall trend analysis. Most station data were distributed monthly or bimonthly (i.e., every other month). Data were assigned to the respective month as the "season." In a few circumstances, if there were only one or two data points in a certain month in the dataset over the entire POR, then those data were reassigned to either the month before or the month after, if applicable. Otherwise, if sufficient data were not available in the month prior to or after the month in question, then the data were removed from the analysis because the requirements of the Seasonal Mann-Kendall test could not be met without the minimum number of data points in each season over the POR.

For the Hendry Creek BMAP stations, **Figure D-4** through **Figure D-9** show the individual station seasonal trend analysis results. As shown in **Figure D-4, Figure D-6, Figure D-8**, and **Figure D-9**, no significant trends were found for Stations HENDGR01, HENDGR11A, HENDGR40, and HENDGR41. However, as shown in **Figure D-5** and **Figure D-7**, increasing trends were found for Stations HENDGR02 and HENDGR30.

Figure D-10 through **Figure D-14** show the Imperial River BMAP stations seasonal trend analysis results. As shown in **Figure D-10**, Station IMPRGR51 had a statistically significant decreasing trend. However, Stations IMPRGR80, IMPRGR90, CBS 11, and CBS 18, as shown in **Figure D-11** through **Figure D-14**, all had increasing trends. **Table 8** and **Table 9** summarize the trend results on an individual station basis.

