# *2018 Statewide Annual Report on Total Maximum Daily Loads, Basin Management Action Plans, Minimum Flows or Minimum Water Levels, and Recovery or Prevention Strategies*

**Florida Department of Environmental Protection**

**Division of Environmental Assessment and Restoration**
**and**
**Office of Water Policy**

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# 2018 Statewide Annual Report: A Summary

## Introduction

Florida has wide-ranging efforts in place to protect and restore the water quality or minimum flows and levels of the state's waters. As required by Section 403.0675, Florida Statutes (F.S.), this report updates the status of protection and restoration actions through total maximum daily loads (TMDLs), basin management action plans (BMAPs), minimum flow or minimum water levels (MFLs), and recovery or prevention strategies.

The Florida Department of Environmental Protection (DEP) is pleased to present this year's statewide annual report in a dynamic and interactive Story Map format. This Story Map is best viewed using Microsoft Edge or Mozilla Firefox 64-bit. Alternatively, we have prepared stand-alone versions of the executive summary and the full report that can be downloaded and viewed offline. These comply with the federal Americans with Disabilities Act.

We invite you to explore the topics of the most interest to you through the executive summary and in each section of this report. Data used to complete this report are available for download through the links in the Contacts and Data section.

## Total Maximum Daily Loads

A TMDL is a water quality restoration goal that establishes the maximum amount of a pollutant that a waterbody can assimilate without causing exceedances of water quality standards. As such, TMDL development is an important step toward restoring state waters to their designated uses.

This report provides details and information for 426 TMDLs adopted as of December 31, 2018. **Figures 1, 2,** and **3** show the TMDLs adopted by waterbody type, parameter, and location and status.

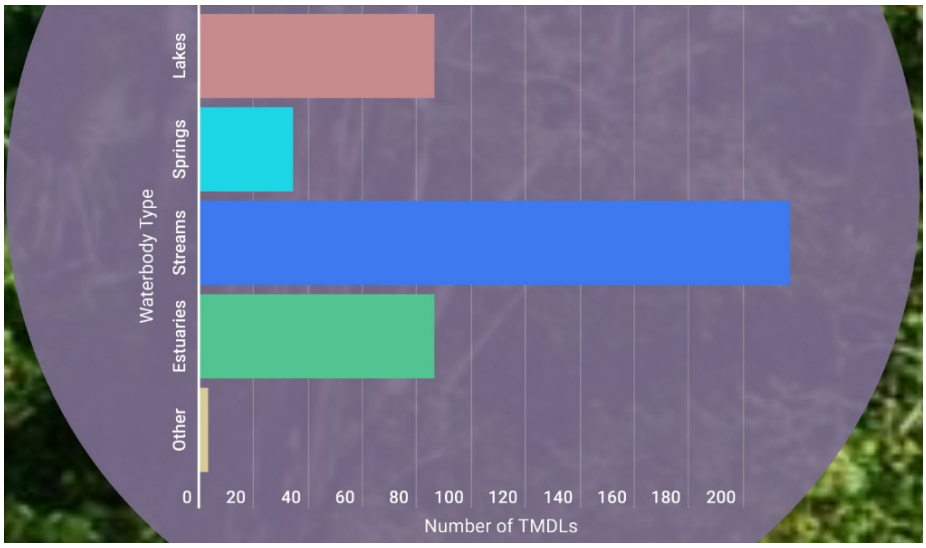



**Figure 1. Adopted TMDLs by waterbody type**

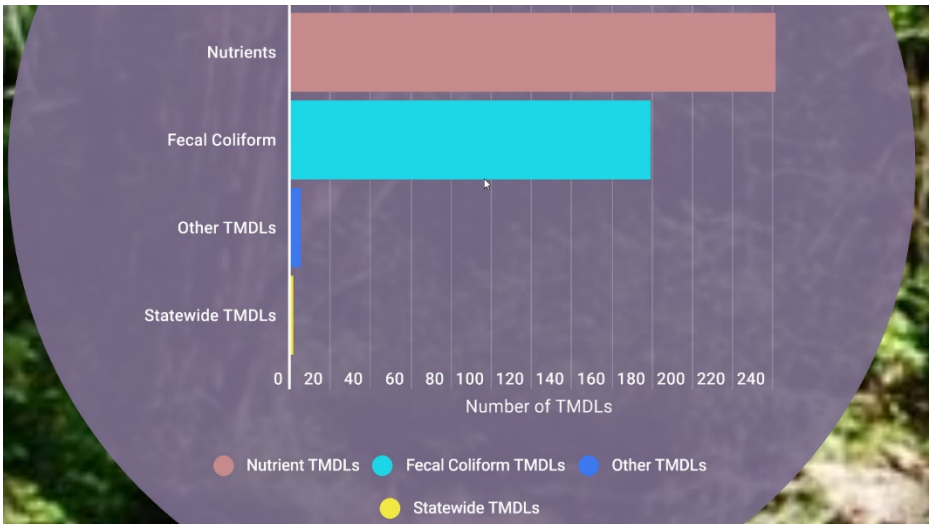



**Figure 2. Adopted TMDLs by parameter**

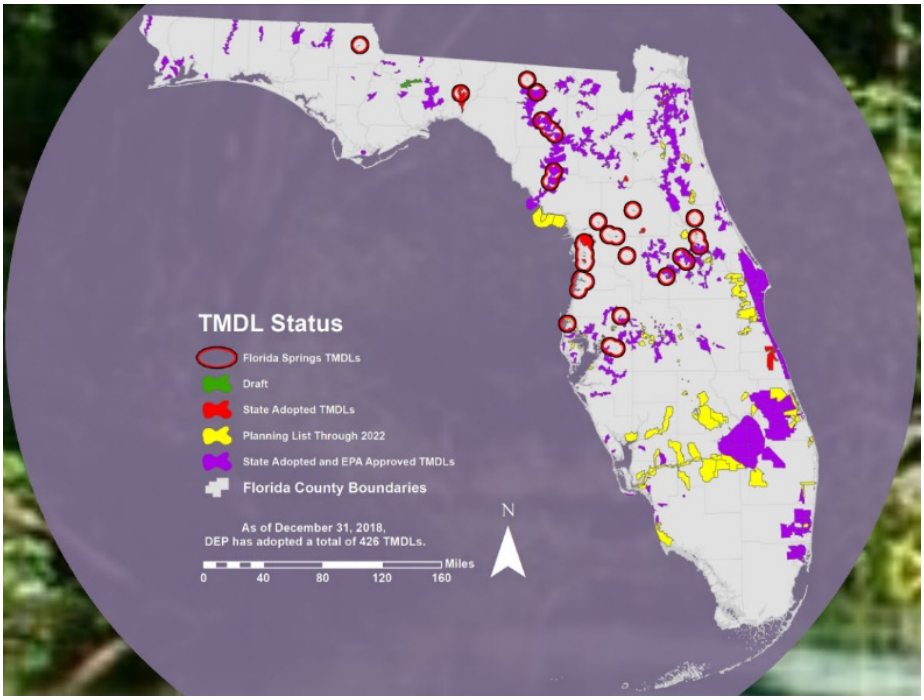



**Figure 3. Map of adopted TMDLs**

## Basin Management Action Plans

A BMAP is the "blueprint" for restoring impaired waters by reducing pollutants to meet the allowable loadings established in a TMDL. BMAPs contain a comprehensive set of strategies, such as permit limits on wastewater facilities, urban and agricultural best management practices (BMPs), and conservation programs designed to implement the pollutant reductions established by a TMDL.

This report provides details and information for 24 BMAPs adopted as of December 31, 2018. **Figures 4** and **5** show the BMAPs adopted by waterbody type and location, respectively.

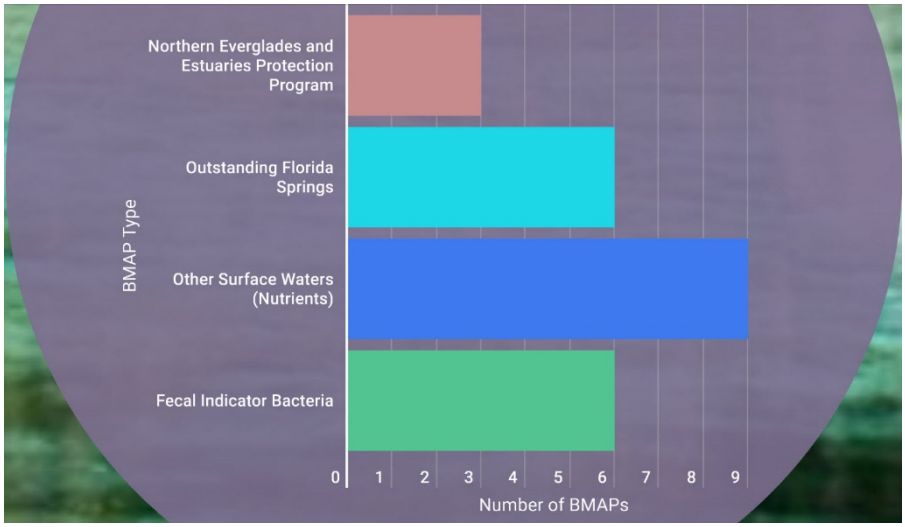



**Figure 4. Adopted BMAPs by type**

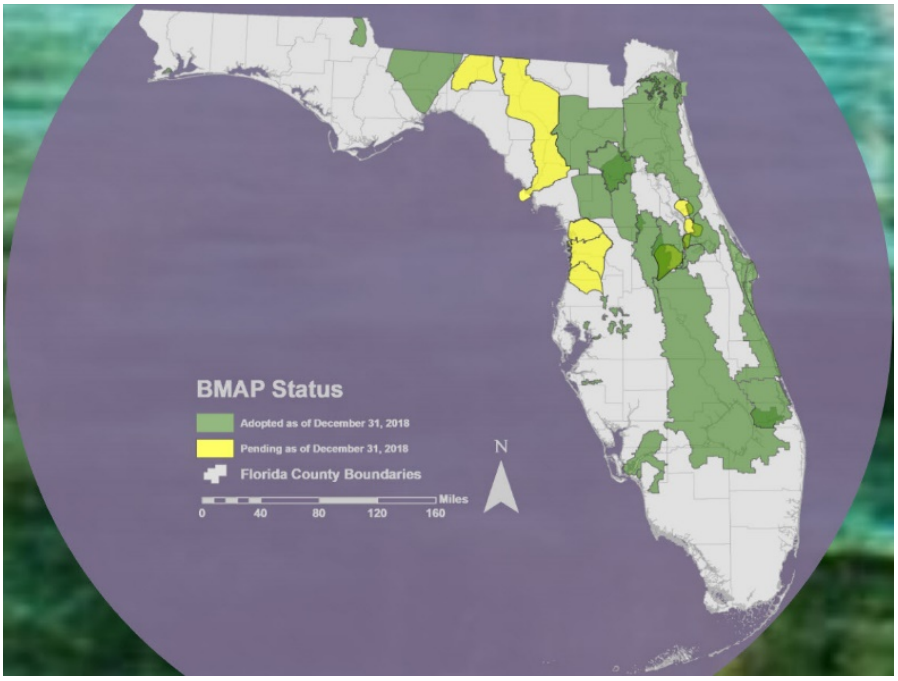



**Figure 5. Map of adopted BMAPS**

## Minimum Flows and Minimum Water Levels

MFLs are the point at which further water withdrawals would be significantly harmful to the water resources or ecology of an area.

As a part of fulfilling their mission and statutory responsibilities, the water management districts establish MFLs for priority waterbodies within their boundaries. MFLs are used both in planning for future water uses and in regulating water withdrawals.

As of March 1, 2019, 422 MFLs have been adopted statewide. **Figures 6** and **7** show the MFLs by waterbody type and location, respectively.

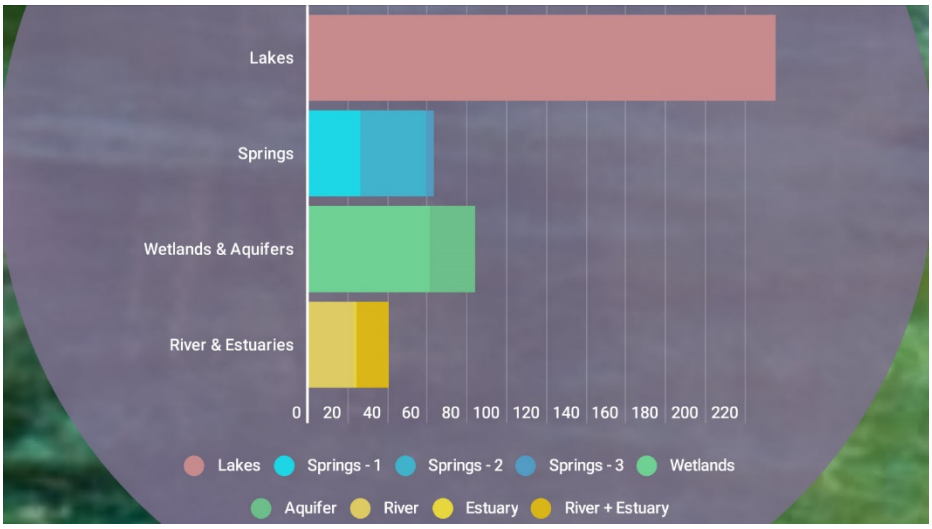



**Figure 6. Adopted MFLs by waterbody type**

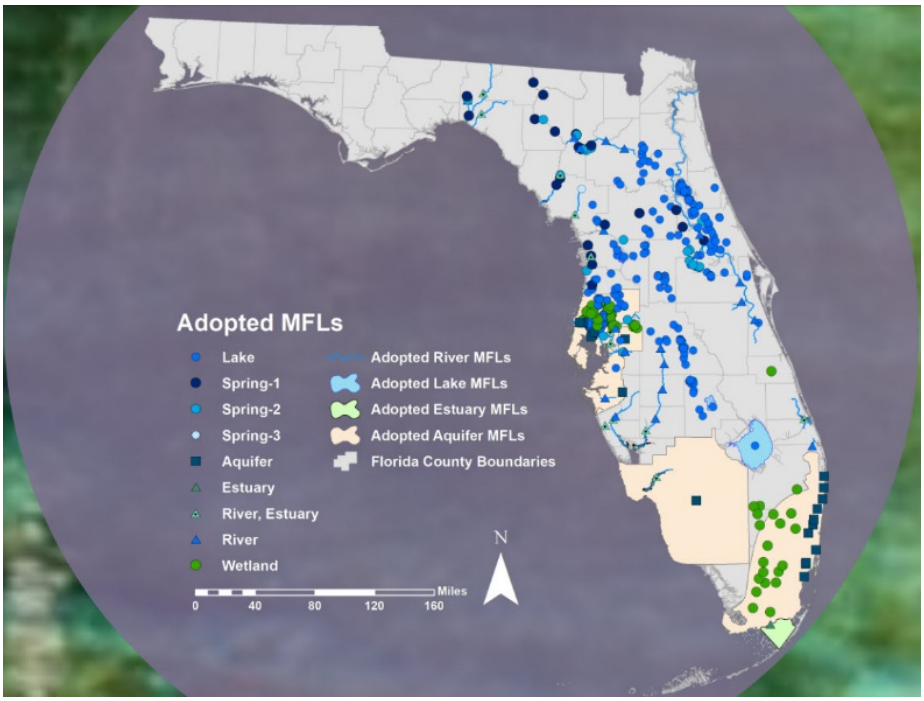



**Figure 7. Map of adopted MFLs**

## Recovery and Prevention Strategies

For waterbodies that are below their MFLs, or are projected to fall below their MFLs within 20 years, the water management districts are required to implement a recovery or prevention strategy to ensure the MFLs are maintained over the long term.

Of the 422 MFLs adopted to date, 135 are identified as being in either recovery or prevention. Nine strategies have been approved to address these MFLs.

**Figures 8** and **9** show the status of the adopted MFLs and of the projects designed to achieve them, respectively.

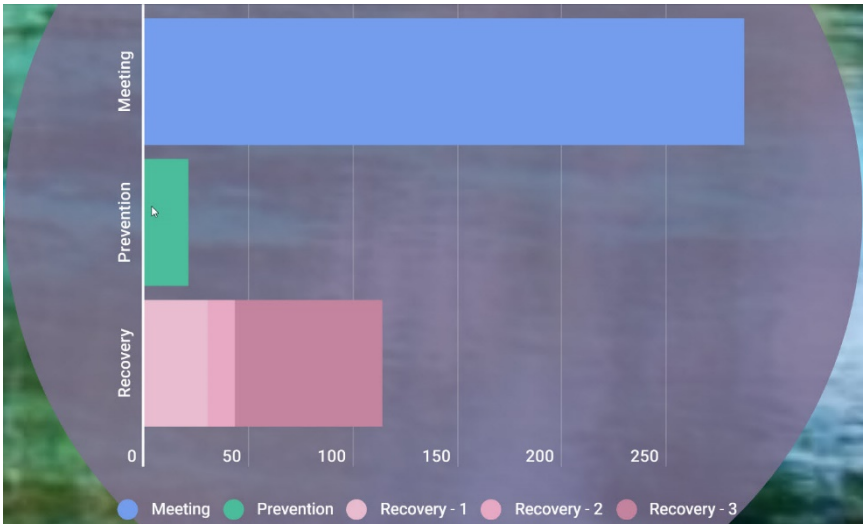



**Figure 8. Adopted MFLs by status**

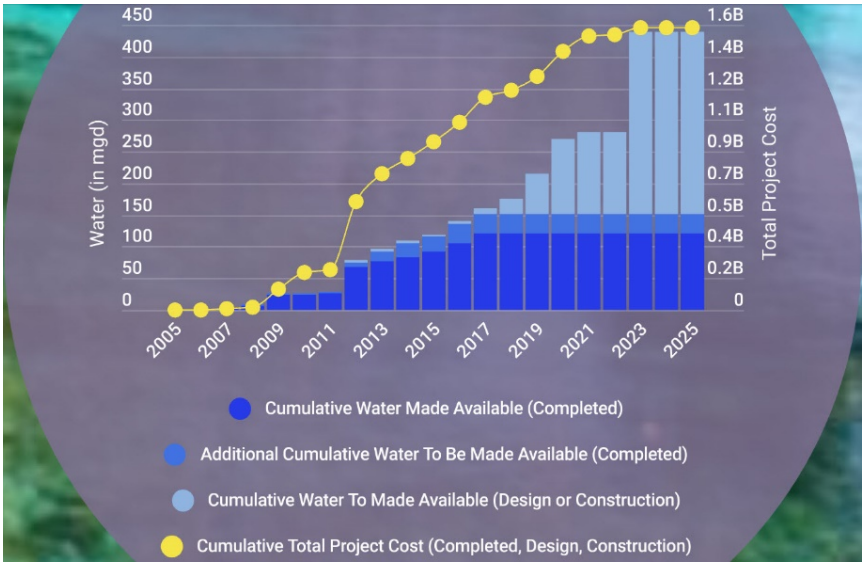



**Figure 9. Status of projects designed to achieve the MFLs**

# Total Maximum Daily Loads

DEP monitors the quality of waterbodies across the state, assessing their condition against the applicable water quality criteria and listing those that exceed the criteria as "impaired" for one or more pollutants. Florida Statutes require TMDLs to be developed for the waterbody or waterbody segments placed on DEP's Verified List of Impaired Waters. A TMDL is a water quality restoration goal that establishes the maximum amount of a pollutant that a waterbody can assimilate without causing exceedances of water quality standards. As such, TMDL development is an important step toward restoring state waters to their designated uses. BMAPs and permits issued for point sources often rely upon TMDLs as the basis for their water quality goals. In Florida, DEP adopts nutrient TMDLs as site-specific water quality criteria, following the procedures outlined in the Implementation of Florida's Numeric Nutrient Standards (2013). This approach aligns TMDLs and water quality standards, so that multiple conflicting criteria do not apply to a single waterbody. The DEP TMDL Program website contains more detailed information.

