Documentation in Support of Category 4e

Waterbody/Watershed Identification

Organization	Pinellas County
Point of Contact	Stacey Day, 22211 US Hwy 19 N, Bldg. 10, Clearwater, FL 33765 sday@pinellascounty.org 727-464-4703
Waterbody(s)	1618D, Starkey Basin/Seminole Bypass Canal; 1618C, Long Bayou/Cross Bayou
No. Waterbody / Pollutant Combinations	2 waterbody segments; Verified and/or Impaired for Dissolved Oxygen and Nutrients (chlorophyll-a) on the Springs Coast 2014 Verified List

Description of Baseline Conditions

Watershed(s)	Starkey Basin/Seminole Bypass Canal, WBID 1618D; Long Bayou/Cross Bayou, WBID 1618C
Baseline Data	Run 45, 2014 **1618C, DO (<4.0 mg/L criterion)**: pp = 17 / 67; vp = 43 / 210 Verified impaired. Nutrients were identified as a causative pollutant based on Chl-a data/nutrient impairment verification. **Nutrients (TN=0.96 mg/L criterion)**: Annual average Chl-a values exceeded 11 µg/l in 2003 - 2005, and values were 19.92, 11.25, and 16.73 µg/l, respectively. Nitrogen is the limiting nutrient based on a median TN/TP ratio of 6.26 (118 values). The verified period total nitrogen median = 0.96 mg/l (119 values), total phosphorus median = 0.17 mg/l (114 values). **1618D, DO (<5.0 mg/L criterion)**: pp = 71 / 469; vp = 51 / 298 Verified Impaired. Nutrients were identified as a causative pollutant based on Chl-a data/nutrient impairment verification. **Nutrients (TN=1.135 mg/L; TP=0.09 mg/L criteria)**: Annual average Chl-a values exceeded 11 µg/l in 1999 - 2004, and values were 32.93, 25.85, 35.19, 35.7, 22.2, and 22.19 µg/l, respectively. Nitrogen and phosphorous are limiting nutrients based on a median TN/TP ratio of 13.38 (104 values). The verified period total nitrogen median = 1.135 mg/l (106 values), total phosphorus = 0.09 mg/l (116 values), and BOD median = 4 mg/l (62 values).
Map	See Figure 1.

Evidence of Watershed Approach

Area of Effort	See Figure 1. Five alum injection sites indicated by red dots (top site has two alum injection systems). Education and pollution ordinances are in effect for the whole area.
Key Stakeholders Involved and Their Roles	Pinellas County—lead on watershed activities; funds BMP projects and monitors water quality City of Largo—works with County on stormwater and land development ordinances and public education/outreach
Watershed Plan & Other Supporting Documentation	The area includes the watershed drainage area from Lake Seminole, the Seminole Bypass Canal, and Long Bayou/Cross Bayou within WBID 1618. WBID 1618C - Long Bayou/Cross Bayou and 1618D - Starkey Basin/Seminole Bypass Canal are impaired for DO (nutrients/chlorophyll-a) and for Nutrients (TN, TP, chlorophyll-a). The objectives outlined by the updated 2014 Lake Seminole Reasonable Assurance Plan (RAP) will address these impairments. The WBID drainage area corresponds to the key projects discussed in the RAP: http://www.pinellascounty.org/environment/watershed/LSPublicationsPDFs/Lake_Seminole_RAP-Update_2014.pdf
Point Sources and Indirect Source Monitoring (Sites)	The entire area is regulated by a Municipal Separate Storm Sewer System (MS4) permit, NPDES MS4 Permit No. FLS000005. There are no permitted point source discharges in the basin, and the entire watershed is served by central sanitary sewer facilities. The 2016 MS4 Annual Report is included here as **Attachment 1**.
Nonpoint Sources	Dominant landuses in the Lake Seminole watershed are: Residential—High Density 14.61%, Medium Density 3.89%, Low Density 2.66%; Commercial—14.75%; Institutional—8.15%; Open land—4.04%; Recreational—3.89%; Transportation—3.61% Stormwater runoff represents the single most important source of external phosphorus loads, and internal nutrient recycling constitutes a substantial cumulative nitrogen and phosphorus source.
Water Quality Criteria	It is expected that Class-III water quality standards for DO, TN, TP, and chlorophyll-a will be attained upon successful completion of all projects.
Restoration Work	The pertinent restoration efforts planned for Lake Seminole include restoring priority wetland and upland habitats (completed in 2008 and being maintained as needed), constructing alum facilities (4 completed and 1 almost functional), and dredging sediments from the lake (to begin in 2018). In addition, the County has fertilizer and pet waste ordinances and education campaigns.

Critical Milestones/Monitoring

Anticipated Critical Milestone(s) and Completion Dates:	Alum injection—4 of 5 sites active; last site will be active in early 2018. Dredging sediment from Lake Seminole—scheduled to begin 2018 and will take several years to complete.
Monitoring Component	Pinellas County regularly monitors Lake Seminole using a stratified random design, as described in **Attachment 2**. The lake is sampled eight times a year at four randomly selected sites per period. In addition, Long Bayou/Cross Bayou is sampled at this same frequency (W5 in the attached report). Two fixed sites are monitored on the Seminole Bypass Canal eight times a year, as described in **Attachment 2**. All parameters and methods are described in Attachment 2. Storm event sampling will occur periodically at the alum systems in order to measure the nutrient reductions as a result of the alum injections. The alum systems are anticipated to provide annual load reductions of 7,600 lbs/yr TN (40%), 3,100 lbs/yr TP (80%), and 200,000 lbs/yr TSS (80%). The dredge project will result in a one-time removal of 416 tons of TN and 77 tons of TP.

Other Key Dates

Estimated Delisting Date	The WBID is in the state's Group 5 Springs Coast Basin. The next review and assessment cycle (cycle 3) is expected in 2018, and if not impaired, DEP is expected to request the WBID be delisted from the federal 303(d) list (if applicable). The implementation of BMPs as described in the RAP will not be completed until at least 2021, so full attainment of standards is unlikely until after that time. In the meantime, these WBIDs should be reassigned to Category 4e.

Financial Commitments

Estimated Implementation Cost	The total project cost for the alum systems was $9,362,566, which includes a 319(h) Clean Water Act Section grant of $1,116,678. The estimated 20 year operation and maintenance cost is $6,068,137. The dredge project will cost nearly $20,000,000 over the next five years.
Land Acquisition (if applicable)	Funding Source: Pinellas County Capitol Improvement Project Funds; SWFWMD Cooperative Funding Initiative Total……..$65,000
Design and Construction (if applicable)	Funding Source: Pinellas County Capitol Improvement Project Funds; SWFWMD Cooperative Funding Initiative Total……...$9,297,566

References:

(Attach any reports supporting the projects and restoration efforts)

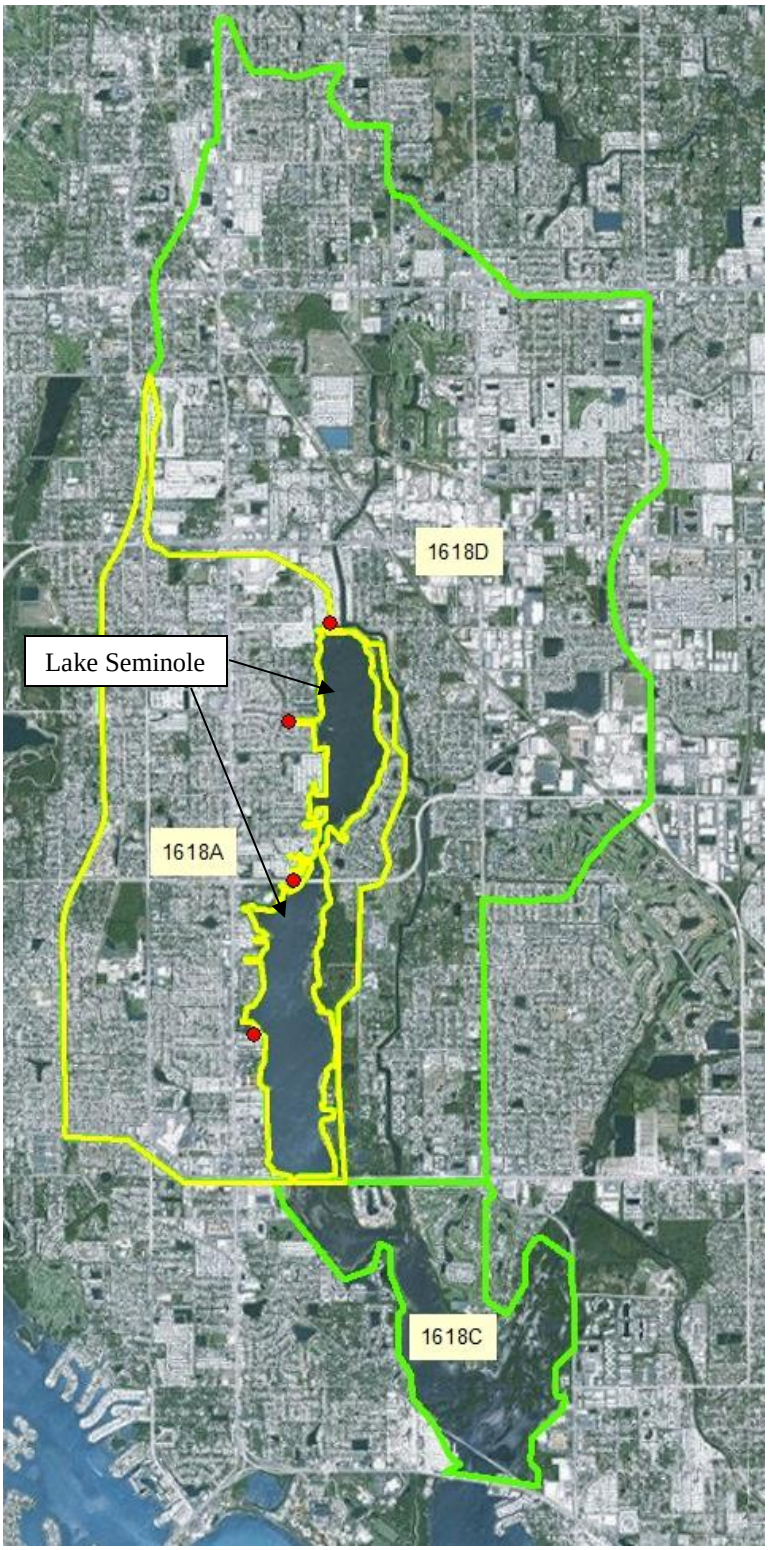

Figure 1. Lake Seminole and associated watersheds (1618A, C, D). Red dots indicate the location of alum inputs.

Attachment 1

Pinellas County NPDES Annual Report 2016

PINELLAS COUNTY NPDES ANNUAL REPORT
January 1, 2016 – December 31, 2016

In compliance with the
National Pollutant Discharge Elimination System
MS4 Permit FLS000005
June 2017

This page intentionally left blank.

INSTRUCTIONS – DEP FORM 62-624.600(2)
ANNUAL REPORT FORM FOR INDIVIDUAL NPDES PERMITS FOR
MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Who Must Submit This Annual Report Form?

- Operators of municipal separate storm sewer systems (MS4s) that are covered by an individual NPDES stormwater permit pursuant to Rule 62-624, F.A.C. must submit this form. Each permitted operator must individually complete and submit this form, even if the operator is covered under a permit with multiple co-permittees or has established an interlocal agreement with one or more co-permittees.

When to Submit This Annual Report Form?

- This form must be fully completed and submitted for each year of coverage under the NPDES stormwater permit term. The Year 1 Annual Report must cover the twelve-month period beginning on the effective date of the permit and is due six months after the first anniversary of the date of permit issuance. All subsequent annual reports are due six months after the anniversary of the effective date of the permit.

Where To Submit This Annual Report Form?

- This form and any REQUIRED attachments must be sent by email to the NPDES Stormwater Program Administrator or to the MS4 coordinator. Their names and email addresses are available at: http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm. If files are larger than 10mb, materials may be placed on the NPDES Stormwater ftp site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading the ANNUAL REPORT files, an email must be sent to the MS4 coordinator or the NPDES program administrator notifying them the report is ready for downloading. Do not submit any materials not specifically required to be submitted as per Section V of this form.

Section I: BACKGROUND INFORMATION

- Row A — Provide the name of the governmental entity submitting this form. For example, "City of Lauderhill."
- Row B — Provide the name of the permit as it appears on the first page of your permit. For example, "Broward County MS4." The permit name will not necessarily be the same name provided in Row A if the permit covers multiple co-permittees. If the name of the permit is the same name provided in Row A, repeat the name in Row B – do not leave the row blank.
- Row C — Provide the last two digits of your permit number as it appears on the first page of your permit.
- Row D — Indicate which permit year the annual report covers. If the permit year is beyond Year 5, check the last box and provide the appropriate permit year number.
- Row E — Indicate the twelve-month period the annual report covers. Provide the month and year for the beginning of the period and the month and year for the end of the period. For example, "March/2003 through February/2004." Do not provide the day.
- Row F — Provide contact information for your Responsible Authority. The definition of a Responsible Authority can be found at Rule 62-620.305, F.A.C.
- Row G — Provide contact information for the Designated Stormwater Management Program Contact if it isn't the same person as the Responsible Authority identified in Row F, otherwise leave this section blank. The Stormwater Management Program Contact is the technical person that oversees the stormwater program and is the primary contact for when the Department has questions about the annual report, is scheduling an annual inspection, or needs to discuss miscellaneous issues concerning implementation of the permit.

Section II: MS4 MAJOR OUTFALL INVENTORY

- This section is required to be completed in all permit years EXCEPT Year 1. In Year 1, you are required to provide an inventory and a map of all known major outfalls, in accordance with Rule 62-624.600(2)(a), F.A.C. In all subsequent permit years, you need to only provide any updates to the inventory by completing this section.
- The definition of a "major" outfall can be found at Rule 62-624.200(5), F.A.C.
- For the third item listed, indicate whether you attached the major outfall inventory and a map of the major outfall locations in accordance with Rule 62-624.600(2)(a), F.A.C. This item is only applicable in Year 1. For all other reporting years, check the "N/A" box.

- For the fourth item listed, indicate whether you attached the estimates of pollutant loadings and event mean concentrations as required under Part V.A of your permit and in accordance with Rule 62-624.600(2)(b), F.A.C. This item is only applicable in Year 3. For all other reporting years, check the "N/A" box.

- For the fifth item listed, indicated whether you attached your permit re-application in accordance with the re-application requirements in Rule 62-624.420(2), F.A.C. This item is only applicable in Year 4. For all other reporting years, check the "N/A" box.

Section VI: CERTIFICATION STATEMENT AND SIGNATURE

- The Responsible Authority listed in Section I.F of this form must sign the certification statement provided in this section, in accordance with Rule 62-620.305, F.A.C. The annual report form will be returned to the permittee if the required signature is not included. If you choose to submit the annual report and attachments electronically, a signed paper copy of this section must also be submitted.

Section VII: STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

- Column A — Columns B through F must be completed for each SWMP element indicated by the permit citation in Column A. No information is to be inserted by the permittee in this column.

- Column B — Provide a summary of the permit requirements in Part III.A of your permit for each SWMP element and, underneath the summary, list the quantifiable SWMP activities related to the requirements. The particular quantifiable SWMP activities are specific to each permittee, but must include, at a minimum, the quantifiable activities that are required by the permit to be reported.

- Column C — Provide a number representing the activities performed in the current reporting year for each of the quantifiable SWMP activities you listed in Column B. This column may not be left blank for any of the quantifiable SWMP activities listed in Column B.

- Column D — Provide a title or description of the record that documents each number you provided in Column C. For example, "Daily Work Orders," "Illicit Complaint/Investigation Forms and Log," or "Construction Inspection Checklists and Log." If the activity is recorded entirely in an electronic database system, you may provide the name of the system, such as the "Hansen Model." This column may not be left blank for any of the numbers provided in Column C.

- Column E — Provide the name of your department/division that is responsible for performing each of the SWMP activities listed in Column B, or provide the name of the co-permittee, private contractor, or other entity that is performing the activities on your behalf. Try to be as specific as possible by including, for example, the name of the employee responsible for a particular SWMP activity if only that employee can answer any questions concerning the activity. This column may not be left blank for any of the SWMP activities listed in Column B.

- Column F — This column allows for any brief comments you determine are necessary to explain the information you provided in Columns C, D, and E.

Section VIII: EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM

- For each section of your permit, discuss the strengths, weaknesses, and needed SWMP revisions to maximize the effectiveness of your SWMP in reducing stormwater pollutant loadings.

Section IX: CHANGES TO STORMWATER MANAGEMENT PROGRAM (SWMP) ACTIVITIES

- This section is to be completed, as applicable, in all permit years EXCEPT Year 4. In Year 4, any desired changes to your SWMP activities should be included in your permit re-application that is to be attached to the Year 4 Annual Report Form.

- Row A — If applicable, include in this row any requested changes to your SWMP activities that are established as specific requirements under Part III.A of your permit. Provide the permit citation/SWMP element that corresponds to the SWMP activity you want changed, describe the requested change, and provide a rationale for the change. Such changes cannot be implemented without prior approval from the Department and may require a permit revision in accordance with Rule 62-620.325, F.A.C.

- Row B — If applicable, include in this row any changes to your SWMP activities that are NOT established as specific requirements under Part III.A of your permit but rather are activities at the discretion of the permittee. Provide the permit citation/SWMP element that corresponds to the SWMP activity you have changed, describe the change, and provide a rationale for the change.

ANNUAL REPORT FORM FOR INDIVIDUAL NPDES PERMITS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (RULE 62-624.600(2), F.A.C.)

- This Annual Report Form must be completed and submitted to the Department to satisfy the annual reporting requirements established in Rule 62-621.600, F.A.C.
- Submit this fully completed and signed form and any REQUIRED attachments by email to the NPDES Stormwater Program Administrator or to the MS4 coordinator. Their names and email addresses are available at: http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm. If files are larger than 10mb, materials may be placed on the NPDES Stormwater ftp site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading the ANNUAL REPORT files, an email must be sent to the MS4 coordinator or the NPDES program administrator notifying them the report is ready for downloading
- Refer to the Form Instructions for guidance on completing each section.
- **Please print or type information in the appropriate areas below.**

SECTION I. BACKGROUND INFORMATION

A.	Permittee Name: PINELLAS COUNTY		
B.	Permit Name: PINELLAS COUNTY CYCLE 3 MS4 PERMIT		
C.	Permit Number: FLS000005-003		
D.	Annual Report Year: ☐ Year 1 ☐ Year 2 ☐ Year 3 ☒ Year 4 ☐ Year 5 ☐ Other, specify Year:		
E.	Reporting Time Period (month/year): January / 2016 through December / 2016		
F.	Name of the Responsible Authority: **Mark S. Woodard**		
	Title: **County Administrator**		
	Mailing Address: **315 Court Street**		
	City: **Clearwater**	Zip Code: **33756**	County: **Pinellas**
	Telephone Number: **727-464-3485**	Fax Number: **727- 464-4384**	
	E-mail Address: **mwoodard@pinellascounty.org**		
G.	Name of the Designated Stormwater Management Program Contact (if different from Section I.F above): **Kelli Hammer Levy**		
	Title: **Division Director**		
	Department: **Pinellas County Department of Public Works - Division of Environmental Management**		
	Mailing Address: **22211 US 19 N, Building 10**		
	City: **Clearwater**	Zip Code: **33765**	County: **Pinellas**
	Telephone Number: **727-464-4425**	Fax Number: **727-464-4403**	
	E-mail Address: **klevy@pinellascounty.org**		

SECTION II. MS4 MAJOR OUTFALL INVENTORY (Not Applicable In Year 1)

A.	Number of outfalls ADDED to the outfall inventory in the current reporting year (insert "0" if none): 1 (Does this number include non-major outfalls? ☐ Yes ☒ No ☐ Not Applicable)
B.	Number of outfalls REMOVED from the outfall inventory in the current reporting year (insert "0" if none): 2 (Does this number include non-major outfalls? ☐ Yes ☒ No ☐ Not Applicable)
C.	Is the change in the total number of outfalls due to lands annexed or vacated? ☒ Yes ☐ No ☐ Not Applicable

SECTION III. MONITORING PROGRAM

A.	Provide a brief statement as to the status of monitoring plan implementation: Please See Appendix A
B.	Provide a brief discussion of the monitoring results to date: *DEP Note: See Part V of the permit for the monitoring requirements. Each permittee must discuss the monitoring results as it relates to the implementation and effectiveness of their SWMP.* Please See Appendix A
C.	Attach a monitoring data summary, as required by the permit. Please See Appendix A

SECTION IV. FISCAL ANALYSIS

A.	Total expenditures for the NPDES stormwater management program for the current reporting year: $38,606,072.26 *DEP Note: If program resources have decreased from the previous year, attach a discussion of the impacts on the implementation of the SWMP as per Part II.F of the permit.*
B.	Total budget for the NPDES stormwater management program for the subsequent reporting year: $43,612,651.20 Projected Increase for operation and maintenance of supporting infrastructure

SECTION V. MATERIALS TO BE SUBMITTED WITH THIS ANNUAL REPORT FORM

Only the following materials are to be submitted to the Department along with this fully completed and signed Annual Report Form (check the appropriate box to indicate whether the item is attached or is not applicable):

Attached	N/A	***DEP Note: Please complete Checklists A & B at the end of the tailored form.***
☒	☐	Any additional information required to be submitted in this current annual reporting year in accordance with Part III.A of your permit that is not otherwise included in Section VII below.
☒	☐	A monitoring data summary as directed in Section III.C above and in accordance with Rule 62-624.600(2)(c), F.A.C.
☐	☒	Year 1 ONLY: An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM) in accordance with Rule 62-624.600(2)(a), F.A.C.
☐	☒	Year 3 ONLY: The estimates of pollutant loadings and event mean concentrations for each major outfall or each major watershed in accordance with Rule 62-624.600(2)(b), F.A.C.
☒	☐	Year 4 ONLY: Permit re-application information in accordance with Rule 62-624.420(2), F.A.C.

