2012 PROGRESS REPORT

For the Lower St. Johns River Main Stem Basin Management Action Plan

Developed by the
Lower St. Johns River TMDL Executive Committee

In cooperation with the
Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration
Bureau of Watershed Restoration
Tallahassee, Florida 32399

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LIST OF ACRONYMS

APRICOT	A Prototype Realistic Innovative Community of Today
ATAC	Allocation Technical Advisory Committee
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CCUA	Clay County Utility Authority
DO	Dissolved Oxygen
EFDC	Environmental Fluid Dynamics Code
EPA	Environmental Protection Agency
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FSU	Florida State University
FYN	Florida Yards and Neighborhoods Program
HSPF	Hydrologic Simulation Program – FORTRAN
kg/yr	Kilograms per Year
LID	Low Impact Development
LSJR	Lower St. Johns River
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MERIS	Medium Resolution Imaging Spectrometer
MS4	Municipal Separate Storm Sewer System
MSMP	Master Stormwater Management Plan
MT	Metric Ton
NAS	Naval Air Station
NNC	Numeric Nutrient Criteria
NRCS	Natural Resources Conservation Service
NS	Naval Station
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PORTS	Physical Oceanographic Real-Time System
PSA	Public Service Announcement
RO	Reverse Osmosis
RST	Regional Stormwater Treatment
SJRWMD	St. Johns River Water Management District
STORET	STOrage and RETrieval (Database)
TAC	Technical Advisory Committee
TCAA	Tri-County Agricultural Area
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
UF–IFAS	University of Florida–Institute of Food and Agricultural Sciences
USGS	U.S. Geological Survey
WBID	Waterbody identification
WWTP	Wastewater Treatment Plant
WWTF	Wastewater Treatment Facility

EXECUTIVE SUMMARY

TOTAL MAXIMUM DAILY LOADS

The Total Maximum Daily Loads (TMDLs) for the main stem of the Lower St. Johns River (LSJR) Basin were adopted by the Florida Department of Environmental Protection (FDEP) in June 2008. The TMDLs target total phosphorus (TP) and total nitrogen (TN) in the freshwater reach to achieve reductions in the chlorophyll-*a* levels in this portion of the river. In addition, a TN TMDL was established in the marine reach to meet dissolved oxygen (DO) levels that would be protective of aquatic life uses.

The LSJR Main Stem Basin Management Action Plan (BMAP) was adopted in October 2008 to implement these TMDLs. This 2012 Progress Report is the fourth annual progress report for the LSJR Main Stem BMAP, and it describes the major accomplishments and issues identified during the reporting period of January 1, 2012 through December 31, 2012 as well as an analysis of water quality trends since BMAP implementation.

MAJOR ACCOMPLISHMENTS

As in the previous 3 reporting periods, there has continued to be success in BMAP implementation during this reporting period. One wastewater treatment facility (WWTF) project in the freshwater reach was completed with a reduction of 4,774 kilograms per year (kg/yr) of TP and 21,844 kg/yr of TN. One wastewater project was also completed in the marine reach for a total reduction of 22,119 kg/yr of TN. One municipal separate storm sewer system (MS4) project was completed in the marine reach for a reduction of 5,533 kg/yr of TN. The WWTFs and MS4s in the freshwater reach have achieved their portion of the TN and TP required reductions.

The Florida Department of Agriculture and Consumer Services (FDACS) has continued to sign up growers under the vegetable and agronomic crop, sod, cow/calf, citrus, and nursery best management practice (BMP) manuals. To date, no producers have opted to monitor water quality instead of implementing BMPs. In addition, FDACS, FDEP, St. Johns River Water Management District (SJRWMD), and several other agencies have continued to identify projects and practices to reduce the movement of nutrients to the Lower St. Johns River, improve water conservation, and result in more efficient farm management as part of the Tri-County Agricultural Area (TCAA) Water Management Partnership. As part of this program, SJRWMD and FDEP have provided funding towards the development of alternative nutrient and water management practices.

BMAP monitoring plan efforts have continued in the freshwater reach, marine reach, and tributaries. SJRWMD continued to sample five ambient stations in the freshwater reach. Data were collected from the DO stations at Dames Point and Clapboard Creek in the marine reach. SJRWMD continued to sample 16 tributaries stations and JEA continued to sample 5 tributaries stations.

MAJOR ISSUES

The major issue in BMAP implementation this past year has been securing funding for projects. For local governments and water management districts, the economic downturn and subsequent decreases in *ad valorem* taxes and development fees have made it difficult to obtain the funding necessary to implement the BMAP projects. While funding continues to be an issue, this limitation has not caused major delays in implementation of BMAP projects scheduled to be completed during this reporting period. There are concerns that the City of

Jacksonville is behind schedule to meet their 2015 milestones for septic tank phase out and stormwater reductions, but no compliance dates applied in 2012.

LSJR Basin monitoring was reduced in 2012, relative to that in 2011, due to a combination of reductions and rededication in resources and monitoring equipment failure. These reductions primarily affected the tributary runoff quality sampling coverage, river DO monitoring and the assessment of the areal extent of algal blooms. Efforts are underway to reinstate some monitoring, and optimize the remaining available resources, for the comprehensive assessment planned for 2013, the 5-year anniversary of the 2008 LSJR TMDL. During the last year, SJRWMD discontinued sampling at 4 freshwater stations and decreased the sampling at one station from biweekly to monthly. SJRWMD also stopped sampling 5 tributaries stations. SJRWMD is in the process of evaluating whether to reinstate monitoring at some of these stations in the future. In addition, the DO station at Fulton Point has been inactive since March 2012 because the channel marker the DO sondes were attached to was hit multiple times during the reporting period. Therefore, limited data are available for this station in 2012.

ACTIVITIES FOR THE UPCOMING YEAR

The fifth annual BMAP progress report will encompass the period of January 1, 2013 through December 31, 2013. During this time, the City of Jacksonville Beach will complete the upgrades to their WWTF, and JEA will complete the Royal Lakes WWTF phase-out, San Jose WWTF phase-out, Buckman WWTF process improvements, and the reuse expansion projects in the marine reach. The City of Jacksonville will continue to phase-out septic tanks and design stormwater projects to meet their marine reach MS4 allocation, or pursue alternate projects or water quality credit trades. The City of Palatka will start construction on their stormwater treatment project in the freshwater reach, and Camp Blanding will complete the maintenance and repair of their swales in the marine reach. FDACS will continue to enroll agricultural producers in BMP programs. In addition, the freshwater ambient water quality sampling, DO stations sampling, and tributaries sampling will continue as described in the monitoring plan. SJRWMD will consider adding back some of the discontinued ambient monitoring stations in the freshwater reach and the tributaries. FDEP will reinstate the DO station at Fulton Point as soon as possible for the marine reach monitoring.

WATER QUALITY TRENDS

In the freshwater reach from 1995 through 2011, mean seasonal TN at the Racy Point station exhibits a significant downward trend, with the sharpest downward movement beginning around 2002. Within the high and low flow subsets of seasonal means, the downward concentration trends are also significant. One unusual feature of the 2012 pattern in river nitrogen was a very high pulse of nitrate-nitrogen, from December through March. This high concentration seems to be caused by the decomposition and remineralization of organic nitrogen created during the large Lake George bloom in summer 2011, which occurred at the same time as the Rodman Reservoir management drawdown.

For freshwater reach TP, there is a significant downward trend for low-flow seasons, suggesting positive effects from the reduction in point source loads. However, the summer mean TP concentration for 2012 appears to run contrary to this downward trend for low-flow seasons. This finding can be explained by the unusual rainfall and runoff pattern for this season, which produced more rainfall over north Florida and a sharp spike in TP load from the basins adjacent to the freshwater reach, without affecting the river's overall upstream discharge and load.

Freshwater reach algal bloom density and duration have been declining in response to nutrient reductions accomplished under BMAP implementation. Despite slightly elevated TP

concentrations in summer 2012, this trend has continued. During the 2012 summer bloom season, the maximum chlorophyll-*a* at the Racy Point station was 35.7 micrograms per liter (µg/L), and was the lowest maximum observed between 1995 – 2012. This finding was partly due to the mildly salty conditions at the Racy Point location during May and June, which are not conducive to cyanobacteria growth, followed by high rainfall and runoff, which tend to dilute bloom density and reduce light for algal photosynthesis.

In the marine reach, the annual mean TN concentration at the Talleyrand station for 2012 was 0.93 milligrams per liter (mg/L). This concentration is below the historical TMDL mean and, while not as low as values observed in 2010 and 2011, it was still sufficiently low to continue the significant downward trend in this nutrient, and it is below the recently proposed U.S. Environmental Protection Agency (EPA) numeric nutrient criteria (NNC) of 1.09 mg/L for TN. The annual mean TP concentration at the Talleyrand site was 0.127 mg/L, also below the historical TMDL mean, although is above the proposed NNC of 0.108 mg/L of TP (concentration proposed for the segment of the LSJR between the Fuller Warren Bridge and Dames Point).

In the marine reach DO monitoring in 2012, there were no extreme low DO excursions observed for the Dames Point and Clapboard Creek monitoring stations. The sum of the fractional daily low DO exposure was 0.11 at Dame Point and 0.20 at Clapboard Creek, both of which are well below the threshold of 1. This low DO period occurred in mid-July, with the minimum mean daily DO reaching 4.68 mg/L. The minimum DO recorded at Dames Point was 4.3 mg/L on July 18th, and the minimum DO recorded at Clapboard Creek was 4.6 mg/L in October. The minimum DO observed during routine ambient water quality monitoring site visits by the SJRWMD in 2012 was 4.48 mg/L at the Talleyrand site on July 12th. In general, most estuarine aquatic organisms of the southeast United States do not begin to exhibit mortality from short duration (24-hour) exposures to low DO until concentrations below 3 mg/L occur.

SECTION 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the fourth annual progress report for the Lower St. Johns River (LSJR) Main Stem Basin Management Action Plan (BMAP). **Section 2** and **Section 3** describe the accomplishments and issues, respectively, during the period from January 1, 2012 through December 31, 2012. A summary of efforts for the upcoming year (January 1, 2013 through December 31, 2013) is included in **Section 4**. **Section 5** provides an overview of water quality trends.

1.2 TOTAL MAXIMUM DAILY LOADS FOR THE LOWER ST. JOHNS RIVER BASIN

The area addressed by the LSJR BMAP is that portion of the St. Johns River that flows between the mouth of the Ocklawaha River, its largest tributary, and the Atlantic Ocean, encompassing a 2,750-square-mile drainage area (see **Figure 1**). Within this reach, the St. Johns River is 101 miles long and has a water surface area of approximately 115-square miles. Major centers of population within the LSJR include Palatka, a city of 10,700 at the southern entrance to the basin; Green Cove Springs, a city of 4,700 at the midpoint; and the Orange Park, Middleburg, and Jacksonville metropolitan area, with a population of over 1 million, in the northern portion of the basin. For assessment purposes, the Florida Department of Environmental Protection (FDEP) has divided the LSJR Basin into water assessment polygons with a unique waterbody identification (WBID) number for each watershed or stream reach. The main stem of the LSJR is divided into 15 WBID segments (see **Figure 1**). The LSJR is also divided into 2 reaches based on salinity: the marine reach and the freshwater reach (**Figure 2**).

The total maximum daily loads (TMDLs) for the main stem of the LSJR Basin were adopted by FDEP in June 2008. The TMDLs include total phosphorus (TP) and total nitrogen (TN) in the freshwater reach to achieve reductions in the chlorophyll-*a* levels in this portion of the river. A TN TMDL was also established in the marine reach to meet dissolved oxygen (DO) levels that would be protective of aquatic life uses. **Table 1** lists the TMDLs and pollutant load allocations adopted by rule for the LSJR.

TABLE 1: TMDLS IN THE LOWER ST. JOHNS RIVER BASIN

RIVER REACH	WBID(S)	TMDL (KG/YR)	TMDL BASELINE LOAD (KG/YR)	WASTELOAD ALLOCATION* (KG/YR)	LOAD ALLOCATION (KG/YR)	OVERALL NEEDED REDUCTION (KG/YR)
Freshwater	2213I to 2213N	500,325 TP	599,610	46,357 TP	453,968 TP	99,285
Freshwater	2213I to 2213N	8,571,563 TN	10,115,552	236,695 TN	8,334,868 TN	1,543,989
Marine	2213A to 2213H	1,376,855 TN	2,453,258	1,027,590 TN	349,265	1,076,403

* Includes a percent reduction from National Pollutant Discharge Elimination System (NPDES) stormwater sources.

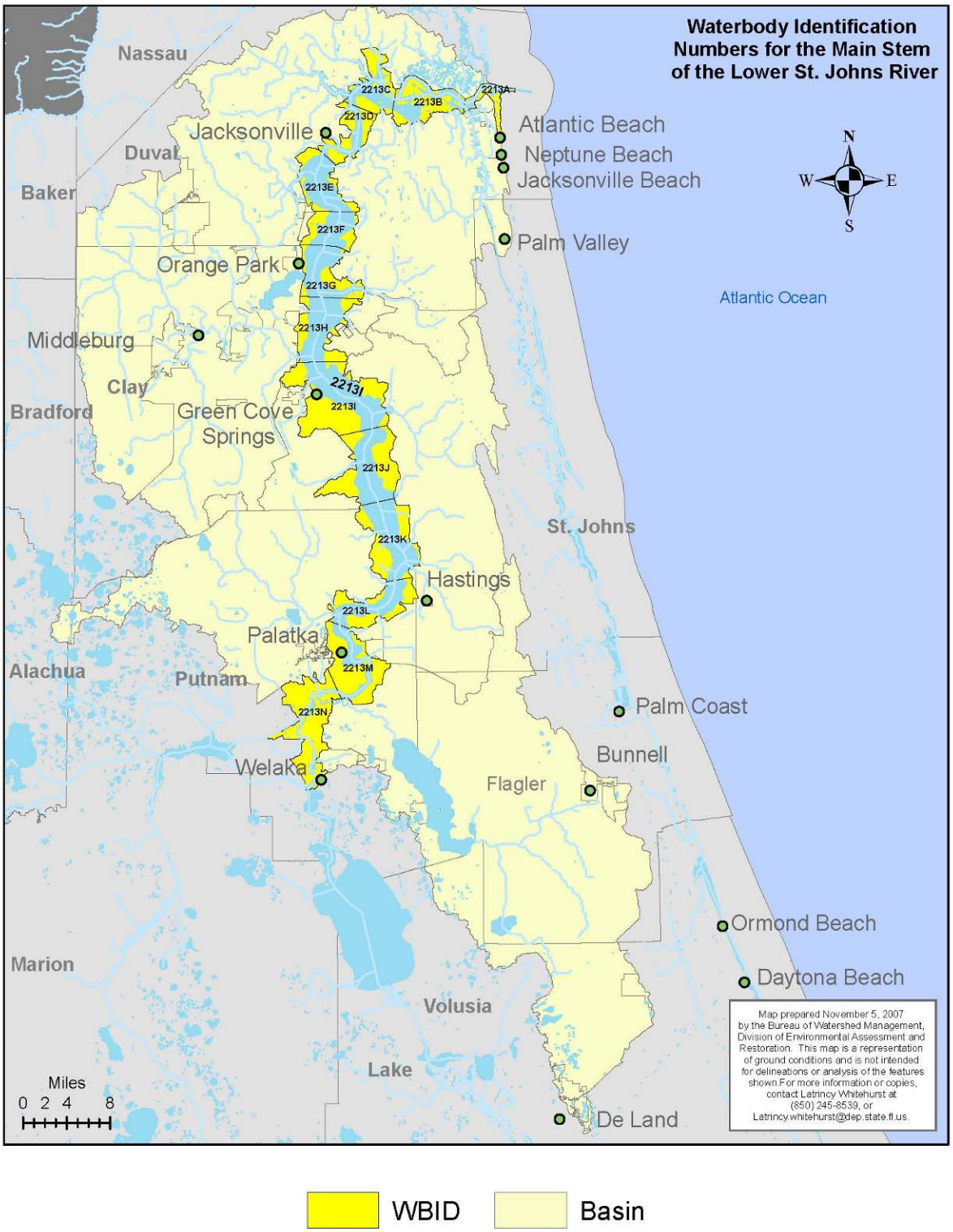


FIGURE 1: LOCATION OF THE LOWER ST. JOHNS RIVER BASIN

FIGURE 2: MARINE AND FRESHWATER REACHES IN THE LOWER ST. JOHNS RIVER BASIN

1.3 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

The LSJR BMAP identified wastewater treatment facilities (WWTFs), municipal separate storm sewer systems (MS4s), urban areas outside of MS4s (non-MS4 areas), and agricultural sources of TN and TP in the basin. Those entities that are responsible for achieving the load reductions in the freshwater reach are:

- City of Green Cove Springs WWTFs
- City of Palatka WWTF
- Georgia-Pacific WWTF
- Seminole Electric WWTF
- Clay County MS4
- Green Cove Springs MS4
- City of Palatka non-MS4
- Clay County non-MS4
- Putnam County non-MS4
- St. Johns County non-MS4
- Town of Hastings non-MS4
- Town of Welaka non-MS4
- Agriculture

The entities responsible for achieving the load reductions in the marine reach are:

- Anheuser Busch WWTF
- City of Atlantic Beach WWTFs
- City of Jacksonville Beach WWTF
- City of Neptune Beach WWTF
- Clay County Utility Authority (CCUA) WWTFs
- JEA WWTFs
- Naval Air Station (NAS) Jacksonville WWTF
- Naval Station (NS) Mayport WWTF
- Smurfit-Stone Container WWTF
- Town of Orange Park WWTF
- City of Atlantic Beach MS4
- City of Jacksonville/ Florida Department of Transportation (FDOT) MS4
- City of Jacksonville Beach MS4
- City of Neptune Beach MS4
- Clay County MS4
- NAS Jacksonville MS4
- NS Mayport MS4
- St. Johns County MS4
- Town of Orange Park MS4
- Camp Blanding non-MS4
- Clay County non-MS4
- St. Johns County non-MS4
- Agriculture

In addition to the these entities, the Florida Department of Agriculture and Consumer Services (FDACS), FDEP, and St. Johns River Water Management District (SJRWMD) are essential to the implementation of the BMAP activities.

1.4 BMAP ALLOCATIONS

The required reductions in the BMAP were developed through an extensive allocation process that built off of the three-step process recommended in the Allocation Technical Advisory Committee (ATAC) Report to the Governor and Legislature (February 2001). "Step 1" and "Step 2" reductions were only applied to nonpoint sources (urban and agriculture) to provide treatment approximately equivalent to the treatment required for domestic and industrial WWTFs. The Step 2 reductions were based on the reduction from nonpoint sources expected from implementation of their respective best management practices (BMPs). Since Step 2 reductions did not result in meeting the assimilative capacity of the river, additional "Step 3" reductions were necessary, which required the same overall percentage reduction from both point and nonpoint sources. Once the initial allocations were determined, the stakeholders had the opportunity to trade allocations before the BMAP was adopted. These "Pre-BMAP" trades mainly occurred between a WWTF and MS4 owned by the same stakeholder. The Pre-BMAP trades resulted in a change in the allocations, in which the entity trading the credits had a lower allocation than the initial allocation and the entity receiving the credits had a higher allocation than the initial allocation. The starting point loads and BMAP allocations after the Pre-BMAP

trades for each entity in the marine and freshwater reaches of the river are shown in **Table 2** through **Table 4**.

TABLE 2: TN STARTING POINT LOADS AND BMAP ALLOCATIONS IN THE FRESHWATER REACH

SOURCE	SOURCE TYPE	STARTING POINT LOAD (KG/YR)	ALLOCATION (KG/YR)
Georgia-Pacific	WWTF	258,155	165,909
Green Cove Springs WWTFs	WWTF	14,600	7,752.5
Palatka WWTF	WWTF	60,889	38,845
Seminole Electric	WWTF	21,045	14,732
Future APRICOT/ Reverse Osmosis (RO) Dischargers	WWTF	9,961	9,961
Clay County	MS4	2,770	2,418
Green Cove Springs	MS4	6,961	6,266.5
Alachua County Non-MS4	Non-MS4	636	0.0
Clay County Non-MS4	Non-MS4	5,579	4,659
Flagler County Non-MS4	Non-MS4	7	7
Hastings	Non-MS4	624	448
Palatka	Non-MS4	9,683	8,858
Pomona Park	Non-MS4	108	108
Putnam County	Non-MS4	43,616	33,976
St. Johns County Non-MS4	Non-MS4	27,277	25,340
Welaka	Non-MS4	1,175	838
Agriculture	Nonpoint Source	310,700	194,336
Upstream Anthropogenic Load	Other Source	4,148,223	2,693,852
Atmospheric Deposition	Other Source	105,688	105,688
Natural Background	Other Source	5,087,856	5,087,856
Total Freshwater TN Loads	**Total Load**	**10,115,552**	**8,401,850**

TABLE 3: TP STARTING POINT LOADS AND BMAP ALLOCATIONS IN THE FRESHWATER REACH

SOURCE	SOURCE TYPE	STARTING POINT LOAD (KG/YR)	ALLOCATION (KG/YR)
Georgia-Pacific	WWTF	63,875	33,182
Green Cove Springs WWTFs	WWTF	3,865	1,929.2
Palatka WWTF	WWTF	9,955	5,954.7
Future APRICOT/RO Dischargers	WWTF	3,320	3,320
Clay County	MS4	404.6	212.6
Green Cove Springs	MS4	1,095.7	1,043.7
Alachua County Non-MS4	Non-MS4	83.8	83.8
Clay County Non-MS4	Non-MS4	767.3	499.4
Flagler County Non-MS4	Non-MS4	0.9	0.9
Hastings	Non-MS4	92.9	49.3
Palatka	Non-MS4	1,507.8	1,507.8
Pomona Park	Non-MS4	15.8	15.8
Putnam County	Non-MS4	5,990.4	3,964.9
St. Johns County Non-MS4	Non-MS4	3,727.4	3,296.6
Welaka	Non-MS4	172.0	90.4
Agriculture	Nonpoint Source	83,455	70,974
Upstream Anthropogenic Load	Other Source	137,157	76,502
Atmospheric Deposition	Other Source	1,356	1,356
Natural Background	Other Source	282,768	282,768
Total Freshwater TP Loads	**Total Load**	**599,610**	**486,751**

TABLE 4: TN STARTING POINT LOADS AND BMAP ALLOCATIONS IN THE MARINE REACH

SOURCE	SOURCE TYPE	STARTING POINT LOAD (KG/YR)	ALLOCATION (KG/YR)
Anheuser Busch – Main Street	WWTF	24,399	12,418
Atlantic Beach Aggregate	WWTF	49,275	21,188
CCUA Aggregate	WWTF	61,569	63,963
Jacksonville Beach WWTF	WWTF	40,150	21,015
JEA Aggregate	WWTF	1,396,622	654,672
Neptune Beach WWTF	WWTF	11,448	6,162
Orange Park WWTF	WWTF	24,886	7,940
Smurfit-Stone Container	WWTF	145,989	74,305
U.S. Navy WWTF Aggregate	WWTF	42,029	11,684
Future APRICOT/RO Dischargers	WWTF	4,979	4,979
Atlantic Beach	MS4	2,474	1,651
Clay County Marine MS4	MS4	25,249	21,188
Jacksonville/FDOT	MS4	243,438	96,016
Jacksonville Beach	MS4	4,974	4,804
Neptune Beach	MS4	1,484	1,437
Orange Park	MS4	3,451	3,348
St. Johns County	MS4	3,057	746
U.S. Navy MS4s	MS4	7,530	7,232
Camp Blanding – State of Florida	Non-MS4	2,870	1,220
Clay County Marine Non-MS4	Non-MS4	12,051	11,107
St. Johns County Marine Non-MS4	Non-MS4	9,846	4,865
Agriculture	Nonpoint Source	12,800	4,170
Atmospheric Deposition - Marine	Other Source	95,028	95,028
Natural Background	Other Source	242,300	242,300
Total Marine TN Loads	**Total Load**	**2,453,094**	**1,373,438**

1.5 NUMERIC NUTRIENT CRITERIA

On November 30, 2012, the U.S. Environmental Protection Agency (EPA) approved FDEP's numeric nutrient criteria (NNC) for rivers, streams, lakes, and some estuaries. However, the only NNC that have taken full effect are for the estuaries located in south Florida because the other criteria only take effect once EPA approves the rule, rescinds their federally promulgated NNC for the same waterbody types, and determines that FDEP's NNC sufficiently address their January 14, 2009 determination that NNC are required in Florida. EPA also proposed NNC for a variety of Florida waters on November 30, including criteria for streams not covered by FDEP's criteria, south Florida flowing waters (canals), coastal waters, and estuaries. EPA is currently required to finalize the criteria in summer 2013 but has indicated that they will not finalize criteria if FDEP adopts and EPA approves criteria for these waters.

While there is uncertainty about the effective dates of both FDEP's NNC and EPA's newly proposed NNC, applicable narrative goals contained in state rules continue to apply to these waters, as well as any established restoration goals in the form of TMDLs. Therefore, the LSJR TMDLs currently remain the applicable nutrient standards for the main stem of the river, and will remain in effect once all of FDEP's nutrient standards are in effect because the standards establish nutrient TMDLs as site-specific interpretations of the narrative nutrient criteria. FDEP will keep the Executive Committee updated on the status of the state's nutrient rules, the EPA rules, and the implications for the LSJR Main Stem TMDLs.

SECTION 2: MAJOR ACCOMPLISHMENTS

2.1 SUMMARY OF EFFORTS

There has continued to be success in BMAP implementation during the reporting period. One WWTF project in the freshwater reach was completed with a reduction of 4,774 kilograms per year (kg/yr) of TP and 21,844 kg/yr of TN. One wastewater project was also completed in the marine reach for a total reduction of 22,119 kg/yr of TN. One MS4 projects was completed in the marine reach for a reduction of 5,533 kg/yr of TN. The WWTFs and MS4s in the freshwater reach have achieved their portion of the TN and TP required reductions.

FDACS has continued to sign up growers under the vegetable and agronomic crop, sod, cow/calf, citrus, and nursery BMP manuals. To date, no producers have opted to monitor water quality instead of implementing BMPs. In addition, FDACS, FDEP, SJRWMD, and several other agencies have continued to identify projects and practices to reduce the movement of nutrients to the river, improve water conservation, and result in more efficient farm management as part of the Tri-County Agricultural Area (TCAA) Water Management Partnership. As part of this program, SJRWMD and FDEP have provided funding towards the development of alternative nutrient and water management practices.

Additional details about the accomplishments over the past year are described in **Section 2.2** through **Section 2.5**. The individual project tables are included in **Appendix A**, and photographs of project implementation efforts are included in **Section 2.2** and **Appendix B**.

2.2 ACCOMPLISHMENTS BY SOURCE TYPE

2.2.1 WASTEWATER TREATMENT FACILITIES

2.2.1.1 Freshwater Reach

City of Palatka

The City of Palatka constructed a new contact chamber (**Figure 3**) and upgraded the aeration system (**Figure 4**) at the Palatka Wastewater Treatment Plant (WWTP). These upgrades have helped to increase the reclaimed water output, which also decreases the amount of effluent discharged to the St. Johns River. These improvements have given the WWTP the capability to be a zero discharge facility (project PAL-5). However, there are some limiting factors that might affect the ability to be at zero discharge. Due to the limited reclaimed water users, a lot of the water is used as irrigation at the airport, and at times this system needs to be shut down (more so in the summer months) for grounds keeping and the water is discharged to the river. Once the city has more reclaimed recipients on the system, this would not be as big of a factor. In addition, discharges to the St. Johns River could occur during severe weather events that cause excessive flows, equipment malfunctions, occasional plant upsets due to abnormal loadings or fluctuations in weather, sampling requirements for toxicity or other parameters, and periodic maintenance of the WWTP and pumping system.

During the last months of 2012, the city sent more effluent to the reclaimed system than ever before. For the month of November 2012, the city processed about 40 million gallons of wastewater, of which 36 million gallons went to reclaimed use and only 4 million went to the St. Johns River. The city will continue to strive for complete zero discharge.

FIGURE 3: CITY OF PALATKA WWTP NEW CONTACT CHAMBER

FIGURE 4: CITY OF PALATKA WWTP NEW AERATION SYSTEM

WWTF Progress Towards the Freshwater TMDLs

Figure 5 and **Figure 6** show the progress made towards meeting the WWTF portion of the freshwater TP and TN TMDLs. The first bar in the figures shows the starting load for the freshwater WWTFs as calculated in the BMAP. The second bar shows the estimated 2012 load based on all completed freshwater WWTF projects (from the BMAP; 2009, 2010, and 2011 progress reports; and those listed above). The third bar indicates the total allocation allowed for the WWTFs in the freshwater reach of the river. The WWTFs in the freshwater reach had already achieved and exceeded their portion of the TP and TN TMDLs.

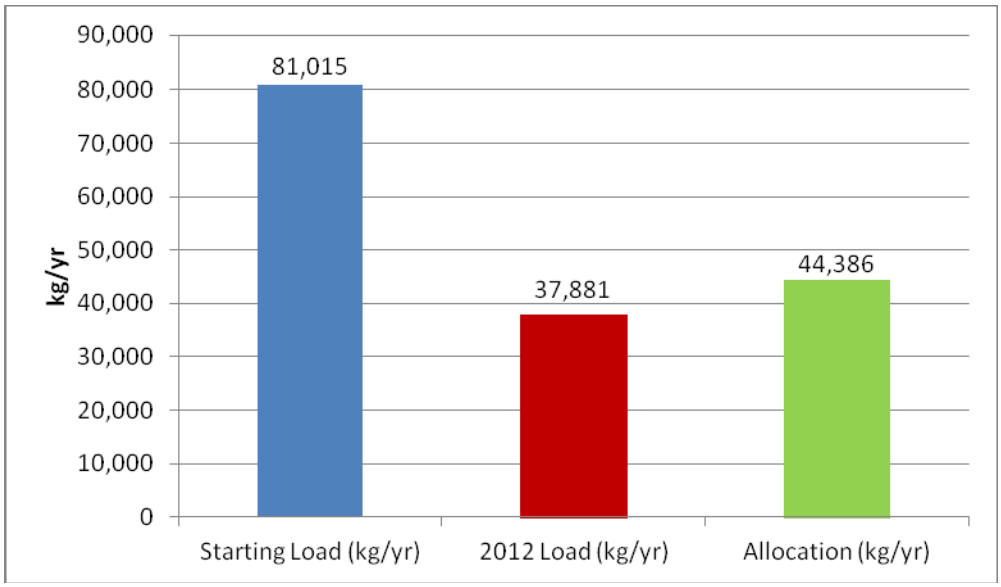


FIGURE 5: WWTF PROGRESS TOWARDS THE TP FRESHWATER TMDL

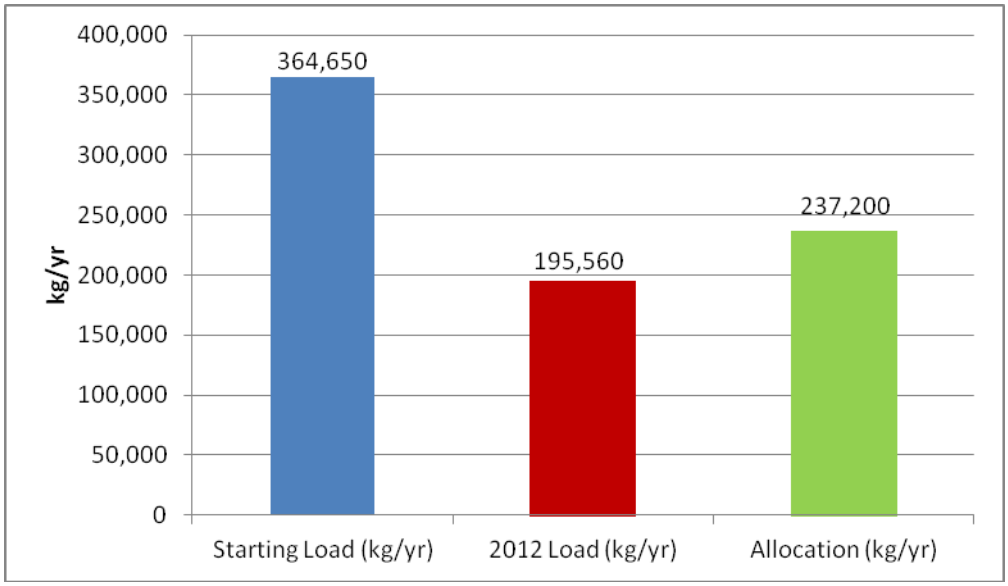


FIGURE 6: WWTF PROGRESS TOWARDS THE TN FRESHWATER TMDL

2.2.1.2 Marine Reach

City of Atlantic Beach

The City of Atlantic Beach completed construction of the city's WWTP #1 (Main) upgrades and sludge and odor control improvements (project AB-2). The master lift station has been constructed at the Atlantic Beach WWTP #2 (Buccaneer) location, and WWTP #2 has been properly abandoned. Operation of the upgraded WWTP #1 has begun, and operators are making modifications to the process to optimize nitrogen levels.

The WWTP #1 upgrades project was a success story on many levels. During design, the city and its engineers, J. Collins Engineering Associates, did extensive work to find both capital and operational savings. The city ended up with a "green" project that incorporates major energy

savings, water savings, more efficient sludge treatment, and reduced operating costs. The capital savings from this project were:

- Reuse of existing force mains by reversing flow direction saved construction of over 5,000 linear feet of pipe.
- Reuse of existing plant structures and tankage by retrofitting equipment and adding baffle walls (see **Figure 7**).
- Procurement of major equipment using combination of bid and life-cycle cost analysis.

