

Part V.

**2013/2014 Annual Monitoring Plan Report
6/1/2013 – 5/31/2014 (Year 3)
City of Jacksonville/FDOT NPDES Permit**

2013/2014 Annual Monitoring Plan Report
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EXECUTIVE SUMMARY:

Goal I of the monitoring plan is to identify water quality problem areas. This portion of the plan is implemented by the Routine Tributary Program (continuously in effect since the 1970's) and the Tributary BMAP I and II Monitoring Program (Begun in 2010). Before the BMAP monitoring began, the Tributary Intensive program was in effect from 2002 to 2006.

Routine Tributary Monitoring includes sampling 103 sites quarterly for fecal coliform bacteria and field parameters. Having a long-term dataset is necessary in determining long-term trends, particularly for fecal coliform compliance, which has demonstrated the most dramatic changes.

In 2013/2014, the City of Jacksonville continued to play a leadership role in the Lower St. Johns River Tributaries Basin Management Action Plan (BMAP) Working Group. Under the direction of FDEP, this group has developed BMAPs for 25 of the fecal coliform impaired WBIDs in Duval County. The City of Jacksonville is responsible for sampling five fecal coliform impaired WBIDs at 12 stations for the Trib I BMAP; and five fecal coliform impaired WBIDs at 18 sites for the Trib II BMAP. (Sites are periodically added, deleted, and changed based on decisions by the TAT Working Group).

Extra efforts this year included conducting inter-agency Walk-the-WBIDs or "walks" in each of the ten BMAP I waterbodies. The goal of these walks was to intensively search for sources of fecal coliform bacteria pollution, and to specifically identify where urban stormwater is adversely affecting surface water resources. This work was conducted from April through July 2014 (overlapping two annual reporting cycles) and will be summarized in this report and next year's report.

Other Tributary efforts this year included completing the monitoring for the Middle Trout River SSAC and some additional monitoring of the Ribault River for the Bacteria Control Plan.

Goal II of the monitoring plan is to assess effectiveness of storm water BMPs. The City has targeted four project areas. The first project, the Upper Deer Creek Regional Wet Detention Pond effectiveness monitoring, has been completed and previously reported in prior reports. The second project, the Cedar River Outfall Regional Stormwater Facility BMP effectiveness study, was completed last year and was summarized in that report.

The remaining two BMP effectiveness studies will be scheduled in the near future.

Water quality data collected through implementation of this monitoring plan is currently located in City of Jacksonville Access databases. These databases are partially formatted for annual upload to FDEP/STORET databases.

This monitoring plan will be reviewed for changes to improve the plan as required next year, in year four.

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INTRODUCTION

The City of Jacksonville, FDOT, City of Atlantic Beach, and City of Neptune Beach submit the following 2013/2014 annual monitoring plan report to fulfill the NPDES Permit monitoring requirement. This monitoring plan report is being submitted as required under Part V.B. of the NPDES MS4 permit. The monitoring plan was approved by the Department on March 5, 2004 with modifications approved on January 17, 2006.

GOALS AND OBJECTIVES OF STORMWATER MONITORING

The goals and objectives of this Monitoring Plan are to assess the effectiveness of the Stormwater Management Program (SWMP) and the associated pollutant reduction from MS4 systems to the waters of the state to the maximum extent practicable (MEP); also, to evaluate load reductions that have occurred and to identify local sources where urban stormwater is adversely affecting surface water resources. The monitoring plan will be revised in Year 4 (next year) to better meet these goals and objectives.

To accomplish the goals and objectives of this monitoring plan the City of Jacksonville is integrating three different water quality efforts. Those programs are:

1. The City of Jacksonville's Routine Tributary Monitoring Program.
2. The City of Jacksonville's Tributary Fecal Coliform BMAP I, and Tributary Fecal Coliform BMAP II monthly monitoring.
3. The City of Jacksonville's studies to document the effectiveness of four different stormwater pollution reduction measures located in four different sub-basins.

SPECIFIC MONITORING GOALS

The focus of our monitoring plan is to address two of the three possible Specific Monitoring Goals discussed in the "*General Guidance and Watershed Considerations for Preparing Stormwater Monitoring Plans as Required for Municipal Separate Storm Sewer System (MS4) Permits*" document provided by FDEP.

- 1. Identify potential water quality problem areas related to stormwater runoff that can be targeted for corrective action, retrofits or non-structural BMPs.**

This monitoring goal will be achieved through the City of Jacksonville's two ongoing tributary monitoring programs (routine and BMAP) previously mentioned. These programs will be described later in the report.

2. Measure the effectiveness of the stormwater pollution reduction measures (BMPs) that have been or will be implemented.

The City of Jacksonville proposes to document the effectiveness of four different stormwater pollution reduction measures located in four different sub-basins. Those four projects are: Upper Deer Creek, Cedar River Outfall, Pine Forest (New Rose Creek), and Woodland Acres Oakwood Villa (Strawberry Creek).

MONITORING PLAN SPECIFICS

GOAL I:

Identify potential water quality problem areas related to stormwater runoff that can be targeted for corrective action, retrofits or non-structural BMPs.

ROUTINE TRIBUTARY PROGRAM

Objectives

The Routine Tributary Program originated back in the 1970s. The program was initiated to assess the water quality impacts that over 300 small wastewater treatment plants (WWTPS) were having on the tributaries of Duval County. In the beginning, tributary monitoring locations were upstream and downstream of the WWTPS. After the elimination (through connection to sanitary sewer) of most of the county’s “package plants” (small WWTPS) water quality monitoring at many of the stations was discontinued. The current Routine Tributary Program has data beginning in 1984 at approximately 105-115 stations scattered throughout Duval County’s tributaries. At this time 103 sites are included in the sampling program.

Station locations are often near bridges and roadways to facilitate sampling efforts; sites are both above and within tidal influence from the St. Johns River or Intracoastal Waterway. The primary objective of this program is collection of long-term dataset that will enable the City to document water quality trends.



GC4 - Mt. Pleasant Creek



TR113A Trout River at Bert Maxwell Boat Ramp

Constituents

The constituents measured in the Routine Tributary Program are limited to field measurements and fecal coliform bacteria.

Field Measurements (multi-parameter water quality instrument):

Dissolved oxygen, percent saturation of dissolved oxygen, pH, temperature, salinity and specific conductance.

Laboratory Analyses:

Both total and fecal coliform bacteria were collected until 1996. For the current program, starting in 1996, laboratory analysis includes only fecal coliform bacteria.

Field Observations:

Stream depth, secchi depth, air temperature, cloud cover, wind velocity and direction, stream appearance, tidal current, visual oil & grease, canopy cover, stream flow stage, current weather, visual turbidity, rain in last 7 days, rain is last 24 hours.



TREE10 Trout River at Old Kings Road

Methodology

Field water quality measurements are collected and logged with a multi-parameter surface water quality meter (MANTA2 multiprobe with optical HDO sensor, Archer hand held display). Fecal coliform samples are collected as surface grab samples.

Frequency

All stations in the Routine Tributary Program are sampled at least quarterly (once every three months).



TR34 Highlands Creek at Broward Rd

Stations

Table 1.

Routine Tributary Stations Sampled (103)

| Station ID | Location of Routine Tributary Station | WBID | LAT-Dec | LONG-Dec |
|------------|---|-------|----------|----------|
| ARL11 | Jones Creek at Monument Rd. | 2246 | 30.34195 | 81.53925 |
| ARL15 | Ginhouse Creek at Monument Rd. | 2248 | 30.34494 | 81.53151 |
| ARL18 | Cowhead Creek at Ft. Caroline Rd. | 2244 | 30.35489 | 81.52299 |
| ARL20 | Sandalwood Canal at Kernan Rd. | 2270 | 30.30645 | 81.48918 |
| ARL23 | Fairchild Branch at Edenfield Rd. | 2213C | 30.38079 | 81.59997 |
| ARL3 | Red Bay Branch at Lone Star Rd. | 2254 | 30.33534 | 81.58028 |
| ARL325 | Strawberry Creek at Lone Star Rd. | 2239 | 30.33779 | 81.55959 |
| ARL453 | Strawberry Creek at Arlington Rd. | 2239 | 30.32274 | 81.58279 |
| ARL6 | Newcastle Creek at Ft. Caroline Hills Rd. | 2235 | 30.36564 | 81.57968 |
| ARL7 | Woodmere Stream at Ferber Rd. | 2213C | 30.3768 | 81.5908 |
| ARL8 | Silversmith Creek at Arlington Rd. | 2278 | 30.3087 | 81.57865 |
| BB1 | Brandy Branch at U.S. 301 | 2226 | 30.37783 | 81.9416 |
| BP64 | Big Pottsburg Creek at Belfort Rd. S. End | 2265B | 30.2576 | 81.58114 |
| BP65 | Bennett Branch at Salisbury Rd. | 2319 | 30.2611 | 81.5972 |
| BP67 | Big Pottsburg Creek at Hogan Rd. | 2265B | 30.28157 | 81.57233 |
| BP71 | Big Pottsburg Creek Trib. (Leeds Pond) at Parental Home Rd. | 2308 | 30.27362 | 81.58984 |
| BR146 | Broward River at Harts Rd. | 2191 | 30.43859 | 81.65954 |
| BR7 | Cedar Creek at Duval Rd. | 2191 | 30.4582 | 81.6806 |
| CR139 | Big Fishweir Creek at Herschel St. | 2280 | 30.29012 | 81.71343 |
| CR2 | Butcher Pen Creek at Wesconnett Blvd. | 2322 | 30.2599 | 81.74004 |
| CR21 | Wills Branch N. Branch at Old Middleburg Rd. | 2282 | 30.29144 | 81.76528 |
| CR22 | Wills Branch S. Branch at Old Middleburg Rd. | 2305 | 30.28491 | 81.7679 |
| CR3A | Willow Branch Creek at Azalea St. Footbridge | 2213E | 30.30418 | 81.69667 |
| CR427 | Cedar River E. Branch at Stuart Ave. | 2262 | 30.31772 | 81.75033 |
| CR428 | Cedar River W. Branch at Stuart Ave. | 2262 | 30.31769 | 81.75122 |
| CR430 | Cedar River at Lenox Ave. | 2262 | 30.29876 | 81.75525 |
| CR5 | Little Fishweir Creek at Park St. | 2280 | 30.29859 | 81.71296 |
| CR6 | Little Fishweir Creek at Greenwood Ave. | 2280 | 30.2914 | 81.7083 |
| CR84 | Williamson Creek at Hyde Park Rd. | 2316 | 30.2737 | 81.74082 |
| CR85 | Cedar River at San Juan Ave. | 2213P | 30.28183 | 81.74015 |
| CR95 | Wills Branch at Lane Ave. S. | 2282 | 30.28826 | 81.75541 |



ARL15 – Ginhouse Creek at Monument Rd

BP67 – Big Pottsburg at Hogan Rd

| Station ID | Location of Routine Tributary Station (continued) | WBID | LAT-Dec | LONG-Dec |
|------------|---|-------|----------|----------|
| DC144 | Dunn Creek at Faye Rd. | 2181 | 30.43764 | 81.58212 |
| DC5 | Terrapin Creek at Alta Rd. | 2204 | 30.42898 | 81.5803 |
| DC6 | Dunn Creek at Dunn Creek Rd. | 2181 | 30.45497 | 81.59685 |
| DC7 | Terrapin Creek at Faye Rd. | 2204 | 30.4344 | 81.5655 |
| DC8 | Rushing Branch at Alta Rd. | 2189 | 30.45273 | 81.57899 |
| DEC1 | Deep Creek at U.S. 90 | 2245 | 30.30033 | 82.03082 |
| DR1 | Deer Creek at Talleyrand Ave. | 2256 | 30.34173 | 81.62808 |
| DR2 | Deer Creek E. of Haines St. D/S of S. Branch | 2256 | 30.34361 | 81.6364 |
| DUC2 | Sampson Creek at State Road 210 | 2419 | 30.06476 | 81.50143 |
| DUC3 | Durbin Creek at Racetrack Rd. | 2365 | 30.09921 | 81.5253 |
| DUC4 | Durbin Creek at U.S. 1 | 2365 | 30.09813 | 81.47266 |
| GC1 | Greenfield Creek at Atlantic Blvd. | 2240 | 30.32071 | 81.45522 |
| GC4 | Mt. Pleasant Creek at Mt. Pleasant Rd. | 2234 | 30.35857 | 81.46651 |
| HC3 | Hogan Creek at First St. W. of Laura St. | 2252 | 30.3366 | 81.65727 |
| IWW2 | Sherman Creek at A1A Bridge | 2227 | 30.37115 | 81.43194 |
| IWWD | Hogpen Creek at San Pablo Rd. | 2270 | 30.30706 | 81.44531 |
| IWWF | Open Creek at San Pablo Rd. | 2299 | 30.27024 | 81.44069 |
| IWWG | Cradle Creek Branch at Fairway Ln. | 2205C | 30.27481 | 81.40322 |
| IWWH | Hopkins Creek at Kings Rd. | 2266 | 30.30924 | 81.41693 |
| JC15 | Cormorant Branch at Julington Creek Rd. | 2381 | 30.14045 | 81.62177 |
| JC3 | Julington Creek at Greenland Rd. | 2351 | 30.1618 | 81.5594 |
| JC339 | Julington Creek at U.S. 1 | 2351 | 30.1885 | 81.5622 |
| JC440 | Julington Creek at Old St. Augustine Rd. | 2351 | 30.14367 | 81.55546 |
| JC441 | Big Davis Creek at U.S. 1 | 2356 | 30.15187 | 81.52608 |
| JC5 | Oldfield Creek at Julington Creek Rd. | 2370 | 30.13857 | 81.60643 |
| LB1 | Long Branch at Wigmore St. | 2233 | 30.37185 | 81.63967 |
| LB2 | Long Branch at Evergreen Ave. | 2233 | 30.36434 | 81.64354 |
| LP3 | Little Pottsburg Creek at Art Museum Dr. | 2284 | 30.30038 | 81.61341 |
| LP4 | Little Pottsburg Creek at Bedford Rd. | 2284 | 30.28619 | 81.61452 |
| MC1 | McCoy Creek at Myrtle Ave. | 2257 | 30.32588 | 81.67771 |
| MC3 | McCoy Creek at Leland St. | 2257 | 30.32656 | 81.69858 |
| JC15 | Cormorant Branch at Julington Creek Rd. | 2381 | 30.14045 | 81.62177 |
| JC3 | Julington Creek at Greenland Rd. | 2351 | 30.1618 | 81.5594 |
| JC339 | Julington Creek at U.S. 1 | 2351 | 30.1885 | 81.5622 |
| OR110 | Fishing Creek at 110th St. | 2324 | 30.241 | 81.73251 |
| OR13 | McGirts Creek at Shindler Dr. | 2338 | 30.22575 | 81.79806 |
| OR344 | McGirts Creek at Normandy Blvd. | 2249A | 30.27436 | 81.83403 |
| OR346 | McGirts Creek at Old Plank Rd. | 2249B | 30.33035 | 81.86166 |
| OR110 | Fishing Creek at 110th St. | 2324 | 30.241 | 81.73251 |



IWWH Hopkins Creek at Kings Rd

| Station ID | Location of Routine Tributary Station (continued) | WBID | LAT-Dec | LONG-Dec |
|------------|---|-------|----------|----------|
| OR348 | Ortega River at Argyle Forest Blvd. | 2249A | 30.19654 | 81.76864 |
| OR4 | Fishing Creek at Timuquana Rd. | 2324 | 30.24732 | 81.73386 |
| OR434 | Ortega River at Collins Rd. | 2249A | 30.20131 | 81.73053 |
| OR8 | Fishing Creek N. Branch at Wesconnett Blvd. | 2324 | 30.24361 | 81.73806 |
| OR9 | Fishing Creek at Wesconnett Blvd. | 2324 | 30.23621 | 81.73926 |
| PC2 | Third Puncheon Branch at JTB Blvd. | 2273 | 30.25104 | 81.5278 |
| PC8 | Cedar Swamp Creek at Glen Kernan Pkwy. | 2290 | 30.25592 | 81.47622 |
| SC1 | Puckett Creek at Wonderwood Dr. | 2227 | 30.3665 | 81.42319 |
| SC3 | Sherman Creek at Wonderwood Dr. | 2227 | 30.37017 | 81.41165 |
| SS1 | Miller Creek at Atlantic Blvd. | 2287 | 30.30614 | 81.62877 |
| SS10 | New Rose Creek at San Jose Blvd. | 2306 | 30.26156 | 81.64608 |
| SS11 | Christopher Creek at San Jose Blvd. | 2321 | 30.25292 | 81.63958 |
| SS17 | South Creek off Plummers Cove at Scott Mill Rd. | 2213F | 30.18928 | 81.63136 |
| SS18 | Deep Bottom Creek at Scott Mill Rd. | 2361 | 30.17881 | 81.63803 |
| SS19 | Tacito Creek at Scott Mill Rd. | 2382 | 30.17019 | 81.64067 |
| SS20 | Mandarin Drain at Mandarin Rd. and Loretto Rd. | 2385 | 30.1635 | 81.64815 |
| SS26 | San Jose Creek at San Jose Blvd. | 2213E | 30.24642 | 81.63167 |
| SS319 | Goodbys Creek at Sanchez Rd. | 2326 | 30.22158 | 81.60908 |
| SS63 | Craig Creek in Park at Hendricks Ave. | 2297 | 30.29513 | 81.64886 |
| SS4 | Miramar Creek at San Jose Blvd. | 2304 | 30.28477 | 81.65615 |
| TC1 | Thomas Creek at U.S. 1 | 2161 | 30.50528 | 81.79167 |
| TR10 | Ninemile Creek at Trout River Blvd. | 2220 | 30.41585 | 81.73427 |
| TR113A | Trout River at Bert Maxwell Boat Ramp | 2203A | 30.40273 | 81.66393 |
| TR114 | Moncrief Creek at Lem Turner Rd. | 2228 | 30.38132 | 81.67134 |
| TR123 | Trout River at U.S. 1 at Boat Ramp Pier | 2203 | 30.43686 | 81.76144 |
| TR128 | Ribault River at Harbor View Boat Ramp | 2224 | 30.3964 | 81.71086 |
| TR23 | Sixmile Creek N. Branch at Imeson Rd. | 2231 | 30.36328 | 81.77297 |
| TR3 | Creek at Palmdale St. at Lake Palmdale Overflow | 2224 | 30.38872 | 81.69814 |
| TR314 | Little Sixmile Creek at Pickettville Rd. | 2238 | 30.37091 | 81.73453 |
| TR316 | Moncrief Creek at 33rd St. | 2228 | 30.36482 | 81.69014 |
| TR34 | Highlands Creek at Broward Rd. | 2203A | 30.42356 | 81.67968 |
| TR37 | Blockhouse Creek at Leonid Rd. | 2207 | 30.42977 | 81.68919 |
| TR40 | West Branch at Capper Rd. | 2210 | 30.42753 | 81.7099 |
| TR422 | Sixmile Creek S. Branch at Imeson Rd. | 2232 | 30.36139 | 81.77308 |
| TREE10 | Trout River at Old Kings Rd. | 2203 | 30.43108 | 81.76855 |
| YWC1 | Yellow Water Creek at Normandy Blvd. | 2323 | 30.22936 | 81.92097 |
| YWC2 | Yellow Water Creek D/S of Sal Taylor Creek | 2323 | 30.19539 | 81.91806 |



SS1 Puckett Creek at Wonderwood Dr



SS19 Tacito Creek at Scott Mill Rd

2013/2014 ROUTINE TRIBUTARY PROGRAM DATA:

The raw surface water quality data collected for this report can be found in Table 12 as Attachment A at the end of this report.

