



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 (<http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm>). Files larger than 10MB may be placed on the FTP site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading files, email the MS4 coordinator or NPDES Program Administrator to notify them the report is ready for downloading; or by mail to the address in the box at right.
- Refer to the Form Instructions for guidance on completing each section.
- **Please print or type information in the appropriate areas below.**

Submit the form and attachments to:
 Florida Department of Environmental Protection
 Mail Station 3585
 2600 Blair Stone Road
 Tallahassee, Florida 32399-2400

SECTION I. BACKGROUND INFORMATION

A.	Permittee Name: Town of Jupiter		
B.	Permit Name: Palm Beach County MS4		
C.	Permit Number: FLS000018-004		
D.	Annual Report Year: <input type="checkbox"/> Year 1 <input type="checkbox"/> Year 2 <input checked="" type="checkbox"/> Year 3 <input type="checkbox"/> Year 4 <input type="checkbox"/> Year 5 <input type="checkbox"/> Other, specify Year:		
E.	Reporting Time Period (month/year): 10 / 18 through 9 / 19		
F.	Name of the Responsible Authority: David L. Brown		
	Title: Director of Utilities		
	Mailing Address: 210 Military Trail		
	City: Jupiter	Zip Code: 33458	County: Palm Beach
	Telephone Number: 561-741-2270		Fax Number: 561-746-2792
G.	Name of the Designated Stormwater Management Program Contact (if different from Section I.F above): David Rotar		
	Title: Utility Services Manager		
	Department: Utilities/Parks & Public Works		
	Mailing Address: 210 Military Trail		
	City: Jupiter	Zip Code: 33458	County: Palm Beach
	Telephone Number: 561-741-2705		Fax Number: 561-746-2792
	E-mail Address: davidr@jupiter.fl.us		

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): 0 (Does this number include non-major outfalls? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable)
B.	Number of outfalls REMOVED from the outfall inventory in the current reporting year (insert "0" if none): 0 (Does this number include non-major outfalls? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable)
C.	Is the change in the total number of outfalls due to lands annexed or vacated? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable

SECTION III. PART V.B. ASSESSMENT PROGRAM

A.	<p>Provide a brief statement as to the status of water quality monitoring plan implementation. Status may include sampling frequency changes, monitoring location changes, or sampling waiver conditions. <i>DEP Note: If permittee participates in a collaborative monitoring plan, permittee may refer to a joint response as defined by the interlocal agreement.</i></p> <p>Name and date of the approved plan: Group Monitoring Plan, September 8, 2016 Town of Jupiter Assessment Plan, January 9, 2019</p> <p>Status: The Group Monitoring Plan is included in the Cycle 4, Year 3 Joint Annual Report Jupiter Assessment Report is attached</p>
B.	<p>Provide a brief discussion of the monitoring and loading results to date which includes a summary of the water quality monitoring data and / or stormwater pollutant loading changes from the reporting year. <i>DEP Note: Results must be specific to the permittee's SWMP.</i></p> <p>Jupiter Assessment Plan is attached and provides the information requested.</p> <p>Please refer to the Cycle 4, Year 3 Joint Annual Report for a summary of the Group's water quality monitoring results for the reporting period.</p>
C.	<p>Attach a monitoring data summary as required by the permit. An analysis of the data discussing changes in water quality and/or stormwater pollutant loading from previous reporting years. <i>DEP Note: Analysis must be specific to the permittee's SWMP.</i></p> <p>See Response for Section IIIB., above</p>

SECTION IV. FISCAL ANALYSIS

A.	Total expenditures for the NPDES stormwater management program for the current reporting year: \$2,853,174
B.	Total budget for the NPDES stormwater management program for the subsequent reporting year: \$3,519,038
C.	<p>Did the current reporting year resources decrease from the previous year? Y <input type="checkbox"/> / N <input checked="" type="checkbox"/></p> <p>If program resources decreased, provide a discussion of the impacts on the implementation of the SWMP.</p> <p>N/A</p>

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	Required Attachments	Permit Citation	Attachment Number/Title
<input type="checkbox"/>	<input checked="" type="checkbox"/>	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.	Part III.A	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	An explanation of why the minimum inspection frequency in Table II.A.1.a. was not met, if applicable.	Part II.A.1	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	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.4	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	A monitoring data summary as directed in Section III.C above and in accordance with Rule 62-624.600(2)(c), F.A.C.	Part V.B.3	Refer to Joint Report & Jupiter Assessment Report
<input type="checkbox"/>	<input checked="" type="checkbox"/>	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.	Part III.A.1	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 2: A summary review of codes and regulations to reduce the stormwater impact from development.	Part III.A.2	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	Part V.A	Refer to Joint Report & Jupiter Assessment Report
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 3: Summary of TMDL Monitoring Results (if applicable).	Part VIII.B.2	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	YEAR 3: Bacteria Pollution Control Plan (if applicable).	Part VIII.B.3	Refer to Joint Report & Jupiter Assessment Report
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 4: A follow-up report on plan implementation of changes to codes and regulations to reduce the stormwater impact from development.	Part III.A.2	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 4: A report on any amendments to the applicable legal authority (if applicable).	Part III.A.7.a	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 4: Permit re-application information in accordance with Rule 62-624.420(2), F.A.C. <ul style="list-style-type: none"> • The monitoring plan (with revisions, if applicable). • If the total annual pollutant loadings have not decreased over the past two permit cycles, revisions to the SWMP, as appropriate. 	Part V.B.3 Part V.A.3	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	YEAR 4: TMDL Supplemental SWMP (if applicable).	Part VIII.B.3	

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): David L. Brown

Title: Director of Utilities

Signature:  Date: 3/12/2020

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

A.	B.					C.	D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity					Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
Part III.A.1	Structural Controls and Stormwater Collection Systems Operation								
Report the current known inventory.									
Report the number of inspection and maintenance activities conducted for each applicable 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.									
<i>Note: Delete structures that are not in your MS4's inventory. The permittee may choose its own unit of measurement for each structural control to be consistent with the unit of measurement in the documentation. Unit options include: miles, linear feet, acres, etc.</i>									
Type of Structure		Number of Structures	Number of Inspections	Percent Inspected	Number of Maintenance Activities	Percent Maintained			
Dry retention systems									
Underdrain filter systems									
Exfiltration trench / French drains (lf)		4221	6	100	0	100	Lucity WO 18-000688	TOJ Stormwater Crew	Six areas have exfiltration trenches.
Grass treatment swales (miles)									
Dry detention systems		6	72	100	72	100	Invoices from Contractor / Inspections in Lucity	Terracon Services, TOJ Stormwater Crew	
Wet detention systems		3	36	100	36	100	Invoices from Contractor / Inspections in Lucity	TOJ Stormwater Crew, Future Horizons	
Detention with filtration systems									
Alum Injection systems									
Pollution control boxes		9	18	100	9	100	Inspections in Lucity	TOJ Stormwater Crew	
pump stations		2	97	100	97	100	Pump Station Log/ Lucity	TOJ Stormwater Crew	
Major outfalls		13	26	100	0	0	Inspection Report/ Lucity	TOJ Stormwater Crew	
Weirs or other control structures pipes / culverts (miles)		93.9	40	100			Lucity	TOJ Stormwater Crew	Inspections are done annually

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	<p style="text-align: right;">Canals Inlets / catch basins / grates</p> <p style="text-align: center;">Ditches / conveyance swales (miles)</p>											Contractor	when doing structure inspections there are 40 Atlas sheets showing the drainage system. The number in "Inspection" indicates the number of sheets that where the lines were inpected. Number of Activities is the number of repairs that were performed on drainage lines. Sinkholes repaired, Joints wrapped	
							5408	5408	100	2149	39.7	Lucity	TOJ Stormwater Crew Contractor	There were 37 structures that were repaired the other activities are cleaning of the grates.
							59.2	2	100	12	100	Lucity	TOJ Stormwater Crew, Future Horizons, Terracon Services	The ditches are inspected twice a year. Mowing and Spraying done monthly.
	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.					<input type="checkbox"/>		N/A	N/A	Met or exceeded inspections frequencies				

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Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
Part III.A.1 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Inspection and maintenance of structural components of the Town's MS4 system helps to enhance water quality. The inspections also help to identify areas that may be developing problems.				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.2	Areas of New Development and Significant Redevelopment				
	Report the number of significant development projects, including new and redevelopment, reviewed and approved by the permittee for post-development stormwater considerations.				
	Number of significant development projects reviewed	8	Energov	TOJ Stormwater	
	Number of significant development projects approved	3	Energov	TOJ Staff	
	Provide in the Year 2 Annual Report the summary report of the review activity. Provide in the Year 4 Annual Report the follow-up report on plan implementation.				
	Year 2 ONLY: Attach the summary report of the review activity	<input type="checkbox"/>			
	Year 4 ONLY: Attach the follow-up report on plan implementation	<input type="checkbox"/>			
Part III.A.2 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Works in conjunction with South Florida Water Management District requirements. Redevelopment allows for the stormwater system to be upgraded.				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.3	Roadways				
	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. <i>Note: If the permittee does not contract activities, delete CONTRACTOR activities.</i>				
	PERMITTEE Litter Control: Frequency of litter collection				Part of Right of Way mowing contract
	PERMITTEE Litter Control: Estimated amount of area maintained (lf)				
	PERMITTEE Litter Control: Estimated amount of litter collected (cy)				
	CONTRACTOR Litter Control: Frequency of litter collection	30	Invoices	Property Works, Terracon	
	CONTRACTOR Litter Control: Estimated amount of area maintained (lf)	132,979	Lucity		
	CONTRACTOR Litter Control: Estimated amount of litter collected (cy)	0	N/A	N/A	Litter is picked up prior to cutting the grass. A count is not kept