FIGURE 7: CITY OF ATLANTIC BEACH EXISTING WWTP #1 TANKAGE MODIFIED TO PROVIDE 4-STAGE NITROGEN REMOVAL PROCESS

The operational cost savings were:

- During design, a thorough energy study was conducted to determine ways to reduce electrical usage. The final project reduced the number of large (energy hog) blowers needed for plant operation from nine to four, with only one blower typically in use (see **Figure 8**). Also, an innovative program for equipment load shedding helped reduce electrical demand charges. That along with other energy savers, like improved automation, fine-bubble diffusers, and efficient yard lighting resulted in a reduction of over 1.2 million kilowatt hours of energy and over 2,000 kilowatt demand charges each year, even with the additional flow from WWTP #2. Combined with the energy savings from eliminating WWTP #2, over 3 million kilowatt hours of energy were saved each year.
- The electrical study also identified changes to reduce the number of emergency generators needed at the plant from 3 to 2, reducing maintenance costs.
- A biosolids treatment study was also conducted during design, and the resulting sludge treatment system reduced costs for transport and disposal of sludge.
- An in-plant reuse system saved potable water use and costs.
- Elimination of WWTP #2 and replacement with a master lift station eliminated operating costs for that treatment plant.

- Flow shedding by redirecting flow from several lift stations through existing force mains reduced the amount of flow that would need to be re-pumped from the new master lift station.
- The project resulted in an overall operational cost savings of over $300,000 per year.

FIGURE 8: CITY OF ATLANTIC BEACH WWTP FOUR NEW, EFFICIENT BLOWERS REPLACED NINE EXISTING BLOWERS

The city also included "good neighbor" items in the construction of the project including used a directional drill method for installation of the new force main to avoid impacts to neighborhoods, wetlands, and oak hammocks; and installation of odor control facilities at the WWTP.

In addition, the city had great cooperation and coordination during construction between the operators, engineers, and contractor (WPC Industrial Contractors, LLC). Keeping an existing plant online and meeting permit limits during construction is difficult at best; however, working together on a daily basis helped to create a successful project.

City of Jacksonville Beach

The new City of Jacksonville Beach WWTP (project JB-1) is receiving and treating wastewater flow (see **Figure 9**). The city has issued a purchase order for programming of 3-tank operation mode due to wastewater flows. The city's consultants, Carter & Verplank and Archimedes, are working on the programming of the 3-tank operation at this time. WPC Contractors are continuing to work on the completion of the operation and maintenance manuals and as-built drawings for the WWTP as part of the final punch list.

FIGURE 9: CITY OF JACKSONVILLE BEACH NEW WWTP AERIAL VIEW

City of Neptune Beach

The City of Neptune Beach has attained the operational level for the upgraded WWTF (project NB-1).

Clay County Utility Authority

CCUA continues to expand its reclaimed water system with the construction of transmission mains, reclaimed water storage tanks, and pumping stations. Storage tanks have recently been completed at the Oak Leaf reclaimed water station (0.75 million gallon capacity) and Mid-Clay reclaimed water station (0.5 million gallon capacity). A new reclaimed water storage tank (0.75 million gallons) and pumping station is presently under construction at the Ridaught Landing WWTF site. A preliminary design was completed for a 135 million gallon reclaimed water storage reservoir at the Mid-Clay WWTF site. Once completed, this reservoir will provide for wet weather storage of excess reclaimed water that is presently discharged to the LSJR.

A major transmission main project consisting of two 18-inch mains is nearing completion to interconnect the Mid-Clay and Ridaught Landing service areas (see **Figure 10**). The Mid-Clay service area does not generate sufficient reclaimed water to meet its present demand. This deficiency is met by pumping groundwater to augment the system. The transmission main project is scheduled to finish by the end of April 2013 and will supply adequate reclaimed water to the Mid-Clay area. The Ridaught to Mid-Clay transmission main and reclaimed water reservoir projects were high priority projects proposed as part of the West Rivers Initiatives study conducted by CH2M Hill during the development of the BMAP in 2008.

FIGURE 10: CCUA FUSING 18-INCH RECLAIMED WATER MAIN FOR DIRECTIONAL DRILL INSTALLATION ON COUNTY ROAD 209

JEA

JEA is in the final stages of a decade long nitrogen reduction initiative. To date, JEA has invested approximately $464 million in improvements to the sewer collection and treatment system, in a 3-pronged approach. The first prong is to phase out older technology plants that JEA took over in parts of the community through acquisitions. The second prong is to upgrade the 5 regional WWTFs to advanced nutrient removal. The third prong is to initiate and continue to expand the reuse system as the community grows.

Specific projects now underway include construction of a final phase of nutrient removal improvements at the Buckman WWTF, JEA's largest plant, which has commenced and is scheduled to be completed by September 30, 2013 (project JEA-16). Construction is also nearing completion for the phase out of the Royal Lakes and San Jose WWTFs (projects JEA-11 and JEA-15), and both plants are scheduled to be phased out by the end of March 2013. The influent from these 2 plants will be directed to the Arlington East WWTF, where it will receive a higher level of nutrient removal.

JEA's aggregate annual TN (a rolling 12-month average) reached low of 513 tons in February 2012 under extended dry weather conditions, before extremely wet weather in the summer and fall of 2012 resulted in the need to treat elevated flows. JEA's aggregate annual TN total was 650 tons for fiscal year 2012, versus a final BMAP allocation of 720 tons. The ongoing nutrient removal project construction at the Buckman WWTF (JEA's largest WWTF) will result in a temporary increase in nutrients from that facility, as parts of the facility must be taken offline to effect improvements. Once the construction is complete in September 2013, the Buckman WWTF will have a substantially more robust treatment system that is capable of maintaining optimal nutrient removal capabilities under a much wider range of conditions (see **Figure 11** and **Figure 12**).

FIGURE 11: JEA UPGRADES AT THE BUCKMAN WWTF

FIGURE 12: JEA UPGRADES AT THE BUCKMAN WWTF

Town of Orange Park

In December 2007, the Town of Orange Park began executing its plan to rehabilitate the existing WWTF to achieve the BMAP goals. Phase 1 of the plan (project OP-1) was substantially completed by July 31, 2010. During 2010, the town reduced TN effluent from the Ash Street WWTP to 8,869 kg/yr of TN, or a 16,022 kg/yr reduction, which represented a 56.6% reduction in stormwater and wastewater TN discharge from the starting point load of 28,277 kg/yr of TN. Phase 2 of the plan (project OP-2) was substantially completed on August 16, 2011, and reached full operational level five days later. The town completed this phase 219 days ahead of the BMAP schedule. During 2012, the town reduced TN discharges by 23,099 kg/yr, which represents an 81.6% reduction in stormwater and wastewater TN discharges from the starting point load (see **Figure 13**).

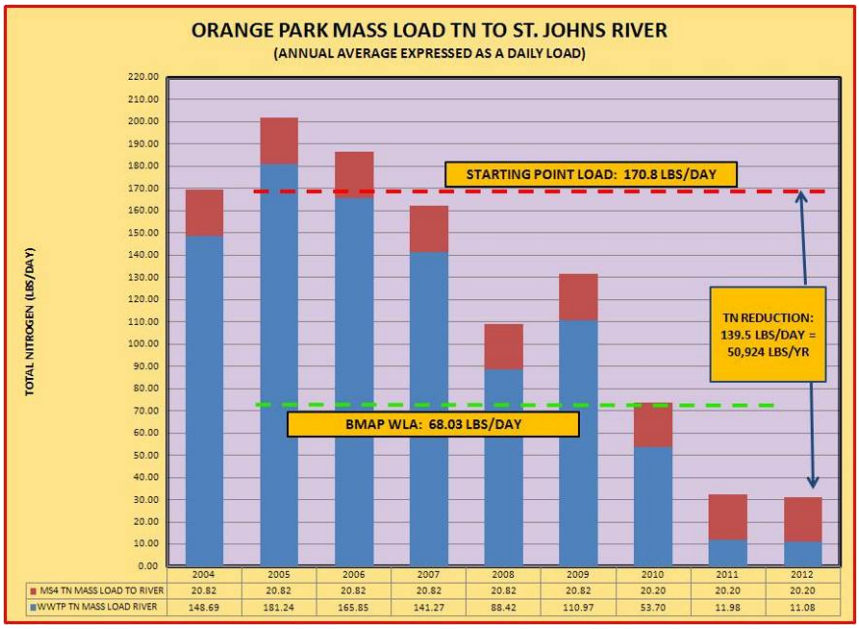


FIGURE 13: TOWN OF ORANGE PARK COMBINED TN EFFLUENT FROM THE MS4 AND ASH STREET WWTP

The town's BMAP projects at the Ash Street WWTP have resulted in outstanding effluent quality. This effluent has a tremendous potential to be a valuable regional water resource. To achieve that potential, the Town of Orange Park Town Council entered into an interlocal agreement with CCUA to transfer treated, filtered effluent to the CCUA Miller Street WWTP for incorporation into the CCUA reclaimed water program. The town's infrastructure to facilitate this agreement was constructed as part of Phase 1 improvements. The ultimate goal of this program is to assist CCUA in reducing the need for groundwater augmentation of the reclaimed water supply.

On June 1, 2011, the town and CCUA began implementing the agreement. Since that time, the town has transferred 84.4 million gallons of treated, filtered effluent to CCUA's reclaimed water program. This represented 17.3% of all town effluent since the beginning of the program. **Figure 14** depicts effluent discharges to the St. Johns River and to CCUA.

The Ash Street effluent discharges to CCUA decreased in 2012 due to very wet weather in the months of May, June, July, and August. In 2011, the town discharged 56.4 million gallons of treated effluent to CCUA (16.7 % of total annual flow). In 2012, the town only discharged 18.0 million gallons of treated effluent to CCUA (4.9% of total annual flow). The wet weather conditions highlight the strengths of the town's BMAP projects. In 2012, the town discharged 71.4 million gallons more effluent into the St. Johns River than it did in 2011, primarily as a result of wet weather conditions. Despite this situation, the town reduced TN discharge by 328.5 pounds in 2012 compared to 2011.

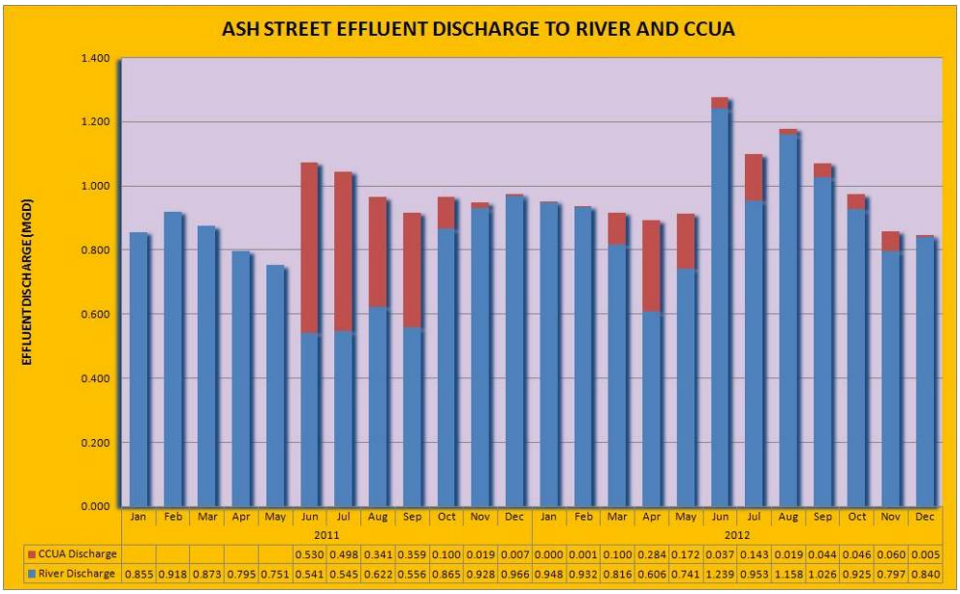


FIGURE 14: TOWN OF ORANGE PARK COMPARISON OF EFFLUENT DISCHARGES FROM ASH STREET WWTP TO THE ST. JOHNS RIVER AND TO CCUA'S RECLAIMED WATER PROGRAM

U.S Navy

Construction of Phase 1 of the NAS Jacksonville reuse expansion project is underway (project USN-2). The Navy completed installation of a pumping station and pipeline from the WWTP to a reuse holding pond on the golf course in 2011. The City of Jacksonville awarded the Phase 1 construction contract to install a pumping station and pipeline from the pond to the NAS Jacksonville golf course irrigation system with SJRWMD funding in 2012. The Phase 1 work should be complete by early 2013. The Navy has awarded the design contract for Phase 2 (zero discharge spray field) in 2012. This design work should be complete by mid-2013 with construction contract execution through the City of Jacksonville and funding from SJRWMD in 2014.

At NS Mayport, the Navy is performing salinity and treatability studies to determine the most feasible option to meet the final waste load allocation by either upgrading the existing WWTP or connecting and discharging to JEA's wastewater system (project USN-5).

WWTF Progress Towards the Marine Reach TMDL

Figure 15 shows the progress made towards meeting the WWTF portion of the marine TN TMDL. The first bar in the figure shows the starting load for the marine WWTFs as calculated in the BMAP. The second bar shows the estimated 2012 load based on all completed marine WWTF projects (from the BMAP; 2009, 2010, and 2011 progress reports, and those listed above). The third bar indicates the total allocation allowed for the WWTFs in the marine reach of the river.

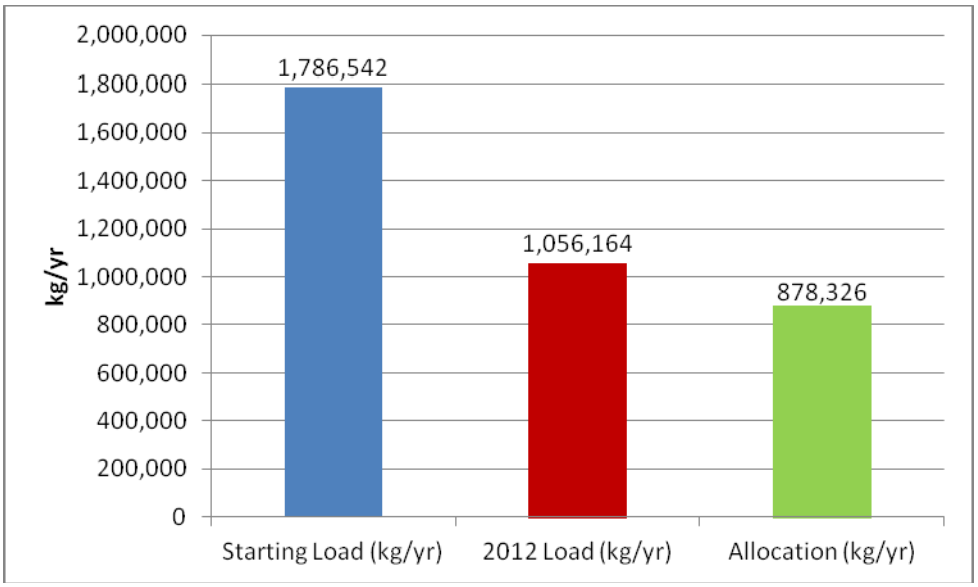


FIGURE 15: WWTF PROGRESS TOWARDS THE TN MARINE TMDL

2.2.1.3 Project Implementation Status

The section above described all the efforts in the past year related to project implementation including design and construction. These are important milestones that lead to project completion and actual load reductions. The WWTF projects that were completed during the last year and their associated load reductions are shown below in **Table 5** and **Table 6** for the freshwater reach of the river and **Table 7** for the marine reach.

TABLE 5: WWTF PROJECTS COMPLETED IN THE FRESHWATER REACH FOR TP IN 2012

ENTITY	PROJECT NUMBER	DESCRIPTION	TP PROJECT REDUCTION (KG/YR)
City of Palatka	PAL-5	Zero discharge	4,774
Total	**-**	**-**	**4,774**

TABLE 6: WWTF PROJECTS COMPLETED IN THE FRESHWATER REACH FOR TN IN 2012

ENTITY	PROJECT NUMBER	DESCRIPTION	TN PROJECT REDUCTION (KG/YR)
City of Palatka	PAL-5	Zero discharge	21,844
Total	**-**	**-**	**21,844**

TABLE 7: WWTF PROJECTS COMPLETED IN THE MARINE REACH FOR TN IN 2012

ENTITY	PROJECT NUMBER	DESCRIPTION	TN PROJECT REDUCTION (KG/YR)
Atlantic Beach	AB-2	Upgrade to Biological Nutrient Removal and Flow Transfer from Buccaneer WWTF	22,119
Total	**-**	**-**	**22,119**

2.2.2 MS4s

2.2.2.1 Freshwater Reach

Clay County

Clay County continued their public education efforts (project CC-1), which include Florida Yards and Neighborhoods (FYN) Program, public service announcements (PSAs), stormwater website, and inspection program and call-in number for illicit discharges. As part of the FYN Program, one home was certified "Florida Friendly" by University of Florida–Institute of Food and Agricultural Sciences (UF-IFAS) in the Lakeside area of Orange Park. **Figure 16** is a visual comparison of the 2009 Google Streetview and a 2012 photograph of this home. Video PSA are run before Clay County Commissioner meetings, and during meeting breaks. These educational videos and the Commissioners' meeting are available to the public via the public access television channel. In addition, the videos are indexed and available at the Clay County website at http://clayfl.swagit.com/Storm_Water_Management/. Also on the website, Clay County maintains a stormwater section available through the navigation pane of the main website: http://www.claycountygov.com/. Basic information related to erosion control, stormwater discharges, and the NPDES program is available. Clay County also inspects for illicit discharges through their compliance department and maintains a call-in number for illicit discharges, which is available on the website.

FIGURE 16: CLAY COUNTY COMPARISON OF FLORIDA FRIENDLY HOME IN 2009 AND 2012

In addition, the established water quality trading mechanism with CCUA has continued for 2012 (project CC-3). An interlocal agreement between Clay County and CCUA was executed in September 2009.

MS4 Progress Towards Meeting the Freshwater TMDLs

Figure 17 and **Figure 18** show the progress made towards meeting the MS4 portion of the freshwater TP and TN TMDLs, respectively. The first bar in the figure shows the starting load for the freshwater MS4s as calculated in the BMAP. The second bar shows the estimated 2012 load based on all completed freshwater MS4 projects (from the BMAP; 2009, 2010, 2011 progress reports; and those listed above). The third bar indicates the total allocation allowed for the MS4s in the freshwater reach of the river. Through completed projects from the BMAP and 2009 and 2010 progress reports, as well as the ongoing efforts listed above, the MS4s in the freshwater reach have met the TP and TN reductions required under the BMAP.

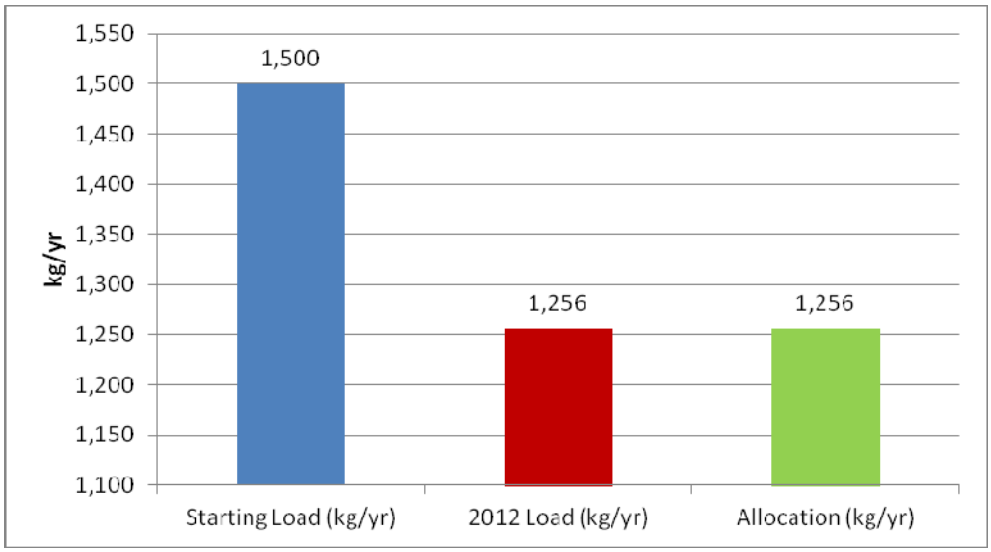


FIGURE 17: MS4 PROGRESS TOWARDS THE TP FRESHWATER TMDL

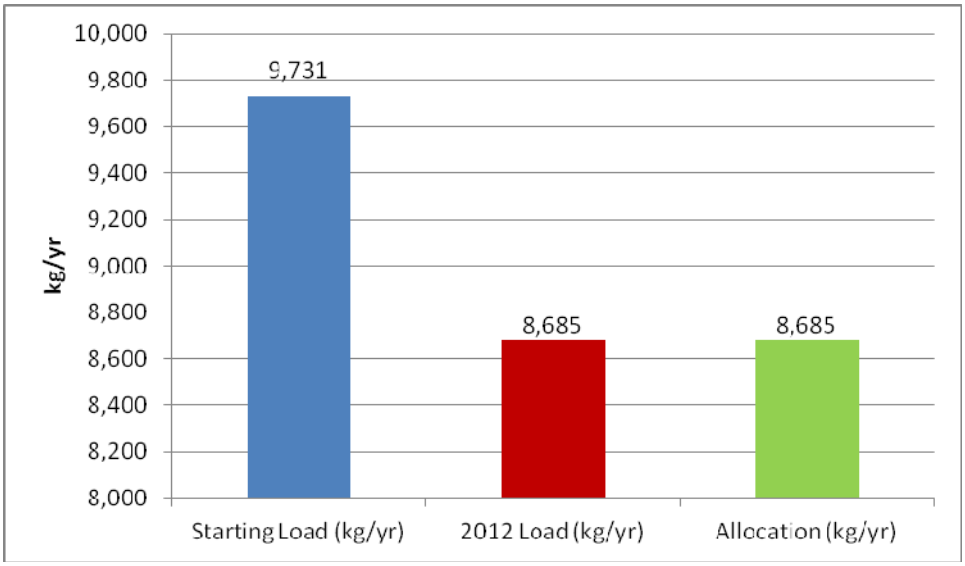


FIGURE 18: MS4 PROGRESS TOWARDS THE TN FRESHWATER TMDL

2.2.2.2 Marine Reach

City of Jacksonville

Since the initiation of the Better Jacksonville Plan, the City of Jacksonville in cooperation with JEA and the Water and Sewer Expansion Authority has made approximately 4,900 sewer connections in septic tank failure areas identified by the Department of Health. Past projects including the number of properties connected are outlined in **Table 8**.

TABLE 8: BETTER JACKSONVILLE PLAN SEPTIC TANK PHASE-OUT PROJECT SUMMARY

PHASE-OUT AREA	TOTAL PROPERTIES	CONNECTION RATE 2011	CONNECTION RATE 2012
Oakwood Villas	1726	42%	53%
Lake Forest	887	54%	62%
Scott Mill	367	76%	78%
Murray Hill B	1130	92%	92%

Phase-Out Area	Total Properties	Connection Rate 2011	Connection Rate 2012
Pernecia	211	93%	93%
Glynlea	495	94%	95%

Additional infrastructure was not constructed for septic tank phase-out this year; however, **Table 8** demonstrates that additional connections have taken place in project areas where infrastructure exists. Using the same methodology presented in the 2011 BMAP Progress Report, the connection rate established for the phase-out area as a whole was applied to the properties in the stream buffer (**Table 9**).

Table 9: Better Jacksonville Plan Septic Tank Phase-out Connected Properties in Stream Buffer Areas

Phase-Out Area	Properties in Buffer	2012 Connection Rate	Connected Properties in Buffer
Oakwood Villas	345	53%	183
Lake Forest	180	62%	111
Scott Mill	220	78%	171
Murray Hill B	780	92%	721
Pernecia	200	93%	186

As agreed to in pre-BMAP discussions and noted in the final BMAP, FDEP planned to conduct a study to quantify nutrient contributions from septic tanks to area waterways. Richard Hicks, FDEP, is the project manager for the study and ArcNLET tool development. The City of Jacksonville, Department of Health, SJRWMD, and U.S. Geological Survey (USGS) are participating in a Technical Advisory Committee (TAC) to review and comment on the study tool's applicability for determining BMAP credits. The TAC met several times during 2012, and spent a considerable amount of volunteer effort in reviewing relevant documents, tapping alternative information sources, and performing independent calculations. Significant value has been brought to the table by the experts on the TAC, as well as the participants from FDEP and the city, who have provided background information and data/reporting and support related to the efforts being conducted by the modeling team. The city has contributed significant technical and financial resources to the TAC over the last year and is committed to continuing this effort.

The TAC has shared its results in an open forum, and released the preliminary TAC findings, *TAC Consensus Findings Memorandum of July 31, 2012*. This memorandum addressed the first point in the TAC's mission and outlined significant issues in the model formulation. Correcting the issues resulted in calculated TN loadings differing by up to a factor of 8from the previous result. It is still the TAC's hope that with additional field verification and review the ArcNLET tool will be able to quantify nitrogen reduction associated with the city's septic tank phase-out projects. The timeline placed on this action is within 6 months of study completion.

The City plans to implement future septic tank phase-outs as described below:

- **Lateral only connections:** The first category of septic tank phase-out is focused on tanks located in exiting service areas within 200 meters of stream banks and in A-type soils (approximately 750 tanks). The city has over $6 million of funding immediately available and will begin the process to phase-out those tanks.
- **Credit Trading:** As described during the BMAP project discussions in 2008, the city has committed to a toolbox of potential projects including structural and non-structural BMPs. One of the tools within this toolbox is water quality credit trading. The city is in the process of re-evaluating potential credit trading partners with regard to partnering on septic tank phase-out projects, receiving work-in-kind credit for the NAS Jacksonville

reuse project and/or other partnerships. No formal agreements have been reached at this time but discussions associated with this effort will begin immediately (project COJ-122).

During 2012, the City of Jacksonville completed construction for 2 Master Stormwater Management Plan (MSMP) projects, continued implementation for 3 more, and continued design on an additional 12 projects as listed in **Table 8**. Of the projects completed and under construction, 2 contain excess water quality treatment. These benefits of these projects are outlined in **Table 8**. **Figure 19** below summarizes the nutrient reduction goals listed in the BMAP, those proposed through MSMP projects, and those already realized through project implementation since BMAP adoption.

TABLE 10: SUMMARY OF CITY OF JACKSONVILLE MSMP PROJECTS

PROJECT NAME	PROJECT NUMBER	STATUS	TECHNOLOGY
Upper Deer Creek Phase 3	COJ-42	Construction Complete	Wet Detention – 0.09 metric ton (MT) TN/yr
Pine Forest/Larsen Acres	COJ-42	Construction Complete	Wet Detention/Flood Control – 0.03 MT TN/yr
Bay Street Bridge - Hogan's Creek Downstream	N/A	Construction Complete	Flood Control Only
Air Liquide Pond Retrofit	COJ-42	Under Construction	Compensatory Treatment
McCoys Creek Pond C	COJ-42	Under Construction	Compensatory Treatment
Miruelo Circle (San Jose Estate Drainage Improvements)	COJ-42	Under Construction	Erosion Control Only
Bunche Drive Pond	COJ-48	Design in Progress	Wet Detention
Country Creek Area Drainage Improvements	COJ-43	Design in Progress	Erosion Control Only
Messer Area Drainage	COJ-48	Design in Progress	Flood Control
Hamilton Jersey Outfall	COJ-42	Design in Progress, Permitting	Flood and Erosion Control
Lower Eastside Phase III Drainage Improvements	COJ-42	Design in Progress	Wet Detention
Mandarin/Orange Picker Drainage Improvements	COJ-42	Design in Progress	Flood Control
Noroad/Lambing Drainage	COJ-43	Design in Progress	Wet Detention/Flood Control
Old Plank Road Outfall	COJ-43	Design in Progress	Wet Detention/Flood Control
Paul Avenue Outfall	COJ-42	Design Complete, Permitting	Wet Detention
NAS Jax Reuse Partnering Project	COJ-42	Design in Progress	Stormwater Reuse
Valens Drive LID Project	COJ-44	Design in Progress	Stormwater Reuse
Crystal Springs Area Drainage	COJ-43	Design in Progress	Wet Detention/Flood Control
Avenue B & Zinnia Drainage	COJ-48	Design in Progress	Erosion Control
Durkeeville West Pond Expansion	COJ-42	Design in Progress	Wet Detention

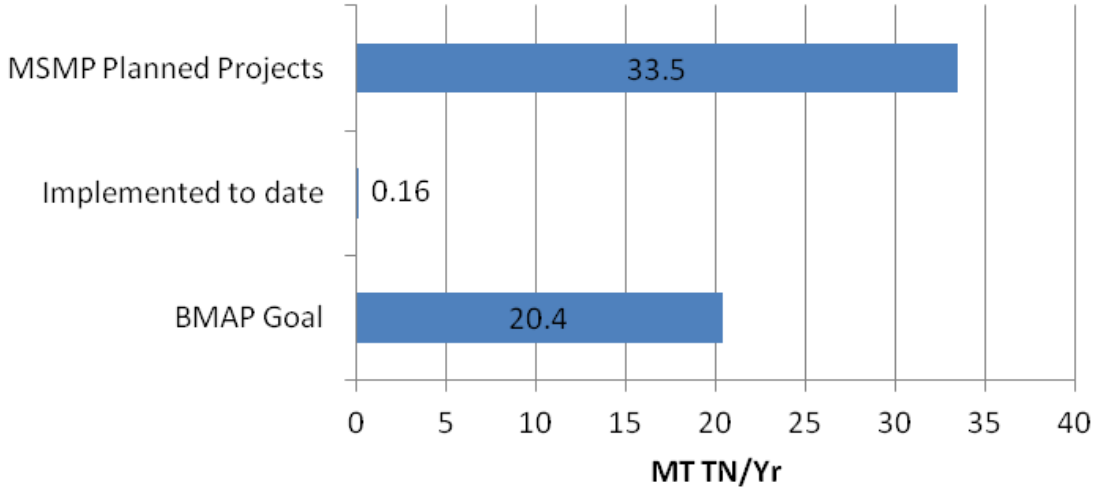


FIGURE 19: TN REDUCTIONS THROUGH CITY OF JACKSONVILLE STORMWATER PROJECTS

Progress in the non-structural BMPs that have an influence on nutrient reductions in the LSJR has been documented with three continuing major non-structural BMP programs. The first non-structural BMP is the continued implementation of Florida Friendly landscaping practices through city ordinance codes and programs like the future adoption of low impact development (LID) practices in the city's land development procedures manual. In November 2011, the city initiated development of its LID manual. The manual will include design specifications and guidelines for implementation of LID practices such as bioretention, pervious pavement, reduced road widths, vegetated filter strips, grassed conveyance swales, and detention with biofiltration. It is anticipated that the manual will be incorporated into the city's land development procedures manual to provide specific guidance to developers. The draft LID manual is available for public comment and it is expected to be completed by July 2013.

The 3 city demonstration projects initiated in 2011 to test LID principles for future implementation have remained in the project planning schedule. The Valens Drive Residential LID project, which will include vegetated curb inlets and a pond with biofiltration, was near the completion of the planning study phase and may been initiated during the next reporting period. The second, Wurn and Spring Glen LID project, which will include supplementing irrigation with stormwater, installing pervious pavement, and instituting downspout disconnects to redirect stormwater from roofs and impervious surfaces, is also near the end of a planning study phase. Finally, the Kennedy Community Center LID demonstration project, co-funded by EPA and the city, will include curb rain garden, pervious pavement for parking, living wall, rain barrels for a community garden, and educational posters has been partially completed as of December 2012. Final completion is targeted for late 2013. This LID demonstration project will provide an opportunity for the city to test operation and maintenance of LID principles in the field, conduct testing to quantify benefits related to runoff reduction and water quality improvement, serve to educate the public, and improve quality of life for the surrounding community.

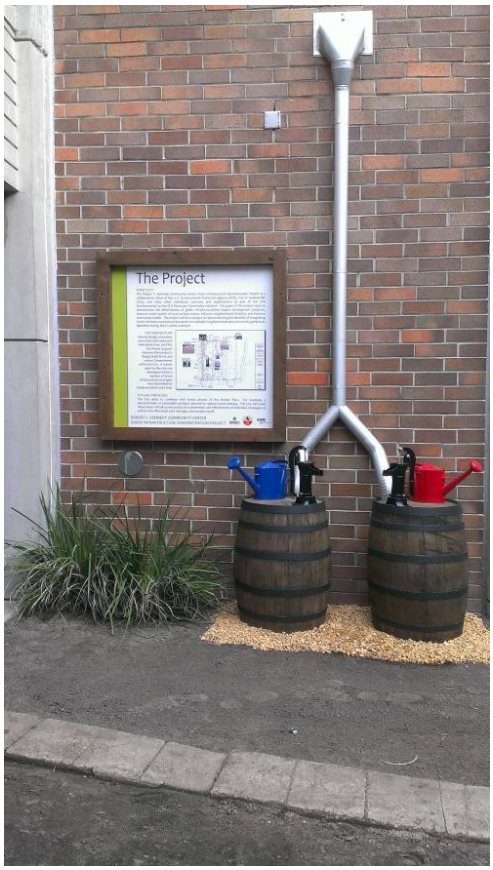


FIGURE 20: CITY OF JACKSONVILLE LID PROJECT AT THE KENNEDY COMMUNITY CENTER

A second non-structural BMP is the implementation of enhanced legal authority to limit pollutants from lift station overflows by implementation of the May 2, 2011 Environmental Protection Board Rule 3 amendments. As noted in the 2011 BMAP Progress Report, Rule 3 was updated to require all private lift stations to be under the responsible charge of a state licensed wastewater facility operator or a certified wastewater collection/transmission system operator. The lift stations are also required to be visited at minimum once per month to ensure proper operations and perform routine maintenance. Additionally, if a private lift station system is found to have an overflow, the city may require the owner of the private lift station to upgrade the existing equipment to address performance shortfalls. The new lift station operation and maintenance requirements were implemented over the past year and initial inspections of the expanded number of private lift station has returned evidence that the program has succeeded in reducing overflow incidents that impact the water quality in tributaries and the main stem LSJR area.