In 2014, DEP provided the U.S. Environmental Protection Agency (EPA) with a priority framework document that contained a long-term plan for addressing how to assess waters and develop TMDLs under the Florida Statutes and Section 303(d) of the federal Clean Water Act (CWA). The document focused on Florida's transition from a pace-driven TMDL development schedule to a new approach based on recovery potential screening. In 2015, DEP updated the approach, expanding the planning horizon for TMDL development through 2022. The Priority Framework Document detailing the approach can be found online.

One important change from previous TMDL priority-setting efforts is a new focus on waters where the TMDL and BMAP approach is the best of the available options for restoration. The long-term plan identifies those impaired waters where DEP expects to develop a site-specific TMDL. The current list of waters prioritized for TMDLs is available online. It includes the waterbodies for which TMDLs will be developed between now and 2022.

As of December 31, 2018, DEP has adopted a total of 426 TMDLs. Of these, 241 were developed for dissolved oxygen (DO), nutrients, and/or un-ionized ammonia; 179 for bacteria; and 5 for other parameters (iron, lead, and turbidity). In addition, the state has adopted a statewide TMDL for mercury, based on fish consumption advisories, affecting over 1,100 waterbody segments. These TMDLs represent areas covering many of the largest watersheds in

the state. DEP has many more TMDLs in various stages of development. **Figure 10** shows the locations and status of adopted TMDLs in Florida.

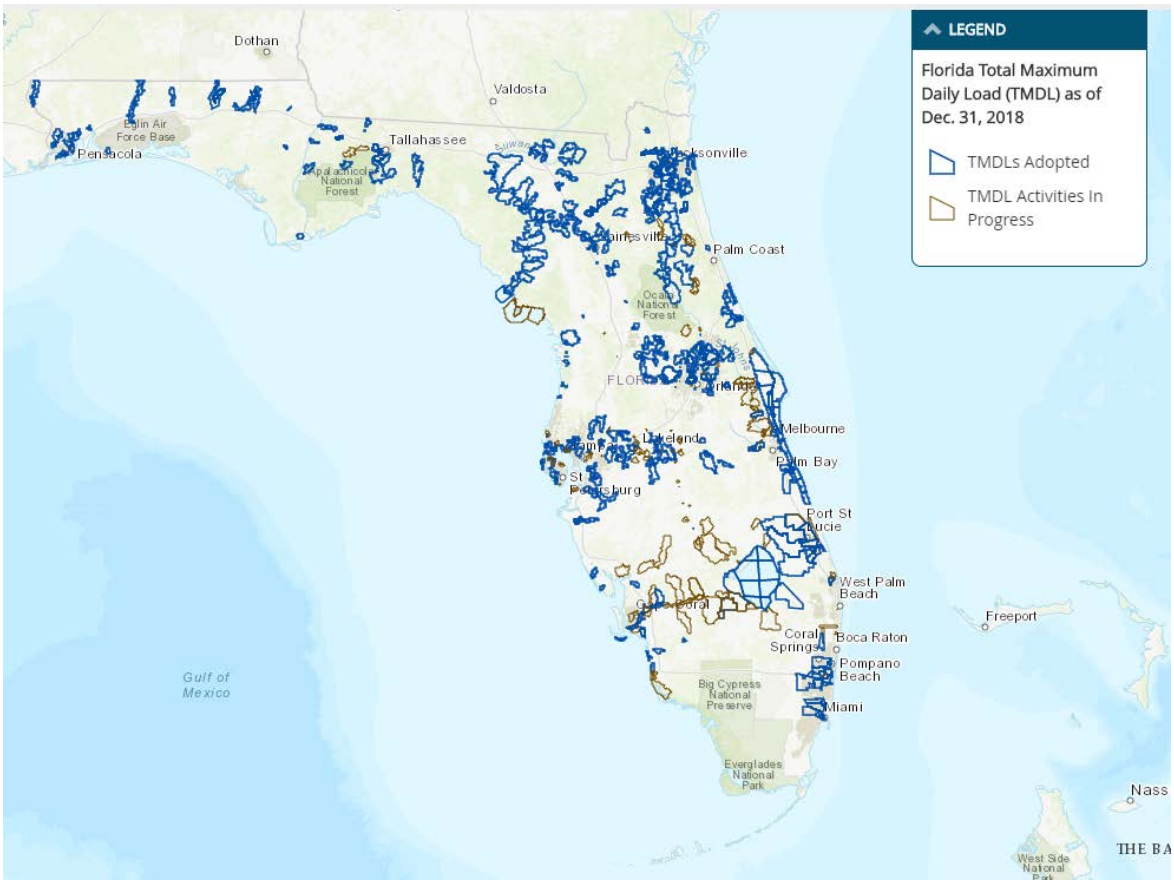



**Figure 10. Locations of adopted TMDLs by status as of December 31, 2018**

# Basin Management Action Plans

A BMAP is a blueprint for restoring impaired waters by reducing pollutants to meet the allowable loadings established in a TMDL. BMAPs contain a comprehensive set of strategies, such as permit limits on wastewater facilities, urban and agricultural best management practices, and conservation programs designed to implement pollutant reductions established by a TMDL. These broad-based plans are developed with local stakeholders and rely on local input and commitment for development and successful implementation. BMAPs are adopted by DEP Secretarial Order and are legally enforceable. This report provides details and information for 24 BMAPs adopted **as of December 31, 2018**.

## How to Use This Report

The management actions listed in the BMAPs comprise local projects proposed and committed to by counties, municipalities, special districts, private industrial facilities, wastewater utilities, commercial agricultural operations, state agencies, and other stakeholders. Throughout 2018, DEP contacted stakeholders in all BMAP areas to request information on the **status of projects through December 31, 2018**. DEP provided stakeholders with tables to be updated with additional information about existing projects and any new or planned projects. The information is provided in tables throughout this report. In some cases, the information provided by the entity was incomplete, or no update was provided, or the project was completed some time ago and the entity could not easily obtain records. As local entities provide additional details and new management actions, the information will be added to the project database for inclusion in future reports.

The **terms** used throughout the project tables are defined as follows:

- **Not provided**: Information was requested by DEP but was not provided by the lead entity.
- **TBD**: To be determined. Information is not currently available but will be provided by the lead entity when it is available.
- **N/A**: Not applicable. Information for that category is not relevant to that project.
- **0**: Zero. The numeric value for that category is zero.

The **project status** designation in the project tables for each BMAP is standardized into the following four categories:

- **Canceled**: Project or activity that was planned but will no longer take place. This includes the cessation of ongoing activities.
- **Completed**: Project, activity, or task that is finished. This includes fully implemented activities (i.e., ongoing activities) that must continue indefinitely to retain assigned credits (such as street sweeping, best management practice clean

out, catch basin clean out, public education, fertilizer cessation/reduction, and vegetation harvesting).

- **Planned**: Project or activity that is conceptual or proposed.
- **Underway**: Project or activity that has commenced or initiated but is not completed and is not yet reducing nutrient loads from the treated area.

## Additional Items of Note

- While the Florida Department of Transportation submits project information, there is no specific cost breakdown for water quality improvement projects, which are embedded into and implemented as part of larger transportation projects adopted in its Five-Year Work Program, pursuant to Section 339.135, F.S.
- In BMAPs statewide, owner-implemented best management practices or water quality monitoring are required for agricultural operations to show compliance with water quality standards. In some BMAPs, load reductions associated with agricultural best management practices have been estimated and are assigned a BMAP project number in the project table for that BMAP. Agricultural enrollment information is provided by the Florida Department of Agriculture and Consumer Services as part of a statewide Implementation Report, submitted annually to the Governor and Legislature. The report includes more details on the status of implementation of the agricultural nonpoint source best management practices, and summarizes survey responses, response rates, site inspections, and other methods used to verify the implementation of and compliance with best management practices pursuant to BMAPs.
- The projects and management strategies are ranked with a priority of high, medium, or low based primarily on need for funding. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the projects to be completed. A high priority was assigned to projects listed as "planned," as well as certain "completed" projects that are ongoing each year (any project with one of these project types: "street sweeping," "catch basin inserts/inlet filter clean out," "public education efforts," "fertilizer cessation," "fertilizer reduction," or "aquatic vegetation harvesting"), and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.
- The project reductions progress charts included in the nutrient BMAP sections represent the reductions associated with completed projects and are grouped by the year the projects were completed.

**Table 1** summarizes the statewide total nitrogen (TN) and total phosphorus (TP) reductions and the annual and total costs for projects that are completed, planned, and underway.

**Table 1. Statewide summary of BMAP reductions**

| Project Status | Sum of TN Reductions (pounds per year [lbs/yr]) | Sum of TP Reductions (lbs/yr) | Sum of Cost Annual Operations and Maintenance | Sum of Cost Estimate |
|---|---|---|---|---|
| **Completed** | 8,999,425 | 893,923 | $80,802,827 | $4,449,715,323 |
| **Planned** | 544,737 | 17,116 | $813,031 | $418,604,069 |
| **Underway** | 971,211 | 92,968 | $4,701,268 | $2,525,711,105 |

## Northern Everglades and Estuaries Protection Program BMAPs

### *Introduction*

In 2007, the Florida Legislature created the Northern Everglades and Estuaries Protection Program, which expanded the Lake Okeechobee Protection Act (created in 2000 and found in Section 373.4595, F.S.) to include the Caloosahatchee and St. Lucie Rivers and Estuaries. During the 2016 session, the Florida Legislature amended the Northern Everglades and Estuaries Protection Program (Section 373.4595, F.S.) to strengthen provisions for implementing the BMAPs and further clarify the roles and responsibilities, coordination, implementation, and reporting efforts among the three Coordinating Agencies, comprising the South Florida Water Management District, DEP, and Florida Department of Agriculture and Consumer Services. The primary goal of the program is to restore and protect the state's surface water resources by addressing the quality, quantity, timing, and distribution of water to the natural system.

Section 373.4595, F.S., requires the Northern Everglades and Estuaries Protection Program BMAPs to include milestones for implementation and water quality improvement, and associated water quality monitoring components sufficient to evaluate whether reasonable progress is being achieved over time. Implementation schedules must include 5-, 10-, and 15-year measurable milestones and targets to achieve the TMDLs addressed by the BMAPs no later than 20 years after BMAP adoption. The initial implementation schedule is used to provide guidance for planning and funding purposes and is exempt from Chapter 120, F.S. If restoration within 20 years is not practicable, the schedule must explain the constraints that prevent the achievement of the TMDLs within 20 years and additional 5-year milestones, as necessary.

The map in **Figure 11** shows the Northern Everglades and Estuaries Protection Program BMAP locations, and the chart in **Figure 12** illustrates the project status in the Caloosahatchee, Lake Okeechobee, and St. Lucie Basins. The project tables in the BMAP list the implementation status of projects as of December 31, 2018. The tables list the impairment reduction, in lbs/yr, attributable to each individual project. These projects were submitted to provide reasonable assurance to DEP that each entity has a plan on how to meet its nutrient reduction obligation, as assigned. However, the list of projects is meant to be flexible enough to allow for changes that may occur over time. During the annual review of BMAP implementation efforts, project-specific information may be revised and updated, resulting in changes to the estimated reductions for those projects. The revisions may increase or decrease estimated reductions, and DEP will work with stakeholders to address revisions as they are identified. For the Northern Everglades

and Estuaries Protection Program BMAPs, DEP works in collaboration with the South Florida, St. Johns River, and Southwest Florida Water Management Districts.

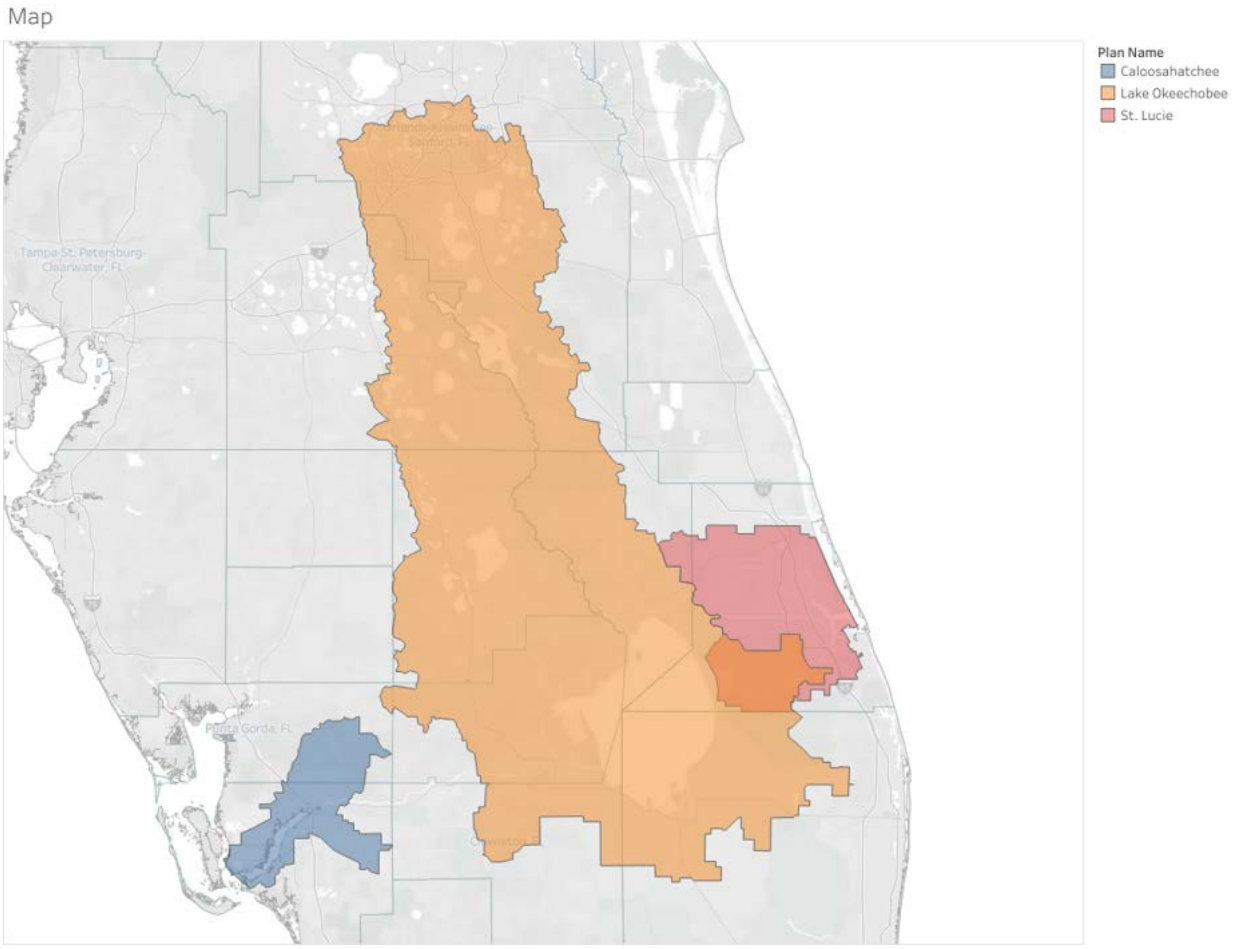



**Figure 11. Northern Everglades and Estuaries Program BMAP locations**

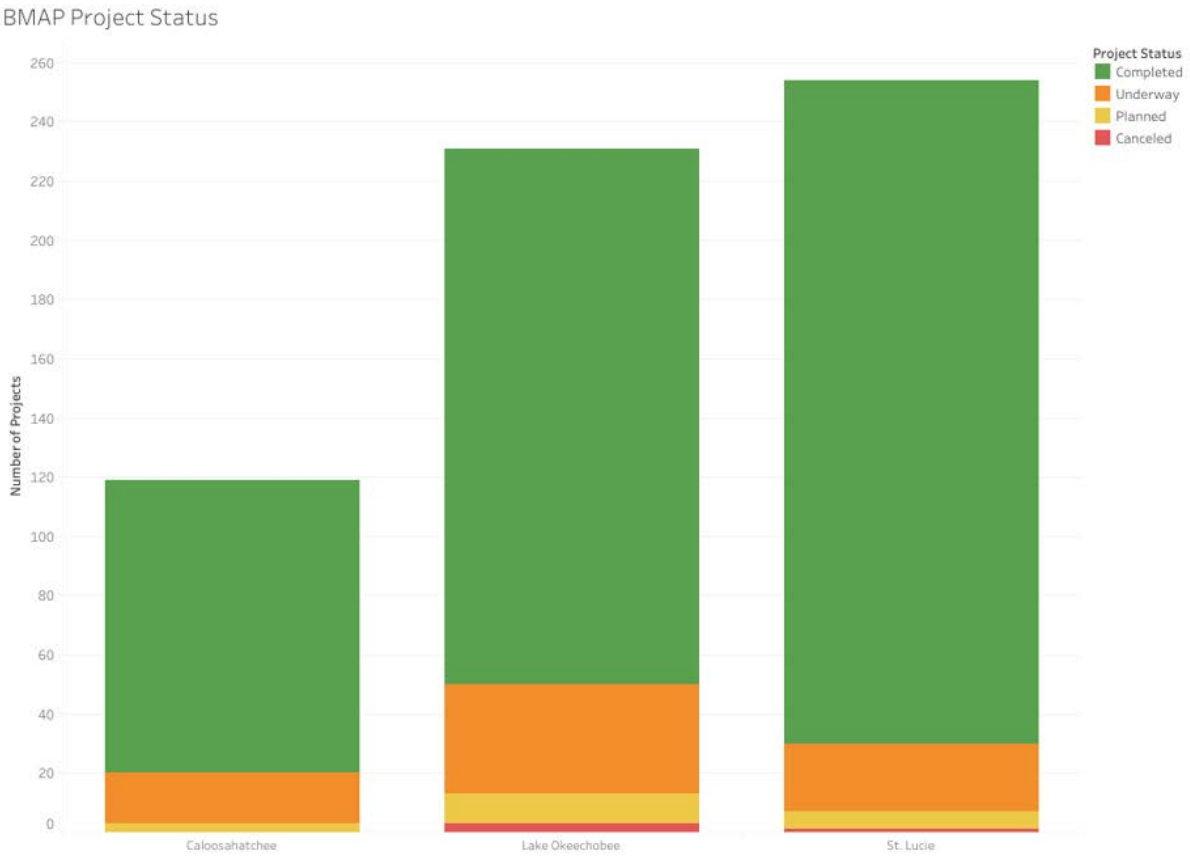



**Figure 12. Northern Everglades and Estuaries Program project status chart**

## *Caloosahatchee Estuary BMAP*

### BACKGROUND

The Caloosahatchee Estuary Basin is the 277,408-acre watershed draining into the tidal portion of the Caloosahatchee system, excluding the watersheds that contribute flows to the estuary at S-79.