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Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
	<p>OPTIONAL: 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. If you do not participate in an Adopt-A-Road program, report "0".</p>				
	<p>Trash Pick-up Events: Total miles cleaned</p>				Town of Jupiter does not have a program
	<p>Trash Pick-up Events: Estimated amount of litter collected (cy) Adopt-A-Road: Total miles cleaned</p>				Town of Jupiter does not have a program
	<p>Adopt-A-Road: Estimated amount of litter collected (cy)</p>				
	<p>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 and total phosphorus loadings that were removed by the collection of sweepings. If no street sweeping program is implemented, provide the explanation of why not in column F.</p>				
	<p>Frequency of street sweeping</p>	Quarterly / Weekly			All Town owned curbed roads quarterly. Selected State and County roads are swept quarterly. Additional sweeping done in Dec., Jan., Feb., March
	<p>Total miles swept</p>	1834	Invoices	U.S. Sweeping Inc	
	<p>Estimated quantity of sweeping material collected (cy / tons)</p>	1486	Invoices	U.S. Sweeping Inc	
	<p>Total phosphorous loadings removed (pounds)</p>	46	Load Reduction Excel sheet	TOJ Personnel	Calculated using FDEP Load Reduction Tool
	<p>Total nitrogen loadings removed (pounds)</p>	71	Load Reduction Excel sheet	TOJ Personnel	Calculated using FDEP Load Reduction Tool

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Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
	Report the equipment yards and maintenances shops that support road maintenance activities, and the number of inspections conducted for each facility.				
	Name of Facility	Number of Inspections			
	Town of Jupiter Maintenance Facility	12	Municipal Maintenance Yard Inspection Check List	Charles Jones	
Part III.A.3 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Street sweeping has helped reduce the amount of pollutants being discharged into the stormwater system.				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
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	0	N/A	N/A	None
	Flood control projects completed that did <u>not</u> include stormwater treatment	0	N/A	N/A	None
	Stormwater retrofit projects planned/under construction	1	Town CIP	Stormwater Utility	
	Stormwater retrofit projects completed	1	Town CIP	Stormwater Utility	Elsa & Paulina
	If there were projects that did not include stormwater treatment, provide as an attachment a list of the projects and an explanation for each of why it did not.	<input type="checkbox"/>	N/A	N/A	
Part III.A.4 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Works in conjunction with South Florida Water Management District requirements. Redevelopment allows for the stormwater system to be upgraded.				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				

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Part III.A.5	Municipal Waste Treatment, Storage, and Disposal Facilities Not Covered by an NPDES Stormwater Permit				
	Report the applicable facilities and the number of the inspections conducted for each facility.				
	Name of Facility	Number of Inspections			
	N/A				Not applicable Town does not own any
Part III.A.5 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: N/A				
	Limitations: N/A				
	SWMP revisions implemented to address limitations: N/A				
Part III.A.6	Pesticides, Herbicides, and Fertilizer Application				
	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 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: FDACS public applicators of pesticides/herbicides	1	Copy of State License	Town of Jupiter Parks & Public Works	
	CONTRACTORS: FDACS commercial applicators of pesticides/ herbicides	4	Copy of State License	Terracon, Future Horizons, Property Works	
	PERSONNEL: Green Industry BMP Program training completed	0	N/A	N/A	Employee is already trained
	CONTRACTORS: FDACS certified / licensed applicators of fertilizer	3	Copy of State License	Terracon, Future Horizons, Property Works	
	Provide a copy of the adopted ordinance with the Year 2 Annual Report. If this provision is not applicable because the permittee is not within the watershed of a nutrient-impaired water body, indicate that in Column F.				
	Year 2 ONLY: Attach copy of adopted Florida-friendly ordinance	<input type="checkbox"/>			
	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, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
	Brochures/Flyers/Fact sheets distributed				

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Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
	Neighborhood presentations: Number conducted Neighborhood presentations: Number of participants Newspapers & newsletters: Number of articles/notices published Newsletters: Number of newsletters distributed Public displays (e.g., kiosks, storyboards, posters, etc.) Radio or television Public Service Announcements (PSAs) School presentations: Number conducted School presentations: Number of participants Seminars/Workshops: Number conducted Seminars/Workshops: Number of participants Special events: Number conducted Special events: Number of participants Number of visitors to stormwater-related pages				
Part III.A.6 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Making sure that all commercial applicators contracted with the Town have received training. Seasonal ban on use of fertilizers with nitrogen and phosphorus should help reduce loads to impaired parts of the Loxahatchee River				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.7.a	Illicit Discharges and Improper Disposal — Inspections, Ordinances, and Enforcement Measures				
	Report amendments in Year 4.				
	Year 4 ONLY: Attach a report on amendments to applicable legal authority	<input type="checkbox"/>			
Part III.A.7.c	Illicit Discharges and Improper Disposal — Investigation of Suspected Illicit Discharges and/or Improper Disposal				
	Report on the proactive inspection program, including the number of inspections conducted by the permittee, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Proactive inspections for suspected illicit discharges	5408	Lucity	TOJ Stormwater/ Public Works employees	Look for illicit discharges when inspecting inlets
	Illicit discharges found during a proactive inspection	0	N/A	N/A	None found
	NOV/WL/citation/fines issued for illicit discharges found during proactive inspection	0	N/A	N/A	None found
	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 discharges received	4	Lucity	TOJ Stormwater	
	Reactive investigations of reports of suspected illicit discharges etc.	4	Lucity	TOJ Stormwater	
	Illicit discharges etc. found during reactive investigation	2	Lucity	TOJ Stormwater	

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	NOV/WL/citation/fines issued for illicit discharges etc. found during reactive investigation	0	N/A	N/A	All cases were resolved in the field by Stormwater.
	Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training) within the reporting year.				
	Personnel trained	0	N/A	N/A	Training will be provided in 2020
	Contractors trained	0	N/A	N/A	No training provided
Part III.A.7.d	Illicit Discharges and Improper Disposal — Spill Prevention and Response				
	Report on the spill prevention and response activities, including the number of spills addressed.				
	Hazardous and non-hazardous material spills responded to	0	N/A	N/A	None Reported
	Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training) within the reporting year.				
	Personnel trained	0	N/A	N/A	Training will be provided in 2020
	Contractors trained	0	N/A	N/A	No training provided
Part III.A.7.e	Illicit Discharges and Improper Disposal — Public Reporting				
	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, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
	Brochures/Flyers/Fact sheets distributed	32,000	2018 Hurricane and Flood Guide	Town of Jupiter	Hurricane Guide is sent out annually to all Town properties. Section on Drainage Maintenance has information pertaining to Illegal

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	Neighborhood presentations: Number conducted Neighborhood presentations: Number of participants Newspapers & newsletters: Number of articles/notices published Newsletters: Number of newsletters distributed Public displays (e.g., kiosks, storyboards, posters, etc.) Radio or television Public Service Announcements (PSAs) School presentations: Number conducted School presentations: Number of participants Seminars/Workshops: Number conducted Seminars/Workshops: Number of participants Special events: Number conducted Special events: Number of participants Number of visitors to stormwater-related pages				dumping.
Part III.A.7.f	Illicit Discharges and Improper Disposal — Oils, Toxics, and Household Hazardous Waste Control				
	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, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
	Brochures/Flyers/Fact sheets distributed				
	Neighborhood presentations: Number conducted				
	Neighborhood presentations: Number of participants				
	Newspapers & newsletters: Number of articles/notices published				
	Newsletters: Number of newsletters distributed				
	Public displays (e.g., kiosks, storyboards, posters, etc.)				
	Radio or television Public Service Announcements (PSAs)				
	School presentations: Number conducted				
	School presentations: Number of participants				
	Seminars/Workshops: Number conducted				
	Seminars/Workshops: Number of participants				
	Special events: Number conducted				
	Special events: Number of participants				
	Storm sewer inlets newly marked/replaced				

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	Number of visitors to stormwater-related pages				
Part III.A.7.g	Illicit Discharges and Improper Disposal — Limitation of Sanitary Sewer Seepage				
	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. Report only the SSOs and inflow / infiltration incidents into the MS4.				
	Owner of the sanitary sewer system	Loxahatchee River District			
	Activity to reduce/eliminate SSOs and I&I: (description)				Town is not responsible for the sanitary sewer system
	Activity to reduce/eliminate SSOs and I&I: (description)				
	SSO incidents discovered				
	SSO incidents resolved				
	Inflow / infiltration incidents discovered				
	Inflow / infiltration incidents resolved				
Part III.A.7 Summary	For activities required by Part III.A.7: Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Inspection of structures allows for detection of illicit discharge				
	Limitations: Duplication of reporting Sanitary Sewer Overflows, this is already required by FDEP of the operator of the sanitary sewer system.				
	SWMP Revisions implemented to address limitations: Remove the duplication of reporting.				
Part III.A.8.a	Industrial and High-Risk Runoff — Identification of Priorities and Procedures for Inspections				
	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.				
	Report on the high-risk facilities inspection program, including the number of inspections conducted and the number and type of enforcement actions taken.				
	Type of Facility	Number of Facilities	Number of Inspections	Enforcement Actions	
	Operating municipal landfills	0	N/A	N/A	