The third non-structural BMP activity was the implementation of improvements to the city street sweeping practices. An estimated nutrient load reduction in TN and TP of 5,553 kg/yr and 3,560 kg/yr, respectively, was calculated using the methodology approved by FDEP for the assessment of urban particulate and solids removed through street sweeping and other BMPs. Based on the initial estimates of the potential for nutrient load reductions from this class of non-structural BMP, the city will continue to implement improvements in the street sweeping procedures.

The LSJR BMAP goals for public education and outreach activities received significant support during the referenced reporting period. The City of Jacksonville provides continuing support for the BMAP through several established public education and outreach programs and special events. Public education and outreach programs are supported by city organizations that include the Duval County Agricultural Extension Office, city Environmental Protection Board, city Environmental Quality Division, and city Public Works and Planning and Development departments.

The city enacted a fertilizer BMP ordinance and an irrigation ordinance to address residential and commercial practices that contribute to nutrient levels in the LSJR. A primary component of the ordinance codes is outreach and education of residents to promote the understanding of the impacts of fertilizer and over-watering on the health of the river. Requirements of the fertilizer ordinance were based on the 2008 State Fertilizer Task Force Model Ordinance, and include commercial fertilizer applicator training in state BMPs, spill prevention plans for bulk fertilizer facility operators, and standards for protecting surface water from fertilizer runoff. In order to accomplish the intended goals and objectives of the ordinance code, the Environmental Quality Division created an educational campaign to inform and educate residents about the value of natural water resources and effective fertilizer application practices for home lawns and around commercial properties. Since the start of the fertilizer and irrigation public outreach program, the Environmental Quality Division completed a comprehensive distribution of more than 52,000 brochures. Due to water quality and quantity concerns related to overwatering and the known contribution to the depletion of water supply and excess runoff of nutrients into the river, landscape irrigation requirements that will reduce the impact to the Floridan aquifer have been enacted. The landscape irrigation requirements include residential and non-residential irrigation limits and weekly schedules.

An updated training plan was prepared in June 2012, through the NPDES permitting process, for the continued implementation of an expanded training program for city staff and contractors involved in pesticide, herbicide, and fertilization application work and other areas of concern to water quality.

The city continues efforts to conduct surface water quality protection programs with irrigation and fertilizer educational outreach at town meetings, homeowner association meetings, businesses, civic organizations, and the Florida Pest Management Association meetings. To date, over 42,000 irrigation and fertilizer brochures have been printed and over 36,000 have been distributed at these events. The city continues participation with the FYN Program, a cooperative University of Florida Extension program, with funding now provided by the city stormwater utility. The Duval County Extension office is a partnership of the City of Jacksonville, UF-IFAS, and the United States Department of Agriculture. Research-based education is offered by trained professionals and volunteers in agriculture, family and consumer sciences, and 4-H youth development. The Florida Yards and Neighborhoods Program provides educational outreach opportunities to homeowners, landscaping professionals, builders, and developers on low maintenance plants and environmentally sustainable practices to enhance landscapes while saving money, time, and energy.

Public education and outreach events were hosted and supported during the referenced reporting period with several significant annual events including the Annual Museum of Science and History Water Festival, Mayor's Environmental Luncheon, 42nd Annual Earth Day Festival, Tree Hill Butterfly Festival, Annual Environmental Protection Board and University of North Florida Environmental Symposium, and Annual Jacksonville Home and Patio Show.

In addition to established annual events, the Environmental Quality Division, Environmental Protection Board, Duval County and University of Florida Agricultural Extension Office, and other city divisions continued public education and outreach programs that support water quality. The IFAS programs combined with other city programs reported that outreach activities included distribution of 33,518 brochures, 47,918 newsletters, broadcasting of 31 radio or television public service announcements, and providing workshop, classroom presentations, or special events to a total of 64,294 participants.

Brochures and door hangers directly related to stormwater BMPs and local environmental ordinance code compliance were distributed during routine environmental field investigations by the Environmental Quality Division, Stormwater Services staff. The Environmental Quality Division provides a 24-hour public education and outreach point of contact for the community through direct email to Stormwater Services (NPDES@coj.net) and through the city's call center known as the Citizen's Active Response Effort (CARE).

Florida Department of Transportation

FDOT has continued with the street sweeping, litter pick-up, and stormwater management systems maintenance efforts. FDOT's public education is through the drainage connection permit inserts (see **Appendix B** for a detailed description and contents). Public outreach activities are performed during pre-construction and public hearing meetings. FDOT also partners with the City of Jacksonville on PSAs.

Clay County

Clay County continued their public education efforts (project CC-12) as described in **Section 2.2.1.1**.

St. Johns County

The insight and understanding that St. Johns County gained from the operation and maintenance of the Deep Creek West Regional Stormwater Treatment (RST) Facility improved the design of the Master's Tract RST Facility (project SJC-17). St. Johns County acquired 160 acres in 2010 for the Masters Tract RST Facility. Three agricultural canals cross the property and convey stormwater runoff from 1,426 acres of land, 74% of which is planted row crops. The project was designed in 2011 with a treatment train that yields 2,145 kg/yr of TN removal. Permits were received in 2012 and the project has been budgeted and is currently out for bid with construction in 2013. St. Johns County and SJRWMD signed a cost-share agreement in the amount of $2,600,000 for the construction of the Masters Tract RST Facility.

St. Johns County continued the fully county-funded storm water education program (project SJC-11). Efforts through the Watershed Protection Program included presentations to 157 groups with 2,722 student interactions and 2,341 adult interactions. Over 3,800 educational materials were distributed this year. Various events were offered at local schools, parks, and homeowner association meetings. The county's illicit discharge course had 29 participants and 676 additional storm drains were marked this year. St. Johns County also uses video public service announcements about storm water, which run on the local government channel. These videos and other information brochures are available on the storm water section of the St. Johns County website at www.sjcfl.us/stormwater.

MS4 Progress Towards Meeting the Marine TMDLs

Figure 21 shows the progress made towards meeting the MS4 portion of the marine TN TMDL. The first bar in the figure shows the starting load for the marine MS4s from the BMAP. The

second bar shows the estimated 2012 load based on all completed marine MS4 projects (from the BMAP; 2009, 2010, and 2011 progress report; and those listed above). The third bar indicates the total allocation allowed for the MS4s in the marine reach of the river.

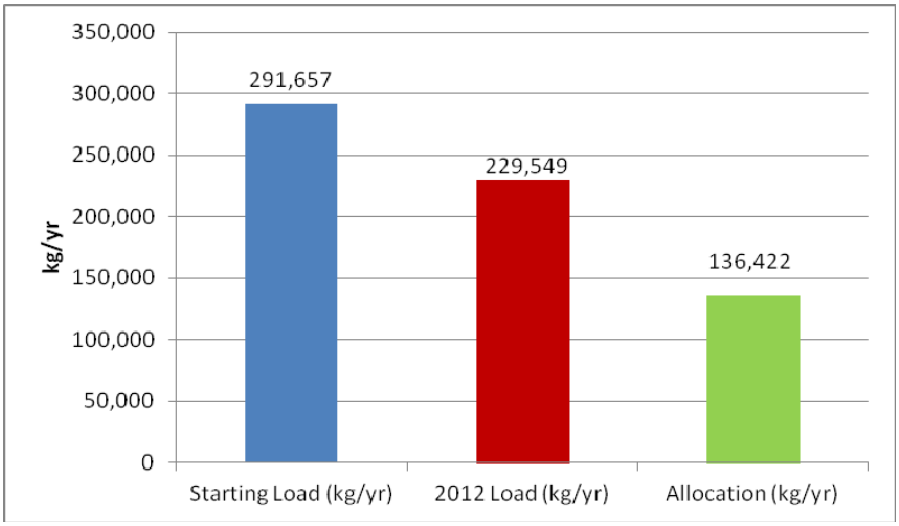


FIGURE 21: MS4 PROGRESS TOWARDS THE TN MARINE TMDL

2.2.2.3 Project Implementation Status

The section above described all of the activities that were underway during the past year, which includes efforts that are not yet complete or are continuous, such as public education. The MS4 projects that were completed during the last year and their associated load reductions are shown below in **Table 9** for the marine reach. The MS4s in the freshwater reach have met the required TN and TP reductions; therefore, no additional projects were completed in the reporting period.

TABLE 11: MS4 PROJECTS COMPLETED IN THE MARINE REACH IN 2012

ENTITY	PROJECT NUMBER	DESCRIPTION	TN PROJECT REDUCTION (KG/YR)
COJ	COJ-121	Street Sweeping	5,553
Total	**-**	**-**	**5,533**

2.2.3 URBAN STORMWATER

2.2.3.1 Freshwater Reach

City of Palatka

The City of Palatka installed stormwater treatment and conveyance systems for the city Waterfront Redevelopment Area. The city also began design on a stormwater and parking project for the southern portion of the park (project PAL-7). It is anticipated that this facility will also catch and treat the some portion of the runoff from the contributing downtown watershed that currently flows through the site to the St. Johns River.

Clay County

Clay County continued their public education efforts (project CC-4) as described in **Section 2.2.1.1**. The established water quality trading mechanism between Clay County and CCUA continued for 2012 (project CC-6).

Putnam County

Putnam County continued its education efforts (project PUT-8) by distributing about 450 educational materials at the county fair in March 2012.

St. Johns County

St. Johns County made its annual payment of $30,000 to the Town of Hastings for the 198.2 kg/yr of TP reduction per the 2009 agreement for water quality credit trading (project SJC-7). The county's education efforts (project SJC-3) also continued this year, as described in **Section 2.2.2.2**.

Non-MS4 Progress Towards Meeting the Freshwater TMDLs

Figure 22 and **Figure 23** show the progress made towards meeting the non-MS4 portion of the freshwater TP and TN TMDLs. The first bar in the figures shows the starting load for the freshwater non-MS4s from the BMAP. The second bar shows the estimated 2012 load based on all completed freshwater non-MS4 projects (from the BMAP; 2009, 2010; and 2011 progress reports, and those listed above). The third bar indicates the total allocation allowed for the non-MS4s in the freshwater reach of the river.

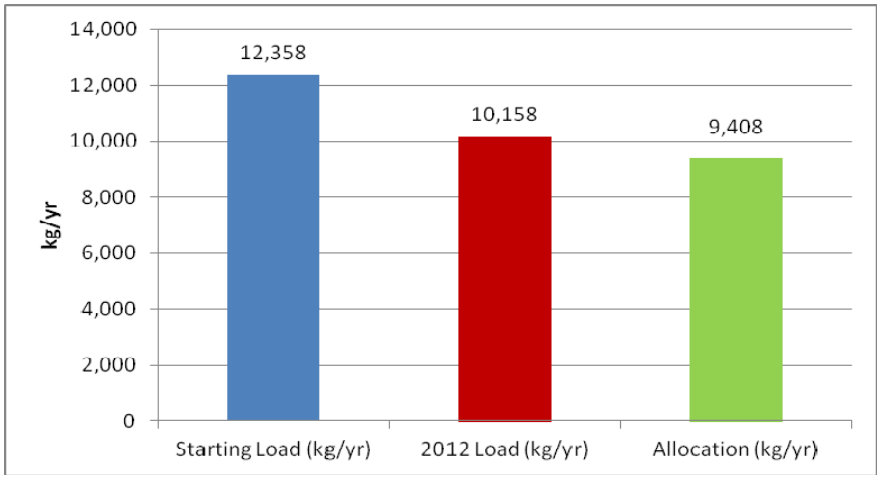


FIGURE 22: NON-MS4 PROGRESS TOWARDS THE TP FRESHWATER TMDL

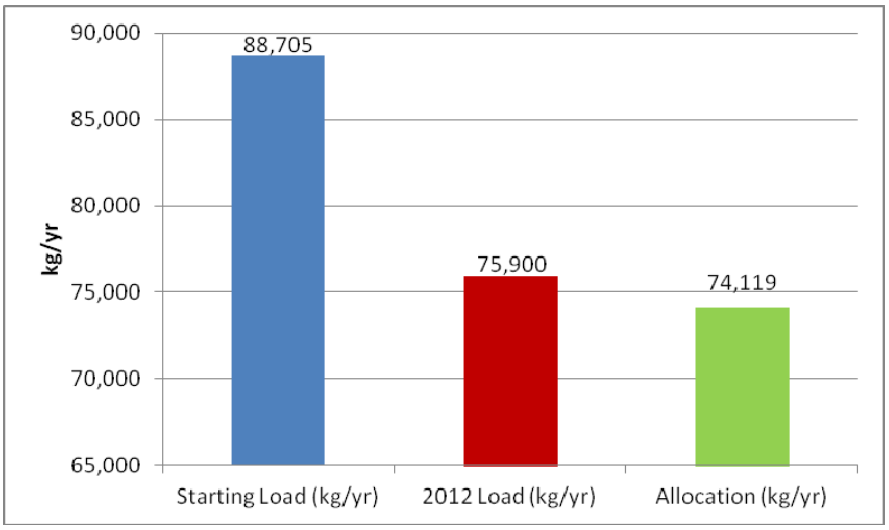


FIGURE 23: NON-MS4 PROGRESS TOWARDS THE TN FRESHWATER TMDL

2.2.3.2 Marine Reach

Camp Blanding

Over the last year, Camp Blanding has completed several roadway mill and pave operations, which included right-of-way improvements, including Avenue B from the new asphalt at the intersection with Jacksonville Street both north and south (7,966 square yards); all of Fort Lauderdale Street and Avenue B at Fort Lauderdale Street (4,511 square yards); Avenue C from Arcadia Street south to Tampa Street (8,433 square yards); Sanford Street (4,442 square yards); Avenue B east from Duval Road to the intersection of Avenue B and Fort Pierce, and also south on Homestead; and Avenue B from the new asphalt located just south of the intersection with Fort Lauderdale, south to edge of new asphalt on Avenue B between Belle Glade Street and Hollywood Street (10,582 square yards).

Camp Blanding also repaired the WWTP washout and added a new stormwater inlet. The erosion control system at the WWTP was created to prevent damage caused by the movement of stormwater travelling within the northeastern section of the Cantonment Area. This new system not only slows the movement of stormwater but also helps to slow and control the flow of stormwater as it enters Black Creek (see **Figure 24** and **Figure 25**). The NPDES permit for the Camp Blanding WWTP now includes the addition of nutrient mass load limitations for TN and TP. In addition, the increase in funding allocated towards operations and maintenance of roads and right-of-ways within the Camp Blanding Cantonment Area has led to a greater funding (>$250,000) for stormwater projects on post (although these are located outside of the Cantonment Area).

FIGURE 24: CAMP BLANDING WWTP NEW EROSION CONTROL STRUCTURE

FIGURE 25: CAMP BLANDING WWTP NEW EROSION CONTROL STRUCTURE

Clay County

Clay County continued their public education efforts (project CC-17) as described in **Section 2.2.1.1**.

St. Johns County

St. Johns County has fully permitted the Bishop Estates Road baffle box project (project SJC-28). This project will be bid in early 2013 and construction complete by December 2013. Discussions with SJRWMD resulted in design modifications to the Deep Creek West RST Facility that will augment the treatment process (project SJC-29). Design is underway to increase the pond capacity and optimize the wetland. In November 2012, the St. Johns County Board of County Commissioners approved a resolution authorizing the County Administrator to enter into a cost-share agreement with SJRWMD in the amount of $500,000 for the construction of the Deep Creek West RST improvements. County Road 13, which runs parallel to the St. Johns River, has several aging culverts in need of replacement. As culverts are replaced, nutrient separating baffle boxes will be introduced into the drainage system (projects SJC-33 and SJC-35). The county's education efforts (project SJC-21) also continued this year, as described in **Section 2.2.2.2**.

Non-MS4 Progress Towards Meeting the Marine TMDL

Figure 26 shows the progress made towards meeting the non-MS4 portion of the marine TN TMDL. The first bar in the figure shows the starting load for the marine non-MS4s from the BMAP. The second bar shows the estimated 2012 load based on all completed marine non-MS4 projects (from the BMAP; 2009, 2010, and 2011 progress reports, and those listed above). The third bar indicates the total allocation allowed for the non-MS4s in the marine reach of the river.

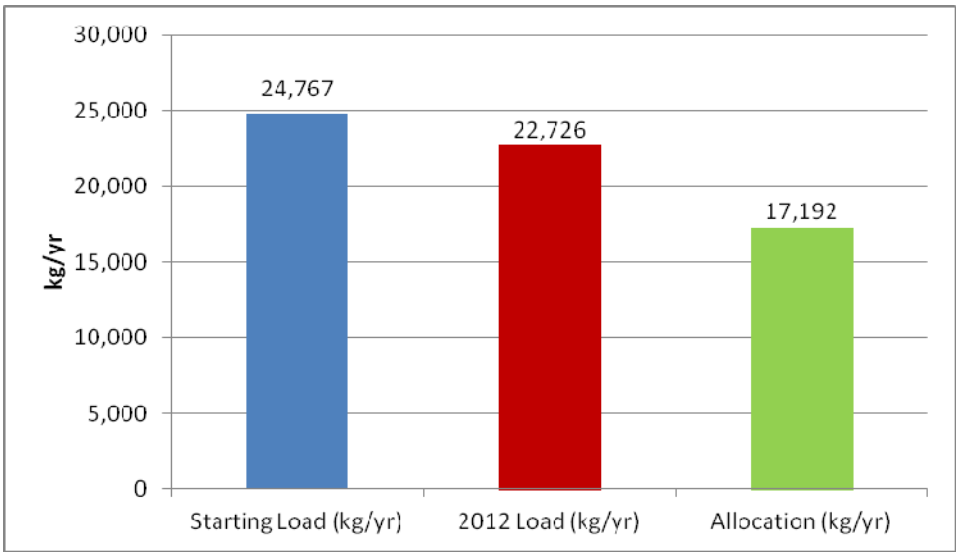


FIGURE 26: NON-MS4 PROGRESS TOWARDS THE TN MARINE TMDL

2.2.3.3 Project Implementation Status

There were no projects completed by the non-MS4s in either the freshwater or the marine reach in 2012.

2.2.4 AGRICULTURE

2.2.4.1 BMP Implementation Status

In 2012, FDACS staff signed up growers under the vegetable and agronomic crop, sod, cow/calf, citrus, and nursery BMP manuals. Because of limited staff, the enrollment goals have not been met, but progress is continuing. The cumulative enrollment numbers are contained in **Table 10**. Enrolled parcels are depicted in **Figure 27**. To date, no producers have opted to monitor water quality instead of implementing BMPs, which is an option Section 403.067, F.S. An estimate of load reductions due to BMP implementation and water management district stormwater treatment areas is shown in **Table 11**.

TABLE 12: AGRICULTURAL ACRES ENROLLED IN BMPS AS OF DECEMBER 31, 2012

2004 SJRWMD LAND USE	2004 ACRES	FDACS-ADJUSTED ACRES FOR ENROLLMENT	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED[1]	RELATED NOTICES OF INTENT (NOIS)	REMAINING ACREAGE[2]
Pasture	55,457	N/A	Cow/Calf, Future (Hay)	19,986.9	17	35,470
Row/Field/Mixed Crops	42,546	TBD	Vegetable/Agronomic Crops	26,223.0	47	16,323
Fallow Cropland	1,446	N/A	N/A	N/A	N/A	N/A
Horse Farm	3,145	TBD	Future Equine	N/A	N/A	3,145
Citrus	375	TBS	Ridge Citrus, Flatwoods Citrus	55.0	2	320
Abandoned Citrus	30	N/A	No enrollment needed	N/A	N/A	N/A
Tree Crops	298	TBD	Specialty Fruit & Nut	0.0	N/A	298
Nurseries and Vineyards	56	TBD	Future Nursery, Specialty Fruit and Nut	0.0	N/A	56
Tree Nurseries	1,207	TBD	Future Nursery, Specialty Fruit and Nut	0.0	N/A	1,207
Ornamentals	964	TBD	Container Nursery	42.5	3	922
Shade Ferns	336	TBD	Leatherleaf Ferns[3]	1,031.0	85	0
Hammock Ferns	362		Future Nursery	0.0	N/A	

2004 SJRWMD Land Use	2004 Acres	FDACS-Adjusted Acres for Enrollment	Related FDACS BMP Programs	Acreage Enrolled[1]	Related Notices of Intent (NOIs)	Remaining Acreage[2]
Sod Farms	4,678	TBD	Statewide Sod	2,440.6	5	256
Specialty Farms	26	TBD	Conservation Plan Rule	0.0	N/A	26
Dairies	1,070	TBD	Conservation Plan Rule	0.0	N/A	1,070
Cattle Feeding	475	TBD	Conservation Plan Rule	0.0	N/A	475
Poultry Feeding	196	TBD	Conservation Plan Rule	0.0	N/A	196
Other Open Lands – Rural	854	N/A	No enrollment needed	N/A	N/A	N/A
Totals	**113,521**	**-**	**-**	**49,779.0**	**159**	**59,064**

[1] Due to improved mapping, reported acres are all within the LSJR Basin; previous reports were based on county boundaries.
[2] Enrollment numbers will depend on the ability of field staff to identify and locate producers, changes in land uses, and actual number of acres in production on an operation. Even with 100% enrollment, the acres will not match the 2004 land use numbers.
[3] Leatherleaf fern NOIs predate 2004 land use data, and some acreage likely is out of production. Enrollment in this program has been discontinued because a modified leatherleaf fern BMP will be incorporated in revisions to the vegetable/agronomic crops BMP manual.

In 2012, FDACS adopted an equine manual and completed work on a statewide consolidated citrus manual, which was adopted January 9, 2013. Revisions to the vegetable/row crop and container nursery manuals have been initiated, with adoption anticipated in late 2013 or early 2014. A new TCAA Water Management Partnership was formed in 2011. Partnership activities in 2012 focused on providing cost share to growers for water management projects and fertilizer banding equipment to help reduce their nutrient discharges to the LSJR. Some of the projects also provide water conservation benefits. Further discussion is provided below on partnership efforts, along with a listing and some examples of approved projects and practices.

Agricultural Load Reduction Allocation and BMP Load Reduction Estimates

Table 11 below contains the reductions required of agricultural land uses in the LSJR Basin and the estimated load reductions achieved through implementation of BMPs by vegetable/row crop operations. Due to the inaccuracies in 2004 land use information and changes in land use since 2004, the estimated total load for agriculture is greater than the actual loading.

Market conditions can affect land use and crop production each year, and these changes are not easily tracked. Most changes are to crops that require less intensive management (e.g., fertilizer amounts) than existing crops, such as potatoes. Therefore, associated load reductions may be greater than those estimated for BMP implementation.

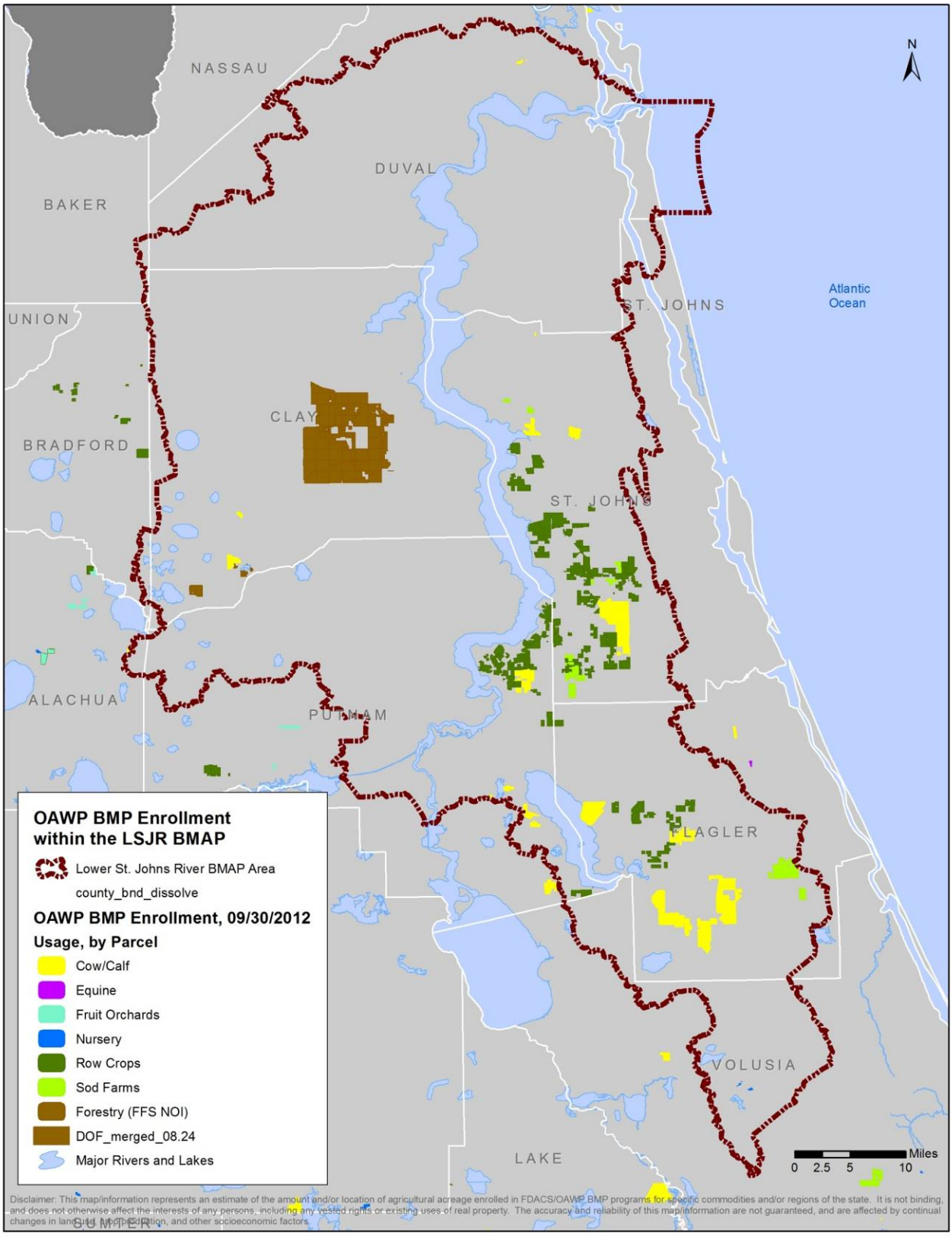


FIGURE 27: MAP OF THE AGRICULTURAL BMP ENROLLMENT IN THE LSJR BASIN

TABLE 13: AGRICULTURAL TN AND TP LOAD REDUCTION ALLOCATION AND ESTIMATED REDUCTIONS IN LOADS FROM BMPS AND RSTS

REDUCTION CATEGORY	TN – FRESHWATER (KG/YR)	TP – FRESHWATER (KG/YR)	TN – MARINE (KG/YR)
Load Reduction Allocation	116,364	12,481	8,630
Estimated Load Reductions via BMPs[1]	47,935	1,581	N/A
Estimated Load Reduction via completed RSTs[2]	2,851	1,335	N/A
Remaining Load Reductions Needed	**65,578**	**9,565**	**8,630**

[1] Estimated reductions are based only on BMP implementation by vegetable/row crops. FDACS will work with FDEP and SJRWMD on a method to determine reductions from other commodities, and a reduction credit for acreage no longer in agricultural production.
[2] RSTs were constructed by the SJRWMD.

Agricultural Land Use Data

Agricultural acreage in the LSJR Basin has declined since the 2004 land use data were collected. In addition, some categories of agricultural land use may include acreage that is not in production or that is not actually agriculture. This is because aerial photos of land use are not always clear enough to interpret accurately. The potential for misinterpretation is generally greatest in the pasture categories. FDACS staff will be working with FDEP and SJRWMD to determine more accurately the agricultural acreage in the basin.

TCAA Water Management Partnership

The objective of the TCAA Water Management Partnership is to contribute to the improved health of the LSJR through on-farm and regional water management projects and practices that reduce the movement of nutrients to the river, improve water conservation, and result in more efficient farm management while maintaining the long-term viability of agriculture in the TCAA. The primary resource concern is the movement of phosphorus off of farmlands into the LSJR and its tributaries; however, nitrogen movement is also a concern. To address these concerns, the TCAA Water Management Partnership is providing funding for water management projects and other practices to better manage and/or treat stormwater runoff and better target or reduce nutrient applications. Technical support and education/outreach to promote enhanced farm practices is also a key component. TCAA Water Management Partnership partners include:

- TCAA growers (including the North Florida Growers Exchange)
- FDACS
- FDEP
- SJRWMD
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)
- UF-IFAS
- St. Johns County
- Florida Resource Conservation and Development Council
- Florida Farm Bureau
- Florida Fruit and Vegetable Association

Project types and cost-share items that are considered for funding by the TCAA Water Management Partnership include the following (see **Figure 28** and **Figure 29**); however, other ideas for projects that would further the program objective may be proposed:

- Projects
    - Drip irrigation
    - Overhead irrigation
    - Enhanced seepage irrigation
    - Tailwater recovery

    - Regional water reuse
    - Regional wet detention
    - Irridrain
- Practices/Equipment
    - Banding equipment
    - Pump upgrades w/soil moisture sensors
    - Soil moisture sensors

The growers and agencies (FDACS, FDEP, SJRWMD, NRCS, and UF-IFAS) are working together to install and demonstrate these projects and practices on TCAA farms through cost-share funding, education, and technical assistance. Current approved and pending projects and practices include:

- Fertilizer banding on potatoes and drop spreader application on sod
- Subsurface drip irrigation on potatoes
- Surface drip on potatoes
- Irridrain on potatoes and sod
- Overhead linear irrigation upgrade on sod
- Center pivot on sod

FIGURE 28: AGRICULTURE OVERHEAD PIVOT IRRIGATION ON SOD WITH FERTIGATION

FIGURE 29: AGRICULTURE FERTILIZER BANDING EQUIPMENT FOR EIGHT ROWS

To be eligible for cost share, TCAA growers must be enrolled in and implementing applicable FDACS BMPs. This is one of 8 eligibility requirements, including the willingness to undergo monitoring to determine the benefits of the projects and to host and participate in educational/demonstration activities on the project site.

FDCAS staff is coordinating the partnership's efforts. SJRWMD has provided $2.25 million in cost share for the partnership, with $750,000 of that dedicated to the purchase of fertilizer banding equipment. Almost $1 million of the total cost share has been committed to projects and practices so far. FDEP is working on providing the funds to monitor the water quality and conservation benefits of approved projects, along with some additional cost share, which may total about $3 million once it is released.

Through the National Water Quality Incentives Program, the NRCS provided increased targeted cost share (75% of NRCS scheduled costs) in 2 specified sub-basins within the TCAA for farms that enrolled in the Environmental Quality Incentives Program. Cost share for this program is available on a regular basis at 50% of NRCS scheduled costs.

Demonstration days and other educational efforts will stem from funded projects. Future irrigation/stormwater recovery and reuse projects are under discussion.

The partnership is intended to be perpetual, to foster ongoing collaboration among agencies and growers. While funding amounts for projects and practices may vary from year to year, there will be continued support for farmers to enhance their farming practices and reduce their farm inputs while maintaining or increasing yields.

2.2.4.2 RST Facilities

SJRWMD has completed two RST facilities, Deep Creek West (also known as Yarborough) and Dog Branch (also known as Edgefield), in the TCAA. Modeling assessments conducted prior to the construction of the Deep Creek RST estimated 998 kg/yr of TN reduction and 816 kg/yr of TP reduction. The Edgefield RST was estimated to achieve 2,404 kg/yr of TN reduction and 1,089 kg/yr of TP reduction.

Differences in nutrient loads entering and exiting the Deep Creek West facility (inflow canal load versus wetland outflow load) are calculated to generate the actual annual total load reductions and overall RST treatment efficiency. Annual TN reductions range from 3,625 kg in 2009, 2,636 kg in 2010, 4,214 kg in 2011, and 2,179 kg through November 2012. The annual average nitrogen reduction for 2009 through November 2012 was 3,164 kg/yr, which exceeds the estimated TN load reductions (1,000 kg/yr) outlined in the LSJR Main Stem BMAP for the Deep Creek West RST.

For the Deep Creek West RST, annual reductions in TP range from 1,668 kg in 2009, 1,385 kg in 2010, 1,794 kg in 2011, and 1,518 kg through November 2012. The annual average phosphorus reduction for 2009 through November of 2012 was 1,591 kg/yr, which also exceeds the estimated TP load reductions (818 kg/yr) outlined in the LSJR Main Stem BMAP. In general, greater treatment efficiencies and reductions are associated with storm events while treatment under ambient conditions can be minimal, and in some cases, nutrients are exported from the RST. The overall 2012 treatment efficiencies for the Deep Creek West RST system were approximately 52% for TN and 55% for TP.

Based on the findings of a wetland dye tracer study conducted in June 2010 at the Deep Creek West RST facility, only 5.1 acres of the 38-acre wetland are functioning under baseflow conditions due to hydraulic short circuiting and dead zones throughout the wetland. Retrofits to the wetland flow regime may be possible but construction costs are high and current funding is limited. However, SJRWMD and St. Johns County are working together to implement cost effective improvements, increase flow volumes and storage volumes in the pond, and increase accordingly the wetted area of the wetland and thereby increasing residence time and treatment. St. Johns County is reviewing design options to increase flow volumes and storage volumes to the pond.