DISCUSSION OF ROUTINE TRIBUTARY PROGRAM RESULTS

Water Quality Trends

Routine Tributary water quality trends for calendar years 1990 through 2013 are plotted in Figures 1 through 7. Each data point is for a **full calendar year**; therefore no 2014 data is used.

Figure 1 charts the percent compliance of six major drainage basins with the State standard for fecal coliform bacteria over the past 24 years. Important Note: The standard used in the Figure 1 chart is for the one day **maximum of 800 colony forming units/100ml** (cfu/100ml), rather than the standard of “not to exceed 400 in 10% of samples” which is used in the Tributary BMAP documents.

The six basins represented in the figures are Arlington River (11 sites), Cedar River (8 sites), Julington/Durbin Creek (9 sites), Ortega River (7 sites), Trout River (13 sites) and Broward River/Dunn Creek (7 sites).



BP64 Arlington River Basin

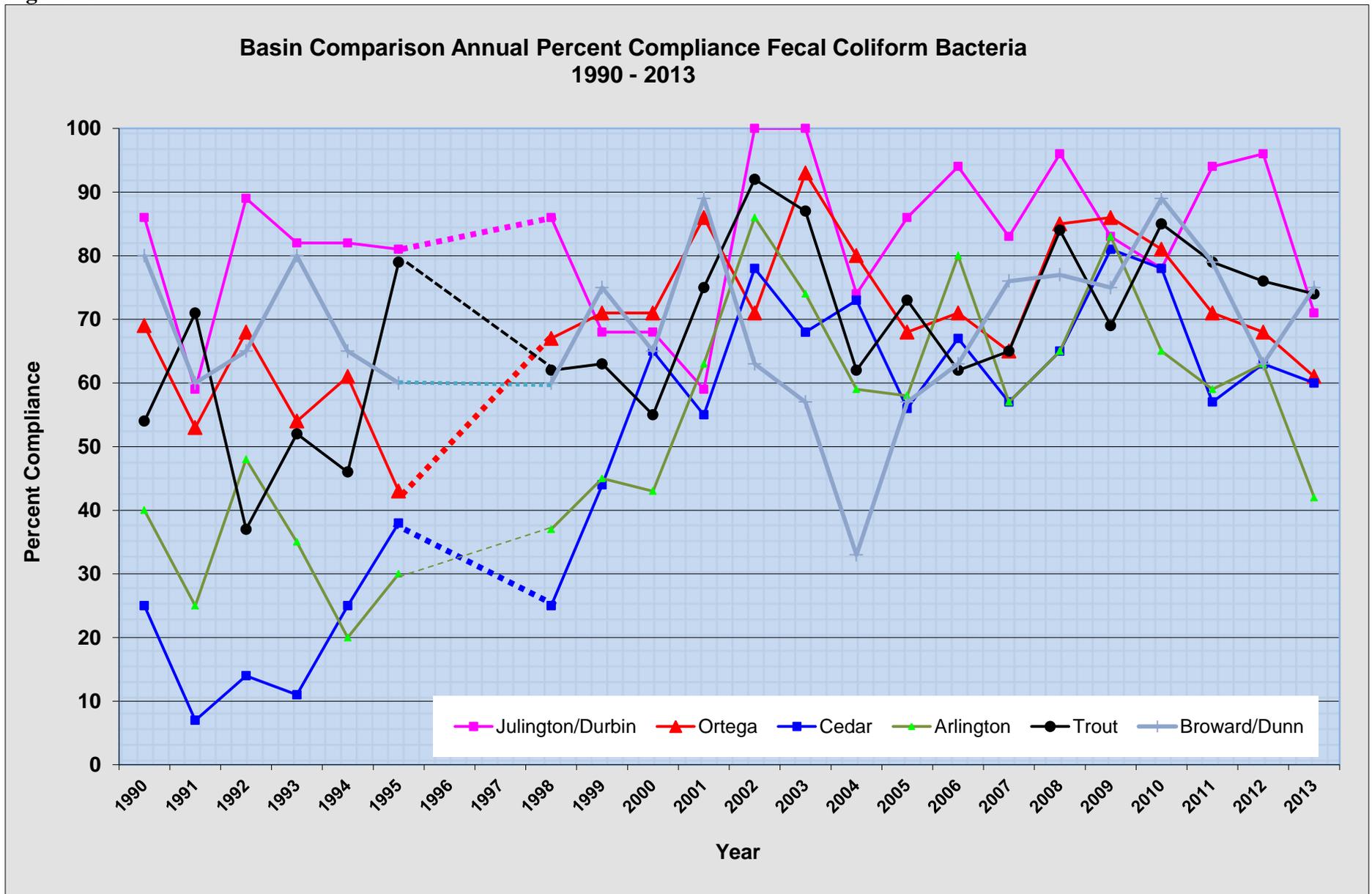
Most basins show a long-term improvement in compliance with the fecal coliform standard. Four basins show very significant improvement between 1998 and 2002. These four basins are Arlington, Ortega, Trout, and Cedar. These significant improvements in bacteria compliance may be due to a combination of factors. One of the most likely causes is the regionalization of the many hundreds of small poorly-maintained wastewater treatment plants that formerly discharged partially treated wastewater into the tributaries. The City Of Jacksonville’s Regionalization Rule required phase-out of these small treatment facilities into fewer, larger, well-operated facilities with better treatment. Another factor contributing to significant improvement in bacteria levels may be the State-wide requirements for stormwater treatment.



For the last 11 years, improvements in bacteria compliance are not as significant. Julington / Durbin Basin shows fluctuations up and down during this period, with a decline in 2013. Arlington River basin likewise shows fluctuations for the past 11 years, but an unexplained decline to 2000 levels in 2013. Ortega River basin shows a gradual decline since 2009. The Trout River basin has remained close to 75-80% compliance for the last three years. The Cedar River basin is very close to 2012 data. And the Broward / Dunn basins, after a dramatic and unexplained low compliance rate in 2004, shows an overall improvement except in 2012.

TR314 Trout River Basin

Figure 1.





JC15 –Julington/Durbin Creek System

Figures 2 - 7 present fecal coliform and dissolved oxygen (D.O.) compliance with State criteria for each of the same six basins. (The Julington/Durbin Creek system, due to the extensive wetlands in the basin and very dark water has poor compliance with the 5.0 mg/L freshwater D.O. standard; and for this creek system the WQB has graphed actual dissolved oxygen values rather than percent compliance.) Looking at D.O. and bacteria compliance together for each basin, the following can be observed. During the 1990's, dissolved oxygen compliance was generally better than fecal coliform compliance for the basins evaluated. However, since around 2000, that trend has changed dramatically in the Arlington River basin

and Cedar River basin, and somewhat in the Ortega River basin, as bacteria levels have significantly improved. Comparing D.O. and bacteria compliance together for each basin, there appears little correlation in the year-to-year variation of the two parameters, with a few exceptions.

Looking at long-term dissolved oxygen trends, most basins show no clear trends, either improving or declining. The exception may be a slight long-term decline in D.O. compliance for the Ortega River basin. For the short term, after a decline in DO compliance last year for most basins (likely due to drought conditions in Northeast Florida which reduced flows, water depths, and dissolved oxygen levels) all basins show a significant improvement in dissolved oxygen compliance in 2013.



CR3A Cedar River Basin

Looking at Figures 2 – 7 for fecal coliform bacteria trends, considering the entire 24 year record, the data indicate a gradual long-term improvement with compliance with the fecal coliform standard, with the possible exception of Broward/Dunn Basin. For the last year, one basin improved slightly and five basins declined slightly.

Looking at Fecal Coliform compliance data for the last 11 years from 2002 to 2013:

1. Julington Creek/Durbin Creek Basin: from a high of 100% compliance in 2002 and 2003, compliance has ranged from 70% to 97%.
2. Arlington River Basin: levels have fluctuated up and down between 55% and 85% compliance, with last year (2013) dropping down to 42%, the lowest compliance rate since 2000.
3. Ortega River Basin: compliance has varied from between 60% to 95%. The last four years have shown slight declines in fecal coliform compliance.
4. Trout River Basin shows a slow improvement since 2004, with current compliance levels at 74%.
5. Cedar River Basin: levels of compliance varied from 55% to 80%, with no strong pattern of improvement or decline.
6. Broward River/Dunn Creek Basin had a steep decline in compliance in 2004. Then this basin has displayed a steady improvement, from a low of 35% compliance in 2004 to 90% compliance in 2010. It then declined slightly for two years and improved last year.

Figure 2.

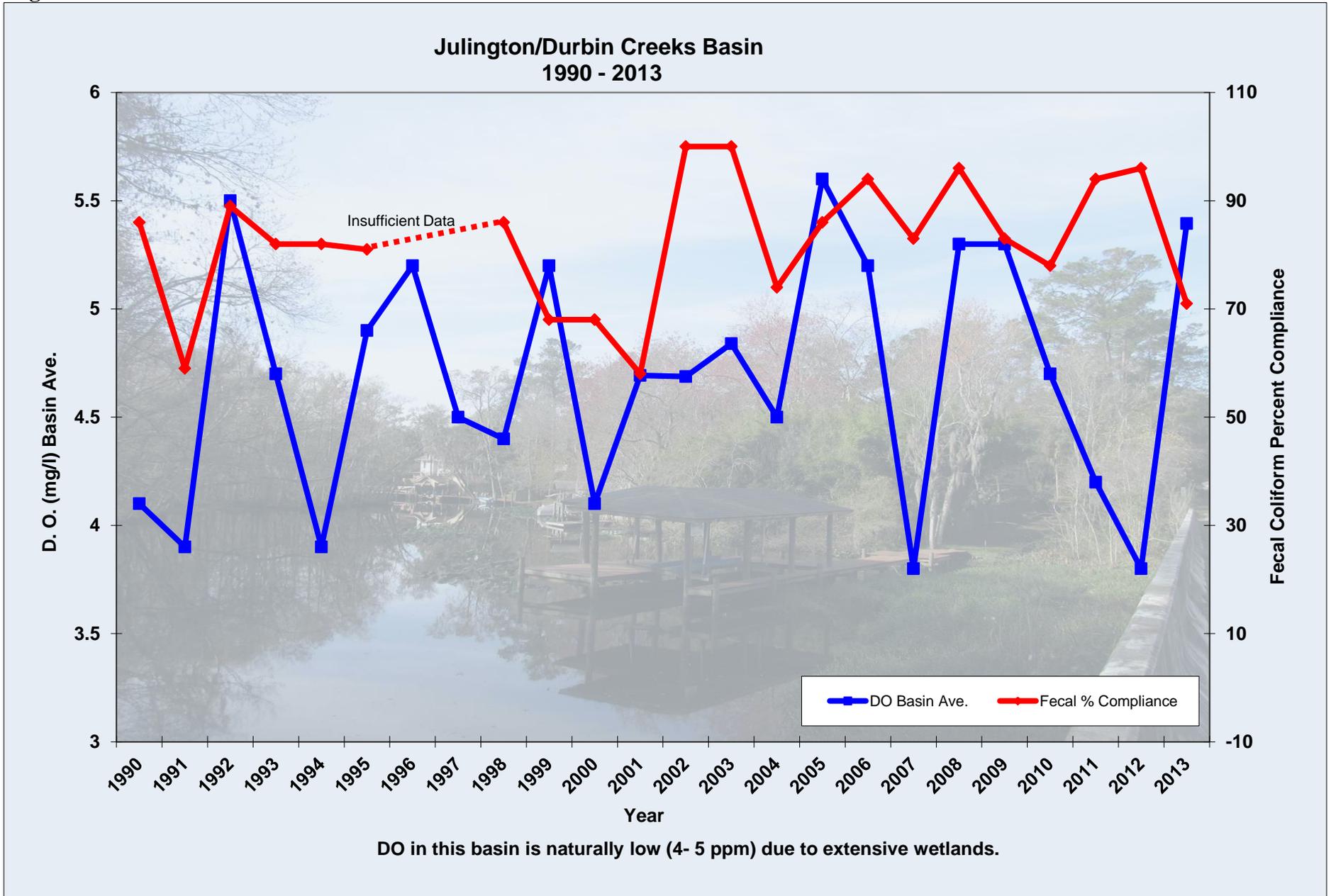


Figure 3.

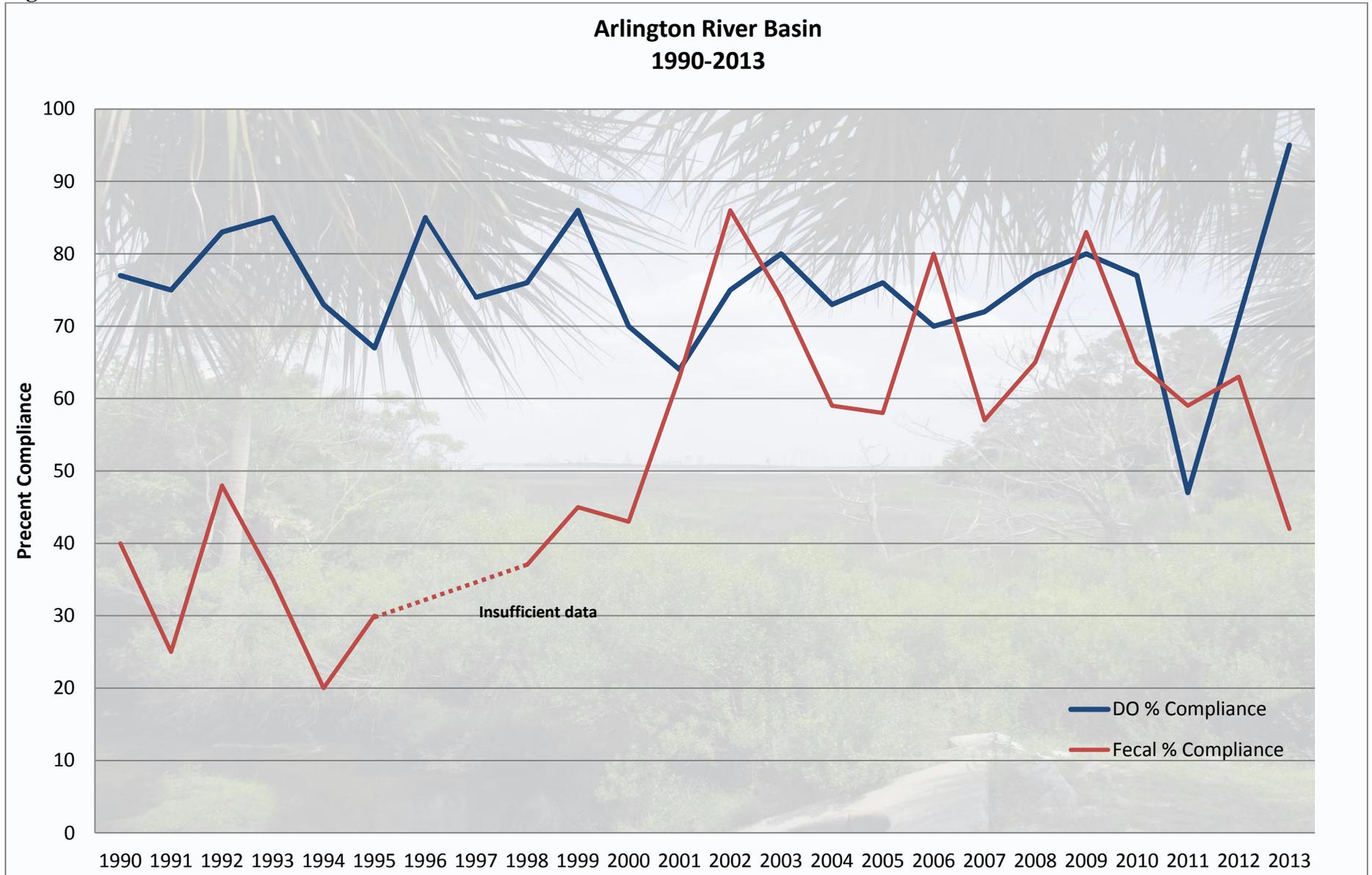


Figure 4.

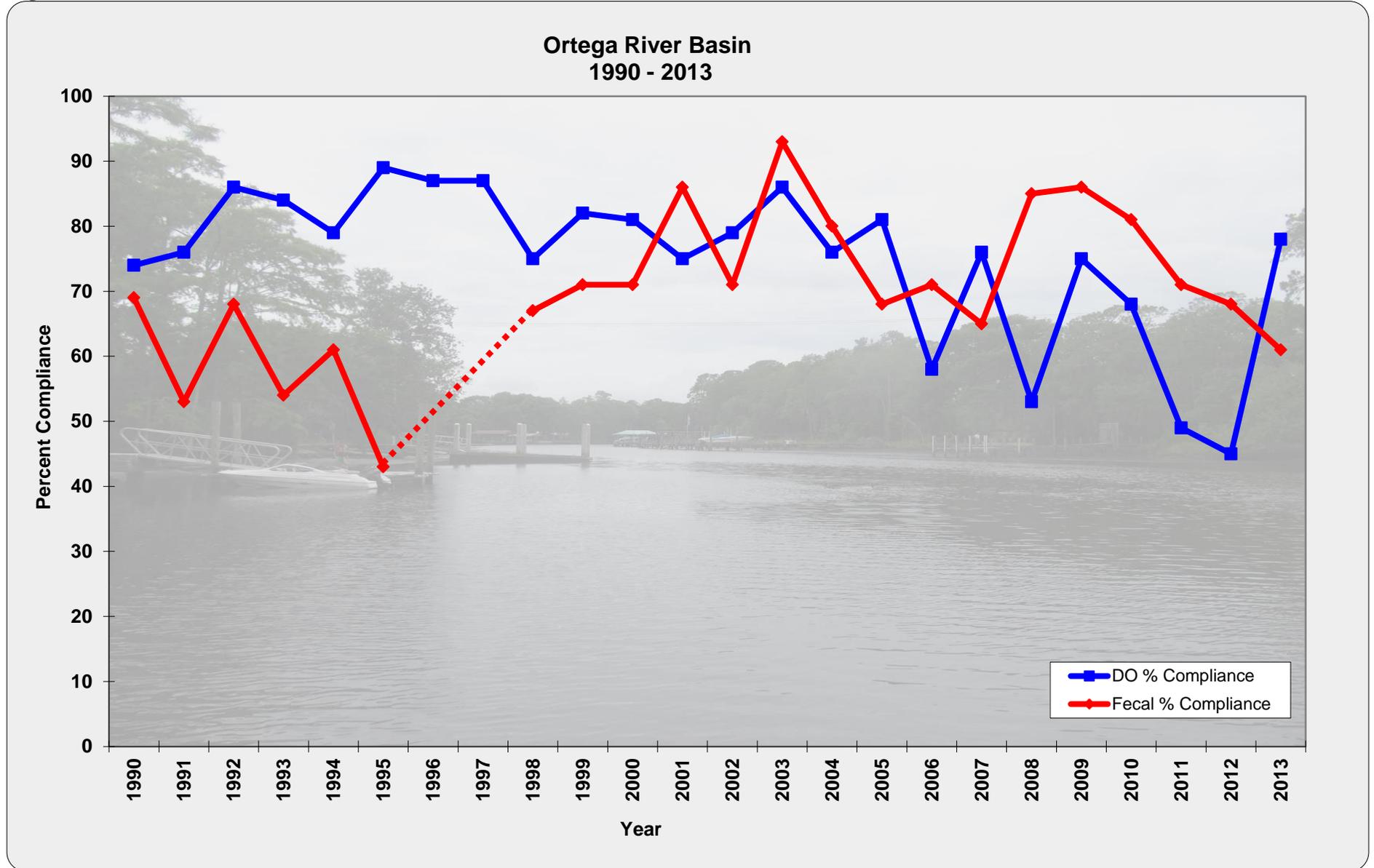


Figure 5.