DEP identified the Caloosahatchee Estuary as impaired for DO and nutrients. In August 2009, DEP adopted the Caloosahatchee Estuary TMDL, which established a reduction target for TN in the Caloosahatchee Estuary, downstream of the Franklin Lock and Dam (S-79), to restore chlorophyll *a* levels. The Caloosahatchee Estuary BMAP was adopted in November 2012 to implement the TN TMDL.

The Caloosahatchee Estuary BMAP is governed by Section 373.4595, F.S., as part of the Northern Everglades and Estuaries Protection Program. The primary goal of this program is to restore and protect the state's surface water resources by addressing the quality, quantity, timing, and distribution of water to the natural system. The statutory milestones for implementation and water quality improvement, and the associated water quality monitoring component, were

included in the 5-Year Review for the Caloosahatchee Estuary BMAP, completed in November 2017, and will be adopted into the next revision of the BMAP no later than January 2020.

**STATUS OF PROJECTS**

Through December 31, 2018, 99 projects were completed. An additional 20 projects that are underway or planned were identified to add to the BMAP. The projects completed to date are estimated to achieve total reductions of 300,517 lbs/yr of TN, or 77 % of the reductions needed to meet the portion of the TN TMDL allocated to the Caloosahatchee Estuary Basin (**Figure 13**).

Caloosahatchee Story Map

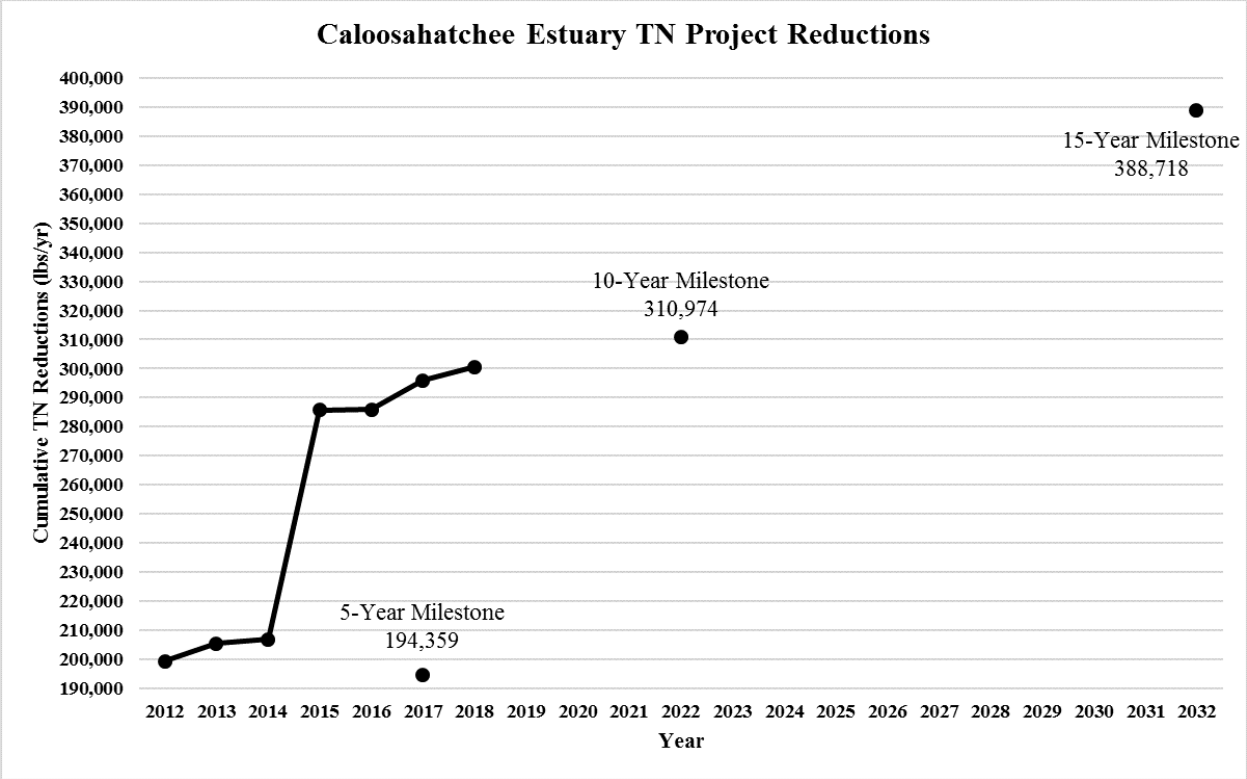



**Figure 13. Caloosahatchee TN project reductions progress**

## *Lake Okeechobee BMAP*

**BACKGROUND**

Lake Okeechobee, the largest lake in the southeastern United States, is a shallow, eutrophic lake with an average depth of 9 feet. The Lake Okeechobee Watershed covers more than 2.9 million acres and consists of 9 sub-watersheds. In 2001, DEP adopted a TP TMDL for Lake Okeechobee after 9 lake segments were identified as impaired by TP. The TMDL is a TP load to Lake Okeechobee of 308,647 lbs/yr (140 metric tons per year), of which 77,162 lbs/yr fall directly on the lake through atmospheric deposition. The remaining 231,556 lbs/yr of TP are allocated to the entire Lake Okeechobee Watershed. The Lake Okeechobee BMAP was adopted in December 2014 to implement the TP TMDL.

The Lake Okeechobee BMAP is governed by Paragraph 373.4595, F.S., as part of the Northern Everglades and Estuaries Protection Program. The primary goal of this program is to restore and protect the state's surface water resources by addressing the quality, quantity, timing, and distribution of water to the natural system. The statutory milestones for implementation and water quality improvement, and the associated water quality monitoring component, will be included in the 5-Year Review for the Lake Okeechobee BMAP, due to the Legislature and Governor in December 2019, and will be adopted into the next revision of the BMAP no later than January 2020.

**STATUS OF PROJECTS**

Load reductions are currently considered only for projects located in the 6 northern sub-watersheds. Through December 31, 2018, 181 projects were completed in the northern sub-watersheds. An additional 47 projects that are underway or planned were identified to add to the BMAP. The projects completed to date in the northern sub-watersheds are estimated to achieve total reductions of 169,743 lbs/yr of TP, or 22 % of the reductions needed to meet the TP TMDL (**Figure 14**).

The Coordinating Agencies (DEP, South Florida Water Management District, and Florida Department of Agriculture and Consumer Services) are working on additional projects that will also achieve nutrient reductions. These projects are listed with identifiers beginning with "CA-," and the reductions shown are coarse estimates developed using the best available information. Projects are also listed that are coordinated by the South Florida Water Management District or Florida Department of Agriculture and Consumer Services in the Lake Okeechobee Watershed. Many of these projects depend on annual legislative funding. For South Florida Water Management District dispersed water management projects, the completion date is the construction completion date, at which time the project is considered complete and operating. Florida Department of Agriculture and Consumer Services projects include lands enrolled in the Best Management Practices Program, hybrid wetland treatment technology, and floating aquatic vegetation treatment funded through the agency. New projects will continue to be developed and identified in conjunction with local stakeholders, and several Coordinating Agency initiatives are underway to plan for projects and gather additional data.

Lake Okeechobee Story Map

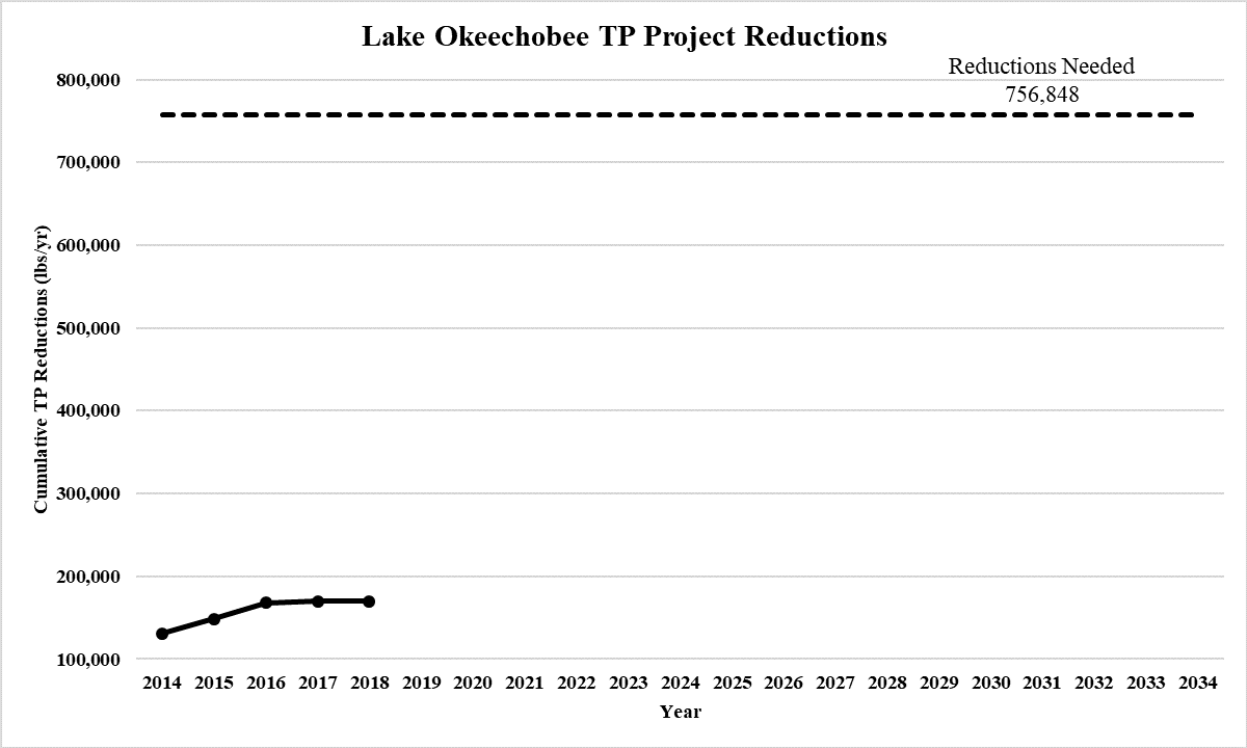



**Figure 14. Lake Okeechobee TP project reductions progress**

## *St. Lucie River and Estuary BMAP*

### BACKGROUND

The St. Lucie River and Estuary Basin is a 514,649-acre watershed located in southeast Florida in Martin County, St. Lucie County, and Okeechobee County. It drains into the St. Lucie Estuary, a major tributary of the Southern Indian River Lagoon. Water quality in the St. Lucie Estuary is affected by freshwater runoff from agricultural and urban sources in the watershed and discharges from Lake Okeechobee.

DEP identified the St. Lucie River and Estuary as impaired because of excessive amounts of TP, TN, and biochemical oxygen demand (BOD). In March 2009, DEP adopted the nutrient and DO TMDL for the St. Lucie Basin. The St. Lucie River and Estuary BMAP was adopted in June 2013 to implement the TN and TP TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 224 projects were completed. An additional 29 projects that are underway or planned were added to the BMAP. The projects completed to date are estimated to achieve total reductions of 543,634 lbs/yr of TN, or 52 % of the reductions needed to meet the TN TMDL, and 142,996 lbs/yr of TP, or 35 % of the reductions needed to meet the TP TMDL. (**Figures 15** and **16**, respectively).

The St. Lucie BMAP is governed by Paragraph 373.4595, F.S., as a part of the Northern Everglades and Estuaries Protection Program. The primary goal of this program is to restore and protect the state's surface water resources by addressing the quality, quantity, timing, and

distribution of water to the natural system. The statutory milestones for implementation and water quality improvement, and the associated water quality monitoring component, were included in the 5-Year Review for the St. Lucie BMAP, completed in June 2018, and will be adopted into the next revision of the BMAP.

St. Lucie Story Map

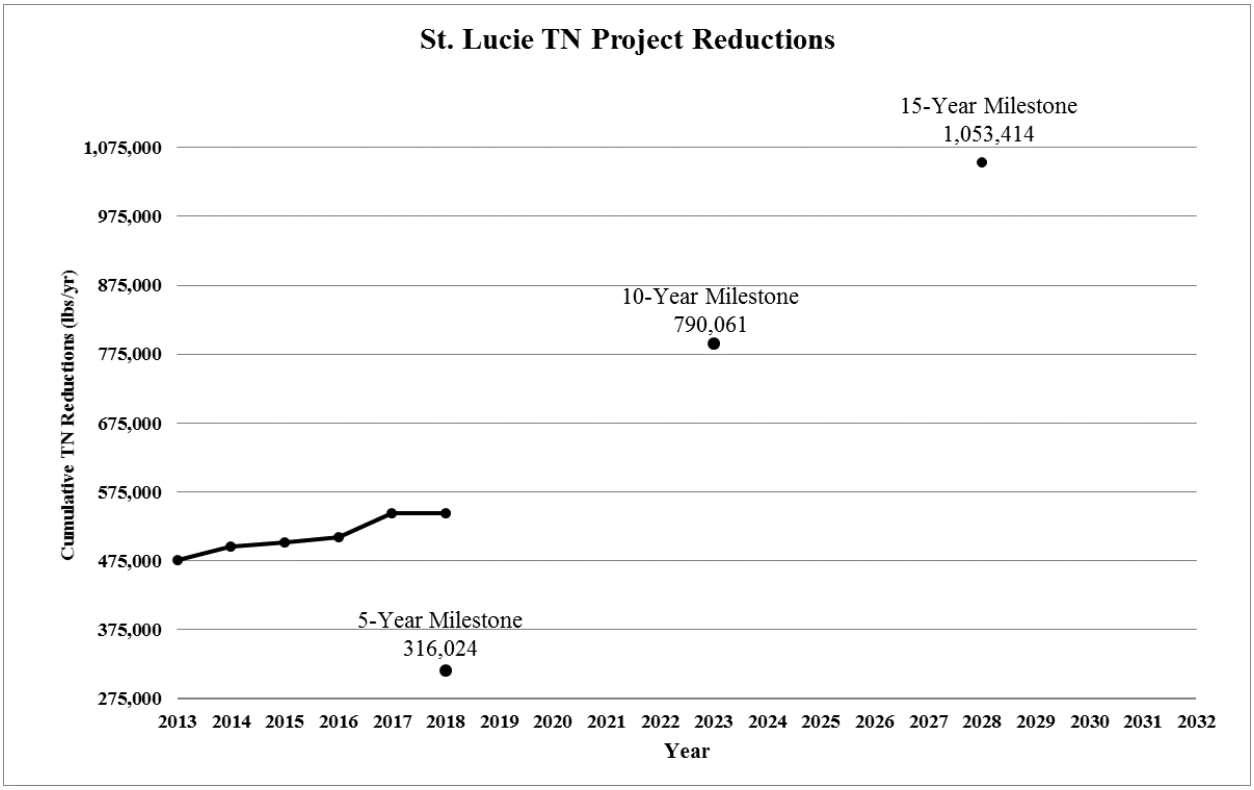



**Figure 15. St. Lucie TN project reductions progress**

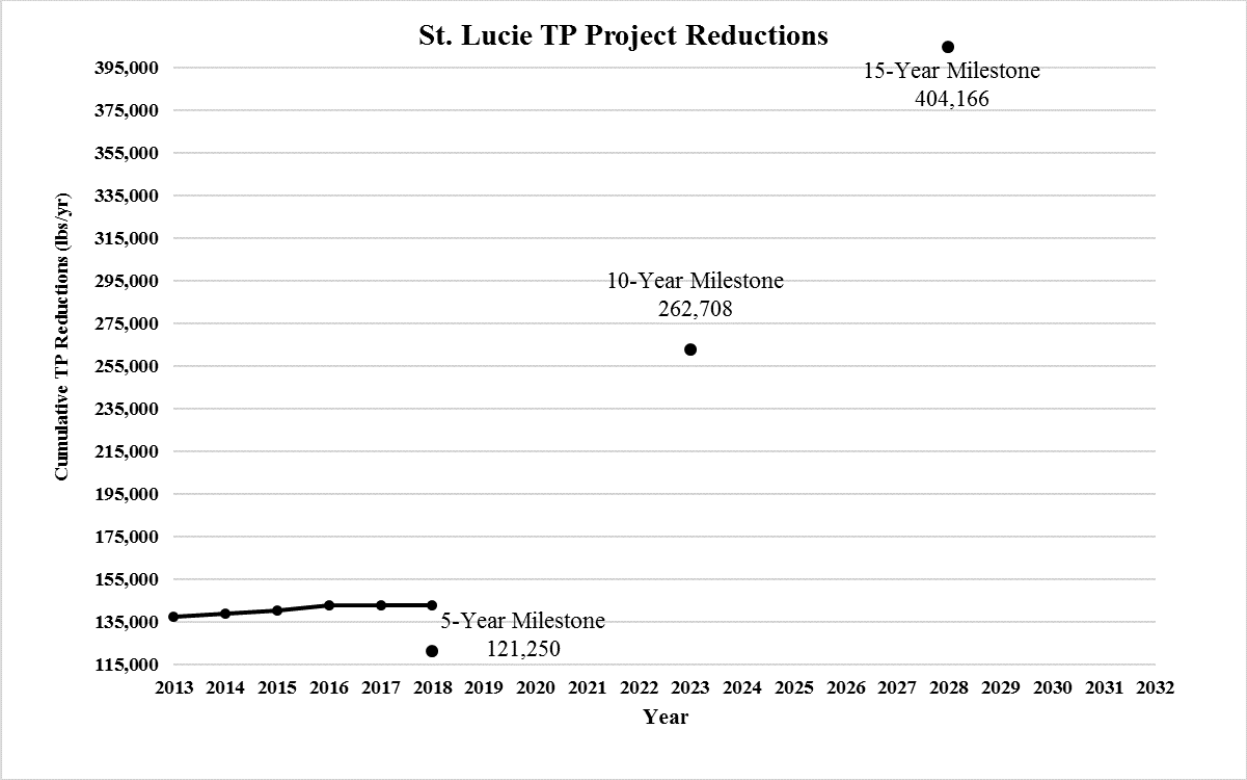



**Figure 16. St. Lucie TP project reductions progress**

## Outstanding Florida Springs BMAPs

### *Introduction*

The Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.) provides for the protection and restoration of the state's Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, 6 additional named springs, and their associated spring runs. The act provides specific requirements for OFS BMAPs beyond those contained in Section 403.067, F.S., for all BMAPs. The special provisions include adopting an implementation plan designed with a target to achieve a TMDL no more than 20 years after BMAP adoption. These BMAPs provide for a phased implementation schedule (5-, 10-, and 15-year targets) designed to achieve incremental reductions within the first 15 years.