Pollutant loading cannot be calculated for the Dog Branch RST at this time due to the absence of flow data; thus, only pollutant concentrations are available for assessment. Monthly ambient concentration data (2007 – 2012) for the Dog Branch RST (inflow concentration versus wetland outflow concentration) indicated a 44% reduction in TP concentration and a 40% reduction in TN concentration. Average ambient TN concentrations were 2.0 milligrams per liter (mg/L) in the inflow and 1.20 mg/L at the wetland outflow. TP concentrations were 0.54 mg/L in the inflow and 0.30 mg/L at the wetland outflow. Average storm event concentrations (2008-2012) for the Dog Branch RST indicated an 82% reduction in TN and 91% reduction in TP. Average storm TN concentrations were 6.65 mg/L in the inflow and 1.14 mg/L at the wetland outflow. TP concentrations were 3.56 mg/L in the inflow and 0.30 mg/L at the wetland outflow. While these current treatment performance estimates derived from ambient and storm data represent only reductions in concentrations, these data are encouraging and lead SJRWMD to believe that the facility is effectively reducing pollutants under both ambient and storm conditions. As flow and volume data become available, these data, in conjunction with pollutant concentrations, will be used to determine a more accurate assessment of treatment performance and watershed pollutant load reductions.

Within the freshwater reach, SJRWMD contractors in 2010 completed a technical memorandum and associated BMP Optimization Model addressing a nutrient reduction strategy for the TCAA. This report suggests that RST areas, such as those already constructed, may not offer the lowest life-cycle cost per mass of TN and TP. Alternatively, field-level treatment, which may require updating standard irrigation practices to reuse of irrigation water, drip or overhead irrigation combined with fertigation, may be more justified from an economic perspective. SJRWMD is participating in the TCAA Water Management Partnership, as discussed above.

Dairy farms comprised the primary contributing agricultural operations within the marine reach. These operations have been abandoned as confirmed by land use assessments, thus negating the need for RST facilities within that section of the river.

2.3 IMPROVING SCIENTIFIC UNDERSTANDING

2.3.1 WATER QUALITY MONITORING

2.3.1.1 Freshwater Reach for the Chlorophyll-a Target

The monitoring plan includes routine ambient sampling to determine progress towards the chlorophyll-a target in the freshwater reach, and an intensified sampling program from April – September when blooms are the most likely. Because of the patchiness of algal blooms, the WBID-wide average bloom density from 2009 – 2011 was calculated with data collected from a multi-station transect monitoring program, with sampling undertaken every 2 weeks by FDEP staff, and laboratory analysis funded by Georgia Pacific and Seminole Electric. Concurrent with

this sampling, SJRWMD, Florida Department of Health, and National Oceanic and Atmospheric Administration (NOAA) staff have been working to apply the Medium Resolution Imaging Spectrometer (MERIS) sensor data, carried aboard the ENVISAT satellite, with the intent of using these data to replace the more time consuming transect sampling endeavor. This approach appeared promising, with the MERIS data matching the transect data closely in comparisons done during the large 2010 river bloom. Unfortunately, the ENVISAT satellite ceased functioning in April 2012. Calibration of the available satellite sensor data is continuing, with the expectation to have an established algorithm and protocol ready for the replacement Sentinel series satellite, planned for launch in 2014. Until that time, SJRWMD plans to reinstitute some river monitoring to provide improved areal coverage of algal blooms.

SJRWMD previously conducted the ambient sampling on a biweekly basis at 9 sites. However, during the last year, SJRWMD discontinued 4 of the monitoring sites (stations SJRCC, SJRCW, SJM37, and SAVSCRAO) and decreased the monitoring frequency at station SJSR16 from biweekly to monthly. During the last year, SJRWMD conducted the ambient freshwater sampling on schedule for the current 5 stations, and these data are uploaded to STORET on a regular basis.

2.3.1.2 Marine Reach for the Dissolved Oxygen Target

Compliance with the DO target in the marine reach of the river is determined through data from 3 continuous DO stations, in which samples are collected every 15 minutes. The USGS station at Dames Point is an existing station, and the DO sampling occurred at this station throughout the last year. The data from this station are maintained by USGS and can be accessed through their website. There are also 2 BMAP stations at Fulton Point and Clapboard Creek. FDEP operates and maintains these stations and stores the continuous DO data. The channel maker that the DO sondes at the Fulton Point station were attached to was hit in March 2012 and was then hit again in July 2012. Therefore, DO data from this station were not collected for most of 2012. FDEP is working to reestablish this station for sampling in 2013.

2.3.1.3 River and Tributary Inflow Monitoring

The tributaries monitoring includes ambient sampling to determine the loads entering the main stem of the river from its tributaries and to estimate the reductions associated with the implementation of stormwater projects.

For the ambient monitoring, SJRWMD sampled a total of 21 stations; however, this last year, SJRWMD discontinued 5 monthly stations. For the remaining 16 stations, 4 are sampled biweekly, 7 are sampled monthly, and 5 are sampled bimonthly. This sampling occurred on schedule over the last year. In addition, JEA is responsible for sampling 5 stations on a bimonthly basis, and this sampling occurred on schedule throughout the year. All of the ambient monitoring data are uploaded to STORET on a regular basis.

2.3.2 Septic Tank Model

FDEP has been working with the City of Jacksonville and independent researchers to develop an approach for estimating septic tank contributions of nitrogen to surface waters and conveyances that connect to the LSJR system. The approach that has evolved includes the collection of site specific and regional data on septic tank inputs and the development and calibration of an innovative modeling tool. This tool can be enhanced by calibration data and applied to any given neighborhood to provide reasonable estimates of septic tank effluent loadings of nitrogen to the river system.

Beginning in October 2009, Florida State University (FSU) began the development of a simplified steady-state model of nitrate transport from septic tank systems via shallow ground water flow. This effort was conducted under the direction of Dr. Ming Ye with funding and oversight from FDEP. Nitrate is the most mobile form of nitrogen and is expected to constitute the primary form of nitrogen load from septic tanks to the LSJR system. This model, called ArcNLET, was developed as a tool for estimating the concentration and loading of nitrate from an area served by septic tanks to nearby surface waters. The model was developed using laboratory measurements and field observations and uses ArcGIS as its software platform. Version 1.1 of ArcNLET was released to the public in summer of 2011 and can be downloaded from the internet (http://people.sc.fsu.edu/~mye/ArcNLET/index.html). FSU provided an initial training session on the use of ArcNLET in July 2011 and has since tested ArcNLET on various scenarios that include several of the City of Jacksonville neighborhoods identified for septic tank phase-out.

FDEP recommended that the ArcNLET model be used for estimating the nitrogen loadings from septic tank contributions to surface waters and conveyances, particularly related to updating the amount of BMAP credit that should be allotted to the City of Jacksonville for septic tank phase-out. The model is designed as a tool where the independent variables such as flow path, velocity, and travel time can be customized if site-specific data are available.

The City of Jacksonville had concerns with some of the independent variables and input data that were used to estimate septic tank loads. To provide feedback to FDEP, the city formed a peer review group to review the model, inputs, and available data. Based on the comments received in 2012 from the peer review process, FSU updated or modified some of the inputs to better fit site conditions. With these modifications in place, FDEP considered the model fully functional for the Jacksonville area and notified the city that the ArcNLET model reduction estimates would be applied for both completed and future phase out efforts; the previous provisional credit method is no longer applicable.

The nitrogen reduction estimates for the city's septic out areas, based on the ArcNLET model, are listed in **Table 14**. If all the phase out areas were connected to sewer, the total estimated reduction is 40,197 kg/yr. For the city neighborhoods that have already been phased out, the estimated reduction calculated with ArcNLET is 2,934 kg/yr, modified from the prior estimate of 10,600 kg/yr based on the provisional credit method.

FDEP has indicated that if more site-specific data are collected, they are receptive to further calibration of the ArcNLET model and the phase out credits may increase. However, for the purposes of BMAP reduction credit, the existing ArcNLET model estimates will be used unless additional data that were collected under acceptable method) are available to further calibrate the ArcNLET model.

TABLE 14: ARCNLET NITROGEN REDUCTION ESTIMATES FOR CITY OF JACKSONVILLE SEPTIC TANK PHASE OUT

PHASE-OUT AREA	NUMBER OF SEPTIC TANKS	TN LOAD (KG/YR)
Southside Estates	2,308	588.91
Oakhaven	883	853.18
Eggleston Heights*	3,517	15,147.50
Point La Vista	851	542.38
Hood Landing II	508	123.46
Scott Mill Hill	361	41.41
Lake Forest	842	27.73

Phase-Out Area	Number of Septic Tanks	TN Load (kg/yr)
Beverly Hills	687	29.00
Murray Hill B	145	2.20
Champion Forest	591	3.24
Beauclerc Gardens	482	9,318.85
Glynlea	543	110.99
Lakeshore	1,399	1,033.65
Oakwood Villa Estates	1,572	2,751.45
Pernecia/Johnnie Circle	19	0.61
Westfield	181	0.00
Biltmore C	224	3.09
Kinard	61	29.64
The Cape	33	0.59
Royal Terrace	106	0.00
Odessa	28	0.00
Atlantic Highlands	74	0.00
Freeman	87	0.00
Inwood Terrace	35	2.30
Christobel	254	0.00
Lone Star Park	313	11.35
Holly Oaks	285	32.46
Emerson	772	42.89
Oak Lawn	235	451.64
Mill Creek	434	25.15
Clifton	488	2,918.89
Julington Creek*	1,978	511.00
Julington Hills	629	223.81
Mt Pleasant	440	370.48
Pablo Point	245	40.77
Sams Peril	201	8.50
Cedar River	423	978.65
Ortega	135	108.71
Ortega Terrace	61	7.13
Empire Point	343	1,903.51
St Nicholas	699	706.25
Spring Glen	479	135.12
Northlake	107	1,059.61
Lincoln Villas	84	0.00
Riverview	1,334	50.47
Total	**25,476**	**40,196.58**

*Based on model calibration.

2.3.3 Algal Initiative

The development of the St. Johns River Nutrient Reduction Initiative ("Algal Initiative") is proceeding at a steady pace. A broad range of project options have been identified and SJRWMD has completed two RST facilities (see **Section 2.2.4.2**). SJRWMD is also pursuing projects to reduce nutrient loadings emanating from Lake George including gizzard shad harvesting, which has proven exceptionally cost effective in other areas. Funding of up to $1,000,000 has been allocated to gizzard shad harvesting from the legislature and has been programmed for use over fiscal years 2013 and 2014. SJRWMD has presented its findings to the Florida Fish and Wildlife Conservation Commission in pursuit of a harvesting permit and is awaiting notification from the Commission. In addition, SJRWMD continues to explore the potential for macrophyte management and harvesting within the Lower and Middle St. Johns River basins. Numerous upstream project opportunities within the Middle St. Johns River Basin

are being examined with design initiated for one project located on SJRWMD lands within the Econlockhatchee River Basin.

St. Johns County has designed and permitted an additional RST on property obtained from the SJRWMD, known as the Masters tract, adjacent to Deep Creek near Hastings. Estimated reduction values for this facility are 2,370 kg/yr of TN and 1,190 kg/yr of TP. The total estimated cost of this project is $6,432,000. SJRWMD contributed $2,600,000 of legislative funding toward this project.

2.3.4 TMDL Model Revisions

SJRWMD engineers and scientists have continued to refine and expand the St. Johns River Estuary hydrodynamic and water quality model suite that was originally developed for the LSJR TMDL, for application to a variety of water quantity and quality management scenarios.

The hydrodynamic foundation of the St. Johns River model, the Environmental Fluid Dynamics Code (EFDC) was expanded upstream through Lake George and the Middle St. Johns River Basins to just upstream of Lake Harney to examine flow reduction and future development scenarios as part of SJRWMD's Water Supply Impact Study. The accompanying water quality model application, built upon the U.S. Army Corps of Engineers CE-QUAL-ICM, was extended into Lake George and Crescent Lake, with its upstream boundary at Astor, to examine Water Supply Impact Study scenario effects on water quality and eutrophication. This modeling work was reviewed by the National Research Council, National Academies, and reports documenting the model calibration and confirmation was electronically published by the SJRWMD in February 2012. The current focus of effort on the hydrodynamic model is directed toward improving the model linkage to CE-QUAL-ICM, and expanding the extent of the model domain up through the lower Ocklawaha and Silver Rivers. Current work on the water quality model is directed toward incorporating an improved method for computing cyanobacteria (blue-green algae) nitrogen fixation, the process by which blue green algae "internally" load the river by converting atmospheric nitrogen gas to organic nitrogen. These modeling suite enhancements are being done to broaden its capability to examine several potential upstream water management scenarios.

In addition to the expansion and enhancement of the core modeling suite, significant advances have been made to the models that provide inputs to the St. Johns River Estuary model package. Because the Middle St. Johns River receives considerable salt flux from diffuse ground water, ground water volume and salt entering the model have been estimated using MODFLOW, a ground water flow model. The EFDC model code was modified to allow interconnection of ground water flows through the bottom layer cells. Daily variability of spring flows entering the model was estimated for major springs (Alexander, Blue, and Blackwater Creek/Wekiva River spring groups) primarily using groundwater levels in nearby wells. A significant enhancement was also made to the St. Johns River Basin hydrologic models that provide surface water runoff to the EFDC hydrodynamic model. Surface water runoff has been computed for the entire St. Johns River Basin, including the Ocklawaha River Basin, utilizing the Hydrologic Simulation Program – FORTRAN (HSPF) model for the period from 1974 through 2008. Work is currently ongoing to update both the Pollution Load Screening Model (PLSM) and HSPF to account for changes in land development and the accompanying effects on water quality, in order to provide time-varying constituent loads. The objective for enhancements to the entire modeling suite in 2013 is to have the capability for a full 13 years of simulation capability from 1996 through 2008.

In the past year, the St. Johns River Estuary modeling package has been applied to two important modeling projects outside of the SJRWMD. The model suite was employed by EPA to translate the LSJR TMDL assimilative capacity nutrient load into representative concentrations for promulgation of NNC for the marine reach of the LSJR. The modeling suite is also currently being applied by the U.S. Army Corps and Engineers and its consultants to examine the potential effects associated with Jacksonville Port deepening scenarios.

2.3.5 SJRWMD Funding for Additional Nutrient Reductions

Several cost share agreements for the expansion of reclaimed water service have been executed including those with Palatka, JEA, CCUA, Neptune Beach, and NAS Jacksonville. Per the BMAP, water quality credits are being held for the river based on the SJRWMD *ad valorem* funding contribution, prorated in relation to the total project cost. Held credits do not accrue to the recipient and are not be available for TMDL compliance or for sale as water quality credits to other entities. Credit reductions will be documented in the recipient's domestic wastewater facilities permit. The estimated amount of credit reservations by the SJRWMD is 45,503 kg/yr of TN. These reductions will be finally calculated for adoption within permit at the time projects are completed and based on final construction costs and actual nutrient reduction data.

2.4 Funding

Camp Blanding received $591,260 for the roadway improvement projects. They also obtained $170,000 in funding to conduct a TMDL management study on the Camp Blanding Cantonment Area in 2013.

The City of Atlantic Beach completed the WWTP #1 upgrades through funding from a FDEP State Revolving Fund loan, along with a $1 million grant from SJRWMD.

The City of Jacksonville continues to utilize funds raised through its stormwater utility to fund stormwater capital improvement projects as well as dedicated funding for septic tank phase-out projects, including both construction and subsidized connection fee. Additionally, the Environmental Protection Board has authorized use of the Environmental Protection Fund, with City Council approval, to assist in outreach and public education activities. This represents the second year that a dedicated funding source has been allocated for these types of activities.

The City of Palatka secured $160,000 for the reconfiguration of parking facilities and construction of a stormwater treatment system in the southern portion of the Riverfront Park.

St. Johns County received $117,874 for Bishop Estates baffle boxes, $819,747 for the countywide stormwater model, $341,310 for countywide TMDLs, $36,286 for the Masters Tract RST, $57,206 for Deep Creek West RST Improvements, and $219,335 for County Road 13 baffle boxes.

2.5 Summary of Accomplishments

The table and figures below illustrate the load reductions made by the stakeholders in the LSJR Basin and the remainder of the nutrient loading in each segment of the river to achieve the TMDLs.

TABLE 15: PROGRESS TOWARDS THE TP TMDL IN THE FRESHWATER REACH

SOURCE	% OF CONTROLLABLE LOAD	STARTING LOAD (KG/YR)	2012 LOAD (KG/YR)	ALLOCATION (KG/YR)	REMAINING REDUCTIONS (KG/YR)	% COMPLETE
WWTF	45%	81,015	37,881	44,386	0	100%
MS4	1%	1,500	1,256	1,256	0	100%
Non-MS4	7%	12,358	10,158	9,408	750	75%
Agriculture	47%	83,455	80,539	70,974	9,565	23%
Total	**100%**	**178,329**	**129,834**	**126,025**	**3,810**	**93%**

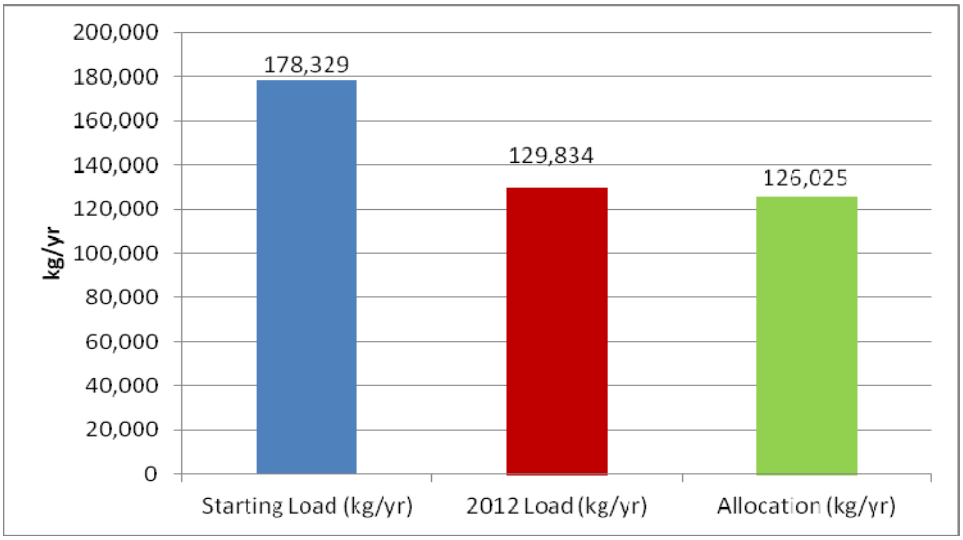


FIGURE 30: PROGRESS TOWARDS THE TP TMDL IN THE FRESHWATER REACH

TABLE 16: PROGRESS TOWARDS THE TN TMDL IN THE FRESHWATER REACH

SOURCE	% OF CONTROLLABLE LOAD	STARTING LOAD (KG/YR)	2012 LOAD (KG/YR)	ALLOCATION (KG/YR)	REMAINING REDUCTIONS (KG/YR)	% COMPLETE
WWTF	47%	364,650	195,560	237,200	0	100%
MS4	1%	9,731	8,685	8,685	0	100%
Non-MS4	17%	88,705	75,900	74,119	1,781	88%
Agriculture	40%	310,700	259,914	194,336	65,578	44%
Total	**100%**	**773,786**	**540,059**	**514,340**	**25,719**	**90%**

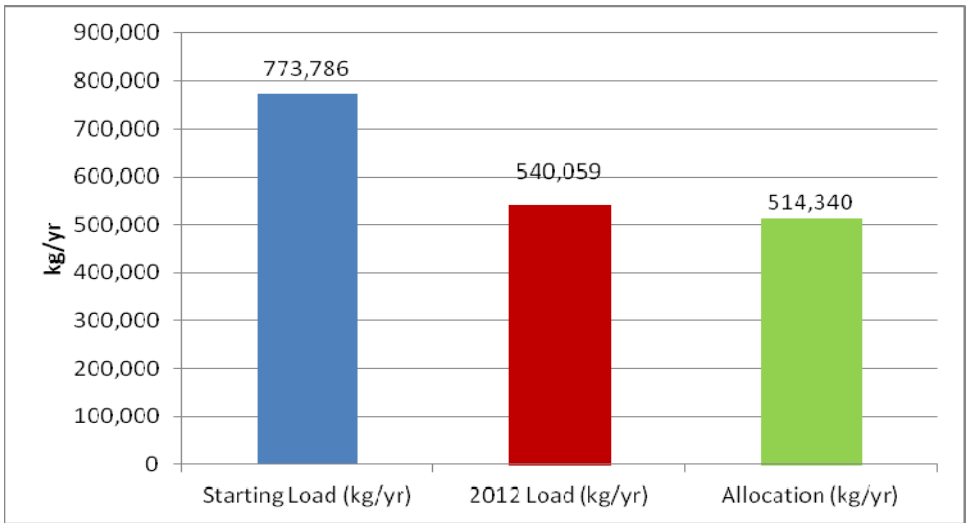


FIGURE 31: PROGRESS TOWARDS THE TN TMDL IN THE FRESHWATER REACH

TABLE 17: PROGRESS TOWARDS THE TN TMDL IN THE MARINE REACH

SOURCE	% OF CONTROLLABLE LOAD	STARTING LOAD (KG/YR)	2012 LOAD (KG/YR)	ALLOCATION (KG/YR)	REMAINING REDUCTIONS (KG/YR)	% COMPLETE
WWTF	84%	1,786,542	1,056,164	878,326	177,838	80%
MS4	14%	291,657	229,549	136,422	93,127	40%
Non-MS4	1%	24,767	22,726	17,192	5,534	27%
Agriculture	1%	12,800	12,800	4,170	8,630	0%
Total	**100%**	**2,115,766**	**1,321,239**	**1,036,110**	**285,129**	**74%**

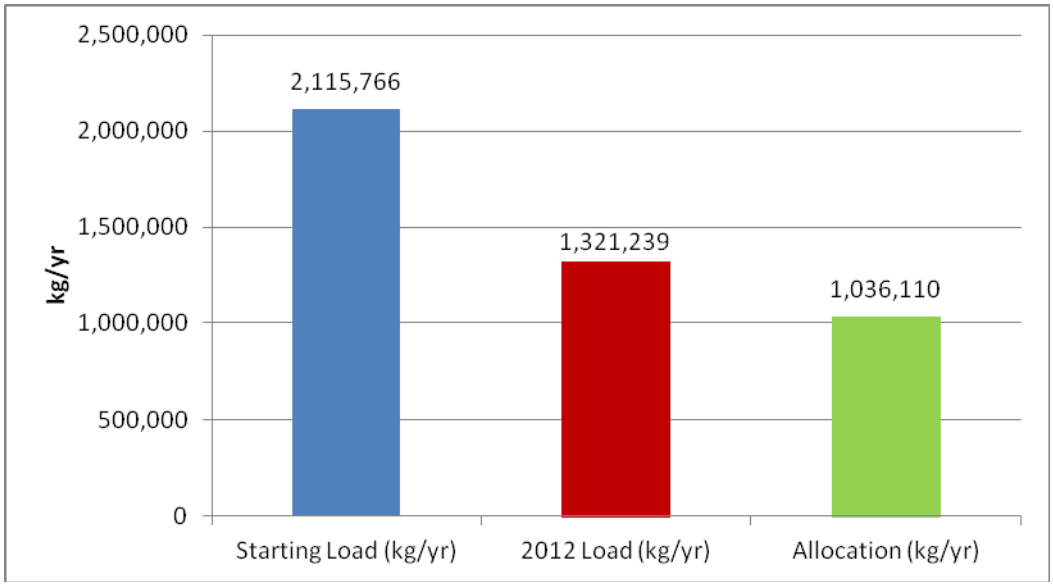


FIGURE 32: PROGRESS TOWARDS THE TN TMDL IN THE MARINE REACH

SECTION 3: MAJOR ISSUES

3.1 SUMMARY OF ISSUES

The major issue in BMAP implementation this past year has been securing funding for projects. For local governments and water management districts, the economic downturn and subsequent decreases in *ad valorem* taxes and development fees have made it difficult to obtain the funding necessary to implement the BMAP projects. While funding continues to be an issue, this limitation has not caused major delays in implementation of BMAP projects scheduled to be completed during this reporting period. There are concerns that the City of Jacksonville is behind schedule to meet their 2015 milestones for septic tank phase out and stormwater reductions, but no compliance dates applied in 2012. During the last year, SJRWMD discontinued sampling at several freshwater and tributaries stations due to reprioritization of efforts. In addition, the DO station at Fulton Point has been inactive since March 2012 because the channel marker the DO sondes were attached to had been hit multiple times during the reporting period. Additional details the issues encountered this past year are described in **Section 3.2**.

3.2 ISSUES BY SOURCE TYPE

3.2.1 WASTEWATER TREATMENT FACILITIES

3.2.1.1 Freshwater Reach

City of Palatka

The City of Palatka has completed its WWTP upgrades for zero discharge (PAL-5). However, weather events may hinder the city's ability to maintain zero discharge depending on the amount of flows received during the event. However, the zero discharge project provides the city with credit beyond their required reductions so not being at zero discharge is not a BMAP compliance issue.

3.2.1.2 Marine Reach

City of Atlantic Beach

The City of Atlantic Beach had some equipment delivery delays that added time to the WWTP #1 upgrades project. Tropical Storm Debby caused some delay, as well. However, the project was completed ahead of the BMAP schedule so the delays did not cause an issue with compliance.

3.2.2 MS4s

3.2.2.1 Marine Reach

City of Jacksonville

The City of Jacksonville is concerned with the current state of the FDEP septic tank study, which is in the form of a model to predict loadings based on site-specific data. Specifically, the BMAP envisioned that a septic tank nutrient study would be conducted and, upon completion, the city would submit a revised nutrient reduction plan to address any loading the study concluded could not be credited by septic tank removal. It is our understanding that the work of the technical advisory committee and the resulting evaluation tool will be used to determine nutrient loading attributable to septic tank phase-out. FDEP has notified the city that the

existing version of the ArcNLET model will be used to determine BMAP credit for septic tank phase out (refer to **Section 2.3.2** for additional details).

The city is also concerned with the schedule to implement the water quality projects outlined in the BMAP. At the current time, there is not enough identified funding to meet BMAP obligations. It is not clear what impacts there will be to the city's ability to plan, fund, and meet BMAP timelines and requirements given the significant limitations and variability of the available funding and the pending finalization of the septic tank nutrient study.

3.2.3 URBAN STORMWATER

3.2.3.1 Marine Reach

St. Johns County

The tight fiscal environment has proven challenging for St. Johns County to secure meaningful funding for projects. County staff is exploring partnerships and grant opportunities to close the funding gaps.

Camp Blanding

During 2012, Camp Blanding did not receive funding to regrade any of the swale system. However, they have a funding request to regrade the entire swale system within the Camp Blanding Cantonment Area and they are waiting for final approval of this funding in 2013. Therefore, Camp Blanding is currently on track to regrade the remaining swales by the end of 2013, as required by the BMAP (project CB-1).

3.2.4 AGRICULTURE

As discussed in the 2011 LSJR BMAP annual report, representatives of FDACS, SJRWMD, and IFAS worked with growers in the TCAA to develop guidance (referred to as "the mitigating BMP table") on the implementation of BMPs for potato operations, to fit the particular circumstances in that region. FDACS has adopted this guidance by rule in Chapter 5M-4, Florida Administrative Code. Growers that previously were hesitant to participate in the FDACS BMP program are now doing so, and most of the TCAA potato farms have enrolled. It should be noted, however, that even those not yet enrolled are implementing many of the BMPs.

3.3 WATER QUALITY MONITORING ISSUES

During the last year, SJRWMD is in the process of evaluating whether to reinstate monitoring at some of these stations in the future.

During the last year, a number of revisions were instituted in the SJRWMD contribution to the LSJR Basin water quality monitoring program, due to the completion of some projects, reprioritization to emerging projects, integration of alternative and more cost-effective sampling technologies, and reductions in monitoring resources. The backbone of the SJRWMD monitoring effort, a 15-station river monitoring program performed twice per month, has remained in 2012, but river shoreline and some tributary monitoring has been eliminated. SJRWMD discontinued sampling at 4 freshwater stations and decreased the sampling at 1 station from biweekly to monthly. SJRWMD also stopped sampling 5 tributaries stations. River shoreline monitoring is still performed in the LSJR under FDEP's Dock and River-at-a-Glance monitoring networks. The planned effort to assess worst-case WBID algal bloom coverage using satellite sensor data was delayed in April with the malfunction of the ENVISAT satellite.

In addition, the DO station at Fulton Point has been down since March 2012 because the channel marker the DO sondes were attached to had been hit multiple times during the reporting period. Therefore, limited data are available for this station in 2012. FDEP is working to install the DO sondes at this location so that sampling can resume in 2013.

SECTION 4: UPCOMING YEAR ACTIVITIES

4.1 SUMMARY OF EFFORTS FOR THE UPCOMING YEAR

The fifth annual BMAP progress report will encompass the period of January 1, 2013 through December 31, 2013. During this time, the City of Jacksonville Beach will complete the upgrades to their WWTF, and JEA will complete the Royal Lakes WWTF phase-out, San Jose WWTF phase-out, Buckman WWTF process improvements, and the reuse expansion projects in the marine reach. The City of Jacksonville will continue to phase-out septic tanks and design stormwater projects to meet their marine reach MS4 allocation. The City of Palatka will start construction on their stormwater treatment project in the freshwater reach, and Camp Blanding will complete the maintenance and repair of their swales in the marine reach. FDACS will continue to enroll agricultural producers in BMP programs. In addition, the freshwater ambient water quality sampling, DO stations sampling, and tributaries sampling will continue through the monitoring plan. Additional details are included in **Section 4.2** and **Section 4.3**.

4.2 UPCOMING EFFORTS BY SOURCE TYPE

4.2.1 WWTFs

4.2.1.1 Marine Reach

City of Jacksonville Beach

The City of Jacksonville Beach will complete the WWTF upgrades (project JB-1) by December 31, 2013, which has an estimated reduction of 21,555 kg/yr of TN.

JEA

JEA will complete the phase out of the Royal Lakes WWTF (project JEA-11) and San Jose WWTF (project JEA-15) by March 31, 2013. JEA will also complete the improvements to the Buckman WWTF (project JEA-16) and the reuse expansion (project JEA-17) by September 30, 2013, and these projects have an estimated reduction of 250,273 kg/yr of TN.

4.2.2 MS4s

4.2.2.1 Marine Reach

City of Jacksonville

The City of Jacksonville will continue with the septic tank phase-out project (project COJ-52) and the implementation of the MSMP projects (projects COJ-42 through COJ-50), or proceed with alternate projects or water quality credit trades.

4.2.3 URBAN STORMWATER

4.2.3.1 Freshwater Reach

City of Palatka

The City of Palatka will begin construction of the stormwater treatment system (project PAL-7) by August 1, 2013.

4.2.3.2 Marine Reach

Camp Blanding

Camp Blanding will finish re-grading the swale system (project CB-1) by December 31, 2013, which will achieve a reduction of 1,999 kg/yr of TN.

St. Johns County

St. Johns County will complete construction of the Bishop Estates baffle boxes by December 2013 (project SJC-28), which is ahead of the BMAP schedule. This project has an estimated reduction of 199 kg/yr.

4.2.4 AGRICULTURE

FDACS will be revising its container nursery and vegetable/agronomic crops manuals, to update the practices as needed and improve clarity and ease of use. The container nursery manual will be expanded to include in-ground nurseries and ferneries. The BMP guidance for potato operations in the TCAA will be revisited, modified if necessary, and incorporated into the vegetable/ agronomic crops manual revisions in some form.

The primary focus in the LSJR Basin will be on significantly increasing enrollment in all commodities, and on supporting and expanding the TCAA Water Management Partnership. Extension agents and researchers with UF-IFAS will continue to assist growers in maximizing nutrient application and irrigation efficiencies, and in applying for cost-share funds for water management projects and BMPs. FDACS staff will continue to provide coordination and technical support for the Partnership. SJRWMD, FDEP, and NRCS will continue to assist growers with developing project concepts and monitoring plans, along with providing cost-share funds as available.

4.3 WATER QUALITY MONITORING

For the freshwater sampling, SJRWMD will continue to monitor at their ambient stations, and is evaluating the reinstatement of some discontinued stations. In the river's marine reach, both the City of Jacksonville and SJRWMD have continued to operate their long-term water quality monitoring programs. FDEP will continue to operate and maintain the DO station at Clapboard Creek and will reinstate the station at Fulton Point as soon as possible for the marine reach monitoring. SJRWMD and JEA will continue the ambient water quality sampling in the tributaries, and SJRWMD will consider adding back some of the discontinued tributaries stations. In addition to these efforts, in 2012 NOAA installed its Physical Oceanographic Real-Time System (PORTS) automated monitoring network in the LSJR, with capabilities for continuous real-time monitoring of wind, currents, tide, salinity, and water temperature. PORTS data for the LSJR can be accessed at http://tidesandcurrents.noaa.gov/ofs/sjofs/sjofs.html.

SECTION 5: WATER QUALITY TRENDS

5.1 PRECIPITATION AND HYDROLOGIC CONDITIONS FOR 2012

Rainfall patterns in 2012 led to dramatically differing runoff conditions between the first and second halves of the year. From the start of the year through May 26th, rain totals were approximately half of the long-term normal (**Figure 33**). Then in a one-month span from May 27th to June 27th, tropical systems Beryl and Debby dropped 23 inches of rain in northeast Florida. Debby in particular greatly increased the annual rain totals, leading to a significant amount of flooding in Black Creek. Rainfall for the remainder of the year remained approximately normal, leading to an annual rain total near the long-term annual average. This widely oscillating rainfall pattern was mirrored in the river and tributary discharge, with flow levels below normal from January through most of May, but then increasing sharply from June through August (**Figure 34**). Low flow was particularly acute for the Ocklawaha River, due to the cessation of discharge at the upstream water control structure at Moss Bluff and the refill of Rodman Reservoir following the winter management drawdown. These low flow conditions contributed to more saline conditions than normal in the LSJR, with marine salinity encroaching upstream to river mile 62, 2 miles farther upstream than the previous maximum encroachment that occurred in May 2007.