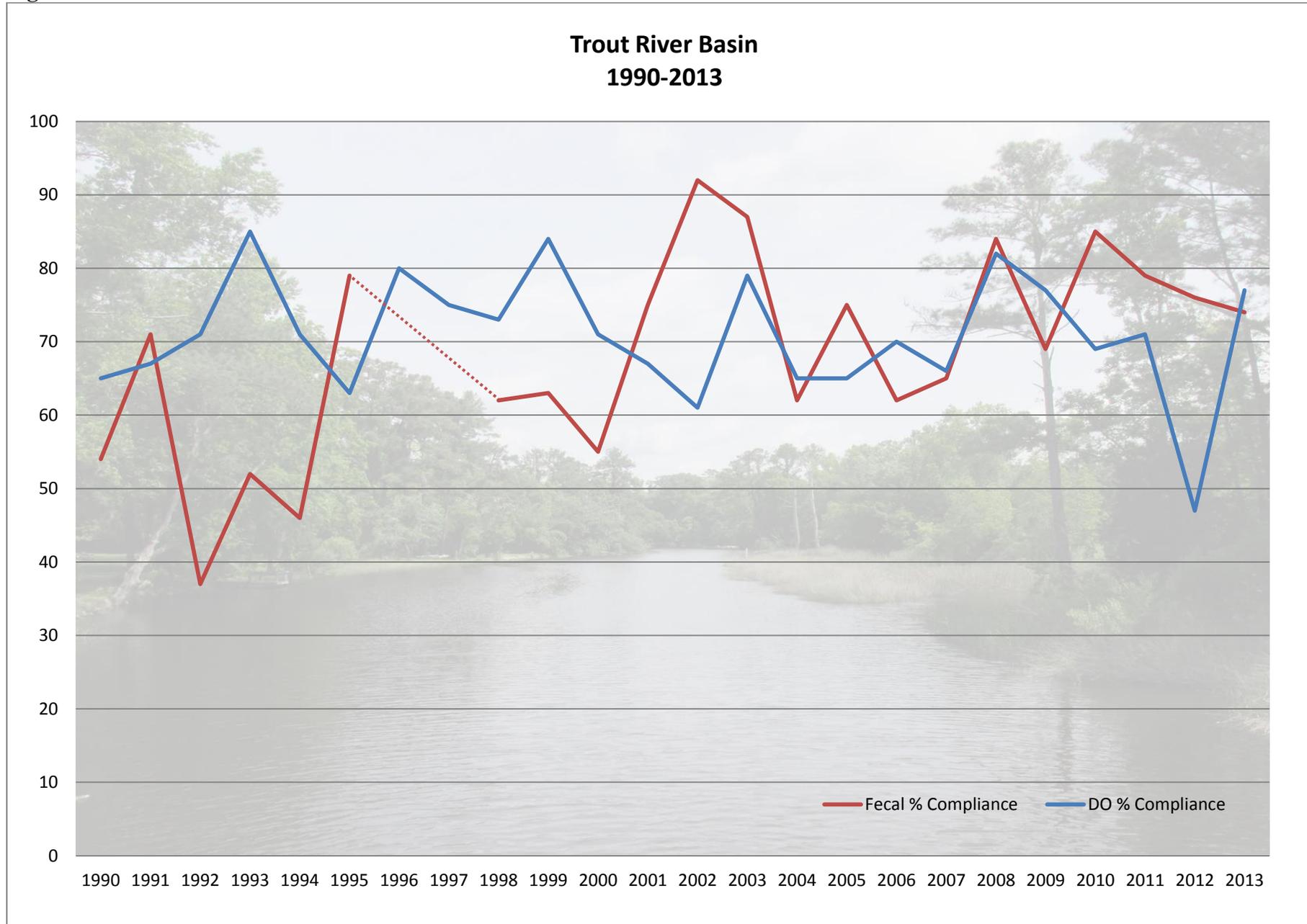


Figure 6.

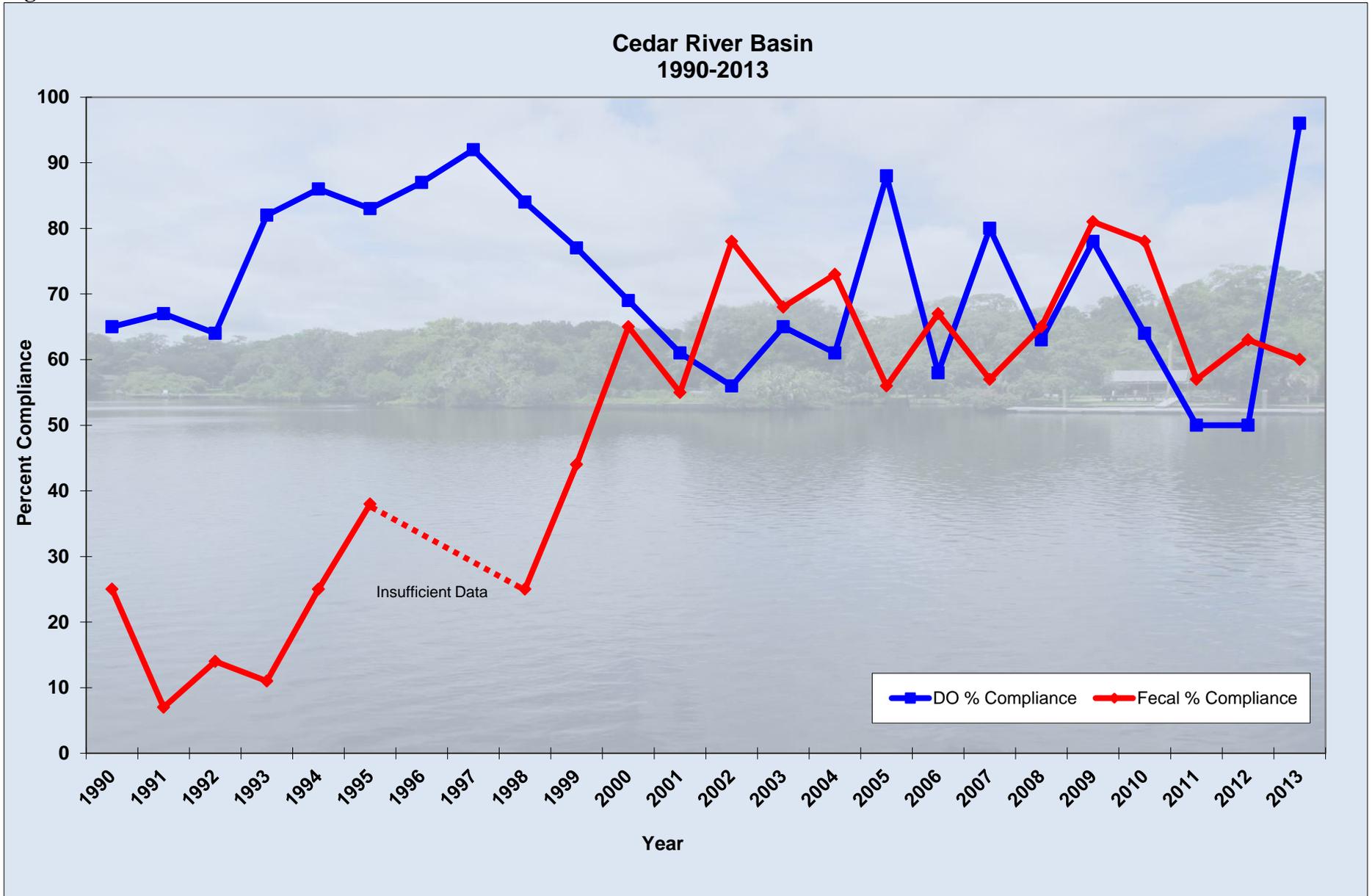
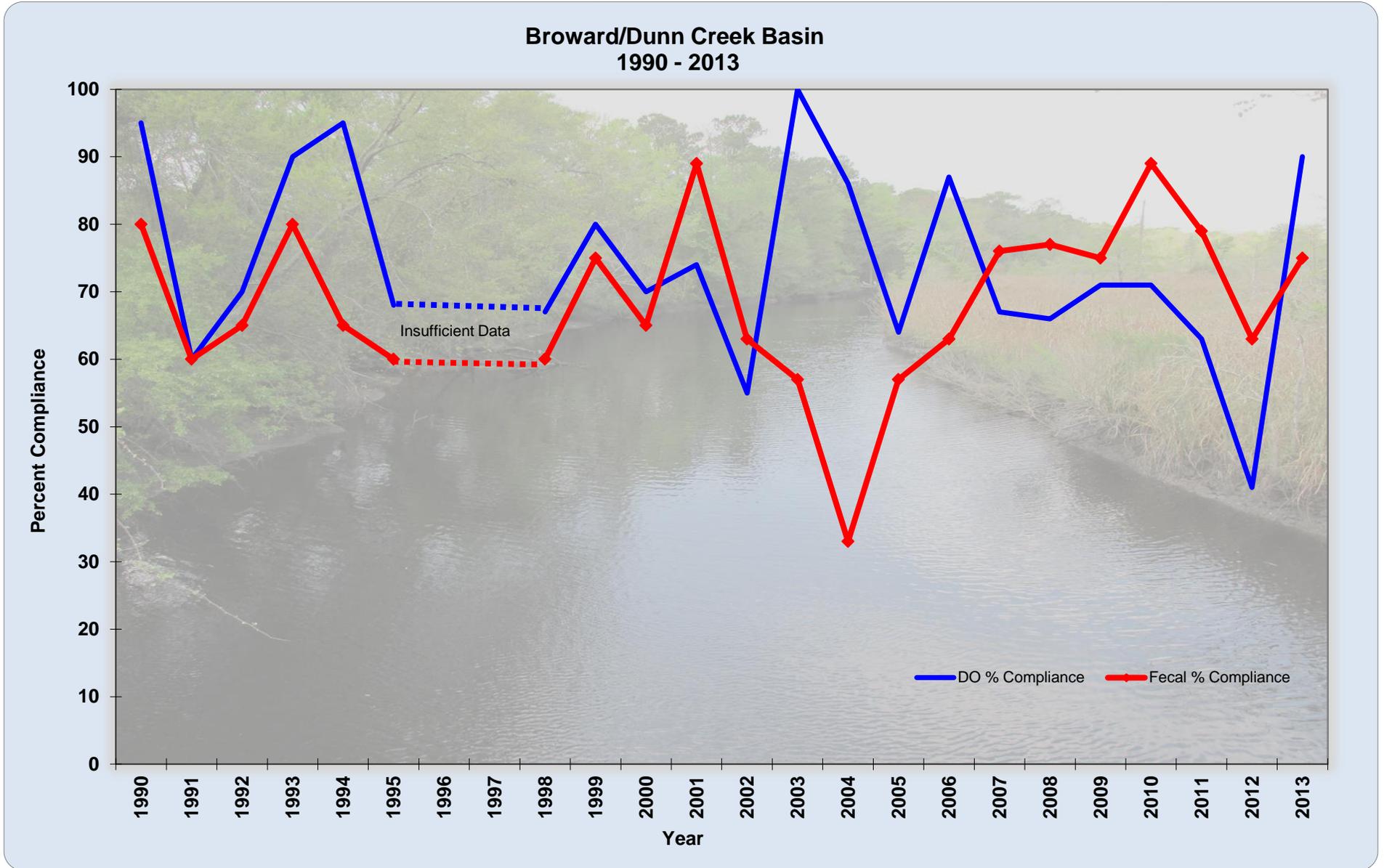


Figure 7.



2013/ 2014 Water Quality Data for Jacksonville WBIDs



SS1 –WBID 2287 Miller Creek

In Table 2 all Water Body ID's (WBID's) monitored by the Routine **and** BMAP Tributary Programs are ranked by fecal coliform bacteria geometric mean for the June 1, 2013 to May 31, 2014, Cycle 3 Year 3 sample period. For emphasis, only City of Jacksonville, EQD monitoring data is used in these rankings, not all data in STORET. The number of data points for each WBID is in parentheses following the waterbody name. The number 1 rank is the worst WBID based on fecal coliform bacteria geometric mean.

For this year's reporting cycle, 14 out of 70 WBIDs (20 percent) have geometric means that exceed the 800 cfu/100ml one time maximum criteria. This exceedance rate is significantly lower than last year's 39 percent, and is similar to the previous year's 17 per cent. Table 2 also shows a comparison of the rankings of all tributaries monitored for this year and the three prior years. There is quite a bit of variation and moving about among the rankings from year to year.



TR422 –WBID 2322 Butcher Pen Creek



HC3 – WBID 2252 Hogan Creek

Looking at the 10 worst-ranking WBIDs (ten highest fecal geometric means) for four years in a row, no basin has been in the highest ten category for all four years. Those basins that have been in the top 10 for three out of the last four years include Miller Creek, Butcher Pen Creek, Hogan Creek, Craig Creek, Cradle Creek Branch, and Fairchild Branch. Those basins that have entered the worst top ten ranking for the first time this year include Normandy Village Run, North & South Creeks, New Rose Creek, Deep Bottom Creek, and Middle Trout River. Those basins showing great improvement from last year include Strawberry Creek, Rushing Branch (only two data points) Long Branch, Red Bay Branch (with only one data point), and Mill Dam Branch.



SS63 – WBID 2297 Craig Creek



IWWG – WBID 2205C Cradle Creek Branch



CR22 – WBID 2305 Normandy Village Run

Routine and BMAP Tributary Program
June 1, 2013 – May 31, 2014
WBIDs Ranked by Fecal Coliform Bacteria Geometric Means

Table 2.

| Current Rank | Waterbody | WBID | Fecal Coliform Bacteria Geometric Mean (Colonies/100 mL) | Rank 2010-2011 | Rank 2011-2012 | Rank 2012-2013 |
|---------------------|-------------------------------------|-------------|---|-----------------------|-----------------------|-----------------------|
| 1 | Miller Creek (33) | 2287 | 3289 | 2 | 19 | 5 |
| 2 | Butcher Pen Creek (2) | 2322 | 2206 | 1 | 1 | 14 |
| 3 | Hogan Creek (36) | 2252 | 1794 | 10 | 14 | 3 |
| 4 | Craig Creek (4) | 2297 | 1729 | 3 | 11 | 38 |
| 5 | Cradle Creek Branch (4) | 2205C | 1515 | 26 | 2 | 9 |
| 6 | Normandy Village Run (3) | 2305 | 1407 | 57 | 12 | 13 |
| 7 | North & South Creeks (4) | 2213F | 1265 | 22 | 24 | 67 |
| 8 | New Rose Creek (4) | 2306 | 1249 | 59 | 25 | 69 |
| 9 | Deep Bottom Creek (27) | 2361 | 1202 | 32 | 17 | 23 |
| 10 | Trout River (8) | 2203 | 1031 | 55 | 58 | 61 |
| 11 | Six Mile Creek N Branch (6) | 2231 | 1027 | 66 | 32 | 53 |
| 12 | Little & Big Fishweir Creeks (8) | 2280 | 1025 | 11 | 30 | 11 |
| 13 | Cedar River (5) | 2262 | 875 | 61 | 22 | 18 |
| 14 | Fairchild Branch & minor trib. (10) | 2213C | 825 | 6 | 6 | 2 |
| 15 | Six Mile Creek S Branch (5) | 2232 | 795 | 56 | 23 | 50 |
| 16 | Williamson Creek (3) | 2316 | 668 | 34 | 10 | 19 |
| 17 | Willow Branch & minor trib. (6) | 2213E | 662 | 21 | 38 | 35 |
| 18 | McCoys Creek (6) | 2257 | 643 | 31 | 45 | 57 |
| 19 | Blockhouse Creek (2) | 2207 | 625 | 28 | 20 | 16 |
| 20 | Hopkins Creek (35) | 2266 | 621 | 67 | 64 | 43 |
| 21 | Oldfield Creek (4) | 2370 | 511 | 8 | 63 | 46 |
| 22 | Cowhead Creek (2) | 2244 | 493 | 9 | 13 | 31 |
| 23 | Little Pottsburg Creek (6) | 2284 | 486 | 29 | 35 | 36 |
| 24 | Newcastle Creek (22) | 2235 | 477 | 30 | 8 | 32 |
| 25 | Strawberry Creek (3) | 2239 | 468 | 19 | 37 | 8 |
| 26 | Tacito Creek (4) | 2382 | 446 | 12 | 48 | 12 |
| 27 | Rushing Branch (2) | 2189 | 442 | 18 | 29 | 6 |
| 28 | West Branch (4) | 2210 | 429 | 16 | 9 | 17 |
| 29 | Cormorant Branch (34) | 2381 | 406 | 7 | 43 | 55 |
| 30 | Ribault River & Palmdale Creek (9) | 2224 | 395 | 52 | 51 | 60 |
| 31 | Wills Branch (5) | 2282 | 391 | 44 | 33 | 33 |
| 32 | Little Six Mile Creek (4) | 2238 | 375 | 27 | 31 | 62 |
| 33 | Long Branch (8) | 2233 | 366 | 38 | 44 | 1 |
| 34 | Ginhouse Creek (2) | 2248 | 360 | 35 | 40 | 25 |
| 35 | Miramar Creek (23) | 2304 | 358 | 40 | 7 | 29 |
| 36 | Fishing Creek (60) | 2324 | 355 | 14 | 27 | 42 |
| 37 | Open Creek (3) | 2299 | 354 | 43 | 46 | 22 |
| 38 | Jones Creek (2) | 2246 | 349 | 25 | 18 | 28 |
| 39 | Julington Creek (7) | 2351 | 322 | 45 | 53 | 51 |
| 40 | Unnamed Creek Mandarin (4) | 2385 | 296 | 4 | 21 | 59 |