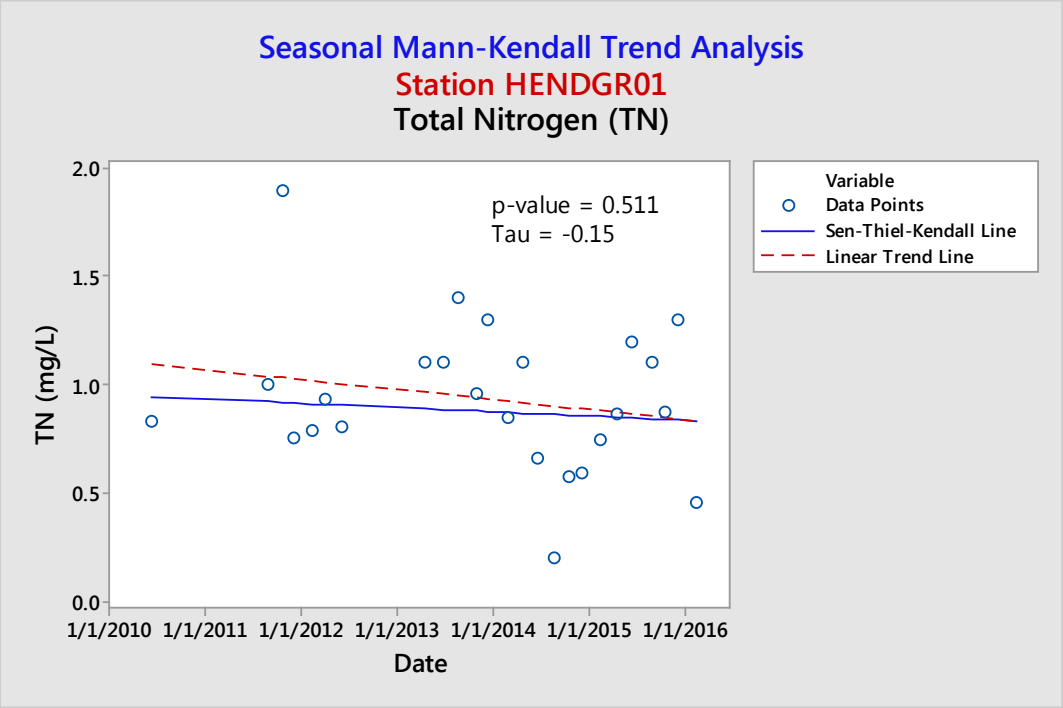

Figure D-4. Station HENDGR01 Seasonal Mann-Kendall trend analysis for TN

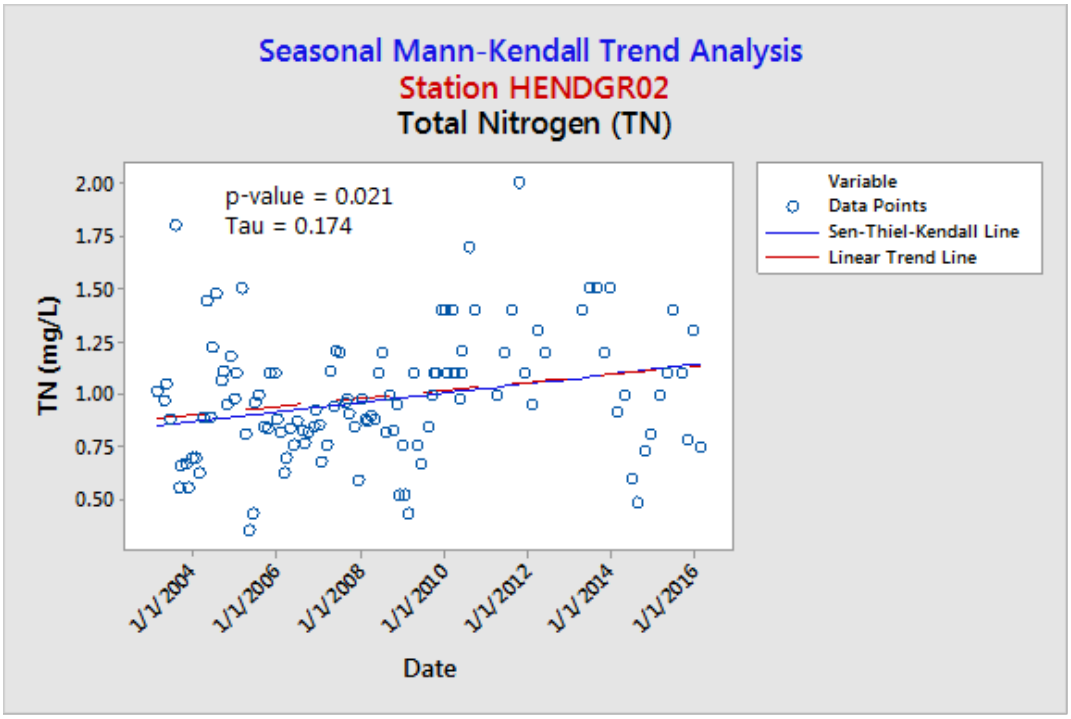

Figure D-5. Station HENDGR02 Seasonal Mann-Kendall trend analysis for TN

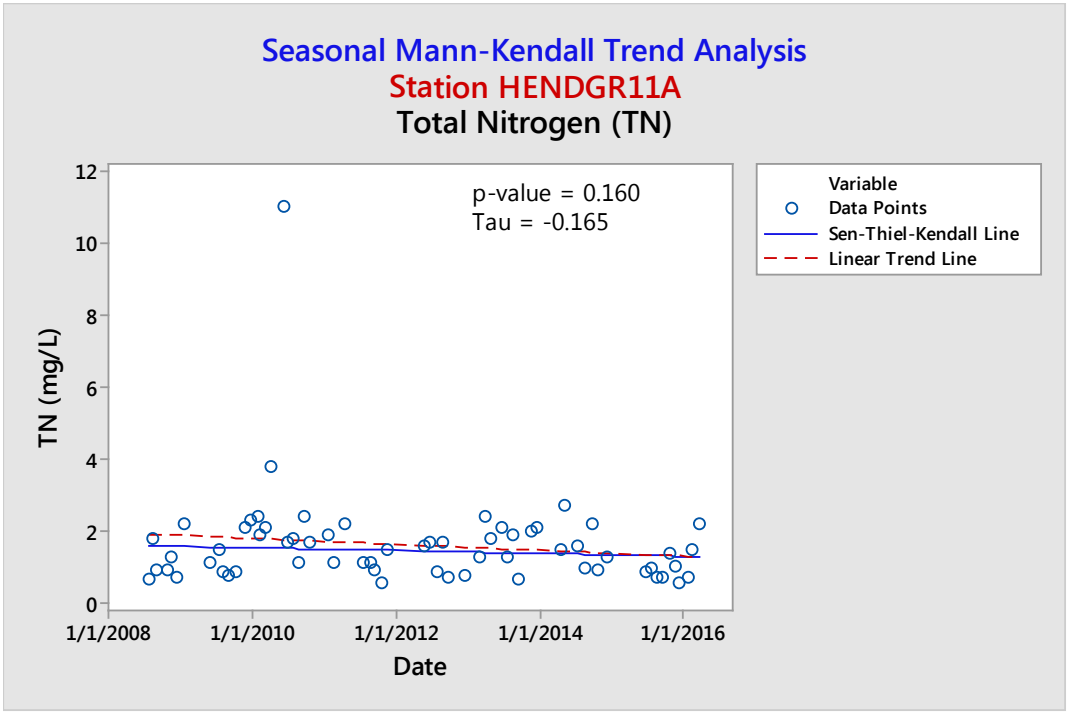

Figure D-6. Station HENDGR11A Seasonal Mann-Kendall trend analysis for TN

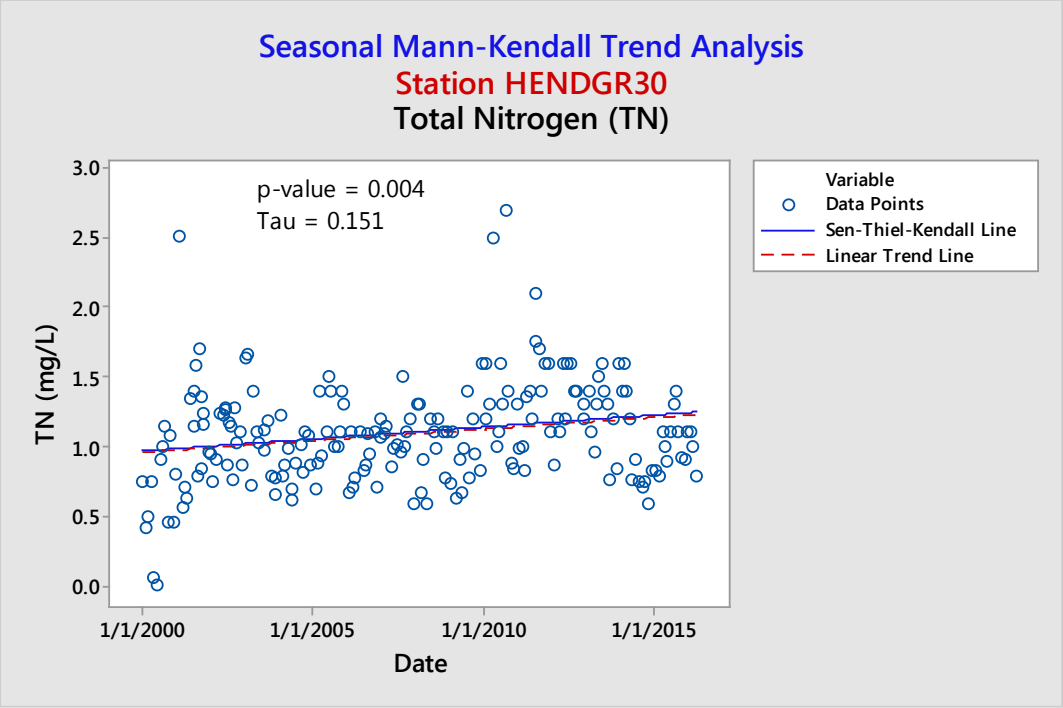

Figure D-7. Station HENDGR30 Seasonal Mann-Kendall trend analysis for TN

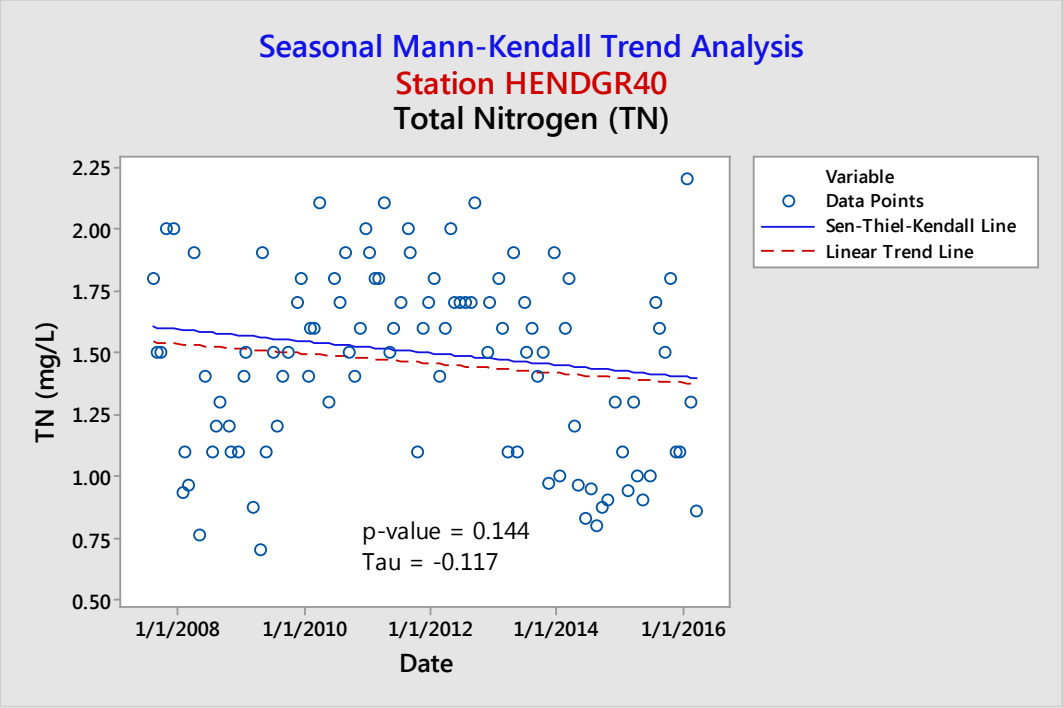

Figure D-8. Station HENDGR40 Seasonal Mann-Kendall trend analysis for TN