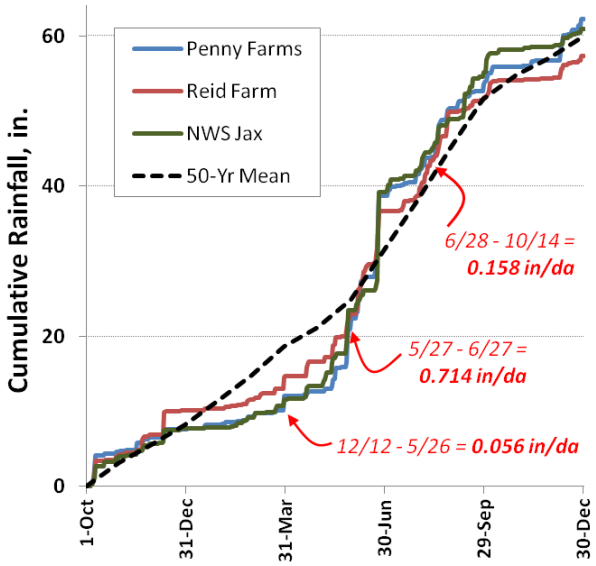


FIGURE 33: CUMULATIVE RAINFALL FROM OCTOBER 1, 2011 THROUGH DECEMBER 31, 2012

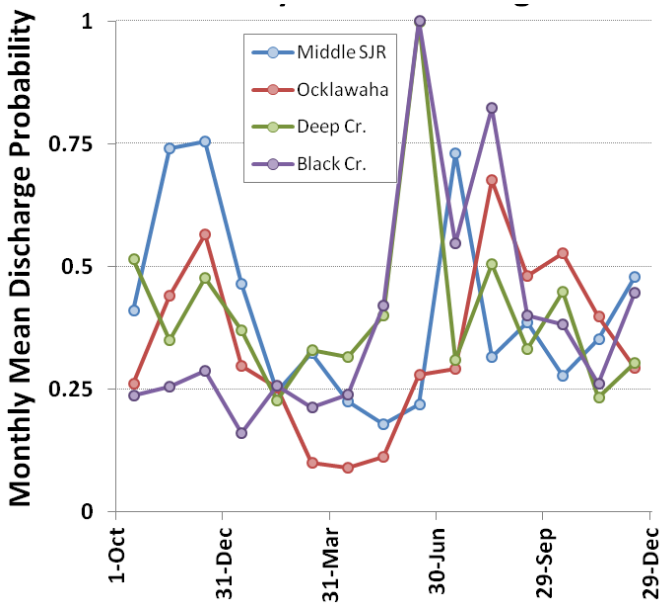


FIGURE 34: MONTHLY MEAN DISCHARGE FROM OCTOBER 1, 2011 THROUGH DECEMBER 31, 2012

5.2 TRENDS IN UPSTREAM CONCENTRATIONS AND LOADS TO THE LSJR

The upstream extent of the LSJR begins at the confluence of the Middle St. Johns and the Ocklawaha Rivers, 100 miles upstream of the mouth. Just downstream of the Ocklawaha confluence, Dunns Creek, the outlet of the 585-square mile Crescent Lake Basin enters the river. Combined, these 3 major tributaries to the LSJR represent 69% of the discharge measured for the St. Johns River at Jacksonville. Owing to these large flow contributions, trends in their TN and TP concentrations affects the LSJR, particularly in the freshwater reach.

The Crescent Lake Basin is largely rural, with the predominant land uses being silviculture, cattle ranching, and row crop agriculture. **Figure 35** and **Figure 36** display the seasonal mean concentrations for TN and TP, respectively, observed for Crescent Lake and its outlet tributary to the LSJR, Dunns Creek, from the start of the TMDL assessment phase (1995) through 2012. Monitoring data are summarized by seasonal (October – March and April – September) means in order to distinguish patterns associated with annual meteorological cycles and peak algal growth, and by flow category to discern discharge-associated trends. Flow categories were assigned by ranking the associated seasonal discharge means for the St. Johns River Buffalo Bluff USGS gauging station into the lower 1/3rd, mid 1/3rd, and upper 1/3rd of flows based on the long-term record for this site. In this discussion, these categories are simply referred to as "winter" and "summer," and "low," "medium," and "high" flows.

The 2012 mean seasonal TN concentrations exiting the Crescent Lake Basin, at 1.28 mg/L (winter) and 1.18 mg/L (summer), are significantly lower than the 1995-1999 annual means observed during the TMDL development phase (**Figure 35**). Likewise, the 2012 mean seasonal TP, at 0.066 mg/L (winter) and 0.059 mg/L (summer) are also less than values observed during the TMDL development phase, although not significantly less than the low-flow condition concentrations observed from spring 1998 through winter 2001 (**Figure 36**). Dry, low runoff conditions typically lead to lower TP concentrations for nonpoint source dominated receiving waters. The mean seasonal TP concentrations for 2011-2012 have returned to lower levels following an extended period from 2002-2010, during which the mean seasonal TP concentration was 0.105 mg/L. Despite the lower TP concentrations for 2011-2012, Crescent

Lake's mean annual chlorophyll-*a* concentrations, a measure of the amount of algal biomass, have exceeded the recently adopted numeric nutrient criteria for both these years, and has exceeded this threshold in 5 of the 10 years since 2003. Under the provisions of this new rule, a colored lake such as Crescent Lake, for which the mean annual chlorophyll-*a* exceeds 20 micrograms per liter (µg/L), would need to meet an annual mean TP concentration of no more than 0.05 mg/L.

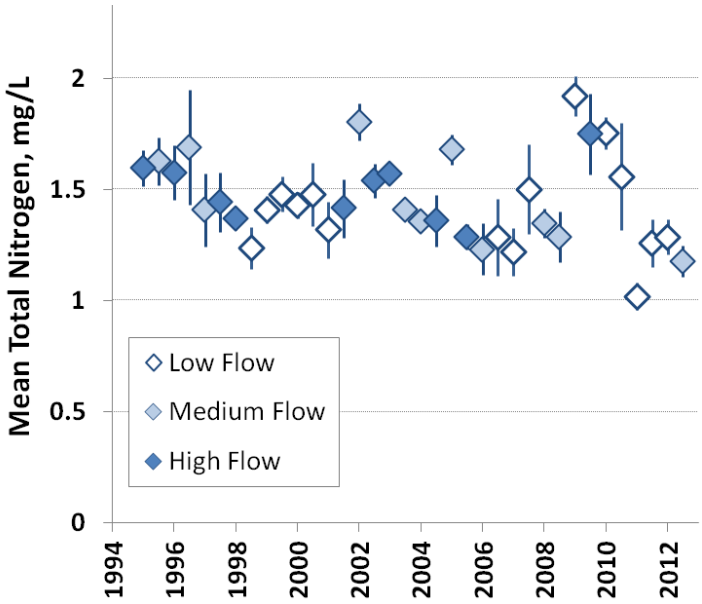


FIGURE 35: SEASONAL MEAN TN CONCENTRATIONS FOR CRESCENT LAKE AND DUNNS CREEK

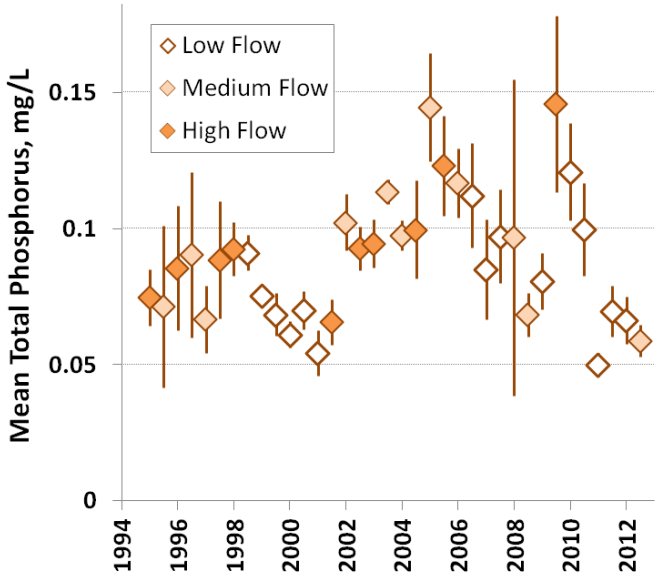


FIGURE 36: SEASONAL MEAN TP CONCENTRATIONS FOR CRESCENT LAKE AND DUNNS CREEK

The winter mean TN concentration exiting the Ocklawaha River, at 0.53 mg/L, was low compared to the long-term mean of 0.74 mg/L, though not significantly different from the long term trend for the low flow category (**Figure 37**). Likewise, the winter mean TP concentration, while low at 0.017 mg/L when compared to the long term winter mean of 0.033 mg/L, is also consistent with low flow conditions (**Figure 38**). Mean seasonal TN and TP concentrations

exiting the Ocklawaha are strongly, positively correlated with river discharge, hence the low winter mean TN and TP concentrations are consistent with the prevailing low flow. Conversely, the mean summer TN concentration, at 0.89 mg/L, was relatively high compared to the discharge-adjusted mean of 0.60 mg/L, and the mean summer TP concentration, at 0.046 mg/L, was also high when compared to the discharge-adjusted mean of 0.030 mg/L. These anomalously high concentrations are likely the effect of the Rodman Reservoir management drawdown, which took place in 2012.

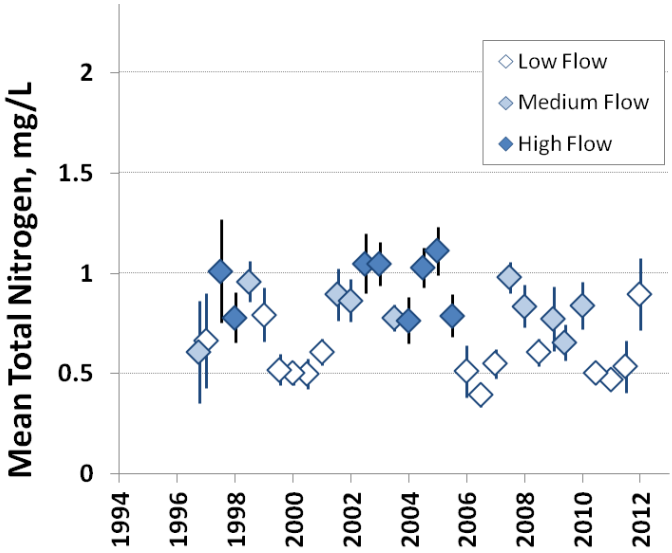


FIGURE 37: SEASONAL MEAN TN CONCENTRATIONS FOR THE OCKLAWAHA RIVER

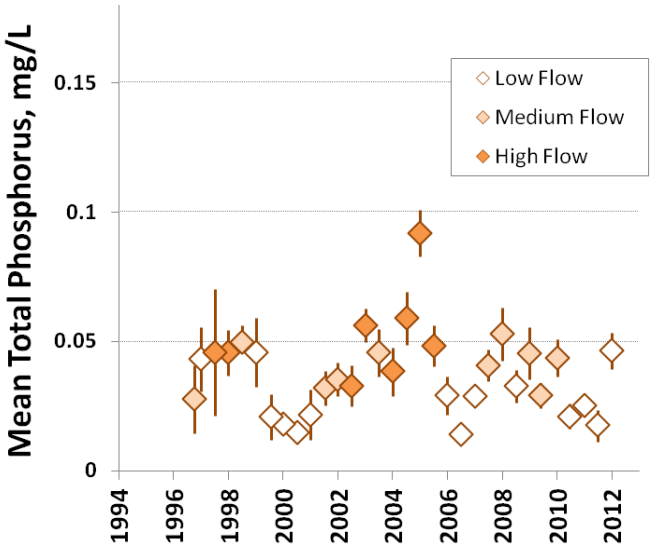


FIGURE 38: SEASONAL MEAN TP CONCENTRATIONS FOR THE OCKLAWAHA RIVER

Lake George acts as a massive capacitor to modify and attenuate TN and TP from the Middle and Upper St. Johns River. While low flow tends to promote high algal biomass in the lakes and lake-like reaches of the St. Johns River, consective years of low flow will exhaust the available phosphorus supply and lead to reduced water column concentrations over time. Following a high flow pulse in May 2010, the Middle St. Johns River entered a persistent low-discharge phase that, with the exception of a moderate discharge spike in the fall of 2011, lasted through

late summer 2012. In summer 2011, Lake George supported a sustained, dense algal bloom, leading to the highest April – September mean chlorophyll-*a* ever observed for this lake, at 97 µg/L. Because Lake George blooms are typically dominated by nitrogen-fixing cyanobacteria, internal loading also resulted in the highest April-September mean TN concentration ever recorded, at 2.2 mg/L (**Figure 39**). After the intense bloom of 2011, the depletion of TP that is typical of successive low flow years was evident, with mean summer TP concentrations only reaching 0.058 mg/L, significantly lower than the long-term (1995-2011) summer mean TP concentration of 0.073 mg/L (**Figure 40**). Without sufficient TP to support growth by nitrogen fixing cyanobacteria, the 2012 average summer TN concentration was only 1.27 mg/L, the lowest observed in monitoring since 1994 and well below the summer mean of 1.6 mg/L.

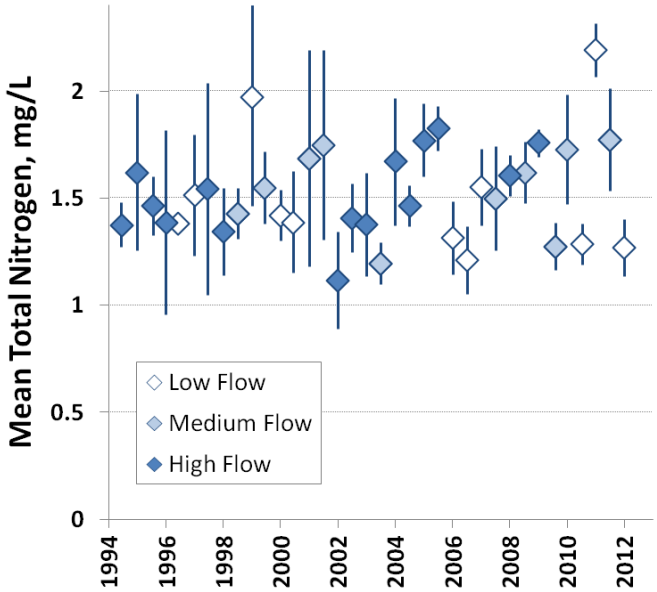


FIGURE 39: SEASONAL MEAN TN CONCENTRATIONS FOR THE MIDDLE ST. JOHNS RIVER AT THE OUTLET OF LAKE GEORGE

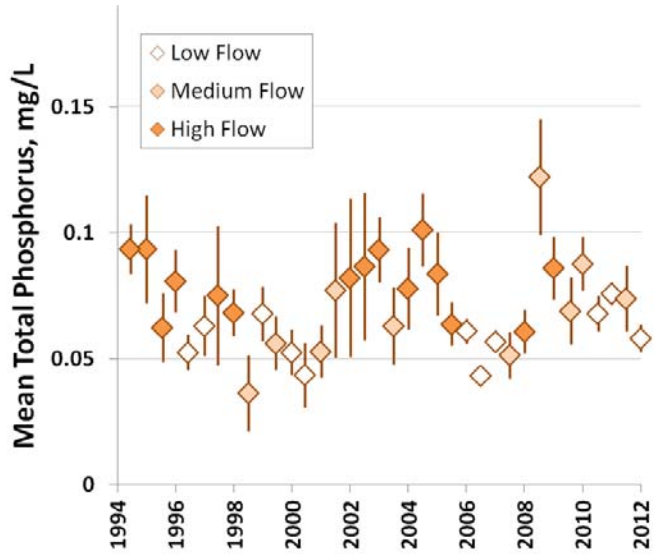


FIGURE 40: SEASONAL MEAN TP CONCENTRATIONS FOR THE MIDDLE ST. JOHNS RIVER AT THE OUTLET OF LAKE GEORGE

The bar charts in **Figure 41** and **Figure 42** summarize the 2012 upstream concentrations and loads to the LSJR. Of the 3 major inputs to the LSJR, the Middle St. Johns supplied the greatest proportion of the 2012 upstream load, accounting for 83.4% of the TN load and 81.9% of the TP load. Loads for the Ocklawaha River and the Crescent Lake Basin were roughly equivalent for 2012.

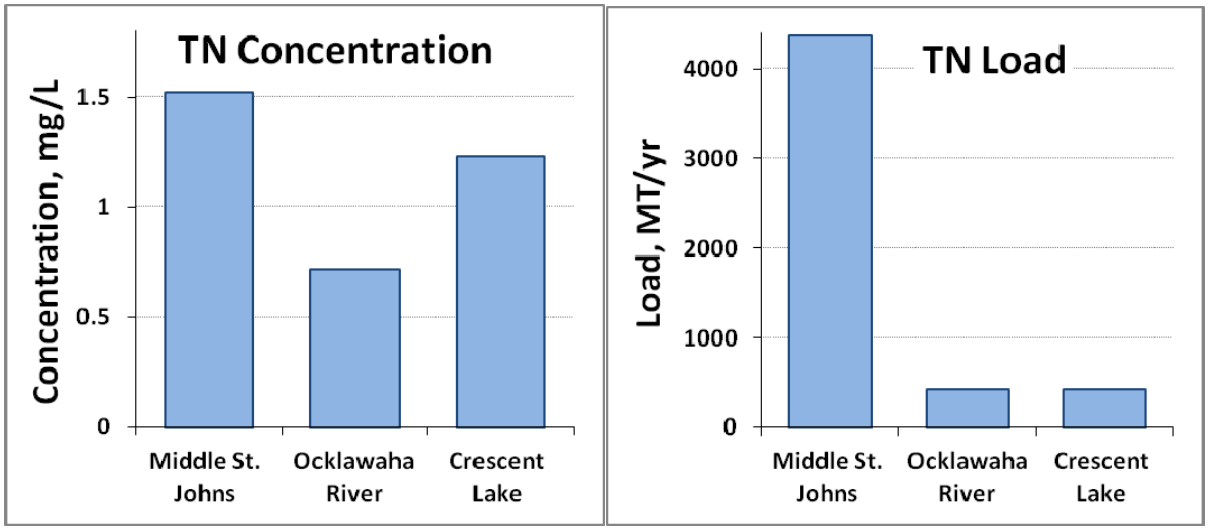


FIGURE 41: SUMMARY OF TN MEAN CONCENTRATIONS AND LOADS AT THE UPSTREAM INPUTS TO THE LSJR

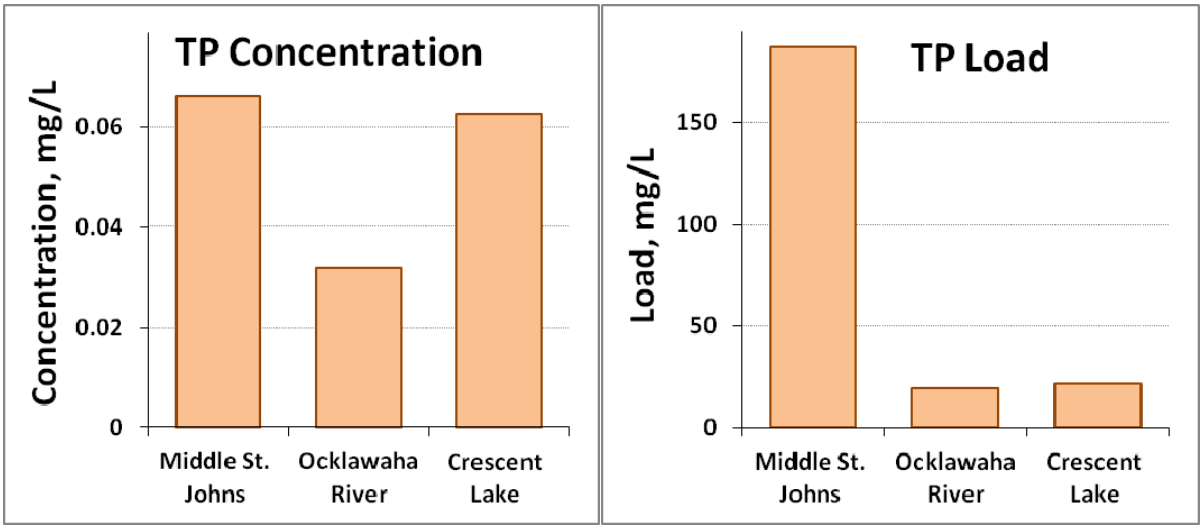


FIGURE 42: SUMMARY OF THE TP MEAN CONCENTRATIONS AND LOADS AT THE UPSTREAM INPUTS TO THE LSJR

5.3 TRENDS IN RIVER NUTRIENTS AND TMDL TARGET CRITERIA

The trends in river TN and TP concentration are a key indicator of the progress of nutrient pollution control endeavors. Because of the large proportion of loads entering from upstream, nutrient pollution control solely within the LSJR Basin cannot completely achieve water quality

targets, but pollution control efforts should nonetheless lead to detectable changes in river monitoring data.

To assess the progress in nutrient pollution reduction, 2 long-term monitoring locations in or near the TMDL "worst-case" WBIDs are examined. In the freshwater reach, the benchmark station in the center of WBID 2213K at Racy Point is used to assess trends. The Racy Point station has had twice-monthly sampling through the 1995 – 2012 assessment period, hence is balanced with respect to sampling density through time and has sufficient detail to identify trends. In the marine reach, the long-term monitoring station at river mile 16 near Talleyrand is referenced to assess nutrient trends. Although this station is in WBID 2213D, 2 WBIDs upstream of the "worst-case" WBID 2213B, it has a continuous data record of at least monthly sampling dating back to 1985, and is less affected by marine salinity mixing; hence, is more representative of river loads. To improve compatibility in the data collected by various programs through time, only surface collections are used from the Talleyrand site.

In the LSJR TMDL process, point and non-point source load allocations were established to achieve separate water quality targets, tailored to the predominant eutrophication-related adverse water quality impacts affecting the fresh and marine reaches of the river. For the freshwater reach, the primary water quality objective was to reduce the density and duration of nuisance algal blooms to a level that would not adversely affect the functioning of healthy aquatic food chains. In the LSJR marine reach, the primary adverse impact of eutrophication was found to arise from the oxygen demand of declining algal blooms and decomposing algal organic matter; hence, for this reach, the TMDL assimilative capacity is based on the maintenance of viable DO levels.

5.3.1 Freshwater Reach Trends in Nutrients

Trends in half-year (October – March and April – September) mean TN and TP from 1995 through 2012 for the Racy Point station are shown in **Figure 43** and **Figure 44**, respectively. As was the case with the tributary and upstream nutrients, concentrations are significantly correlated with discharge, so trends over the assessment period are grouped into low, medium, and high flow categories. Trends within flow categories can be indicative of the relative progress in sources of nutrient pollutant load. Elevated nutrient concentrations during low flow conditions can indicate that point source loads contribute significantly to receiving water concentrations, while elevated high flow concentrations suggests that non-point source runoff is a significant contributor. The target mean concentrations, determined from water quality model simulations performed with all sources assigned their allocated loads, are indicated by the red dashed lines in **Figure 43** and **Figure 44**. As this is the mean concentration calculated for the river's assimilative capacity, mean concentrations would be expected to vary above and below this line for any given season, but should not be predominantly above this level.

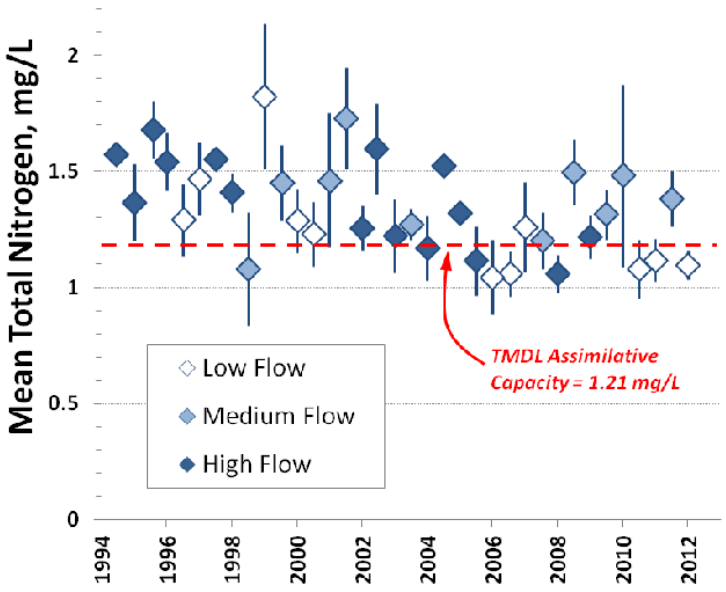


FIGURE 43: TRENDS IN SEASONAL TN AT THE RACY POINT STATION

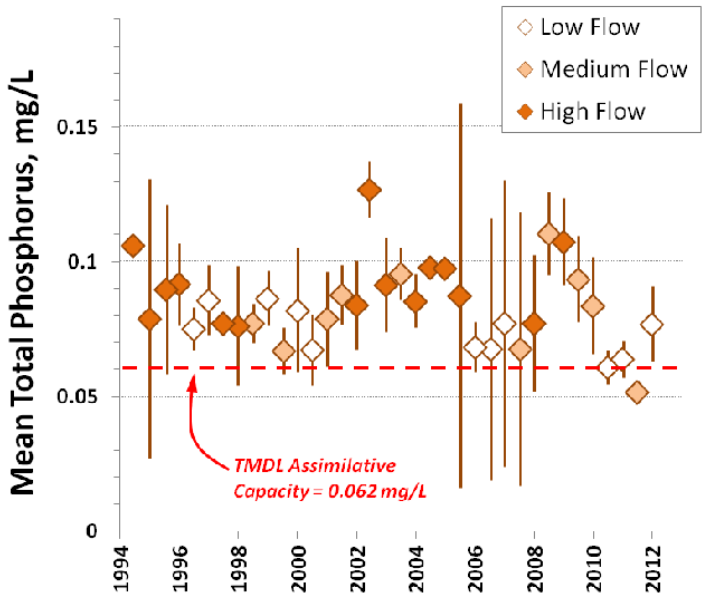


FIGURE 44: TRENDS IN SEASONAL TP AT THE RACY POINT STATION

From 1995 through 2011, mean seasonal TN at the Racy Point station exhibits a significant downward trend, with the time series pattern suggesting the sharpest downward movement beginning around 2002. The winter and summer mean concentrations for 2012 continue in this trend. Within the high and low flow subsets of seasonal means, the downward concentration trends are also significant. One unusual feature of the 2012 pattern in river nitrogen was a very high pulse of nitrate-nitrogen, the oxidized inorganic component of TN, from December through March. Maximum river nitrate-N reached 0.572 mg/L at the Shands Bridge sampling site, and was near maximum concentrations at most other river stations. This unusually high nitrate-N concentration is believed due to the decomposition and remineralization of organic N created during the large, sustained Lake George bloom of summer 2011, coincident with the Rodman

Reservoir management drawdown, which tends to increase nitrate-N concentrations exiting the Ocklawaha River.

There is no significant trend in TP when all flow categories are combined, but there is a significant downward trend for low-flow seasons, suggesting positive effects from the reduction in point source loads. However, the summer mean TP concentration for 2012 appears to run contrary to this downward trend for low-flow seasons. This can be explained by the unusual rainfall and runoff pattern for this season, which produced proportionally more rainfall over north Florida and a sharp spike in TP load from the basins adjacent to the freshwater reach, without affecting the river's overall upstream discharge and load. This pulse in discharge and TP concentration is shown in **Figure 45** for the water quality monitoring stations at Palatka, located at the upstream end of the LSJR freshwater reach, and Racy Point, near the midpoint of the reach. TP concentrations are elevated at the downstream Racy Point location, but not at Palatka, in response to this discharge event, which can be identified by the sharp increase in measured discharge at the USGS Deep Creek gauging station (black line, **Figure 45**). The result was unusually high overall TP concentration relative to the prevailing river flow conditions.

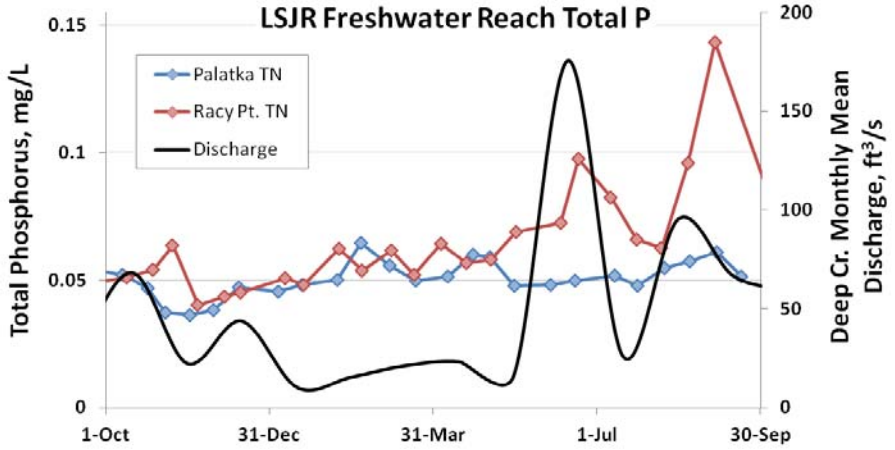


FIGURE 45: TREND IN 2012 TP CONCENTRATIONS AT THE PALATKA AND RACY POINT STATIONS

5.3.2 FRESHWATER REACH TMDL CRITERIA PERFORMANCE

The LSJR is a system dominated by the pelagic (open water) food chain, in which algae, the base of the food chain, are consumed by microscopic animals (rotifers, crustaceans, and insect larvae, collectively referred to as the zooplankton) which are in turn consumed by juvenile fish. Plankton monitoring in the LSJR has established that during blue-green algal (cyanobacteria) blooms, important pelagic zooplankton decline, shunting organic carbon from algal primary productivity instead to bacterial decomposition. To prevent this decline, a criteria was designed that sought to limit the duration of a nuisance bloom, defined as a concentration of chlorophyll-*a* of more than 40 µg/L, to a duration no longer than 40 days.

As was the case for nutrient concentrations, freshwater reach algal bloom density and duration have been declining in response to nutrient reduction efforts accomplished under the TMDL. Despite slightly elevated TP concentrations in summer 2012, this trend has continued. During the 2012 summer bloom season, the maximum chlorophyll-*a* observed at Racy Point was 35.7 µg/L, and was the lowest maximum observed between 1995 – 2012 (**Figure 46**). This was partly due to the mildly salty conditions at the Racy Point location during May and June, which is not conducive to cyanobacteria growth, followed by sustained high rainfall and runoff, which tends to dilute bloom density and add color that can reduce light for algal photosynthesis.

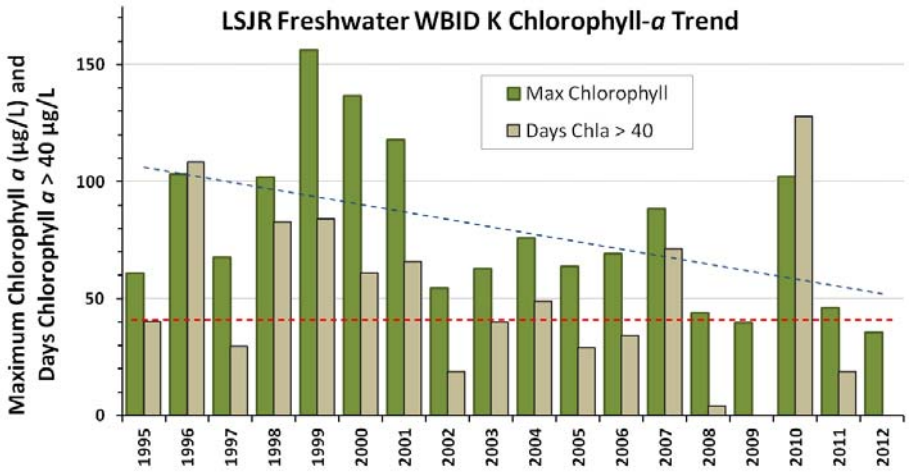
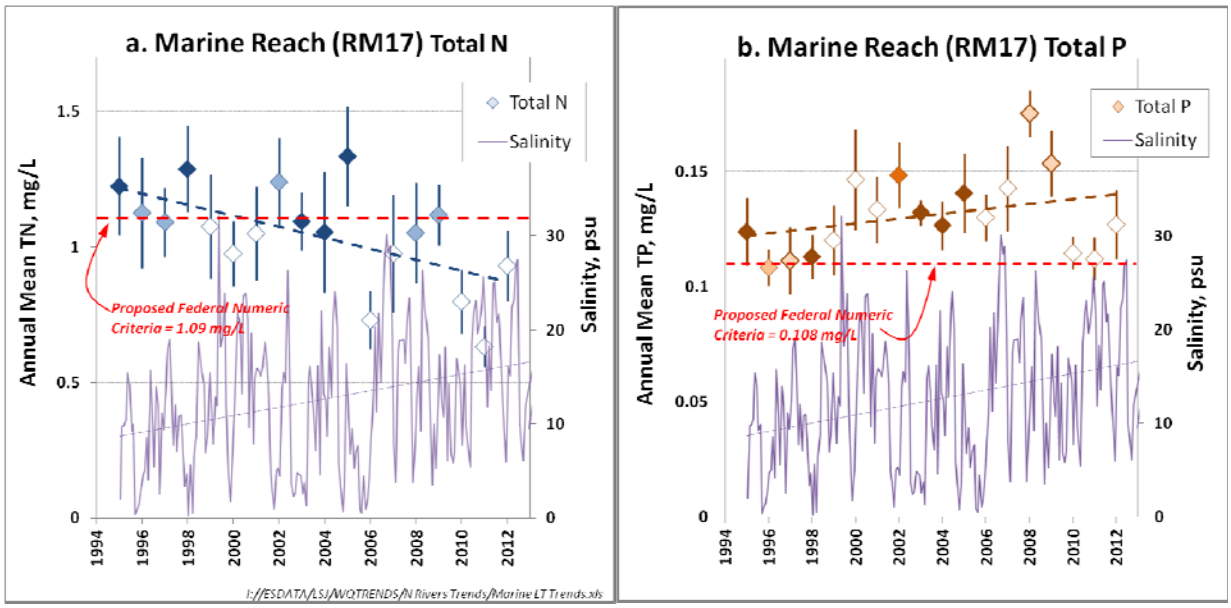


FIGURE 46: CHLOROPHYLL-A TRENDS AT THE RACY POINT STATION

5.3.3 MARINE REACH TRENDS IN NUTRIENTS

Two versions of the annual time series in mean TN and TP concentrations were examined to identify trends: (1) annual means based on the unaltered data (**Figure 47**), and (2) annual means calculated from data values that were adjusted to reflect the concentration without marine water dilution (**Figure 48**). Because the concentration of offshore Atlantic inner-shelf water TN and TP is lower than that of the river, long-term changes in salinity that lead to a greater proportion of marine water in the river can affect river concentration trends, and obscure trends related to changes in the external load. As river salinity has increased on average from 1995 through 2011, this could lead to an apparent downward trend in concentration that is not driven by nutrient pollution load decreases.