Routine and BMAP Tributary Program
June 1, 2013 – May 31, 2014
WBIDs Ranked by Fecal Coliform Bacteria Geometric Means

Table 2.

| Current Rank | Waterbody | WBID | Fecal Coliform Bacteria Geometric Mean (Colonies/100 mL) | Rank 2010-2011 | Rank 2011-2012 | Rank 2012-2013 |
|---------------------|-----------------------------------|-------------|---|-----------------------|-----------------------|-----------------------|
| 41 | McGirts Creek (3) | 2338 | 265 | 39 | 55 | 64 |
| 42 | Silversmith Creek (2) | 2278 | 238 | 37 | 15 | 15 |
| 43 | Nine Mile Creek (4) | 2220 | 201 | 24 | 68 | 49 |
| 44 | Deep Creek (2) | 2245 | 201 | 51 | 70 | 66 |
| 45 | Hogpen Creek (7) | 2270 | 199 | 50 | 42 | 54 |
| 46 | Christopher Creek (4) | 2321 | 176 | 5 | 4 | 26 |
| 47 | Deer Creek (16) | 2256 | 157 | 48 | 57 | 24 |
| 48 | Bennett Branch (2) | 2319 | 155 | 15 | 39 | 10 |
| 49 | Terrapin Creek (4) | 2204 | 144 | 41 | 34 | 34 |
| 50 | Sherman & Puckett Creeks (58) | 2227 | 143 | 63 | 61 | 48 |
| 51 | Goodby's Creek (4) | 2326 | 141 | 17 | 28 | 41 |
| 52 | Ortega River (8) | 2249A | 121 | 62 | 65 | 68 |
| 53 | Red Bay Branch (1) | 2254 | 90 | 13 | 5 | 4 |
| 54 | Sampson Creek (4) | 2419 | 89 | 20 | 50 | 56 |
| 55 | Moncrief Creek (7) | 2228 | 86 | 36 | 16 | 37 |
| 56 | Big Davis Creek (3) | 2356 | 79 | 53 | 62 | 40 |
| 57 | Cedar & Ortega River (3) | 2213P | 73 | 71 | 54 | 58 |
| 58 | Thomas Creek (4) | 2161 | 68 | 58 | 60 | 70 |
| 59 | Yellow Water Creek (6) | 2323 | 64 | 64 | 69 | 47 |
| 60 | Big Pottsburg Creek (4) | 2265B | 64 | 33 | 56 | 39 |
| 61 | Highlands Creek & Trout River (8) | 2203A | 61 | 60 | 66 | 52 |
| 62 | Greenfield Creek (4) | 2240 | 58 | 46 | 26 | 20 |
| 63 | Durbin Creek (8) | 2365 | 50 | 49 | 67 | 63 |
| 64 | McGirts Creek (6) | 2249B | 38 | 42 | 41 | 21 |
| 65 | Dunn Creek (4) | 2181 | 35 | 54 | 52 | 45 |
| 66 | Broward River (6) | 2191 | 32 | 65 | 36 | 30 |
| 67 | Cedar Swamp Creek (3) | 2290 | 32 | 47 | 49 | 44 |
| 68 | Big Pottsburg Creek (3) | 2308 | 27 | 23 | 3 | 65 |
| 69 | Mill Dam Branch (4) | 2273 | 18 | 70 | 47 | 7 |
| 70 | Mt. Pleasant Creek (3) | 2234 | 6 | 69 | 59 | 27 |
| 71 | Brandy Branch (0) | 2225 | 0 | 68 | 71 | |



On the following page, Table 3 lists all WBID's monitored by the Routine and BMAP Tributary Programs listed in order alphabetically by waterbody name, as an easier way to find information on a particular stream. The number of samples collected during this reporting period is in parentheses following the waterbody name.



For each WBID, this table presents three sets of data:

1. Fecal coliform geometric mean,
2. Percent **compliance** for dissolved oxygen measurements and
3. Percent **compliance** for the fecal coliform bacteria Class III water quality standard of less than or equal to 800 colony forming units (cfu)/100ml (not the 400 cfu used in the BMAP evaluations). This table compares data for the last three years.



**Routine and BMAP Tributary Program
Current and Previous Reporting Periods**

Table 3.

| Waterbody [†] | WBID | FCC Geomean (Colonies/100mL) | | | Percent D.O. Compliance* | | | Percent Fecal Compliance** | | |
|-------------------------------------|-------|---------------------------------|---------------|---------------|-----------------------------|---------------|---------------|-------------------------------|---------------|---------------|
| | | 2013- 2014 | 2012- 2013 | 2011- 2012 | 2013- 2014 | 2012- 2013 | 2011- 2012 | 2013- 2014 | 2012- 2013 | 2011- 2012 |
| Bennett Branch (2) | 2319 | 155 | 1448 | 259 | 50% | 67% | 33% | 100% | 0% | 100% |
| Big Davis Creek (3) | 2356 | 79 | 446 | 51 | 67% | 60% | 67% | 100% | 80% | 67% |
| Big Pottsburg Creek (3) | 2308 | 27 | 73 | 3397 | 100% | 100% | 33% | 100% | 50% | 0% |
| Big Pottsburg Creek (4) | 2265B | 64 | 480 | 160 | 75% | 100% | 25% | 100% | 67% | 100% |
| Blockhouse Creek (2) | 2207 | 625 | 1358 | 596 | 100% | 50% | 33% | 100% | 50% | 67% |
| Brandy Branch (0) | 2225 | | | 1 | | | 0% | | | 100% |
| Broward River (6) | 2191 | 32 | 620 | 318 | 33% | 38% | 13% | 100% | 63% | 88% |
| Butcher Pen Creek (2) | 2322 | 2206 | 1386 | 8343 | 100% | 75% | 25% | 0% | 25% | 25% |
| Cedar & Ortega River (3) | 2213P | 73 | 197 | 192 | 100% | 75% | 50% | 67% | 75% | 75% |
| Cedar River (5) | 2262 | 875 | 1289 | 506 | 50% | 80% | 27% | 20% | 50% | 67% |
| Cedar Swamp Creek (3) | 2290 | 32 | 411 | 219 | 100% | 100% | 100% | 100% | 75% | 67% |
| Christopher Creek (4) | 2321 | 176 | 849 | 3079 | 75% | 50% | 67% | 50% | 50% | 33% |
| Cormorant Branch (34) | 2381 | 406 | 254 | 235 | 42% | 36% | 33% | 68% | 73% | 100% |
| Cowhead Creek (2) | 2244 | 493 | 607 | 762 | 50% | 80% | 100% | 50% | 40% | 33% |
| Cradle Creek Branch (4) | 2205C | 1515 | 1789 | 3703 | 100% | 100% | 67% | 25% | 25% | 33% |
| Craig Creek (4) | 2297 | 1729 | 519 | 1019 | 50% | 0% | 33% | 25% | 50% | 33% |
| Deep Bottom Creek (27) | 2361 | 1202 | 887 | 649 | 38% | 38% | 33% | 33% | 38% | 73% |
| Deep Creek (2) | 2245 | 201 | 61 | 3 | 100% | 0% | 0% | 100% | 67% | 100% |
| Deer Creek (16) | 2256 | 157 | 859 | 158 | 50% | 23% | 43% | 81% | 36% | 74% |
| Dunn Creek (4) | 2181 | 35 | 387 | 199 | 75% | 67% | 50% | 100% | 78% | 100% |
| Durbin Creek (8) | 2365 | 50 | 122 | 22 | 25% | 33% | 10% | 100% | 83% | 100% |
| Fairchild Branch & minor trib. (10) | 2213C | 825 | 3067 | 2467 | 89% | 75% | 80% | 40% | 25% | 20% |
| Fishing Creek (60) | 2324 | 355 | 416 | 474 | 71% | 78% | 40% | 65% | 56% | 63% |
| Ginhouse Creek (2) | 2248 | 360 | 849 | 257 | 50% | 60% | 25% | 100% | 40% | 100% |
| Goodby's Creek (4) | 2326 | 141 | 419 | 474 | 75% | 33% | 33% | 75% | 60% | 67% |
| Greenfield Creek (4) | 2240 | 58 | 1083 | 487 | 50% | 50% | 67% | 100% | 25% | 67% |
| Highlands Creek & Trout River (8) | 2203A | 61 | 258 | 25 | 86% | 75% | 50% | 100% | 75% | 100% |
| Hogan Creek (36) | 2252 | 1794 | 2518 | 758 | 50% | 68% | 75% | 17% | 25% | 67% |
| Hogpen Creek (7) | 2270 | 199 | 256 | 239 | 86% | 63% | 33% | 86% | 88% | 83% |
| Hopkins Creek (35) | 2266 | 621 | 415 | 37 | 59% | 70% | 73% | 37% | 51% | 87% |
| Jones Creek (2) | 2246 | 349 | 795 | 628 | 100% | 100% | 67% | 100% | 60% | 67% |
| Julington Creek (7) | 2351 | 322 | 273 | 194 | 71% | 60% | 33% | 71% | 80% | 100% |
| Little & Big Fishweir Creeks (8) | 2280 | 1025 | 1426 | 428 | 60% | 100% | 0% | 38% | 11% | 64% |
| Little Pottsburg Creek (6) | 2284 | 486 | 530 | 320 | 83% | 100% | 63% | 67% | 83% | 88% |
| Little Six Mile Creek (4) | 2238 | 375 | 154 | 425 | 75% | 75% | 25% | 75% | 50% | 75% |

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

†Parentheses denotes the number of samples taken during the period of between June 1, 2013 and May 31, 2014

**Routine and BMAP Tributary Program
Current and Last Reporting Period**

Table 3.

| Waterbody | WBID | FCC Geomean (Colonies/100mL) | | | Percent D.O. Compliance* | | | Percent Fecal Compliance** | | |
|------------------------------------|-------|---------------------------------|---------------|---------------|-----------------------------|---------------|---------------|-------------------------------|---------------|---------------|
| | | 2013- 2014 | 2012- 2013 | 2011- 2012 | 2013- 2014 | 2012- 2013 | 2011- 2012 | 2013- 2014 | 2012- 2013 | 2011- 2012 |
| Long Branch (8) | 2233 | 366 | 3199 | 231 | 67% | 40% | 63% | 50% | 0% | 75% |
| McCoys Creek (6) | 2257 | 643 | 212 | 225 | 50% | 75% | 25% | 67% | 75% | 63% |
| McGirts Creek (3) | 2338 | 265 | 89 | 166 | 100% | 100% | 100% | 67% | 100% | 100% |
| McGirts Creek (6) | 2249B | 38 | 1072 | 243 | 83% | 100% | 33% | 100% | 33% | 100% |
| Mill Dam Branch (4) | 2273 | 18 | 1800 | 222 | 100% | 100% | 0% | 100% | 0% | 100% |
| Miller Creek (33) | 2287 | 3289 | 1859 | 615 | 60% | 88% | 75% | 24% | 29% | 50% |
| Miramar Creek (23) | 2304 | 358 | 675 | 2352 | 86% | 100% | 42% | 52% | 50% | 25% |
| Moncrief Creek (7) | 2228 | 86 | 523 | 684 | 57% | 50% | 50% | 86% | 50% | 83% |
| Mt. Pleasant Creek (3) | 2234 | 6 | 818 | 96 | 67% | 67% | 67% | 100% | 33% | 100% |
| New Rose Creek (4) | 2306 | 1249 | 37 | 489 | 100% | 50% | 33% | 50% | 50% | 67% |
| Newcastle Creek (22) | 2235 | 477 | 604 | 1734 | 68% | 54% | 100% | 41% | 54% | 50% |
| Nine Mile Creek (4) | 2220 | 201 | 352 | 22 | 75% | 67% | 75% | 100% | 100% | 100% |
| Normandy Village Run (3) | 2305 | 1407 | 1387 | 1008 | 100% | 100% | 100% | 33% | 33% | 50% |
| North & South Creeks (4) | 2213F | 1265 | 56 | 501 | 100% | 100% | 33% | 50% | 100% | 67% |
| Oldfield Creek (4) | 2370 | 511 | 372 | 43 | 33% | 0% | 0% | 50% | 100% | 100% |
| Open Creek (3) | 2299 | 354 | 919 | 223 | 100% | 67% | 67% | 67% | 43% | 100% |
| Ortega River (8) | 2249A | 121 | 45 | 29 | 75% | 71% | 18% | 100% | 100% | 100% |
| Red Bay Branch (1) | 2254 | 90 | 1896 | 2795 | 100% | 75% | 60% | 100% | 0% | 0% |
| Ribault River & Palmdale Creek (9) | 2224 | 395 | 174 | 209 | 78% | 71% | 50% | 89% | 71% | 83% |
| Rushing Branch (2) | 2189 | 442 | 1856 | 446 | 100% | 75% | 50% | 100% | 0% | 50% |
| Sampson Creek (4) | 2419 | 89 | 244 | 211 | 75% | 67% | 20% | 100% | 67% | 80% |
| Sherman & Puckett Creeks (58) | 2227 | 143 | 353 | 60 | 52% | 65% | 76% | 66% | 49% | 88% |
| Silversmith Creek (2) | 2278 | 238 | 1379 | 688 | 100% | 75% | 40% | 100% | 50% | 60% |
| Six Mile Creek N Branch (6) | 2231 | 1027 | 258 | 413 | 60% | 100% | 33% | 17% | 100% | 100% |
| Six Mile Creek S Branch (5) | 2232 | 795 | 324 | 504 | 100% | 75% | 67% | 40% | 100% | 33% |
| Strawberry Creek (3) | 2239 | 468 | 1800 | 316 | 67% | 88% | 50% | 67% | 38% | 60% |
| Tacito Creek (4) | 2382 | 446 | 1410 | 221 | 33% | 25% | 0% | 75% | 25% | 100% |
| Terrapin Creek (4) | 2204 | 144 | 546 | 322 | 100% | 83% | 57% | 100% | 33% | 71% |
| Thomas Creek (4) | 2161 | 68 | 34 | 61 | 25% | | 0% | 100% | 100% | 100% |
| Trout River (8) | 2203 | 1031 | 156 | 137 | 75% | 50% | 13% | 25% | 83% | 88% |
| Unnamed Creek Mandarin (4) | 2385 | 296 | 193 | 592 | 33% | 25% | 0% | 75% | 100% | 33% |
| West Branch (4) | 2210 | 429 | 1353 | 1293 | 33% | 67% | 33% | 75% | 25% | 33% |
| Williamson Creek (3) | 2316 | 668 | 1260 | 1116 | 100% | 100% | 25% | 67% | 100% | 50% |
| Willow Branch & minor trib. (6) | 2213E | 662 | 537 | 313 | 60% | 60% | 14% | 67% | 60% | 57% |
| Wills Branch (5) | 2282 | 391 | 570 | 405 | 100% | 100% | 50% | 80% | 57% | 75% |
| Yellow Water Creek (6) | 2323 | 64 | 365 | 9 | 100% | 80% | 67% | 100% | 67% | 100% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

*Parentheses denotes the number of samples taken during the period of between June 1, 2013 and May 31, 2014

TRIBUTARY INTENSIVE PROGRAM

In the 2013/2014 reporting cycle the “Tributary Intensive” work was comprised of the City of Jacksonville responsibilities for scheduled monitoring for two different Basin Management Action Plans (BMAPS) and several special studies.

The first BMAP for which the City of Jacksonville has responsibilities for monitoring, is the BMAP adopted for the Fecal Coliform TMDL for the first group of Lower St. Johns River Tributaries. (Trib BMAP I). This BMAP, adopted December 2009 is for ten tributaries all within Duval County. The tributaries or WBIDs covered in this BMAP are: Newcastle Creek (2235), Hogan Creek (2252), Butcher Pen Creek (2322), Miller Creek (2287), Miramar Creek (2304), Big Fishweir Creek (2280), Deer Creek (2256), Terrapin Creek (2204), Goodby’s Creek (2326) and Open Creek (2299). The City of Jacksonville has committed to perform the required fecal coliform BMAP monitoring for five of these WBIDS: Newcastle, Hogan, Miller, Miramar and Deer Creeks.

The second BMAP in which the City of Jacksonville has responsibility to monitor is for the second group of Lower St. Johns River tributaries (Trib BMAP II). This BMAP, adopted August 2010, covers 15 tributaries in Jacksonville: Blockhouse Creek (2207), Cormorant Branch (2381), Craig Creek (2297), Deep Bottom Creek (2361), Fishing Creek (2324), Greenfield Creek (2240), Hopkins Creek (2266), McCoy Creek (2257), Moncrief Creek (2228), Pottsburg Creek (2265B), Sherman Creek (2227), Trout River downstream (2203A), Middle Trout River (2203), Williamson Creek (2316), Wills Branch (2282). The City of Jacksonville has agreed to monitor in five of these tributaries: Fishing Creek, Deep Bottom Creek, Hopkins Creek, Sherman Creek, and Cormorant Branch.



Miller Creek
Surface Film on Water near Headwaters

Lower St. Johns River Tributary I Fecal Coliform BMAP Monitoring (Trib BMAP I)

Objectives

This BMAP, adopted December 2009 is for ten tributaries all within Duval County. The Tributaries (WBIDs) covered in this BMAP are: Newcastle Creek (2235), Hogan Creek (2252), Butcher Pen Creek (2322), Miller Creek (2287), Miramar Creek (2304), Big Fishweir Creek (2280), Deer Creek (2256), Terrapin Creek (2204), Goodby's Creek (2326) and Open Creek (2299). The City of Jacksonville has committed to perform the required fecal coliform BMAP monitoring for five of these WBIDS: Newcastle, Hogan, Miller, Miramar and Deer Creeks. The purpose of the monitoring program is to search for and eliminate sources of bacterial contamination and to measure improvements in fecal coliform levels that may be attributed the various BMAP projects implemented by stakeholders.

Constituents

As described in the monitoring plan for this BMAP the constituents include:

Field Measurements:

Water Temperature
pH
Specific Conductance
Dissolved Oxygen (D.O.)
Secchi Depth
Total Stream Depth
Sample Depth
Meteorological Data

Laboratory Analyses:

Fecal Coliform Bacteria

Additional field observations include stream appearance, tidal condition, visual oil & grease, and canopy cover.

Methodology

Field water quality measurements are collected and logged with a multi-parameter surface water quality meter (MANTA2 multiprobe with optical HDO sensor and Archer hand held display) or comparable multi-parameter instrument. Water samples are collected as surface water grab samples.