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE							
A.	B.		C.		D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity		Number of Activities Performed		Documentation / Record	Entity Performing the Activity	Comments
	Hazardous waste treatment, storage, disposal and recovery (HWTSDR) facilities		0	N/A	N/A		
	EPCRA Title III, Section 313 facilities (TRI)		1	1	0	EPA database/Lucity inspection of structures	TOJ Stormwater Staff Facility has EPA permit
	Facilities determined as high risk by the permittee		0	N/A	N/A	N/A	No facilities to our knowledge
Part III.A.8.b	Industrial and High-Risk Runoff — Monitoring for High Risk Industries						
	Report the number of high risk facilities sampled.						
	High risk facilities sampled		0	N/A	N/A	No sampling done	
Part III.A.8 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.						
	Strengths: None identified						
	Limitations: Duplication when EPA and FDEP permits are required with annual reporting						
	SWMP revisions implemented to address limitations: Remove duplication from NPDES requirement						
Part III.A.9.a	Construction Site Runoff — Site Planning and Non-Structural and Structural Best Management Practices						
	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		3	Energov	Town of Jupiter		
	PERMITTEE SITES: Construction site plans approved		3	Energov	Town of Jupiter		
	PRIVATE SITES: Construction site plans reviewed		12	Energov	Town of Jupiter		
	PRIVATE SITES: Construction site plans approved		7	Energov	Town of Jupiter		
	Report the number of development 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		10	Energov	Town of Jupiter		
	Confirmed ERP coverage		10	Energov	Town of Jupiter		
	Notified of CGP stormwater permit requirements		10	Energov	Town of Jupiter		
	Confirmed CGP coverage		6	Energov	Town of Jupiter	Only six meet the requirements needing CGP	
Part III.A.9.b	Construction Site Runoff — Inspection and Enforcement						
	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		3				
	PERMITTEE SITES: Pre-, During, and Post inspections of active construction		69	NPDES	Town of Jupiter	Police	

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE						
A.	B.		C.	D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity		Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
	sites for E&S and waste control BMPs			Compliance Inspection Report	Employees	Department Bldg., Elsa Rd, Saturn did not meet requirements for CGP
	PERMITTEE SITES: Percentage of active construction sites inspected		100			
	PRIVATE SITES: Active construction sites		9			
	PRIVATE SITES: Pre-, During, and Post inspections of active construction sites for E&S and waste control BMPs		309	Lucity	Town of Jupiter Employees	
	PRIVATE SITES: Percentage of active construction sites inspected		100			
	Enforcement Action		0	N/A	N/A	N/A
Part III.A.9.c	Construction Site Runoff — Site Operator Training					
	Report the type of training activities, the number of inspectors, site plan reviewers and site operators trained (both in-house and outside training).					
		DEP Certification	Annual Training			
	Permittee construction site inspectors	8	1	Sign in Sheet	Joint NPDES Group	Attended Soil and Erosion Control
	Permittee construction site plan reviewers		0	N/A	N/A	Training will be done in 2020
	Permittee construction site operators		0	N/A	N/A	We do not have operators of construction sites
Part III.A.9 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.					
	Strengths: Town inspects construction runoff on every routine inspection of each construction site to ensure SWPPP and BMPs are followed.					
	Limitations: Annual training of personnel is not necessary and is time consuming.					
	SWMP revisions implemented to address limitations:					

SECTION VIII. 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.
		N/A
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)
		N/A

SECTION IX. TMDL Status Report

A.	YEAR 1 Provide a table summarizing the status of the TMDL process. Include a list of prioritized TMDLs and their monitoring and implementation schedule; and include the Identification number of the outfall prioritized for TMDL monitoring.								
	WBID Number	Segment/ Waterbody/ Basin	Pollutant of Concern	TMDL DEP / EPA	Percent Reduction (WLA)	Priority Rank	Priority Outfall	Monitoring Summary / BPCP Due Date	Supplemental SWMP Due Date
	3226C	SW Fork of Loxahatchee River	Fecal	<input checked="" type="checkbox"/> / <input type="checkbox"/>	N/A	1	N/A	Refer to Joint Report & Jupiter Assessment Report	(Year 4 AR; N/A) if BPCP)
				<input type="checkbox"/> / <input type="checkbox"/> <input type="checkbox"/> / <input type="checkbox"/>					
B.	YEAR 3 and annually thereafter, provide a summary of the estimated load reductions that have occurred for the pollutant(s) of concern being discharged from the MS4 to the TMDL water body during the reporting period and cumulatively since the date the Supplemental SWMP was implemented. Year 3: Submit a Monitoring data summary or BPCP (if applicable). Year 4: Submit a Supplemental SWMP (if applicable).								
	WBID Number	Pollutant of Concern	Monitoring Summary / BPCP Submitted	Supplemental SWMP Submitted	Projected load reductions OR Actual load reductions to date				
	3226C	Bacteria	N/A	N/A	BPCP report will be submitted with Year 4 in accordance with the attached Loxahatchee River Pollutant Reduction Plan				
C.	Provide a brief statement as to the status of TMDL implementation according to Part VIII.B of the permit (e.g. status of monitoring to validate WLA):								
	Town is working on RAP with FDEP. Attached is the December 2019 draft of Loxahatchee River Pollutant Reduction Plan, the working document for the Loxahatchee River RAP efforts.								

January 16, 2020

To: Town of Jupiter

From: Chris Guth, P.E. – Federico & Associates, Inc.
Eric Stanley, P.E. – Hazen and Sawyer

Monitoring and Pollutant Loading Report

Cycle 4, Year 3 – Annual Report

Introduction

An assessment program was developed as part of the Cycle 4, Year 1 annual report to assist in determining the overall effectiveness of the Town of Jupiter (Town) Stormwater Management Program (SWMP) in reducing stormwater pollutant loadings, to the Maximum Extent Practicable (MEP), from its Municipal Separate Storm Sewer System (MS4) to receiving water bodies. The Water Quality Monitoring Assessment Report is a summary of the data collected as part of the assessment program.

1. Review of Water Quality Monitoring Plan

As part of the Town of Jupiter's (Town) Water Quality Monitoring Plan, ambient water quality data collectively obtained through a joint program by the Palm Beach County MS4 permittees (Permit No. FLS000018-003) are being used. The Town is also utilizing additional monitoring locations which have been placed in areas that represent centralized collection zones for major stormwater outfalls and thus characterize water quality conditions in the watershed.

In addition to the combination of ambient water quality data collected through the joint program and the additional monitoring locations being utilized by the Town at strategic points throughout the system, a short-term monitoring plan is being implemented in the upstream reaches of the Jones Creek Watershed to assist in identifying the source(s) of the elevated fecal bacteria levels often observed in Jones Creek. Sample locations are adjusted based on the obtained results in order to hone in on the area(s) of the Jones Creek watershed that are most problematic.

1.1 Monitoring Locations

A total of six (6) MS4 monitoring locations have historically been utilized by the Town (**Figure 1**). Two (2) of those locations represent sites currently monitored under the Joint MS4 Program with the remaining four (4) being selected by the Town to provide additional detail on observed water quality impairments. A seventh monitoring location is broadly known as the Jones Creek Watershed (JCWS) and is comprised of multiple individual sampling points. The focus area for the JCWS sampling is shown in purple hatch in **Figure 1**.

2. Data Analysis

Samples that were collected from the permanent monitoring locations were tested for the parameters listed in **Table 1**. Of particular importance are fecal coliform bacteria, Total Nitrogen (TN), Total Phosphorous (TP), and Chlorophyll α due to fecal coliform TMDL for the Southwest Fork of the Loxahatchee River (published in 2012) and Loxahatchee River Reasonable Assurance Plan (RAP) currently being developed and in the draft phase. An overview of these specific parameters is included in this report.