DO NOT SUBMIT ANY OTHER MATERIALS

(such as records and logs of activities, monitoring raw data, public outreach materials, etc.)

SECTION VI. CERTIFICATION STATEMENT AND SIGNATURE

The Responsible Authority listed in Section I.F above must sign the following certification statement, as per Rule 62-620.305, F.A.C:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Responsible Authority (type or print): Mark S. Woodard

Title: County Administrator

Signature:  Date: June 27, 2017

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

Part III.A.1 — **Structural Controls and Stormwater Collection Systems Operation**

Maintain an up-to-date inventory of the structural controls and roadway stormwater collection structures operated by the permittee, including, at a minimum, all of the types of control structures listed in Table II.A.1.a of the permit. Report the current known inventory.

Provide an inventory of all known major outfalls covered by the permit and a map depicting the location of the major outfalls (hard copy or CD-ROM). Provide the outfall inventory and map with the Year 1 Annual Report.

Report the number of inspection and maintenance activities conducted for each type of structure included in Table II.A.1.a, and the percentage of the total inventory of each type of structure inspected and maintained. If the minimum inspection frequencies set forth in Table II.A.1.a were not met, provide as an attachment an explanation of why they were not and a description of the actions that will be taken to ensure that they will be met.

Maintain documentation of the wet detention systems in the Adopt-A-Pond program. Report the number of systems in the Adopt-A-Pond program.

Type of Structure	Number of Activities Performed					Documentation / Record	Entity Performing the Activity	Comments
	Total Number of Structures	Number of Inspections	Percentage Inspected	Number of Maintenance Activities	Percentage Maintained			
Dry retention systems	37	74	100	74	100	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, Crew Diary, GIS	Public Works (PW), Stormwater/Veg. Management Division (SMD) Eric Fehrmann	See Appendix for Additional Information
Exfiltration trench (linear feet)	25,295	764	100	764	100			Includes Underground Ex., Dry Det w/Ex., Wet Det w/Ex.
Grass treatment swales (miles)	4.52	140	100	140	100			
Detention with filtration systems	191	764	100	764	100			Wet/Dry ponds w/Ex.
Wet detention systems	138	276	100	276	100			Conv. Pond w/ Littoral Shelf, Wet Pond w/ Mit.
Alum injection systems	5	12	100	260	100	Weekly Check Sheet	PW, Division of Environmental Management (DEM) Joseph Thames	Each Alum system has weekly maintenance

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

Type of Structure	Number of Activities Performed					Documentation / Record	Entity Performing the Activity	Comments
	Total Number of Structures	Number of Inspections	Percentage Inspected	Number of Maintenance Activities	Percentage Maintained			
Pollution control boxes	2	4	100	4	100	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, Crew Diary, GIS	PW/SMD Eric Fehrmann	2 CDS units
Major stormwater outfalls	263	263	100	10	4			See Appendix D
Weirs or other control structures	449	898	100	898	100			All permitted facilities except SS44, CDS & Sed. Sumps have structures
MS4 pipes / culverts (miles)	826.5	136.5	17	44.2	5.3			From Pipe Repl. 0313, Storm drain cleaning 1302, 1306, 1307, 1308 plus underground maint.
Inlets / catch basins / grates	22,727	4,066	18	2778	12			From Drainage Structure repair 0316, 0317, 0318
Ditches / conveyance swales (miles)	306.7	1302	100	1163	100			Sum of Mech + hand clean ditches, Veg. spray. 1002, 1003, 1104
PW Adopt-A-Pond					N/A			County AAP program inactive. Other AAP program for private ponds only
ATTACH explanation if any of the minimum inspection frequencies in Table II.A.1.a were <u>not</u> met					N/A			

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Year 1 ONLY: Attach a map of all known major outfalls	N/A		BTS – GIS Section	
Part III.A.2	**Areas of New Development and Significant Redevelopment**				
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
	Report the number of significant redevelopment projects reviewed by the permittee for post-development stormwater considerations. Report the number of new development projects reviewed under Part III.A.9.a.				
	Number of significant redevelopment projects reviewed	26	Permits Plus Database	Development Review Services (DRS) Cliff Still	
	Provide in the Year 2 Annual Report the summary report of the review of local codes activity. Provide in the Year 4 Annual Report the follow-up report on plan implementation of modifying codes to allow low impact design BMPs.				
	Year 2 ONLY: Attach the summary report of the review activity	N/A	N/A	N/A	N/A
	Year 4 ONLY: Attach the follow-up report on plan implementation	Attached		PW/DEM Joseph Thames	See Appendix C
Part III.A.3	**Roadways**				
	Annually review (and revise, as needed) and implement the permittee's written procedures for the litter control program(s) for public streets, roads, and highways, including rights-of-way, employed within the permittee's jurisdictional area and properly dispose of collected material. Implement the program on a monthly, or on an as needed, basis. Report on the litter control program, including the frequency of litter collection, an estimate of the total number of road miles cleaned or amount of area covered by the activities, and an estimate of the quantity of litter collected.				
	PERMITTEE Litter Control Program: Frequency of litter collection	Every 6 Weeks	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, Crew Diary	PW/SMD Eric Fehrmann	
	PERMITTEE Litter Control Program: Estimated amount of area maintained (acres)	1,220.6			
	PERMITTEE Litter Control Program: Estimated amount of litter collected (cubic yards)	3894			Agile 0401, 0404 plus misc. pick up by Coordinators

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	CONTRACTOR Litter Control Program: Frequency of litter collection	0	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, Crew Diary	PW/SMD Eric Fehrmann	
	CONTRACTOR Litter Control Program: Estimated amount of area maintained (linear feet)	0			
	CONTRACTOR Litter Control Program: Estimated amount of litter collected (cubic yards)	0			
	If an Adopt-A-Road or similar program is implemented, report the total number of road miles cleaned and an estimate of the quantity of litter collected.				
	Trash Pick-up Events: Total miles cleaned	4	WEBGIS / Performance Tracking Spreadsheet	PW/DEM Joseph Thames	Pinellas County DEM Volunteer Clean Up Program
	Trash Pick-up Events: Estimated amount of litter collected (cubic yards)	14.5			
	Adopt-A-Road Program: Total miles cleaned	457	Public works operations and monthly and quarterly reports	PW/SMD Eric Fehrmann	Keep Pinellas Beautiful, Inc. Adopt-a-Mile Program
	Adopt-A-Road Program: Estimated amount of litter collected (Lbs)	15,752			
	Report on the street sweeping program, including the frequency of the sweeping, total miles swept, an estimate of the quantity of sweepings collected, and the total nitrogen (TN) and total phosphorus (TP) loadings that were removed by the collection of sweepings. If no street sweeping program is implemented, provide the explanation of why not in the Year 1 Annual Report.				
	Frequency of street sweeping	Min. 10 cycles per year arterials, 4 cycles per year local roads	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, GIS, Sweeper Diaries	PW/SMD Eric Fehrmann	Figures calculated using the FSA MS4 Load Reduction Tool Version 1.2
	Total miles swept (per year)	Arterial: 10,068 Local Roads: 9,087.4 Bayside Bridge: 1,084.9 Total – 20,240.3			
	Estimated quantity of sweeping material collected (tons/CY)	Arterial: 608 CY Local Roads: 1,344.6 Bayside Bridge: 461.7			
	Total nitrogen loadings removed (pounds)	2,697			

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Total phosphorus loadings removed (pounds)	1,729	CMMS Agile Database, Performance Sheet, Tracking Check Sheets, GIS, Sweeper Diaries	PW/SMD Eric Fehrmann	Figures calculated using the FSA MS4 Load Reduction Tool Version 1.2
	Year 1 ONLY: If have curbs and gutters, attach explanation of why no street sweeping program and the alternate BMPs used or planned	N/A	N/A	N/A	N/A
	Annually review (and revise, as needed) and implement the permittee's written standard practices to reduce the pollutants in stormwater runoff from areas associated with road repair and maintenance, and from permittee-owned or operated equipment yards and maintenance shops that support road maintenance activities. Report the number of applicable facilities and the number of inspections conducted for each facility.				
		Number of Inspections			
	Name of facility #1: ***North County Maintenance Yard***	6	Index of PW Material/Equipment Facilities	WW/SMD Eric Fehrmann	Sites are inspected a minimum of weekly and maintenance performed as needed. Major sites are swept monthly materials are collected and properly disposed of.
	Name of facility #2: ***40th St Maintenance Yard***	12			
	Name of facility #3: ***126th Ave. Maintenance Yard***	12			
	Name of facility #4: ***Central Campus PW Fleet***	12	Fleet Management Records	Fleet Management Sites Real Estate Management (REM), John Neal; PW/SMD, Eric Fehrmann	
	Name of facility #5: ***Ulmerton Rd. Fleet Yard***	12			
	Name of facility #6: ***GMD North Fleet Yard***	12			

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Name of facility #7: ***GMD South Fleet Yard***	1	Fleet Management Records	Fleet Management Sites REM, John Neal; PW/SMD Eric Fehrmann	
	Name of facility #8: ***46th St. Fleet Sub-station***	1			
Part III.A.4	**Flood Control Projects**				
	Report the total number of flood control projects that were constructed by the permittee during the reporting period and the number of those projects that did NOT include stormwater treatment. The permittee shall provide a list of the projects where stormwater treatment was not included with an explanation for each of why it was not. Report on any stormwater retrofit planning activities and the associated implementation of retrofitting projects to reduce stormwater pollutant loads from existing drainage systems that do not have treatment BMPs.				
	Flood control projects completed during the reporting period	3	CIP Book	SMD David Talhouk	
	Flood control projects completed during the reporting period that did <u>not</u> include stormwater treatment	0			
	ATTACH a list of the flood control projects that did <u>not</u> include stormwater treatment and an explanation for each of why it was not	N/A			
	Stormwater retrofit projects planned	1			
	Stormwater retrofit projects under construction during the reporting period	1			
	Stormwater retrofit projects completed during the reporting period	1			
Part III.A.5	**Municipal Waste Treatment, Storage, and Disposal Facilities Not Covered by an NPDES Stormwater Permit**				
	Annually review (and revise, as needed) and implement the permittee's written procedures for inspections and the implementation of measures to control discharges from the following facilities that are not otherwise covered by an NPDES stormwater permit: • Operating municipal landfills; • Municipal waste transfer stations; • Municipal waste fleet maintenance facilities; and • Any other municipal waste treatment, waste storage, and waste disposal facilities. Report the number of applicable facilities and the number of the inspections conducted for each facility.				

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
		Number of Inspections			
	Name of facility #1: ***North County Maintenance Yard***	6	NPDES MS4 Permit Stormwater Inspection for High Risk Industrial Facilities & Municipal Facilities Tracking form	PW/SMD Eric Fehrmann	40th Street Stockpile, monthly Inspection; North Maintenance Yard, bimonthly Inspection
	Name of facility #2: ***40th St Maintenance Yard***	12			
	Name of facility #3: ***126th Ave. Maintenance Yard***	12			
Part III.A.6					
	Continue to require proper certification and licensing by the Florida Department of Agriculture and Consumer Services (FDACS) for all applicators contracted to apply pesticides, herbicides, or fertilizers on permittee-owned property, as well as any permittee personnel employed in the application of these products. Report the number of permittee personnel applicators and contracted commercial applicators of pesticides and herbicides who are FDACS certified / licensed. Report the number of permittee personnel and contractors who have been trained through the Green Industry BMP Program, and the number of contracted commercial applicators of fertilizer who are FDACS certified / licensed.				
	PERSONNEL: Florida Department of Agriculture and Consumer Services (FDACS) certified applicators of pesticides and herbicides	41/9	Service Reports, Licenses / Ecological Services, Mosquito and Vegetation	Parks & Conservation Resources (PCR) - Bob Miller; PW/DEM Joseph Thames	
	CONTRACTORS: FDACS certified / licensed applicators of pesticides and herbicides	7/1	Certificates / Service Reports	PCR, Bob Miller; REM, Teri Hasbrouck	
	CONTRACTORS: FDACS certified / licensed applicators of fertilizer	15	Licenses, Certificates	PCR - Bob Miller	
	PERSONNEL: Green Industry BMP Program training completed	16	Service Reports, Licenses	PCR, Bob Miller; PW/DEM, Joseph Thames	All Govt staff. UF does not provide distinction

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE				
CONTRACTORS: Green Industry BMP Program training completed	50	Service Reports, Licenses	PCR, Bob Miller	GIBMP all others – except other government
Pursuant to SB 2080 (2009), all local governments are encouraged to adopt a Florida-friendly Landscaping Ordinance similar to the one set forth in the document "Florida-friendly Guidance Models for Ordinances, Covenants and Restrictions." If the broader Florida-friendly ordinance described above is not adopted, then all local governments within the watershed of a nutrient-impaired water body shall adopt the Department's Model Ordinance for Florida-Friendly Fertilizer Use on Urban Landscapes pursuant to SB 494 (2009) or an ordinance that includes all of the requirements set forth in the Model Ordinance. The ordinance shall be adopted within 24 months of the date of permit issuance. Provide a copy of the adopted ordinance with the subsequent Year 1 or Year 2 Annual Report.				
Year 1 or Year 2 ONLY: Attach copy of adopted Florida-friendly ordinance	N/A-submitted in Year 1	N/A	N/A	N/A
During Year 1 of the permit, develop and implement a written public education and outreach program plan to encourage citizens to reduce their use of pesticides, herbicides, and fertilizers. Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage citizens to reduce their use of pesticides, herbicides, and fertilizers, including the type and number of activities conducted, the type and number of materials distributed, the percentage of the population reached by the activities in total, and the number of Web site visits (if applicable). Activities performed under the Florida Yards and Neighborhoods (FYN) program should only be reported if the permittee is contributing funding towards the FYN staff and program within its jurisdiction. **FYN PROGRAM FUNDING: Permittee Provides Funding? ☒ Yes ☐ No Amount of Funding = $8,385.25** **WATERSHED CAMPAIGN: Permittee Provides Funding? ☒ Yes ☐ No Amount of Funding = $59,500.00**				
Estimated percentage of the population reached by the activities in total	~40			Estimate only - Based on unincorporated pop 287K for 2015
FYN: In-person outreach (phone, email, walk-in)	2,813	FYN 2016 Annual Report	IFAS/Extension, FYN Brian Niemann	
FYN: Brochure/Flyers/Fact sheets distributed	1,676			
FYN: Neighborhood presentations: Number of participants	0			Included in seminars category
FYN: Neighborhood presentations: Number conducted	0			
FYN: Public displays (e.g., kiosks, storyboards, posters, etc.)	510 citizens reached			
FYN: Radio or television Public Service Announcements (PSAs)	28,194 citizens potentially reached			Decrease in PSA frequency from CY 2015

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	FYN: School presentations: Number conducted	0	FYN 2016 Annual Report	IFAS/Extension, FYN Brian Niemann	Included in seminars category
	FYN: School presentations: Number of participants	0			
	FYN: Seminars/Workshops: Number conducted	117			
	FYN: Seminars/Workshops: Number of participants	3,040			
	FYN: Special events: Number conducted	0			Included in seminars category
	FYN: Special events: Number of participants	0			
	Vehicle Wraps	3	Vehicle photos	PW/DEM Joseph Thames	
	Watershed Campaign- Pinellas County fertilizer ordinance materials distributed	5,011	Fertilizer Database		Includes 3000 provided to retailers
	Watershed Campaign – Pinellas County Landscape BMP Certification attendees	585	Fertilizer database		
	Watershed Campaign - Web Site: Number of hits / visitors to the fertilizer page	7,210	Communications report		
Part III.A.7.a	**Illicit Discharges and Improper Disposal — Inspections, Ordinances, and Enforcement Measures**				
	Where applicable, strengthen the legal authority to conduct inspections, conduct monitoring, control illicit discharges, illicit connections, illegal dumping and spills into the MS4 and to require compliance with conditions in ordinances, permits, contracts, and orders. Report amendments, as needed.				
	ATTACH a report on any amendments to the applicable legal authority	N/A			Submitted with Year 1 Annual Report
Part III.A.7.c	**Illicit Discharges and Improper Disposal — Investigation of Suspected Illicit Discharges and/or Improper Disposal**				
	During Year 1 of the permit, develop and implement a written proactive inspection program plan for identifying and eliminating sources of illicit discharges, illicit connections, or dumping to the MS4. Report on the proactive inspection program, including the number of inspections conducted, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Proactive inspections for suspected illicit discharges / connections / dumping	44	Enforcement database	PW/DEM Joseph Thames	

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

Illicit discharges / connections / dumping found during a proactive inspection	5	Enforcement database	PW/DEM Joseph Thames	All issues were corrected upon notification
Notices of Violation (NOVs) / warning letters / citations issued for illicit discharges / connections / dumping found during a proactive inspection	0			
Fines issued for illicit discharges / connections / dumping found during a proactive inspection	0			
Year 1 ONLY: Attach the written proactive inspection program plan	N/A			

Annually review (and revise, as needed) and implement the permittee's written procedures to conduct reactive investigations to identify and eliminate the source(s) of illicit discharges, illicit connections or improper disposal to the MS4, based on reports received from permittee personnel, contractors, citizens, or other entities regarding suspected illicit activity. Report on the reactive investigation program as it relates to responding to reports of suspected illicit discharges, including the number of reports received, the number of investigations conducted, the number of illicit activities found, and the number and type of enforcement actions taken.

Reports of suspected illicit connections / discharges / dumping received	179	Enforcement Database	PW/DEM Joseph Thames	Reactive only
Reactive investigations of reports of suspected illicit discharges/ connections / dumping	146			
Illicit discharges / connections / dumping found during a reactive investigation	73			
Notices of Violation (NOVs) / warning letters / citations issued for illicit discharges / connections / dumping found during a reactive investigation	7			NOV/WRN/CO
Fines issued for illicit discharges / connections / dumping found during a reactive investigation	1			

During Year 1 of the permit, develop and implement a written plan for the training of all appropriate permittee personnel (including field crews, fleet maintenance staff, and inspectors) and contractors to identify and report conditions in the stormwater facilities that may indicate the presence of illicit discharges / connections / dumping to the MS4. Refresher training shall be provided annually. Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training).