Frequency

All City of Jacksonville fecal coliform BMAP sampling is being conducted on a monthly frequency (even though the BMAP document allows some sites to be sampled quarterly). When fecal coliform results exceed 5000 cfu/100 ml, follow-up sampling is implemented in an effort to identify a source for the elevated results. All follow-up results are tracked independently and are not entered into STORET.

Stations

Table 6. City of Jacksonville Tributary Group I BMAP Monitoring Stations (18)

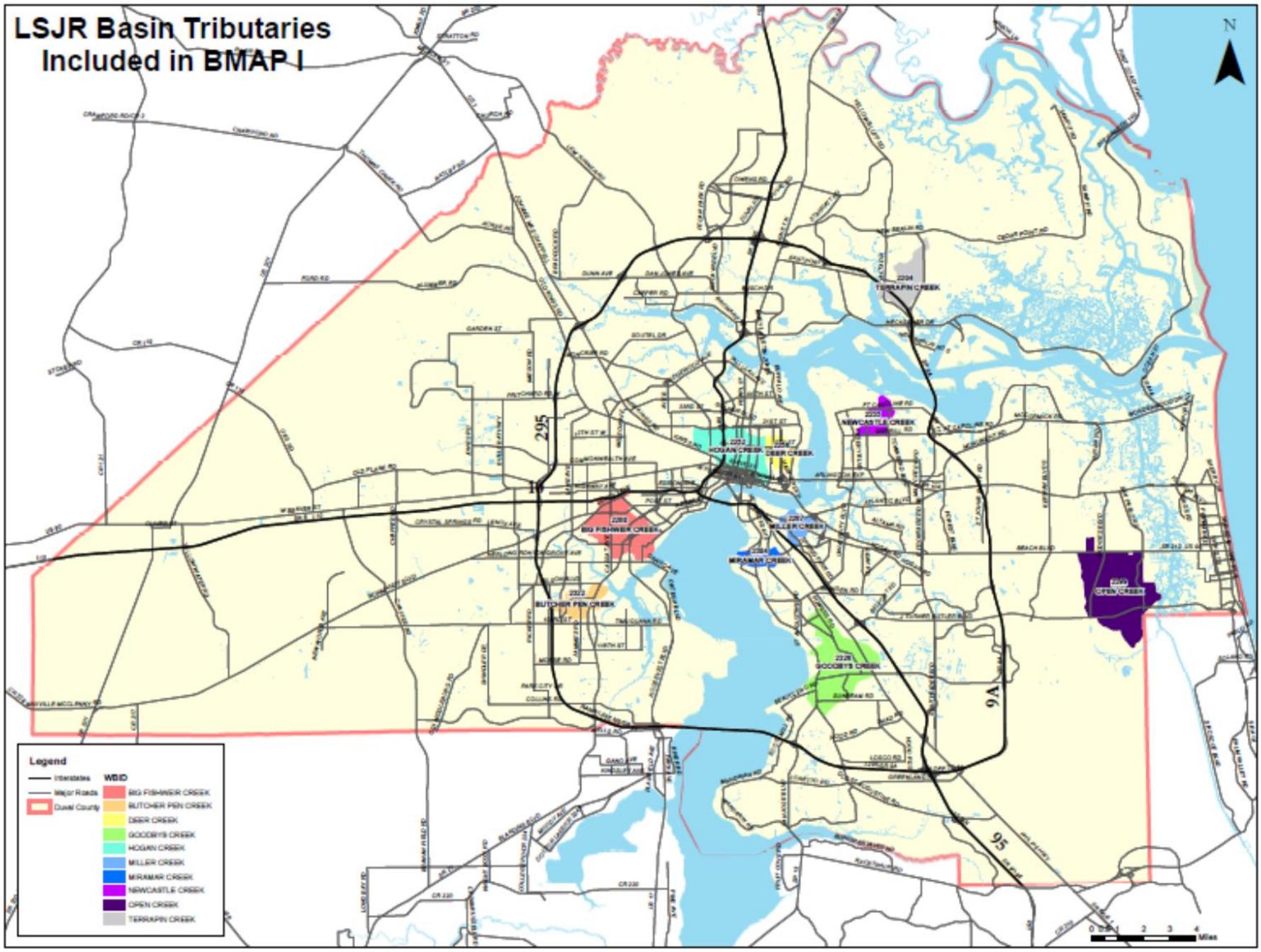
| Site | WBID | LOCATION | LAT-Dec | LONG-Dec | Stream Name |
|-----------------------|----------------------|--|-----------|-----------|-----------------|
| ARL5A | 2235 | Newcastle Creek at Berrywood Ln. | 30.35455 | 81.5787 | Newcastle Creek |
| ARL5B ⁺ | 2235 | Newcastle Creek Upstream of Berrywood Ln. | 30.354044 | 81.578652 | Newcastle Creek |
| ARL6 * | 2235 | Newcastle Creek at Fort Caroline Hills Dr. | 30.36567 | 81.57977 | Newcastle Creek |
| HC1A | 2252 | Hogan Creek at Broad St. | 30.34089 | 81.66146 | Hogan Creek |
| HC2A | 2252 | Hogan Creek at Hubbard St. | 30.33336 | 81.65327 | Hogan Creek |
| HC3 * | 2252 | Hogan Creek at First Street | 30.33652 | 81.65738 | Hogan Creek |
| HC4 ⁺ | 2252 | Hogan Creek at 10th St. | 30.34904 | 81.66214 | Hogan Creek |
| DR1 * | 2256 | Deer Creek east of Talleyrand Ave. | 30.34171 | 81.62814 | Deer Creek |
| DR2 * | 2256 | Deer Creek at ML King Jr. Parkway | 30.34365 | 81.63621 | Deer Creek |
| DR2S ⁺ | 2256 | Deer Creek Southern Junction Box, just upstream from DR2 | 30.34368 | 81.63644 | Deer Creek |
| DR3 ⁺ | 2256 | Deer Creek at Talleyrand Ave. | 30.34141 | 81.6292 | Deer Creek |
| SS1 * | 2287 | Miller Creek at Atlantic Blvd. | 30.30612 | 81.62888 | Miller Creek |
| SS21 ⁺ | 2287 | Miller Creek West Branch at Camden Ave. | 30.30056 | 81.63118 | Miller Creek |
| SS23 | 2287 | Miller Creek East Branch at Mayfair Rd. | 30.29837 | 81.63055 | Miller Creek |
| SS2A ⁺ | 2287 | Miller Creek South Branch at Stillman St. | 30.3047 | 81.62655 | Miller Creek |
| SSBSC | 2287 | Miller Creek at Atherton Rd. | | | |
| SS4 * | 2304 | Miramar Creek at San Jose Blvd. | 30.2825 | 81.65134 | Miramar Creek |
| SS505 | 2304 | Miramar Creek at Emerson St. west of St. Augustine Rd. | 30.28483 | 81.64497 | Miramar Creek |
| SS5A ⁺ | 2304 | Miramar Creek at Orlando Circle W. | 30.282018 | 81.649557 | Miramar Creek |
| SSGAD | 2304 | Miramar Creek at Gadston Rd | | | |

[Denotes new site](#)

* Denotes Routine Tributary Site and BMAP site.

⁺ Denotes deleted site.

LSJR Basin Tributaries Included in BMAP I



2013/2014 TRIBUTARY GROUP I FECAL COLIFORM BMAP COJ DATA (Trib BMAP I):

The surface water quality data (temperature, pH, specific conductance, dissolved oxygen, percent saturation of dissolved oxygen and fecal coliform bacteria) are located in Table 7. The percent compliance for fecal coliform noted at the bottom of each table uses the 800 cfu standard.

Table 7. BMAP I Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|-----------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2235 | Newcastle Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| ARL6 | 6/28/2013 | 24.27 | 6.31 | 279.2 | 6.03 | 72.6 | 950 |
| ARL5A | 6/28/2013 | 25.96 | 6.4 | 376.8 | 3.63 | 45 | 1 |
| ARL6 | 7/17/2013 | 25.18 | 7.36 | 281.1 | 7.7 | 94.2 | 3700 |
| ARL5A | 7/17/2013 | 26.13 | 6.69 | 420.9 | 4.2 | 52.3 | 1712 |
| ARL6 | 8/15/2013 | 25.13 | 6.97 | 222.8 | 5.7 | 70.6 | 8182 |
| ARL5A | 9/3/2013 | 26.67 | 6.13 | 305.8 | 4.62 | 58.1 | 9720 |
| ARL6 | 9/3/2013 | 24.92 | 6.59 | 244.1 | 6.8 | 82.8 | 6750 |
| ARL5A | 11/19/2013 | 21.62 | 6.9 | 411 | 7.61 | 85.3 | 5800 |
| ARL6 | 11/19/2013 | 20 | 7.25 | 281 | 5.45 | 60 | 1351 |
| ARL6 | 12/2/2013 | 18.2 | 7.19 | 649 | 4.29 | 45.6 | 1171 |
| ARL5A | 12/2/2013 | | | | | | 721 |
| ARL6 | 1/17/2014 | 13.89 | 7.41 | 491 | | | 190 |
| ARL5A | 1/17/2014 | 13.71 | | 397 | | | 38 |
| ARL6 | 2/13/2014 | 14.56 | 7.74 | 252.9 | 6.99 | 69.1 | 360 |
| ARL5A | 2/13/2014 | 16.24 | 7.51 | 329.6 | 6.12 | 62.8 | 90 |
| ARL6 | 3/19/2014 | 17.48 | 7.81 | 272 | 8.23 | 86.1 | 631 |
| ARL5A | 3/19/2014 | 20.48 | 7.66 | 641 | 8.49 | 94.1 | 1 |
| ARL6 | 4/10/2014 | 19.65 | 7.21 | 292.6 | 6.66 | 72.6 | 811 |
| ARL5A | 4/10/2014 | 22.71 | 6.95 | 643.3 | 7.05 | 82.9 | 1 |
| ARL5A | 5/27/2014 | 23.96 | 7.41 | 341.6 | 3.79 | 45.1 | 2600 |
| ARL6 | 5/27/2014 | 22.41 | 7.64 | 245.6 | 5.29 | 61.2 | 1171 |
| Percent Compliance | | | | | 68% | | 41% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 7. BMAP I Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|-------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2252 | Hogan Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| HC2A | 6/4/2013 | 27.6 | | 524.3 | | | 2800 |
| HC3 | 6/4/2013 | 27.39 | | 523.7 | | | 2300 |
| HC1A | 6/4/2013 | 27.77 | | 8 | | | 721 |
| HC1A | 7/8/2013 | 26.48 | 6.82 | 487.1 | 3.35 | 42 | 5900 |
| HC3 | 7/8/2013 | 28.34 | 7.18 | 613.2 | 4.8 | 62.2 | 2300 |
| HC2A | 7/8/2013 | 28.73 | 7.04 | 979.6 | 3.1 | 40.5 | 1351 |
| HC1A | 8/21/2013 | 28.23 | 6.79 | 441.9 | 3.23 | 41.8 | 8559 |
| HC2A | 8/21/2013 | 28.83 | 6.9 | 1614 | 3.01 | 39.4 | 3600 |
| HC3 | 8/21/2013 | 29.09 | 6.83 | 1281 | 3.3 | 43.5 | 3400 |
| HC1A | 9/10/2013 | 27.69 | 7.21 | 509.5 | 5.49 | 70.3 | 4400 |
| HC2A | 9/10/2013 | 27.68 | 6.95 | 1307 | 3.36 | 43.2 | 1712 |
| HC3 | 9/10/2013 | 28.18 | 7.3 | 1380 | 5.37 | 69.6 | 1532 |
| HC3 | 10/7/2013 | 26.74 | 7.2 | 943 | 2.8 | 35.3 | 44000 |
| HC1A | 10/7/2013 | 26.05 | 6.96 | 382.4 | 2.5 | 31.1 | 31000 |
| HC2A | 10/7/2013 | 26.81 | 7.11 | 2964 | 2.98 | 37.9 | 19550 |
| HC2A | 11/13/2013 | 18.93 | 7.52 | 4279 | 5.13 | 66.9 | 2500 |
| HC3 | 11/13/2013 | 18.28 | 7.51 | 1789 | 4.99 | 52.7 | 901 |
| HC1A | 11/13/2013 | 16.42 | 7.62 | 545 | 4.24 | 43.4 | 811 |
| HC2A | 12/4/2013 | 19.17 | 6.11 | 6361 | 6.7 | 74 | 811 |
| HC3 | 12/4/2013 | 19.28 | 6.01 | 4744 | 8.51 | 94.7 | 811 |
| HC1A | 12/4/2013 | 19.81 | 7.64 | 1690 | 8.81 | 97 | 811 |
| HC1A | 1/13/2014 | 16.22 | 7.3 | 1030 | 7.54 | 77.3 | 4300 |
| HC3 | 1/13/2014 | 16.51 | 7.25 | 1144 | 6.27 | 64.6 | 1441 |
| HC2A | 1/13/2014 | 16.35 | 7.38 | 1310 | 6.95 | 72.3 | 1351 |
| HC2A | 2/3/2014 | 17.89 | 7.54 | 1059 | | | 991 |
| HC3 | 2/3/2014 | 18.48 | 7.54 | 3301 | | | 631 |
| HC1A | 2/3/2014 | 18.43 | 7.69 | 4452 | | | 90 |
| HC1A | 3/4/2014 | 17.55 | 7.28 | 498.9 | 5.45 | 57.6 | 991 |
| HC2A | 3/4/2014 | 18.16 | 6.94 | 6394 | 5.71 | 62.2 | 811 |
| HC3 | 3/4/2014 | 18.27 | 7.16 | 1557 | 4.51 | 48.5 | 631 |
| HC3 | 4/3/2014 | 20.01 | 7.24 | 453.2 | 5.84 | 64.8 | 901 |
| HC1A | 4/3/2014 | 19.97 | 7.23 | 462.5 | 5.77 | 64 | 541 |
| HC2A | 4/3/2014 | 20.89 | 7.22 | 505.3 | 6.36 | 71.8 | 541 |
| HC1A | 5/14/2014 | 25.02 | 7.26 | 431.5 | 4.52 | 55.2 | 2900 |
| HC2A | 5/14/2014 | 26 | 7.01 | 2817 | 3.25 | 41.8 | 2100 |
| HC3 | 5/14/2014 | 26.33 | 7.22 | 1122 | 5.52 | 69.2 | 1351 |
| Percent Compliance | | | | | 50% | | 17% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 7. BMAP I Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|-------------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2256 | Deer Creek | | | | | | Fecal Coliform (CFU/100mL) |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | |
| DR1 | 6/4/2013 | 27.46 | | 9046 | | | 1351 |
| DR2 | 7/8/2013 | 26.19 | 6.96 | 339.8 | 1.59 | 19.9 | 631 |
| DR1 | 7/8/2013 | 28.16 | 6.77 | 8570 | 3.29 | 43.6 | 360 |
| DR1 | 8/21/2013 | 29.39 | 6.78 | 12585 | 4.58 | 62.9 | 1171 |
| DR1 | 9/10/2013 | 27.52 | 6.74 | 10689 | 1.28 | 16.9 | 541 |
| DR1 | 10/3/2013 | 25.79 | 7.16 | 8000 | 4.35 | 55.1 | 721 |
| DR1 | 11/13/2013 | 18.07 | 7.36 | 13760 | 2.1 | 23.3 | 180 |
| DR2 | 12/4/2013 | 21.57 | 7.22 | 1079 | 3.46 | 39.2 | 1 |
| DR2 | 1/6/2014 | | | | | | 2000 |
| DR1 | 1/6/2014 | | | | | | 360 |
| DR1 | 2/3/2014 | 14.01 | 7.23 | 15439 | | | 450 |
| DR1 | 4/3/2014 | 19.37 | 7.11 | 1374 | 3.13 | 34.4 | 270 |
| DR2 | 4/3/2014 | 21.04 | 7.34 | 372.1 | 5.55 | 62.8 | 90 |
| DR1 | 5/5/2014 | 24.49 | 6.47 | 14905 | 5.73 | 72.7 | 721 |
| Percent Compliance | | | | | 50% | | 81% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 7. BMAP I Program June 1, 2012 – May 31, 2013

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|--------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2287 | Miller Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| SS1 | 6/17/2013 | 28.13 | 7.63 | 7116 | 7.9 | 110 | 4300 |
| SS21D | 6/17/2013 | 23.83 | 6.21 | 369.3 | 3.27 | 39 | 10450 |
| SS23 | 6/17/2013 | 25.78 | 6.88 | 738.2 | 4.62 | 57.2 | 2400 |
| SS1 | 7/18/2013 | 27.15 | 6.82 | 3905 | 3.39 | 43.5 | 8018 |
| SS21D | 7/18/2013 | 24.84 | 6.42 | 253 | 2.53 | 30.4 | 11892 |
| SS23 | 7/18/2013 | 25.41 | 6.86 | 638.7 | 2.77 | 34.1 | 6000 |
| SS1 | 8/20/2013 | 29.5 | 7.22 | 8815 | 5.47 | 74.3 | 721 |
| SS21D | 8/20/2013 | 25.14 | 6.44 | 367.2 | 5.42 | 66.3 | 29000 |
| SS23 | 8/20/2013 | 26.14 | 6.87 | 938.5 | 3.45 | 43.1 | 630 |
| SS1 | 9/3/2013 | 28.04 | 6.72 | 616.3 | 3.95 | 50.9 | 34000 |
| SS21D | 9/3/2013 | 25.58 | 6.9 | 354.8 | 5.1 | 62.9 | 40000 |
| SS23 | 9/3/2013 | 25.99 | 6.85 | 557.1 | 4.16 | 51.7 | 4800 |
| SS1 | 11/19/2013 | 17.48 | 7.88 | 5763 | 8.81 | 93.8 | 270 |
| SS21D | 11/19/2013 | 19.72 | 7.27 | 245 | 8.29 | 90.7 | 15856 |
| SS23 | 11/19/2013 | 18.99 | 7.28 | 524 | 4.7 | 50.8 | 5900 |
| SS1 | 12/18/2013 | 13.61 | 7.72 | 3878 | 8.68 | 85.1 | 450 |
| SS21D | 12/18/2013 | 16.39 | 6.77 | 355.6 | 5.28 | 54.5 | 10270 |
| SS23 | 12/18/2013 | 13.66 | 7.11 | 640.9 | 4.68 | 45.4 | 1532 |
| SS1 | 1/17/2014 | 12.15 | 7.69 | 4891 | | | 180 |
| SS21D | 1/17/2014 | 11.15 | 7.43 | 485 | | | 1200 |
| SS23 | 1/17/2014 | 10.11 | 7.84 | 1345 | | | 380 |
| SS1 | 2/10/2014 | 13.81 | 6.68 | 13169 | 6.41 | 65.4 | 2900 |
| SS21D | 2/10/2014 | 16.45 | 8.05 | 338 | 6.48 | 66.8 | 13784 |
| SS23 | 2/10/2014 | 13.48 | 7.18 | 919.9 | 5.49 | 53.2 | 450 |
| SS1 | 3/13/2014 | 12.61 | 7.11 | 3141 | 7.59 | 72.7 | 991 |
| SS21D | 3/13/2014 | 11.13 | 7.08 | 200 | 10.85 | 99.4 | 5000 |
| SS23 | 3/13/2014 | 14.16 | 7.22 | 581.9 | 5.66 | 55.6 | 721 |
| SS1 | 4/10/2014 | 18.29 | 7.04 | 2059 | 5.01 | 54 | 3100 |
| SS21D | 4/10/2014 | 18.74 | 7.53 | 338.8 | 5.67 | 61.3 | 9009 |
| SS2A | 4/10/2014 | 17.29 | 7.28 | 584.3 | 5.69 | 59.8 | 1261 |
| SS1 | 5/29/2014 | 27.35 | 6.22 | 14450 | 5.6 | 73.4 | 2400 |
| SS21D | 5/29/2014 | 22.87 | 7.79 | 351.8 | 3.91 | 45.6 | 8300 |
| SS23 | 5/29/2014 | 24.08 | 7.07 | 603 | 2.3 | 27.5 | 33000 |
| Percent Compliance | | | | | 60% | | 24% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 7. BMAP I Program. June 1, 2012 – May 31, 2013