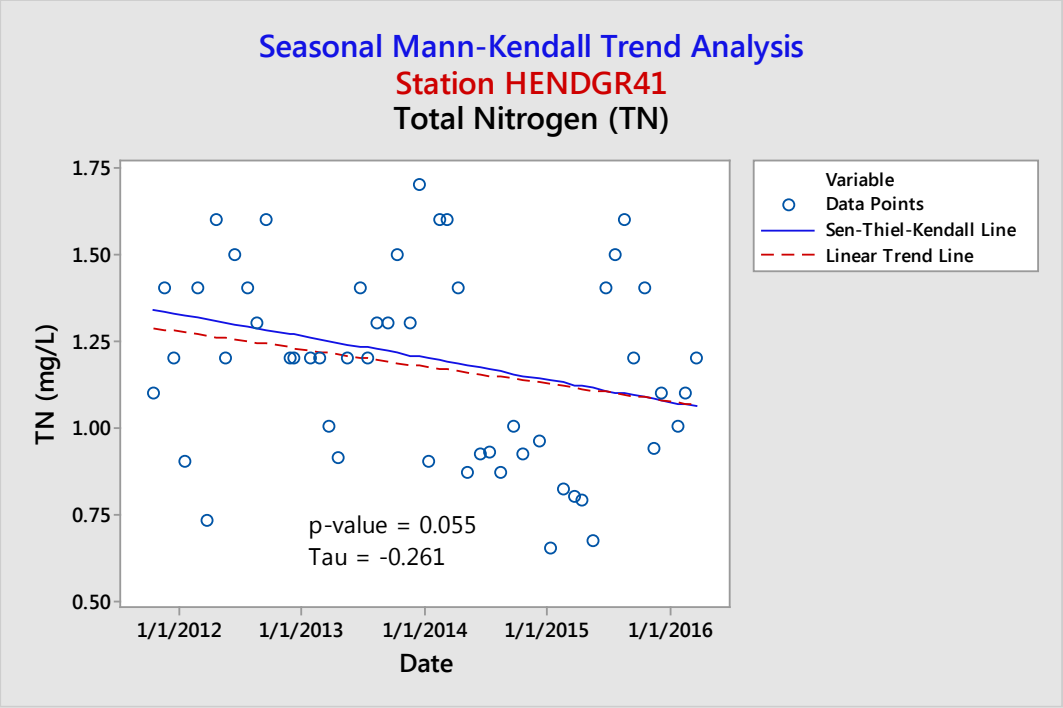

Figure D-9. Station HENDGR41 Seasonal Mann-Kendall trend analysis for TN

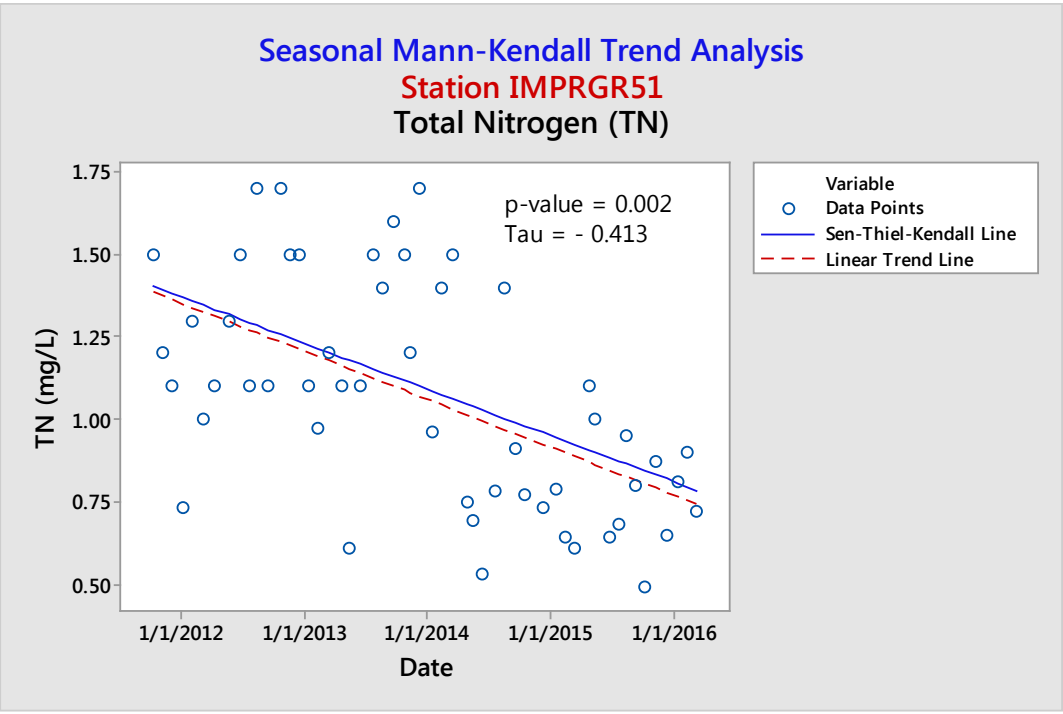

Figure D-10. Station IMPRGR51 Seasonal Mann-Kendall trend analysis for TN

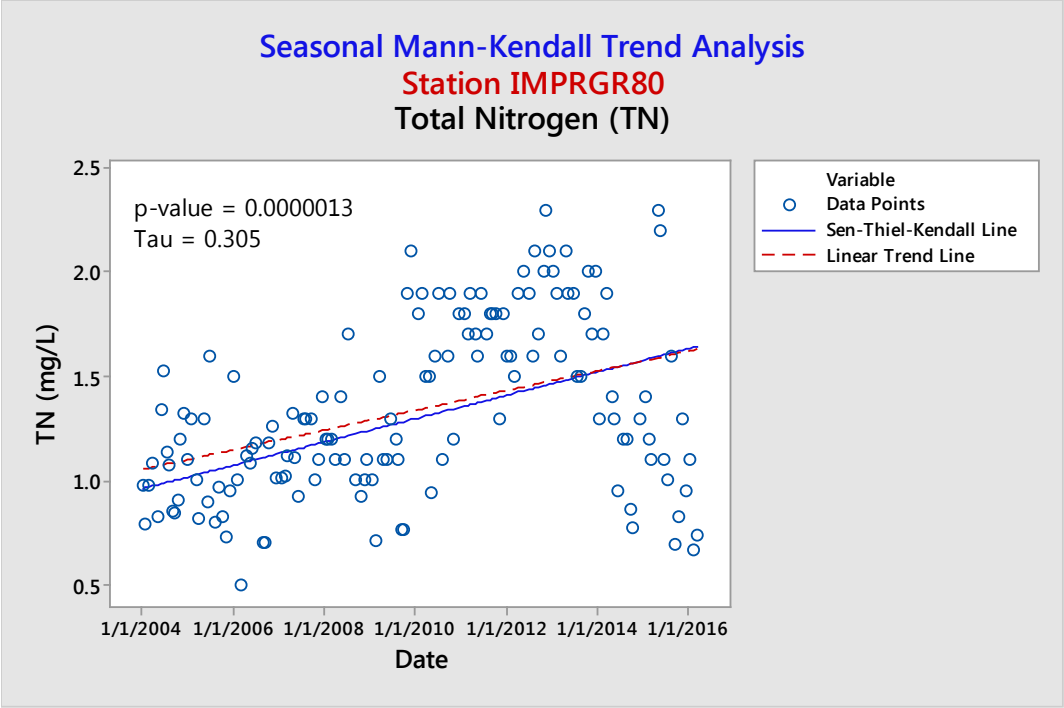

Figure D-11. Station IMPRGR80 Seasonal Mann-Kendall trend analysis for TN

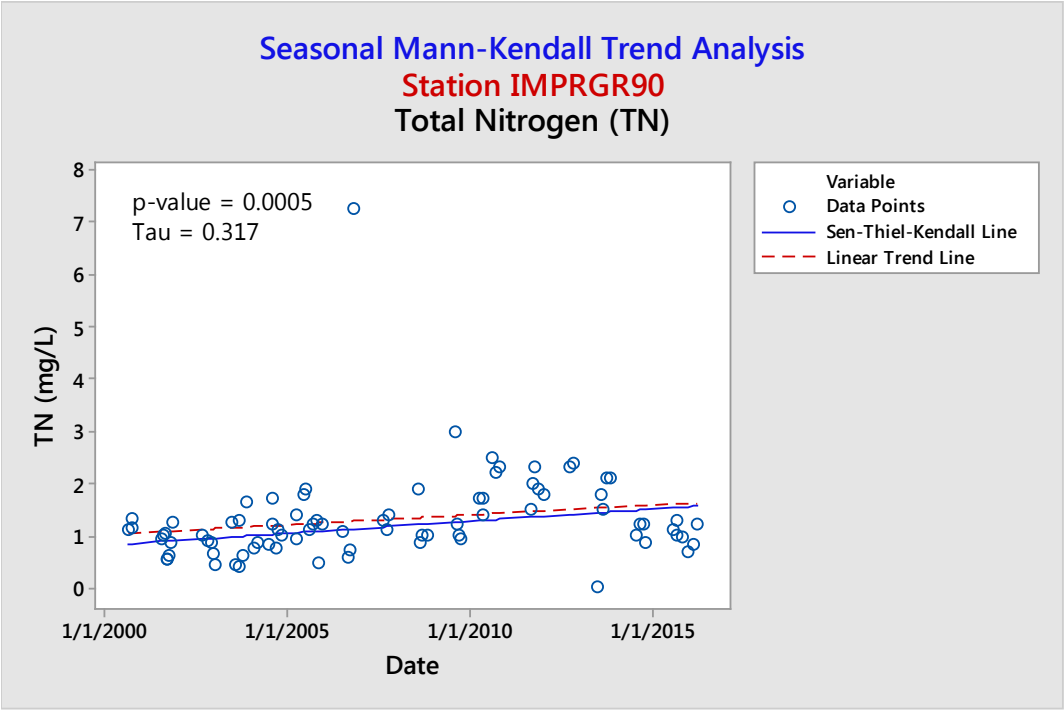

Figure D-12. Station IMPRGR90 Seasonal Mann-Kendall trend analysis for TN

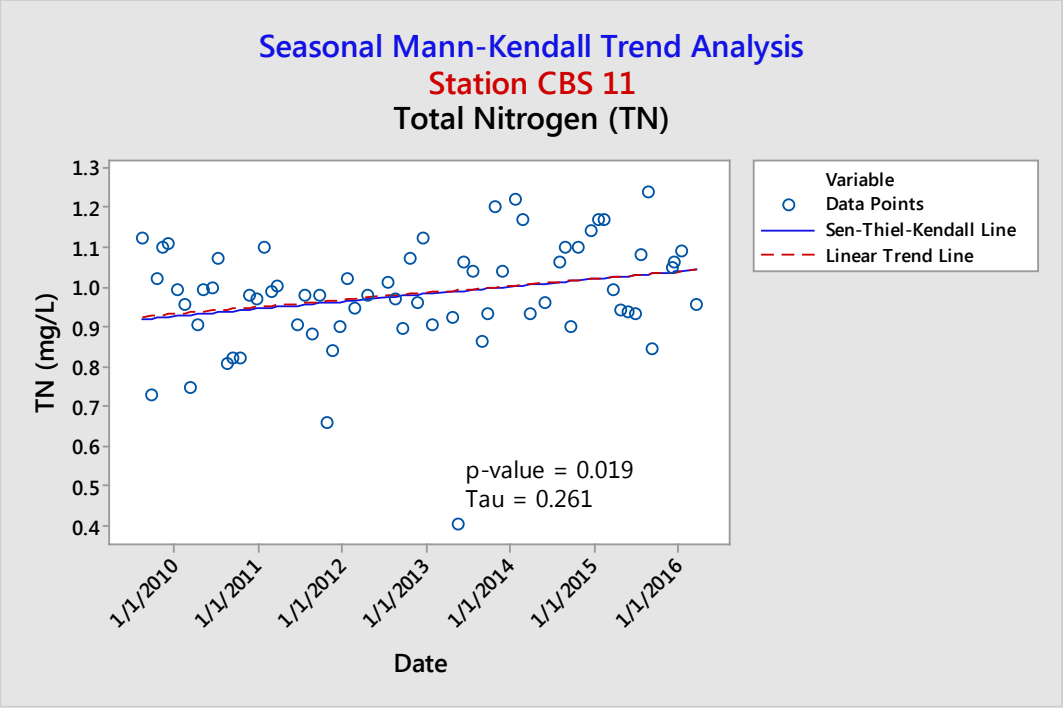

Figure D-13. Station CBS 11 Seasonal Mann-Kendall trend analysis for TN