	Initial Training	**Refresher Training**				
Personnel trained	**21**	**0**		Skyprep records	PW/DEM Joseph Thames	Illicit Discharge and Detection online training
Contractors trained	**0**	**0**				

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE							
Part III.A.7.d	**Illicit Discharges and Improper Disposal — Spill Prevention and Response**						
	Annually review (and revise, as needed) and implement the permittee's written spill-prevention/spill-response plan and procedures to prevent, contain, and respond to spills that discharge into the MS4. Report on the spill prevention and response activities, including the number of spills addressed.						
	Hazardous and non-hazardous material spills responded to	858			911 database/WRMS Enforcement database	EMS & Fire Admin Sandy Brooking	
	During Year 1 of the permit, develop and implement a written plan for the training of all appropriate permittee personnel (including field crews, firefighters, fleet maintenance staff and inspectors) and contractors on proper spill prevention, containment, and response techniques and procedures. Refresher training shall be provided annually. Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training).						
		Initial Training	**Refresher Training**				
	Personnel trained	140/0/21	87/43/0		Training Attendance Sheets, Skyprep records	EMS & Fire Admin Sandy Brooking; Risk Management Rodney Bolt; PW/DEM Joseph Thames	Hazwoper and Refresher Training.
	Contractors trained	**0**	**0**		Skyprep records	PW/DEM Joseph Thames	Spill Prevention and Response online training
Part III.A.7.e	**Illicit Discharges and Improper Disposal — Public Reporting**						
	During Year 1 of the permit, develop and implement a written public education and outreach program plan to promote, publicize, and facilitate public reporting of the presence of illicit discharges and improper disposal of materials into the MS4. Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage the public reporting of suspected illicit discharges and improper disposal of materials, including the type and number of activities conducted, the type and number of materials distributed, the percentage of the population reached by the activities in total, and the number of Web site visits (if applicable).						
	Estimated percentage of the population reached by the activities in total	~90%			Communications Report or Environmental Management Database	PW/DEM Joseph Thames	Estimate only - Based on unincorporated pop 287K for 2015

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Brochures/Flyers/Fact sheets distributed	10,377	Communication's Department reports or Environmental Management Database	PW/DEM Joseph Thames	
	Public Service Announcements (PSAs) Impressions (Theater Ads)	0 / 0			Was not implemented in 2016
	In-person outreach (phone, email, walk-in)	15,431			
	Facebook reaches	168,429			
	Twitter Impressions	24			
	Stormdrains marked	215			
	Vehicles / Buses wrapped	3/4			
	Web Site: Number of visitors to the watershed-related pages	54,214			
Part III.A.7.f	**Illicit Discharges and Improper Disposal — Oils, Toxics, and Household Hazardous Waste Control**				
	During Year 1 of the permit, develop and implement a written public education and outreach program plan to encourage the proper use and disposal of used motor vehicle fluids, leftover hazardous household products, and lead acid batteries. Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage the proper use and disposal of oils, toxics, and household hazardous waste, including the type and number of activities conducted, the type and number of materials distributed, the amount of waste collected / recycled / properly disposed, the percentage of the population reached by the activities in total, and the number of Web site visits (if applicable).				
	Estimated percentage of the population reached by the activities in total	60% - 70%	Estimate	Solid Waste T.F. Armbruster	Based on utility bill inserts & public outreach
	Household Chemical Collection Center Program: Amount of waste collected / recycled / properly disposed (tons)	1,548	Software / Logs		

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Household Chemical Collection Center Program: Events	51	Annual Schedule	Solid Waste T.F. Armbruster	Mobile collections & Haz-to-go
	Household Hazardous Waste Materials Guides distributed	277,000	Invoice / tracking log		Recycling Dir. & HEC# Brochure
	Brochures/Flyers/Fact sheets distributed	5,000 2,815	Invoice / tracking log		SW Info card "Don't strain the drain"
	Neighborhood presentations: Number conducted	87	Tracking log		
	Neighborhood presentations: Number of participants	1,1751	Tracking log		
	Newspapers & newsletters: Number of articles/notices published	64	Invoices		Adv. Mobile collection, in two newspapers
	Newsletters: Number of newsletters distributed	60,630	Invoices		
	Public displays (e.g., kiosks, storyboards, posters, etc.)	0	Tracking log		
	Radio or television Public Service Announcements (PSAs)	1	Count		Solid Waste Ops/Channel 13
	School presentations: Number conducted	142	Tracking log		
	School presentations: Number of participants	7,478	Tracking log		
	Seminars/Workshops: Number conducted	1,290	-		SQG Bus. Inspected
	Seminars/Workshops: Number of participants	0	-		
	Special events: Number conducted	11	Tracking log		
	Special events: Number of participants	2,051	Tracking log		
	Storm sewer inlets newly marked/replaced	NA	NA		
	Web Site: Number of visitors to the stormwater-related pages	NA	NA		
Part III.A.7.g	**Illicit Discharges and Improper Disposal — Limitation of Sanitary Sewer Seepage**				
	Annually review (and revise, as needed) and implement the permittee's written procedures to reduce or eliminate sanitary wastewater contamination into the MS4, including discharges to the MS4 from sanitary sewer overflows (SSOs) and from inflow / infiltration from collection / transmission systems and/or septic tank systems. Advise the appropriate utility owner of a violation if constituents common to wastewater contamination are discovered in the MS4 Report on the type and number of activities undertaken to reduce or eliminate SSOs and inflow/ infiltration, the number of SSOs or inflow / infiltration incidents found and the number resolved, and the name of the owner of the sanitary sewer system within the permittee's jurisdiction.				

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer pipe inspected for infiltration (linear feet)	1,013,487.3	Spreadsheet Data from Maximo	Utilities General Maintenance Division (GMD) Debra Gerdes	TV/Smoke Test
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer pipe sealed, lined, and / or replaced (linear feet)	6,939	GIS Records	Utilities Engineering Jeremy Waugh	27 Line Segments w/CIPP
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer line breaks repaired	266	Spreadsheet Data from Maximo	Utilities GMD Debra Gerdes	Main Line / Service/FY15 # was 107 and not 6107 as reported
	Activity to reduce/eliminate SSOs and inflow / infiltration: Septic systems removed	92	DOH Records	Florida Dept. of Health, Pinellas County Office Henry Kunce	Based off of Septic Tank Abandonment permits issued
	Activity to reduce/eliminate SSOs and inflow / infiltration: Emergency generator added	2	Plant Records	Utilities Engineering Tom Menke	PS 443 in East Lake Woodlands and PS 371 at Lake Tarpon
	SSO incidents discovered	90	Summary Spreadsheet	Utilities Water Quality Division Stephanie Ammons	
	SSO incidents resolved	90	Summary Spreadsheet		
	Inflow / infiltration incidents discovered	246	Spreadsheet Data from Maximo	Utilities GMD Debra Gerdes	Discovered by TV and Smoke Testing
	Inflow / infiltration incidents resolved	236			

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

	Name of owner of the sanitary sewer system	Pinellas County Board of County Commissioners

Part III.A.8.a — **Industrial and High-Risk Runoff — Identification of Priorities and Procedures for Inspections**

Continue to maintain an up-to-date inventory of all existing high risk facilities discharging into the permittee's MS4. The inventory shall identify the outfall and surface water body into which each high risk facility discharges. For the purposes of this permit, high risk facilities include:

- Operating municipal landfills;
- Hazardous waste treatment, storage, disposal and recovery facilities;
- Facilities that are subject to EPCRA Title III, Section 313 (also known as the Toxics Release Inventory (TRI) maintained by the U.S. EPA); and
- Any other industrial or commercial discharge that the permittee determines is contributing a substantial pollutant loading to the permittee's MS4. This could include facilities identified through the proactive inspection program as per Part III.A.7.c of the permit.

Report on the high risk facilities inventory, including the type and total number of high risk facilities and the number of facilities newly added each year.

During Year 1 of the permit, develop and implement a written plan for conducting inspections of high risk facilities to determine compliance with all appropriate aspects of the stormwater program. While the permittee may determine the order and frequency of the inspections, the permittee shall inspect each identified facility at least once during the permit term; however, facilities identified as high risk due to the findings of the proactive inspection program as per Part III.A.7.c of the permit shall be inspected annually. Report on the high risk facilities inspection program, including the number of inspections conducted and the number and type of enforcement actions taken.

	Number of Facilities	Number of Inspections	For violations discovered during a high risk inspection				
			Fines issued	Notices of Violation (NOVs) / warning letters / citations issued			
Total high risk facilities	36	0				PW/DEM Joseph Thames	All inspections of high risk and EPCRA Title III facilities completed by end of year 3
New high risk facilities added to the inventory during the current reporting period	0	0					
Operating municipal landfills	0	0					None without permits

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE								
	Hazardous waste treatment, storage, disposal and recovery (HWTSDR) facilities	0	0					
	EPCRA Title III, Section 313 facilities (that are not landfills or HWTSDR facilities)	36	0				PW/DEM Joseph Thames	All inspections of high risk and EPCRA Title III facilities completed by end of year 3
	Facilities determined as high risk by the permittee through the proactive inspections as per Part III.A.7.c	0	0					
	Other facilities determined as high risk by the permittee (that are not facilities identified through the proactive inspections)	0	0					
Part III.A.8.b	**Industrial and High-Risk Runoff — Monitoring for High Risk Industries**							
	Sampling of the discharge to the stormwater system may be required on an as-needed basis in the event that inspections of high-risk facilities disclose suspected illicit discharges to the MS4. New high-risk industrial facilities as defined in 40 CFR 122.26(d)(2)(iv)(C) must be evaluated to determine if the new discharge is contributing a substantial pollutant load to the MS4. The evaluation may include site-specific monitoring. Report the number of high risk facilities sampled.							
	High risk facilities sampled	0					PW/DEM Joseph Thames	No sampling needed this year
Part III.A.9.a	**Construction Site Runoff — Site Planning and Non-Structural and Structural Best Management Practices**							
	Continue to implement the local codes or land development regulations and the written pre-construction site plan review procedures that require the use and maintenance of appropriate structural and non-structural erosion and sedimentation controls during construction to reduce the discharge of pollutants to the MS4. Report the number of permittee and private pre-construction site plans reviewed for stormwater, erosion, and sedimentation controls, and the number approved.							
	PERMITTEE SITES: Construction site plans reviewed	23		SWFWMD and FDEP databases / Municipal tracking logs			PW/SMD Bruce Wirth	Based on issued permits
	PERMITTEE SITES: Construction site plans approved	23						
	PRIVATE SITES: Construction site plans reviewed	268		Site Plan Files			DRS Cliff Still	Based on approved site plans only
	PRIVATE SITES: Construction site plans approved	268						

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
	Annually review (and revise, as needed) and implement the permittee's written procedures to notify all new development / redevelopment permit applicants of the need to obtain all required stormwater permits. Report the number of new development/redevelopment permit applicants notified of the ERP and CGP, and the number of applicants who confirmed ERP and CGP coverage.				
	Notified of ERP stormwater permit requirements	268	Site Plan Files	DRS Cliff Still	This number only represents approved site plans, others would have also been notified but not approved
	Confirmed ERP coverage	44			Based on approved site plans only
	Notified of CGP stormwater permit requirements	44			
	Confirmed CGP coverage	44	Site Plan Files	DRS Cliff Still	Based on approved site plans only
Part III.A.9.b	**Construction Site Runoff — Inspection and Enforcement**				
	As an attachment to the Year 1 Annual Report, the permittee shall submit a written plan that details the standard operating procedures for implementation of the stormwater, erosion and sedimentation inspection program for construction sites discharging stormwater to the MS4. The permittee shall implement the plan for inspecting construction sites immediately upon written approval by the Department. Prior to Department approval, the permittee shall continue to perform inspections in accordance with its previously developed construction site inspection procedures. Report on the inspection program for privately-operated and permittee-operated construction sites, including the number of active construction sites during the reporting year, the number of inspections of active construction sites, the percentage of active construction sites inspected, and the number and type of enforcement actions / referrals taken.				
	PERMITTEE SITES: Active construction sites	43	NPDES Reports	PW/Construction Wesley Merritt	Records from County Inspectors & Contractors
	PERMITTEE SITES: Inspections of active construction sites for proper stormwater, erosion and sedimentation BMPs	2478			
	PERMITTEE SITES: Percentage of active construction sites inspected	95			
	PRIVATE SITES: Active construction sites	44	Permits Plus Database	DRS Cliff Still	
	PRIVATE SITES: Inspections of active construction sites for proper stormwater, erosion and sedimentation BMPs	1635			

	PRIVATE SITES: Percentage of active construction sites inspected	100	Permits Plus Database	DRS Cliff Still	
	Red Tags issued	0			Inspectors do not issue Red Tags
	Notices of Violation (NOVs) issued	14			
	Stop Work Orders issued	0			Inspectors do not issue SWO's
	Fines issued	4			
	Year 1 ONLY: Attach the written construction site inspection program plan	N/A			

Part III.A.9.c	**Construction Site Runoff — Site Operator Training**

During Year 1 of the permit, develop and implement a written plan for stormwater training / outreach for construction site plan reviewers, site inspectors and site operators. Provide training for permittee personnel (employed by or under contract with the permittee) involved in the site plan review, inspection or construction of stormwater management, erosion, and sedimentation controls. Also provide training for private construction site operators. All permittee inspectors (employed by or under contract with the permittee) of construction sites shall be certified through the Florida Stormwater, Erosion and Sedimentation Control Inspector Training program, or an equivalent program approved by the Department. Refresher training shall be provided annually.

Report the type of training activities, the number of inspectors, site plan reviewers and site operators trained (both in-house and outside training), and the number of private construction site operators trained by the permittee.

	Certification Training	**Initial Training (non-certification)**	**Refresher Training**			
Permittee construction site inspectors	5	N/A	0	Attendance Spreadsheet	PW/DEM Joseph Thames	Pinellas County provides the FDEP Sediment & Erosion Control Training at a minimum twice per year to county, municipal, and contractor staff.
Permittee construction site plan reviewers	6	N/A	0			
Permittee construction site operators	5	N/A	0			
Private construction site operators	22	N/A	1			

SECTION VIII. EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM (SWMP)		
	Permit Citation/ SWMP Element	**SWMP EVALUATION**
A.	**Part II.A.1 Structural control inspection and maintenance**	Strengths: Pinellas County's MS4 is inspected and maintained by the Public Works Department. Public Works personnel conduct the inspections cyclically using Trimble GPS units to update the Stormwater Inventory and identify if maintenance or repair is needed. Maintenance and repair work requests are generated in the Work Management System for completion by the applicable sections in the Public Works Department. Maintenance scheduling is performed through systems analysis to prioritize and identify the source of the drainage complaints. Each system is fully restored to its original design to ensure the system is working in its entirety, which has significantly reduced the "high" and "emergency" stormwater conveyance work requests and moved the focus towards preventative maintenance.
		Weaknesses: None.
		SWMP Revisions to address deficiencies: Pinellas County is fully compliant with this requirement.
	Part II.A.2 Significant redevelopment	Strengths: Pinellas County has recently incorporated a low impact design stormwater manual into its Code of Ordinances. The Stormwater Manual offers the latest technologies available in LID and urban stormwater management, and is paired with modeling software to demonstrate BMP effectiveness. Planning and Development Review Services Department staff continue to review new and re-development projects for habitat, wetland, and stormwater impacts.
		Weaknesses: The Stormwater Manual implementation is still relatively recent and will need to be closely monitored to ensure it is utilized to its maximum potential.
		SWMP Revisions to address deficiencies: None at this time until the effectiveness of the manual can be assessed.
	Part II.A.3 Roadways	Strengths: Pinellas County has brought its street sweeping program entirely in-house. This program is reviewed and revised annually to identify roadways that need to be added and/or where frequencies need to be adjusted. The pollution prevention practices during road repair include project phasing to reduce the amount of exposed soil during the maintenance activity and to use appropriate erosion control Best Management Practices (BMPs).
		Weaknesses: Additional Erosion and Sediment Control training is needed to ensure County staff are utilizing proper BMPs.
		SWMP Revisions to address deficiencies: Street sweeping program revisions will include focus on TMDL and impaired WBIDs. Pinellas County is incorporating erosion and sediment control practices in their in-house Illicit Discharge training program and will be providing key staff with additional Erosion and Sediment Control assistance and regular refreshers.

SECTION VIII. EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM (SWMP)		
	Part II.A.4 Flood control	Strengths: Pinellas County has a six-year Capital Improvement Program (current cycle 2010-2016), for which 85 to 95% of projects incorporates flood control and stormwater. The Capital Improvement Program is supported through the "Penny for Pinellas" sales tax that is renewed every ten years (current cycle 2010-2020).
		Weaknesses: None.
		SWMP Revisions to address deficiencies: Pinellas County is fully compliant with this requirement.
	Part II.A.5 Waste TSD Facilities	Strengths: Pinellas County operates 3 maintenance yards that qualify under this requirement. These yards are inspected regularly based on their usage.
		Weaknesses: None.
		SWMP Revisions to address deficiencies: Pinellas County is fully compliant with this requirement.
	Part II.A.6 Pesticide, herbicide, fertilizer application	Strengths: Pinellas County continues to implement and enforce the most stringent fertilizer ordinance in the State. This ordinance includes a sale retail and application ban in the summer, as well as requirements on application rates, certification training, buffer zones, and weather restrictions. Pinellas County monitors the certifications of all staff and contractors who operate in the County. Our outreach programs follow a triple approach: FYN, Be Floridian (fertilizer campaign managed by Pinellas County), and the Pinellas County Watershed Outreach Campaign. Avenues for outreach include but not limited to internet, TV, radio, billboards, vehicle wraps, brochures, events, and local/national/global cleanup efforts (Keep Pinellas Beautiful, Great American Cleanup, International Coastal Conservation Cleanup) with a total budget of approximately $59,500 per year, and reaching an estimate of 90% of the County population.
		Weaknesses: None.
		SWMP Revisions to address deficiencies: None. Pinellas County is fully compliant with this requirement.
	Part II.A.7 Illicit Discharge Detection and Elimination	Strengths: Pinellas County continues to implement a robust Illicit Discharge Detection and Elimination outreach program. We currently offer on-line Training and all Pinellas County affected field personnel are required to take this training. Pinellas County also runs a comprehensive proactive and reactive Illicit Discharge inspection program within the unincorporated area and for FDOT through an Interlocal Agreement. The SSO program is actively tracked through a Work Management System and GIS data, and Utilities is continuing their I&I program as well as has developed a storm event protocol to reduce the number of SSOs.
		Weaknesses: None.
		SWMP Revisions to address deficiencies: Pinellas County is fully compliant with this requirement.
	Part II.A.8 High Risk Industry Runoff	Strengths: Pinellas County has highly trained and specialized staffs who fulfill this requirement.
		Weaknesses: None.
		SWMP Revisions to address deficiencies: None. Pinellas County is fully compliant with this requirement.

SECTION VIII. EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM (SWMP)		
	Part II.A.9 Construction Site Runoff	Strengths: All Pinellas County staff involved with construction site design, operation and inspection are State certified for Sediment and Erosion Control. The County offers Erosion Control Training and Certification and refreshers twice a year.
		Weaknesses: Proper maintenance and implementation of Best Management Practices on municipal and privately owned sites is sometimes challenging.
		SWMP Revisions to address deficiencies: Increase Sediment and Erosion Control Training and Outreach to affected groups.

SECTION IX. CHANGES TO THE STORMWATER MANAGEMENT PROGRAM (SWMP) ACTIVITIES (Not Applicable In Year 4)		
A.	**Permit Citation/ SWMP Element**	**Proposed Changes to the Stormwater Management Program Activities Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change) — REQUIRES DEP APPROVAL PRIOR TO CHANGE IF PROPOSING TO REPLACE OR DELETE AN ACTIVITY.**
B.	**Permit Citation/ SWMP Element**	**Changes to the Stormwater Management Program Activities NOT Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change)**

CHECKLIST A: ATTACHMENTS TO BE SUBMITTED WITH THE ANNUAL REPORTS

Below is a list of items required by the permit that may need to be attached to the annual report. Please check the appropriate box to indicate whether the item is attached or is not applicable for the current reporting period. Please provide the number and the title of the attachments in the blanks provided.