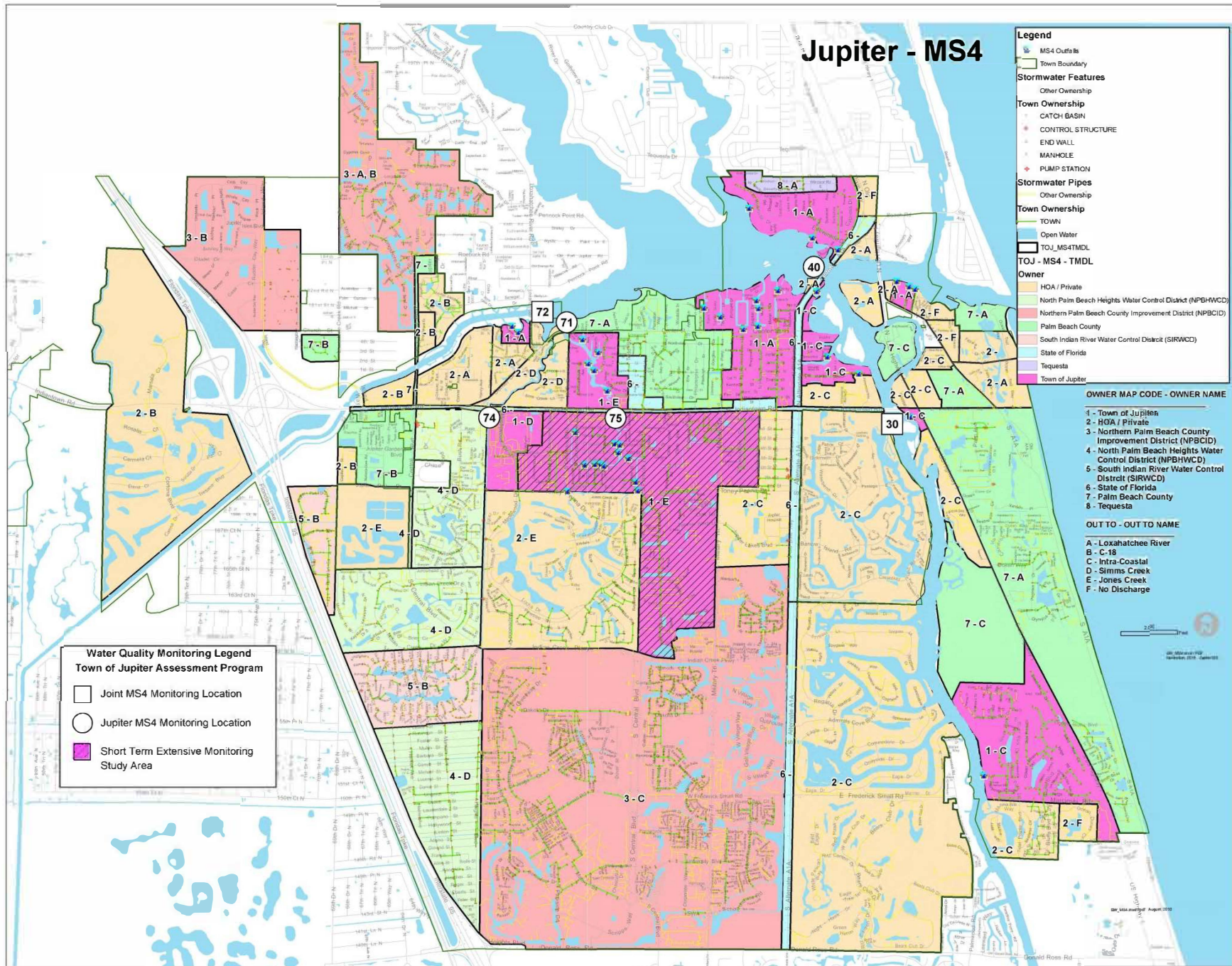


Figure 1 - Town of Jupiter MS4 Boundaries and Water Quality Monitoring Stations

Table 1 – MS4 Monitoring Parameters Table

Parameters	Field Analysis	Laboratory Analysis
Alkalinity		X
Chlorophyll α		X
Color		X
Conductivity (salinity)	X	
Dissolved Oxygen	X	
Enterococci (marine only)		X
Fecal Coliform		X
Nitrate/Nitrite		X
Organic Nitrogen		X
Orthophosphorus		X
pH	X	
Temperature	X	
Total Kjeldahl Nitrogen (TKN)		X
Total Ammonia		X
Total Nitrogen (TN)		X
Total Phosphorous (TP)		X
Total Organic Carbon (TOC)		X
Total Suspended Solids (TSS)		X

2.1 Fecal Coliform Bacteria

Fecal Coliform bacteria counts are problematic within the Town’s MS4 as evidenced by the fact that a fecal bacteria TMDL has been developed for the Southwest Fork of the Loxahatchee River. The criteria for class II waters, such as the Southwest Fork, are summarized in **Table 2**.

Fecal Coliform bacteria counts measured at each of the permanent water quality monitoring stations are provided in **Figure 2**. The single sample limits of 43 counts/100 mL and 800 counts/100 mL for the TMDL and general Class II Waters, respectively, are included for comparison purposes.

Table 2 – Applicable Water Quality Standards for Fecal Coliform Bacteria

Governing Criteria	Description
Class II Water Body (per 62-302.530 F.A.C)	Median Most Probable Number (MPN) shall not exceed 14 counts/100 milliliters (mL)
	MPN shall not exceed 43 counts/100 mL in more than 10% of samples
	MPN shall not exceed 800 counts/100 mL on any one day
Loxahatchee River Southwest Fork TMDL	MPN shall not exceed 43 counts/100 mL in any one sampling event

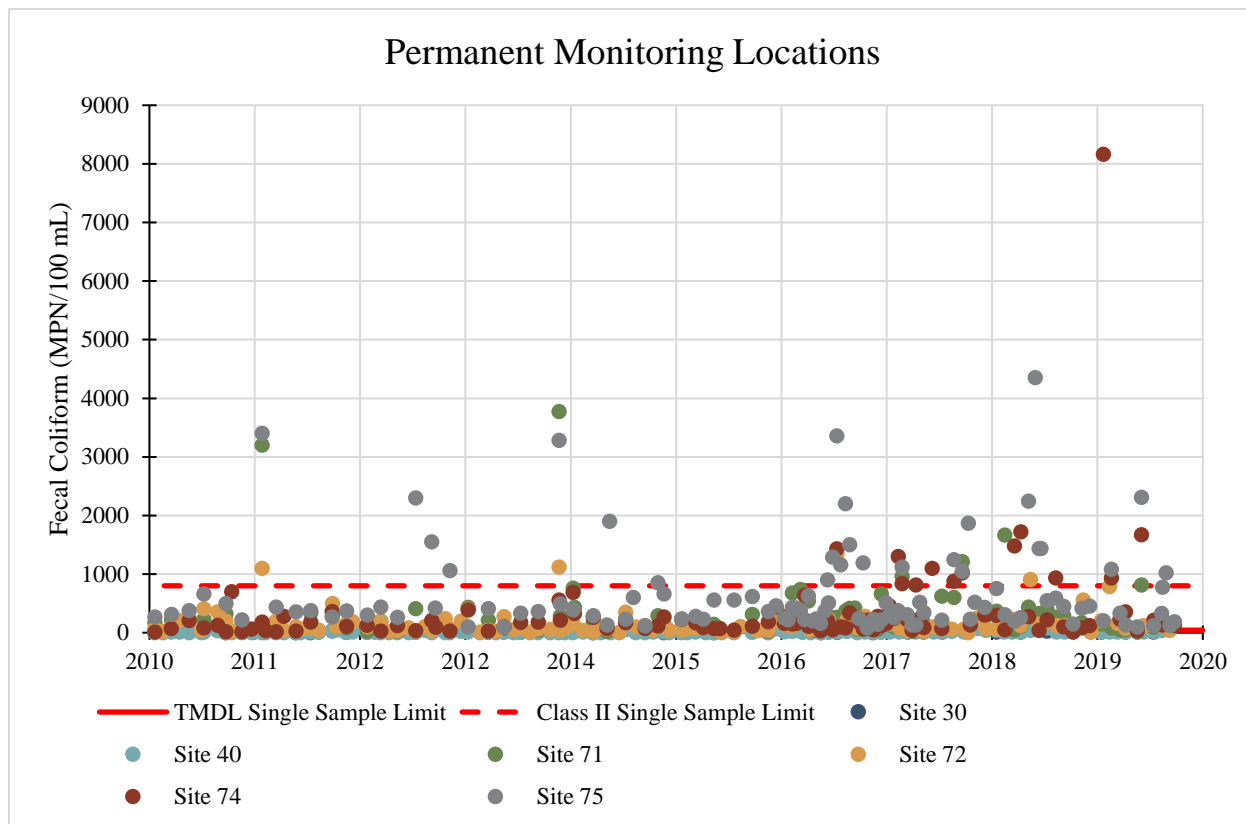


Figure 2 – Fecal Coliform Bacteria Counts at the Six Permanent Water Quality Monitoring Locations

The frequency of exceeding the 800 count/100 mL Class II water criteria has generally increased since 2010 and this pattern continues when looking at the entire period of record (only data from 2010 and later included for presentation purposes). A summary of total exceedances of the TMDL single sample limit and the Class II single sample limit is presented in **Table 3**.

Table 3 – Summary of Fecal Coliform Bacteria Exceedances

Station	Collection Period of Record (MM/YY)	Total Samples (n)		Quantity of Samples >43 counts/100 mL (% of samples)		Quantity of Samples >800 counts/100 mL (% of samples)	
		2016 and Later	Total POR	2016 and Later	Total POR	2016 and Later	Total POR
30	01/91 – 09/19	18	161	1 (6%)	16 (10%)	0 (0%)	0 (0%)
40	08/92 – 09/19	44	236	4 (9%)	22 (9%)	0 (0%)	0 (0%)
71	08/92 – 09/19	60	203	57 (95%)	178 (88%)	4 (7%)	8 (4%)
72	02/92 – 09/19	44	239	40 (91%)	170 (71%)	3 (7%)	9 (4%)
74	07/09 – 09/19	61	112	56 (92%)	95 (85%)	13 (21%)	13 (12%)
75	09/07 – 09/19	67	124	67 (100%)	124 (100%)	18 (27%)	25 (20%)

Exceedances of both criteria are most commonly observed in the upstream reaches of Jones and Sims Creek (Stations 75 and 74, respectively). The monitoring locations near the confluence of Jones and Sims Creek and the Southwest Fork of the Loxahatchee River are similar in quality when evaluating the frequency of

exceedances compared to both the TMDL and Class II water quality criteria. In contrast, Stations 30 and 40 both show Fecal Coliform levels which meet the general Class II water quality criteria for samples collected and exceed the Southwest Fork TMDL limit of 43 counts/100 mL at a much less frequent rate than other sampling locations. It should be noted that monitoring stations 30 and 40 are outside of WBID 3226C, which is covered by the fecal coliform TMDL. The frequency of fecal coliform levels exceeding the TMDL limit of 43 counts/100 mL were included for comparison purposes but measurements exceeding this amount do not represent water quality that is not in compliance with the water quality standards.

Due to the frequent impairments observed at water quality monitoring station 75 (upstream reach of Jones Creek), additional short-term sampling is being conducted in an effort to identify the contaminant source(s). The Town partnered with the Loxahatchee River District (LRD) to perform a detailed evaluation of the elevated fecal coliform levels in the basin. The preliminary findings of that analysis are included as **Attachment 1**. Overall there is no single source that has been identified following extensive monitoring despite monitoring at a high frequency and at numerous locations within the basin. The LRD and Town plan on continuing this monitoring effort in order to eventually improve the bacteria levels within the basin.