The act further specifies that a BMAP for an OFS must include the following provisions:

- The delineation of priority focus areas, to which statutory prohibitions on certain activities will apply.
- The identification of each point source or category of nonpoint sources and estimated pollutant loads in the springshed, including, but not limited to, urban turfgrass fertilizer, sports turfgrass fertilizer, agricultural fertilizer, onsite sewage treatment and disposal systems (OSTDS), also referred to as "septic systems" (the

terms are used interchangeably), wastewater treatment facilities, animal wastes, and stormwater facilities.

- A list of all specific projects and programs identified to implement a nutrient TMDL:
    - A priority rank, planning-level cost estimate, estimated completion date, and estimated nutrient load reduction for each listed project.
    - The source and amount of financial assistance to be made available by DEP, a water management district, or other entity for each listed project.
- A remediation plan if DEP identifies OSTDS as contributors of at least 20 % of the nonpoint source nitrogen pollution in a priority focus area, or if DEP determines remediation is necessary to achieve a TMDL:
    - A list of all specific projects identified in an OSTDS remediation plan.
- A description of the best management practices adopted by rule. The project information included in this report lists the implementation status of the BMAP projects as of December 31, 2018.

**Figures 17** and **18** show the OFS BMAP locations and project status chart, respectively. The Wekiva Spring, Santa Fe River, Silver Springs, and Rainbow Spring BMAPs were updated in June 2018 to include additional protections for OFS, as provided by the 2016 Florida Springs and Aquifer Protection Act. Pending the outcomes of legal challenges, these BMAP adoptions are not effective, and therefore the information presented in this report is based on the previously adopted BMAPs.

Additionally, new BMAPs for the Suwannee River and Volusia Blue Spring are not effective, pending legal challenges. Future reports will include information on these BMAPs.

Revisions to the Upper Wakulla and Jackson Blue Springs BMAPs were adopted on January 4, 2019. Future reports will include project information for these updated BMAPs. On January 4, 2019, new BMAPs were also adopted for Wacissa, DeLeon, Gemini, Homosassa/Chassahowitzka, Crystal River/Kings Bay, and Weeki Wachee Springs. The policies in these new BMAPs were effective as of their adoption date, and subsequent reports will contain tracking and updates for these plans.

For the Jackson Blue Spring, Rainbow River and Springs, Santa Fe River Basin, Silver River and Springs, and Upper Wakulla River and Wakulla Springs enrollment and verification of farm fertilizer and livestock waste acres treated are based on the Florida Department of Agriculture and Consumer Services' December 2018 NOI enrollment. TN reductions shown are based on the assumed efficiencies referenced in the BMAP and 100 % NOI enrollment.

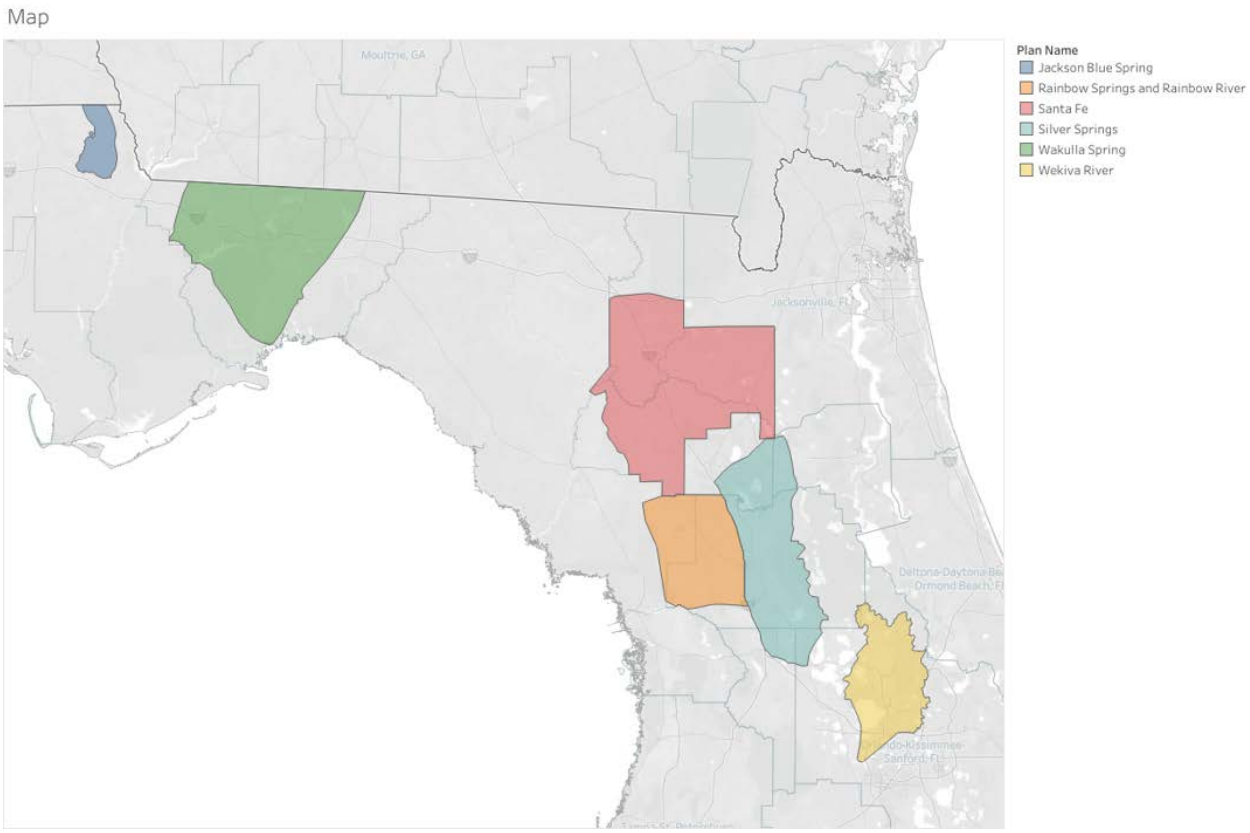



**Figure 17. OFS BMAP locations**

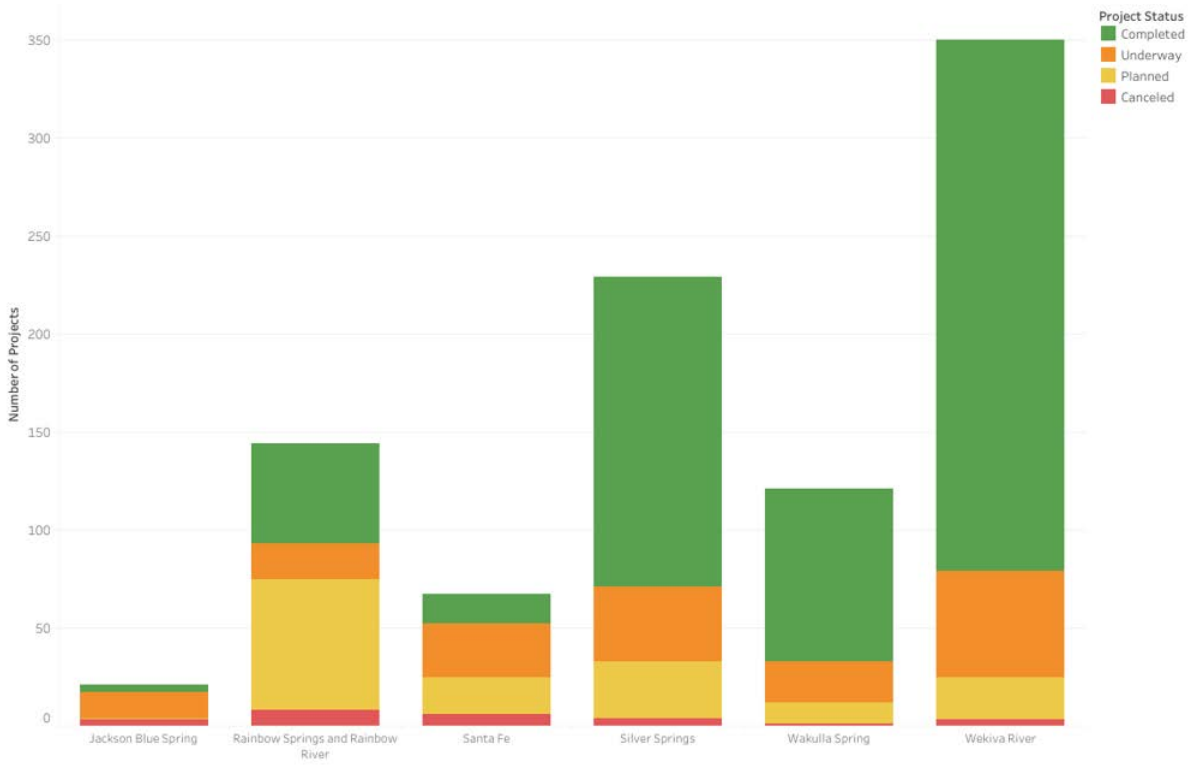



**Figure 18. OFS project status chart**

## *Jackson Blue Spring and Merritts Mill Pond BMAP*

### BACKGROUND

The Jackson Blue Basin encompasses 141 square miles in Jackson County, Florida. Jackson Blue Spring, an OFS, forms the headwaters of the 270-acre Merritts Mill Pond, which forms the headwaters of Spring Creek, a tributary to the Chipola River, an Outstanding Florida Water.

DEP determined that the Jackson Blue Spring segment (WBID 180Z) and Merritts Mill Pond (WBID 180A) were impaired by nitrate as nitrogen. In January 2013, DEP adopted a TMDL for nitrate to protect the aquatic flora and fauna in the spring and pond. To achieve the monthly average nitrate target of 0.35 mg/L in the Jackson Blue Basin, the nitrate loads from nonpoint sources need to be reduced by 90 %. The Jackson Blue BMAP was adopted in May 2016 to implement the nitrate TMDL in the watershed.

### STATUS OF PROJECTS

Through December 31, 2018, 4 projects have been completed. An additional 14 projects that are underway or planned have been added to the BMAP. The projects completed to date are estimated to achieve total reductions of 69,487 lbs/yr of TN, and projects underway are estimated to achieve total reductions of 107,832 lbs/yr (**Figure 19**). These projects are primarily agricultural best management practices and septic-to-sewer projects.

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones or the 20-year target will not be met, an explanation of possible causes and potential solutions will be provided. As of January 2019, the requirements and additional protections afforded to an OFS by this restoration plan are in place. The next report will include project information for the BMAP.

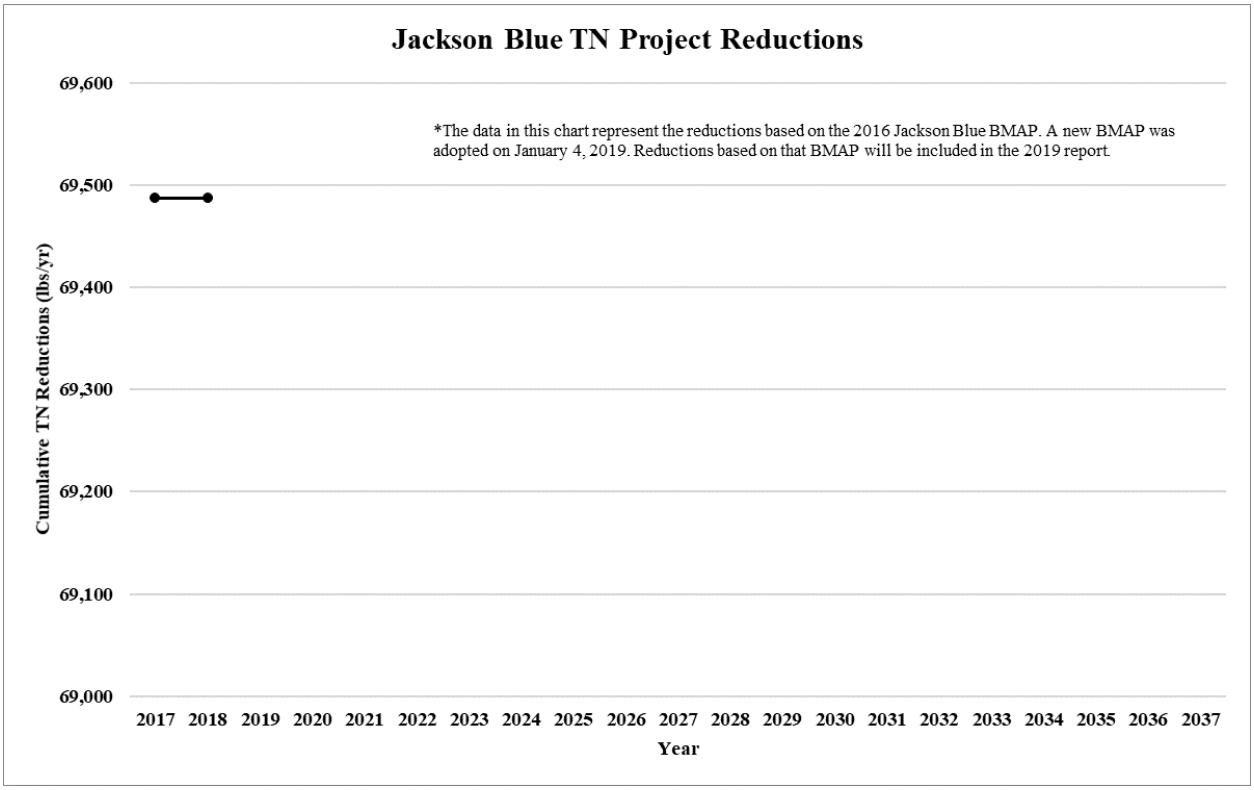



**Figure 19. Jackson Blue Spring and Merritts Mill Pond TN project reductions progress**

## *Rainbow Spring BMAP*

### BACKGROUND

The Rainbow Spring BMAP area covers 679 square miles and includes portions of Marion County and Levy County. The BMAP area approximates the extent of the groundwater capture area determined by the Southwest Florida Water Management District and includes the surface drainage for the Rainbow River. The eastern boundary of the BMAP area coincides with the western extent of the Silver Springs BMAP area and Interstate 75.

DEP identified Rainbow Spring Group and Rainbow Spring Group Run as impaired for nutrients because of an imbalance of flora and fauna evidenced by excessive algal growth and the smothering of submerged aquatic vegetation. In 2013, DEP adopted the Rainbow Spring Group and Rainbow Spring Group Run TMDLs, which established a target concentration of 0.35 mg/L nitrate and an 82 % reduction in nitrate concentration for each impaired waterbody. The Rainbow Spring BMAP was adopted in December 2015 to implement the TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 51 projects have been completed. An additional 85 projects that are underway or planned have been added to the BMAP. Overall, completed projects are estimated to reduce the TN loading at Rainbow Spring and Rainbow Spring Group Run by 4,532 lbs/yr (**Figure 20**).

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones or the 20-year target will not be met, an explanation of possible causes and potential solutions will be provided. These milestones will be specified in a revised BMAP document. The revised Rainbow Spring BMAP was scheduled to be readopted by July 1, 2018, to meet the statutory requirements added by the 2016 Florida Legislature. As of December 31, 2018, the OFS BMAP is not in effect.

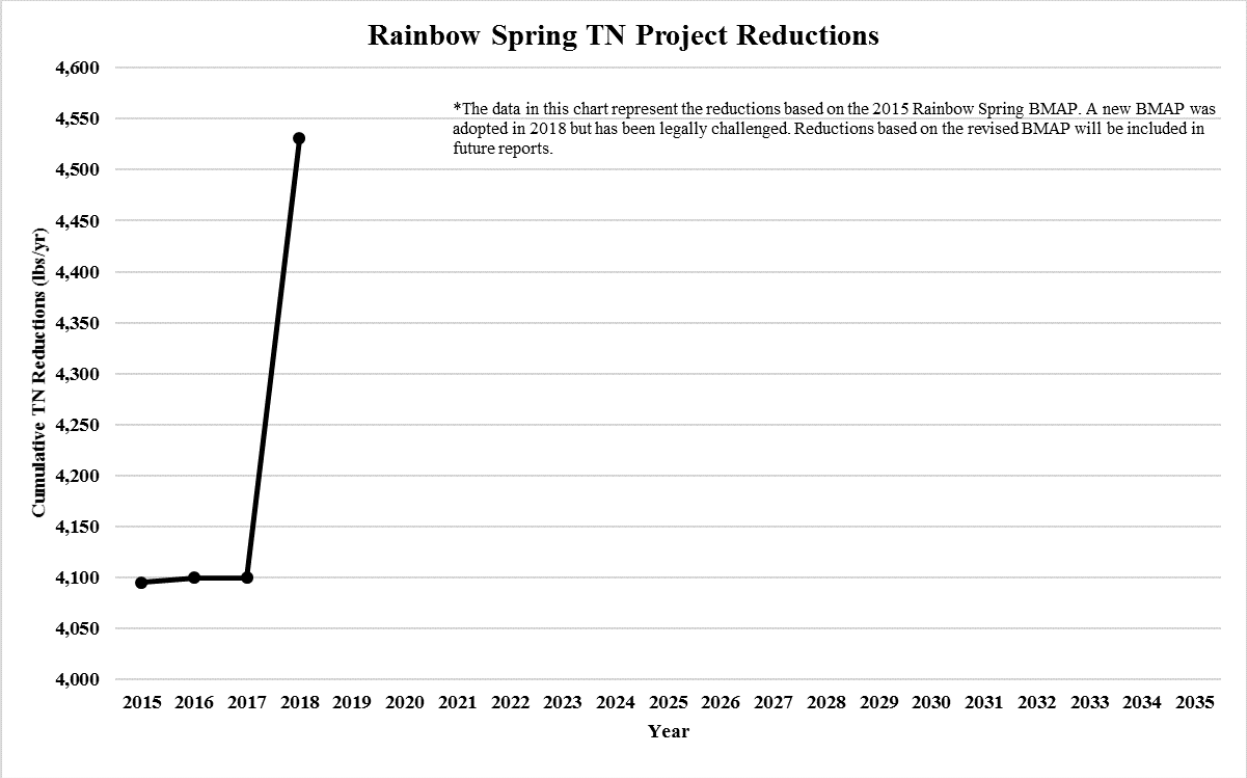



**Figure 20. Rainbow Spring TN project reductions progress**

## *Santa Fe River BMAP*

### BACKGROUND

The Santa Fe River Basin encompasses an area of over 1 million acres and includes all or portions of Alachua County, Bradford County, Columbia County, Gilchrist County, and Union County. Urban areas include Lake City and Fort White in Columbia County and Alachua, Archer, High Springs, La Crosse, and Newberry in Alachua County. The basin also includes the following OFS: Ichetucknee Spring Group, Hornsby Spring, Devil's Ear Spring, Poe Spring, Columbia Spring, and Treehouse Spring.