Attached	N/A	Rule / Permit Citation	Required Attachment	Attachment Number	Attachment Title
☐	☒	Part II.F	**EACH ANNUAL REPORT:** If program resources have decreased from the previous year, a discussion of the impacts on the implementation of the SWMP.		
☐	☒	Part III.A.1	**EACH ANNUAL REPORT:** An explanation of why the minimum inspection frequency in Table II.A.1.a was not met, if applicable.		
☐	☒	Part III.A.4	**EACH ANNUAL REPORT:** A list of the flood control projects that did not include stormwater treatment and an explanation for each of why it did not, if applicable.		
☐	☒	Part III.A.7.a	**EACH ANNUAL REPORT:** A report on amendments / changes to the legal authority to control illicit discharges, connections, dumping, and spills, if applicable.		
☒	☐	Part V.B.9	**EACH ANNUAL REPORT:** Reporting and assessment of monitoring results. **[Also addressed in Section III of the Annual Report Form]**	A	SURFACE WATER QUALITY MONITORING SUMMARY
☒	☐	Part VIII.B.3.e	**EACH ANNUAL REPORT:** A status report on the implementation of the requirements in this section of the permit and on the estimated load reductions that have occurred for the pollutant(s) of concern.	A	
☐	☒	Part VIII.B.4.f	**EACH ANNUAL REPORT after approval of the BPCP:** The status of the implementation of the Bacterial Pollution Control Plan (BPCP).		
☐	☒	Part III.A.1	**YEAR 1:** An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM).		
☐	☒	Part III.A.3	**YEAR 1:** If have curbs and gutters but no street sweeping program, an explanation of why no street sweeping program and the alternate BMPs used or planned.		
☐	☒	Part III.A.6	**YEAR 1 or YEAR 2:** A copy of the adopted Florida-friendly Ordinance, if applicable.		
☐	☒	Part III.A.7.c	**YEAR 1:** A proactive illicit discharge / connection / dumping inspection program plan.		
☐	☒	Part III.A.9.b	**YEAR 1:** A construction site inspection program plan. **[For approval by DEP]**		
☐	☒	Part III.A.2	**YEAR 2:** A summary report of a review of codes and regulations to reduce the stormwater impact from new development / redevelopment.		
☐	☒	Part V.A.2	**YEAR 3:** Estimates of annual pollutant loadings and EMCs, and a table comparing the current calculated loadings with those from the previous two Year 3 ARs.		
☒	☐	Part III.A.2	**YEAR 4:** A follow-up report on plan implementation of changes to codes and regulations to reduce the stormwater impact from new development / redevelopment.	B	APPENDIX B
☒	☐	Part V.A.3	**YEAR 4:** If the total annual pollutant loadings have not decreased over the past two permit cycles, revisions to the SWMP, as appropriate.	A	SURFACE WATER QUALITY MONITORING SUMMARY
☒	☐	Part V.B.3	**YEAR 4:** The monitoring plan (with revisions, if applicable).	C	SURFACE WATER QUALITY MONITORING PROGRAM
☒	☐	Part VII.C	**YEAR 4:** An application to renew the permit.	Cover Letter	
☒	☐	Part VIII.B.3.d	**YEAR 4:** A TMDL Implementation Plan / Supplemental SWMP.	A	SURFACE WATER QUALITY MONITORING SUMMARY

CHECKLIST B: THE REQUIRED ANNUAL REVIEWS OF WRITTEN STANDARD OPERATING PROCEDURES (SOPs) & PLANS

The permit requires annual review, and revision if needed, of written Standard Operating Procedures (SOPs) and plans (e.g., public education and outreach, training, inspections). Please indicate your review status below. **If you have made revisions that need DEP approval, you must complete Section VIII.A of the annual report.**

Did not complete review of existing SOP / Plan	Developed new written SOP / Plan	Reviewed & no revision needed to existing SOP / Plan	Reviewed & revised existing SOP / Plan	Permit Citation	Description of Required SOPs / Plans
☐	☐	☐	☒	Part III.A.1	SOP and/or schedule of inspections and maintenance activities of the structural controls and roadway stormwater collection system.
☐	☐	☐	☒	Part III.A.2	SOP for development project review and permitting procedures and/or local codes and regulations for new development / areas of significant development.
☐	☐	☒	☐	Part III.A.3	SOP for the litter control program.
☐	☐	☐	☒	Part III.A.3	SOP for the street sweeping program.
☐	☐	☒	☐	Part III.A.3	SOP for inspections of equipment yards and maintenance shops that support road maintenance activities.
☐	☐	☒	☐	Part III.A.5	SOP for inspections of waste treatment, storage, and disposal facilities not covered by an NPDES stormwater permit.
☐	☐	☒	☐	Part III.A.6	Plan for public education and outreach on reducing the use of pesticides, herbicides and fertilizer.
☐	☐	☒	☐	Part III.A.6	SOP for reducing the use of pesticides, herbicides and fertilizer, and for the proper application, storage and mixing of these products.
☐	☐	☐	☒	**Part III.A.7.c**	**Plan for proactive illicit discharge / connections / dumping inspections.***
☐	☐	☐	☒	Part III.A.7.c	SOP for reactive illicit discharge / connections / dumping investigations.
☐	☐	☐	☒	Part III.A.7.c	Plan for illicit discharge training.
☐	☐	☐	☒	Part III.A.7.d	SOP for spill prevention and response efforts.
☐	☐	☐	☒	Part III.A.7.d	Plan for spill prevention and response training.
☐	☐	☒	☐	Part III.A.7.e	Plan for public education and outreach on how to identify and report the illicit discharges and improper disposal to the MS4.
☐	☐	☒	☐	Part III.A.7.f	Plan for public education and outreach on the proper use and disposal of oils, toxics and household hazardous waste.
☐	☐	☒	☐	Part III.A.7.g	SOP to reduce / eliminate sanitary wastewater contamination of the MS4.
☐	☐	☐	☒	Part III.A.8	SOP for inspections of high risk industrial facilities.
☐	☐	☒	☐	Part III.A.9.a	SOP for construction site plan review for stormwater, erosion and sedimentation controls, and ERP and CGP coverage.
☐	☐	☒	☐	**Part III.A.9.b**	**Plan for inspections of construction sites.***
☐	☐	☒	☐	Part III.A.9.c	Plan for stormwater, erosion and sedimentation BMPs training.

*** Revisions to these plans require DEP approval – please complete Section VIII.A of the annual report.**

REMINDER LIST OF THE TMDL / BMAP REPORTS TO BE SUBMITTED SEPARATELY FROM AN ANNUAL REPORT		
Rule / Permit Citation	**Report Title**	**Due Date**
Part VIII.B.3.a	**6 MONTHS from effective date of permit:** TMDL Prioritization Report.	7/1/13
Part VIII.B.3.b	**12 MONTHS from effective date of permit:** TMDL Monitoring and Assessment Plan.	1/1/14
Part VIII.B.3.c	**6 MONTHS from receiving analyses from the lab:** TMDL Monitoring Report.	submitted
Part VIII.B.4	**30 MONTHS from start date in TMDL Prioritization Report:** A Bacterial Pollution Control Plan (BPCP).	submitted

BMAP Reporting

MS4 permittees are NOT required to submit the annual report required by any BMAP that applies to them since the NPDES Stormwater Staff can obtain them from the department's Watershed Planning and Coordination staff. However, to assure that the stormwater staff are aware of which BMAPs apply to the MS4 permittees and when the latest BMAP annual report was submitted, please complete the information below, if applicable:

Rule/Permit Citation	BMAP Title	Date BMAP Annual Report Submitted to DEP
Part VIII.B.2		
Part VIII.B.2		
Part VIII.B.2		
Part VIII.B.2		

END OF REVISED TAILORED MS4 AR FORM
CYCLE 3 PERMIT

Attachment 2

Pinellas County NPDES Annual Report 2016
Appendix A: Surface Water Quality Monitoring Summary

APPENDIX A

SURFACE WATER QUALITY MONITORING SUMMARY

1.0 Introduction

Since October 1990, the Pinellas County's Public Works Department, Division of Environmental Management (DEM) has monitored surface water quality in four lakes, nine receiving water bodies, and the majority of the County's 52 drainage basins. In January 2003, a revised monitoring program (Janicki, 2003) was implemented to provide better geographical coverage of County waters and to provide more statistically defensible results in comparison to the original (1991-2002) program.

In this report, water quality conditions are summarized by site, by basin, and for the entire County from 2003-2016. Parameters measured in situ included temperature, flow, salinity, specific conductance, pH, dissolved oxygen, water column depth, and Secchi depth. Analyses of grab samples collected from the field included chlorophyll (a, b, c), nutrients (total Kjeldahl nitrogen [TKN], ammonia nitrogen [NH3], nitrate + nitrite nitrogen [NOX], total nitrogen [TN], total phosphorus [TP], and dissolved orthophosphorus [OP]), five day biological oxygen demand (BOD5), color, total suspended solids (TSS), transmissivity, *Enterococcus*, *Escherichia coli*, fecal coliform, and turbidity.

Based on the current FDEP verified impaired lists, TMDLs, and Reasonable Assurance Plans:

- All 5 Tampa Bay strata, 1 of 8 western Intracoastal strata, three lake strata, and 33 of the 36 WBIDs associated with the 56 fixed land sites do not meet criteria for dissolved oxygen, nutrients, or bacteria.
- 20 fixed land site WBIDs do not meet nutrient or dissolved oxygen criteria.
- 29 fixed land site WBIDs do not meet fecal coliform criteria.
- The northern lobe of Old Tampa Bay near the Tarpon Outfall Canal discharge, Riviera Bay, and Long Bayou do not meet nutrient or dissolved oxygen criteria.
- Lake Seminole does not meet nutrient criteria, and Lake Tarpon does not meet criteria for nutrients and dissolved oxygen.
- All strata in Tampa Bay are listed as impaired for bacteria either in the water column or in shellfish.

Results of statistical time series trend analyses are included in this report for the first time. These analyses provide a more accurate examination of the water quality trends in the County over time as compared to the precipitation-influenced annual loads discussed in previous reports. Most of the Pinellas County basins show stable or improving trends in TN, TP, TSS, and chlorophyll-a.

2.0 Methodology

Field sample collections and measurements were carried out according to Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (FDEP 2008).

2.1 - FIELD MEASUREMENTS AND SAMPLE COLLECTION

Physical parameters including temperature, pH, dissolved oxygen, conductivity, and salinity were measured using Hydrolab® multiprobe units. Surface readings were taken at a depth of 0.2 meter from the surface. If the total water column depth was >0.5 meter but <1.0 meter, data were recorded at the surface and 0.2 meter from the bottom. For depths greater than 1.0 meter, data were also recorded at mid-depth.

From 2003-2016 for both fixed land sites and open water strata sites, water samples were collected at 0.2 meter using a horizontally-oriented Alpha™ bottle water sampler. Bottle immersion was used in lieu of an Alpha™ sampler for fixed land sites that were accessible by field staff.

Flow measurements were collected using a modification of the US Geological Survey's (USGS) stream flow methodology with a Marsh McBirney Model 2000 Flow-Mate® or by using data collected at either real-time USGS continuous flow monitoring locations or data logging Hydrologic Data Collection, Inc (HDI) continuous flow monitoring locations. Water quality samples were not collected if flow was not detectable.

2.2 - LABORATORY METHODS

All water samples were delivered to the Pinellas County Utilities Department, the same day and usually within six hours of sample collection at any given site. The Pinellas County Utilities Department Laboratory, a National Environmental Laboratory Accreditation Conference (NELAC) certified lab, performed most sample analyses. If needed, Pace Analytical (formerly E-lab), a

NELAC certified laboratory, also provided analysis services for this program. The laboratories follow analysis protocol from:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.

Standard Methods for the Examination of Water and Wastewater, 21st Edition. APHA, WEF, AWWA, 2012

2.3 - OPEN WATER SITES

The ambient water quality program consists of two types of sample sites distinguished by selection method. The first type are randomly selected sites in open water bodies (strata) including Tampa Bay, from Oldsmar south to Riviera Bay; along the western mainland shore, from the mouth of the Anclote River south to Ft. De Soto; and the two largest lakes, Lake Tarpon and Lake Seminole (see Figure 1). Samples collected at these sites are used to assess status and trends in County receiving water bodies.

The stratified random monitoring program was designed for the Division of Environmental Management (DEM) by Janicki Environmental, Inc. (Janicki, 2003), County staff provided a set of goals and objectives as well as budgetary and logistic constraints for the program. The consultant designed a monitoring program with a probabilistic design consisting of an Environmental Protection Agency (EPA) Environmental Monitoring Assessment Program (EMAP)-based element and a stratified random element. The EMAP-based design element consists of overlaying hexagonal grids on strata (water body segments) and randomly selecting a sample location within each grid. This allows for estimating surface area for water quality conditions within each stratum. The stratified random element allows for statistical methods to be used to estimate population means and confidence limits for water quality metrics. The stratified random element also has a temporal and spatial component.

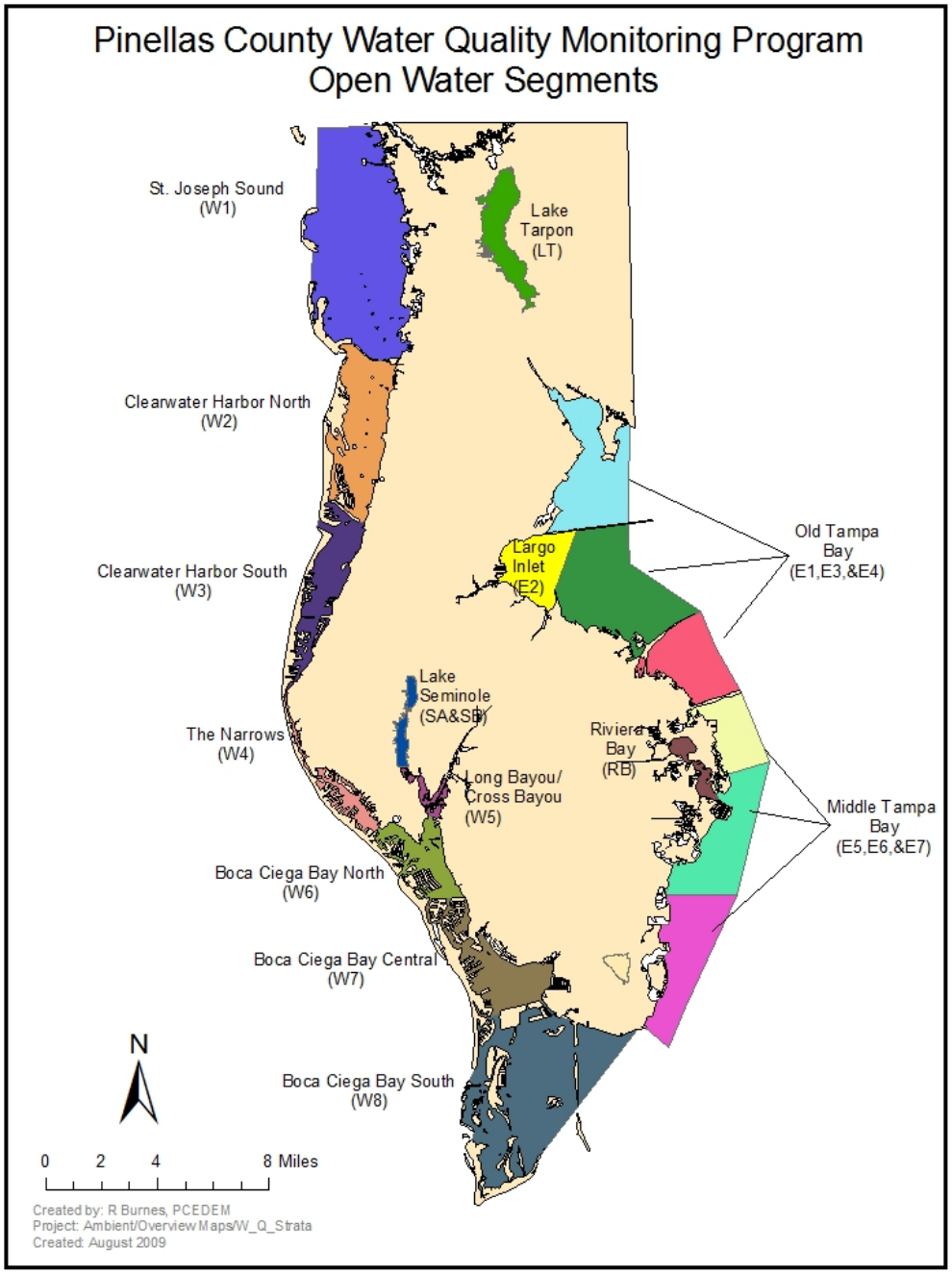

Figure 1: Pinellas County Open Water Quality Monitoring Strata.

Lake Tarpon, Lake Seminole, and the marine waters along the shores of Pinellas County were subdivided into 19 strata. East and west coast reporting units were selected based on the location of causeways, bridges, and the Tampa Bay Estuary Program boundaries (Pribble et al., 1999). It should be noted that Pinellas County stopped sampling in eastern strata E6 and E7 in 2014, which are receiving waters for the City of St. Petersburg, based on the termination of the monitoring agreement with the City.

The temporal unit is a daytime period of approximately four hours. There are two temporal units in each day representing morning and afternoon. The order of visitation (i.e., morning vs. afternoon) within each strata was randomized. The temporal population of interest was defined as a one-year set of all possible temporal units excluding Fridays, Saturdays, Sundays, holidays, and days before holidays. The calendar year was divided into four dry season sample periods of 50.75 days and four wet season sample periods of 40.5 days. Primary and secondary sampling dates were randomly selected from the first 31 days in dry season periods and the first 25 days in the wet season periods.

Due to inherent Global Positioning System (GPS) errors and boat drift at sampling sites, a spatial unit representing each sampled site was defined as a 30 meter diameter circle. From 2003 to September 2007 for east coast strata, the spatial population of interest was the set of all spatial units from the Pinellas County shoreline to the 2 meter mean low water isobath in Tampa Bay. Starting in October 2007, the eastern strata spatial population of interest was expanded to include all waters from the shoreline to strata boundaries. For west coast strata, the spatial population of interest was the set of all spatial units from the shoreline of the peninsula mainland to the eastern shore of the barrier islands. Also, the populations of interest in the eastern and western coastal reporting units were defined so each reporting unit was not located within more than one Tampa Bay Estuary Program bay segment reporting unit. The Lake Seminole population of interest was stratified geographically into a northern and southern lobe. This stratification was imposed to ensure that an equal number of samples were collected in each lobe. Lake Tarpon comprises a single stratum.

A total of 32 samples were selected for each stratum for the year. There were 8 sample periods and four sites were assigned to a sample period. In eastern strata sample effort was further stratified with 6 sample sites randomly selected from waters greater than 2 meters and 26 sites randomly selected from waters less than 2 meters.

2.4 - LAND BASINS AND SITE LOCATIONS

The second monitoring location type is a set of fixed land-based sites along streams, ditches, canals, and the Anclote River (Figure 2). Water quality samples and flow data are collected each sample period and are used to assess the condition of the waterway and for estimation of nutrient and sediment loads from these waterways to receiving waterbodies. Lake Chautauqua and Alligator Lake are monitored as fixed sites.

The county is composed of fifty-two watersheds. Most of the watersheds, excluding the eleven watersheds solely in St. Petersburg's jurisdiction, contain at least one fixed monitoring station near the final discharge point of the tributary or watershed and just upstream of tidal influence. Sampling at these sites allowed for estimates of nutrient loads discharged from the tributary or watershed into the receiving water body. Fifty-six sites were visited in 2016. Seven sites were in tidally influenced areas or lakes and only water quality data were collected. At all other sites both water quality data and flow data were collected. USGS continuous volume discharge data are available for nine sites. Another nine sites have continuous volume discharge data available from Hydrologic Data-Collection, Inc. County staff measured flow at the time of sample collection at all remaining sites. A set of fixed sites was sampled on the same day. Sampling took place during the same random schedule determined for the open water program.

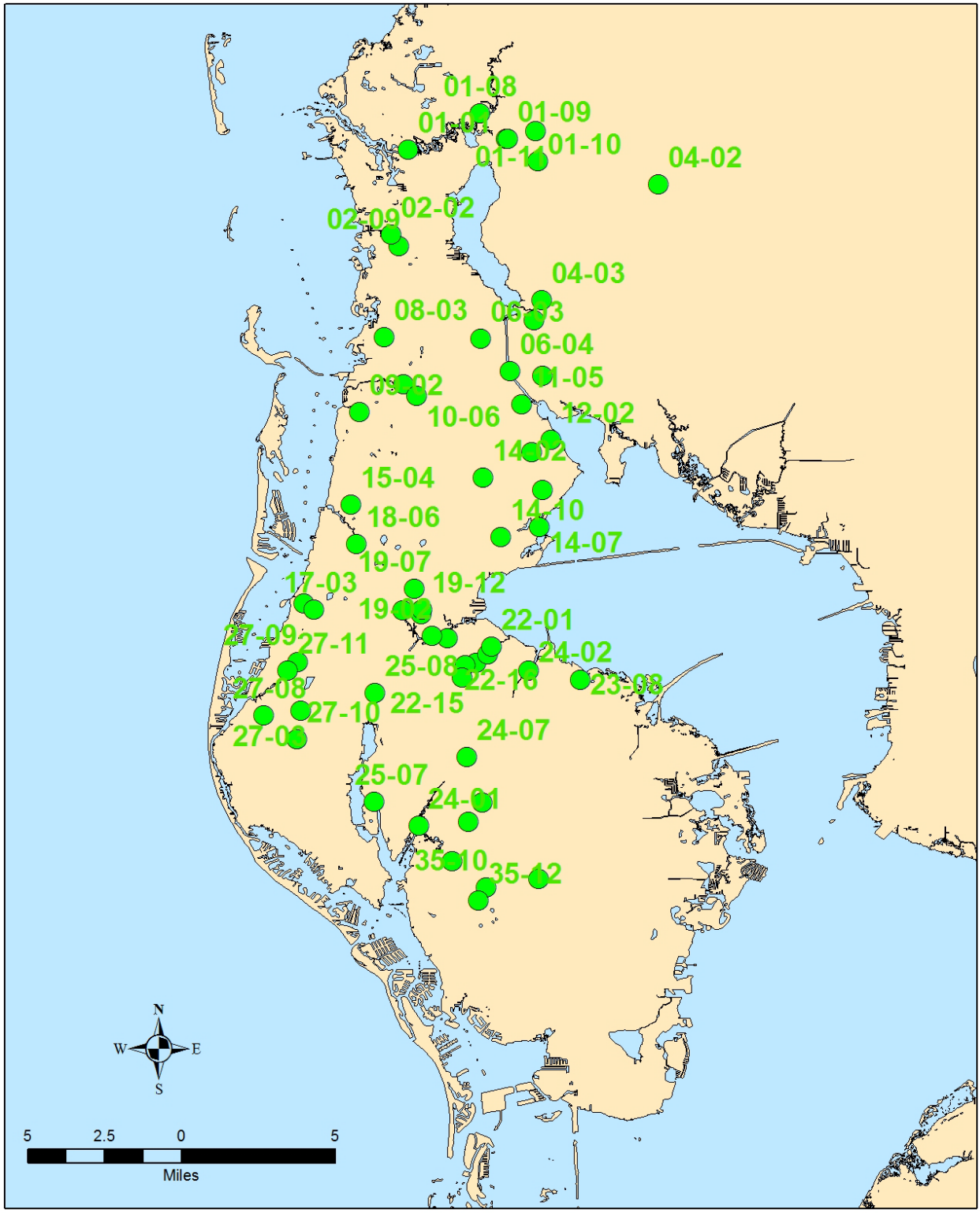

Figure 2: Pinellas County Water Quality Fixed Sites.