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | | |
|---------------------------|---------------|--------------------|------|----------------|-------------|-------------|------------|----------------------------|
| 2304 | Miramar Creek | | | | | | | Fecal Coliform (CFU/100mL) |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | | |
| SS4 | 6/12/2013 | 25.26 | 6.41 | 472.7 | 4.46 | 54.7 | 1622 | |
| SSGAD | 6/12/2013 | 27.22 | 6.6 | 428.7 | 5.1 | 64.8 | 2000 | |
| SS4 | 7/15/2013 | 24.98 | 7.01 | 441.7 | 5.7 | 69.6 | 3000 | |
| SSGAD | 7/15/2013 | 26.49 | 6.71 | 404.1 | 5.59 | 70.1 | 3300 | |
| SS4 | 8/15/2013 | 28.05 | 6.55 | 327.1 | 5.43 | 69.9 | 1 | |
| SSGAD | 8/15/2013 | 29.07 | 6.79 | 305 | 5.97 | 78.3 | 1 | |
| SS4 | 9/3/2013 | 27.04 | 6.84 | 423.5 | 5.07 | 64.2 | 2800 | |
| SSGAD | 9/3/2013 | 28.59 | 6.77 | 386.9 | 6.05 | 79.6 | 2500 | |
| SS4 | 10/17/2013 | 23.22 | 6.57 | 2150 | 6.5 | 77.2 | 1802 | |
| SS4 | 11/14/2013 | 19.07 | 6.92 | 10570 | 8.64 | 74.7 | 1171 | |
| SSGAD | 11/14/2013 | 18.87 | 7.3 | 478 | 4.9 | 52.8 | 631 | |
| SS4 | 12/11/2013 | 18.71 | 6.83 | 436.5 | 5.12 | 55.3 | 920 | |
| SSGAD | 12/11/2013 | 19.14 | 6.92 | 415.3 | 6.83 | 74.4 | 100 | |
| SS4 | 1/16/2014 | 14.4 | 7.73 | 918 | | | 660 | |
| SSGAD | 1/16/2014 | 14.56 | 7.51 | 815 | | | 310 | |
| SS4 | 2/10/2014 | 16.52 | 7.54 | 7622 | 3.86 | 40.8 | 270 | |
| SSGAD | 2/10/2014 | 15.98 | 7.87 | 398.9 | 7.89 | 80.5 | 541 | |
| SS4 | 3/31/2014 | 17.23 | 7.12 | 434.2 | 6.53 | 68.5 | 631 | |
| SSGAD | 3/31/2014 | 17.07 | 7.12 | 395.4 | 8.25 | 86.2 | 1 | |
| SS4 | 4/1/2014 | 18.61 | 7.94 | 453 | 9.58 | 102 | 811 | |
| SSGAD | 4/1/2014 | 18.99 | 7.92 | 417 | 8.91 | 96.1 | 180 | |
| SS4 | 5/21/2014 | 21.86 | 6.99 | 831.4 | 5 | 57.3 | 721 | |
| SSGAD | 5/21/2014 | 23.05 | 7.11 | 416.4 | 5.01 | 58.7 | 991 | |
| Percent Compliance | | | | | 86% | | 52% | |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

**DISCUSSION OF FECAL COLIFORM MONITORING TRIBUTARY I BMAP
(Trib BMAP I):**

The objective of the BMAP monitoring effort is twofold: 1. To track fecal coliform water quality improvements resulting from implementation of a variety of projects within each BMAP WBID, and 2. To identify hotspots and then follow-up with additional sampling and investigations so that new or problematic sources will be identified and corrective measures taken by appropriate stakeholders. Stakeholders including the City of Jacksonville provide FDEP with annual updates on the water quality monitoring, project implementation status, and any corrective actions on a WBID basis. It is beyond the scope of this monitoring report to include those project lists and discussion.

The City of Jacksonville’s fecal coliform BMAP I monitoring results are summarized in Table 8. In order for a WBID to be considered in compliance by the impaired water rule, no more than 10 percent of the samples may exceed 400 cfu/100 ml. Compliance with the 400 cfu/100 ml standard (not the 800 cfu standard as in Table 7) is displayed in Table 8 which includes the last four years of data separated by year.

The ten BMAP I tributaries are some of the worst fecal coliform bacteria impaired WBIDs in the Lower St. Johns River Basin. They were intentionally selected for this reason. All of the five BMAP I WBIDs being monitored by the City of Jacksonville had exceedances much greater than 10 percent. This year, like last year, the two creeks with the highest percentage of fecal coliform violations were Hogan Creek and Miller Creek (97% both years for Hogan, 91% and 89% for Miller, of samples above 400 cfu/100ml.) This year the highest geometric mean was for Miller Creek at 3289. The lowest geometric mean was for Deer Creek at 157. Deer Creek exceeded the 400 cfu/100 ml in 50% of the samples.

Looking at data for four years, there are no real improving trends for any of the five BMAP I waterbodies in the short term. This is different than the longer-term comparisons with the TMDL figures which do show a significant improvement in fecal coliform levels in BMAP I WBIDs. For the last four years, the worst water quality (highest geometric mean) has been in Miller Creek for three of the years and Hogan Creek in one year. The best water quality (lowest geometric mean) has been in Deer Creek for three years and Miramar Creek in one year. Much effort has again been spent in studying and investigating the creeks with the most elevated bacteria levels. Hogan Creek and Miller Creek in particular have had successes in discovering and removing sources, as reported in the Tributary BMAP Annual Progress Reports. Additional work has been initiated recently by DEP Tallahassee staff in collecting samples to identify where human sources are originating from in these creeks. It may take more time, but it is anticipated that all this effort will eventually result in lower fecal coliform bacteria levels.



Miramar Creek

Table 8. Tributary Group I Fecal Coliform BMAP COJ Data Summary. Sampling effort, number of samples exceeding the 400 cfu/100 mL state standard for impairment designation, and geometric means.

2013-2014

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|------|------------------|-------------------|------------------------|-------------------------------------|--------------------------------|
| 2235 | New Castle Creek | 22 | 15 | 68% | 477 |
| 2252 | Hogan Creek | 36 | 35 | 97% | 1794 |
| 2256 | Deer Creek | 16 | 8 | 50% | 157 |
| 2287 | Miller Creek | 33 | 30 | 91% | 3289 |
| 2304 | Miramar Creek | 23 | 16 | 70% | 358 |

2012-2013

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|------|------------------|-------------------|------------------------|-------------------------------------|--------------------------------|
| 2235 | New Castle Creek | 24 | 16 | 67% | 1540 |
| 2252 | Hogan Creek | 36 | 35 | 97% | 2518 |
| 2256 | Deer Creek | 14 | 9 | 64% | 859 |
| 2287 | Miller Creek | 35 | 31 | 89% | 1859 |
| 2304 | Miramar Creek | 18 | 12 | 67% | 675 |

2011 -2012

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|------|------------------|-------------------|------------------------|-------------------------------------|--------------------------------|
| 2235 | New Castle Creek | 35 | 30 | 86% | 1416 |
| 2252 | Hogan Creek | 47 | 31 | 66% | 550 |
| 2256 | Deer Creek | 37 | 22 | 59% | 334 |
| 2287 | Miller Creek | 48 | 38 | 79% | 1878 |
| 2304 | Miramar Creek | 17 | 16 | 94% | 1629 |

2010 -2011

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|------|------------------|-------------------|------------------------|-------------------------------------|--------------------------------|
| 2235 | New Castle Creek | 25 | 13 | 52% | 373 |
| 2252 | Hogan Creek | 34 | 32 | 94% | 1178 |
| 2256 | Deer Creek | 32 | 13 | 41% | 197 |
| 2287 | Miller Creek | 34 | 30 | 88% | 4446 |
| 2304 | Miramar Creek | 25 | 11 | 44% | 252 |

Lower St. Johns River Tributary II Fecal Coliform BMAP Monitoring (Trib BMAP II)

Objectives

This BMAP, adopted in August 2010, is for 15 tributaries in Duval County. These 15 WBIDs include: Blockhouse Creek (2207), Cormorant Branch (2381), Craig Creek (2297), Deep Bottom Creek (2361), Fishing Creek (2324), Greenfield Creek (2240), Hopkins Creek (2266), McCoy Creek (2257), Moncrief Creek (2228), Pottsburg Creek (2265B), Sherman Creek (2227), Trout River downstream (2203A), Middle Trout River (2203), Williamson Creek (2316), and Wills Branch (2282). The City of Jacksonville has agreed to monitor in five of these tributaries: Fishing Creek, Deep Bottom Creek, Hopkins Creek, Sherman Creek, and Cormorant Branch. The purpose of the monitoring program is to search for and eliminate sources of bacterial contamination, and to measure improvements in fecal coliform levels that may be attributed the various BMAP projects implemented by stakeholders.

Constituents

As described in the monitoring plan for this BMAP the constituents include:

Field Measurements:

Water Temperature

pH

Specific Conductance

Dissolved Oxygen (D.O.)

Secchi Depth

Total Stream Depth

Sample Depth

Meteorological Data

Laboratory Analyses:

Fecal Coliform Bacteria

Additional field observations include stream appearance, tidal condition, visual oil & grease, and canopy cover.

Methodology

Field water quality measurements are collected and logged with a multi-parameter surface water quality meter (MANTA2 multiprobe with optical HDO sensor and Archer hand held display) or comparable multi-parameter instrument. Water samples are collected as surface water grab samples.

Frequency

All City of Jacksonville fecal coliform BMAP sampling is being conducted on a monthly frequency (even though the BMAP document allows some sites to be sampled quarterly). When fecal coliform results exceed 5000 cfu/100 ml follow-up sampling is implemented in an effort to identify a source for the elevated results. All follow-up results are tracked independently and are not entered into STORET.

Stations

Table 9. City of Jacksonville Tributary Group II BMAP Monitoring Stations (18)

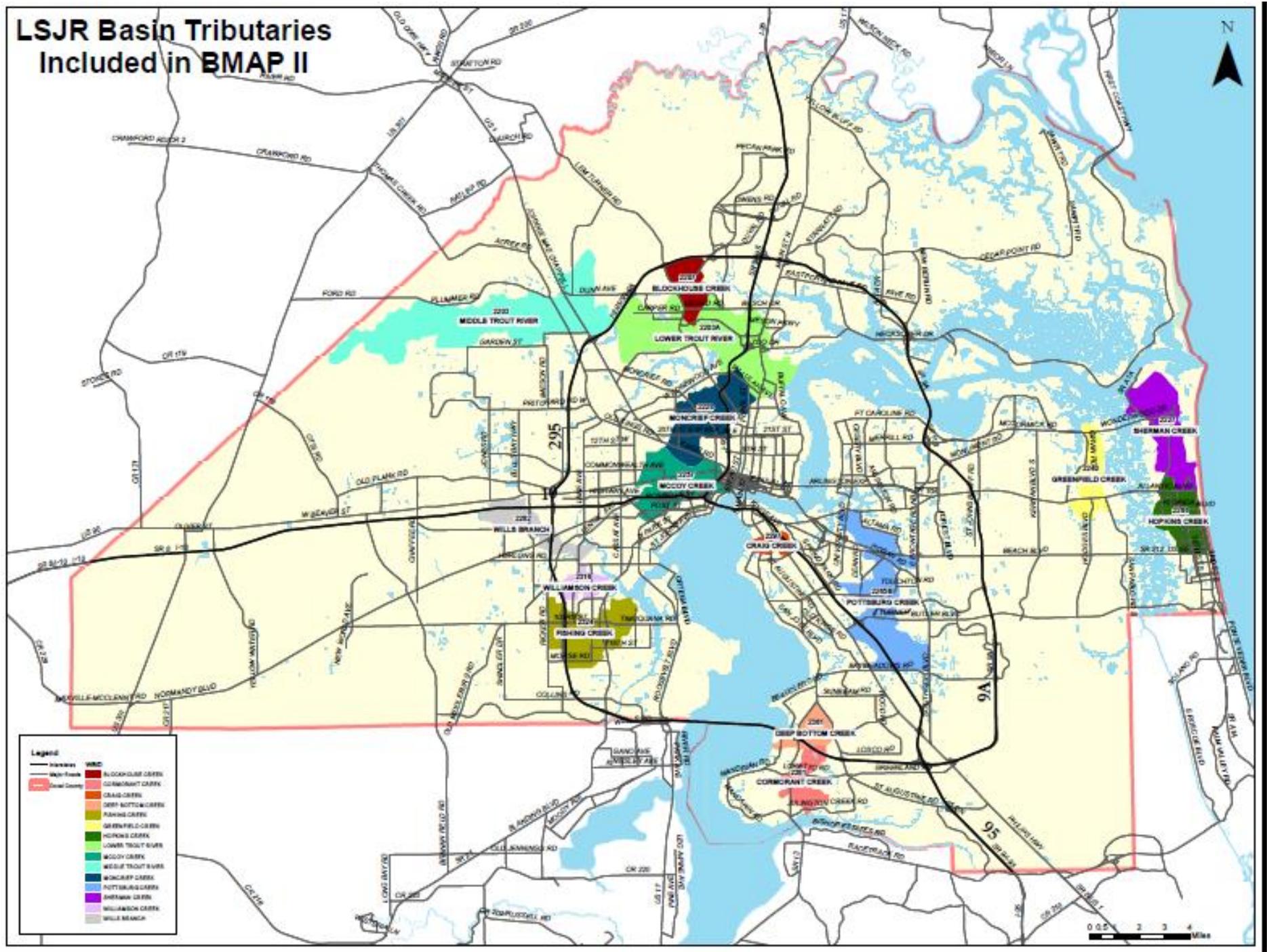
| PCODE | WBID | LOCATION | LAT-Dec | LONG-Dec | Stream Name |
|---------------------|------|--|----------|----------|-------------------|
| COAB4 | 2227 | Sherman Creek, East Channel at 20th Street. This site was moved. | 30.35302 | 81.4072 | Sherman Creek |
| COAB3 | 2227 | Puckett Creek at Assissi Lane | 30.35364 | 81.41812 | Sherman Creek |
| COAB2 | 2227 | Sherman Creek, West Channel at Fleet Landing Blvd. | 30.35359 | 81.41286 | Sherman Creek |
| SC1 * | 2227 | Puckett Creek at Wonderwood Dr. | 30.3665 | 81.42319 | Sherman Creek |
| IWW2 * | 2227 | Sherman Creek at A1A (Mayport Rd.) | 30.37115 | 81.43194 | Sherman Creek |
| COAB1 | 2266 | Hopkins Creek, North Branch at Atlantic Blvd. | 30.32459 | 81.4129 | Hopkins Creek |
| CONB1 | 2266 | Hopkins Creek Main Channel at Penman Rd. | 30.3099 | 81.40705 | Hopkins Creek |
| IWWH * | 2266 | Hopkins Creek at Kings Rd. | 30.30924 | 81.41693 | Hopkins Creek |
| OR94 | 2324 | Fishing Creek Near Confluence with Ortega River | 30.25946 | 81.72773 | Fishing Creek |
| OR118 | 2324 | Fishing Creek, South Branch at 118th Street | 30.23371 | 81.74317 | Fishing Creek |
| OR8W | 2324 | Fishing Creek, North Branch at Jammes Rd. | 30.24036 | 81.74741 | Fishing Creek |
| OR4 * | 2324 | Fishing Creek at Timuquana Rd. | 30.24732 | 81.73386 | Fishing Creek |
| DBPine ⁺ | 2361 | Deep Bottom Creek Channel Near Headwaters | 30.19479 | 81.61239 | Deep Bottom Creek |
| DBHartE | 2361 | | | | Deep Bottom Creek |
| DBHartW | 2361 | Deep Bottom Creek, Northwest Branch at Hartley Rd. | 30.18398 | 81.62444 | Deep Bottom Creek |
| SS18 * | 2361 | Deep Bottom Creek at Scott Mill Rd. | 30.17881 | 81.63803 | Deep Bottom Creek |
| JC437 | 2381 | Cormorant Branch at Marbon Rd. | 30.14928 | 81.62829 | Cormorant Branch |
| JC2A | 2381 | Cormorant Branch at Heather Grove Lane | 30.15846 | 81.62934 | Cormorant Branch |
| JC15* | 2381 | Cormorant Branch at Julington Creek Rd. | 30.14045 | 81.62177 | Cormorant Branch |

Denotes new site

* Denotes Routine Tributary Site and BMAP site.

⁺ Denotes deleted site.

LSJR Basin Tributaries Included in BMAP II



Legend

- Interstate
- Major Freeway
- Local County
- Blockhouse Creek
- Concomant Creek
- Craig Creek
- Deep Bottom Creek
- Fishing Creek
- Greenfield Creek
- Hopkins Creek
- Lower Trout River
- Woody Creek
- Middle Trout River
- Moncrief Creek
- Pottsville Creek
- Sherman Creek
- Williamson Creek
- Hills Branch

2013/2014 TRIBUTARY GROUP II FECAL COLIFORM BMAP COJ DATA (Trib BMAP II):
 The surface water quality data (temperature, pH, specific conductance, dissolved oxygen, percent saturation of dissolved oxygen and fecal coliform bacteria) are located in Table 10.