DEP identified the lower portion of the Santa Fe River (from River Rise westward to its confluence with the Suwannee River) as impaired for DO and nutrients. In September 2008, DEP adopted the Santa Fe River TMDL for nitrate to protect the aquatic flora and fauna in the river. To achieve the annual average nitrate target of 0.35 milligrams per liter in the Santa Fe River Basin, the nitrate loads from nonpoint sources need to be reduced by 35 %. The Santa Fe River BMAP was adopted in February 2012 to implement the nitrate TMDL in the watershed.

### STATUS OF PROJECTS

Through December 31, 2018, 15 projects have been completed. An additional 46 projects that are underway or planned have been added to the BMAP. The projects completed to date are estimated to achieve total reductions of 32,836 lbs/yr of TN, and projects underway are estimated to achieve total reductions of 397,557 lbs/yr (**Figure 21**). These projects are primarily agricultural best management practices.

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones or the 20-year target will not be met, an explanation of possible causes and potential solutions will be provided. The revised BMAP was scheduled to be readopted by July 1, 2018, to meet the statutory requirements added by the 2016 Florida Legislature. As of December 31, 2018, the OFS BMAP is not in effect.

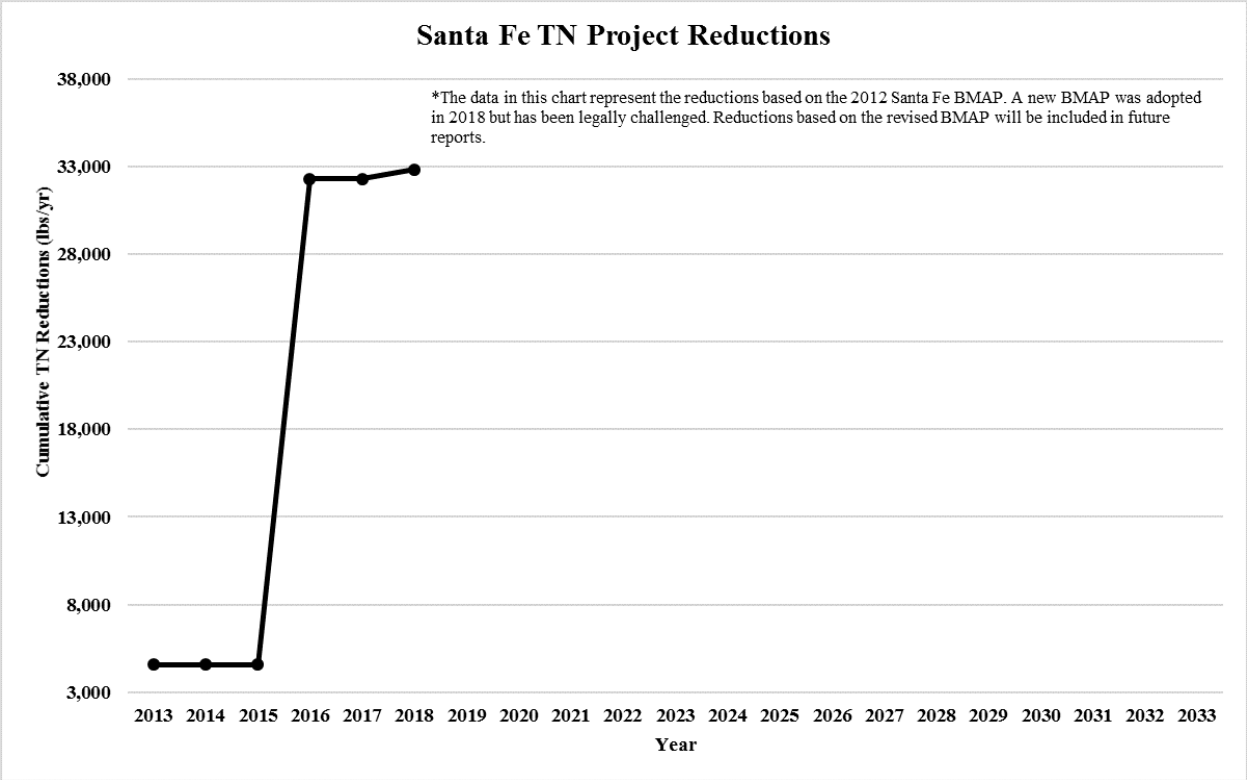



**Figure 21. Santa Fe TN project reductions progress**

## *Silver River and Springs BMAP*

### BACKGROUND

The Silver Springs BMAP area covers 989 square miles and is located primarily in Marion County. The BMAP area approximates the extent of the 1,000-year modeled groundwater capture zone. The BMAP addresses the surface drainage basin for Silver River but not other surface water basins located in the BMAP area. The western boundary of the BMAP area coincides with the eastern extent of the Rainbow Springs BMAP area and Interstate 75.

DEP identified Silver Springs, Silver Springs Group, and Upper Silver River as impaired for nutrients, because of an imbalance of flora and fauna evidenced by excessive algal growth and the smothering of submerged aquatic vegetation. In 2012, DEP adopted the TMDL, which established a concentration target of 0.35 milligrams per liter of nitrate and a 79 % reduction in nitrate concentration for each impaired waterbody. The Silver Springs BMAP was adopted in October 2015 to implement the TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 158 projects have been completed. An additional 67 projects that are underway or planned have been added to the BMAP. Overall, completed projects are estimated to reduce the TN loading at the springs and Upper Silver River by 43,736 lbs/yr (**Figure 22**).

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones or the 20-year target will not be met, an explanation of possible causes and potential solutions will be provided. These milestones will be specified in a revised BMAP document. The revised BMAP was scheduled to be readopted by July 1, 2018, to meet the statutory requirements added by the 2016 Florida Legislature. As of December 31, 2018, the OFS BMAP is not in effect.

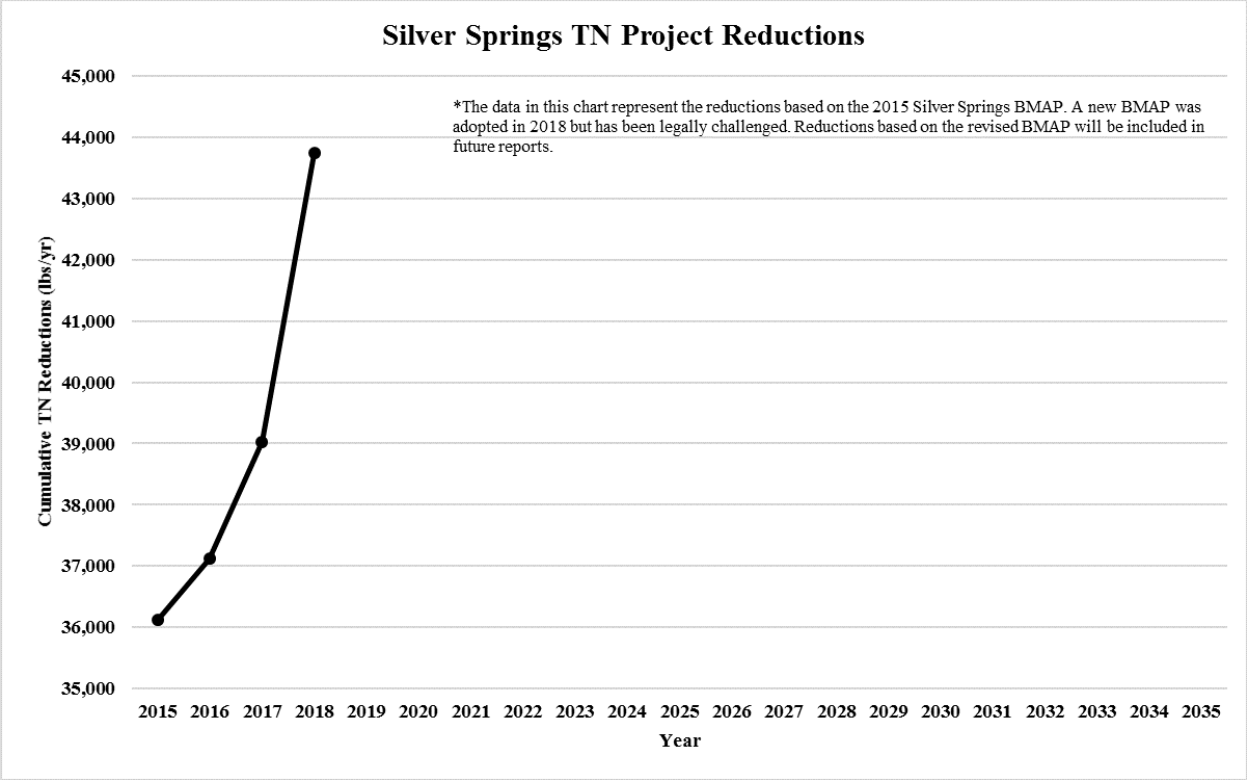



**Figure 22. Silver River and Springs TN project reductions progress**

## *Upper Wakulla River and Wakulla Springs BMAP*

### BACKGROUND

The BMAP area encompasses 848,445 acres, or 1,325 square miles. The Upper Wakulla River and Wakulla Springs are designated as Outstanding Florida Waters. The river and springs are a very dynamic groundwater and surface water–fed system. Wakulla Springs, designated as an OFS, is one of the deepest freshwater springs in the world and the primary source of water for the Wakulla River. In the Upper Wakulla River and Wakulla Springs Basin, the Cody Scarp generally separates the semi-confined geologic features to the north (soils characterized with lower potential for groundwater impacts) and areas of unconfined geologic features to the south (highly permeable karst areas with a high potential for groundwater impacts).

DEP determined that the Upper Wakulla River segment is impaired by nitrate. The biological community in the river is affected by excessive algal mats linked to elevated nitrate concentrations from anthropogenic sources. In 2012, DEP adopted the Upper Wakulla River TMDL to reduce nitrate inputs to the river and springs. The TMDL defined the nitrate target as composed of both nitrate and nitrite as nitrogen. The Upper Wakulla River and Wakulla Springs BMAP was adopted in October 2015 to implement the TMDL.

### STATUS OF PROJECTS

Through December 31, 2018, 88 projects have been completed. An additional 32 projects that are underway or planned have been added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 693,574 lbs/yr (**Figure 23**).

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones, or the 20-year target, will not be met, an explanation of possible causes and potential solutions will be provided. These milestones will be specified in a revised BMAP document. The revised Upper Wakulla River and Wakulla Springs BMAP was readopted in June 2018 to meet the statutory requirements added by the 2016 Florida Legislature. As of January 2019, the requirements and additional protections afforded to an OFS by this restoration plan are in place. The next report will include project information for this BMAP.

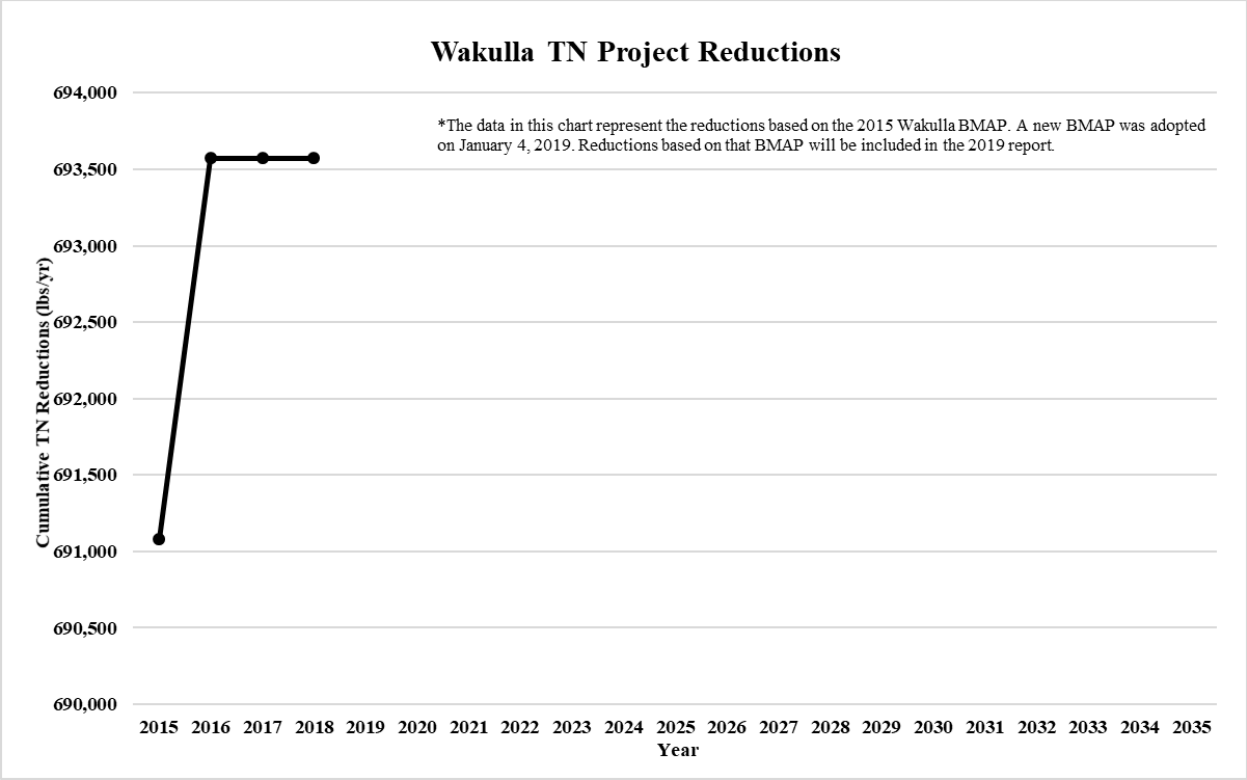



**Figure 23. Upper Wakulla River and Wakulla Springs TN project reductions progress**

## *Wekiva River, Rock Springs Run, and Little Wekiva Canal BMAP*

### BACKGROUND

The Wekiva River system (including the main stem of the Wekiva River and Rock Springs Run) is designated by the state as an Outstanding Florida Water, the Wekiva River and portions of its tributaries are designated as a state Aquatic Preserve worthy of special protection because of their natural attributes, and the river is also designated by the federal government as a Wild and Scenic River. The BMAP area includes the Wekiva River surface water basin, a large portion of the springshed for the group of springs that contributes flow (and nutrients) to the system, the

Little Wekiva Canal Basin, and the surface water basin of the Little Wekiva River and Blackwater Creek. The BMAP area covers 513 square miles.

DEP determined that the Wekiva River and Rock Springs Run is impaired by elevated TP and nitrate-nitrogen, based on evidence of an imbalance in aquatic flora. The Little Wekiva Canal was verified as impaired for DO and nutrients based on elevated levels of chlorophyll *a* and was subsequently verified as impaired for DO attributable to elevated TN and BOD. In 2008, DEP adopted nutrient TMDLs for the Wekiva River, Wekiwa Springs, and Rock Springs Run (nitrate and TP), as well as nutrient and DO TMDLs for the Little Wekiva Canal. The Wekiva River, Rock Springs Run, and Little Wekiva Canal BMAP was adopted in October 2015 to implement nitrate, TN, TP, and BOD reductions to achieve the TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 271 projects have been completed. An additional 76 projects that are underway or planned have been added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 172,437 lbs/yr (**Figure 24**).

Additional information will be provided when the OFS BMAP reaches its 5-, 10-, and 15-year milestones. If the milestones, or the 20-year target, will not be met, an explanation of possible causes and potential solutions will be provided. These milestones will be specified in a revised BMAP document. The revised Wekiva River, Wekiwa Springs, and Rock Springs Run BMAP was scheduled to be readopted by July 1, 2018, to meet the statutory requirements added by the 2016 Florida Legislature. As of December 31, 2018, the OFS BMAP is not in effect.