2.5 - PARAMETER DESCRIPTIONS

The following is a list of all water quality metrics collected in the sample program.

Alkalinity: Alkalinity is a measure of the capacity of water to neutralize acids and is reported in units of mg/L $CaCO_3$. Water samples contain alkaline chemicals like carbonates, bicarbonates, and hydroxides that neutralize acid and buffer water against pH changes. Total alkalinity is measured by adding acid to a water sample until the water sample pH reaches a standard, accepted pH endpoint. At this standard pH all alkaline chemicals are neutralized by the acid.

Aluminum: Dissolved aluminum is measured in streams and lakes treated with alum, an aluminum chemical, to remove nutrients. Water samples are filtered so only dissolved aluminum is measured. Dissolved aluminum is expressed in mg/L units.

BOD5: Biochemical oxygen demand is the quantity of dissolved oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at 20 degrees Centigrade, expressed in milligrams per liter (mg/L).

Chlorophyll-a: Water column chlorophyll-a (Chl-a) concentrations are a measure of the quantity or biomass of planktonic algae or phytoplankton in a water body. Excessive nutrient loadings into a water body can result in high phytoplankton biomass conditions known as algae blooms. High algal biomass can greatly reduce water clarity, which in turn may limit the growth and distribution of desirable bottom vegetation such as seagrasses and can seriously degrade the aesthetic quality of a water body. In addition, persistent conditions of high algae biomass often result in die-off, sinking, and decay of the algae in water bodies. Decaying matter consumes oxygen and may result in fish kills. Chl-a is measured in µg/L.

Color: Color is a measure of dissolved inorganic and organic substances in a water sample. Color is measured in platinum-cobalt units (PCU).

Conductivity: Conductivity is a measure of water's capability to pass electrical flow. This ability is directly related to the concentration of ions in the water such as dissolved salts and inorganic materials like chlorides, sulfides, and carbonate compounds. Conductivity is measures in millisiemens per centimeter (mS/cm).

Dissolved Oxygen: Dissolved oxygen (DO), measured in mg/L or percent saturation, strongly influences where organisms live. Oxygen enters the aquatic environment from the atmosphere (wind, waves, direct diffusion), plant photosynthesis, and mixing and diffusion from more oxygenated water masses. A physical property of water is that the solubility of oxygen is greater

in cold water than in warm water therefore, less oxygen can be dissolved in water as water temperature increases. Biological factors such as increased metabolic rates and oxygen uptake rates of aquatic organisms may further reduce dissolved oxygen levels. Since biological oxygen uptake is often the greatest in bottom waters compared to surface waters, the first signs of an oxygen stressed water body are usually observed as low bottom water dissolved oxygen levels. Such conditions may result in isolated or widespread fish kills.

Enterococcus: Enterococci, indicators of water column pathogens, are found in intestinal tracts of animals and humans. Its presence can be natural or from a man-made source like a sewage spill. *Enterococcus* is expressed as most probable number (MPN)/100ml.

Escherichia coli: *Escherichia coli* (*E. coli*), indicators of water column pathogens, are found in intestinal tracts of animals and humans. Its presence can be natural or from a man-made source like a sewage spill. *E. coli* is expressed in MPN/100ml.

Fecal coliform: Fecal coliforms, indicators of water column pathogens, are found in the intestinal tracts of animals and humans. Its presence can be natural or from a man-made source like a sewage spill. Fecal coliform is expressed in colony forming units (CFU)/100ml.

Flow: Flow was measured at fixed land sites. Width and depth data was collected to estimate cross sectional areas of channels. Water velocity was measured on-site using a flowmeter. The flow was then calculated in cubic feet per second (cfs). Flow volume was combined with water quality parameter concentrations to estimate loading for total nitrogen, total phosphorus, and total suspended solids.

Nutrients: This report presents two nutrient values, total phosphorus (TP) and total nitrogen (TN). TP and TN are both measured in mg/L. Nutrients are chemical elements such as nitrogen and phosphorus that sustain life and promote growth. The amount of nutrients available in a water body is one of the controlling factors for plant growth. Waters containing few nutrients cannot support a large plant community and will not attract animal life, as there will not be a source of food. Nutrients cause problems when they are overabundant. In particular, microscopic plants or algae, when under bloom conditions, may appear as green "clouds" in the water. The poor water clarity from such nutrient-induced algae blooms can limit water column light transparency, which in turn, will often limit available light necessary for desirable types of bottom vegetation, such as seagrasses, to grow. Data on specific phosphorus and nitrogen components are available on request from PCDEM.

pH: pH is a measure of how acidic or basic water is. The measurements are on a scale from 0 (acidic) to 14 (basic), with 7.0 considered neutral. If pH is too high or low, aquatic organisms will not be able to live. Additionally, pH can affect the solubility and toxicity of chemicals and heavy metals in water.

Salinity: Salinity is a measure of the total amount of dissolved solids in seawater and is measured in parts per thousand (ppt). Sodium and chloride make up 86% of sea salts, with sulfur, magnesium, potassium, and calcium accounting for 13%. Salinities in Pinellas County generally vary between 0 ppt (freshwater) and 33 ppt. Salinity is affected by precipitation, evaporation, freshwater inputs, springs, and mixing with other water masses such as the Gulf or streams.

Secchi Depth: The Secchi disk is a black and white circular disk used to measure water clarity. The depth at which the disk is no longer visible is recorded to the nearest tenth of a meter.

Total Suspended Solids: Totals suspended solids (TSS) are the amount of particulate material in the water including algae, sediments, and microorganisms. TSS is measured in mg/L. TSS affects the amount of light that can penetrate the water column and thus is part of what determines where plants grow. Increases in TSS can be caused by algae blooms, increased runoff into a system, erosion, and by resuspension of bottom sediments in shallow areas.

Transmissivity: Transmissivity is the measurement of the percent transmittance of a 660 nanometer light over a 10 centimeter path length and is useful in determining total concentrations of matter in the water and as a measure of water clarity (Wet Labs, 2001).

Turbidity: Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted. Turbidity is measured in nephelometric turbidity units (NTU).

Biological: In addition to measuring these water quality parameters, Pinellas County has initiated biological monitoring at certain sites twice a year on alternate years. Sites in the Springs Coast Basin are monitored in even years starting in 2014, and those in the Tampa Bay Basin are monitored in odd years starting in 2015. This monitoring uses FDEP methods in order to determine:

- **SCI**: The Stream Condition Index (SCI) is a composite macroinvertebrate index for use in flowing streams. Sampling consists of 20 dipnet sweeps of the most productive habitats found in a 100-meter stretch of a stream. Organisms collected in these sweeps are preserved and brought back to the laboratory for processing, and data generated from the taxonomy and relative abundance of these organisms is used to calculate ten biological metrics, each of which has been shown to respond predictably to human

disturbance. These scores are then summed to obtain an overall score of biological health. A balanced macroinvertebrate community is attained if the average score of at least two temporally independent SCIs, performed at representative locations and times, is 40 or higher, with neither of the two most recent SCI scores less than 35.

- **HA**: A Habitat Assessment (HA) is performed concurrently with each SCI collection. Eight attributes known to have potential effects on stream biota are rated to produce a score between 8 and 160, with a higher score indicating less human disturbance. Parameters looked at include substrate diversity, substrate availability, water velocity, habitat smothering, artificial channelization, bank stability, riparian buffer zone width, and riparian zone vegetation quality.
- **RPS**: A Rapid Periphyton Survey (RPS) measures the relative abundance of algae growing on stream substrates within the 100 meter observed area. Nine observations are made every 10 meters which include presence or absence of algae and average length of algae if present. If less than 25 percent of the algae is longer than 6 mm, flora is considered balanced.
- **LVS**: The Linear Vegetation Survey (LVS) for flowing streams documents the plant community in the 100 meter stream reach. The average sensitivity of the plant community is calculated based on species ecological tolerance to environmental changes. If the average sensitivity is greater than 2.5, the plant community is in balance. The percentage of invasive exotics is also noted, with a balanced plant community being less than 25 percent of the plants being invasive. Two separate floral evaluations are required for assessment, and the assessment is considered unresolved if both evaluations do not agree (i.e., one passes but the other fails).

3.0 - ANALYSIS AND DISCUSSION OF RESULTS

Data analyses focused on water quality metrics used by the Florida Department of Environmental Protection to determine impairment of water bodies and on water quality metrics related to water clarity.

3.1 - DETERMINATION OF WET AND DRY SEASONS

Annual rainfall and wet and dry seasons for the period of record were determined using rainfall data from the Southwest Florida Water Management District (Southwest Florida Water

Management District, 2017). The annual dry season is from January through May and from October through December. The annual wet season is from June through September. Average annual rainfall for the period 1915-2015 is 51.79 inches. Rainfall by month is summarized for 2003 through 2016 in Figure 3. Annual rainfall as well as wet and dry season rainfall totals are summarized for 2003 through 2016 in Figure 4.

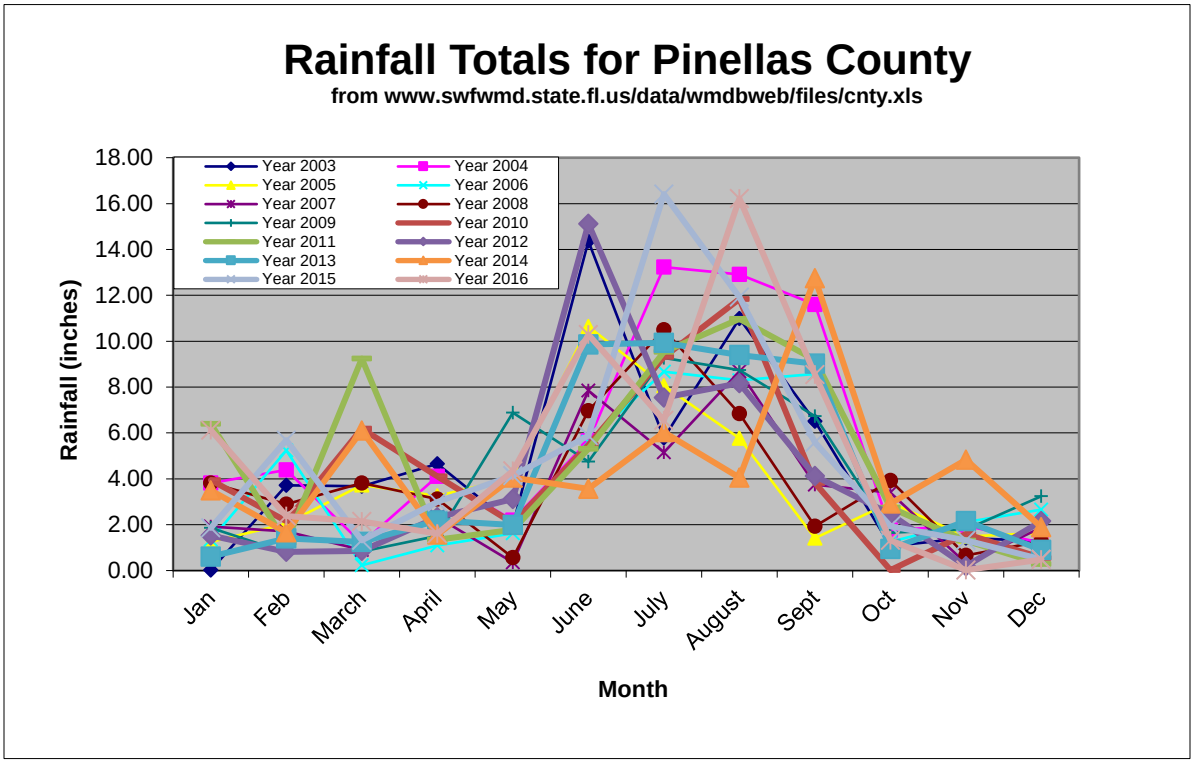

Figure 3: Monthly Weighted Rainfall Sums for Pinellas County from Southwest Florida Water Management District Data (2003 to 2016).

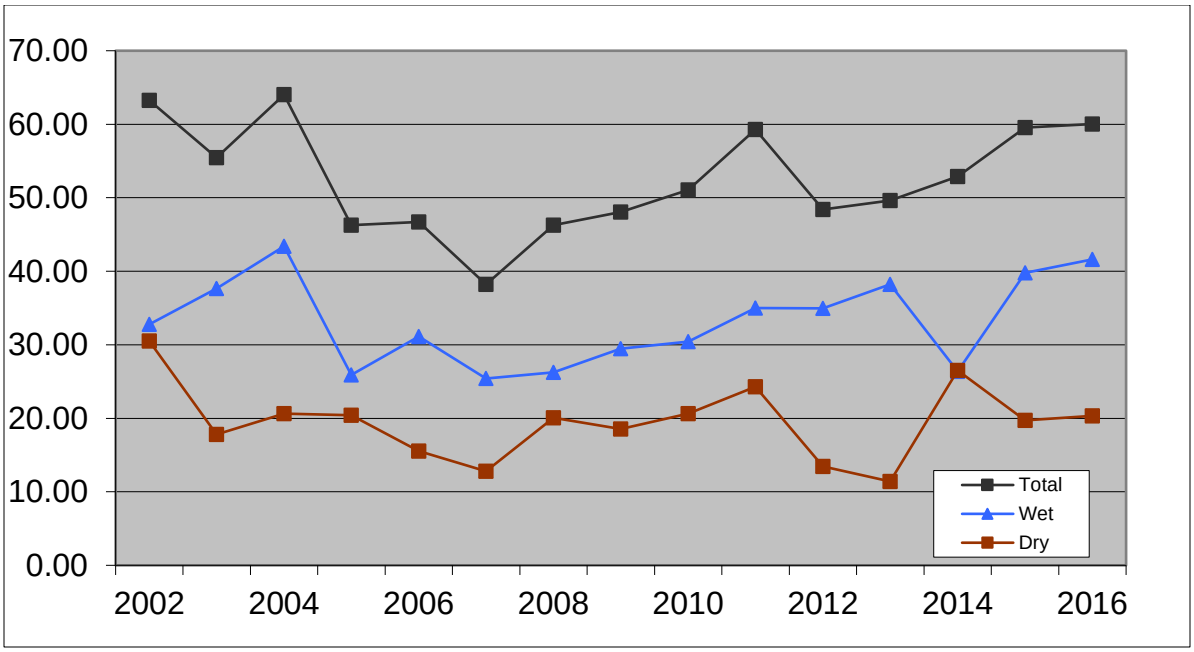

Figure 4: Annual, Dry Season and Wet Season weighted rainfall for Pinellas County from Southwest Florida Water Management District Data (2003 to 2016).

3.2 - LONG-TERM WATER QUALITY CONCENTRATION TREND ANALYSIS (2003-2016)

Pinellas County hired Janicki Environmental Inc., to perform long-term trend analyses on key water quality parameters (described in Janicki, 2014). The core statistical test used to determine long-term trends is the seasonal Kendall Tau Test for Trend. The "seasonal" aspect of the test was defined by the eight sampling periods currently used by Pinellas County for conducting their routine monitoring. For periods when Pinellas County utilized nine sampling periods, the samples were grouped into the eight sampling periods currently used and averaged. A multi-step process is used to implement the Kendall Tau trend test, as summarized in the following paragraphs. For each step in the analysis, the procedure produces a page of graphical output and intermediate datasets that are combined and used to provide detailed results for each test as well as graphical output provided for each result on the water quality parameters.

In the first step of each trend analysis, a time series plot of the raw time series is prepared for the period of record. In the second step of the trend analysis, the distribution of values for each sampling period are provided to describe the within and across season variability in the data across years. A complete set of univariate statistics is calculated and a figure provides a valuable overall view of the seasonality of the data. In the third step of the analysis, a correlation analysis

is performed for each seasonal value, the previous season's value, two seasons prior, etc., until correlation statistics have been calculated for all previous seasons up to 15 seasons prior. A table of these values is provided in the output. In the fourth step of the analysis, a determination is made as to whether seasonality exists in the time series of data.

If the data are determined to be seasonal, then the data are adjusted for season by subtracting the median seasonal value from each data point. The season-adjusted data are then applied to a Kendall Tau. The Kendall Tau test determines the slope of the time series of data, and p-values for various data conditions.

The next step is to test the data for autocorrelation in a similar fashion to that completed to identify seasonality. In the first phase of this analysis, the season-adjusted data are de-trended by removing the effects of the slope identified. In the next step of the analysis, the season adjusted and de-trended data are prepared in the form of a correlogram to test for the presence of autocorrelation in the time series. If the 1-season lag or the 2-season lag are significantly correlated with the present values, then the data are identified as auto-correlated and an adjustment is made to the p-value.

In the final step of each trend analysis, the appropriate p-value (corrected for auto-correlation if necessary), significance assessment (based on alpha=0.05), slope, autocorrelation assessment (present/absent), and seasonality assessment (present/absent) of the trend analysis are compiled and mapped to provide a results summary for each parameter across stations and also tabulated in a summary table of trend test results (**Table 1 and Figures 5-8**).

A few of the basins did not have sufficient data to perform the trend analysis due to changes in site locations: Klosterman Bayou, Oldsmar, and Cedar Creek. A minimum of eight years of data (60 data points) is required.

3.3 -- BIOLOGICAL MONITORING

Results for the fifteen Spring Coast WBIDs sampled in 2014 and eight Tampa Bay WBIDs sampled in 2015 are summarized in Table 3. Bonn Creek, Pinellas Park Ditch #5, and Cedar Creek were not sampled for SCI because the former are cemented ditches and the latter is tidal. However, habitat assessment and floral measurements (RPS and LVS) were collected.

Habitat Assessment

The majority of the habitat assessment scores were suboptimal (81 – 120), with 16 in the marginal category (41 – 80). Hollin Creek was not sampled a second time because of a construction project just downstream that negatively affected the water flow at the sample site; therefore, this assessment is currently unresolved. Brooker Creek scored in the optimal category, although it was sampled only once due to inappropriate hydrological conditions in the fall and is currently deemed unresolved.

SCI

Five streams had average SCI scores greater than 40: Bee Branch, Jerry Branch, McKay Creek, Cow Branch, and Alligator Creek. Most of the remaining fell into the impaired category, with average SCI scores less than 40 and at least one of them below 35: Church Creek, Curlew Creek, Joes Creek, Rattlesnake Creek, Spring Branch, Stevenson Creek, Cross Canal, Allen Creek, Long Branch, Mullet Creek, Briar Creek, and Bishop Creek. The Hollin Creek SCI assessment is currently unresolved. Brooker Creek had a passing score for a single assessment (54) and is likely to have an average greater than 40, but until the second assessment can be completed, it has to be considered unresolved.

Floral Measures

The majority of WBIDs complied with the NNC criteria for RPS (percent filamentous algae < 25). Seminole Bypass Canal, Cross Canal, and Brooker Creek are unresolved. Bee Branch, Joes Creek, Pinellas Park Ditch #5, McKay Creek, Seminole Bypass Canal, Stevenson's Creek, Allen Creek, Long Branch, and Mullet Creek failed the NNC criteria for sensitive plants and nuisance exotics. They had greater than 25 percent invasive exotic species. Briar Creek had no plants, and therefore passed the LVS measures. Both Alligator Creek and Bishop Creek had few tolerant plants species, but the percentage of exotic invasive species was unresolved.

3.4 – PROGRAM STRENGTHS

Pinellas County is committed to reducing stormwater pollution from its municipal separate storm sewer system. The Pinellas County Stormwater Management Program (SWMP) has been in effect since the early 1990's, prior to the inception of the first NPDES Permit in 1997. In addition to the County's robust Countywide Ambient Water Quality Monitoring Program, the SWMP has

also historically included a Capital Improvement Program funded by the Penny for Pinellas (one percent sales tax) since 1990. This Capital Improvement Program has funded many drainage and water quality projects over the years.

In 2013, Pinellas County established a dedicated Non Ad Valorem Surface Water Assessment for all properties in unincorporated county. This dedicated revenue of approximately $19 million per year currently funds all of the operational and maintenance needs of the NPDES program, as well as water quality monitoring, outreach efforts, and support for stormwater compliance programs. Highlights of recently strengthened programs and increased level of service under the SWMP include:

- Implementation of the Fertilizer Ordinance, including retail sales and application restrictions on both phosphorous and nitrogen, backed by a strong compliance program
- Increased frequency and proactive planning of work in the ditch and channel maintenance
- Increased frequency in the street sweeping program,
- Implementation of a site plan drainage compliance program to improve water quality discharging from private stormwater management systems
- Addition of a biological monitoring program to support the ambient water quality monitoring program
- Continued pollutant source tracking studies
- New permitted facilities studies to investigate opportunities for water quality retrofits
- Increased level of service for public outreach

3.5 – FUTURE WORK: HYDROLOGIC NORMALIZATION ANALYSIS

The Florida Department of Environmental Protection (FDEP) has requested that Non-Point Source Discharge Elimination System (NPDES) permittees include a mechanism by which to account for the effects of climatological variation in rainfall on nutrient loading to waterbodies. In response, Pinellas County hired Janicki Environmental Inc. (Janicki, 2014) to conduct a project to identify a mechanism by which the County could adjust their annual nutrient loading estimates for the effects of variation in annual rainfall totals in order to comply with the new FDEP directive and track progress of their stormwater master plan over time.