Table 10 BMAP II Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|-------------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2361 | Deep Bottom Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| DBHARTE | 6/26/2013 | 27.77 | 6.33 | 276.2 | 2.83 | 36.3 | 1100 |
| DBHARTW | 6/26/2013 | 27.91 | 6.36 | 267.3 | 0.42 | 38.6 | 2900 |
| SS18 | 6/26/2013 | 27.82 | 6.72 | 293 | 4.31 | 55.4 | 950 |
| SS18 | 7/1/2013 | 26.73 | 6.79 | 257.9 | 5.01 | 63 | 400 |
| SS18 | 8/1/2013 | 27.38 | 6.79 | 195.3 | 5.31 | 67.5 | 6000 |
| DBHARTE | 9/11/2013 | 26.44 | 6.49 | 290.5 | 1.44 | 18 | 560 |
| DBHARTW | 9/11/2013 | 27.15 | 6.52 | 279.7 | 2.1 | 26.6 | 1900 |
| SS18 | 9/11/2013 | 26.84 | 6.78 | 278.7 | 3.08 | 38.8 | 2400 |
| DBHARTE | 10/10/2013 | 21.62 | 7.39 | 233.3 | 6.43 | 73.6 | 2300 |
| DBHARTW | 10/10/2013 | 23.57 | 6.62 | 249.7 | 6.61 | 78.5 | 5400 |
| SS18 | 10/10/2013 | 23.3 | 6.89 | 265.4 | 6.42 | 75.9 | 2300 |
| SS18 | 11/18/2013 | 21.38 | 7.21 | 336 | 2.76 | 31.2 | 1081 |
| SS18 | 12/16/2013 | 16.15 | 7.29 | 264.9 | 7.18 | 73.5 | 1532 |
| DBHARTE | 1/16/2014 | 14.23 | 7.54 | 512 | | | 520 |
| DBHARTW | 1/16/2014 | 14.53 | 7.13 | 423 | | | 1500 |
| SS18 | 1/16/2014 | 14.41 | 7.75 | 808 | | | 870 |
| DBHARTE | 2/5/2014 | 20.4 | 7.3 | 239.9 | 4.72 | 52.7 | 1600 |
| DBHARTW | 2/5/2014 | 20.35 | 7.39 | 153 | 6.59 | 73.6 | 6000 |
| DBHARTE | 3/11/2014 | | | | | | 270 |
| DBHARTW | 3/11/2014 | | | | | | 2500 |
| SS18 | 3/11/2014 | | | | | | 721 |
| DBHARTE | 4/2/2014 | 18.5 | 7.53 | 251.8 | 4.32 | 46.4 | 280 |
| DBHARTW | 4/2/2014 | 19.64 | 7.5 | 258.1 | 4.24 | 46.7 | 2000 |
| SS18 | 4/2/2014 | 18.97 | 7.35 | 246.4 | 6.53 | 70.8 | 310 |
| DBHARTE | 5/5/2014 | 21 | 7.07 | 218.6 | 3.66 | 41.3 | 450 |
| DBHARTW | 5/5/2014 | 22.05 | 7.06 | 280.8 | 2.76 | 31.3 | 3700 |
| SS18 | 5/5/2014 | 20.77 | 6.93 | 370.2 | 4.85 | 54.6 | 180 |
| Percent Compliance | | | | | 38% | | 33% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 10. BMAP 2 Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|------------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2381 | Cormorant Branch | | | | | | Fecal Coliform (CFU/100mL) |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | |
| JC15 | 6/13/2013 | 26.74 | 6.45 | 278.7 | 2.52 | 31.7 | 991 |
| JC2A | 6/13/2013 | 27.27 | 6.81 | 270.1 | 3.81 | 48.5 | 180 |
| JC437 | 6/13/2013 | 26.73 | 6.6 | 243.8 | 3.76 | 47.3 | 991 |
| JC15 | 7/24/2013 | 25.47 | 6.56 | 266.8 | 2.89 | 35.6 | 2800 |
| JC2A | 7/24/2013 | 25.46 | 6.77 | 256.5 | 4.78 | 58.8 | 2200 |
| JC437 | 7/24/2013 | 25.23 | 6.88 | 230.9 | 5.34 | 65.4 | 2400 |
| JC15 | 8/26/2013 | 25.32 | 6.39 | 243.6 | 2.16 | 26.5 | 721 |
| JC2A | 8/26/2013 | 25.94 | 6.65 | 268.2 | 3.92 | 49 | 450 |
| JC15 | 9/11/2013 | 27.34 | 6.55 | 395.9 | 2.03 | 25.9 | 480 |
| JC2A | 9/11/2013 | 26.39 | 6.99 | 232.2 | 4.26 | 53.3 | 600 |
| JC437 | 9/11/2013 | 25.72 | 6.83 | 228.4 | 4.31 | 53.3 | 730 |
| JC15 | 10/16/2013 | 23.4 | 6.91 | 668.4 | 6.66 | 78.9 | 1 |
| JC2A | 10/16/2013 | 22.29 | 6.94 | 278.6 | 5.9 | 68.4 | 1622 |
| JC437 | 10/16/2013 | 21.91 | 6.95 | 258.9 | 5.65 | 65 | 1081 |
| JC15 | 11/18/2013 | 20.75 | 7.26 | 432 | 4.84 | 54.1 | 270 |
| JC2A | 11/18/2013 | 21.29 | 7.34 | 318 | 6.91 | 78.1 | 811 |
| JC15 | 12/16/2013 | 15.62 | 6.85 | 238.9 | 3.58 | 36.3 | 631 |
| JC2A | 12/16/2013 | 14.5 | 7.27 | 269.5 | 6.41 | 63.4 | 721 |
| JC437 | 12/16/2013 | 13.75 | 7.26 | 246.3 | 6.73 | 65.4 | 631 |
| JC2A | 1/16/2014 | | | | | | 280 |
| JC437 | 1/16/2014 | 14.27 | 7.59 | 425 | | | 270 |
| JC15 | 1/22/2014 | | | | | | 90 |
| JC15 | 2/5/2014 | 19.09 | 6.97 | 268.6 | 3.03 | 32.9 | 210 |
| JC2A | 2/5/2014 | 18.96 | 7.01 | 305.5 | 5.23 | 56.8 | 200 |
| JC437 | 2/5/2014 | 19.13 | 7 | 267.2 | 4.75 | 51.8 | 170 |
| JC15 | 3/20/2014 | 15.41 | 7.72 | 233 | 4.31 | 43.5 | 300 |
| JC2A | 3/20/2014 | 17.02 | 7.41 | 257.8 | 7.84 | 81.8 | 250 |
| JC437 | 3/20/2014 | 16.15 | 7.57 | 234.9 | 6.65 | 68.1 | 82 |
| JC15 | 4/2/2014 | 20.98 | 7.01 | 194.4 | 5.58 | 63 | 17 |
| JC2A | 4/2/2014 | 19.52 | 7.04 | 250.6 | 5.76 | 63.2 | 180 |
| JC437 | 4/2/2014 | 19.08 | 7 | 231.1 | 5.7 | 62.1 | 98 |
| JC15 | 5/12/2014 | 22.66 | 6.79 | 183.2 | 3.72 | 43.3 | 4500 |
| JC2A | 5/12/2014 | 24.49 | 6.9 | 238.7 | 4.15 | 50.1 | 2900 |
| JC437 | 5/12/2014 | 23.85 | 6.88 | 207.9 | 4.86 | 58 | 2200 |
| Percent Compliance | | | | | 42% | | 68% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 10. BMAP 2 Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | | |
|---------------|---------------|--------------------|------|----------------|-------------|-------------|-------|----------------------------|
| 2227 | Sherman Creek | | | | | | | Fecal Coliform (CFU/100mL) |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | | |
| COAB2 | 6/11/2013 | 28.31 | 6.64 | 882 | 3.21 | 41.6 | 90 | |
| COAB3 | 6/11/2013 | 25.17 | 6.45 | 446.6 | 1.79 | 21.9 | 1171 | |
| COAB4LS | 6/11/2013 | 26.25 | 7.06 | 903.6 | 1.43 | 17.9 | 541 | |
| IWW2 | 6/11/2013 | 29.26 | 7.52 | 25764 | 0.43 | 6.1 | 90 | |
| SC1 | 6/11/2013 | 28.83 | 7.08 | 20020 | 4.09 | 57 | 180 | |
| COAB2 | 7/22/2013 | 27.5 | 6.84 | 971.8 | 3.35 | 42.9 | 1532 | |
| COAB3 | 7/22/2013 | 25.37 | 6.83 | 630.8 | 2.2 | 27 | 2700 | |
| IWW2 | 7/22/2013 | 29.66 | 7.14 | 32870 | 4.47 | 66.3 | 180 | |
| SC1 | 7/22/2013 | 29.17 | 6.87 | 24076 | 3.06 | 43.5 | 1261 | |
| SC3 | 7/22/2013 | 27.24 | 7.14 | 5333 | 2.82 | 36.3 | 901 | |
| COAB2 | 8/8/2013 | 29.08 | 6.72 | 913.1 | 3.6 | 47.3 | 180 | |
| COAB3 | 8/8/2013 | 26.82 | 6.94 | 571.4 | 3.02 | 38.1 | 2500 | |
| IWW2 | 8/8/2013 | 30.19 | 7.67 | 44386 | 6.38 | 99.8 | 90 | |
| SC1 | 8/8/2013 | 30.89 | 6.99 | 30955 | 3.9 | 58.5 | 901 | |
| COAB2 | 9/12/2013 | 27.38 | 6.8 | 886.6 | 0.4 | 5.1 | 440 | |
| COAB3 | 9/12/2013 | 26.44 | 7.35 | 913.1 | 3.39 | 42.5 | 30000 | |
| IWW2 | 9/12/2013 | 28.95 | 7.05 | 36572 | 4.52 | 67.2 | 49 | |
| SC1 | 9/12/2013 | 28.05 | 6.88 | 28843 | 0.89 | 12.7 | 820 | |
| COAB3 | 10/3/2013 | 24.36 | 7.1 | 15034 | 3.8 | 48.1 | 1802 | |
| IWW2 | 10/3/2013 | 25.87 | 7.21 | 35399 | 6.68 | 93.8 | 1 | |
| SC1 | 10/3/2013 | 25.8 | 6.99 | 33343 | 3.76 | 52.3 | 360 | |
| COAB2 | 10/21/2013 | 24.87 | 6.66 | 916 | 7.73 | 94.2 | 811 | |
| COAB2 | 11/25/2013 | 18.36 | 7.34 | 1436 | 8.16 | 87.2 | 450 | |
| COAB3 | 11/25/2013 | 15.78 | 7.41 | 1013 | 5.58 | 66.6 | 2100 | |
| IWW2 | 11/25/2013 | 18.06 | 6.43 | 39821 | 5.26 | 77.1 | 1 | |
| SC1 | 11/25/2013 | 16.44 | 6 | 28476 | 8.35 | 95 | 360 | |
| COAB2 | 12/9/2013 | 21.64 | 7.13 | 1530 | 5.12 | 58.4 | 1441 | |
| COAB3 | 12/9/2013 | 18.75 | 7.31 | 1381 | 6.3 | 67.9 | 1441 | |
| IWW2 | 12/9/2013 | 23.76 | 7.06 | 33866 | 6.41 | 85.6 | 90 | |
| SC1 | 12/9/2013 | 20.08 | 6.82 | 28866 | 4.96 | 59.4 | 270 | |
| SC3 | 12/9/2013 | 20.13 | 6.56 | 27124 | 4.91 | 59.8 | 270 | |
| COAB2 | 1/23/2014 | 10.91 | 7.42 | 431 | | | 180 | |
| COAB3 | 1/23/2014 | 10.71 | 7.12 | 431 | | | 991 | |
| COAB4LS | 1/23/2014 | 11.41 | 7.49 | 427 | | | 270 | |
| IWW2 | 1/23/2014 | 12.59 | 6.54 | 14325 | | | 1 | |
| SC1 | 1/23/2014 | 12.41 | 6.59 | 11239 | | | 1 | |
| COAB2 | 2/6/2014 | 16.37 | 8.02 | 1639 | 5.86 | 60.5 | 30 | |
| COAB3 | 2/6/2014 | | | | | | 1 | |
| COAB4LS | 2/6/2014 | 14.86 | | 1121 | 4.13 | 41.2 | 62 | |
| IWW2 | 2/6/2014 | 14.61 | 7.07 | 35525 | 7.81 | 88.8 | 10 | |

Table 10. BMAP 2 Program. June 1, 2012 – May 31, 2013

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|----------------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2227 | Sherman Creek | (continued) | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| SC1 | 2/6/2014 | 14.88 | 7.28 | 11765 | 6.43 | 66.7 | 46 |
| SC3 | 2/6/2014 | 14.47 | 7.69 | 2105 | 6.46 | 64.2 | 150 |
| COAB2 | 3/12/2014 | | | | | | 1622 |
| COAB3 | 3/12/2014 | | | | | | 1171 |
| COAB4LS | 3/12/2014 | | | | | | 1 |
| IWW2 | 3/12/2014 | | | | | | 1 |
| SC1 | 3/12/2014 | | | | | | 1 |
| COAB2 | 4/16/2014 | 18.36 | 6.9 | 1188 | 5.43 | 58.4 | 90 |
| COAB3 | 4/16/2014 | 15.13 | 6.86 | 410 | 2.75 | 27.6 | 2800 |
| COAB4LS | 4/16/2014 | 16.34 | 8.28 | 912.9 | 1.85 | 19.1 | 450 |
| IWW2 | 4/16/2014 | 19.69 | 7.19 | 40119 | 8.95 | 103.1 | 1 |
| SC1 | 4/16/2014 | 18.12 | 7.13 | 28904 | 6.23 | 74.8 | 90 |
| SC3 | 4/16/2014 | 19.02 | 7.2 | 27902 | 5.18 | 62.3 | 90 |
| COAB2 | 5/13/2014 | 25.1 | | 1042 | | | 1261 |
| COAB3 | 5/13/2014 | 23.61 | 6.54 | 1155 | 2.48 | 29.5 | 2900 |
| COAB4LS | 5/13/2014 | 24.4 | 8.6 | 779.9 | 1.01 | 12.2 | 1 |
| IWW2 | 5/13/2014 | 27.95 | 7.35 | 32473 | 4.81 | 69.5 | 90 |
| SC1 | 5/13/2014 | 27.55 | 7.3 | 24332 | 2.83 | 32.1 | 721 |
| Percent Compliance | | | | | 52% | | 66% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 10. BMAP 2 Program. June 1, 2012 – May 31, 2013

Red denotes violation of Class III Surface Water Quality Standards

Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|---------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2266 | Hopkins Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| COAB1 | 6/18/2013 | 28.17 | 6.54 | 433 | 4.81 | 62.2 | 631 |
| CONB1 | 6/18/2013 | 27.51 | 6.92 | 2439 | 5.21 | 66.9 | 2500 |
| IWWH | 6/18/2013 | 28.95 | 7.15 | 15458 | 9.08 | 124.9 | 1712 |
| COAB1 | 7/9/2013 | 28.94 | 6.52 | 452.3 | 3.01 | 39.4 | 1351 |
| CONB1 | 7/9/2013 | 27.57 | 6.87 | 3613 | 3.42 | 44.1 | 1171 |
| IWWH | 7/9/2013 | 29.7 | 7 | 27697 | 4.54 | 66 | 1 |
| COAB1 | 8/14/2013 | 28.79 | 6.75 | 503.8 | 2.61 | 34.1 | 931 |
| CONB1 | 8/14/2013 | 28.98 | 7.01 | 5046 | 5.2 | 69.2 | 901 |
| COAB1 | 9/12/2013 | 26.75 | 7.05 | 283.2 | 4.79 | 60.3 | 42000 |
| CONB1 | 9/12/2013 | 26.21 | 7.3 | 543.5 | 5.95 | 74.2 | 50000 |
| IWWH | 9/12/2013 | 29.32 | 7.1 | 31198 | 4.88 | 71.6 | 480 |
| COAB1 | 10/2/2013 | 24.42 | 7.31 | 2347 | 2.76 | 33.5 | 2700 |
| CONB1 | 10/2/2013 | 24.45 | 6.94 | 18334 | 3.3 | 42.8 | 631 |
| IWWH | 10/2/2013 | 25.14 | 7.05 | 33653 | 4.79 | 65.9 | 300 |
| COAB1 | 11/25/2013 | 16.88 | 7.52 | 1868 | 9.18 | 94.3 | 1532 |
| CONB1 | 11/25/2013 | 18.47 | 7.01 | 5591 | 6.23 | 67.7 | 1622 |
| IWWH | 11/25/2013 | 16.55 | 5.9 | 28794 | 6.21 | 70.9 | 721 |
| COAB1 | 12/17/2013 | 14.53 | 6.83 | 972.2 | 3.93 | 39 | 1712 |
| CONB1 | 12/17/2013 | 14.79 | 7.19 | 25698 | 5.45 | 59.6 | 901 |
| IWWH | 12/17/2013 | 16.22 | 7.79 | 29555 | 7.5 | 85.8 | 1 |
| COAB1 | 1/23/2014 | 10.69 | 6.91 | 1041 | | | 360 |
| CONB1 | 1/23/2014 | 12.03 | 7.42 | 7029 | | | 1351 |
| IWWH | 1/23/2014 | 11.47 | 6.99 | 15441 | | | 991 |
| COAB1 | 2/13/2014 | 12.85 | 7.46 | 10130 | 6.14 | 60.6 | 1171 |
| CONB1 | 2/13/2014 | 13.02 | 7.29 | 17556 | 7 | 71.4 | 1171 |
| IWWH | 2/13/2014 | 12.18 | 7.15 | 34037 | 8.01 | 86 | 1 |
| COAB1 | 3/26/2014 | 14.04 | 7.06 | 436.1 | 11.53 | 97.5 | 1441 |
| CONB1 | 3/26/2014 | 14.59 | 7.2 | 2383 | 6.39 | 63.7 | 4300 |
| IWWH | 3/26/2014 | 14.5 | 6.82 | 19737 | 6.7 | 71.1 | 1081 |
| COAB1 | 4/14/2014 | 22.55 | 6.82 | 482.6 | 3.91 | 45.5 | 1400 |
| CONB1 | 4/14/2014 | 22.9 | 6.8 | 24037 | 4.74 | 60.3 | 420 |
| IWWH | 4/14/2014 | 22.9 | 6.64 | 27625 | 6.21 | 80.2 | 33 |
| COAB1 | 5/8/2014 | 25.37 | 7.43 | 432.3 | 1.86 | 20.9 | 450 |
| CONB1 | 5/8/2014 | 24.92 | 7.14 | 6213 | 3.91 | 48.5 | 1081 |
| IWWH | 5/8/2014 | 24.2 | 6.85 | 19112 | 3.09 | 40.6 | 270 |
| Percent Compliance | | | | | 59% | | 37% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