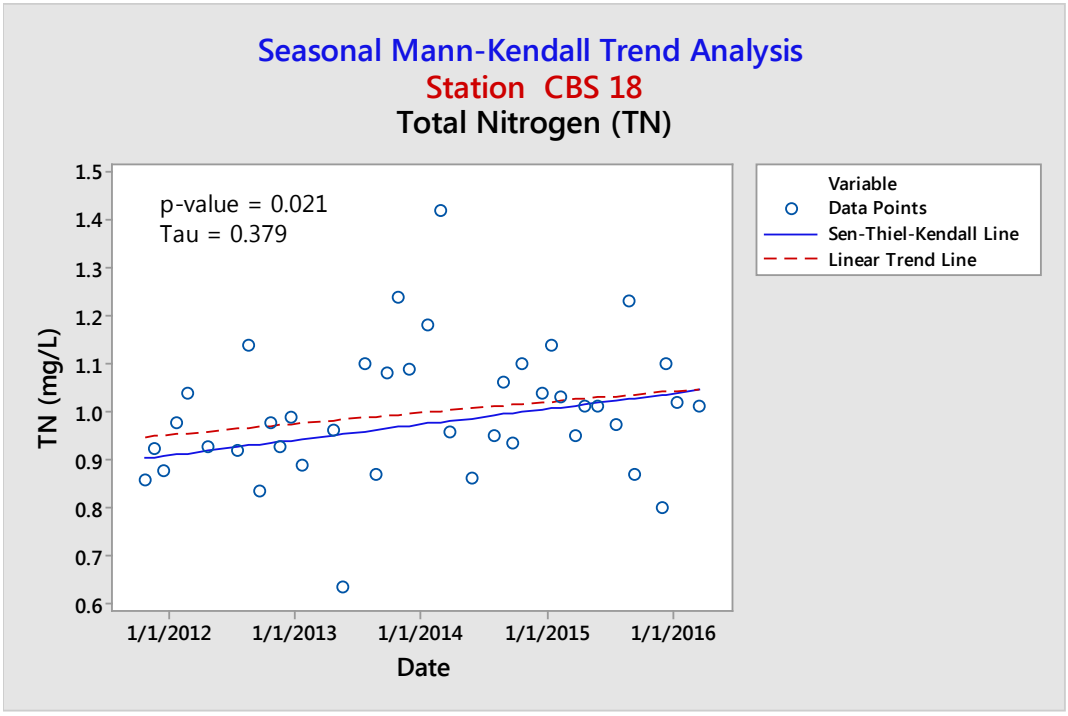

Figure D-14. Station CBS 18 Seasonal Mann-Kendall trend analysis for TN

Regional Mann-Kendall Trend Results

Data from select stations were compiled into regions and analyzed for trends using Regional Mann-Kendall trend analysis, assigning the regions to either the Hendry Creek or Imperial River BMAP areas. For the Hendry and Imperial regions, **Figure 7** and **Figure 8** show the Regional Mann-Kendall trend analysis results using all data in their original collection frequency. When looking at the regions independently from each other, **Figure 7** shows an increasing trend for the Hendry region, although no significant trend was found for the Imperial region (**Figure 8**).

For the Hendry and Imperial regions, **Figure D-15** through **Figure D-18** show the Regional Mann-Kendall trend analysis results using the data aggregated into AGMs on a CY and WY basis. As shown in **Figure D-15** and **Figure D-16**, an increasing trend was found for the Hendry region based on both CY and WY. As shown in **Figure D-17**, no significant trend was found for Imperial River based on CY. However, as shown in **Figure D-18**, an increasing trend was found for Imperial River based on WY. **Table 10** and **Table 11** summarize the Regional Mann-Kendall trend results.

When evaluated using all data points in their original frequency, and as AGMs calculated for the WY and CY, the Hendry region results showed a consistent increasing trend for each analysis (**Table 10**). In contrast, only the analysis using data aggregated into AGMs based on WY showed an increasing trend for the Imperial region, while the other two analyses (using all data points and AGMs based on CY) showed no significant trend (**Table 11**).