The approach to normalize annual loads to rainfall can be summarized by the following steps:

Step 1. Generate long-term (1950 to 2015) basin-specific rainfall estimates using the non-point source model interpolation procedure.

Step 2. Generate the Standardized Precipitation Index (SPI) for the basin-specific rainfall estimates above.

Step 3. Calculate non-point source based Hydrologic loads for 2003-2015 using the non-point source model and 2011 land use information.

Step 4. Multiply ambient WQ concentrations and hydrologic loads to generate empirically-based nutrient loading estimates.

Step 5. Regress the SPI values on the empirically-based nutrient loads.

Step 6. Define the Baseline Load and predictive equation for normalizing loads.

Janicki established the Baseline Load based on data from 2003-2015. Janicki has compared 2016 loading values against this Baseline Load and made recommendations towards refinement of the analysis. It will be several years before a valid assessment can be conducted to compare against the Baseline Load; the analysis will require data through at least 2020 to provide the statistical confidence to assess whether stormwater management actions are having an effect on the estimated nutrient loads. In the meantime, further enhancement of this method will be explored, perhaps using NEXRAD data to refine the basin specific hydrologic loads, and results will be reported in the coming years.

3.6 – WATER QUALITY RESULTS COMPARISON 2003-PRESENT

Pinellas County conducted an Event Mean Concentration and annual loadings Analysis in Year 3 of this permit cycle. Very little change was seen in comparing 2007 results to 2016 results. Since the data was hydrologically normalized, and the same EMCs were used, loading changes are representative of changes in jurisdictional acreage and land use. Pinellas County's urban area is 98% built-out and land use changes are minor since the original permit application submittal.

The data presented in this report, which includes a basic summary of water quality parameters based on in-situ concentrations and flow measurements, as well as long term trends, and more recently biological assessments, provides a much better representation of the efficiency of Pinellas County's Stormwater Management Plan. Basin-specific water quality results and trends over the last two permit cycles are discussed in **Table 2** beginning on page 27 of this report.

Results show that water quality is improving in almost all inland Pinellas County watersheds, which are seeing decreasing trends in nitrogen, phosphorus, chlorophyll-a, and total suspended solids. This is likely a result of increased non-structural Best Management Practices implemented as part of the Pinellas County Stormwater Management Plan in recent years. Additionally, all receiving coastal waters, both on the Tampa Bay side and on the Intracoastal Waters side, are showing decreasing trends in pollutants of concern and/or are meeting water quality standards; this is indicative that the County's SWMP is effective in the contributing watersheds.

Due to monitoring sites being relocated to better locations, three watersheds (Klosterman Bayou, Oldsmar, and Cedar Creek) still have insufficient data for long term trends to be established. These watersheds will continue to be evaluated until long term trends can be determined. A Nutrient Source Tracking Study of Klosterman Bayou was completed in 2010, which showed the nutrient issue will likely have to be addressed by the Innisbrook Golf Course (private facility) and the Dunn WWTP (Waste Water Treatment Plant).

A few watersheds have inconclusive results, with either no trend or opposing trends in water quality parameters. Three of these have ongoing studies which should help clarify potential pollution sources:

- Mullet Creek: A 2013 Bishop and Mullet Creek Water Quality and Biological Study found that although dissolved oxygens levels in the creek were routinely less than water quality standards, there was no evidence that nutrients or chlorophyll were causative factors. Healthy fish and benthic communities were reported and it was found that the creeks support recruitment of important estuarine dependent fish species of economic value.
- Allen's Creek: Water quality trends at some of the sites in Allen's Creek showed significantly reduced nutrient and chlorophyll a concentrations and generally stable trends otherwise. An Allen's Creek Watershed Management Plan was completed in 2014 in cooperation with the cities of Clearwater and Largo. The plan includes nine recommended projects to address flooding and erosion issues in the watershed. These projects will be prioritized for inclusion in the Capital Improvement Program.
- Long Branch: No trends were evident in Long Branch Creek. TN concentrations are below the state water quality criterion, although DO is still below the established criterion. A Water Quality Study was conducted in the Long Branch Watershed in 2010, followed by a BMP Recommendations Report in 2012. The Long Branch TMDL Implementation Plan

is also close to completion, which will address specific BMPs being implemented or planned for the watershed.

Boots on the ground source tracking as well as a thorough review of existing studies and proposed BMPs will be conducted in the coming year to better understand and address water quality in these three watersheds.

Pinellas County has completed multiple water quality studies and watershed management plans over the years in order to understand the issues facing each one of those watersheds. Studies to date include:

- Allen's Creek
- Anclote River (in progress)
- Bishop and Mullet Creek
- Brooker Creek
- Clearwater Harbor / St Joseph Sound
- Cross Bayou
- Curlew Creek and Smith Bayou (in progress)
- Joe's Creek
- Klosterman Bayou
- Lake Seminole
- Lake Tarpon
- Long Branch
- McKay Creek
- Roosevelt Creek
- Starkey Basin
- South Creek (planned)

Each of these studies results in measures being recommended to improve water quality in the watershed. Most of the watershed plans or studies listed above are already in the implementation phase. More information pertaining to BMPs and Stormwater Management Plan measures being implemented in each watershed is available via the hyperlinks above.

Table 1. Long term trends analysis results for select parameters (based on data collected 2003-2016).

Major Basin	PC Basin	Station	Variable	Units	Trend Result
CHSJS	Anclote River	01-01	Chl_a	(ug/L)	No Trend
CHSJS	Anclote River	01-01	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Anclote River	01-01	DO %Saturation	(%)	No Trend
CHSJS	Anclote River	01-01	Enterococci	(#/100 ml)	Decreasing
CHSJS	Anclote River	01-01	TN	(mg/L)	No Trend
CHSJS	Anclote River	01-01	TP	(mg/L)	No Trend
CHSJS	Anclote River	01-01	TSS	(mg/L)	Decreasing
CHSJS	Anclote River	01-01	Turbidity	(mg/L)	No Trend
CHSJS	Anclote River	01-08	Chl_a	(ug/L)	No Trend
CHSJS	Anclote River	01-08	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Anclote River	01-08	DO %Saturation	(%)	No Trend
CHSJS	Anclote River	01-08	Enterococci	(#/100 ml)	No Trend
CHSJS	Anclote River	01-08	TN	(mg/L)	No Trend
CHSJS	Anclote River	01-08	TP	(mg/L)	Decreasing
CHSJS	Anclote River	01-08	TSS	(mg/L)	Decreasing
CHSJS	Anclote River	01-08	Turbidity	(mg/L)	No Trend
OTB - North	Brooker Creek	04-03	Chl_a	(ug/L)	No Trend
OTB - North	Brooker Creek	04-03	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Brooker Creek	04-03	DO %Saturation	(%)	No Trend
OTB - North	Brooker Creek	04-03	Enterococci	(#/100 ml)	No Trend
OTB - North	Brooker Creek	04-03	TN	(mg/L)	No Trend
OTB - North	Brooker Creek	04-03	TP	(mg/L)	No Trend
OTB - North	Brooker Creek	04-03	TSS	(mg/L)	Decreasing
OTB - North	Brooker Creek	04-03	Turbidity	(mg/L)	No Trend
OTB - North	South Creek	06-03	Chl_a	(ug/L)	Decreasing
OTB - North	South Creek	06-03	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	South Creek	06-03	DO %Saturation	(%)	No Trend
OTB - North	South Creek	06-03	Enterococci	(#/100 ml)	No Trend
OTB - North	South Creek	06-03	TN	(mg/L)	No Trend
OTB - North	South Creek	06-03	TP	(mg/L)	Decreasing
OTB - North	South Creek	06-03	TSS	(mg/L)	No Trend
OTB - North	South Creek	06-03	Turbidity	(mg/L)	No Trend
CHSJS	Smith Bayou	08-03	Chl_a	(ug/L)	No Trend
CHSJS	Smith Bayou	08-03	Coliform_Fecal	(#/100 ml)	Decreasing
CHSJS	Smith Bayou	08-03	DO %Saturation	(%)	No Trend
CHSJS	Smith Bayou	08-03	Enterococci	(#/100 ml)	No Trend
CHSJS	Smith Bayou	08-03	TN	(mg/L)	Decreasing
CHSJS	Smith Bayou	08-03	TP	(mg/L)	Increasing
CHSJS	Smith Bayou	08-03	TSS	(mg/L)	No Trend

Major Basin	PC Basin	Station	Variable	Units	Trend Result
CHSJS	Smith Bayou	08-03	Turbidity	(mg/L)	No Trend
CHSJS	Curlew Creek	10-02	Chl_a	(ug/L)	Increasing
CHSJS	Curlew Creek	10-02	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Curlew Creek	10-02	DO %Saturation	(%)	No Trend
CHSJS	Curlew Creek	10-02	Enterococci	(#/100 ml)	Decreasing
CHSJS	Curlew Creek	10-02	TN	(mg/L)	No Trend
CHSJS	Curlew Creek	10-02	TP	(mg/L)	No Trend
CHSJS	Curlew Creek	10-02	TSS	(mg/L)	No Trend
CHSJS	Curlew Creek	10-02	Turbidity	(mg/L)	No Trend
OTB - North	Possum Branch	11-05	Chl_a	(ug/L)	No Trend
OTB - North	Possum Branch	11-05	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Possum Branch	11-05	DO %Saturation	(%)	No Trend
OTB - North	Possum Branch	11-05	Enterococci	(#/100 ml)	No Trend
OTB - North	Possum Branch	11-05	TN	(mg/L)	Decreasing
OTB - North	Possum Branch	11-05	TP	(mg/L)	No Trend
OTB - North	Possum Branch	11-05	TSS	(mg/L)	No Trend
OTB - North	Possum Branch	11-05	Turbidity	(mg/L)	No Trend
OTB - North	Bishop Creek	12-02	Chl_a	(ug/L)	No Trend
OTB - North	Bishop Creek	12-02	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Bishop Creek	12-02	DO %Saturation	(%)	No Trend
OTB - North	Bishop Creek	12-02	Enterococci	(#/100 ml)	No Trend
OTB - North	Bishop Creek	12-02	TN	(mg/L)	Decreasing
OTB - North	Bishop Creek	12-02	TP	(mg/L)	No Trend
OTB - North	Bishop Creek	12-02	TSS	(mg/L)	No Trend
OTB - North	Bishop Creek	12-02	Turbidity	(mg/L)	No Trend
OTB - North	Bishop Creek	12-04	Chl_a	(ug/L)	No Trend
OTB - North	Bishop Creek	12-04	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Bishop Creek	12-04	DO %Saturation	(%)	No Trend
OTB - North	Bishop Creek	12-04	Enterococci	(#/100 ml)	No Trend
OTB - North	Bishop Creek	12-04	TN	(mg/L)	No Trend
OTB - North	Bishop Creek	12-04	TP	(mg/L)	No Trend
OTB - North	Bishop Creek	12-04	TSS	(mg/L)	No Trend
OTB - North	Bishop Creek	12-04	Turbidity	(mg/L)	No Trend
OTB - North	Mullet Creek	13-05	Chl_a	(ug/L)	No Trend
OTB - North	Mullet Creek	13-05	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Mullet Creek	13-05	DO %Saturation	(%)	Decreasing
OTB - North	Mullet Creek	13-05	Enterococci	(#/100 ml)	No Trend
OTB - North	Mullet Creek	13-05	TN	(mg/L)	No Trend
OTB - North	Mullet Creek	13-05	TP	(mg/L)	No Trend
OTB - North	Mullet Creek	13-05	TSS	(mg/L)	No Trend

Major Basin	PC Basin	Station	Variable	Units	Trend Result
OTB - North	Mullet Creek	13-05	Turbidity	(mg/L)	Decreasing
OTB - North	Alligator Creek	14-02	Chl_a	(ug/L)	No Trend
OTB - North	Alligator Creek	14-02	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Alligator Creek	14-02	DO %Saturation	(%)	No Trend
OTB - North	Alligator Creek	14-02	Enterococci	(#/100 ml)	No Trend
OTB - North	Alligator Creek	14-02	TN	(mg/L)	No Trend
OTB - North	Alligator Creek	14-02	TP	(mg/L)	No Trend
OTB - North	Alligator Creek	14-02	TSS	(mg/L)	No Trend
OTB - North	Alligator Creek	14-02	Turbidity	(mg/L)	No Trend
OTB - North	Alligator Creek	14-07	Chl_a	(ug/L)	No Trend
OTB - North	Alligator Creek	14-07	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Alligator Creek	14-07	DO %Saturation	(%)	No Trend
OTB - North	Alligator Creek	14-07	Enterococci	(#/100 ml)	No Trend
OTB - North	Alligator Creek	14-07	TN	(mg/L)	Decreasing
OTB - North	Alligator Creek	14-07	TP	(mg/L)	No Trend
OTB - North	Alligator Creek	14-07	TSS	(mg/L)	Decreasing
OTB - North	Alligator Creek	14-07	Turbidity	(mg/L)	Decreasing
OTB - North	Alligator Creek	14-10	Chl_a	(ug/L)	No Trend
OTB - North	Alligator Creek	14-10	Coliform_Fecal	(#/100 ml)	No Trend
OTB - North	Alligator Creek	14-10	DO %Saturation	(%)	No Trend
OTB - North	Alligator Creek	14-10	Enterococci	(#/100 ml)	Decreasing
OTB - North	Alligator Creek	14-10	TN	(mg/L)	No Trend
OTB - North	Alligator Creek	14-10	TP	(mg/L)	No Trend
OTB - North	Alligator Creek	14-10	TSS	(mg/L)	No Trend
OTB - North	Alligator Creek	14-10	Turbidity	(mg/L)	No Trend
CHSJS	Spring Branch	15-04	Chl_a	(ug/L)	No Trend
CHSJS	Spring Branch	15-04	Coliform_Fecal	(#/100 ml)	Decreasing
CHSJS	Spring Branch	15-04	DO %Saturation	(%)	No Trend
CHSJS	Spring Branch	15-04	Enterococci	(#/100 ml)	Decreasing
CHSJS	Spring Branch	15-04	TN	(mg/L)	Decreasing
CHSJS	Spring Branch	15-04	TP	(mg/L)	No Trend
CHSJS	Spring Branch	15-04	TSS	(mg/L)	No Trend
CHSJS	Spring Branch	15-04	Turbidity	(mg/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	Chl_a	(ug/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	DO %Saturation	(%)	Increasing
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	Enterococci	(#/100 ml)	Decreasing
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	TN	(mg/L)	Decreasing
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	TP	(mg/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	TSS	(mg/L)	Decreasing

Major Basin	PC Basin	Station	Variable	Units	Trend Result
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-01	Turbidity	(mg/L)	Decreasing
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	Chl_a	(ug/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	DO %Saturation	(%)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	Enterococci	(#/100 ml)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	TN	(mg/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	TP	(mg/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	TSS	(mg/L)	No Trend
CHSJS	Coastal Zone 1/Rattlesnake Crk	17-03	Turbidity	(mg/L)	No Trend
CHSJS	Stevenson's Creek	18-06	Chl_a	(ug/L)	No Trend
CHSJS	Stevenson's Creek	18-06	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	Stevenson's Creek	18-06	DO %Saturation	(%)	No Trend
CHSJS	Stevenson's Creek	18-06	Enterococci	(#/100 ml)	Decreasing
CHSJS	Stevenson's Creek	18-06	TN	(mg/L)	Decreasing
CHSJS	Stevenson's Creek	18-06	TP	(mg/L)	No Trend
CHSJS	Stevenson's Creek	18-06	TSS	(mg/L)	No Trend
CHSJS	Stevenson's Creek	18-06	Turbidity	(mg/L)	No Trend
OTB - South	Allens Creek	19-02	Chl_a	(ug/L)	No Trend
OTB - South	Allens Creek	19-02	Coliform_Fecal	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-02	DO %Saturation	(%)	No Trend
OTB - South	Allens Creek	19-02	Enterococci	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-02	TN	(mg/L)	No Trend
OTB - South	Allens Creek	19-02	TP	(mg/L)	No Trend
OTB - South	Allens Creek	19-02	TSS	(mg/L)	No Trend
OTB - South	Allens Creek	19-02	Turbidity	(mg/L)	No Trend
OTB - South	Allens Creek	19-07	Chl_a	(ug/L)	No Trend
OTB - South	Allens Creek	19-07	Coliform_Fecal	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-07	DO %Saturation	(%)	Increasing
OTB - South	Allens Creek	19-07	Enterococci	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-07	TN	(mg/L)	No Trend
OTB - South	Allens Creek	19-07	TP	(mg/L)	No Trend
OTB - South	Allens Creek	19-07	TSS	(mg/L)	No Trend
OTB - South	Allens Creek	19-07	Turbidity	(mg/L)	No Trend
OTB - South	Allens Creek	19-08	Chl_a	(ug/L)	Decreasing
OTB - South	Allens Creek	19-08	Coliform_Fecal	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-08	DO %Saturation	(%)	No Trend
OTB - South	Allens Creek	19-08	Enterococci	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-08	TN	(mg/L)	No Trend
OTB - South	Allens Creek	19-08	TP	(mg/L)	Decreasing
OTB - South	Allens Creek	19-08	TSS	(mg/L)	No Trend

Major Basin	PC Basin	Station	Variable	Units	Trend Result
OTB - South	Allens Creek	19-08	Turbidity	(mg/L)	No Trend
OTB - South	Allens Creek	19-09	Chl_a	(ug/L)	No Trend
OTB - South	Allens Creek	19-09	Coliform_Fecal	(#/100 ml)	Decreasing
OTB - South	Allens Creek	19-09	DO %Saturation	(%)	No Trend
OTB - South	Allens Creek	19-09	Enterococci	(#/100 ml)	Decreasing
OTB - South	Allens Creek	19-09	TN	(mg/L)	No Trend
OTB - South	Allens Creek	19-09	TP	(mg/L)	No Trend
OTB - South	Allens Creek	19-09	TSS	(mg/L)	No Trend
OTB - South	Allens Creek	19-09	Turbidity	(mg/L)	No Trend
OTB - South	Allens Creek	19-10	Chl_a	(ug/L)	No Trend
OTB - South	Allens Creek	19-10	Coliform_Fecal	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-10	DO %Saturation	(%)	Decreasing
OTB - South	Allens Creek	19-10	Enterococci	(#/100 ml)	No Trend
OTB - South	Allens Creek	19-10	TN	(mg/L)	Increasing
OTB - South	Allens Creek	19-10	TP	(mg/L)	No Trend
OTB - South	Allens Creek	19-10	TSS	(mg/L)	No Trend
OTB - South	Allens Creek	19-10	Turbidity	(mg/L)	Increasing
OTB - South	Long Branch	22-01	Chl_a	(ug/L)	No Trend
OTB - South	Long Branch	22-01	DO %Saturation	(%)	No Trend
OTB - South	Long Branch	22-01	TN	(mg/L)	No Trend
OTB - South	Long Branch	22-01	TP	(mg/L)	No Trend
OTB - South	Long Branch	22-01	TSS	(mg/L)	No Trend
OTB - South	Long Branch	22-01	Turbidity	(mg/L)	No Trend
OTB - South	Roosevelt Creek	23-08	Chl_a	(ug/L)	No Trend
OTB - South	Roosevelt Creek	23-08	Coliform_Fecal	(#/100 ml)	No Trend
OTB - South	Roosevelt Creek	23-08	DO %Saturation	(%)	No Trend
OTB - South	Roosevelt Creek	23-08	Enterococci	(#/100 ml)	No Trend
OTB - South	Roosevelt Creek	23-08	TN	(mg/L)	Decreasing
OTB - South	Roosevelt Creek	23-08	TP	(mg/L)	Decreasing
OTB - South	Roosevelt Creek	23-08	TSS	(mg/L)	No Trend
OTB - South	Roosevelt Creek	23-08	Turbidity	(mg/L)	No Trend
Boca Ciega	Cross Bayou	24-01	Chl_a	(ug/L)	Increasing
Boca Ciega	Cross Bayou	24-01	Coliform_Fecal	(#/100 ml)	No Trend
Boca Ciega	Cross Bayou	24-01	DO %Saturation	(%)	No Trend
Boca Ciega	Cross Bayou	24-01	Enterococci	(#/100 ml)	Decreasing
Boca Ciega	Cross Bayou	24-01	TN	(mg/L)	Decreasing
Boca Ciega	Cross Bayou	24-01	TP	(mg/L)	Decreasing
Boca Ciega	Cross Bayou	24-01	TSS	(mg/L)	Decreasing
Boca Ciega	Cross Bayou	24-01	Turbidity	(mg/L)	No Trend
OTB - South	Cross Bayou	24-02	Chl_a	(ug/L)	No Trend