2.2 Nutrients

While exceedances are more commonly observed with Fecal Coliform bacteria compared to other parameters within the Town's MS4, nutrients remain an important water quality metric that is tracked by the Town as part of the continuous monitoring performed within the MS4 and the short-term monitoring performed in the headwaters of Jones Creek. Furthermore, the Town has been an active participant in the Loxahatchee River RAP currently being developed. A brief review of nutrient concentrations within the limits of the Town's MS4 is provided below.

Total Nitrogen

Total Nitrogen (TN) concentrations are evaluated for compliance based on the comparison to an annual geometric mean (AGM) limit of 1.26 mg/L for the water quality monitoring located within the Southwest Fork or waterbodies which discharge to it. Station 30 is located within the Intracoastal Waterway and Station 40 is located within the Lower Loxahatchee River which have a criterion that the TN AGM concentration not exceed 0.66 mg/L and 0.63 mg/L, respectively. AGMs recorded since 2010 are summarized in **Table 4** for the six permanent monitoring stations.

When comparing the water quality data collected at the permanent monitoring stations to the AGM criteria it is clear concentrations are commonly in compliance throughout the Town's monitoring network. Only one exceedance is observed (Station 74) from 2010 to present.

Table 4 - Total Nitrogen AGM

Monitoring Station ID	Total Nitrogen Compliance										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	Samples (n)
30	0.291	0.274	0.237	0.232	0.244	0.200	0.262	0.297	0.327	0.271	3
40	0.202	0.279	0.212	0.206	0.219	0.246	0.275	0.265	0.307	0.273	9
71	0.421	0.436	0.389	0.409	0.411	0.449	0.498	0.411	0.469	0.477	3
72	0.462	0.582	0.492	0.481	0.549	0.548	0.703	0.741	0.674	0.608	9
74	1.160	1.067	1.207	0.927	0.993	1.032	1.404	1.249	1.157	1.190	3
75	0.781	0.577	0.708	0.471	0.667	0.617	0.644	0.670	0.601	0.692	7

Footnote 1: Based on samples collected at the permanent water quality monitoring stations.

Footnote 2: Red entries represent values that exceed the AGM limit. Compliance at Stations 30 is based on comparison with the Intracoastal Waterway NNC (0.66 mg/L) and Station 40 is based on comparison with the Lower Loxahatchee NNC (0.63 mg/L) while all other stations are compared to the Southwest Fork NNC (1.26 mg/L).

Total Phosphorus

Total Phosphorus (TP) concentrations are evaluated for compliance based on the comparison to an AGM limit of 0.075 mg/L for stations within or adjacent to the Southwest Fork. Limits of 0.035 mg/L (Intracoastal Waterway) and 0.032 mg/L (Lower Loxahatchee River) were used for Stations 30 and 40, respectively. AGMs recorded since 2010 are summarized in **Table 5** for the six permanent monitoring stations.

TP concentrations exceed the AGM criteria at only two (2) of the six (6) permanent water quality monitoring stations with the impacted stations being the upstream reach of Jones Creek and the upstream reach of Sims Creek. Exceedances are commonly observed at those two locations from 2010 to present. Recent trends appear to show increasing concentrations at Station 74 and no statistically significant increasing or decreasing trend at Station 75.

Despite the upstream reach of Jones Creek (Station 75) meeting the AGM criteria in 2017 and 2018, single sample concentrations measured at the headwaters of the basin commonly exceed the AGM criteria. The Town has performed rigorous analyses of the short-term sampling results coupling the concentrations with other parameters such as rainfall and tide but a strong correlation between concentrations and other conditions has yet to be established. The Town will continue to monitor the upstream reaches of Jones Creek and modify the sampling locations as appropriate in an attempt to more accurately locate the source(s) of phosphorus being discharged to the creek. Much of the loading is likely a nonpoint source from the community surrounding Jones Creek. Many of the yards for the homes abut the canal bank and therefore pet waste and improper fertilizer applications may be contributing to the observed exceedances.

Table 5 - Total Phosphorus AGM

Monitoring Station ID	Total Phosphorus Compliance											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	Samples (n)
30	0.028	0.024	0.024	0.022	0.022	0.025	0.022	0.025	0.029	0.022	0.022	3
40	0.014	0.015	0.018	0.014	0.013	0.013	0.019	0.021	0.018	0.018	0.018	9
71	0.047	0.045	0.036	0.046	0.044	0.046	0.040	0.033	0.041	0.033	0.033	3
72	0.035	0.033	0.040	0.036	0.038	0.039	0.037	0.033	0.034	0.034	0.034	9
74	0.061	0.052	0.049	0.085	0.077	0.084	0.071	0.086	0.106	0.066	0.066	3
75	0.098	0.072	0.102	0.079	0.088	0.087	0.075	0.067	0.069	0.100	0.100	7

Footnote 1: Based on samples collected at the permanent water quality monitoring stations.

Footnote 2: Red entries represent values that exceed the AGM limit. Compliance at Stations 30 is based on comparison with the Intracoastal Waterway NNC (0.035 mg/L) and Station 40 is based on comparison with the Lower Loxahatchee NNC (0.032 mg/L) while all other stations are compared to the Southwest Fork NNC (0.075 mg/L).

2.3 Chlorophyll α

The Chlorophyll α AGM criteria is 5.5 ug/L for stations located within or adjacent to the Southwest Fork, 4.7 ug/L for Station 30 located in the Intracoastal Waterway, and 1.8 ug/L for Stations 40 located in the Lower Loxahatchee. The AGMs calculated at each of the permanent water quality monitoring stations within the Town's MS4 from 2010 to present are provided in **Table 6**. Not including Station 30, which has been in compliance for nine of the past ten years, exceedances occur regularly at monitoring stations located within the Town's MS4. All other monitoring locations have exceeded the AGM criteria every year from 2010 present except for Station 71, which has been in compliance for one year.

The consistent exceedances of the Chlorophyll α AGMs are a driving factor for the development of the Loxahatchee River RAP. Stakeholders within the Loxahatchee River watershed (including the Town) have identified projects and/or programs to help reduce nutrient and Chlorophyll α concentrations in order to achieve compliance with the respective water quality criteria. The RAP is currently in draft form with a list of projects planned by numerous stakeholders and water quality benefit estimates provided for each.

Table 6 – Chlorophyll α AGM

Monitoring Station ID	Chlorophyll α Compliance											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	AGM (mg/L)	Samples (n)
30	5.45	3.90	3.95	3.12	3.94	3.93	3.93	2.93	4.13	3.99		3
40	2.42	2.55	2.54	1.52	1.97	2.38	2.71	2.07	2.33	2.69		9
71	9.96	6.52	8.18	9.17	7.21	6.94	8.43	5.30	6.21	6.13		3
72	14.77	8.97	10.53	9.81	10.00	10.28	9.79	6.08	5.89	9.93		9
74	18.31	9.46	10.64	15.85	17.54	12.25	12.57	15.77	25.18	8.87		3
75	16.43	6.05	8.84	7.30	8.54	9.21	8.26	5.90	10.83	6.69		7

Footnote 1: Based on samples collected at the permanent water quality monitoring stations.

Footnote 2: Red entries represent values that exceed the AGM limit. Compliance at Stations 30 is based on comparison with the Intracoastal Waterway NNC (4.7 ug/L) and Station 40 is based on comparison with the Lower Loxahatchee NNC (1.8 ug/L) while all other stations are compared to the Southwest Fork NNC (5.5 ug/L).

3. Pollutant Loading Estimates and Results

The Town of Jupiter municipal separate stormwater system (MS4) discharges to the Intracoastal Waterway North (ICWWN) and Loxahatchee basins. The NPDES permit requires that average annual pollutant loading and event mean construction estimates be provided for five-day biochemical oxygen demand (BOD₅), Copper (Cu), Total Nitrogen (TN), Total Phosphorus (TP), Total Suspended Solids (TSS), and Zinc (Zn).

Loading contributions for 2013 and 2018 from the Town to both of the watersheds were obtained from the ‘Summary of Average Pollutant Loading Model Activities’ prepared by Mock-Roos for reference by the copermittees. Reductions were accounted for in the total loading estimate based on the properties of various projects that were completed by the Town between 2013 and 2018. In addition, credit for public education was accounted for. These reduction credits are consistent with the credits included in the Loxahatchee River Reasonable Assurance Plan (RAP) currently in development. A summary of pollutant loading estimates for each of the six parameters is provided in **Table 7**.

Table 7 – Pollutant Loading Estimates for Town of Jupiter MS4

	Town of Jupiter Pollutant Loadings (lb/yr)					
	ICWWN and Loxahatchee Watersheds					
	BOD ₅	TSS	TP	Cu	ZN	TN
2013 Loading to ICWWN	9,516	22,058	321	21	104	3,154
2013 Loading to Loxahatchee	56,440	269,369	2,249	143	642	17,830
2013 Total	65,956	291,427	2,570	164	746	20,984
2018 Loading to ICWWN	8,595	14,127	288	18	92	2,981
2018 Loading to Loxahatchee	45,099	173,919	1,882	113	494	15,908
2018 Total	53,694	188,046	2,170	131	586	18,889
Public Education (6%)	3,222	11,283	130	8	35	1,133
Street Sweeping	0	0	46	0	0	71
Pine Gardens South Water Quality Improvements	0	0	2	0	0	18
Cinquez Park Drainage Improvements II	0	0	1	0	0	14
Water Plant Detention Pond Cleanout	0	0	67	0	0	165
Indian Creek Exfiltration Trench	0	0	1	0	0	6
Boyd Medication Retention	0	0	0	0	0	2
Sonoma Isles Stormwater Harvesting	0	0	221	0	0	124
Total Reductions	3,222	11,283	467	8	35	1,533
Total Loading	50,472	176,763	1,703	123	551	17,356
Percent Reduction	23%	39%	34%	25%	26%	17%

The Town has achieved significant reductions in pollutant loadings from projects implemented over the past five (5) years and will continue to implement projects that provide water quality benefits above and beyond what is required where cost effective to do so.