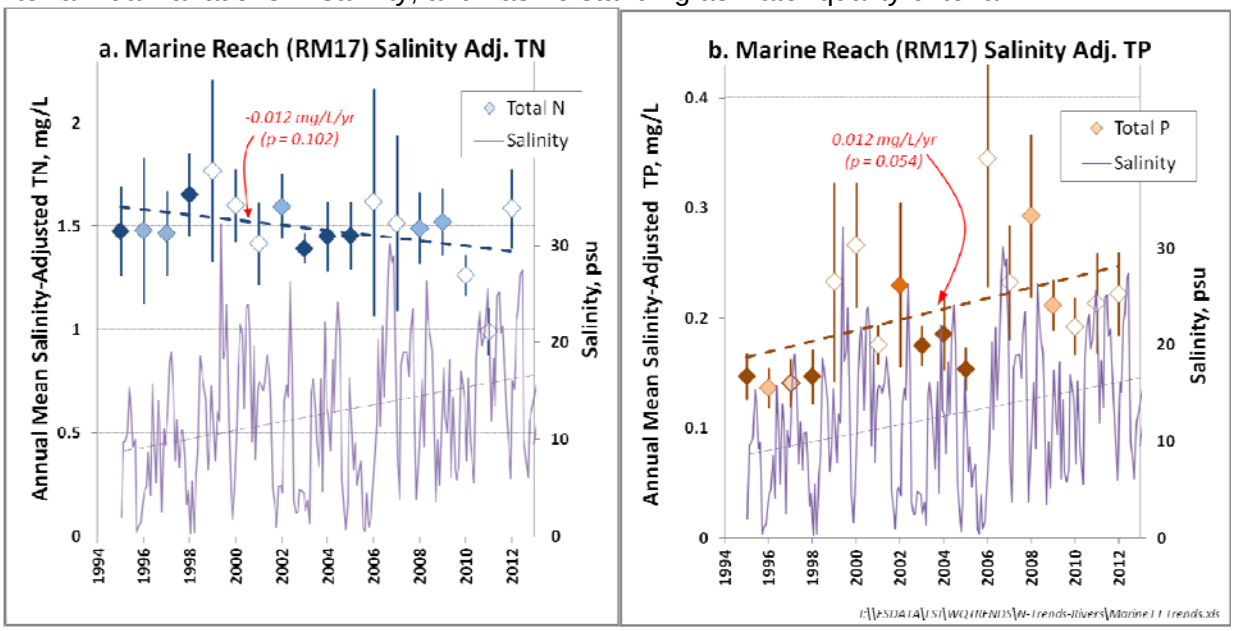
The annual mean TN concentration at the Talleyrand station for 2012 was 0.93 mg/L. This is below the historic mean and, while not as low as values observed in 2010 and 2011, was still sufficiently low to continue the significant downward trend in this nutrient, and is below the recently proposed EPA NNC of 1.09 mg/L. The annual mean TP concentration at the Talleyrand site was 0.127 mg/L, also below the historic mean, although is above the proposed NNC of 0.108 mg/L. Although the slope of the annual means over time is upward, the trend is not significant.



Note: Open symbols indicate low (lower 33%), lightly filled symbols indicate medium (33-66%), and dark symbols indicate high (upper 33%) annual mean discharge conditions.

FIGURE 47: ANNUAL TN AND TP CONCENTRATIONS AND MONTHLY SALINITY AT THE RIVER MILE 17 STATION

When mean TN and TP concentrations are adjusted for the upward trend in salinity that has occurred over this assessment window, the downward trend in TN is still evident, but the significance of this trend decreases and is marginal at a probability level of 0.103. The salinity adjustment increases the significance of the upward TP trend. It should be emphasized that the analysis of salinity-adjusted trends is based on a hypothetical seawater concentration. It is done to facilitate the assessment of trends in nutrient load reduction absent of the influence of inter-annual variations in salinity, and has no standing as water quality criteria.



Note: Open symbols indicate low (lower 33%), lightly filled symbols indicate medium (33-66%), and dark symbols indicate high (upper 33%) annual mean discharge conditions.

FIGURE 48: SALINITY-ADJUSTED ANNUAL MEANS IN TN AND TP FOR THE RIVER MILE 17 STATION

As an alternative to the salinity adjustment of nutrient concentrations, TN and TP concentrations were plotted against salinity for a pre-TMDL time interval (1995-2004) and post TMDL (2006-2012) to examine the differences for equivalent salinity conditions (**Figure 49**). TN concentrations are significantly correlated with salinity, and while the pre-TMDL and post-TMDL regressions are not significantly different, the more recent relationship (2006-2012) between salinity and TN is below that of the pre-TMDL relationship, with an average difference of 0.09 mg/L. This salinity adjustment is not viable for TP, as concentrations are not correlated with salinity. The scatter plot does however suggest that at lower salinity, the current time period exhibits higher TP concentrations than that of the pre-TMDL interval. While the source of this increased TP is unknown at this time, some research suggests that as salinity encroachment into previously freshwater portions of river estuaries increases, tidal wetlands that were formerly predominantly inundated by freshwater can begin to exude higher concentrations of phosphorus, due to the release of bound phosphorus as wetland soils are exposed to higher concentrations of sulfate from marine water influence.

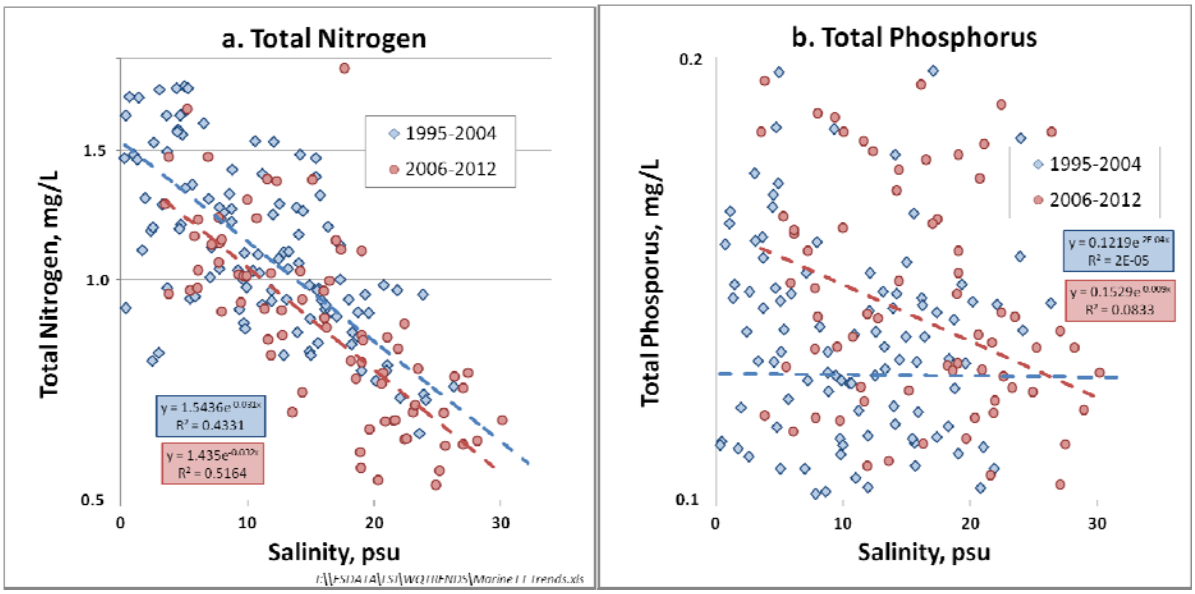


FIGURE 49: SCATTER PLOTS OF TN AND TP VERSUS SALINITY FOR THE TALLEYRAND STATION

5.3.4 MARINE REACH TMDL CRITERIA PERFORMANCE

In the LSJR marine reach, lowered DO is the most direct and sensitive water quality variable responding to nutrient enrichment and eutrophication. There was a general consensus in the scientific community that the applicable state criteria at the time of the TMDL development was not appropriate for blackwater river estuaries, such as the St. Johns River and others of its type that predominate in the South Atlantic United States, which exhibit occasional low DO as a natural event. As an alternative, FDEP and SJRWMD proposed a modified version of the recently published Atlantic Virginian Province estuary saltwater criteria. These criteria limited the intensity (i.e., low concentration) and duration of low DO events based on the tolerance of the most sensitive endemic fauna of the estuary. The criteria were based on an extensive review of acute and chronic effects of marine aquatic life to low DO, and as such had a convincing stressor-response foundation. Since the adoption of the intensity-duration criteria in 2005 as state site-specific alternative criteria of the St. Johns River estuary, FDEP has continued to refine this approach and is expected to propose it as a statewide standard for estuarine and coastal waters.

In the calculation of the marine reach DO criteria, exposure to low DO is treated similar to the exposure to a toxicant, where the duration and intensity combine to determine the exposure that would result in organism mortality. Above a concentration of 5 mg/L, there is considered to be no effect from low DO. Exposures below 5 mg/L for a day (24 hours) are treated as a fraction of a lethal dose, with the strength of the "dose" increasing as DO becomes lower. When the sum of the exceedances for a period of time (usually the summer when low DO is more likely due to higher water temperatures) is greater than 1, a violation of the criteria has occurred. The duration/exposure categories of exposure in the Lower St. Johns SSAC are shown in **Table 15**.

TABLE 18: DAYS OF ALLOWABLE EXPOSURE AND FRACTIONAL IMPAIRMENT DOSE LEVELS OF LOW DO

CATEGORY	<4.0 MG/L	4.0 - <4.2 MG/L	4.2 - <4.4 MG/L	4.4 - <4.6 MG/L	4.6 - <4.8 MG/L	4.8 - <5.0 MG/L
Maximum Days Duration	0	16	21	30	47	55
Fractional Exposure	1	0.063	0.048	0.033	0.021	0.018

The BMAP compliance calculation utilizes data collected at 3 locations in the marine reach worst-case WBID. The USGS continuous water quality station at Dames Point in Jacksonville (USGS station ID# 302309081333001) is the flagship in this network, and has been in existence since 1996, with an interruption in service in 2002-2003. The station has 2 sensors positioned in the water column at near surface and near bottom. Because the St. Johns River in this reach is strongly vertically mixed, there is rarely a significant difference between surface and bottom sensors. For this calculation, the daily minimum and maximum values for each location were averaged, and then these daily averaged surface and bottom data were averaged to produce one daily average value. The results of the criteria calculation for the Dames Point daily values are shown in **Figure 50**.

For the 10 years of available data from 1996 through 2007, the DO criterion was exceeded every year except for 1996 and 2004. There were several large gaps in the 1996 data, making this determination of compliance somewhat inconclusive. Large fish kills occurred in the St. Johns River in 1999 and 2005, 2 years with large criteria exceedance values. From 2008 to the present, the concentration has remained well below the exceedance threshold. In 2010, daily average DO never went below 5 mg/L. In 2012, the sum of the fractional daily exposure to low DO was 0.11, well below the threshold of 1. This low DO period occurred in mid-July, with the minimum mean daily DO reaching 4.68 mg/L. The minimum DO recorded was 4.3 mg/L on July 18th. The minimum DO observed during routine ambient water quality monitoring site visits by the SJRWMD in 2012 was 4.48 mg/L, at the Talleyrand site on July 12th, at a depth of 7 meters. In general, most estuarine aquatic organisms of the southeast United States do not begin to exhibit mortality from short duration (24-hour) exposures to low DO until concentrations below 3 mg/L occur.

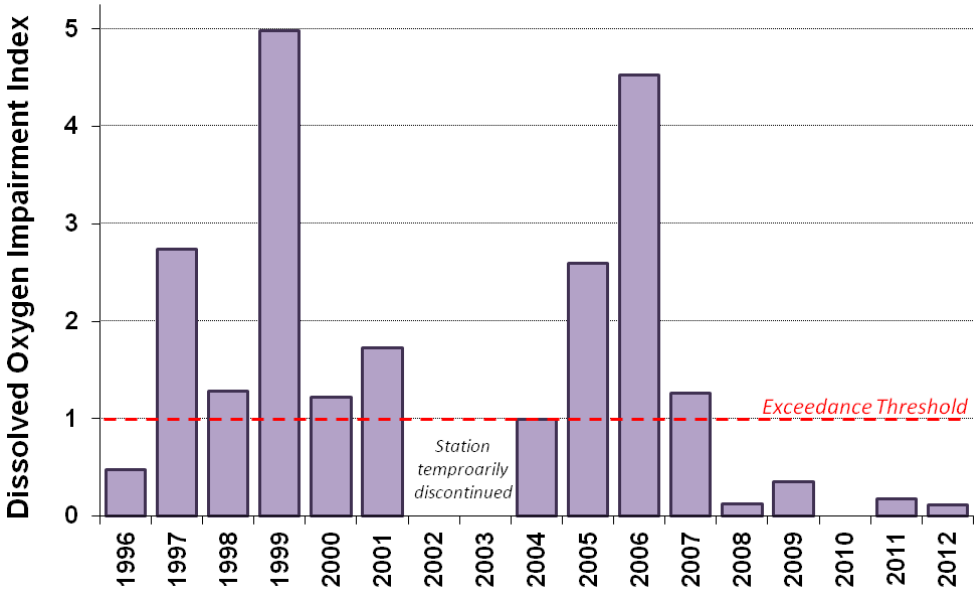


FIGURE 50: LEVELS OF LOW DO IMPAIRMENT BASED ON THE LSJR CRITERIA FOR 1996-2012

In addition to the Dames Point DO station, FDEP operates 2 satellite stations, one on Clapboard Creek at Heckscher Drive, and another on river channel marker 36 near the southeast corner of Blount Island. The channel marker 36 station features a two-instrument array, with sondes positions in the upper and lower water column.

For the DO sondes at the channel marker station, data were only available for January 5, 2012 through February 26, 2012 (refer to **Section 3.3**). The lowest daily average DO concentration was 7.25 mg/L. The average depth of measurements was 1.43 meters with a range of 0.99 to 1.76 meters. Since only 53 days of data were available and no readings were below 5 mg/L, the total fractional exposure was not calculated. For the DO sonde at the bottom, data were available from January 5, 2012 through March 7, 2012. The lowest daily average DO concentration was 7.62 mg/L. The average depth of measurements was 2.07 meters with a range of 1.74 to 2.34 meters. As with the surface sonde, since only 63 days of data were available and no values were below 5 mg/L, the total fractional exposure was not calculated.

Data sonde records were available for January 9, 2012 through November 9, 2012 at the Clapboard Creek site. Measurements were logged at 15-minute intervals and individual data sets were processed to create a time series of observations. Daily minimum, average, and maximum values were calculated for DO, percent DO saturation, water temperature, pH, salinity, and specific conductance (see **Figure 51** through **Figure 55**). If there were less than 48 observations in a day, that date was excluded from further analysis. Over the 2012 period, a total of 279 days were considered in the analysis. The mean depth of observations was 1.96 meters with a range of 1.29 – 2.46 meters.

Out of the 249 calculated daily average DO values, there were 6 values between 4.6 and 4.8 mg/L and 4 values between 4.8 and 5.0 mg/L. Substituting these values into the DO SSAC expression yielded a total fractional exposure of 0.20 for 2012. This fractional exposure result is consistent with that observed for the Dames Point station; however, it should be noted that the June 21, 2012 through July 19, 2012 data gap encompassed the time period when the minimum DO concentrations were observed at Dames Point. During 2012, there were no fish kills

reported to the Florida Fish and Wildlife Conservation Commission Fish Kill Hotline for the marine reach of the LSJR.

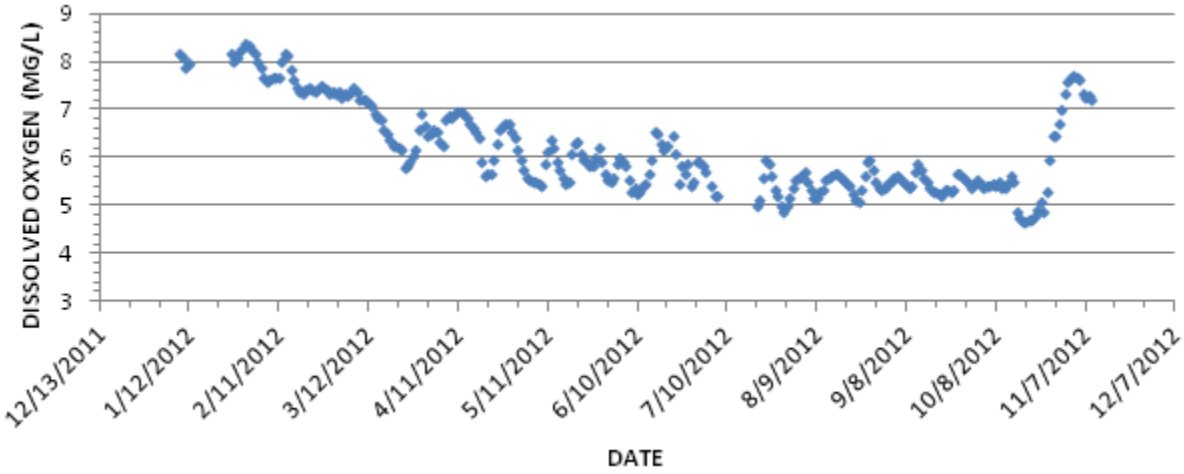


FIGURE 51: DAILY AVERAGE DO CONCENTRATION AT THE CLAPBOARD CREEK SITE

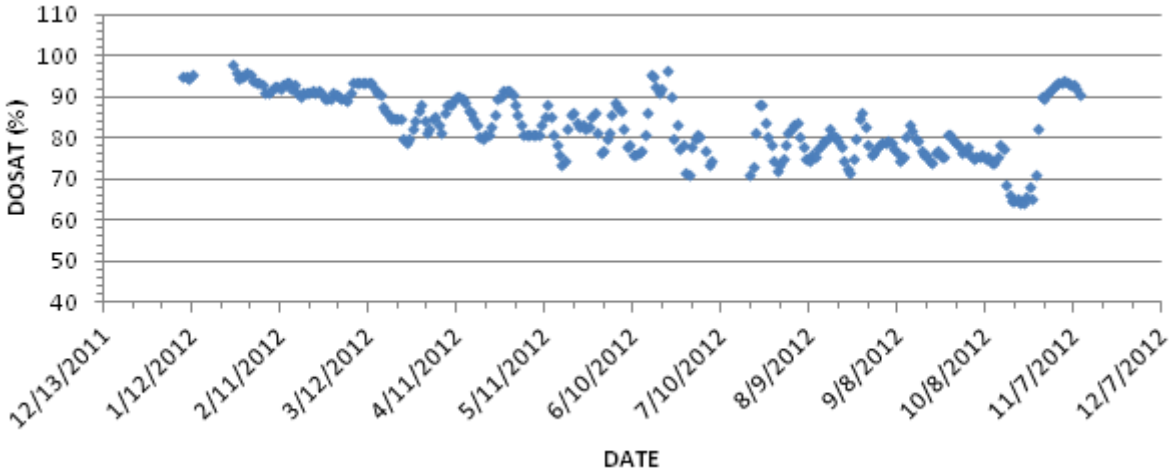


FIGURE 52: DAILY AVERAGE DO SATURATION AT THE CLAPBOARD CREEK SITE

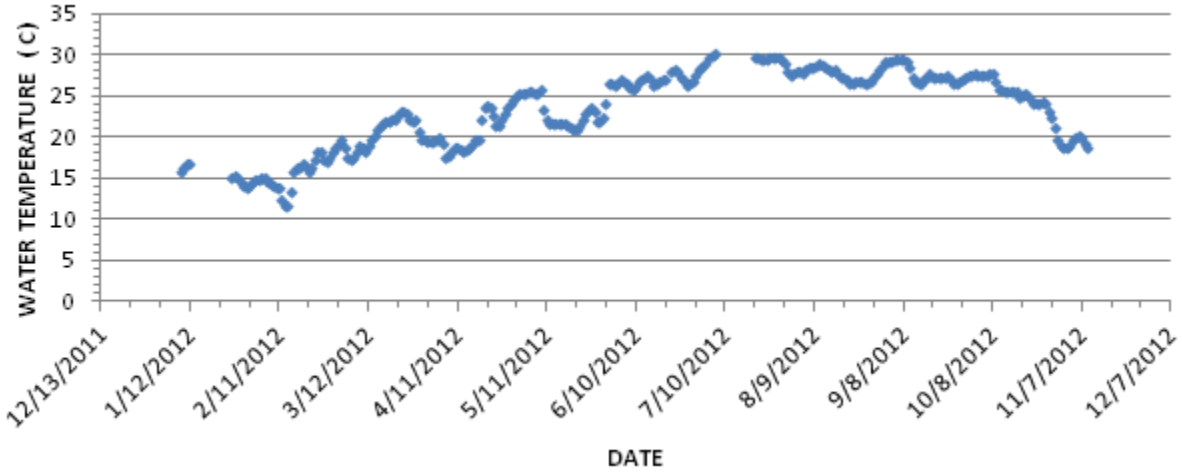


FIGURE 53: DAILY AVERAGE WATER TEMPERATURE AT THE CLAPBOARD CREEK SITE

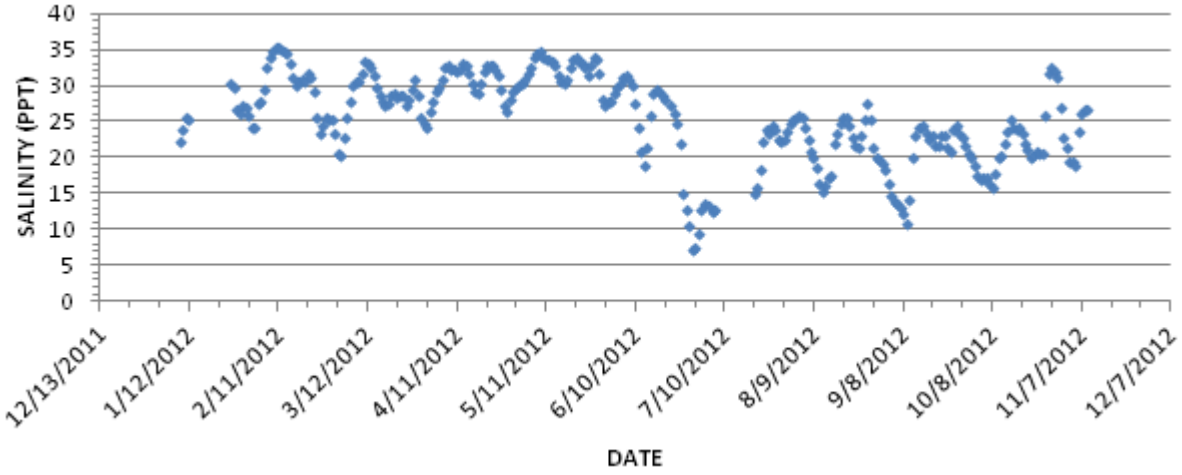


FIGURE 54: DAILY AVERAGE SALINITY AT THE CLAPBOARD CREEK SITE

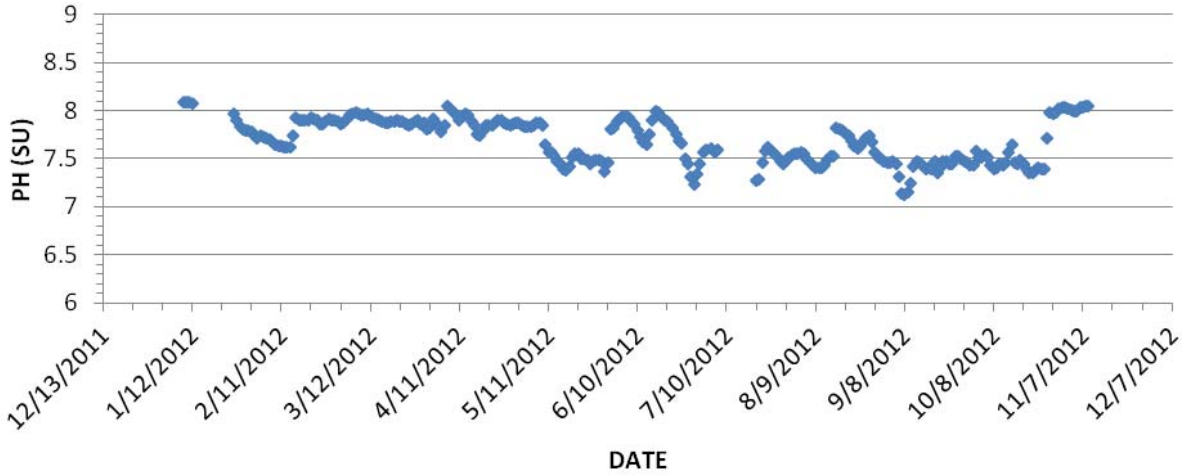


FIGURE 55: DAILY AVERAGE PH AT THE CLAPBOARD CREEK SITE

APPENDIX A: BMAP PROJECTS

The BMAP project tables below show the status of the projects as of December 31, 2012. These tables provide information on the nutrient reduction attributed to each individual project and the remaining nutrient load after each project is implemented, shown in both kilograms per year (kg/yr) and pounds per year (lbs/yr). The expected load reductions are subtracted from the entity's starting point load. The remaining nutrient balance once all projects have been implemented by an entity should be equal to or exceed the allocation for that entity's facility or facilities. The schedule to implement each of the projects is also included in the tables.

FRESHWATER PHOSPHORUS ALLOCATION

Name of Facility	*Wasteload Allocation (kg/yr)*
Clay County MS4	***212.6***
FLR04E045	

FACILITY NAME	PROJECT NUMBER	DESCRIPTION	TYPE(S) OF BMP(S) IMPLEMENTED	ACRES TREATED	DEADLINE	PROJECT TP REDUCTION (KG/YR)	PROJECT TP REDUCTION (LBS/YR)
CC MS4 FLR04E045	N/A	Total Reduction Required	N/A	N/A	N/A	191.9	422.2
CC MS4 FLR04E045	CC-1	Education Program	N/A	N/A	Ongoing	16.2	35.6
CC MS4 FLR04E045	CC-2	FDOT SR 21 Widening from SR 215 to CR 220	Dry retention (1")	12	Completed	2.3	5.1
CC MS4 FLR04E045	CC-3	Trade with CCUA	N/A	N/A	Completed	173.4	381.5
CC MS4 FLR04E045	N/A	Total Project Reductions	N/A	N/A	N/A	191.9	442.2
CC MS4 FLR04E045	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

City of Green Cove Springs Aggregate..... 1,929.2
FL0635618

Facility Name	Project Number	Description	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Green Cove Total (Aggregate)	N/A	Total Reduction Required	N/A	1,935.8	4,258.8
GCS – Harbor Road FL0020915, South FL0030210	GCS-3	Operational changes	Completed	2,486	5,469.2
Green Cove Total (Aggregate)	N/A	Total Project Reductions	N/A	2,486	5,469.2
Green Cove Total (Aggregate)	N/A	Credit/(Deficit)	N/A	550.2	1,210.4

City of Green Cove Springs MS4 ..... 1,043.7
FLR04E103

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Green Cove MS4	N/A	Total Reduction Required	N/A	N/A	N/A	52	114
GCS MS4 FLR04E103	GCS-3	SW Drainage System Improvements	Wet Detention (1”, 21 day)	54.6	Completed	15	33
GCS MS4 FLR04E103	GCS-4	Cypress Baffle Box	Baffle Box	125	Completed	6	13
GCS MS4 FLR04E103	GCS-5	Green Cove Springs Industrial Park	Wet Detention (2.5”, 21 day)	91.6	Completed	31	68
GCS MS4 FLR04E103	GCS-6	Vystar Credit Union	Dry Detention	1.8	Completed	0	0
Green Cove MS4	N/A	Total Project Reductions	N/A	N/A	N/A	52	114
Green Cove MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

City of Palatka WWTF 5,954.7
FL0040061

Facility Name	Project Number	Description	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Palatka WWTF	N/A	Total Reduction Required	N/A	4,000.3	8,800.7
Palatka WWTF FL0040061	PAL-1	Reuse to golf course	Completed	1,730	3,806
Palatka WWTF FL0040061	PAL-2	Reuse to ball fields	Completed	691	1,520
Palatka WWTF FL0040061	PAL-3	Reuse to cemeteries	Completed	1,205	2,651
Palatka WWTF FL0040061	PAL-4	Reuse at WTP	Completed	1,555	3,421
Palatka WWTF FL0040061	PAL-5	Zero discharge	Completed – 06/30/212	4,774	10,503
Palatka WWTF	N/A	Total Project Reductions	N/A	9,955	21,901
Palatka WWTF	N/A	Credit/(Deficit)	N/A	5,954.7	13,100.3

Georgia-Pacific 33,182
FL0002763

Facility Name	Project Number	Description	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Georgia-Pacific	N/A	Total Reduction Required	N/A	30,693	67,525
Georgia-Pacific	GP-1	Complete Process Improvements	Completed	30,693	67,525
Georgia-Pacific	N/A	Total Project Reductions	N/A	30,693	67,525
Georgia-Pacific	N/A	Credit/(Deficit)	N/A	0	0

Name of Facility ..... ***Load Allocation (kg/yr)***

City of Palatka Non-MS4 ..... ***1,507.8***

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Palatka Non-MS4	N/A	Total Reduction Required	N/A	N/A	0	0
Palatka Non-MS4	PAL-7	Downtown Watershed First-Flush Treatment	Stormwater treatment system	04/01/2014	Not quantified	Not quantified
Palatka Non-MS4	N/A	Total Project Reductions	N/A	N/A	0	0
Palatka Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	0	0
Palatka Non-MS4 Total			**Implementation Schedule**			
a. Final Design			01/15/2013			
b. Secure Permitting			02/01/2013			
c. Bid			06/01/2013			
d. Begin Construction			08/01/2013			
e. End Construction			01/01/2014			

Clay County Non-MS4 ..... ***499.4***

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
CC Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	267.9	589.4
CC Non-MS4	CC-4	Education Program	N/A	N/A	Ongoing	30.7	67.5
CC Non-MS4	CC-5	FDOT construction of 7 new wet ponds on SR15 from Putnam County line to SR16	Wet pond (1", 14 days)	281	Completed	89.5	196.9
CC Non-MS4	CC-6	Trade with CCUA	N/A	N/A	Completed	147.7	324.9
CC Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	267.9	589.4
CC Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

Hastings Non-MS4 ..... 49.3

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Hastings Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	43.6	95.9
Hastings Non-MS4	HAS-1	WWTP Chemical Feed Systems	N/A	N/A	Completed	249.1	548.0
Hastings Non-MS4	HAS-2	FDOT 4 laning of SR 207	Wet Pond (1", 14 days)	12	Completed	3.6	7.9
Hastings Non-MS4	HAS-3	FDOT 4 laning of SR207 from CR305 to Cypress Link Blvd	Wet Pond (1", 14 days)	106	Completed	33.6	73.9
Hastings Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	286.3	629.9
Hastings Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	242.7	533.9

Putnam County Non-MS4 ..... 3,964.9

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Putnam Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	2,025.5	4,456.1
Putnam Non-MS4	PUT-1	Trade with Putnam Lanes WWTF	N/A	N/A	Completed	12.5	27.5
Putnam Non-MS4	PUT-2	Trade with Hiawatha WWTF	N/A	N/A	08/31/2014	49.8	109.6
Putnam Non-MS4	PUT-3	Septic Tank Phase-Out	N/A	N/A	12/31/2014	298.0	656.0
Putnam Non-MS4	PUT-4	Edgefield RST O&M Value	N/A	N/A	Completed	269.1	592.0
Putnam Non-MS4	PUT-5	FDOT construction of 7 new wet ponds on SR15 from Clay County line to south of Gordon Wilkins Rd	Wet pond (1", 14 days)	1,181	Completed	376.8	829.0
Putnam Non-MS4	PUT-6	Algal Initiative	N/A	N/A	10/31/2017	824.6	1,814.0
Putnam Non-MS4	PUT-8	Education and Outreach	Education	N/A	Ongoing	194.7	428.0
Putnam Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	2,025.5	4,456.1
Putnam Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

Putnam County Non-MS4 Total	**Implementation Schedule**
Trade with Hiawatha WWTF a. Start Date of Project	04/01/2008
b. Completion Date - Design	Completed - 02/01/2009
c. Completion Date - Construction	The line is constructed but need the East Putnam County Regional WWTF to be completed for regional tie in. Estimated completion is 8/31/2014.
d. Completion Date – Completion of Project	08/31/2014
Septic Tank Phase-Out US 17 – tie into EPCR WWTF a. Start Date of Project	01/01/2009
b. Completion Date - Design	Completed - 02/02/2009
c. Completion Date - Construction	12/30/2014
d. Completion Date – Completion of Project	12/30/2014
Algal Initiative a. Start Date of Project	10/01/2008
b. Completion Date – Project Assessment	Completed - 10/31/2010
c. Completion Date – Project Fundraising	10/31/2012
d. Completion Date – Construction	10/31/2017