Major Basin	PC Basin	Station	Variable	Units	Trend Result
OTB - South	Cross Bayou	24-02	Coliform_Fecal	(#/100 ml)	Increasing
OTB - South	Cross Bayou	24-02	DO %Saturation	(%)	Decreasing
OTB - South	Cross Bayou	24-02	Enterococci	(#/100 ml)	No Trend
OTB - South	Cross Bayou	24-02	TN	(mg/L)	Decreasing
OTB - South	Cross Bayou	24-02	TP	(mg/L)	Decreasing
OTB - South	Cross Bayou	24-02	TSS	(mg/L)	No Trend
OTB - South	Cross Bayou	24-02	Turbidity	(mg/L)	No Trend
Boca Ciega	Starkey Road/Seminole Bypass	25-07	DO %Saturation	(%)	No Trend
Boca Ciega	Starkey Road/Seminole Bypass	25-07	TN	(mg/L)	Decreasing
Boca Ciega	Starkey Road/Seminole Bypass	25-07	TP	(mg/L)	No Trend
Boca Ciega	Starkey Road/Seminole Bypass	25-07	TSS	(mg/L)	No Trend
Boca Ciega	Starkey Road/Seminole Bypass	25-07	Turbidity	(mg/L)	No Trend
CHSJS	McKay Creek	27-03	Chl_a	(ug/L)	No Trend
CHSJS	McKay Creek	27-03	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-03	DO %Saturation	(%)	No Trend
CHSJS	McKay Creek	27-03	DO %Saturation	(%)	No Trend
CHSJS	McKay Creek	27-03	Enterococci	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-03	TN	(mg/L)	No Trend
CHSJS	McKay Creek	27-03	TP	(mg/L)	No Trend
CHSJS	McKay Creek	27-03	TSS	(mg/L)	No Trend
CHSJS	McKay Creek	27-03	Turbidity	(mg/L)	No Trend
CHSJS	McKay Creek	27-08	Chl_a	(ug/L)	No Trend
CHSJS	McKay Creek	27-08	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-08	DO %Saturation	(%)	No Trend
CHSJS	McKay Creek	27-08	Enterococci	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-08	TN	(mg/L)	No Trend
CHSJS	McKay Creek	27-08	TP	(mg/L)	No Trend
CHSJS	McKay Creek	27-08	TSS	(mg/L)	Decreasing
CHSJS	McKay Creek	27-08	Turbidity	(mg/L)	No Trend
CHSJS	McKay Creek	27-09	Chl_a	(ug/L)	No Trend
CHSJS	McKay Creek	27-09	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-09	DO %Saturation	(%)	No Trend
CHSJS	McKay Creek	27-09	Enterococci	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-09	TN	(mg/L)	Decreasing
CHSJS	McKay Creek	27-09	TP	(mg/L)	No Trend
CHSJS	McKay Creek	27-09	TSS	(mg/L)	No Trend
CHSJS	McKay Creek	27-09	Turbidity	(mg/L)	No Trend
CHSJS	McKay Creek	27-10	Chl_a	(ug/L)	No Trend
CHSJS	McKay Creek	27-10	Coliform_Fecal	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-10	DO %Saturation	(%)	No Trend

Major Basin	PC Basin	Station	Variable	Units	Trend Result
CHSJS	McKay Creek	27-10	Enterococci	(#/100 ml)	No Trend
CHSJS	McKay Creek	27-10	TN	(mg/L)	No Trend
CHSJS	McKay Creek	27-10	TP	(mg/L)	No Trend
CHSJS	McKay Creek	27-10	TSS	(mg/L)	No Trend
CHSJS	McKay Creek	27-10	Turbidity	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-09	Chl_a	(ug/L)	No Trend
Boca Ciega	Joes Creek	35-09	Coliform_Fecal	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-09	DO %Saturation	(%)	No Trend
Boca Ciega	Joes Creek	35-09	Enterococci	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-09	TN	(mg/L)	Decreasing
Boca Ciega	Joes Creek	35-09	TP	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-09	TSS	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-09	Turbidity	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-10	Chl_a	(ug/L)	No Trend
Boca Ciega	Joes Creek	35-10	Coliform_Fecal	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-10	DO %Saturation	(%)	No Trend
Boca Ciega	Joes Creek	35-10	Enterococci	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-10	TN	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-10	TP	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-10	TSS	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-10	Turbidity	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-11	Chl_a	(ug/L)	No Trend
Boca Ciega	Joes Creek	35-11	Coliform_Fecal	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-11	DO %Saturation	(%)	No Trend
Boca Ciega	Joes Creek	35-11	Enterococci	(#/100 ml)	No Trend
Boca Ciega	Joes Creek	35-11	TN	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-11	TP	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-11	TSS	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-11	Turbidity	(mg/L)	Decreasing
Boca Ciega	Joes Creek	35-12	Chl_a	(ug/L)	No Trend
Boca Ciega	Joes Creek	35-12	Coliform_Fecal	(#/100 ml)	Decreasing
Boca Ciega	Joes Creek	35-12	DO %Saturation	(%)	Decreasing
Boca Ciega	Joes Creek	35-12	Enterococci	(#/100 ml)	Decreasing
Boca Ciega	Joes Creek	35-12	TN	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-12	TP	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-12	TSS	(mg/L)	No Trend
Boca Ciega	Joes Creek	35-12	Turbidity	(mg/L)	No Trend

Table 2: Basin by basin summary for the period of record. Analysis is based on the long term trend results in Figures 5 through 8 and Table 1, and the biological data results in Table 3. TP = total phosphorus, TN = total nitrogen, TSS = total suspended solids, Chl-a = chlorophyll a.

Basin Number	Basin Name	Municipality % of Area	Analysis
1	Anclote River	TARPON SPRINGS, 40%; UNINCORPORATED, 60%	Long term trend analyses indicate significantly reduced TSS and TP concentrations and stable TN and Chl-a concentrations at the upstream site. At the downstream site, long term trend analyses indicate significantly reduced TSS and stable TN, TP, and Chl-a concentrations. Chl-a and TP annual geometric means in this basin have decreased to below the criterion since 2013. These positive trends indicate that the Pinellas County SWMP is effective in this watershed. Pinellas County will be evaluating this basin in its upcoming watershed management plan.
2	Klosterman Bayou	TARPON SPRINGS, 11.32%; UNINCORPORATED, 88.68%	There is insufficient data to perform the long term trend analyses for this basin.
4	Brooker Creek	OLDSMAR, 9.77%; UNINCORPORATED, 90.23%	Long term trend analyses show significantly decreasing TSS concentrations and stable TN, TP, and Chl-a concentration, indicating the SWMP's positive impact in this watershed. Biological sampling shows a passing grade for this basin. This watershed is composed of 60% conservation/preserve land, and most of the urban areas have private MS4s, limiting the ability of the County to influence water quality in that area.
5	Oldsmar	OLDSMAR, 75.95%; UNINCORPORATED, 24.05%	There is insufficient data to perform the long term trend analyses for this basin.
6	South Creek	CLEARWATER, 3.81%; OLDSMAR, 5.56%; UNINCORPORATED, 90.64%	Long term trend analyses indicate significantly reduced TP and Chl-a concentrations and stable TN and TSS concentrations. Biological sampling shows a passing grade for this basin. This indicates the SWMP is successful in this area.
8	Smith Bayou	DUNEDIN, 10.50%; UNINCORPORATED, 89.50%	Long term trend analyses indicate significantly reduced TN concentrations, and stable Chl-a and TSS concentrations, which indicates the SWMP is successful in this area.

Basin Number	Basin Name	Municipality % of Area	Analysis
9	Cedar Creek	DUNEDIN, 98.51%; UNINCORPORATED, 1.49%	There is insufficient data to perform the long term trend analyses for this basin.
10	Curlew Creek	CLEARWATER, 21.06%; DUNEDIN, 24.71%; UNINCORPORATED, 54.23%	Long term trend analyses indicate stable TN, TP, and TSS concentrations. The most recent biological monitoring resulted in passing SCI scores, an improvement since 2014.
11	Possum Branch	CLEARWATER, 56.01%; OLDSMAR, 19.25%; SAFETY HARBOR, 21.94%; UNINCORPORATED, 2.80%	Long term trend analyses show significantly reduced TN concentrations and stable Chl-a, TP, and TSS concentrations, indicating the SWMP has had positive impact in this watershed.
12	Bishop Creek	CLEARWATER, 26.49%; SAFETY HARBOR, 60.50%; UNINCORPORATED, 13.00%	Long term trend analyses show significantly reduced TN concentrations and stable Chl-a, TP, and TSS concentrations at the lower site, and stable trends for all parameters at the upper site, indicating the SWMP has had positive impact in this watershed.
13	Mullet Creek	CLEARWATER, 24.36%; SAFETY HARBOR, 63.18%; UNINCORPORATED, 12.46%	Long term trend analyses indicate stable Chl-a, TN, TP, and TSS concentrations. This watershed was part of a tidal creek study (Mullet and Bishop Creek), which indicated presence of healthy fish and benthic communities.
14	Alligator Creek	CLEARWATER, 66.28%; SAFETY HARBOR, 5.46%; UNINCORPORATED, 28.26%	Long term trend analyses indicate significantly reduced TN and TSS concentrations and stable Chl-a and TP concentrations at the lowest site, and stable trends for all parameters at the two upper sites. Biological sampling shows a passing grade for this basin, which indicates the SWMP is successful in this watershed.
15	Spring Branch	CLEARWATER, 30.54%; DUNEDIN, 61.82%; UNINCORPORATED, 7.64%	Long term trend analyses show significantly reduced TN concentrations and stable Chl-a, TP, and TSS concentrations, which indicates the SWMP has had a positive impact in this watershed.
17	Coastal Zone 1	BELLEAIR, 38.76%; BELLEAIR BLUFFS, 4.05%; CLEARWATER, 36.62%; LARGO, 10.44%; UNINCORPORATED, 10.13%	Long term trend analyses show significantly reduced TN and TSS concentrations and stable TP and Chl-a concentrations at the lower site. The upper site has stable TN, TP, TSS, and Chl-a concentrations, which indicates the SWMP has had a positive impact in this watershed. The most recent biological monitoring resulted in passing SCI scores, an improvement since 2014.

Basin Number	Basin Name	Municipality % of Area	Analysis
18	Stevensons Creek	CLEARWATER, 83.22%; LARGO, 2.14%; UNINCORPORATED, 14.64%	Long term trend analyses show significantly reduced TN concentrations and stable Chl-a, TP, and TSS concentrations, which indicates the SWMP has had a positive impact in this watershed. The most recent biological monitoring resulted in passing SCI scores, an improvement since 2014.
19	Allens Creek	CLEARWATER, 34.41%; LARGO, 36.07%; UNINCORPORATED, 29.52%	Long term trend analyses indicate generally stable concentrations at most sites. One site had significantly reduced TP and Chl-a concentrations and another site saw improved dissolved oxygen. Results are considered inconclusive at this time. BMP recommendations from the Watershed Management Plan will be implemented to improve water quality in this watershed.
22	Long Branch	LARGO, 63.13%; UNINCORPORATED, 36.87%	Long term trend analyses indicate stable Chl-a, TN, TP, and TSS concentrations. A TMDL Implementation Plan has just been drafted for this basin. Ongoing monitoring will allow for assessment of watershed activities..
23	Roosevelt	LARGO, 0.08%; PINELLAS PARK, 20.14%; ST PETERSBURG, 51.85%; UNINCORPORATED, 27.93%	Long term trend analyses indicate significantly reduced TN and TP and stable Chl-a and TSS concentrations. This indicates the SWMP has had a positive impact in this watershed.
24	Cross Bayou	LARGO, 21.03%; PINELLAS PARK, 34.13%; SEMINOLE, 1.34%; UNINCORPORATED, 43.50%	Long term trend analyses indicate significantly reduced TN, TP, and TSS concentrations at the site flowing into Boca Ciega Bay. At the site flowing into Tampa Bay, TN and TP concentrations were significantly reduced, and TSS and Chl-a were stable. This indicates the SWMP is effective in this watershed.
25	Starkey Road	CLEARWATER, 0.03%; LARGO, 48.16%; PINELLAS PARK, 1.83%; SEMINOLE, 9.17%; UNINCORPORATED, 40.81%	Long term trend analyses indicate significantly reduced TN concentrations and stable TSS and TP concentrations, which suggests that the SWMP is successful in this area. There was not enough data to assess Chl-a at this time.
27	McKay Creek	BELLEAIR BLUFFS, 3.12%; LARGO, 46.29%; SEMINOLE, 8.01%; UNINCORPORATED, 42.57%	Long term trend analyses indicate significantly reduced TSS concentrations and stable TP, TN, and Chl-a at one site, reduced TN and stable TP, TSS, and Chl-a at another site, and stable TN, TP, Chl-a, and TSS concentrations at all other sites. Biological sampling indicates a passing grade for this basin, which suggests the SWMP is successful in this area.

Basin Number	Basin Name	Municipality % of Area	Analysis
35	Joes Creek	KENNETH CITY, 5.25%; PINELLAS PARK, 14.88%; ST PETERSBURG, 41.86%; UNINCORPORATED, 38.02%	Long term trend analyses indicate significantly reduced TN concentrations at the lowest site, and stable Chl-a, TSS, TN, and TP concentrations elsewhere. Pinellas County is currently planning a bank stabilization project for parts of the main channel in the basin which should help resolve elevated TSS loads in the future. A TMDL Implementation Plan has just been drafted. Ongoing monitoring will be utilized to assess effects of management activities.. The most recent biological monitoring resulted in passing SCI scores, an improvement since 2014.
E1	Old Tampa Bay	Clearwater Oldsmar, Safety Harbor, Unincorporated	Long term trend analyses indicate significantly reduced TSS, TN, and TP concentrations and stable Chl-a concentrations. Chl-a concentration means have been below or near the criterion for the last four years, and Old Tampa Bay has been meeting the FDEP recognized Reasonable Assurance threshold for chlorophyll-a since 2005. All of this indicates that the SWMP in contributing watersheds is effective.
E2	Old Tampa Bay	Clearwater, Largo, Unincorporated	Long term trend analyses indicate significantly reduced TSS, TN, and TP concentrations and stable Chl-a concentrations. Chl-a concentration means have decreased to near or below the criterion since 2012, and Old Tampa Bay has been meeting the FDEP recognized Reasonable Assurance threshold for chlorophyll-a since 2005. All of this indicates that the SWMP in contributing watersheds is effective.
E3	Old Tampa Bay	Unincorporated	Long term trend analyses indicate significantly reduced TSS, TN, and TP concentrations and stable Chl-a concentrations. Chl-a annual means have met the criterion most years. Exceptions occurred in 2003, 2009, and 2014, where Chl-a values were elevated due to sampling after large rain events. Old Tampa Bay has been meeting the FDEP recognized Reasonable Assurance threshold for chlorophyll-a since 2005. All of this indicates that the SWMP in contributing watersheds is effective.
E4	Middle Tampa Bay	Unincorporated	Long term trend analyses indicate significantly reduced TSS and stable TN, TP, and Chl-a concentrations. Generally, this stratum meets the criterion for Chl-a except for 2013 and 2014. The higher annual averages can be attributed to one sampling event during the summer months for both years. Old Tampa Bay has been meeting the FDEP recognized Reasonable

Basin Number	Basin Name	Municipality % of Area	Analysis
			Assurance threshold for Chl-a since 2005, indicating that the SWMP in contributing watersheds is effective.
E5	Middle Tampa Bay	Unincorporated	Long term trend analyses indicate significantly reduced TSS, TN, and TP concentrations and stable Chl-a concentrations. Chl-a concentration means are below the criterion. All of this indicates that the SWMP in contributing watersheds is effective.
LT	Lake Tarpon	Tarpon Springs, Unincorporated	Long term trend analyses indicate significantly reduced TN concentrations and stable TP, TSS, and Chl-a concentrations. Although Chl-a often exceeds the criterion, TN and TP are consistently below the criterion, indicating that the SWMP in the watershed is effective. The County is currently completing a water quality study for the lake which suggests that the Chl-a criteria may not be appropriate for this lake and recommends the development of a higher site-specific alternative criteria.
RB	Riviera Bay	Unincorporated	Long term trend analyses indicate significantly reduced TSS, TN, and TP concentrations and stable Chl-a concentrations. Chl-a concentration geometric means are below the criterion, and Old Tampa Bay has been meeting the FDEP recognized Reasonable Assurance threshold for chlorophyll-a since 2005. All of this indicates that the SWMP in contributing watersheds is effective.
SA	Lake Seminole	Seminole, Unincorporated	Long term trend analyses indicate significantly reduced Chl-a, TN, TP, and TSS concentrations in the northern portion (SA) of the lake. This is likely due to the SWMP and the specific best management activities recommended by the watershed management plan for the lake.
SB	Lake Seminole	Seminole, Unincorporated	Long term trend analyses indicate significantly reduced Chl-a, TN, TP, and TSS concentrations in the southern portion (SB) of the lake. This is likely due to the SWMP and the specific best management activities recommended by the watershed management plan for the lake.
W1	St Joseph Sound	Dunedin, Tarpon Springs, Unincorporated	Long term trend analyses indicate significantly reduced TSS concentrations and stable TN, TP, and Chl-a concentrations. Chl-a, TN, and TP annual geometric

Basin Number	Basin Name	Municipality % of Area	Analysis
			means are well below the criterion, indicating that the SWMP in contributing watersheds is effective.
W2	Clearwater Harbor North	Clearwater Dunedin	Long term trend analyses indicate stable Chl-a, TN, TP, and TSS concentrations. Chl-a, TN, and TP are well below the criterion, indicating that the SWMP in contributing watersheds is effective.
W3	Clearwater Harbor South	Belleair, Belleair Beach, Belleair Bluffs, Clearwater, Indian Rocks Beach, Largo, Unincorporated	Long term trend analyses indicate significantly reduced TSS concentrations and stable Chl-a, TN, and TP concentrations. Chl-a, TP, and TN annual geometric means are below the criteria, indicating that the SWMP in contributing watersheds is effective.
W4	Narrows	N Redington Beach, Madeira Beach, Redington Beach, Redington Shores, Unincorporated	Long term trend analyses indicate stable Chl-a, TN, TP, and TSS concentrations, although Chl-a exceeds the criterion in some years. This segment represents a very constricted area of the Intracoastal called the Narrows, which has very poor flushing. All surrounding segments have shown improvement, indicating that the SWMP is effective in the contributing watersheds.
W5	Long Bayou	Seminole, Unincorporated	Long term trend analyses indicate significantly reduced TN and TP concentrations and stable Chl-a and TSS concentrations. Chl-a annual geometric means are below the criterion in twelve out of fourteen years, indicating that the SWMP in contributing watersheds is effective.
W6	Boca Ciega Bay	Madeira Beach, Treasure Island, Unincorporated	Long term trend analyses indicate significantly reduced TP concentrations and stable TN, Chl-a, and TSS concentrations. Chl-a annual geometric means are below the criterion, indicating that the SWMP in contributing watersheds is effective.
W7	Boca Ciega Bay	Gulfport, St Pete Beach, South Pasadena, Treasure Island, Unincorporated	Long term trend analyses indicate significantly reduced Chl-a, TP, and TSS concentrations and stable TN concentrations. Chl-a concentration geometric means show a decrease to below the criterion since 2011. All of this indicates that the SWMP in contributing watersheds is effective.
W8	Boca Ciega Bay	St Pete Beach, Unincorporated	Long term trend analyses indicate significantly reduced TSS concentrations and stable TN, TP, and Chl-a concentrations. Chl-a annual geometric means are generally below the criterion, indicating that the SWMP in contributing watersheds is effective.