4. Conclusions

Fecal Coliform bacteria continue to be problematic throughout the Town's MS4 as evidenced by frequent exceedances of the single sample limit prescribed in the TMDL, in addition to frequent exceedances of the less stringent Class II single sample limit. In contrast, TN concentrations are generally in compliance with the AGM criteria throughout the MS4 and TP concentrations often exceed the limit in the Jones and Sims Creek upstream monitoring stations but are in compliance throughout the rest of the MS4.

While nutrient concentrations are not elevated across the entire MS4, Chlorophyll α concentrations nearly always exceed the limit (with the lone exception being Station 30). Elevated Chlorophyll α levels could be partially attributed to excessive nutrient loadings accelerating algae growth within the receiving waterbody.

The Town has been successful in significantly reducing pollutant loadings to the receiving water bodies and will continue to strive for additional reductions with future projects whenever possible. In addition to the work already completed, the Town continues to implement water quality improvement features in projects whenever possible and many of these future projects are incorporated in the Loxahatchee River RAP.

Attachment 1

Jones Creek Drainage Basins Fecal Indicator Bacteria (FID) and Turbidity Monitoring Preliminary Findings Summary (Prepared by Loxahatchee River District)



Jones Creek Drainage Basins Fecal Indicator Bacteria (FIB) and Turbidity Monitoring Preliminary Findings Summary – November 2019

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Bud Howard (Bud.Howard@lrecd.org),
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Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

Summary

This report provides a summary of preliminary findings from a special project conducted by the Loxahatchee River District (LRD) in partnership with the Florida Department of Environmental Protection (FDEP). The goal of this project is to try and improve our understanding of the source(s) of elevated Fecal Indicator Bacteria (FIB) concentrations and high turbidity events in the Jones Creek drainage basin in the Loxahatchee River watershed in Jupiter, Florida.

Some noteworthy observations include:

- Genetic testing indicates the presence of low levels of human waste. The concentrations and lack of common chemical tracers are indicative of a single household, rather than broken wastewater infrastructure. These findings are leading us to adjust our monitoring locations to try and narrow in on potential pollution sources such as a camper discharge, a homeless encampment, a residence still utilizing a septic system, or a broken sewer lateral line joining an individual home to the main gravity sewer line.
- Water quality instrumentation ('Data Sonde') has provided insight into the ranges and variation of turbidity, chlorophyll, light, salinity, pH, dissolved oxygen, and tide stage within the creek, as well as interesting patterns and relationships between the parameters.
- Our research is confounded by, and we urge residents to stop detrimental behaviors such as the dumping of fish and (reported) alligator carcasses, pet waste, grass clippings, vegetation and other wastes into Jones Creek.

While we do not fully understand all the factors driving the high bacteria and turbidity issues in Jones Creek, we are building on our understanding of factors, and identifying key problem areas that we can focus on for water quality improvements. LRD will continue to monitor the water quality in Jones Creek and will proceed with the dry season sampling in this collaborative study with FDEP.

Background

FIB are used as an indicator of human waste in surface waters. Studies have linked high FIB concentrations to an increase in human-borne illnesses/pathogens. Thus, the concentrations of FIB are a concern to any recreational waterway. Turbidity is a measure of water clarity, where particles (mineral or organic debris) remain suspended in the water column and this decreases water clarity. Turbidity can be a natural occurrence due to wind, waves and tides, or can be related to surface discharges, such as sediment/mineral or pollutant inputs upstream. The decrease in water clarity can be detrimental to organisms requiring light penetration on the seafloor and makes the water unappealing for recreational use.

Over the past several years, the LRD, in partnership with the Town of Jupiter, has conducted extensive water quality monitoring and thoroughly explored the watersheds to try and identify the potential source(s) of FIB and high turbidity. With no obvious source of the high FIB values, LRD and FDEP partnered to capitalize on FDEP's more sophisticated analytical methods to further investigate the potential sources of FIB. In addition, LRD deployed a pair of near-continuous water quality monitoring instruments in Jones Creek to explore the results and relationships between turbidity, chlorophyll, salinity, temperature, light, dissolved oxygen, pH and water level. This project includes twice monthly wet season monitoring from August through September, and dry season sampling to January 2020. These preliminary results summarize the wet season results of water quality samples collected through September 25th, 2019.

Wet Season Sampling & Results

Enterococci and fecal coliform are both FIB commonly used as an indicator of human waste when detected in high counts in surface waters. Enterococci exceedances in Jones Creek range from the 100+ to 5,000+ MPN/100mL, well above the Environmental Protection Agency's (EPA's) recommended Beach Action Value (BAV) of 71 MPN/100mL for recreational waters. This is a concern for the residents and environmental managers.

LRD has conducted extensive water quality monitoring and thoroughly explored the watershed to try and identify the potential source(s) of FIB. With no obvious source of the high FIB values, LRD is now collaborating with Florida Department of Environmental Protection (FDEP) experts to further investigate the potential sources of FIB.

Samples were collected from the locations indicated in Fig. 1; further described in Table 1. Each sample location is near a source of incoming water (e.g., creek, culvert or storm drain) and chosen to assist in the determination of a FIB source. In Jones Creek, sample location 75 reflects tidal inputs (75 is also directly upstream of a possible homeless encampment), PLE discharges through a slough (PLE is a Town of Jupiter natural area and possible homeless encampment), during extreme rains and high lake levels TPJ drains a golf course community to the south and JCU drains adjacent commercial/residential neighborhoods (flow in and out of JCU is restricted by vegetation and mangrove overgrowth). Add statement to describe site CALC.

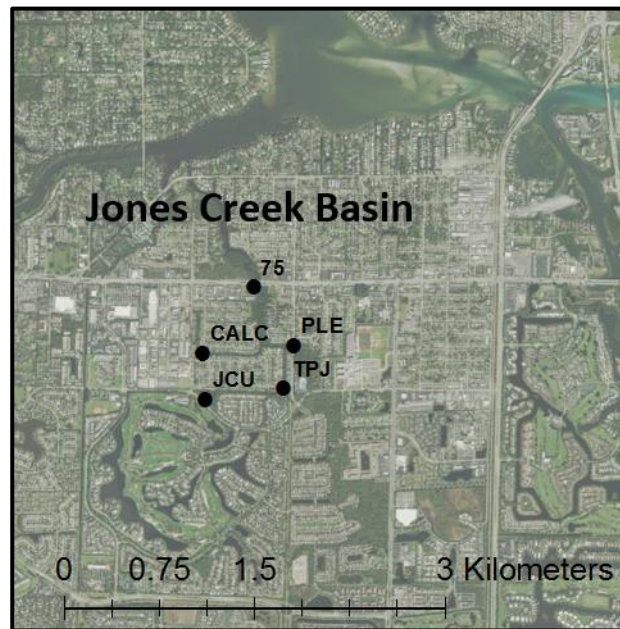


Figure 1. Map of sample locations in Jones Creek, a tributary into the Loxahatchee River in Jupiter, Florida.

Table 1. Description of water quality sampling locations

Site Name	Site ID	Description	Latitude	Longitude
Indiantown Rd Bridge	75	Deep mangrove lined channel.	26.933685	-80.113127
Caloosahatchee Culvert	CALC	Culvert bridge on Caloosahatchee Dr.; shallow mangrove creek with low sunlight.	26.929011	-80.117231
Toney Penna Jones Creek	TPJ	Toney Penna Foot Bridge; clearing in mangrove tidal creek.	26.926428	-80.110738
Jones Creek Upper	JCU	Culvert across from Jupiter Christian Academy; shaded, freshwater vegetation, flow often restricted.	26.925715	-80.116983
Pennock Lane East	PLE	Immediately upstream of weir structure draining natural area.	26.929480	-80.109928

All samples were collected by LRD's Wildpine laboratory staff. 5 samples were collected per sampling event at 0.3 m depth during an outgoing tide (preferably mid to end ebb). Wet season sampling included Aug 12, Aug 27, Sep 10, Sep 25, 2019. Samples were processed according to the standard/NELAC certified methods and/or using FDEP's pre-packaged 'kits' and sent on ice overnight to FDEP's Laboratory for confirmatory FIB and further analysis.

Environmental Parameters and Water Quality

During sample collection LRD staff collected environmental data including (methods in parenthesis): temperature (EPA 170.1), salinity (SM 2520 B), conductivity (EPA 120.1), pH (EPA 150.1), dissolved oxygen (mg/L EPA 360.1; percent FDEP FT1500), rainfall and tidal stage. After collection samples were processed for chlorophyll-a (SM 10200 H), turbidity (EPA 180.1), orthophosphorous (SM 4500-P F), total phosphorous (SM 4500-P E), nitrate and nitrite (EPA 353.2), total kjeldahl nitrogen (EPA 351.2), total nitrogen (calculation) and Enterococci (Enterolert/QT) at LRD's WildPine Laboratory.

Across the entire watershed average rainfall ranged from 13 inches in August to 4 inches in September (See <https://loxahatcheeriver.org/river/rainfall/>). In the Wet season temperatures ranged from 25.4°C (77.7°F) to 31.84°C (89.3°F). Both turbidity and chlorophyll-a (measure of algal biomass) increased as temperature, pH and dissolved oxygen decreased (Fig. 2).