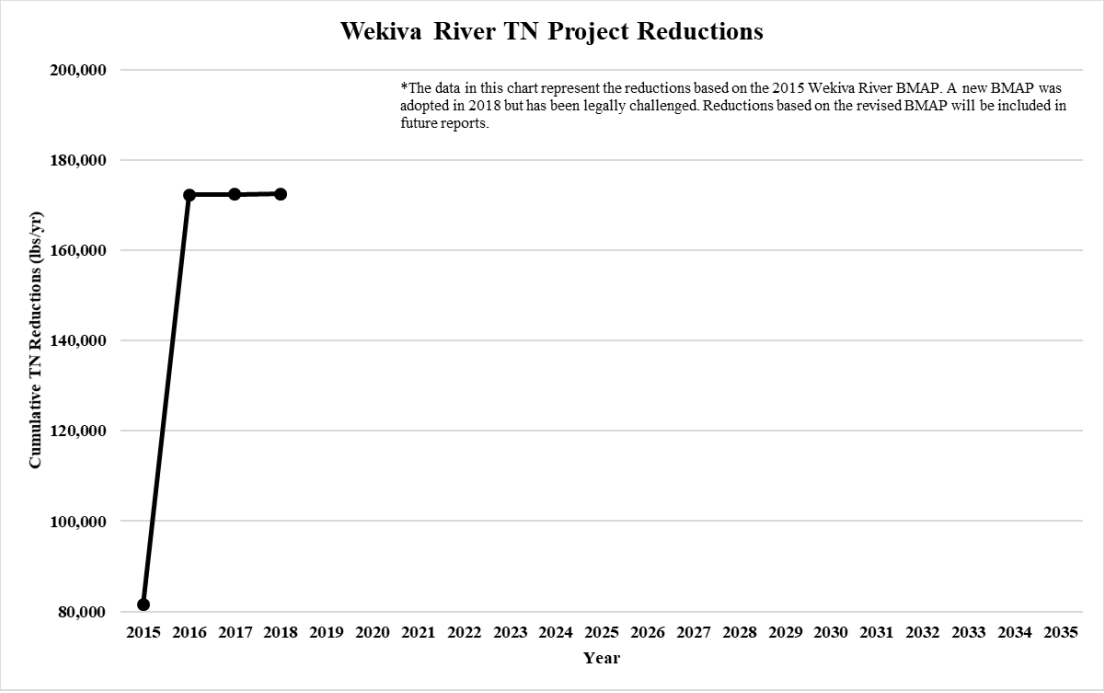



**Figure 24. Wekiva River, Rock Springs Run, and Little Wekiva Canal TN project reductions progress**

## Surface Water BMAPs for Nutrients

Other BMAPs not in the OFS or Northern Everglades and Estuaries Protection Program groups that address nutrient impairments are included in the Surface Water BMAPs for Nutrients group. **Figures 25** and **26** show the locations of these BMAPs and project status chart, respectively.

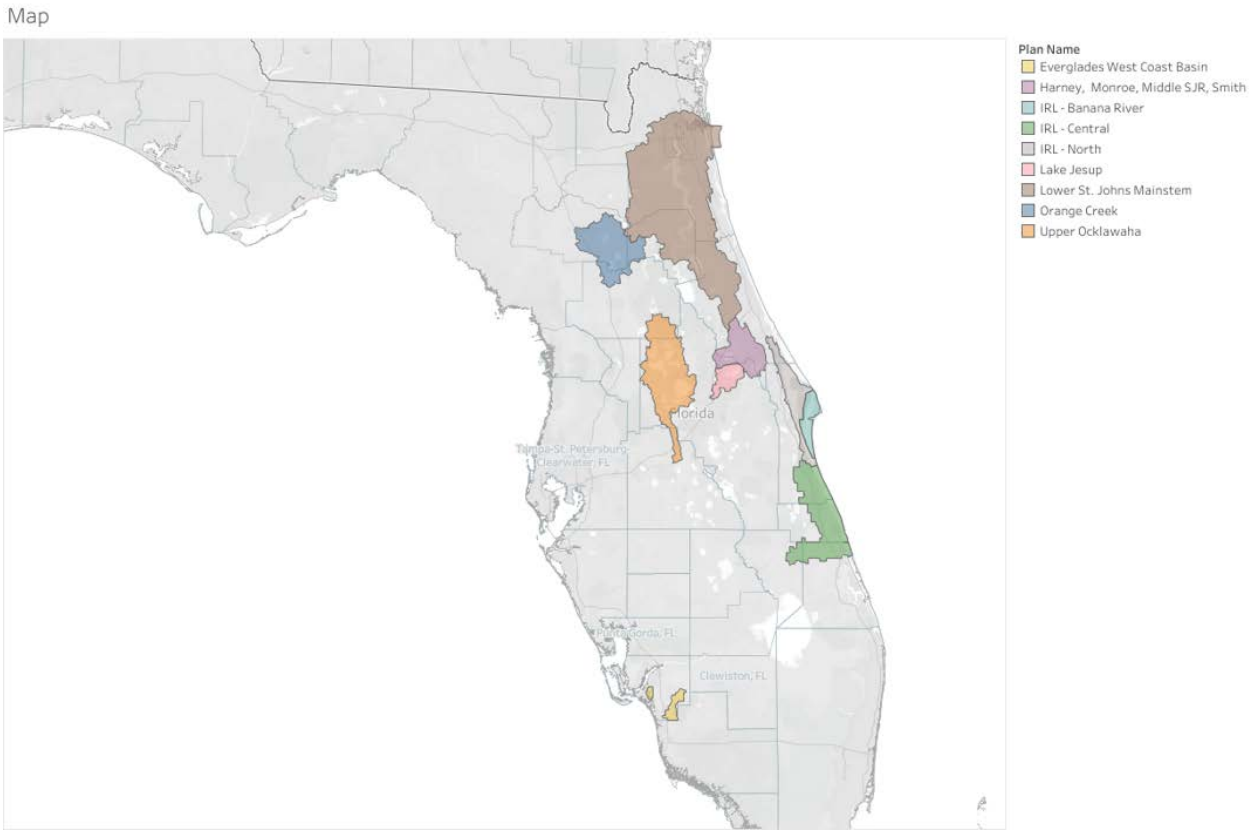



**Figure 25. Surface water nutrient BMAP locations**

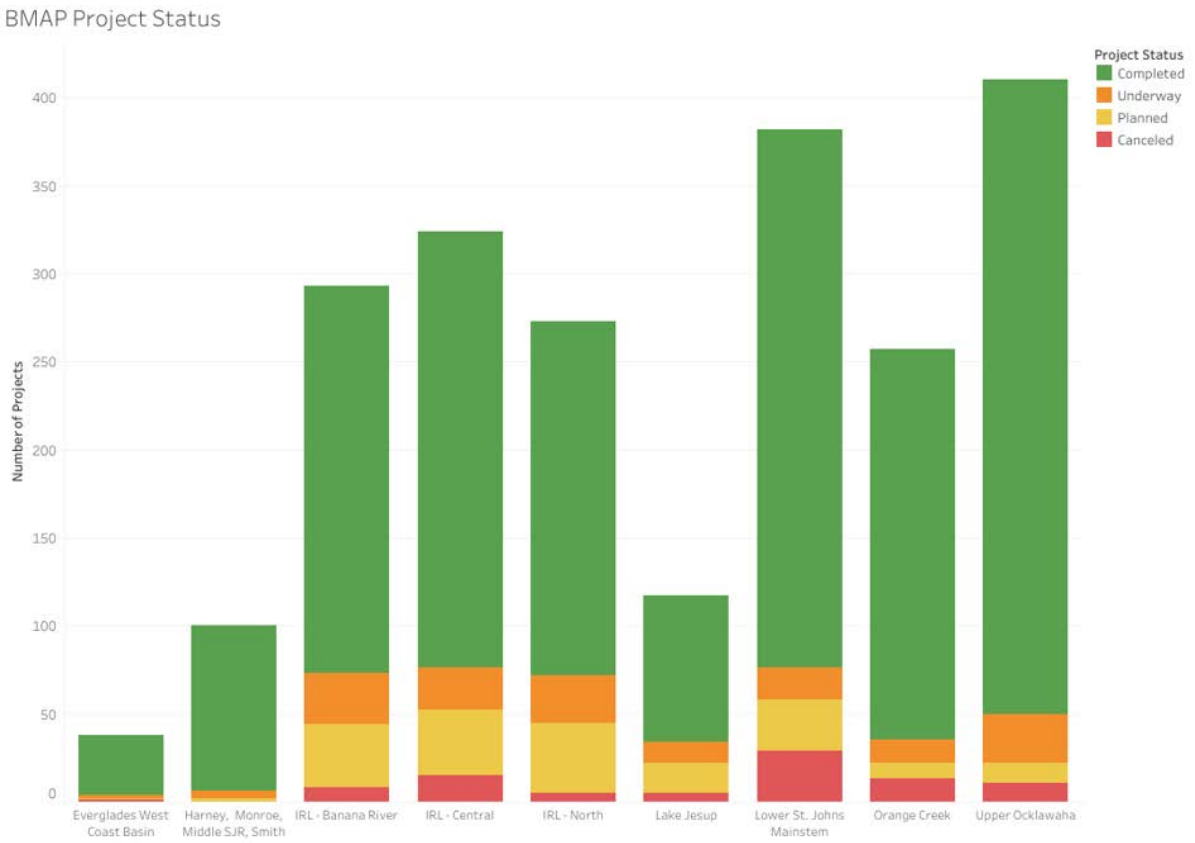



**Figure 26. Surface water nutrient BMAP project status chart**

## *Everglades West Coast BMAP*

### BACKGROUND

The Everglades West Coast Basin is the 55,469-acre watershed composed of the Hendry Creek and Imperial River Basins, which drain into Estero Bay in the Western Everglades area. Estero Bay proper is a shallow, subtropical lagoon with a watershed encompassing 11,317 acres and is separated from the Gulf of Mexico by barrier islands. Hendry Creek is in the southwest part of Lee County, 3 miles south of the City of Ft. Myers and 3 miles southeast of the City of Cape Coral. It flows south for 6 miles into north Estero Bay and drains a watershed of 15.35 square miles. The Imperial River Watershed covers 14,784 acres, of which 4,416 acres are surface waters. Oak Creek and Leitner Creek flow into the upstream portion of the Imperial River.

DEP identified Hendry Creek and Imperial River as impaired for DO. In August 2008, DEP adopted the Hendry Creek and Imperial River TMDLs, which established reduction targets for TN for the basins. The Everglades West Coast BMAP was adopted in November 2012 to implement the TN TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 12 projects were completed and 1 planned project was added to the BMAP in the Hendry Creek Basin. The projects completed to date are estimated to achieve total TN reductions of 6,892 lbs/yr, or 67 % of the reductions needed to meet the TN TMDL (**Figure 27**). In the Imperial River Basin, 22 projects were completed. An additional 2 projects that are underway or planned were added to the BMAP in the Imperial River Basin. The projects completed to date are estimated to achieve total TN reductions of 15,742 lbs/yr, or 26 % of the reductions needed to meet the TN TMDL (**Figure 28**).

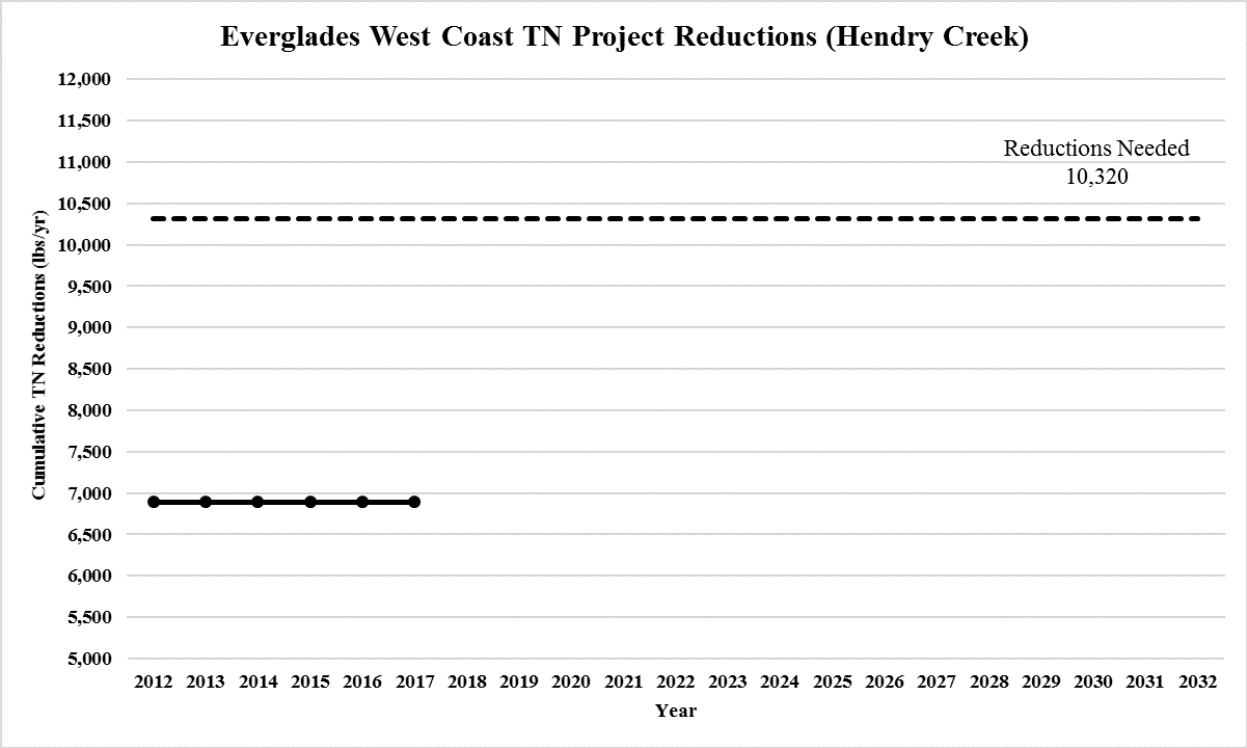



**Figure 27. Everglades West Coast (Hendry Creek) TN project reductions progress**

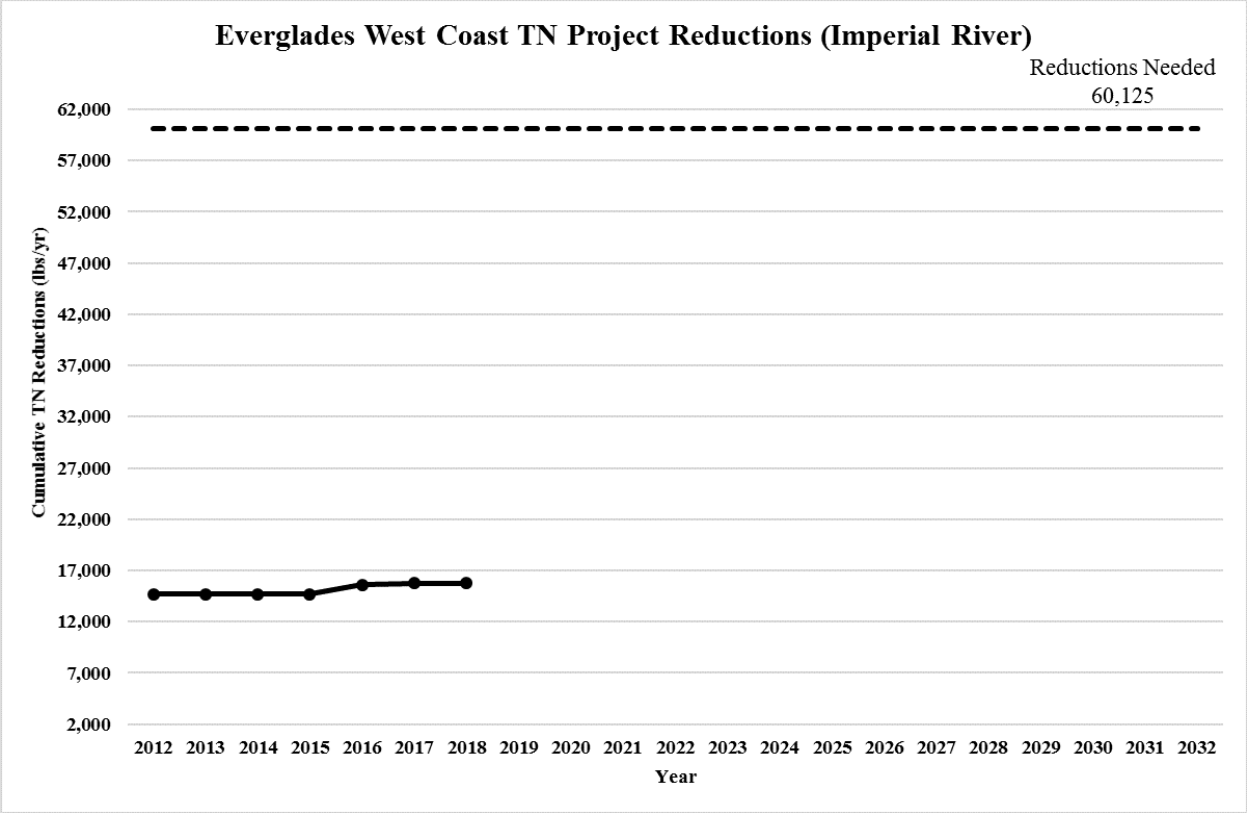



**Figure 28. Everglades West Coast (Imperial River) TN project reductions progress**

## *Indian River Lagoon – Banana River Lagoon BMAP*

### BACKGROUND

The Banana River Lagoon BMAP area covers 97,139 acres of the Indian River Lagoon (IRL) Basin that lies between Merritt Island and the coastal barrier island and extends in a north-south direction from Banana Creek south to the Eau Gallie Causeway. Sykes Creek and Newfound Harbor are the primary tributaries to the Banana River.

DEP verified the IRL Basin as impaired because of excessive amounts of TN and TP, as evidenced by a decrease in seagrass distribution and by low DO. In March 2009, DEP adopted the nutrient and DO IRL Basin TMDLs, with a focus on the water quality conditions necessary for seagrass regrowth at the depth limits where seagrass historically grew in the basin, based on a multiyear composite of seagrass coverage. The Banana River Lagoon BMAP was adopted in February 2013 to implement the TN and TP TMDLs.

The Banana River Lagoon BMAP is one of three separate BMAPs developed for the IRL sub-basins, because of the lagoon's large size and hydrologic diversity. The Banana River Lagoon was further divided into project zones with boundaries based on the distinct hydrology in different areas of the basin and their corresponding annual residence times. The zones are important because flushing times vary greatly among locations and consequently affect how

nutrient reductions will impact these distinct areas. The project zones identify large areas where projects should be implemented to ensure that the load reductions achieve the desired response for each sub-basin. The two project zones are as follows:

- **Banana River Lagoon A** – The area north of and including the State Road 520 Causeway.

- **Banana River Lagoon B** – The area south of the State Road 520 Causeway.

### STATUS OF PROJECTS

Through December 31, 2018, 220 projects were completed. An additional 65 projects that are underway or planned were added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 45,443 lbs/yr, or 47 % of the reductions needed to meet the portion of the TN TMDL allocated to the Banana River Lagoon. Completed projects completed to date are estimated to achieve total TP reductions of 9,422 lbs/yr, or 42 % of the reductions needed to meet the portion of the TP TMDL allocated to the Banana River Lagoon. **Figures 29** and **30** show the progress made towards TN reductions in Zones A and B, respectively, and **Figures 31** and **32** show the progress towards TP reductions in Zones A and B, respectively.