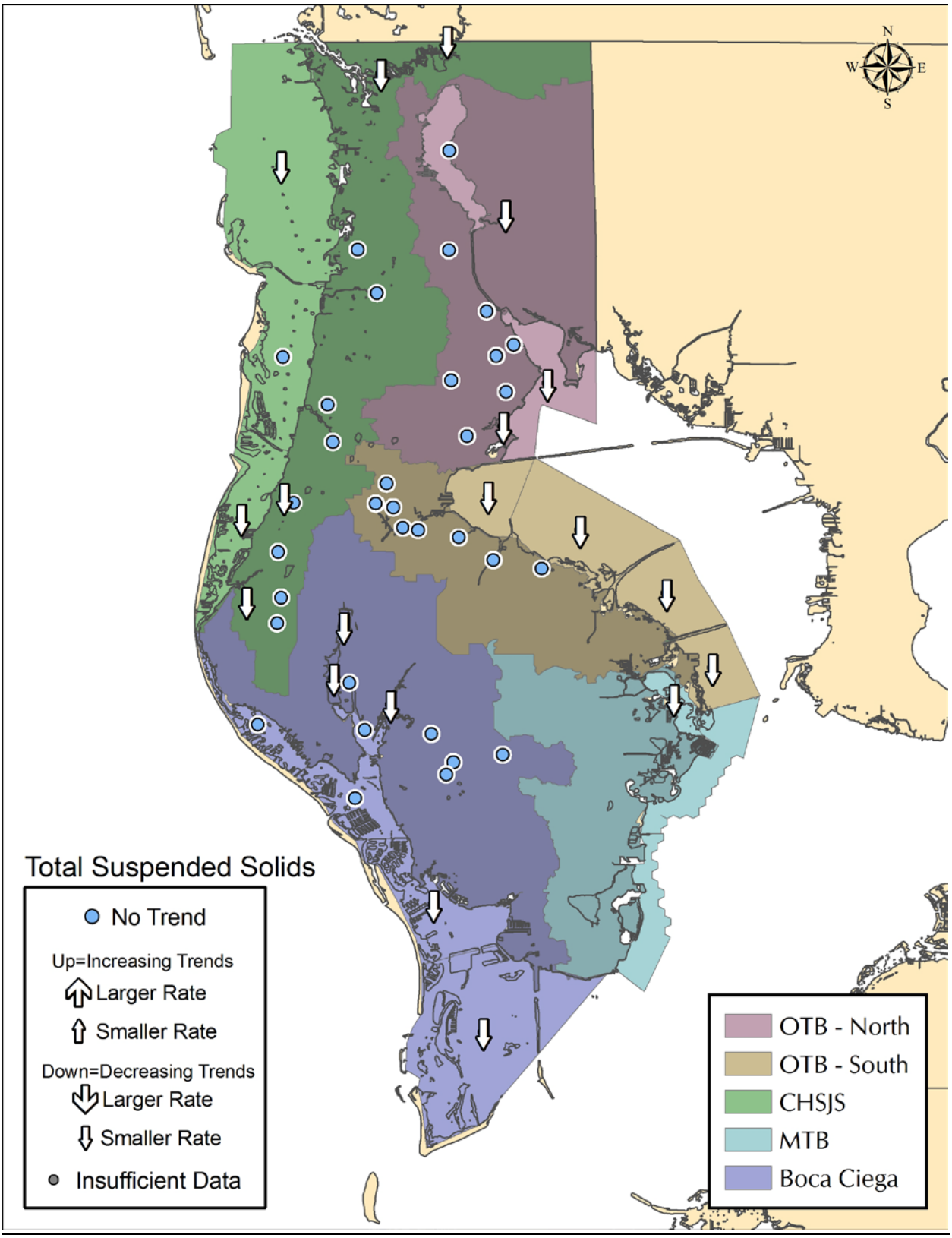

Figure 5. Long Term Trends Analysis for ambient water quality sites: Total Suspended Solids.

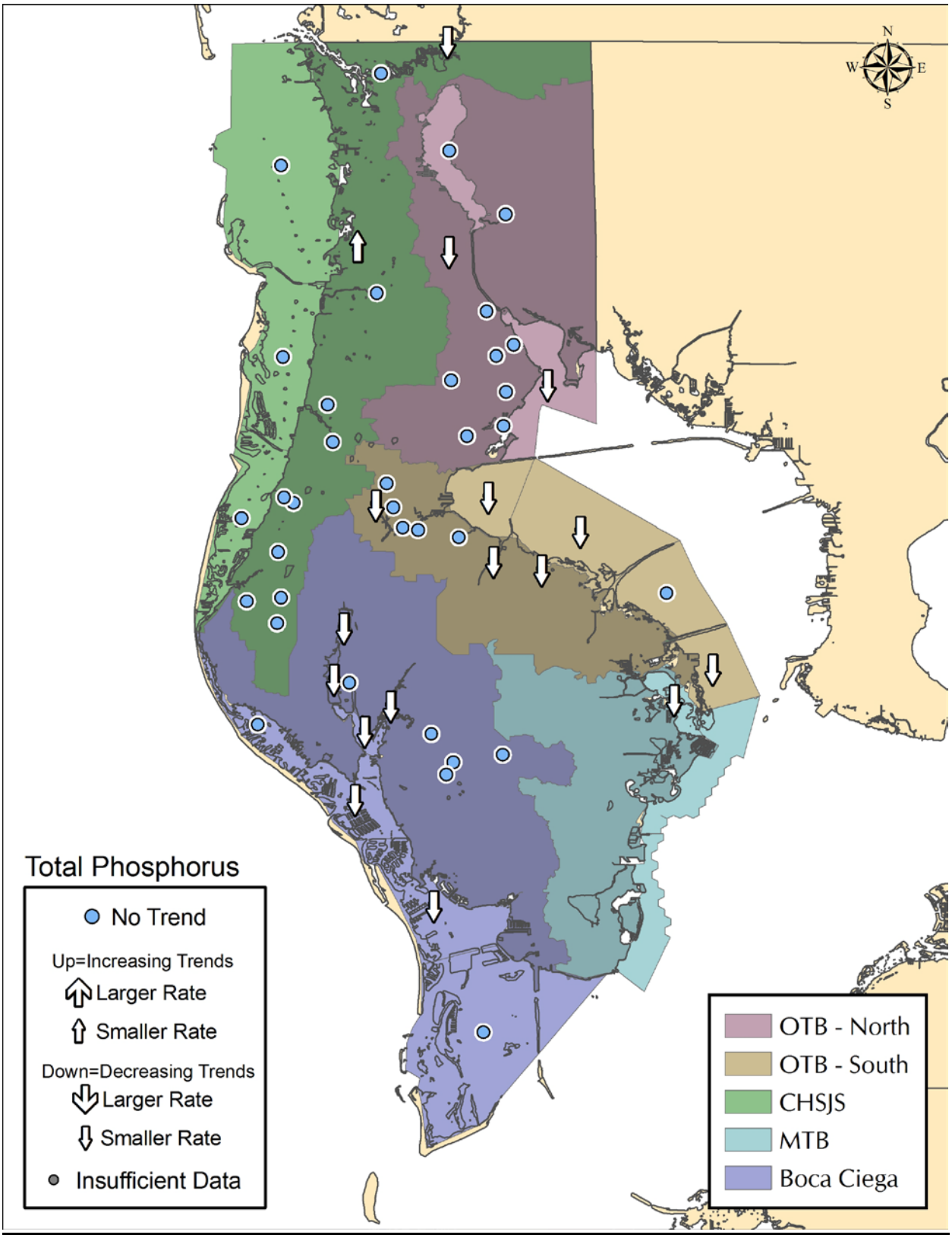

Figure 6. Long Term Trends Analysis for ambient water quality sites: Total Phosphorus.

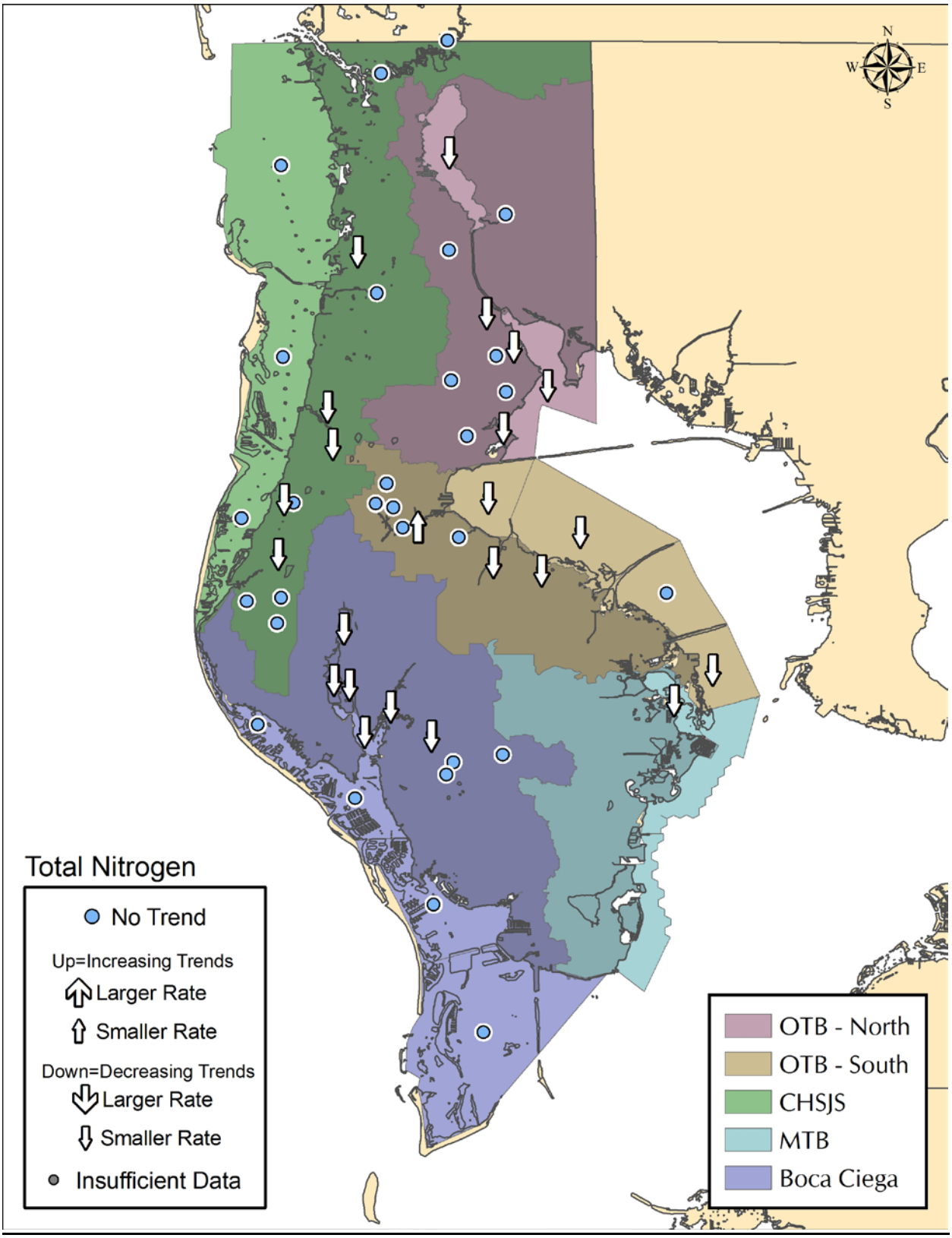

Figure 7. Long Term Trends Analysis for ambient water quality sites: Total Nitrogen.

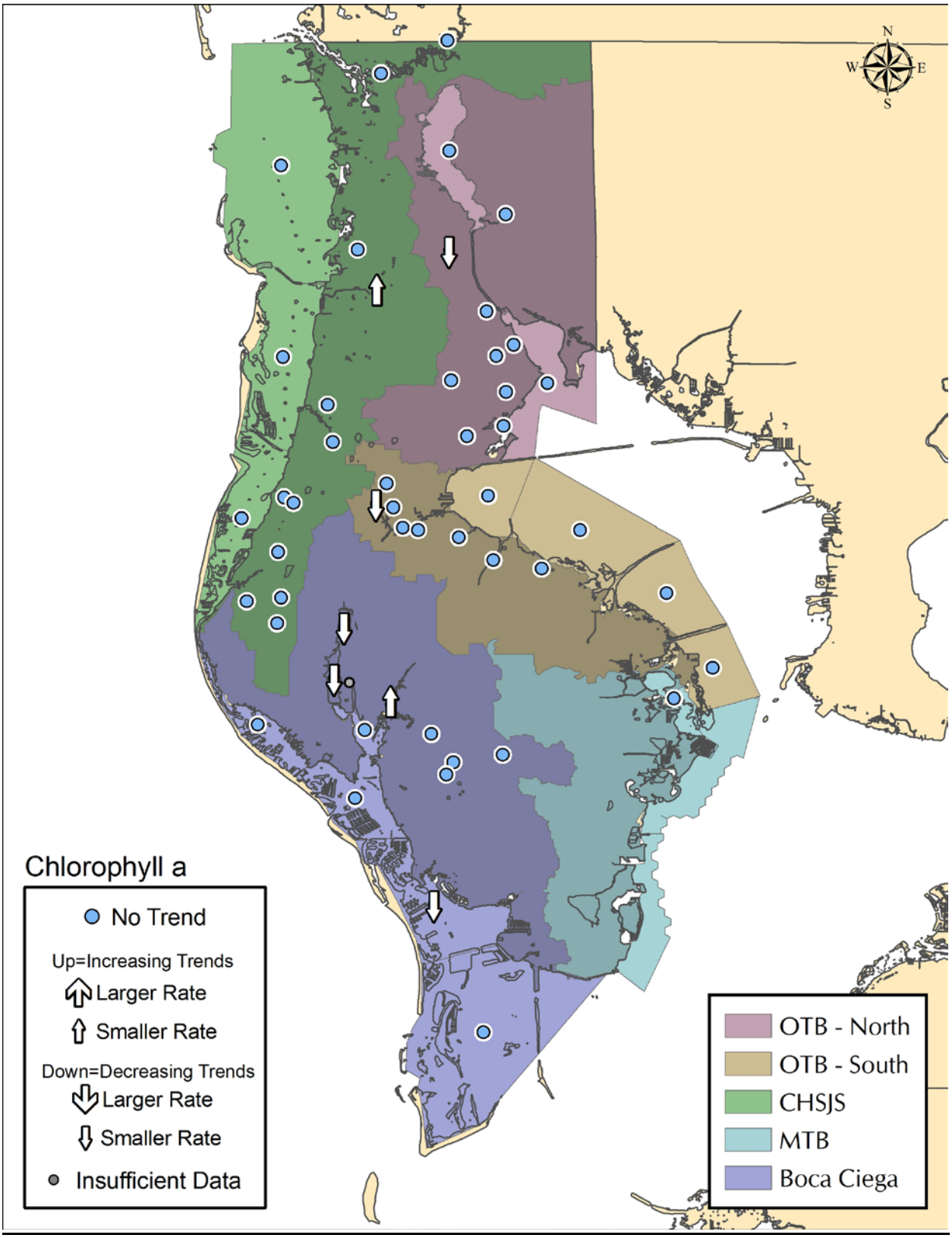

Figure 8. Long Term Trends Analysis for ambient water quality sites: Chlorophyll-a.

Table 3. Results for biological monitoring.

Habitat Assessment - Pinellas County					Fail		Pass	unresolved	
								NP= No aquatic plants observed	
Field ID	**Station Name**	**WBID**	**Sample Date**	**Habitat**	**SCI Score**	**Average SCI**	**RPS (%)**	**Sensitivity (COC)**	**Nuisance Exotics**
01-09	Hollin Creek		4/7/2015	101	52		0	NP	0
04-04	Brooker Creek	1474	2/3/2015	138	54	50	0	4.45	0
04-03	Brooker Creek	1474	10/31/2016	118	46		0	NP	NP
06-03	Cow Branch	1529	2/17/2015	71	44	41	5	NP	NP
			11/18/2015	77	37		5	1.2	64.7
08-03	Bee Branch	1527B	4/17/2014	87	49	43	2	0.875	56.2
			12/16/2014	80	37		2	0.15	59.2
			2/10/2016	76	33	31	1	0.91	66.7
			4/11/2017	76	28		0	1.7	37.8
09-02	Cedar Creek	1556A	11/24/2014	91	NA	NA	0	NP	NP
10-02	Curlew Creek	1538A	5/8/2014	72	33	38	0	NP	0
			10/24/2014	80	43		0	NP	NP
			4/10/2016	94	47	42	0	NP	NP
			11/16/2016	92	37		2	NP	NP
10-06	Jerry Branch	1550	11/24/2014	83	43	42	0	NP	0
			12/10/2015	95	41		4	NP	NP
			4/13/2016	88	56	46	2	NP	NP
			12/16/2016	84	36		0	NP	NP
11-05	Briar Creek	1541	2/25/2015	72	36	33	5	NP	NP
			12/4/2015	69	30		0	NP	NP
12-04	Bishop Creek	1569A	2/25/2015	68	37	32	2	NP	NP
			12/4/2015		27		0	0.67	83.9
13-05	Mullet Creek	1575A	3/15/2015	104	34	29	0	0.23	94.4
			11/13/2015	80	24		13	1.4	Q
14-19	Alligator Creek	1574	3/19/2015	110	58	61	10	3	51.4
			10/12/2015	119	63		0	NP	NP
15-04	Spring Branch	1567B	5/15/2014	64	38	35	0	5.9	40
			1/6/2015	83	32		0	4.3	14.3
			3/9/2016	78	41	31	0	NP	NP
			11/30/2016	74	21		0	NP	NP

Habitat Assessment - Pinellas County					Fail		Pass	unresolved	
								NP= No aquatic plants observed	
Field ID	**Station Name**	**WBID**	**Sample Date**	**Habitat**	**SCI Score**	**Average SCI**	**RPS (%)**	**Sensitivity (COC)**	**Nuisance Exotics**
17-01	Rattlesnake Creek	1614	4/24/2014	84	43	38	0	NP	NP
			11/14/2014	82	34		0	NP	NP
			4/26/2016	91	46	43.5	0	0	100
			10/19/2016	77	41		5	0	100
18-06	Stevenson's Creek	1567C	5/1/2014	75	42	37	5	0.4	81.9
			10/9/2014	66	32		0	0.21	96.2
			2/17/2016	80	60	55	10	0.58	80.9
			11/9/2016	76	50		0	0.16	96
19-08	Allen Creek	1604B	4/3/2015	73	37	30	0	0.87	66.7
			10/26/2015	98	23		3	0.9	66.7
19-12	Allen Creek	1604B	3/31/2015	104	25	37	0	0.38	64.3
			10/26/2015	92	49		0	0	100
22-05	Long Branch	1627	3/24/2015	110	36	36.5	7	0.06	93.8
			10/23/2015	98	37		0	0.92	72
24-07	Cross Canal	1641	5/1/2015	68	12	8	28	3.6	31.9
			12/8/2016	62	3		0	2.3	51.6
25-02	Seminole Bypass Canal (Starkey Basin)	1618D	5/13/2014	52	NA	NA	95.5	1.4	63
			12/9/2014	55	NA		12	0.829	72.9
25-07	Seminole Bypass Canal (Starkey Basin)	1618D	12/8/2015	42	NA	NA	21	1.6	44.1
			12/14/2016	51	NA		6	1.48	49.1
27-08	Church Creek	1643	4/28/2014	85	30	34	0	NP	NP
			12/3/2014	102	39		2	NP	NP
			3/9/2016	105	52	38	0	NP	NP
			11/23/2016	77	25		0	NP	NP
27-11	McKay Creek	1633B	4/23/2014	98	46	44	0	0.95	64.3
			5/7/2015	93	42		0	0.68	70.8
			1/26/2016	68	38	39	0	NP	NP
			10/5/2016	91	40		5	1.45	59.2
35-01	Pinellas Park Ditch #5	1668B	5/13/2014	56	NA	NA	0	0.32	92.3
			12/9/2014	46	NA		11	0.35	90.5
			2/23/2016	61	NA	NA	32	1.7	54.9
			12/14/2016	65	NA		79	1.49	58.3

Habitat Assessment - Pinellas County					Fail		Pass	unresolved	
									NP= No aquatic plants observed
Field ID	**Station Name**	**WBID**	**Sample Date**	**Habitat**	**SCI Score**	**Average SCI**	**RPS (%)**	**Sensitivity (COC)**	**Nuisance Exotics**
35-04	Bonn Creek	1668D	12/9/2014	55	NA	NA	2	1.6	60
			12/14/2016	64	NA		87	1.49	64.7
35-09	Bonn Creek	1668D	5/14/2014	68	NA		13.3	1.7	63.3
35-10	Joes Creek	1668A	5/14/2014	56	33	21	4	1	50
			10/28/2014	61	22		7	0.33	66.7
			2/23/2016	53	30	42	33	2.4	25.9
			12/7/2016	71	54		8	2	25
35-11	Joes Creek	1668A	10/30/2014	75	12		2	0.34	80.8
35-12	Miles Creek	1668A	10/28/2014	67	12		0	0.4	76.8
35-16	Joes Creek	1668A	10/30/2014	66	27		44	1.3	53.8

Literature Cited

American Public Health Association (APHA). 1992. *Standard Methods of Water and Wastewater. 18th ed. American Public Health Association, American Water Works Association, Water Environment Federation publication.* APHA, Washington D.C.

Florida Department of Environmental Protection (FDEP). 2008. *Standard Operating Procedures for Field Activities: DEP-SOP-001/01.* Tallahassee, Florida.

Janicki Environmental, Inc. 2003. *A Design of a Surface Water Quality Monitoring Program for Pinellas County Florida.* St. Petersburg, Florida.

Janicki Environmental, Inc. 2014. *Pinellas County Monitoring Program Review, Task 1: Technical Memorandum: Timeseries Trend Analysis*. St. Petersburg, Florida.

Pribble, Raymond, Janicki, A.J., and Greening, H. 1999. *Baywide Environmental Monitoring Report,1993-1998.* Tampa Bay Estuary Program, 1999, Technical Publication #07-99. St. Petersburg, Florida.