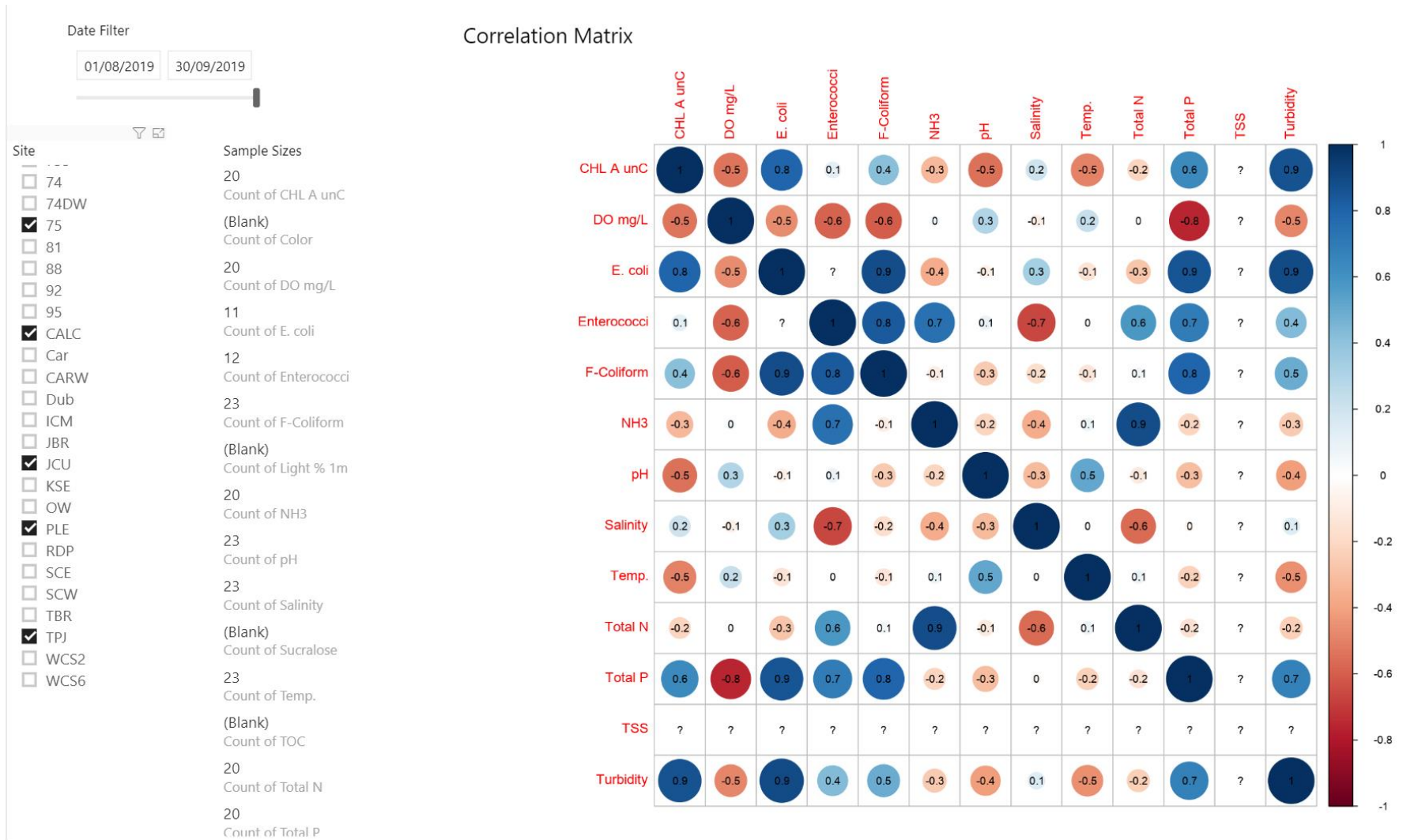


Figure 2. Correlation Matrix of water quality parameters measured in Jones Creek. Interactive version available at LRD's website: Loxahatcheeriver.org/river/river-keeper.

Chemical Indicators

Most humans ingest forms of chemicals that are not processed during digestion and can be detected in human waste material. Common chemicals include: Acetaminophen, Naproxen, Ibuprofen, hydrocodone and sucralose. All five chemical tracers were analyzed, however in the wet season in Jones Creek only sucralose (a sweetener found in treated and untreated human waste) was measured above the FDEP minimum detection limits. See <https://fldeploc.dep.state.fl.us/sop>

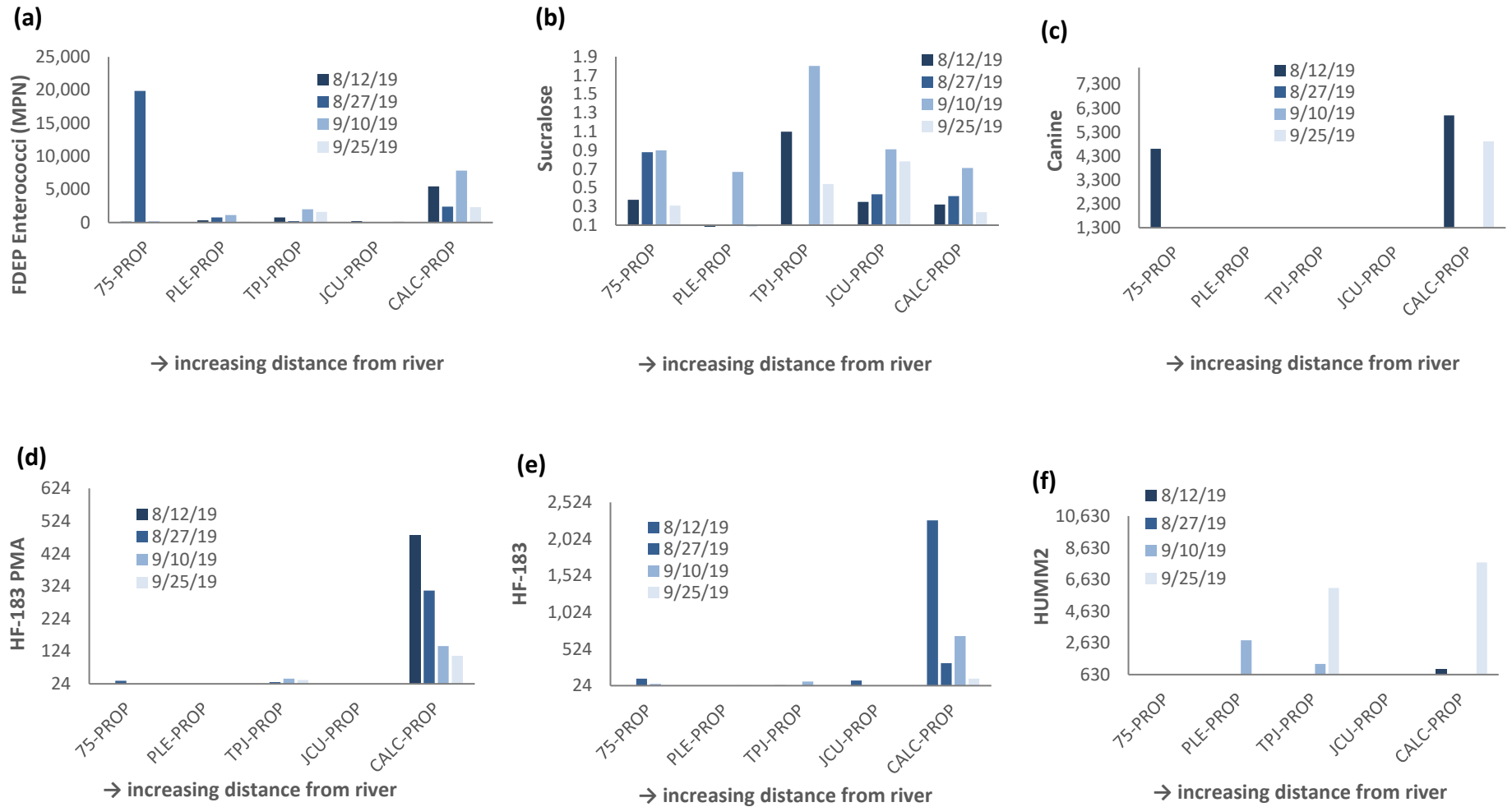
Genetic Markers

Quantitative polymerase chain reaction (qPCR) is a laboratory technique used to detect genetic material. Here three markers/methods were used to determine human genetic material; *Bacteroides* 16S rRNA gene targets using HF-183, *Bacteroides* 16S rRNA gene targets using HF-183 propidium monoazide (PMA) to differentiate between live and dead cells and a *Bacteroides* non-16S rRNA gene target PCR-HUMM2. Markers were also used to detect the genetic material of canines. Populations of raccoons and wading birds have been noted in this basin, There is no current genetic marker available to determine the presence of raccoons, and bird markers were not tested. LRD collected samples and all qPCR analyses was conducted by FDEP at the FDEP Molecular Biology Laboratory following the designated standard operating procedures (SOPs). See <https://floridadep.gov/dear/florida-dep-laboratory/content/molecular-biology>

Initial results indicate continued high levels of FIB in Jones Creek. The caloosahatchee culvert station (CALC-PROP) upstream in Jones Creek consistently had higher FIB (Fig. 3a), higher HF-183 PMA (Fig. 3d), and HF-183 (Fig. 3e) human genetic material, as well as the highest concentration of canine genetic material (Fig. 3c). The exception was high FIB (Fig 3a) and canine genetic material (Fig. 3c) at station 75 – the closest monitoring station to the Loxahatchee River- on August 12th 2019.

The presence of human waste in the genetic markers, with the absence in the chemical indicators is indicative of low concentrations indicative of a single household, rather than broken wastewater infrastructure. These findings are leading us to adjust our monitoring locations to try and narrow in on those potential pollution sources such as a camper discharge, a homeless encampment, a residence still utilizing a septic system, or a broken sewer lateral line joining the home to the gravity sewer line.