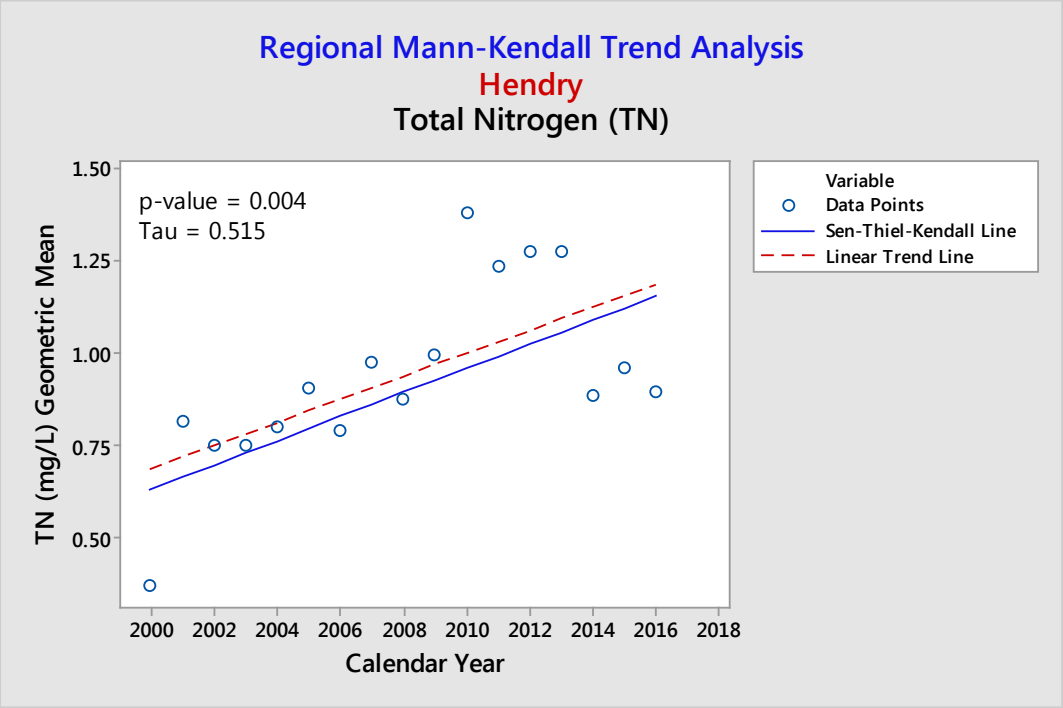

Figure D-15. Regional Mann-Kendall TN (AGM) trend analysis for the Hendry region (CY)

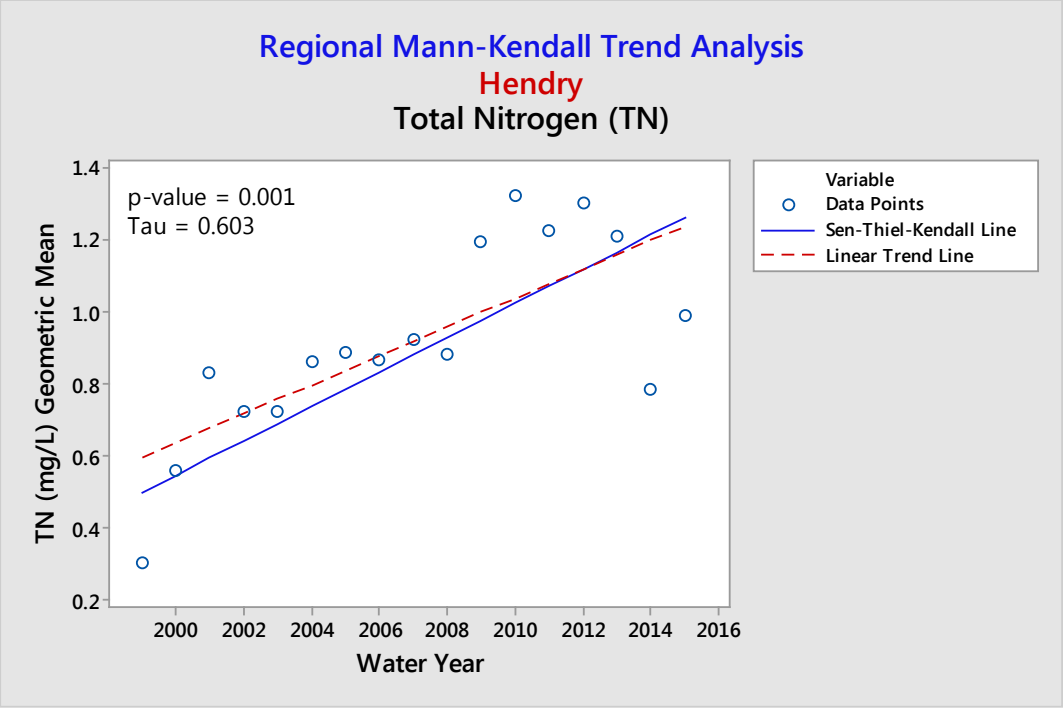

Figure D-16. Regional Mann-Kendall TN (AGM) trend analysis for the Hendry region (WY)

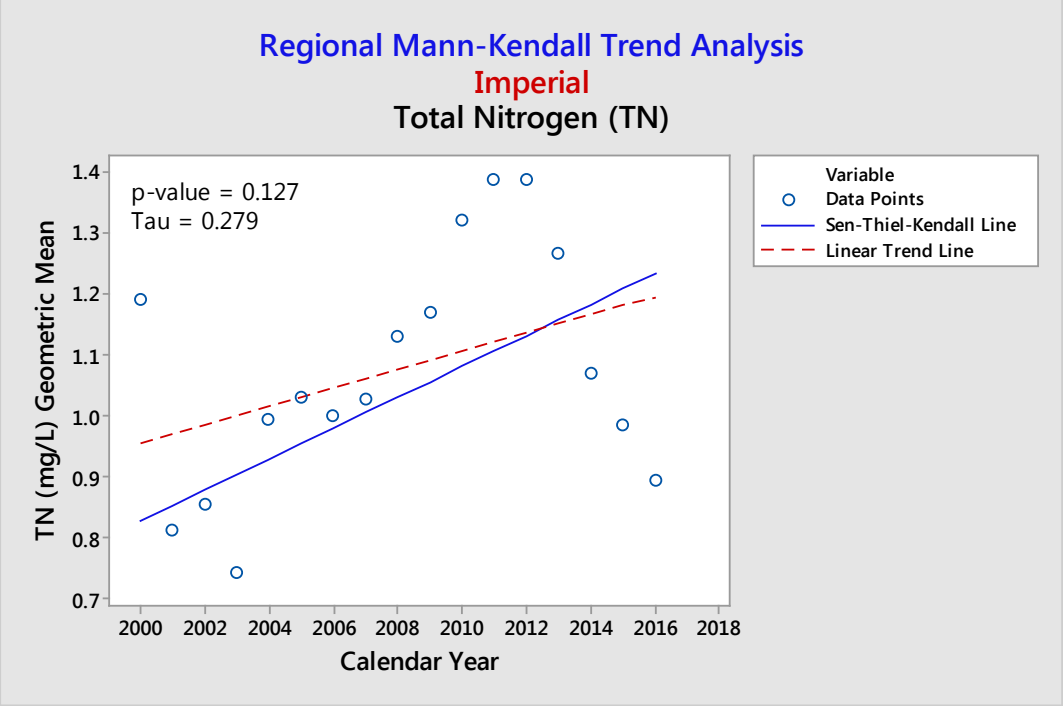

Figure D-17. Regional Mann-Kendall TN (AGM) trend analysis for the Imperial region (CY)