Table 10. BMAP 2 Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------|---------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2324 | Fishing Creek | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| OR118 | 6/5/2013 | 26.43 | | 340.5 | | | 951 |
| OR4 | 6/5/2013 | 26.39 | | 338.5 | | | 721 |
| OR8W | 6/5/2013 | 24.32 | | 181.1 | | | 450 |
| OR94 | 6/5/2013 | 28.67 | | 3503 | | | 901 |
| OR118 | 7/1/2013 | 25.64 | 6.93 | 180.9 | 4.35 | 53.7 | 210 |
| OR4 | 7/1/2013 | 26.52 | 6.63 | 325.5 | 4.33 | 54.3 | 1400 |
| OR8W | 7/1/2013 | 27.35 | 7.56 | 330.2 | 9.22 | 117.4 | 780 |
| OR94 | 7/1/2013 | 28.38 | 6.8 | 2060 | 4.87 | 63.4 | 66 |
| OR110 | 8/13/2013 | 26.6 | 6.61 | 221.1 | 3.19 | 40.1 | 270 |
| OR118 | 8/13/2013 | 26.34 | 6.73 | 207.3 | 4.11 | 51.3 | 270 |
| OR4 | 8/13/2013 | 28.81 | 6.78 | 246.5 | 4.98 | 65 | 8182 |
| OR8 | 8/13/2013 | 28.58 | 6.98 | 248.5 | 6.8 | 88.5 | 2000 |
| OR8W | 8/13/2013 | 27.89 | 6.95 | 254.1 | 6.15 | 79 | 5946 |
| OR9 | 8/13/2013 | 27.33 | 6.93 | 196.1 | 3.69 | 46.9 | 1171 |
| OR94 | 8/13/2013 | 31.78 | 6.89 | 1097 | 5.46 | 75.2 | 90 |
| OR118 | 9/4/2013 | 26.82 | 6.4 | 181.2 | 4.11 | 51.9 | 1622 |
| OR4 | 9/4/2013 | 28.43 | 6.9 | 287 | 4.75 | 61.6 | 1892 |
| OR8W | 9/4/2013 | 28.35 | 7.1 | 320.5 | 7.37 | 95.5 | 2000 |
| OR94 | 9/4/2013 | 29.85 | 7.09 | 782.9 | 5.47 | 72.8 | 90 |
| OR110 | 10/15/2013 | 21.3 | 6.5 | 229.3 | 9.78 | 111.2 | 2800 |
| OR118 | 10/15/2013 | 20.43 | 6.3 | 199.4 | 5.39 | 60.2 | 541 |
| OR4 | 10/15/2013 | 22.05 | 6.75 | 747.5 | 8.89 | 102.7 | 4300 |
| OR8 | 10/15/2013 | 21.53 | 7.02 | 293.9 | 10.07 | 115 | 2800 |
| OR8W | 10/15/2013 | 20.38 | 6.86 | 0.1 | 5.28 | 58.9 | 4600 |
| OR9 | 10/15/2013 | 21.19 | 7.03 | 252.9 | 9.66 | 109.6 | 8919 |
| OR94 | 10/15/2013 | 23.75 | 7.1 | 4477 | 10.58 | 127.8 | 631 |
| OR118 | 11/14/2013 | 10.48 | 7.43 | 461 | 4.15 | 37.3 | 180 |
| OR4 | 11/14/2013 | 15.53 | 7.17 | 433 | 8.47 | 85 | 270 |
| OR8W | 11/14/2013 | 11.53 | 7.78 | 288 | 13.18 | 121.1 | 270 |
| OR94 | 11/14/2013 | 14.57 | 7.45 | 3567 | 8.07 | 80.2 | 90 |
| OR118 | 12/5/2013 | 18.03 | 7.2 | 777 | 9.03 | 95.6 | 991 |
| OR4 | 12/5/2013 | 18.35 | 6.68 | 2018 | 7.98 | 83 | 360 |
| OR8W | 12/5/2013 | 18.09 | 7.08 | 750 | 6.65 | 70.5 | 180 |
| OR94 | 12/5/2013 | 17.57 | 6.79 | 7120 | 7.54 | 80.8 | 450 |
| OR110 | 1/21/2014 | 11.49 | 7.39 | 435 | | | 450 |
| OR118 | 1/21/2014 | 10.68 | 7.75 | 898 | | | 721 |
| OR4 | 1/21/2014 | 11.57 | 7.79 | 714 | | | 2100 |
| OR8 | 1/21/2014 | 12.41 | 7.42 | 524 | | | 4700 |
| OR8W | 1/21/2014 | 10.51 | 7.51 | 754 | | | 4700 |

Table 10. BMAP 2 Program. June 1, 2013 – May 31, 2014

Red denotes violation of Class III Surface Water Quality Standards
Green Specific Conductance denotes Marine Water

| Water Body ID | Waterbody | Water Quality Data | | | | | |
|---------------------------|----------------------------------|--------------------|------|----------------|-------------|-------------|----------------------------|
| 2324 | Fishing Creek (continued) | | | | | | |
| Station | DATE | Temp © | pH | Specific Cond. | D.O. (mg/L) | D.O. % Sat. | Fecal Coliform (CFU/100mL) |
| OR9 | 1/21/2014 | 11.1 | 7.64 | 522 | | | 360 |
| OR94 | 1/21/2014 | 12.11 | 7.72 | 900 | | | 1 |
| OR118 | 2/12/2014 | 12.52 | 7.77 | 299.6 | 5.08 | 48 | 20 |
| OR4 | 2/12/2014 | 14.61 | 7.77 | 527.1 | 7.69 | 76.2 | 460 |
| OR8W | 2/12/2014 | 13.14 | 7.71 | 216.9 | 10.75 | 103 | 360 |
| OR94 | 2/12/2014 | 14.41 | 7.43 | 5115 | 8.57 | 86 | 150 |
| OR118 | 3/3/2014 | 21.97 | 7.18 | | 8.79 | 101.1 | 1 |
| OR4 | 3/3/2014 | 17.94 | 7.61 | 248.4 | 8.53 | 90.7 | 180 |
| OR8W | 3/3/2014 | 18.4 | 7.49 | 219.9 | | | 90 |
| OR94 | 3/3/2014 | 18.38 | 7.18 | 3419 | 8.24 | 89.3 | 180 |
| OR110 | 4/7/2014 | 21.38 | 7.16 | 216.4 | 4.66 | 53 | 270 |
| OR118 | 4/7/2014 | 20.72 | 7.17 | 265 | 3.05 | 34.3 | 1 |
| OR4 | 4/7/2014 | 22 | 7.21 | 244 | 2.81 | 244 | 160 |
| OR8 | 4/7/2014 | 20.94 | 7.35 | 273.8 | 6.94 | 78.5 | 811 |
| OR8W | 4/7/2014 | 21.79 | 7.22 | 225 | 9.95 | 114.2 | 180 |
| OR9 | 4/7/2014 | 21.27 | 7.19 | 274.2 | 5.91 | 63.8 | 270 |
| OR94 | 4/7/2014 | 23.28 | 7.08 | 327.7 | 5.19 | 61.3 | 1 |
| OR118 | 5/7/2014 | 22.4 | 7.35 | 289.5 | 4.04 | 46.9 | 90 |
| OR4 | 5/7/2014 | 23 | 7.62 | 1163 | 7.62 | 56.2 | 1261 |
| OR8W | 5/7/2014 | 23.65 | 7.45 | 192.4 | 9.61 | 114.7 | 270 |
| OR94 | 5/7/2014 | 25.09 | 8.5 | 6562 | 6.23 | 77.7 | 90 |
| Percent Compliance | | | | | 71% | | 65% |

Notes:

*Dissolved Oxygen (D.O.) compliance for this table is set at greater than or equal to 4.0 mg/L for saltwater; greater than or equal to 5.0 mg/L for freshwater.

**Fecal coliform compliance is less than or equal to 800 colony forming units/100ml.

**DISCUSSION OF FECAL COLIFORM MONITORING TRIBUTARY II BMAP
(Trib BMAP II):**

As mentioned in the BMAP I Section, the objective of the BMAP monitoring effort is twofold: 1. To track fecal coliform water quality improvements resulting from implementation of a variety of projects within each BMAP WBID, and 2. To identify hotspots and then follow-up with additional sampling and investigations so that new or problematic sources will be identified and corrective measures taken by appropriate stakeholders.

The City of Jacksonville's fecal coliform BMAP II monitoring results are summarized in Table 11. As in the discussion for BMAP I results, we have again calculated the percent of samples in each WBID that are greater than 400 cfu/100 ml and the geometric mean for each basin. Once again, all five BMAP II WBIDs being monitored by the City had exceedances greater than 10 percent. The data reveals no real improvements yet between the three years.

The worst basin this year was Deep Bottom Creek with 81 % of samples greater than 400 cfu/100 ml and a geometric mean of 1202. (This was very similar to the last two years of data). Sherman Creek had the lowest percent of samples above 400 at 43%. The basin with the lowest geometric mean was also Sherman Creek with 143 cfu/100 ml. Unlike the BMAP I tributaries, almost all geometric means for the 5 BMAP II tributaries for all three years, are below 1000, the only exception being Deep Bottom Creek for this year.

Table 11. Tributary Group 2 Fecal Coliform BMAP COJ Data Summary. Sampling effort, number of samples exceeding the 400 cfu/100 mL state standard for impairment designation and geometric means.

2013-2014

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|-------------|-------------------|--------------------------|----------------------------------|---|---------------------------------------|
| 2227 | Sherman Creek | 58 | 25 | 43% | 143 |
| 2266 | Hopkins Creek | 35 | 28 | 80% | 621 |
| 2324 | Fishing Creek | 60 | 30 | 50% | 355 |
| 2361 | Deep Bottom Creek | 27 | 22 | 81% | 1202 |
| 2381 | Cormorant Branch | 34 | 19 | 56% | 406 |

2012-2013

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|-------------|-------------------|--------------------------|----------------------------------|---|---------------------------------------|
| 2227 | Sherman Creek | 57 | 33 | 58% | 294 |
| 2266 | Hopkins Creek | 37 | 24 | 65% | 415 |
| 2324 | Fishing Creek | 47 | 26 | 55% | 463 |
| 2361 | Deep Bottom Creek | 32 | 25 | 78% | 887 |
| 2381 | Cormorant Branch | 33 | 16 | 48% | 254 |

2011 -2012

| WBID | Waterbody | Number of samples | Number > 400 cfu/100ml | Percent of samples > 400 cfu/100 ml | BMAP Geometric Mean cfu/100 ml |
|-------------|-------------------|--------------------------|----------------------------------|---|---------------------------------------|
| 2227 | Sherman Creek | 65 | 35 | 54% | 136 |
| 2266 | Hopkins Creek | 39 | 18 | 46% | 200 |
| 2324 | Fishing Creek | 29 | 19 | 66% | 453 |
| 2361 | Deep Bottom Creek | 25 | 20 | 80% | 714 |
| 2381 | Cormorant Branch | 25 | 7 | 28% | 248 |

ADDITIONAL TRIBUTARY INTENSIVE MONITORING

A large interagency effort occurred for the ten BMAP I tributaries between April and July 2014. As part of the five year assessment, Maps-on-the-Table exercises and Walk-the-WBIDs exercises were conducted on these basins. Led by DEP Tallahassee, this large effort included all stakeholders (City of Jacksonville EQD, City of Jacksonville Public Works, DEP Jacksonville, Duval County Health Department, FDOT, DACS, and JEA).

Maps-on-the-Table consisted of assembling all the various agency staff members who may have knowledge about actual physical conditions of the drainage area of each waterbody and aspects that may affect water quality and fecal coliform levels. These people gathered together and went over maps of each basin, discussing and noting anything on the maps that may require further inspection and investigation in the field. Types of information of interest included locations of the following:

- Sanitary sewer lift stations, repeat SSOs
- Neighborhoods with older sanitary sewer lines
- Failing septic system areas, soggy drain fields
- Tail pipes into ditches
- Homeless areas, homeless camps
- Dog walk areas or dog parks
- Animal kennels, dumped cat litter
- Bird rookeries
- Concentrations of geese and Muscovy ducks, areas where ducks are fed
- Farm animals, hobby farms, horses
- Wild hogs, raccoons, other wild animals
- Rotting biological material around dumpsters, open or rusty dumpsters
- Trash, garbage dumping, food waste, used diapers
- Grease behind restaurants
- Stormwater blockages such as trash and debris
- Stormwater conveyances in need of maintenance
- Overgrown ponds
- Areas prone to flooding
- Ideal breeding conditions created by low flows, sediment, and shady conditions



Trashy Storm Drain
in Miller Creek Drainage Basin



Trash in Stormwater Pond
in Hogan Creek Drainage Basin

After the Maps-on-the-Table exercise for each basin, then staff members assembled together in the field to conduct the actual Walk-the-WBID exercise for each basin, investigating the areas of concern noted previously, searching for sources of fecal coliform bacteria, either anthropogenic or natural, and the stormwater conveyances that may be impacting levels of bacteria in the streams. Detailed notes and photographs were taken for each Walk, with follow-up work conducted and being planned for all problems found. The timeline for the work is shown below:

Maps-on-the-Table Exercise

- 4/21/2014 Miller Creek, Hogan Creek, Butcher Pen Creek
- 5/19/2014 Big Fishweir Creek, Miramar Creek, Newcastle Creek
- 6/5/2014 Terrapin Creek, Open Creek, Goodbys Creek, Deer Creek

Walk-the-WBID Exercise

- 4/23/2014 Miller Creek, Hogan Creek, Butcher Pen Creek
- 5/22/2014 Miramar Creek, Newcastle Creek
- 6/19/2014 Open Creek, Terrapin Creek, Deer Creek
- 6/30/2014 Big Fishweir Creek
- 7/23/2014 Goodbys Creek

Findings of the Walk-the-WBID Exercise and efforts to remedy the problems discovered will be summarized in next year's report.



Butcher Pen Creek WBID
Ditch Inspection



Miramar Creek WBID
Waterfowl in Pond



Newcastle Creek WBID
Group Walking the Ditch



Walk-the-WBID Group[



Goodbys Creek WBID
Checking a Stormwater Ditch



Goodbys Creek WBID
JEA Lift Station Inspection



Goodbys Creek WBID
Pulling Manhole Covers

GOAL II

Measure the effectiveness of the stormwater pollution reduction measures (BMPs) that have been or will be implemented.

STORMWATER BMP EFFECTIVENESS

To accomplish this monitoring goal the City of Jacksonville proposed to conduct effectiveness monitoring for four separate storm water pollution reduction measures when implemented. The City has completed construction on all four of these projects: Upper Deer Creek, Cedar River Outfall, Pine Forest (completed March 2012), and Woodland Acres (completed October 2009).

Upper Deer Creek Regional Stormwater Facility BMP Effectiveness Monitoring

The Upper Deer Creek Regional Stormwater Facility monitoring (three phases) was complete and results reported (with the final report by CDM Smith attached) in the 2011/2012 annual report.



Deer Creek Regional Stormwater Pond

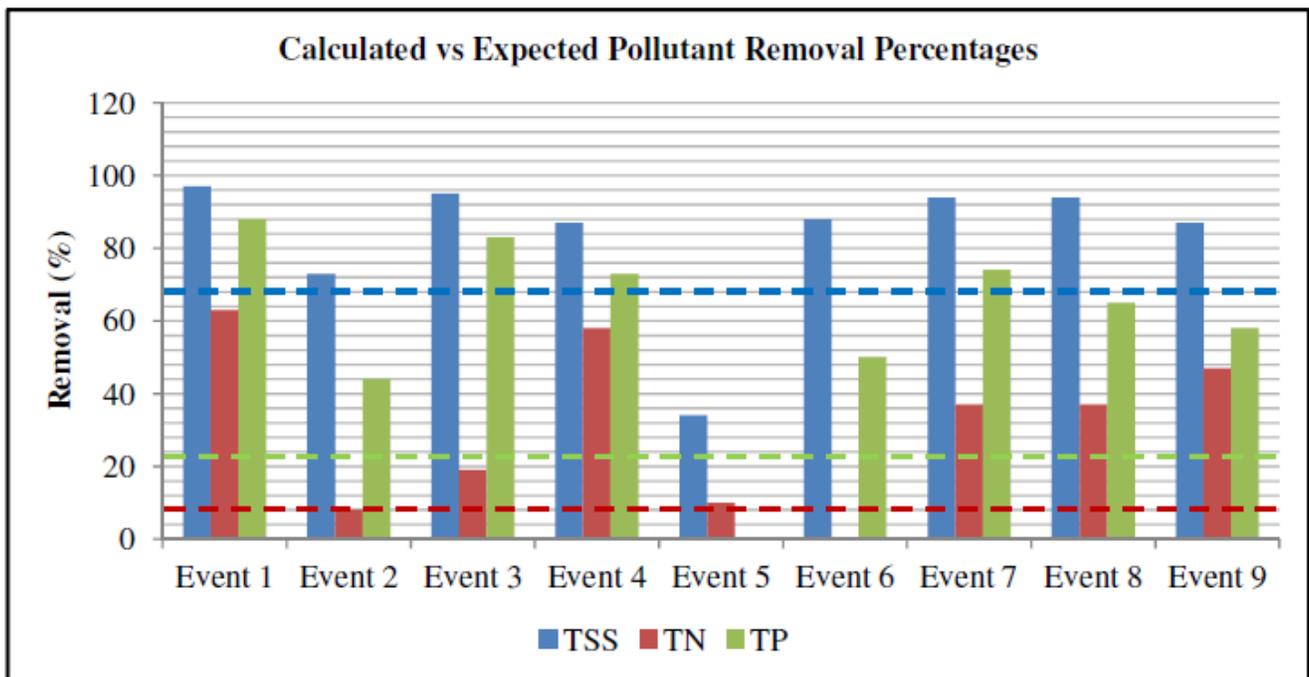
Cedar River Outfall Regional Stormwater Wet Detention Facility BMP Effectiveness Monitoring

The Cedar River Outfall Regional Stormwater wet detention facility was planned by the City of Jacksonville to control the loading of contaminants to the Cedar River.



Cedar River Regional Stormwater Pond

The Cedar River Outfall Regional Stormwater wet detention facility construction was completed in January 2008. The completion of the monitoring program occurred in October 2012, under the direction of CDM Smith and the University of North Florida. The final report for the Monitoring Program was attached to last year's Annual report.



Pine Forest and Woodland Acres BMP Effectiveness Monitoring

The Monitoring Plan component for stormwater BMP effectiveness monitoring originally described a fairly simple plan of grab samples collected before and after BMP construction and at upstream and downstream locations.

The implementation of the intensive event-based studies at Deer Creek and Cedar River stormwater facilities mandated a very intensive and demanding workload requiring extra equipment, effort, time, costs, and human resources. This demanding workload allowed monitoring at only one project at a time and precluded any monitoring of the remaining two projects.

The remote automatic monitoring equipment for the Cedar River pond effectiveness study was removed from the site last year and stored for possible future use at additional sites.

The Pine Forest stormwater pond and drainage improvements in the New Rose Creek watershed had construction complete in March 2012. The Woodland Acres Oakwood Villa pond and stormwater drainage improvements in the Strawberry Creek basin had construction complete in October 2009. It is anticipated that the monitoring to assess the effectiveness these two projects will begin sometime in the future now that the Deer Creek and Cedar River BMP effectiveness studies are completed.