Figure 3. Initial results for (a) enterococci FIB, (b) sucralose (chemical indicator of human waste), (c) qPCR canine genetic material, and qPCR Human genetic markers showing (d) Propidium monoazide (PMA) treated 'live' Bacteroides, (e) HF-183 live and dead Bacteroides and (f) HUMM2 Bacteroidetes non-16S rRNA gene targets.

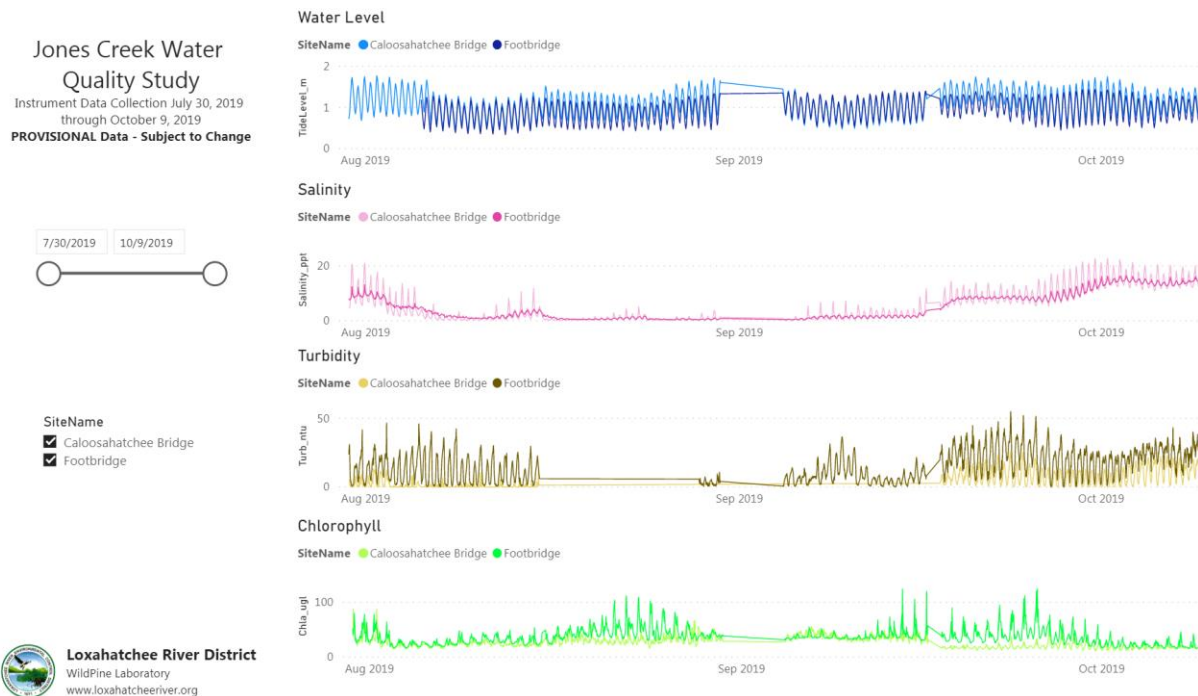
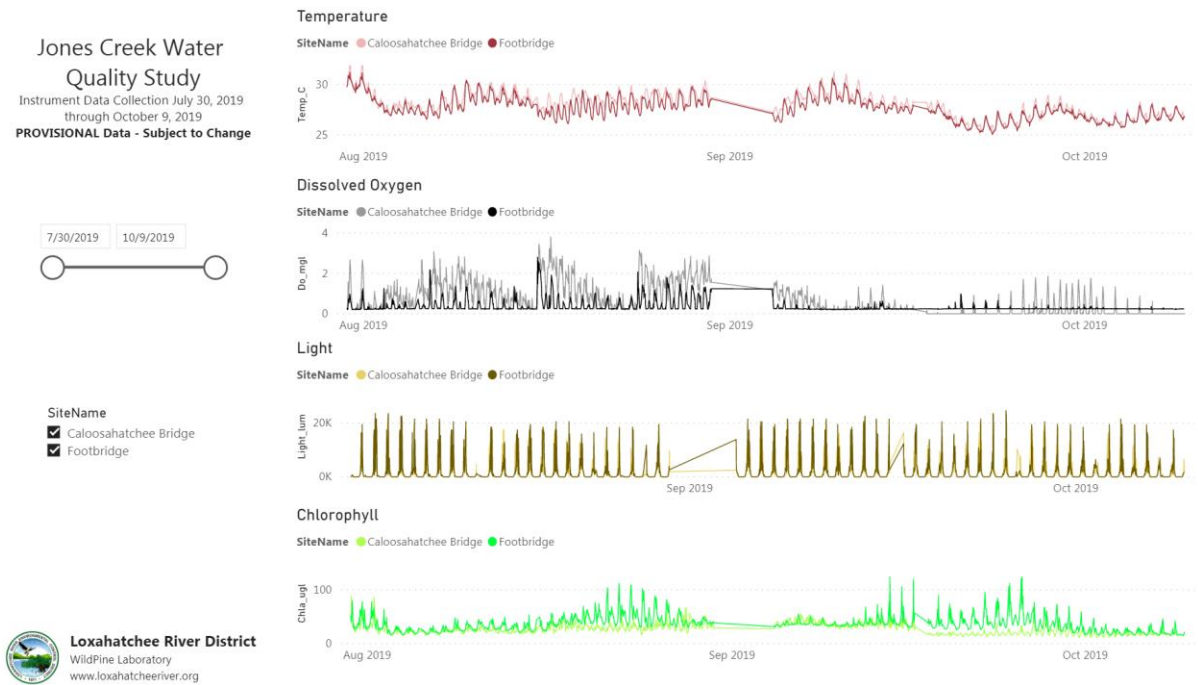


High Frequency Water Quality Data Collection – Data Sonde Instruments

In support of this special project, and to improve our understanding of the patterns and magnitude of changes in various water quality parameters, LRD deployed a pair of near-continuous water quality monitoring instruments ('Data Sondes') in Jones Creek. The instruments (Hydrolab DS5X) had sensors for turbidity, chlorophyll, salinity, temperature, dissolved oxygen, pH and water level set to record data every 15-minutes. The instruments were deployed from residential docks near the Caloosahatchee Bridge (near the CALC water quality monitoring station) and near the Footbridge (near the TPJ water quality monitoring station) from July 30, 2019 through October 9, 2019. The instruments were deployed for two weeks then brought back to the laboratory for data download, cleaning and calibration. Quality control (QC) measurements were made at the time of deployment, at one week out, then just prior to removal with a separate instrument and/or known calibration concentration. If the data for that deployment was glaringly wrong it was deleted from the dataset, though for this preliminary data review we were less aggressive with data filtering to preserve as much as the information as possible. Light sensors (Onset Computer Corp) were also deployed to assess diurnal patterns in water quality parameters. All instruments were removed on August 30 because a powerful hurricane (Dorian) was forecast to strike our area, then redeployed on September 4.

All of the Data Sonde data is presented in a multitude of interactive data visualizations available from the Jones Creek web page provided by LRD: www.loxahatcheeriver.org/JonesCreek. Not surprisingly water temperatures were high with some measurements over 31°C (89°F). Temperatures dipped to approximately 25°C (77 °F) during a few early mornings. Dissolved oxygen (DO) levels were generally very low and hypoxic (<2 mg/L), common in mangrove tidal creeks. DO showed more variability during the period prior to the hurricane when there were more rain events compared to September when there was very little rain. Salinity ranged from near zero to over 22 psu and was highly influenced by the tide cycle. In general, salinity tended to decrease during periods of increased rainfall. The Caloosahatchee site showed more variability in salinity than the Footbridge site further upstream. Turbidity values varied with substantial diurnal fluctuations ranging from zero to near 50 NTU in each tide cycle. This is common in shallow tidal regions, where sediments are easily resuspended by tidal currents. Unfortunately, the turbidity data did not pass QC for several deployments and was deleted (shown as gaps in Fig. 4), but the data indicated high variability and generally higher readings during periods of little rainfall. Lastly, chlorophyll values, a measure of algae productivity, were also high and variable ranging from the teens to over 100 ug/L. The chlorophyll values and light data confirmed the diurnal pattern with high chlorophyll concentrations during daylight hours. Like other parameters, the Caloosahatchee site showed greater variability and generally higher concentrations of chlorophyll. On the Jones Creek website page 7 of the visualizations shows the correlation matrix with some moderate positive and negative correlations between parameters, but some of these relationships are notably different between the two sites.

Figure 4. Sample screens of the interactive data visualization tools to explore the water quality data collected by instrumentation near the Caloosahatchee Bridge and the Footbridge in Jones Creek available on LRD's website: www.loxahatcheeriver.org/JonesCreek.



Conclusions

Neither the high FIB nor the high turbidity in Jones Creek can be attributed to an isolated timeframe, specific site/location, or related to any singular water quality measure. This suggests a combination of factors leading to decreased water quality in Jones Creek. LRD will continue to collaborate with FDEP to both isolate problem areas and develop potential solutions starting with priority site CALC.

During data collection we have noticed a several issues that can be addressed by the public. Some of these examples include finding fish, lobster, and alligator carcasses, pet waste bags and landscape vegetation floating and along the bridge banks of Jones Creek. Any dead and/or decaying matter is likely to harbor bacteria and will not improve water quality. We urge residents to refrain from discarding waste products into the creek.

Dry season sample collection is underway until January 2020. We intend to prepare a summary report once all of the results are finalized.