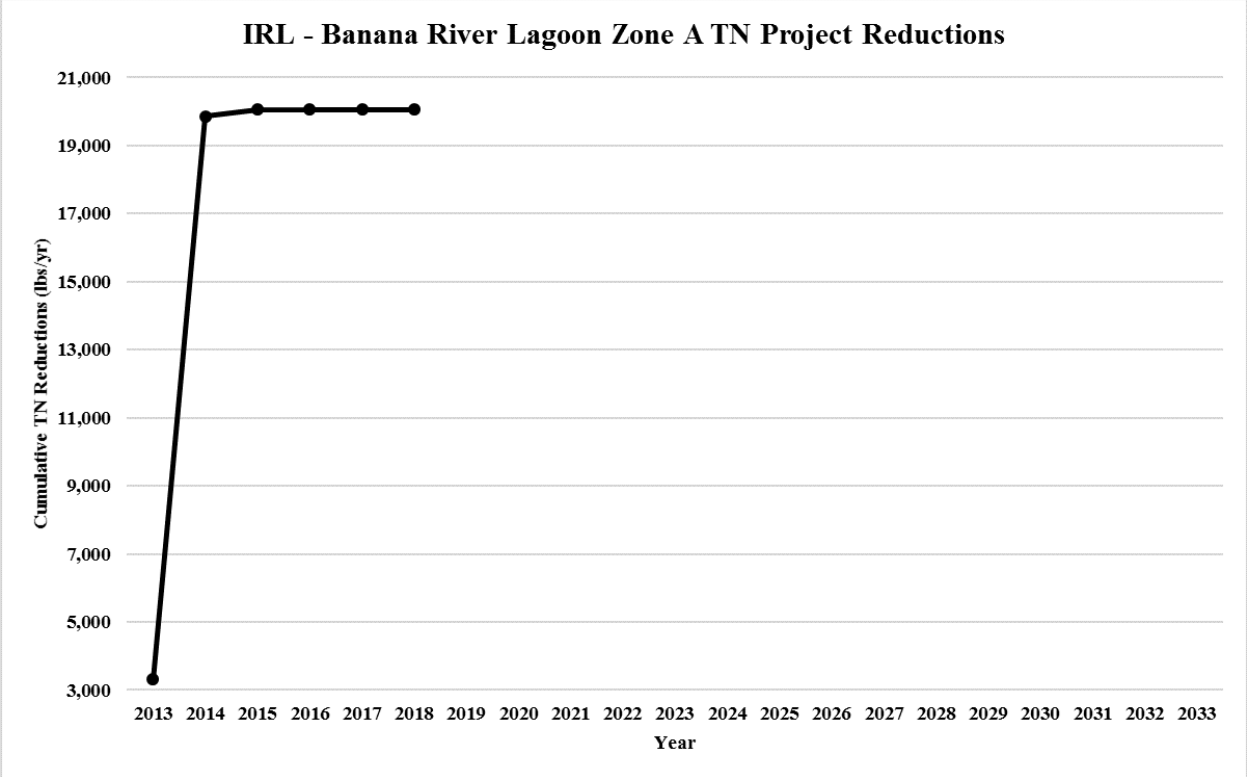



**Figure 29. Banana River Lagoon Zone A TN project reductions progress**

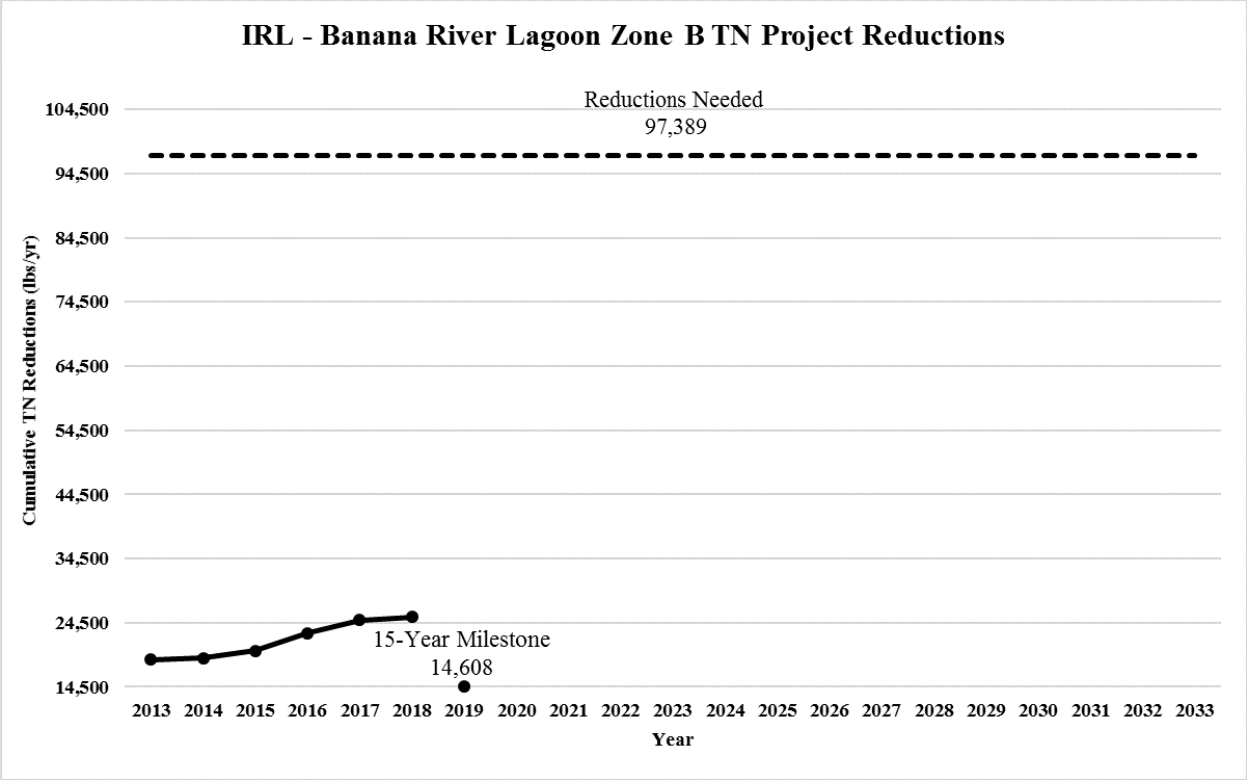



**Figure 30. Banana River Lagoon Zone B TN project reductions progress**

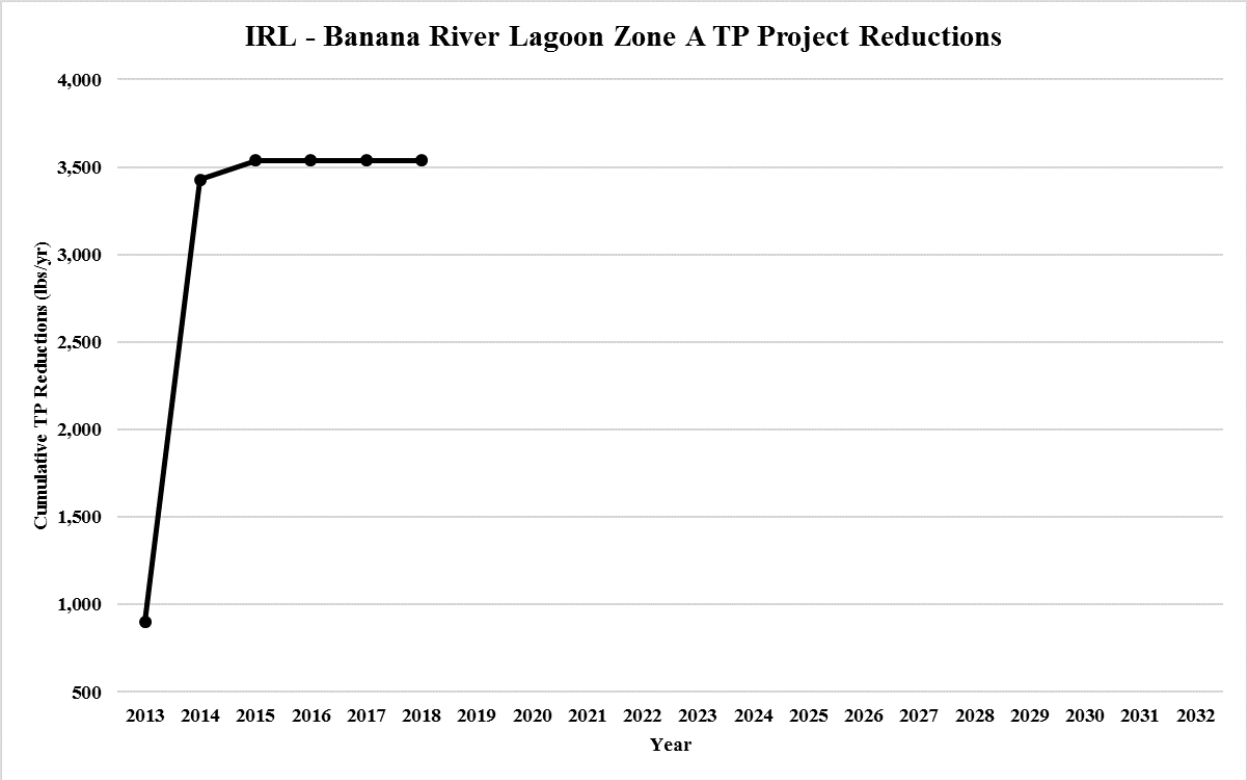



**Figure 31. Banana River Lagoon Zone A TP project reductions progress**

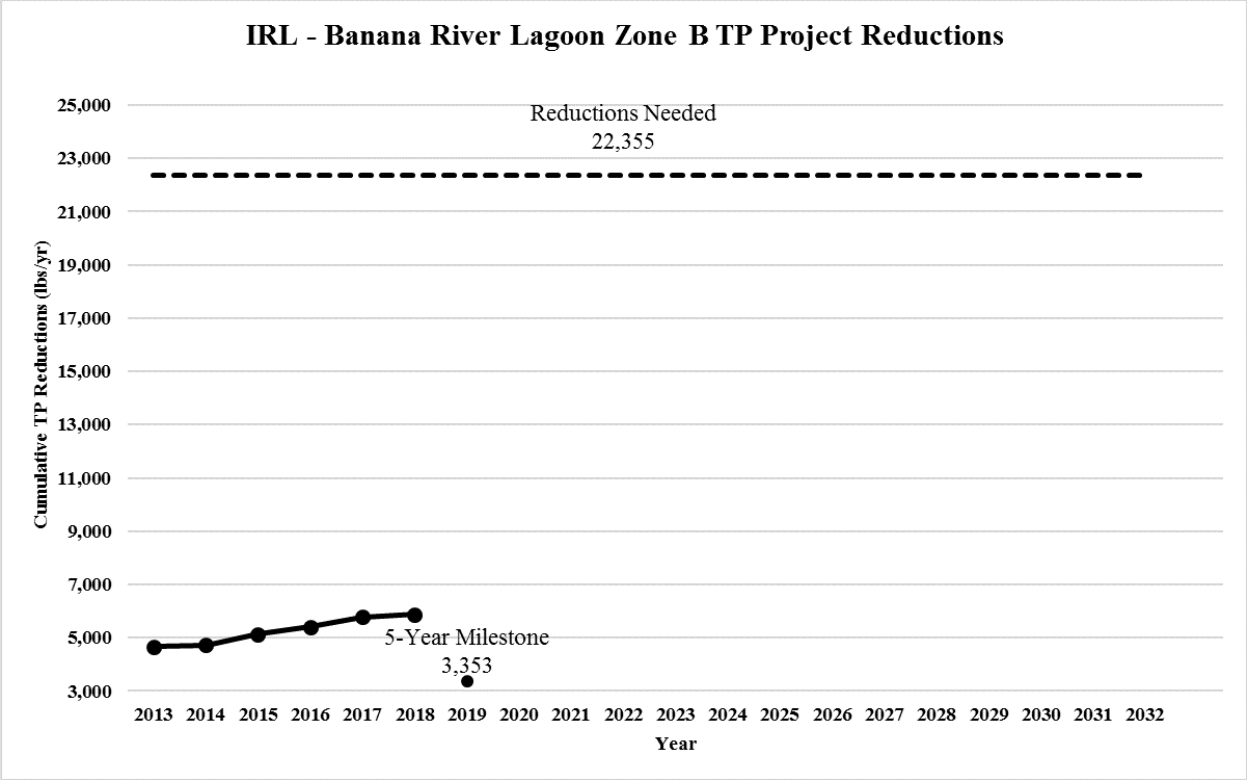



**Figure 32. Banana River Lagoon Zone B TP project reductions progress**

## *IRL – Central Indian River Lagoon BMAP*

### BACKGROUND

The Central Indian River Lagoon BMAP covers 476,469 acres of the IRL Basin, which lies between Melbourne and Fort Pierce, and extends north-south from the Melbourne Causeway south to the boundary between Indian River County and St. Lucie County.

DEP verified the IRL Basin as impaired because of excessive amounts of TN and TP, as evidenced by a decrease in seagrass distribution and by low DO. In March 2009, DEP adopted the IRL Basin nutrient and DO TMDLs, with a focus on the water quality conditions necessary for seagrass regrowth at the depth limits where seagrass historically grew in the basin, based on a multiyear composite of seagrass coverage. The Central Indian River Lagoon BMAP was adopted in February 2013 to implement the TN and TP TMDL.

The Central Indian River Lagoon BMAP is one of three separate BMAPs developed for the IRL sub-basins because of the lagoon's large size and hydrologic diversity. The Central Indian River Lagoon was further divided into project zones with boundaries based on the distinct hydrology in different areas of the basin and their corresponding annual residence times. The zones are important because flushing times vary greatly among locations and consequently affect how nutrient reductions will impact these distinct areas. The project zones identify large areas where projects should be implemented to ensure that the load reductions achieve the desired response for each sub-basin. The three project zones are as follows:

- **Central A** – Melbourne Causeway (U.S. Highway 192) to the north tip of Grant Farm Island.
- **Central SEB** – Grant Farm Island to Wabasso Causeway (CR 510).
- **Central B** – Wabasso Causeway to the boundary between Indian River County and St. Lucie County.

This BMAP also encompasses a portion of the South Indian River Lagoon Sub-Basin extending to Fort Pierce Inlet and including the drainage areas for Fort Pierce Farms Canal and C-25 Canal. Any projects provided by stakeholders in the South Indian River Lagoon are not a BMAP requirement, and the project schedule does not represent a compliance plan.

### STATUS OF PROJECTS

Through December 31, 2018, 248 projects were completed. **Figures 33** and **34** show the progress towards TN and TP project reductions, respectively. An additional 61 projects that are underway or planned were added to the BMAP. Allocations are currently being developed for the Central Indian River Lagoon BMAP, and nutrient reductions associated with projects will be calculated to align with the allocation methodology. Once this is complete, future reports will contain information about TN and TP reductions in the Central Indian River Lagoon BMAP.