St. Johns County Non-MS4 ..... 3,296.6

Facility Name	Project Number	Description	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
SJC Non-MS4	N/A	Total Reduction Required	N/A	430.8	947.8
SJC Non-MS4	SJC-3	Stormwater Education	Ongoing	186.4	410.1
SJC Non-MS4	SJC-4	Low-Impact Development	Ongoing	Not quantified	Not quantified
SJC Non-MS4	SJC-5	Slow release fertilizer ordinance	Completed	Not quantified	Not quantified
SJC Non-MS4	SJC-6	Deep Creek RST O&M value	Completed	255.9	563.0
SJC Non-MS4	SJC-7	Purchase Hastings WWTF reduction credits	Completed	198.2	436.0
SJC Non-MS4	N/A	Total Project Reductions	N/A	640.5	1,409.1
SJC Non-MS4	N/A	Credit/(Deficit)	N/A	209.7	461.3

Welaka Non-MS4 ..... 90.4

Facility Name	Project Number	Description	Deadline	Project TP Reduction (kg/yr)	Project TP Reduction (lbs/yr)
Welaka Non-MS4	N/A	Total Reduction Required	N/A	81.6	179.5
Welaka Non-MS4	WEL-1	Septic Tank Phase-Out	Completed	153.0	336.6
Welaka Non-MS4	N/A	Total Project Reductions	N/A	153.0	336.6
Welaka Non-MS4	N/A	Credit/(Deficit)	N/A	71.4	157.1

POINT SOURCE – FRESHWATER NITROGEN ALLOCATION

Name of Facility ***Wasteload Allocation (kg/yr)***

Clay County MS4 2,418
FLR04E045

FACILITY NAME	PROJECT NUMBER	DESCRIPTION	TYPE(S) OF BMP(S) IMPLEMENTED	ACRES TREATED	DEADLINE	PROJECT TN REDUCTION (KG/YR)	PROJECT TN REDUCTION (LBS/YR)
CC MS4 FLR04E045	N/A	Total Reduction Required	N/A	N/A	N/A	352	774
CC MS4 FLR04E045	CC-1	Education Program	N/A	N/A	Ongoing	111	244
CC MS4 FLR04E045	CC-2	FDOT SR 21 Widening from SR 215 to CR 220	Dry retention (1")	12	Completed	5	11
CC MS4 FLR04E045	CC-7	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	236	519
CC MS4 FLR04E045	N/A	Total Project Reductions	N/A	N/A	N/A	352	774
CC MS4 FLR04E045	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

City of Green Cove Springs Aggregate..... 7,752.5
FL0635618

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Green Cove Total (Aggregate)	N/A	Total Reduction Required	N/A	6,847.5	15,064.5
GCS – Harbor Road FL0020915, South FL0030210	GCS-3	Operational changes	Completed	9,641	21,210.2
Green Cove Total (Aggregate)	N/A	Total Project Reductions	N/A	9,641	21,210.2
Green Cove Total (Aggregate)	N/A	Credit/(Deficit)	N/A	2,793.5	6,145.7

City of Green Cove Springs MS4 ..... 6,266.5
FLR04E103

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Green Cove MS4	N/A	Total Reduction Required	N/A	N/A	N/A	694.5	1,528
GCS MS4 FLR04E103	GCS-3	SW Drainage System Improvements	Wet Detention (1", 21 day)	54.6	Completed	28	62
GCS MS4 FLR04E103	GCS-4	Cypress Baffle Box	Baffle Box	125	Completed	15	33
GCS MS4 FLR04E103	GCS-5	Green Cove Springs Industrial Park	Wet Detention (2.5", 21 day)	91.6	Completed	58	128
GCS MS4 FLR04E103	GCS-6	Vystar Credit Union	Dry Detention	1.8	Completed	0.5	1
GCS MS4 FLR04E103	GCS-7	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	593	1,305
Green Cove MS4	N/A	Total Project Reductions	N/A	N/A	N/A	694.5	1,528
Green Cove MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

City of Palatka WWTF 38,845
FL0040061

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Palatka WWTF	N/A	Total Reduction Required	N/A	22,044	48,497
Palatka WWTF FL0040061	PAL-1	Reuse to golf course	Completed	13,000	28,600
Palatka WWTF FL0040061	PAL-2	Reuse to ball fields	Completed	5,227	11,499
Palatka WWTF FL0040061	PAL-3	Reuse to cemeteries	Completed	9,091	20,000
Palatka WWTF FL0040061	PAL-4	Reuse at WTP	Completed	11,727	25,799
Palatka WWTF FL0040061	PAL-5	Zero discharge	Completed - 06/30/2012	21,844	48,057
Palatka WWTF	N/A	Total Project Reductions	N/A	60,889	133,956
Palatka WWTF	N/A	Credit/(Deficit)	N/A	38,845	85,459

Georgia-Pacific WWTF..... 165,909
FL0002763

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Georgia-Pacific	N/A	Total Reduction Required	N/A	92,246	202,941
Georgia-Pacific	GP-1	Complete Process Improvements	Completed	92,246	202,941
Georgia-Pacific	N/A	Total Project Reductions	N/A	92,246	202,941
Georgia-Pacific	N/A	Credit/(Deficit)	N/A	0	0

Seminole Electric 14,732
FL0036498

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Seminole Electric Total	N/A	Total Reduction Required	N/A	6,314	13,891
Seminole Electric FL0036498	SE-1	SCR Upgrade	Completed	6,314	13,891
Seminole Electric Total	N/A	Total Project Reductions	N/A	6,314	13,891
Seminole Electric Total	N/A	Credit/(Deficit)	N/A	0	0

Name of Facility ***Load Allocation (kg/yr)***

City of Palatka Non-MS4 8,858

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Palatka Non-MS4	N/A	Total Reduction Required	N/A	N/A	825	1,815
Palatka Non-MS4	PAL-6	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	Completed	825	1,815
Palatka Non-MS4	PAL-7	Downtown Watershed First-Flush Treatment	Stormwater treatment system	04/01/2014	Not quantified	Not quantified
Palatka Non-MS4	N/A	Total Project Reductions	N/A	N/A	825	1,815
Palatka Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	0	0
Palatka Non-MS4 Total			**Implementation Schedule**			
a. Final Design			01/15/2013			
b. Secure Permitting			02/01/2013			
c. Bid			06/01/2013			
d. Begin Construction			08/01/2013			
e. End Construction			01/01/2014			

Clay County Non-MS4 4,659

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
CC Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	920	2,024
CC Non-MS4	CC-3	Education Program	N/A	N/A	Ongoing	223	491
CC Non-MS4	CC-4	FDOT Construction of 7 new Wet Ponds on SR 15 from Putnam County Line to SR 16	Wet pond (1”, 14 days)	281	Completed	172	378
CC Non-MS4	CC-8	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	525	1,155
CC Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	920	2,024
CC Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

Hastings Non-MS4 448

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Hastings Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	177	389
Hastings Non-MS4	HAS-1	WWTP Chemical Feed Systems	N/A	N/A	Completed	176	388
Hastings Non-MS4	HAS-2	FDOT 4 laning of SR 207	Wet Pond (1", 14 days)	12	Completed	7	15
Hastings Non-MS4	HAS-3	FDOT 4 laning of SR207 from CR305 to Cypress Link Blvd	Wet Pond (1", 14 days)	106	Completed	65	143
Hastings Non-MS4	HAS-4	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	54	119
Hastings Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	302	664
Hastings Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	125	275

Putnam County Non-MS4 33,976

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Putnam Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	9,639	21,206
Putnam Non-MS4	PUT-1	Trade with Putnam Lanes WWTF	N/A	N/A	Completed	50	110
Putnam Non-MS4	PUT-2	Trade with Hiawatha WWTF	N/A	N/A	08/31/2014	150	330
Putnam Non-MS4	PUT-3	Septic Tank Phase-Out	N/A	N/A	12/31/2014	1,097	2,414
Putnam Non-MS4	PUT-4	Edgefield RST O&M Value	N/A	N/A	Completed	594	1,307
Putnam Non-MS4	PUT-5	FDOT construction of 7 new wet ponds on SR15 from Clay County line to south of Gordon Wilkins Rd	Wet pond (1", 14 days)	1,181	Completed	723	1,591
Putnam Non-MS4	PUT-6	Algal Initiative	N/A	N/A	10/31/2017	1,551	3,412
Putnam Non-MS4	PUT-7	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	4,056	8,923
Putnam Non-MS4	PUT-8	Education and outreach	Education	N/A	Ongoing	1,418	3,119
Putnam Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	9,639	21,206
Putnam Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

Putnam County Non-MS4 Total	**Implementation Schedule**
Trade with Hiawatha WWTF a. Start Date of Project	04/01/2008
b. Completion Date - Design	02/01/2009 – Completed
c. Completion Date - Construction	08/31/2014
d. Completion Date – Completion of Project	08/31/2014
Septic Tank Phase-Out US 17 – tie into EPCR WWTF a. Start Date of Project	01/01/2009
b. Completion Date - Design	Completed - 02/02/2009
c. Completion Date - Construction	12/31/2014
d. Completion Date – Completion of Project	12/31/2014
Algal Initiative a. Start Date of Project	10/01/2008
b. Completion Date – Project Assessment	Completed - 10/31/2010
c. Completion Date – Project Fundraising	10/31/2012
d. Completion Date – Construction	10/31/2017

St. Johns County Non-MS4 25,340

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
SJC Non-MS4	N/A	Total Required Reduction	N/A	1,850	4,070
SJC Non-MS4	SJC-3	Stormwater Education	Ongoing	1,078	2,372
SJC Non-MS4	SJC-4	Low-Impact Development	Ongoing	Not quantified	Not quantified
SJC Non-MS4	SJC-5	Slow release fertilizer ordinance	Completed	Not quantified	Not quantified
SJC Non-MS4	SJC-6	Deep Creek RST O&M value	Completed	313	689
SJC Non-MS4	SJC-8	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	Completed	1,937	4,261
SJC Non-MS4	SJC-27	Application of freshwater non-MS4 TN credits to the marine non-MS4 section	Completed	-1,391	-3,060
SJC Non-MS4	N/A	Total Project Reductions	N/A	1,937	4,261
SJC Non-MS4	N/A	Credit/(Deficit)	N/A	87	191

Welaka Non-MS4 838

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Welaka Non-MS4	N/A	Total Reduction Required	N/A	337.0	741.4
Welaka Non-MS4	WEL-1	Septic Tank Phase-Out	Completed	490.0	1,078.0
Welaka Non-MS4	WEL-2	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	Completed	100.0	220.0
Welaka Non-MS4	N/A	Total Project Reductions	N/A	590.0	1,298.0
Welaka Non-MS4	N/A	Credit/(Deficit)	N/A	253.0	556.6

POINT SOURCE – MARINE NITROGEN ALLOCATION

Name of Facility ***Wasteload Allocation (kg/yr)***

Anheuser Busch – Main Street 12,418
FL0041530

FACILITY NAME	PROJECT NUMBER	DESCRIPTION	DEADLINE	PROJECT TN REDUCTION (KG/YR)	PROJECT TN REDUCTION (LBS/YR)
Anheuser Busch – Main Street	N/A	Total Reduction Required	N/A	11,981	26,358
Anheuser Busch – Main Street	ANB-1	Complete Process Improvements	Completed	11,981	26,358
Anheuser Busch – Main Street	N/A	Total Project Reductions	N/A	11,981	26,358
Anheuser Busch – Main Street	N/A	Credit/(Deficit)	N/A	0	0

City of Atlantic Beach Aggregate 21,188
FL0626881

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Atlantic Bch Total (Aggregate)	N/A	Total Reduction Required	N/A	28,087	61,791
Buccaneer WWTP FL0023248	AB-1	Complete Upgrade to Sequencing Batch Reactor	Completed	9,985	21,967
Main WWTP FL0038776	AB-2	Upgrade to Biological Nutrient Removal and Flow Transfer from Buccaneer WWTF	10/01/2013	22,119	48,661
Atlantic Bch Total (Aggregate)	N/A	Total Project Reductions	N/A	32,104	70,628
Atlantic Bch Total (Aggregate)	N/A	Credit/(Deficit)	N/A	4,017	8,837
Atlantic Beach Total (Aggregate)			**Implementation Schedule**		
Main WWTF Nutrient Removal Phase a. Preliminary Plans Complete			Completed - 03/30/2009		
b. Final Plans and Specifications Complete			Completed - 10/01/2010		
c. Begin Construction (Construction Contracts Awarded)			Completed - 12/13/2010		
d. End Construction			Completed - 11/19/2012		
e. Begin Operation of Main WWTF Upgrade			Completed - 12/03/2012		
f. Abandon Buccaneer WWTF			Completed - 11/19/2012		
g. Operational Level Attained			10/01/2013		

City of Atlantic Beach MS4..... 1,651
FLS000012

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Atlantic Bch MS4	N/A	Total Reduction Required	N/A	N/A	N/A	823	1,811
Atlantic Bch MS4 FLS000012	AB-4	Core City Capital Improvement Project: stormwater, sanitary sewer and water systems upgrades	Second Generation Baffle Box	180	Completed	659	1,450
Atlantic Bch MS4 FLS000012	AB-5	Hopkins Creek Stormwater Treatment System	Wet Detention	53	Completed	12	26
Atlantic Bch MS4 FLS000012	AB-6	FDOT Widening of SR 10 (Atlantic Blvd) roadway & bridge upgrade	Wet Pond (1", 14 days)	152	Completed	50	110
Atlantic Bch MS4 FLS000012	AB-7	FDOT Atlantic Blvd and Mayport Rd Interchange	Wet Pond (1", 14 days)	50	Completed	18	40
Atlantic Bch MS4 FLS000012	AB-8	FDOT Wonderwood Connector Segment 1 – Girvin to Sandcastle	Wet Pond (1", 14 days)	70	Completed	6	13
Atlantic Bch MS4 FLS000012	AB-9	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	78	172
Atlantic Bch MS4	N/A	Total Project Reductions	N/A	N/A	N/A	823	1,811
Atlantic Bch MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

City of Jacksonville/Florida Department of Transportation MS4..... 96,016
FLS000012

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	N/A	Total Reduction Required	N/A	N/A	N/A	147,422	324,328
COJ MS4 FLS000012	COJ-1	Big Fishweir Creek-Murray Hill Phase I-Drainage improvements	Second generation baffle box	219	Completed	80	176
COJ MS4 FLS000012	COJ-2	Sixmile Creek-West 1st Street/Melson Avenue-Drainage improvements	Wet detention	254	Completed	470	1,034
COJ MS4 FLS000012	COJ-3	McCoys Creek Pond A & B	Wet detention	680	Completed	750	1,650
COJ MS4 FLS000012	COJ-4	McCoys Creek Pond F	Wet detention	11	Completed	10	22
COJ MS4 FLS000012	COJ-5	Riverside Ave-baffle boxes	Second generation baffle box	70	Completed	40	88
COJ MS4 FLS000012	COJ-6	St Augustine Rd (Emerson to US 1)-Regional pond facilities	Wet detention	167	Completed	200	440
COJ MS4 FLS000012	COJ-7	Powers Avenue/Old Kings Rd-Regional pond facilities	Wet detention	520	Completed	620	1,364
COJ MS4 FLS000012	COJ-8	Fouraker Rd- from Old Middleburg Rd. to Normandy Blvd. regional pond facilities	Wet detention	32	Completed	40	88
COJ MS4 FLS000012	COJ-9	Greenland Road-from St. Augustine Rd to Coastal Lane- detention pond facilities	Wet detention	33	Completed	30	66
COJ MS4 FLS000012	COJ-10	Barnes Rd-from University Blvd. to Parental Home Rd.- detention pond facilities	Wet detention	97	Completed	20	44
COJ MS4 FLS000012	COJ-11	Emerson St.-from Emerson St. Expwy. to Spring Glenn Rd - detention pond facility	Wet detention	17	Completed	20	44
COJ MS4 FLS000012	COJ-12	Bowden Rd-from U.S.# 1 to Salisbury Rd. - detention pond facilities	Wet detention	98	Completed	130	286
COJ MS4 FLS000012	COJ-13	Parental Home Rd Phase I (Bowden Rd from Salisbury Rd to Dean Rd) - detention pond facility	Wet detention	28	Completed	20	44
COJ MS4 FLS000012	COJ-14	Parental Home Rd Phase II (Beach Blvd to Ibach Rd) detention pond facility	Wet detention	82	Completed	10	22
COJ MS4 FLS000012	COJ-15	Lorretto Rd from S.R. 13 to Old St. Augustine Road - detention pond facilities	Wet detention	55	Completed	50	110
COJ MS4 FLS000012	COJ-16	Belford Rd-Pottsburg Ck. to Touchton Rd. detention pond facilities	Wet detention	20	Completed	10	22
COJ MS4 FLS000012	COJ-17	Royal Terrace phases A+B+C+D+E+1+2+3+4 - master pond facility	Wet detention	332	Completed	410	902

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-18	University Pointe regional pond facility	Wet detention	102	Completed	150	330
COJ MS4 FLS000012	COJ-19	Cleveland Road-Phase I-B wet detention pond	Wet detention	269	Completed	150	330
COJ MS4 FLS000012	COJ-20	Hogan Creek	Wet detention	48	Completed	50	110
COJ MS4 FLS000012	COJ-21	McCoy Creek Pond D	Wet detention	27	Completed	30	66
COJ MS4 FLS000012	COJ-22	Upper Deer Creek Regional Stormwater Facility	Wet detention	537	Completed	840	1,848
COJ MS4 FLS000012	COJ-23	Hugh Edwards Canal	Wet detention	329	Completed	760	1,672
COJ MS4 FLS000012	COJ-24	Cedar River Outfall Improvements	Wet detention	1,452	Completed	530	1,166
COJ MS4 FLS000012	COJ-25	Sandalwood Canal	Wet detention	3,118	Completed	880	1,936
COJ MS4 FLS000012	COJ-26	Moncrief Creek	Wet detention	619	Completed	650	1,430
COJ MS4 FLS000012	COJ-27	Lincoln Villas-East Side-regional pond facility	Wet detention	185	Completed	100	220
COJ MS4 FLS000012	COJ-28	Old Middleburg Rd from Wilson Blvd to 103rd St-regional pond facilities	Wet detention	192	Completed	210	462
COJ MS4 FLS000012	COJ-29	Lakeshore Woodcrest Drainage Improvement	Wet detention	296	Completed	440	968
COJ MS4 FLS000012	COJ-30	Townsend Rd drainage improvements	Wet detention	151	Completed	60	132
COJ MS4 FLS000012	COJ-31	Lenox Ave (Highway to McDuff)	Wet detention	108	Completed	180	396
COJ MS4 FLS000012	COJ-32	Wesconnett Blvd (Blanding to Blanding)	Wet detention	396	Completed	40	88
COJ MS4 FLS000012	COJ-33	Durkeeville West	Wet detention	106	Completed	160	352
COJ MS4 FLS000012	COJ-34	Huffman Boulevard	Wet detention	16	Completed	20	44
COJ MS4 FLS000012	COJ-35	Spring Park Rd/Emerson to University	Wet detention	36	Completed	50	110
COJ MS4 FLS000012	COJ-36	Barnes Rd/Kennerly to University	Wet detention	418	Completed	720	1,584
COJ MS4 FLS000012	COJ-37	Pritchard Rd (Jones to I-295)	Wet detention	116	Completed	0	0

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-38	Lenox, Lane to Normandy	Wet detention	47	Completed	30	66
COJ MS4 FLS000012	COJ-39	Cahoon Rd, Phase I	Wet detention	23	Completed	20	44
COJ MS4 FLS000012	COJ-40	Pulaski Road (Eastport Dr to New Berlin Rd)	Wet detention	19	Completed	20	44
COJ MS4 FLS000012	COJ-41	Lamoya Roadway Project	Wet detention	17	Completed	0	0
COJ MS4 FLS000012	COJ-42	LSJR upstream of Trout River	Wet detention[1]	3,141	12/31/2023	2,500	5,500
COJ MS4 FLS000012	COJ-43	Ortega River	Wet detention[1]	7,169	12/31/2023	4,600	10,120
COJ MS4 FLS000012	COJ-44	Arlington River	Wet detention[1]	3,352	12/31/2023	2,500	5,500
COJ MS4 FLS000012	COJ-45	LSJR Downstream of Trout River	Wet detention[1]	514	12/31/2023	200	440
COJ MS4 FLS000012	COJ-46	Intracoastal Waterway	Wet detention[1]	7,646	12/31/2023	4,600	10,120
COJ MS4 FLS000012	COJ-47	Julington Creek	Wet detention[1]	4,404	12/31/2023	2,600	5,720
COJ MS4 FLS000012	COJ-48	Trout River	Wet detention[1]	5,329	12/31/2023	2,100	4,620
COJ MS4 FLS000012	COJ-49	Broward River	Wet detention[1]	837	12/31/2023	700	1,540
COJ MS4 FLS000012	COJ-50	Dunn Creek	Wet detention[1]	1,300	12/31/2023	600	1,320
COJ MS4 FLS000012	COJ-51	Public Education Activities	N/A	N/A	Ongoing	13,145	28,919
COJ MS4 FLS000012	COJ-121	Street Sweeping	Street sweeping	N/A	Ongoing	5,553	12,243
COJ MS4 FLS000012	COJ-52	Septic Tank Phase-Out Projects[2]	N/A	N/A	12/31/2023[3]	40,197	88,433
COJ MS4 FLS000012	COJ-122	Future Projects and/or Trades[4]	To be determined	N/A	12/31/2023	37,459	82,410
COJ MS4 FLS000012	COJ-53	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	6,926	15,237
COJ MS4 FLS000012	N/A	City of Jacksonville Projects Subtotal	N/A	N/A	N/A	132,680	291,896
COJ MS4 FLS000012	COJ-54	FDOT Urban Office Reconstruction	Dry retention w/ underdrain	7	Completed	9	20

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-55	FDOT Fort George Inlet Bridge	Wet pond (1", 14 days)	18	Completed	6	13
COJ MS4 FLS000012	COJ-56	FDOT Widening of Riverside Area	Wet pond (1", 14 days)	14	Completed	5	11
COJ MS4 FLS000012	COJ-57	FDOT Widening of Merrill Road between Wompi Drive and Milcoe road	Wet pond (1", 14 days)	58	Completed	21	46
COJ MS4 FLS000012	COJ-58	FDOT Widening of Merrill Road between 9A and Wompi Drive	Wet pond (1", 14 days)	69	Completed	25	55
COJ MS4 FLS000012	COJ-59	FDOT Widening of SR 13 to six lane divided highway	Wet pond (1", 14 days)	174	Completed	63	139
COJ MS4 FLS000012	COJ-60	FDOT Bch Blvd Widening from ICWW to E. of Penman	Wet pond (1", 14 days)	25	Completed	9	20
COJ MS4 FLS000012	COJ-61	FDOT I-295 and SR 21 (Blanding) interchange upgrade	Wet pond (1", 14 days)	42	Completed	15	33
COJ MS4 FLS000012	COJ-62	FDOT I-295 and SR 17 (Blanding) interchange expansion	Wet pond (1", 14 days)	96	Completed	35	77
COJ MS4 FLS000012	COJ-63	FDOT JTB/Belfort Road Interchange	Wet pond (1", 14 days)	155	Completed	56	123
COJ MS4 FLS000012	COJ-64	FDOT Pine Avenue Sidewalk	Dry retention (1")	7	Completed	9	20
COJ MS4 FLS000012	COJ-65	FDOT 9A from Baymeadows Road to I-95	Wet pond (1", 14 days)	550	Completed	200	440
COJ MS4 FLS000012	COJ-66	FDOT Widening of I-95 from St. Johns County line to 9A/I-295	Wet pond (1", 14 days)	175	Completed	64	141
COJ MS4 FLS000012	COJ-67	FDOT Widening of I-95 from I-295 to south of JTB	Wet pond (1", 14 days)	441	Completed	160	352
COJ MS4 FLS000012	COJ-68	FDOT Widening of SR 10 (Atlantic Blvd from St. Johns Bluff to San Pablo)	Wet pond (1", 14 days)	1096	Completed	397	873
COJ MS4 FLS000012	COJ-69	FDOT Widening of Southside Blvd	Dry retention	146	Completed	53	117
COJ MS4 FLS000012	COJ-70	FDOT New JTB/9A Interchange	Detention/retention (1")	339	Completed	442	972
COJ MS4 FLS000012	COJ-71	FDOT Southside (SR 115) frontage road	Wet pond (1", 14 days)	8	Completed	3	7
COJ MS4 FLS000012	COJ-72	FDOT I-95 Improvement - from I-295 to Nassau County Line South Project	Wet pond (1", 14 days)	291	Completed	105	231
COJ MS4 FLS000012	COJ-73	FDOT I-95 Improvement - S. of Clarke rd to I-295	Wet pond (1", 14 days)	94	Completed	34	75
COJ MS4 FLS000012	COJ-74	FDOT 9A Improvement - South Project	Wet pond (1", 14 days)	176	Completed	64	141

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-75	FDOT 9A from South of Atlantic to Beach Blvd	Wet pond (1", 14 days)	124	Completed	45	99
COJ MS4 FLS000012	COJ-76	FDOT I-295/I-95/9A Interchange	Wet pond (1", 14 days)	580	Completed	200	440
COJ MS4 FLS000012	COJ-77	FDOT Branan Field Chafee roadway project	Wet pond (1", 14 days)	187	Completed	115	253
COJ MS4 FLS000012	COJ-78	FDOT Wonderwood Connector Segment 1 project Girvin to Sandcastle	Wet pond (1", 14 days)	70	Completed	19	42
COJ MS4 FLS000012	COJ-79	FDOT JIA South Access Connector project	Dry detention	63	Completed	82	180
COJ MS4 FLS000012	COJ-80	FDOT I-95 Widening from Lem Turner to I-295 project	Wet pond (1", 14 days)	117	Completed	42	92
COJ MS4 FLS000012	COJ-81	FDOT 4 laning of SR 13	Wet pond (1", 14 days)	105	Completed	38	84
COJ MS4 FLS000012	COJ-82	FDOT SR21 Widening from S. of Cedar River to E. of Cassat	Wet pond (1", 14 days)	19	Completed	7	15
COJ MS4 FLS000012	COJ-83	FDOT Arlington Expressway Project	Unknown	27	Completed	10	22
COJ MS4 FLS000012	COJ-84	FDOT Merrill Rd Southside Blvd Interchange Project	Wet pond (1", 14 days)	15	Completed	5	11
COJ MS4 FLS000012	COJ-85	FDOT Baymeadows Project from East of US 1 to SR 13	Wet pond (1", 14 days)	35	Completed	9	20
COJ MS4 FLS000012	COJ-86	FDOT SR 115/8th St Project	Wet pond (1", 14 days)	31	Completed	11	24
COJ MS4 FLS000012	COJ-87	FDOT SR 115/8th St Project	Wet pond (1", 14 days)	4	Completed	1	2
COJ MS4 FLS000012	COJ-88	FDOT JTB from I-95 to Gate Parkway Project	Wet pond (1", 14 days)	58	Completed	21	46
COJ MS4 FLS000012	COJ-89	FDOT I-295 from West of Duval to Biscayne Blvd	Wet pond (1", 14 days)	20	Completed	7	15
COJ MS4 FLS000012	COJ-90	FDOT Beaver Street (US 90) Project from Stockton to Tyler	Wet pond (1", 14 days)	7	Completed	3	7
COJ MS4 FLS000012	COJ-91	FDOT 9A from Baymeadows to JTB Project	Wet pond (1", 14 days)	195	Completed	71	156
COJ MS4 FLS000012	COJ-92	FDOT JTB/A1A Interchange Project	Wet pond (1", 14 days)	20	Completed	3	7
COJ MS4 FLS000012	COJ-93	FDOT Southside Blvd/I-95 Connector	Dry retention (1")	76	Completed	99	218
COJ MS4 FLS000012	COJ-94	FDOT Beach Blvd improvement from west of FCCJ to East of San Pablo	Wet pond (1", 14 days)	165	Completed	60	132

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-95	FDOT Widening of SR 13	Unknown	227	Completed	82	180
COJ MS4 FLS000012	COJ-96	FDOT Branan Field Chafee roadway project (Argyle Forrest to 103rd)	Wet pond (1", 14 days)	112	Completed	40	88
COJ MS4 FLS000012	COJ-97	FDOT Branan Field Chafee roadway project (103rd to I-10)	Wet pond (1", 14 days)	150	Completed	55	121
COJ MS4 FLS000012	COJ-98	FDOT Southside (SR115) & Bch Blvd (SR202) interchange & rd widening	Wet pond (1", 14 days)	33	Completed	12	26
COJ MS4 FLS000012	COJ-99	FDOT Wonderwood Connector Segment 2	Wet pond (1", 14 days)	58	Completed	21	46
COJ MS4 FLS000012	COJ-100	FDOT JTB/Kernan project	Wet pond (1", 14 days)	65	Completed	24	53
COJ MS4 FLS000012	COJ-101	FDOT I-95 from JTB to Emerson	Dry retention (1")	105	Completed	137	301
COJ MS4 FLS000012	COJ-102	FDOT Heckscher Drive / 9a Interchange-1 DRS	Dry Retention (1")	103	Completed	89	196
COJ MS4 FLS000012	COJ-103	FDOT Heckscher Drive / 9a Interchange-2 WDS	Wet pond (1", 14 days)	68	Completed	25	55
COJ MS4 FLS000012	COJ-104	FDOT Wonderwood Segment 3 Project	Wet pond (1", 14 days)	69	Completed	25	55
COJ MS4 FLS000012	COJ-105	FDOT Collins Rd Collector Distributor	Wet pond (1", 14 days)	142	Completed	51	112
COJ MS4 FLS000012	COJ-106	FDOT JTB / I-95 Ramp project (40-031-18233-6)	Wet pond (1", 14 days)	54	Completed	20	44
COJ MS4 FLS000012	COJ-107	FDOT SR 5 US 1 Project (209516-3-52-01)	Wet pond (1", 14 days)	27	Completed	10	22
COJ MS4 FLS000012	COJ-108	FDOT 4 laning of SR 207	Wet Pond (1", 14 days)	12	Completed	7	15
COJ MS4 FLS000012	COJ-109	FDOT 4 laning of SR207 from CR305 to Cypress Link Blvd	Wet Pond (1", 14 days)	106	Completed	65	143
COJ MS4 FLS000012	COJ-110	FDOT 4 laning of SR207 from SR15 (US 17) to CR207	Wet Pond (1", 14 days)	538	Completed	330	726
COJ MS4 FLS000012	COJ-111	FDOT Six laning of I-95 from Flagler County Line to SR 16	Wet pond (1", 14 days)	800	Completed	255	561
COJ MS4 FLS000012	COJ-112	FDOT I-95 Rest Area Reconstruction	Wet pond (1", 14 days)	52	Completed	17	37
COJ MS4 FLS000012	COJ-113	FDOT Six laning of I-95 from World Golf Village to Duval County line	Wet pond (1", 14 days)	537	Completed	237	521
COJ MS4 FLS000012	COJ-114	FDOT Widening of SR 16	Swale treatment system	68	Completed	22	48

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
COJ MS4 FLS000012	COJ-115	FDOT SR 207 from I-95 to SR 312	Wet pond (1", 14 days)	102	Completed	33	73
COJ MS4 FLS000012	COJ-116	FDOT SR 207 from SR 312 to US 1	Wet pond (1", 14 days)	536	Completed	171	376
COJ MS4 FLS000012	COJ-117	FDOT Stormwater Education Efforts in St. Johns County	N/A	N/A	Ongoing	286	629
COJ MS4 FLS000012	COJ-118	FDOT Education Efforts in City of Jacksonville	N/A	N/A	Ongoing	1,461	3,214
COJ MS4 FLS000012	COJ-119	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	769	1,692
COJ MS4 FLS000012	COJ-120	FDOT Future Projects and/or Trade (Fertilizer Cessation)	N/A	N/A	Completed	18,445	40,663
COJ MS4 FLS000012	N/A	FDOT Projects Subtotal	N/A	N/A	N/A	25,312	55,768
COJ MS4 FLS000012	N/A	Total Project Reductions	N/A	N/A	N/A	157,992	347,664
COJ MS4 FLS000012	N/A	Credit/(Deficit)	N/A	N/A	N/A	10,570	23,336
City of Jacksonville MS4 Total			**Implementation Schedule**				
Future COJ Stormwater Projects a. Start Date of Project			01/01/2009				
b. Completion Date – Attain 50% of required reduction			07/31/2015				
c. Completion Date – Completion of Project			12/31/2023				
Septic Tank Phase-Out Projects a. Start Date of Project			10/31/2008				
b. Completion Date - Phase-out 50% of Septic Tanks			07/31/2015				
c. Completion Date – Completion of Project			12/31/2023				

[1] The estimated reductions are based on the treatment expected for wet detention ponds. The City has committed to provide a detailed implementation plan and schedule for the stormwater projects by 2010 as part of the Master Stormwater Management Plan update. In addition, the City has committed to accomplish, at a minimum, a 50% implementation of the future stormwater projects by the mid-point of the 15-year timeline shown.

[2] The load reductions associated with septic tank phase-out have been revised based on the Florida State University (FSU) septic tank model. While the estimates may be further refined based on acceptable site-specific information, new estimates have been established and the septic tank study is complete.

[3] The schedule broadly outlines the project milestones for septic tank phase-outs. While the general schedule depicts implementation over a 15-year time frame, the City will continuously implement projects throughout the implementation period. At a minimum, the City will accomplish a 50% implementation of the septic tank phase out projects by the mid-point of the 15-year implementation timeline shown.

[4] Additional projects and/or water quality credit trades must be completed by the due date for the septic tank phase-out project, which is December 31, 2023.