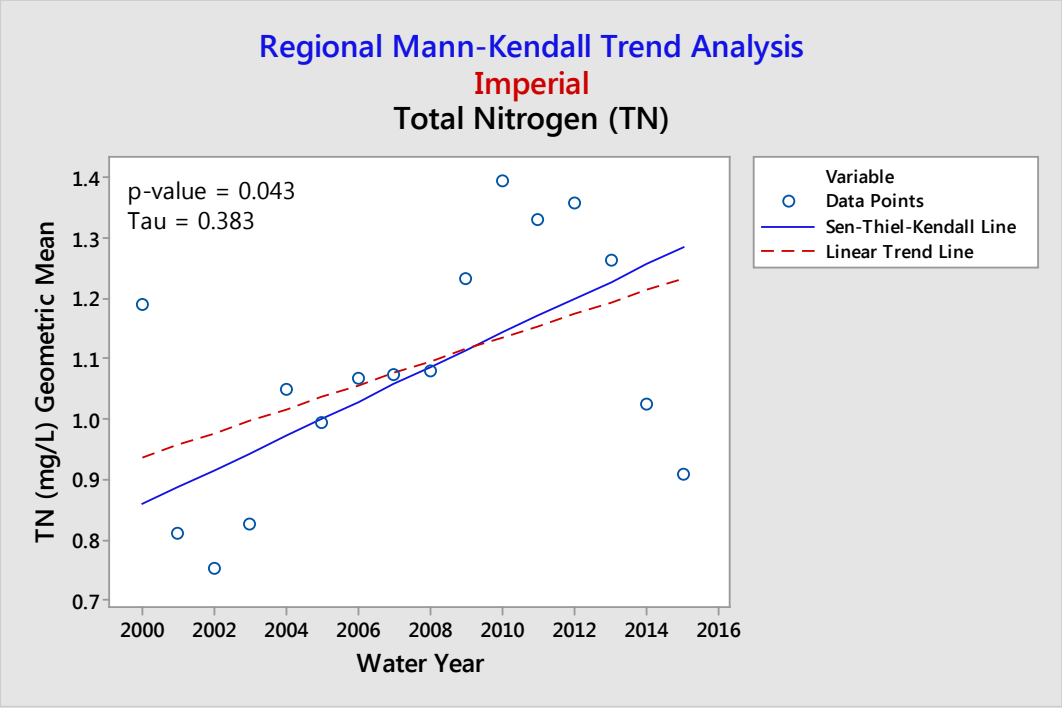

Figure D-18. Regional Mann-Kendall TN (AGM) trend analysis for the Imperial region (WY)

Appendix E: Important Links

Cover page:
DEP website: http://www.dep.state.fl.us/mainpage/default.htm

Acknowledgments:
Sara Davis email: sara.c.davis@dep.state.fl.us

Summary:
Hendry Creek DO TMDL report:
http://www.dep.state.fl.us/water/tmdl/docs/tmdls/final/gp1/hendrydofinal091208.pdf
Imperial River DO TMDL report:
http://www.dep.state.fl.us/water/tmdl/docs/tmdls/final/gp1/imperialdofinal091208.pdf
Everglades West Coast BMAP: http://www.dep.state.fl.us/water/watersheds/docs/bmap/ewc-bmap-final-nov12.pdf

Section 1:
Hendry Creek DO TMDL report:
http://www.dep.state.fl.us/water/tmdl/docs/tmdls/final/gp1/hendrydofinal091208.pdf
Imperial River DO TMDL report:
http://www.dep.state.fl.us/water/tmdl/docs/tmdls/final/gp1/imperialdofinal091208.pdf
Everglades West Coast BMAP: http://www.dep.state.fl.us/water/watersheds/docs/bmap/ewc-bmap-final-nov12.pdf

Section 2:
Lee County "Fertilize Smart" campaign website: http://fertilizesmart.com/
Lee County "Slime Monster" Facebook page: https://www.facebook.com/pages/Slime-Monster/881207931905350
Lee County PSA video: https://www.youtube.com/watch?v=eMsgXHWeqIU
Lee County pet waste education campaign: http://fertilizesmart.com/pet-waste-info/
FDACS BMP manuals: http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs/BMP-Rules-Manuals-and-Other-Documents
2013 Everglades West Coast BMAP Progress Report:
http://www.dep.state.fl.us/water/watersheds/docs/bmap/ewc-bmap-apr-2013.pdf
2014 Everglades West Coast BMAP Progress Report:
http://www.dep.state.fl.us/water/watersheds/docs/bmap/ewc-bmap-apr-2014.pdf
2015 Everglades West Coast BMAP Progress Report:
http://www.dep.state.fl.us/water/watersheds/docs/bmap/ewc-bmap-apr-2015.pdf

Appendix B:
Chapter 2016-1, Laws of Florida: http://laws.flrules.org/2016/1