City of Jacksonville Beach WWTF.....21,015
FL002031

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Jax Bch WWTF	N/A	Total Reduction Required	N/A	19,135	42,097
Jax Bch WWTF FL0020231	JB-1	Upgrade WWTF to Advance Wastewater Treatment for TN removal	12/31/2013	21,555	47,421
Jax Bch WWTF	N/A	Total Project Reductions	N/A	21,555	47,421
Jax Bch WWTF	N/A	Credit/(Deficit)	N/A	2,420	5,324
Jacksonville Beach Total WWTF			**Implementation Schedule**		
Phase One – Initial Nutrient Removal Phase a. Preliminary Plans Complete			Completed – 01/01/2008		
b. Final Plans and Specifications Complete			Completed – 2009		
c. Begin Construction			Completed – 04/06/2009		
d. End Construction			07/01/2013		
e. Begin Operation			08/01/2013		
f. Operational Level Attained			12/31/2013		

City of Jacksonville Beach MS4 4,804
FLS000013

Facility Name	Project Number	Description	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Jax Bch MS4	N/A	Total Reduction Required	N/A	N/A	170	374
Jax Bch MS4 FLS000013	JB-2	FDOT Beach Blvd widening (Pond 2)	38.87	Completed	14	31
Jax Bch MS4 FLS000013	JB-3	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	Completed	156	343
Jax Bch MS4	N/A	Total Project Reductions	N/A	N/A	170	374
Jax Bch MS4	N/A	Credit/(Deficit)	N/A	N/A	0	0

City of Neptune Beach WWTF..... 6,162
FL0020427

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Neptune Beach WWTF FL0020427	N/A	Total Reduction Required	N/A	5,286	11,629
Neptune Beach WWTF FL0020427	NB-1	Complete Process Improvements	Completed – 01/15/2012	7,322	16,108
Neptune Beach WWTF FL0020427	N/A	Total Project Reductions	N/A	7,322	16,108
Neptune Beach WWTF FL0020427	N/A	Credit/(Deficit)	N/A	2,036	4,479
Neptune Beach Total WWTF			**Implementation Schedule**		
Phase One – Initial Nutrient Removal Phase a. Preliminary Plans Complete			01/01/2009		
b. Final Plans and Specifications Complete			Completed – 05/14/2010		
c. Begin Construction			Completed – 08/03/2010		
d. End Construction			Completed – 05/31/2011		
e. Begin Operation			Completed – 06/01/2011		
f. Operational Level Attained			Completed – 01/15/2012		

City of Neptune Beach MS4 1,437
FLS000012

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Neptune Beach MS4	N/A	Total Reduction Required	N/A	47	103
Neptune Beach MS4	NB-2	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	Completed	47	103
Neptune MS4	N/A	Total Project Reductions	N/A	47	103
Neptune MS4	N/A	Credit/(Deficit)	N/A	0	0

Clay County MS4 21,188
FLR04E045

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
CC MS4 FLR04E045	N/A	Total Reduction Required	N/A	N/A	N/A	4,061	8,934
CC MS4 FLR04E045	CC-9	Wells Road Improvements	Wet Detention Pond	120	Completed	9	20
CC MS4 FLR04E045	CC-10	County Road 224 Phase I	Wet Detention Pond	70	Completed	38	84
CC MS4 FLR04E045	CC-11	County Road 224 Phase II	Wet Detention Pond	140	Completed	68	150
CC MS4 FLR04E045	CC-12	Education Program	N/A	N/A	Ongoing	1,010	2,222
CC MS4 FLR04E045	CC-13	FDOT Construction of Stormwater Management Systems for Clay County Recreational Trail on SR15	Retention/ Detention (1")	69	Completed	90	198
CC MS4 FLR04E045	CC-14	FDOT SR 15 Widening @ Fleming Island	Retention/ Detention (1")	606	Completed	1,336	2,939
CC MS4 FLR04E045	CC-15	FDOT SR 15 Widening @ Fleming Island from Village Sq Park Rd to South of Margarets Walk Rd	Retention/ Detention (1")	301	Completed	664	1,461
CC MS4 FLR04E045	CC-16	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	846	1,861
CC MS4 FLR04E045	N/A	Total Project Reductions	N/A	N/A	N/A	4,061	8,934
CC MS4 FLR04E045	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

Clay County Utility Authority Aggregate..... 63,963
FL0629006

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
CCUA Total Facilities	N/A	Total Reduction Required	N/A	-2,394	-5,267
Fleming Island WWTF FL0043834	CCUA-1	Upgrade to APRICOT and Reuse	Completed	18,195	40,029
Miller Street WWTF FL0025151	CCUA-2	Reuse Water upgrades including Spencer WWTP	Completed	16,209	35,670
Miller Street WWTF FL0025151	CCUA-3	WWTF Improvements to meet APRICOT standards	Completed	10,335	22,737
CCUA Total Facilities	N/A	Total Project Reductions	N/A	44,739	98,426
CCUA Total Facilities	N/A	Credit/(Deficit)	N/A	47,133	103,693

JEA Aggregate 654,672
FL0620564

Facility Name	Project Number	Description	Construction Complete	Achieve Operational Effectiveness	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
JEA Total Facilities	N/A	Total Reduction Required	N/A	N/A	741,951	1,632,292
JEA Julington Creek FL0043591	JEA-1	Complete Process Improvements	Completed	N/A	5,909	13,000
JEA Arlington East FL0026441	JEA-2	Complete Process Improvements	Completed	N/A	92,727	204,000
JEA District II FL0026450	JEA-3	Complete Process Improvements	Completed	N/A	140,000	308,000
JEA Southwest FL0026468	JEA-4	Complete Process Improvements	Completed	N/A	45,909	101,000
JEA Buckman FL0026000	JEA-5	Complete Process Improvements	Completed	N/A	50,455	111,000
JEA Monterey FL00230604	JEA-6	Complete Process Improvements	Completed	N/A	35,455	78,001
JEA Mandarin FL0023493	JEA-7	Complete Process Improvements	Completed	N/A	12,726	27,997
JEA San Pablo FL0024767	JEA-8	Complete Phase Out	Completed	N/A	6,364	14,001
JEA Woodmere FL0026786	JEA-9	Complete Phase Out	Completed	N/A	10,000	22,000
JEA Beacon Hills FL0026778	JEA-10	Complete Phase Out	Completed	Completed	5,700	12,540
JEA Royal Lakes FL0026751	JEA-11	Complete Phase Out	02/01/2013	02/01/2013	0	0
JEA Jax Heights FL0023671	JEA-12	Complete Phase Out	08/14/2014	08/14/2014	0	0
JEA Arlington East FL0026441	JEA-13	Complete Process Improvements	Completed	Completed	118,172	259,978
JEA District II FL0026450	JEA-14	Complete Process Improvements	09/30/2015	09/30/2015	0	0
JEA San Jose FL0023663	JEA-15	Complete Phase Out	03/31/2013	03/31/2013	0	0
JEA Buckman FL0026000	JEA-16	Complete Process Improvements	03/30/2013	09/30/2013	191,183	420,603
JEA Facilities	JEA-17	Reuse expansion (approx 10 mgd) at Arlington East, Mandarin and District II	Completed – 11/15/2012	09/30/2013	59,090	129,998
JEA Total Facilities	N/A	Total Project Reductions	N/A	N/A	773,690	1,702,118
JEA Total Facilities	N/A	Credit/(Deficit)	N/A	N/A	31,739	69,826

JEA WWTF Total	**Implementation Schedule**
Phased WWTF Nutrient Removal a. Preliminary Plans Complete	09/30/2008
b. Final Plans and Specifications Complete	Completed - 01/30/2009
c. Begin Construction	Completed - 06/30/2009
d. Interim Progress Report Due	Completed - 12/01/2009
e. Interim Progress Report Due	Completed - 06/30/2010
f. Interim Progress Report Due	Completed - 12/01/2010
g. Interim Progress Report Due	Completed - 06/30/2011
h. Interim Progress Report Due	Completed - 12/01/2011
i. End Construction	Completed - 11/15/2012
j. Begin Operations	Completed - 11/15/2012
k. Interim Progress Report Due	03/31/2013
l. Operational Level Attained	09/30/2014

Smurfit-Stone Container..... 74,305
FL0000400

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Smurfit-Stone	N/A	Total Reduction Required	N/A	71,684	157,705
Smurfit-Stone	SS-1	Complete Process Improvements	Completed	71,684	157,705
Smurfit-Stone	N/A	Total Project Reductions	N/A	71,684	157,705
Smurfit-Stone	N/A	Credit/(Deficit)	N/A	0	0

St. Johns County MS4 746
FLR04E025

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
SJC MS4 FLR04E025	N/A	Starting Load	N/A	N/A	N/A	2,311	5,084
SJC MS4 FLR04E025	SJC-11	Stormwater Education	Education	N/A	Ongoing	153	337
SJC MS4 FLR04E025	SJC-12	Low-Impact Development	N/A	N/A	Ongoing	Not quantified	Not quantified
SJC MS4 FLR04E025	SJC-13	Slow release fertilizer ordinance	N/A	N/A	Completed	Not quantified	Not quantified
SJC MS4 FLR04E025	SJC-14	FDOT 4 laning of SR 312	Wet Pond (1", 14 days)	38	Completed	14	31
SJC MS4 FLR04E025	SJC-15	FDOT A1A Stormwater retrofit from Duval County line to Thousand Oaks lane	Dry detention	98	Completed	216	475
SJC MS4 FLR04E025	SJC-16	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	60	132
SJC MS4 FLR04E025	SJC-17	Algal Initiative – Masters Tract RST Facility*	Wet pond, treatment wetland	N/A	10/31/2017	1,868	4,109
SJC MS4 FLR04E025	N/A	Total Project Reductions	N/A	N/A	N/A	2,311	5,084
SJC MS4 FLR04E025	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0
St. Johns County M N/A **S4 Total**			**Implementation Schedule**				
Algal Initiative a. Start Date of Project			10/01/2008				
b. Completion Date – Project Assessment			Completed - 10/31/2010				
c. Completion Date – Project Fundraising			10/31/2012				
d. Completion Date – Construction			10/31/2017				

*Note: This project is located in the freshwater reach. The trading ratio from the freshwater reach to marine reach is 1:1.

Town of Orange Park WWTF 7,940
FL0023922

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Orange Park WWTF	N/A	Total Reduction Required	N/A	16,946	37,281
Ash Street WWTF FL0023922	OP-1	Phase 1 Improvements	Completed	15,953	35,097
Ash Street WWTF FL0023922	OP-2	Phase 2 Improvements	Completed	6,942	15,272
Orange Park WWTF	N/A	Total Project Reductions	N/A	22,885	50,369
Orange Park WWTF	N/A	Credit/(Deficit)	N/A	5,939	13,088
Orange Park Total WWTF			**Implementation Schedule**		
Phase Two – Additional nutrient removal phase a. Preliminary Plans Complete			Completed - 06/30/2009		
b. Final Plans and Specifications Complete			Completed - 11/01/2009		
c. Begin Construction			Completed - 11/01/2010		
d. End Construction			Completed - 08/15/2011		
e. Begin Operation			Completed - 08/21/2011		
f. Operational Level Attained			Completed 1 08/21/2011		

Town of Orange Park MS4 3,348
FLR04E075

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Orange Park MS4	N/A	Total Reduction Required	N/A	103	227
Orange Park MS4	OP-4	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	Completed	103	227
Orange Park MS4	N/A	Total Project Reductions	N/A	103	227
Orange Park MS4	N/A	Credit/(Deficit)	N/A	0	0

US Navy Aggregate ***11,684***
FL0639451

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
USN Total (Aggregate)	N/A	Total Reduction Required	N/A	30,345	66,759
NAS Jax WWTF FL0000957	USN-1	Reuse to Timuquana Country Club	Completed	7,693	16,925
NAS Jax WWTF FL0000957	USN-2	Expand Reuse System	02/25/2014	2,790	6,138
NAS Jax WWTF FL0000957	USN-3	Inflow/infiltration repair projects	Completed	2,790	6,138
NS Mayport WWTF FL0000922	USN-4	Inflow/infiltration repair projects	Completed	5,753	12,657
NS Mayport WWTF FL0000922	USN-5	Modifications to the Mayport WWTF	10/01/2015	11,319	24,901
USN Total (Aggregate)	N/A	Total Project Reductions	N/A	30,345	66,759
USN Total (Aggregate)	N/A	Credit/(Deficit)	N/A	0	0
US Navy Total (Aggregate)			**Implementation Schedule**		
Expand Reuse System a. Start Date of Project			02/07/2008		
b. Completion Date – Design			Completed - 09/30/2009		
c. Submit 1st Progress Report			Completed - 10/01/2011		
d. Submit 2nd Progress Report			Completed - 04/01/2012		
e. Submit 3rd Progress Report			10/01/2013		
c. Completion Date - Construction			02/25/2014		
d. Completion Date – Project			02/25/2014		
Modifications to Mayport WWTF a. Start Date of Project			10/01/2012		
b. Completion Date – Design			02/25/2014		
c. Begin Construction			04/01/2014		
d. End Construction			07/01/2015		
e. Operational Level Attained			10/01/2015		

US Navy MS4s 7,232
FLR04E091 and FLR04E056

Facility Name	Project Number	Description	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
USN MS4s	N/A	Total Reduction Required	N/A	298	656
USN MS4	USN-6	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	Completed	298	656
USN MS4	N/A	Total Project Reductions	N/A	298	656
USN MS4	N/A	Credit/(Deficit)	N/A	0	0

Name of Facility ***Load Allocation (kg/yr)***

Camp Blanding Non-MS4 1,220

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
Camp Blanding	N/A	Total Reduction Required	N/A	N/A	N/A	1,650	3,630
Camp Blanding	CB-1	Re-grade existing swale system	Swales	2,220	12/31/2013	1,999	4,398
Camp Blanding	CB-2	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	98	216
Camp Blanding	N/A	Total Project Reductions	N/A	N/A	N/A	2,097	4,613
Camp Blanding	N/A	Credit/(Deficit)	N/A	N/A	N/A	447	983
Camp Blanding Non-MS4 Total			**Implementation Schedule**				
Re-grade existing swale system a. Start Date of Project			Completed - 01/01/2009				
b. Completion Date – Re-grade 1st set of swales			Completed - 12/31/2009				
c. Completion Date – Re-grade 2nd set of swales			Completed - 12/31/2010				
d. Completion Date – Re-grade 3rd set of swales			Completed - 12/31/2011				
f. Completion Date – Re-grade 4th and 5th set of swales			12/31/2013				
g. Completion Date – Completion of Project			12/31/2013				

Clay County Non-MS4..... 11,107

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
CC Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	944	2,077
CC Non-MS4	CC-17	Education Program	N/A	N/A	Ongoing	482	1,060
CC Non-MS4	CC-18	FDOT SR 23 improvement from Kindlewood Rd to Duval County line - 5 systems	Wet pond (1", 14 days)	112	Completed	69	152
CC Non-MS4	CC-19	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	393	865
CC Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	944	2,077
CC Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

St. Johns County Non-MS4 4,865

Facility Name	Project Number	Description	Type(s) of BMP(s) Implemented	Acres Treated	Deadline	Project TN Reduction (kg/yr)	Project TN Reduction (lbs/yr)
SJC Non-MS4	N/A	Total Reduction Required	N/A	N/A	N/A	4,981	10,958
SJC Non-MS4	SJC-17	Algal Initiative – Masters Tract RST Facility*	Wet pond, treatment wetland	N/A	10/31/2017	277	609
SJC Non-MS4	SJC-18	Greenbriar Road Paving/Improvements	Wet ponds	40	Completed	33	73
SJC Non-MS4	SJC-21	Stormwater Education	Education	N/A	Ongoing	492	1,082
SJC Non-MS4	SJC-22	Low-Impact Development	N/A	N/A	Ongoing	Not quantified	Not quantified
SJC Non-MS4	SJC-23	Slow release fertilizer ordinance	N/A	N/A	Completed	Not quantified	Not quantified
SJC Non-MS4	SJC-24	FDOT SR 312 from US 1 to SR 3	N/A	38	Completed	84	185
SJC Non-MS4	SJC-25	Atmospheric deposition load reduction – Seminole Electric SCR upgrade	N/A	N/A	Completed	390	858
SJC Non-MS4	SJC-26	Algal Initiative	N/A	N/A	10/31/2017	611	1,344
SJC Non-MS4	SJC-27	Application of freshwater non-MS4 credits	N/A	N/A	Completed	1,391	3,060
SJC Non-MS4	SJC-28	Bishop Estates Baffles Boxes	2nd generation baffle boxes	N/A	10/31/2017	119	262
SJC Non-MS4	SJC-29	Deep Creek West RST Improvements**	Wet pond, treatment wetland	N/A	10/31/2017	909	2,000
SJC Non-MS4	SJC-30	Fruit Cove Secret Oaks Place Baffle Box	2nd generation baffle boxes	N/A	10/31/2017	42	92
SJC Non-MS4	SJC-31	Fruit Cove Lemon Wood Road Baffle Box	2nd generation baffle boxes	N/A	10/31/2017	104	229
SJC Non-MS4	SJC-32	Fruit Cove Degrove Road Baffle Box	2nd generation baffle boxes	N/A	10/31/2017	36	79
SJC Non-MS4	SJC-33	CR 13 & Joe Ashton Road Baffle Box	2nd generation baffle boxes	N/A	10/31/2017	75	165
SJC Non-MS4	SJC-34	Colee Cove Road Baffle Box	2nd generation baffle boxes	N/A	10/31/2017	350	770
SJC Non-MS4	SJC-35	CR 13 Culvert Box #8	2nd generation baffle boxes	N/A	10/31/2017	68	150
SJC Non-MS4	N/A	Total Project Reductions	N/A	N/A	N/A	4,981	10,958
SJC Non-MS4	N/A	Credit/(Deficit)	N/A	N/A	N/A	0	0

St. Johns County Non-MS4 Total	**Implementation Schedule**
Algal Initiative a. Start Date of Project	10/01/2008
b. Completion Date – Project Assessment	Completed - 10/31/2010
c. Completion Date – Project Fundraising	10/31/2012
d. Completion Date – Construction	10/31/2017

*Note: This project is located in the freshwater reach. The trading ratio from the freshwater reach to marine reach is 1:1.
** Reductions are estimates pending design finalization.

APPENDIX B: ADDITIONAL PROJECT PICTURES

Agriculture

OVERHEAD PIVOT IRRIGATION ON SOD WITH FERTIGATION

DROP NOZZLE TO MINIMIZE WIND DRIFT AND EVAPORATIVE LOSS

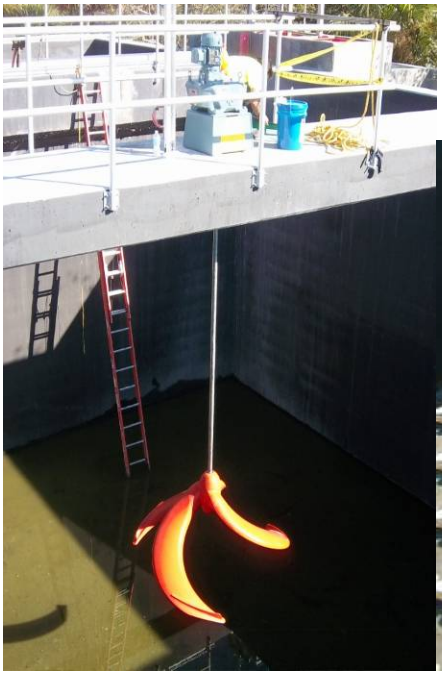
FERTILIZER TENDER TO REFILL THE BANDER

MEASURING DISTANCE BETWEEN LINES FOR SUBSURFACE DRIP TAPE ON POTATOES

DIGGING FURROWS TO LAY SUBSURFACE DRIP TAPE LINES

MANIFOLDS WITH VALVES ATTACHED TO END OF EACH DRIP TAPE LINE TO REGULATE/DIRECT FLOW OF WATER

City of Atlantic Beach



NEW, EFFICIENT EQUIPMENT INSTALLED TO PROVIDE BETTER TREATMENT AND ENERGY SAVINGS

AUTOMATED VALVES CONTROL AIR FLOW TO AERATION BASINS

REMOTE MONITORS MEASURE DISSOLVED OXYGEN TO DETERMINE BLOWER AND VALVE CONFIGURATION

PROGRAMMABLE BLOWER SETTINGS PROVIDE PLANT OPERATORS WITH FLEXIBILITY

OPERATORS RECEIVE TRAINING ON NEW EFFLUENT FILTERS

NEW 100 KILOWATT GENSET REPLACED OLD 300 KILOWATT GENSET

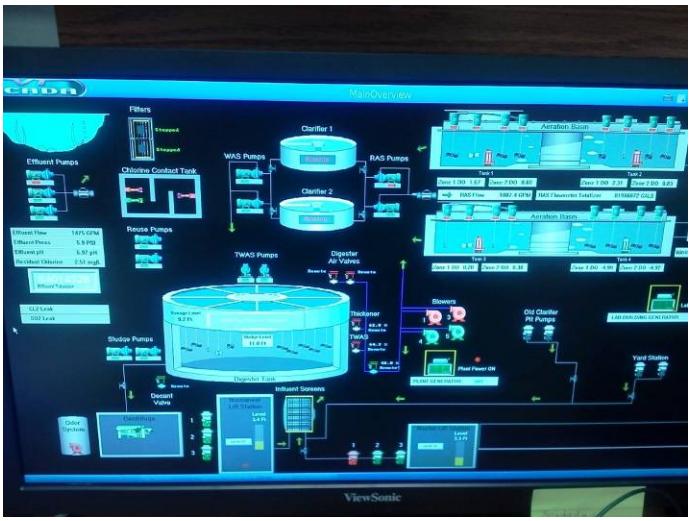
YARD LIGHTING REPLACED WITH ENERGY EFFICIENT LIGHTING

ON-SITE REUSE SYSTEM INSTALLED FOR WATER CONSERVATION

NEW CENTRIFUGE INSTALLED TO REPLACE INEFFICIENT SLUDGE DRYING BEDS

NEW SLUDGE TREATMENT BUILDING CONSTRUCTED

ODOR CONTROL EQUIPMENT INSTALLED



NEW SYSTEM ALLOWS OPERATORS TO MONITOR AND CONTROL ALL PLANT FUNCTIONS

TANKAGE AND EQUIPMENT AT WWTP #2 DEMOLISHED AND THE PLANT PROPERLY ABANDONED

SETTING ELECTRICAL BUILDING FOR NEW MASTER LIFT STATION AT WWTP #2

NEW MASTER LIFT STATION LOCATED AT FORMER WWTP #2 SITE

DIRECTIONAL DRILLING USED TO INSTALL MUCH OF THE FORCE MAIN FROM NEW MASTER LIFT STATION TO WWTP #1

City of Jacksonville

CITY OF JACKSONVILLE LID PROJECT AT THE KENNEDY COMMUNITY CENTER

CITY OF JACKSONVILLE LID PROJECT AT THE KENNEDY COMMUNITY CENTER

City of Jacksonville Beach

NEW SEQUENCING BATCH REACTOR TANK

NEW DECANT MECHANISM ON THE SEQUENCING BATCH REACTOR TANK

City of Palatka

CITY OF PALATKA WWTP UPGRADES

CITY OF PALATKA WWTP UPGRADES

FDOT

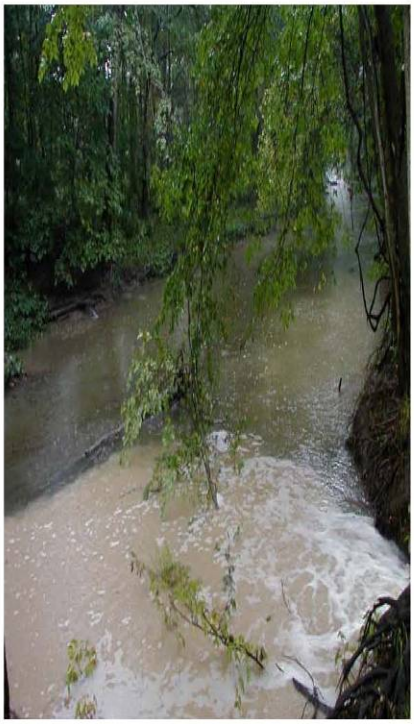
National Pollutant Discharge Elimination System Program

Be a responsible new neighbor on the State's Highway

- **If you see a spill (oil or any other hazardous material/substance/waste) on the highway or any adjacent property, please call the STATE WATCH OFFICE at 1-800-320-0519**
- **If you see an unusual connection or what seems to be an illicit connection to drainage ditches, or pollution problem, Please call the CITY OF JACKSONVILLE at 630-2489 or specifically -**
  Chemical Spills and Pollution: (904) 255-7171
  Water Pollution: (904) 255-7100
  Groundwater Contamination: (904) 255-7100
  Petroleum Storage Systems: (904) 255-7100
- **Disposal of products containing hazardous materials, paints, yard and pool chemicals, motor oil, and antifreeze should be taken to any County Household Hazardous Waste Center for proper disposal. If you have no idea of the location of the nearest Collection Center, Please call 1-800-741-4337 or 807-3300**
- **Be aware of the FLORIDA STORMWATER MANAGEMENT SYSTEMS. For more information, Please call the FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION at 807-3300; ST. JOHN'S RIVER WATER MANAGEMENT DISTRICT at 730-6270 or 1-800-451-7106**
- **Remember to sweep/vacuum trash and debris. Keep leaves, grass clippings and yard trimmings out of storm drains. Decomposing leaves in our creeks decrease oxygen levels and cause harmful effects on aquatic life. Do not wash fertilizers, pesticides, or driveway/sidewalk/parking lot sediments into storm drain.**

Multiple source pollution is everyone's problem. Let's reduce any environmental adverse impact and remember to put effort in preventing Pollution to our Creeks, Rivers, and Beaches in Duval County.

Multiple source pollutants degrade our Creeks, contaminate the Water and cause the reduction of in-stream biodiversity.



For additional information contact: Alan Obaigbena, P.E. Florida Department of Transportation at 1-800-749-2967 extn. 7064

FDOT EDUCATION INFORMATION – BE A RESPONSIBLE NEW NEIGHBOR ON THE STATE'S HIGHWAY

Pollution Prevention

Illicit Discharges/Illegal Connections/Dumping

- Illicit Connection means a non permitted man-made conveyance or drainage pipeline, graded channel, conduit, inlet or outlet, or condition of property whether on the surface or subsurface through which the discharge of any pollutant to the storm drain or conveyance system occurs or may occur.

- Illicit Discharge is a discharge that is not composed entirely of stormwater or not associated with the following discharge or flows:

  Water line flushing;
  Landscape irrigation, Lawn watering;
  Springs and Diverted stream flows;
  Uncontaminated ground water infiltration; Uncontaminated pumped groundwater;
  Discharges from potable water sources
  Foundation and Footing drains
  Air condition condensate;
  Dechlorinated Swimming Pool
  Flows from Riparian Habits and Wetlands
  Irrigation water;
  Uncontaminated Roof Drain;
  Rising Ground water
  Residential Car Washing;
  Street Wash Waters;
  Emergency Fire Fighting
  Water from crawl space
  Reclaimed Water Line Flushing per 62-610 FAC

WHY ARE ILLICIT DISCHARGE DETECTION AND ELIMINATION EFFORTS NECESSARY?

Illicit Discharges enter the stormwater drain or conveyance system through either direct or indirect connections. The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown to be high to significantly degrade receiving water quality and threaten aquatic ecosystem, wildlife, and human health.

WHY IS ILLEGAL DUMPING DETRIMENTAL?

Illegal dumping can also have a detrimental effect on surface water and ground water quality. Improper disposal of sewage from recreational practices such as boating or camping is an example of such dumping. Improper disposal of household and automotive products can also significantly impact surface water and groundwater.

PLEASE REPORT ANY ILLEGAL DUMPING AND POTENTIAL ILLICIT DISCHARGES TO THE DEPARTMENT, FOR INVESTIGATION.

Multiple source pollutants degrade our creeks, contaminating the water and reducing the in-stream biodiversity.

Please report any potential Illicit Discharges or Dumping to:

Alan Obaigbena, P.E.

Florida Department of Transportation

1-800-749-2967 extn. 7064

FDOT EDUCATION INFORMATION – ILLICIT DISCHARGES/ILLEGAL CONNECTIONS/DUMPING

Pollution Prevention

Let's Work Together to Reduce Multiple Source Pollution!

- Properly dispose of products containing hazardous materials. Discarded paints, yard and pool chemicals, motor oil, and antifreeze should be taken to any County Household Hazardous Waste Center for proper disposal.
- Use yard chemicals and fertilizers sparingly. Fertilizer runoff from your yard can pollute our surface waters, causing degradation and increased growth of algae.
- Use leaves and grass clippings for mulch. They add nutrients to the soil and reduce the need for fertilizer and water.
- Plant native trees and plants. They require less water and fertilizer.
- Keep leaves and yard trimmings out of storm drains. Decomposing leaves in our creeks decrease oxygen levels, harming aquatic life.
- Retain native vegetation as a buffer to ditches and road-side swales. It will capture pollutants before they reach our creeks.
- Wash your car on a grassy area where the wash water will slowly infiltrate instead of the driveway, where soapy water can run directly into storm drains and into our creeks.
- Don't dump waste or litter on the ground. These materials find their way to our creeks through the stormwater system.
- Pick up pet waste. Pet waste contains nitrogen, phosphorus, and bacteria that can contaminate our creeks.
- Multiple source pollution is everyone's problem. Let's reduce our environmental impact.

Multiple source pollutants degrade our creeks, contaminating the water and reducing the in-stream biodiversity.

For more information contact:

Alan Obaigbena, P.E.

Florida Department of Transportation

1-800-749-2967 extn. 7064

FDOT EDUCATION INFORMATION – LET'S WORK TOGETHER TO REDUCE MULTIPLE SOURCE POLLUTION

Pollution Prevention

Best Management Practices (BMPs) for Erosion and Sedimentation Control at Construction Sites

The use of best management practices (BMPs) for sedimentation and erosion control for all excavations are now required. BMPs must provide equal or better protection than those currently compiled by the Florida Department of Environmental Protection.

Did you know that uncontrolled erosion run-off from a construction site will most likely end up in a creek or lake? Eroding construction sites are a leading cause of water quality problems in Florida. Turbid run-off from construction sites enters nearby storm sewer systems that discharge directly to water bodies. This cloudy water can:

- smother vegetation and other in-stream habitats,
- prevent light penetration within the water body,
- clog gills of fish and other aquatic organisms, and
- transport toxic metals and other compounds to our surface waters.

Erosion control is easy and can be relatively inexpensive. When developing your erosion control plan remember to apply the principals of erosion and sediment control:

- Fit development to the terrain
- Install protective measures before any clearing or earth moving
- Time grading and construction to minimize soil exposure
- Retain existing vegetation wherever possible
- Vegetate and mulch denuded areas
- Divert runoff away from denuded areas
- Minimize length and steepness of slopes
- Keep runoff velocities low
- Prepare conveyances and outlets to handle increased flows
- Trap sediment on site
- Inspect and maintain control measures

A properly installed silt fence can prevent sediments from migrating off site.

Did You Know???

For every acre under construction, about a dump truck and a half of soil washes into the storm system and into a nearby stream/Creek unless the contractor uses proper erosion control.

FDOT EDUCATION INFORMATION – BMPS FOR EROSION AND SEDIMENT CONTROL AT CONSTRUCTION SITES

TIPS FOR COMMONLY USED BMPs

Construction Entrances
- Remove vegetation, roots, and other material from entrance.
- Lay down geotextile then 6 inches of FDOT No. 1 Coarse Aggregate on top.
- The length of entrance must be at least 50 feet.
- Maintain as needed to prevent tracking or flow of mud onto public rights-of-way.

Silt Fences
- Install within 24 hours of land disturbance.
- Bury 8 inches of fabric in trench.
- Leave no gaps (overlap or twist ends together).
- **Maintain and repair until a ground cover is established.**

Soil Piles
- Locate away from downslope streets, driveways, streams, wetlands, lakes, etc.
- Keep covered with plastic sheeting.
- Carefully wet down exposed soil to keep dust and erosion to a minimum.

Storm Sewer Inlet Protection
- Protect nearby storm sewer inlets with straw or synthetic bale, synthetic fabric, filter sock, or other measure.
- Inspect, repair, and replace as needed, and remove sediment deposits after every storm.

Sediment Cleanup
- Remove soil tracked onto the street after each workday.
- Cleanup all soil that has washed off site following a storm.

Preserving Existing Vegetation
- Preserve existing trees, shrubs, and other vegetation whenever possible.
- To prevent root damage, do not grade, place soil piles, or park vehicles near trees marked for preservation.
- Place plastic mesh around trees extending to the drip line to protect the area below their branches.

Revegetation
- Seed, sod, or mulch bare soil as soon as possible. **Vegetation is the most effective way to control erosion.**

Seeding and Mulching
- Spread and compact 2 – 4 inches topsoil.
- Seed with appropriate mix for site and season.
- Rake lightly to cover seed with ¼ inch of soil.
- Mulch with anchored straw.
- Gently water every other day until grass is 2 inches tall.

Sodding
- Leave or replace 4 inches of topsoil.
- Lightly water soil before laying sod.
- On slopes, lay sod starting at the bottom and work toward the top, laying in a brickwork pattern. Peg each piece down in several places.
- Use sod from sources certified by the Division of Plant Industry as "noxious weed-free".
- Initial watering should wet soil 6 inches deep. Then water lightly every other day to keep soil moist.

For additional information regarding erosion and sediment control, refer to the "Florida Development Manual: A Guide to Sound Land and Water Management" and the FDEP "Stormwater, Erosion, and Sedimentation Control Inspector Manual".

For more information contact:

Alan Obaigbena, P.E

Florida Department of Transportation

800-749-2967 extn 7064

FDOT EDUCATION INFORMATION – TIPS FOR COMMONLY USED BMPS