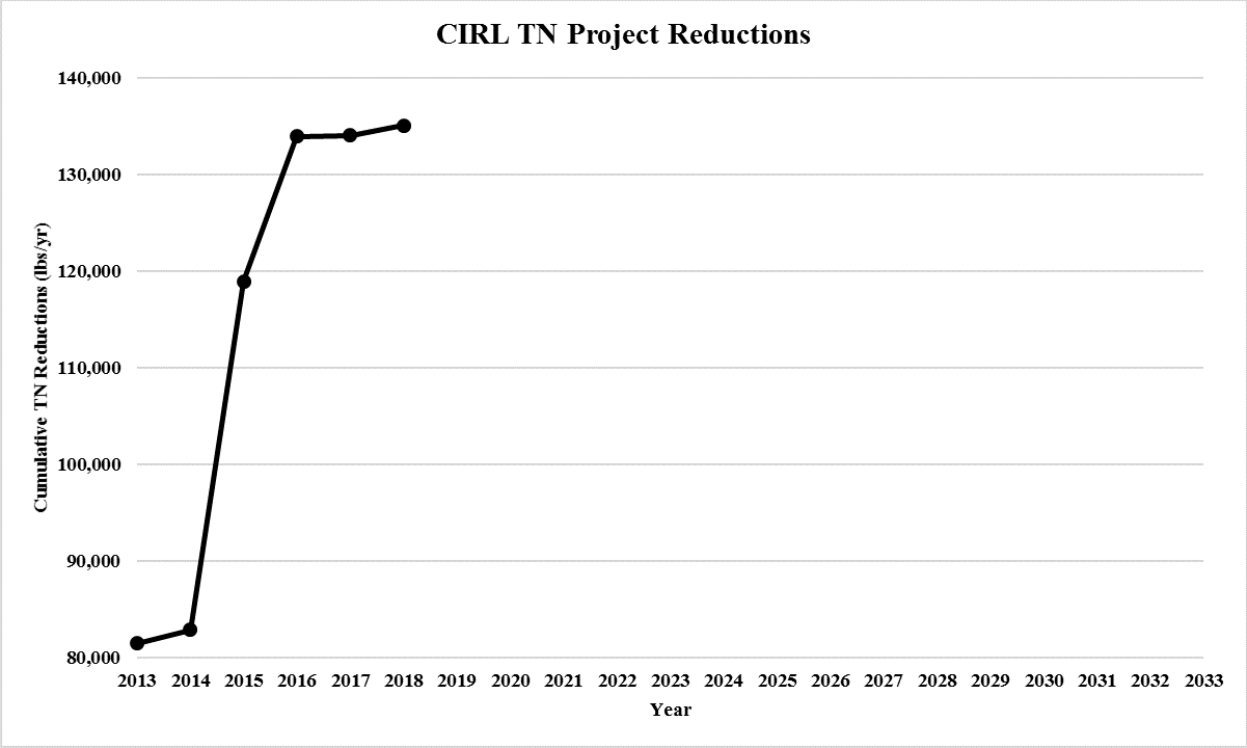



**Figure 33. Central Indian River Lagoon TN project reductions progress**

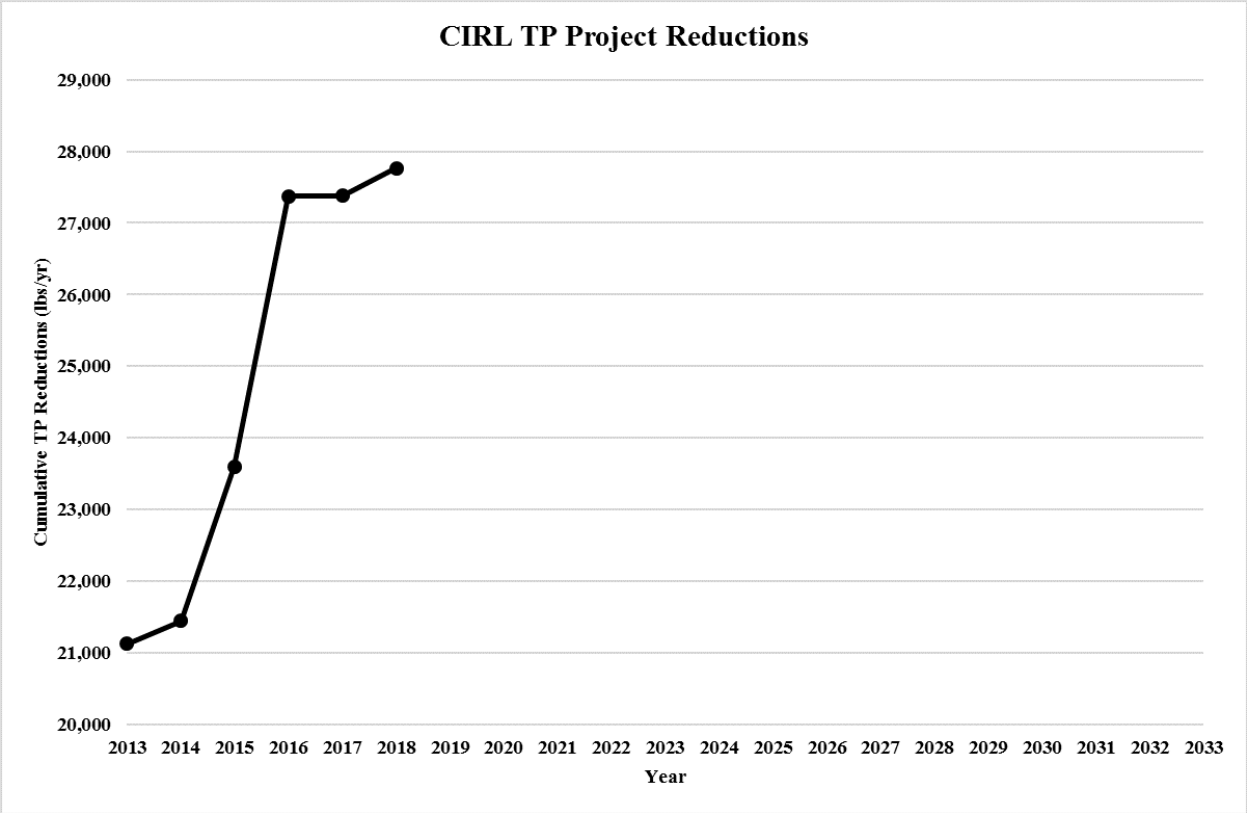



**Figure 34. Central Indian River Lagoon TP project reductions progress**

## *IRL – North Indian River Lagoon BMAP*

### BACKGROUND

The North Indian River Lagoon BMAP covers 211,398 acres of the IRL Basin between Edgewater and Melbourne and extends in a north-south direction from Turnbull Creek to the Melbourne Causeway. Turnbull Creek, the Canaveral Barge Canal, the valley between Ten Mile Ridge and the Atlantic Coastal Ridge, and the Eau Gallie River are the primary tributaries to the North Indian River Lagoon.

DEP verified the IRL Basin as impaired because of excessive amounts of TN and TP, as evidenced by a decrease in seagrass distribution and by low DO. In March 2009, DEP adopted the IRL Basin nutrient and DO TMDLs, with a focus on the water quality conditions necessary for seagrass regrowth at the depth limits where seagrass historically grew in the basin, based on a multiyear composite of seagrass coverage. The North Indian River Lagoon BMAP was adopted in February 2013 to implement the TN and TP TMDLs.

The North Indian River Lagoon BMAP is one of three separate BMAPs developed for the IRL sub-basins because of the lagoon's large size and hydrologic diversity. The North Indian River Lagoon was further divided into project zones with boundaries based on the distinct hydrology in different areas of the basin and their corresponding annual residence times. The zones are important because flushing times vary greatly among locations and consequently affect how

nutrient reductions will impact these distinct areas. The project zones identify large areas where projects should be implemented to ensure that the load reductions achieve the desired response for each sub-basin. The two project zones are as follows:

- **North A** – Turnbull Creek to NASA Causeway (State Road 405).
- **North B** – NASA Causeway to Melbourne Causeway (U.S. Hwy. 192).

**STATUS OF PROJECTS**

Through December 31, 2018, 201 projects were completed. An additional 67 projects that are underway or planned were added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 96,677 lbs/yr, or 44 % of the reductions needed to meet the portion of the TN TMDL allocated to the North Indian River Lagoon. Completed projects completed to date are estimated to achieve total TP reductions of 29,869 lbs/yr, or 57 % of the reductions needed to meet the portion of the TP TMDL allocated to the North Indian River Lagoon. **Figures 35** and **36** show the progress made towards TN reductions in Zones A and B, respectively, and **Figures 37** and **38** show the progress towards TP reductions in Zones A and B, respectively.

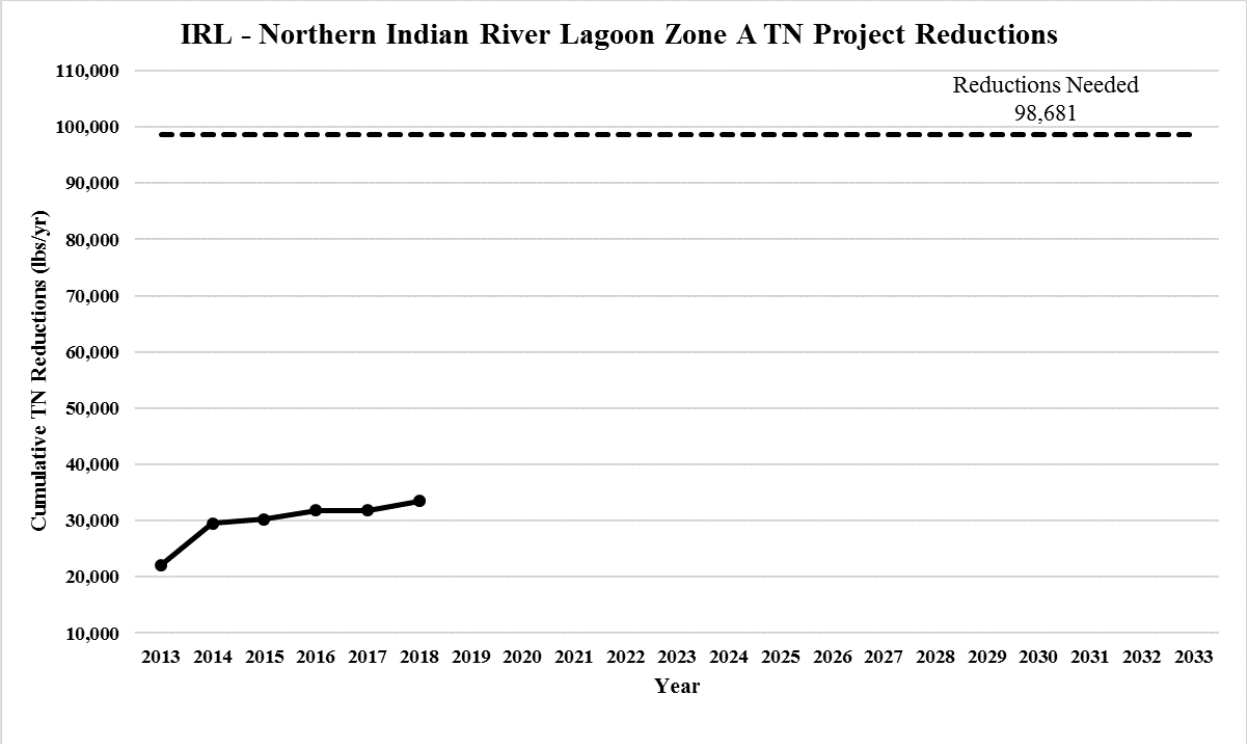



**Figure 35. North Indian River Lagoon Zone A TN project reductions progress**

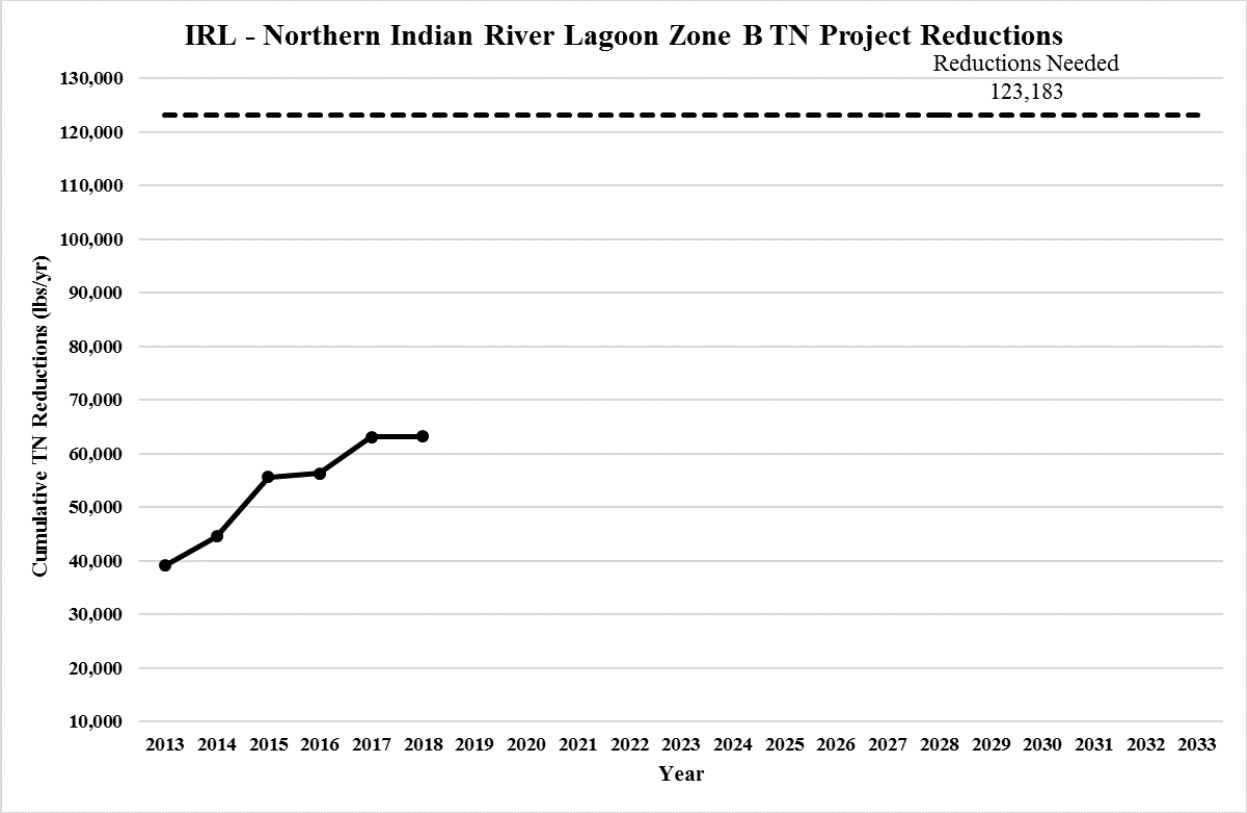



**Figure 36. North Indian River Lagoon Zone B TN project reductions progress**

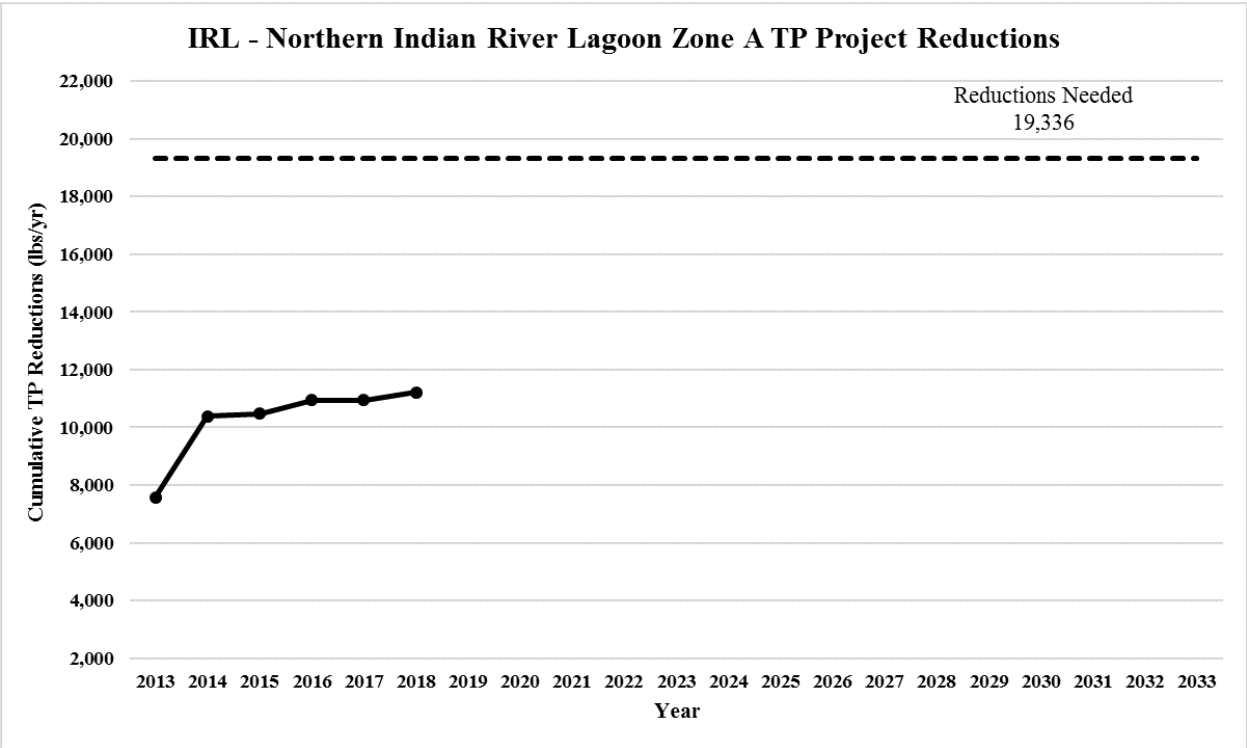



**Figure 37. North Indian River Lagoon Zone A TP project reductions progress**

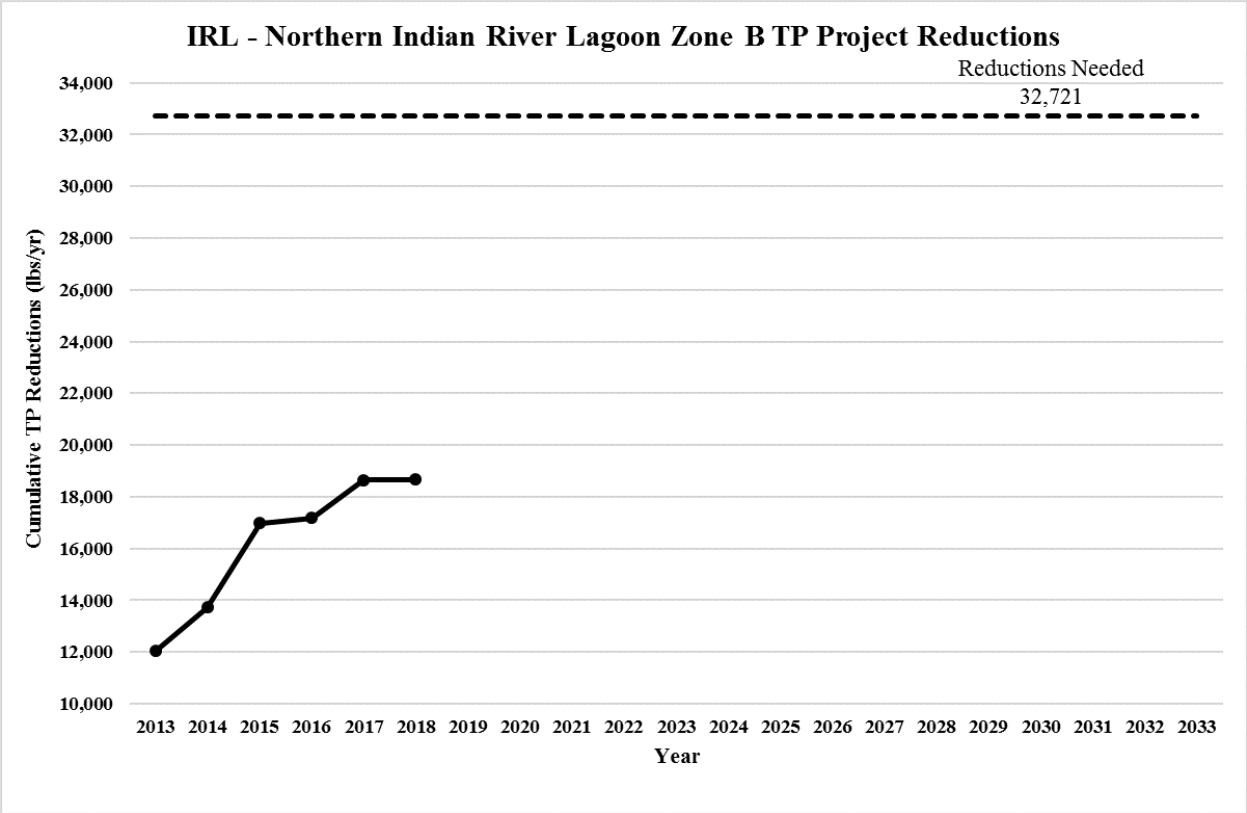



**Figure 38. North Indian River Lagoon Zone B TP project reductions progress**

## *Lake Jesup BMAP*

### BACKGROUND

Lake Jesup is one of the largest lakes in Central Florida and is part of the St. Johns River system. The lake has a surface area of 10,660 acres (16.7 square miles) and drains a watershed of 86,382 acres (135 square miles).

DEP identified Lake Jesup as impaired for nutrients. In 2006, DEP adopted TMDLs for TP and TN for the lake. The Lake Jesup BMAP was adopted in 2010 to implement the TP TMDL. Because of uncertainties in the nitrogen dynamics in the system, the TN TMDL was not explicitly addressed in the 2010 BMAP. However, many of the actions implemented to address TP also result in TN reductions.

### STATUS OF PROJECTS

Through December 31, 2018, 83 projects were completed. An additional 29 projects that are underway or planned were added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 50,201 lbs/yr, or 30 % of the reductions needed to meet the TN TMDL allocated to the Lake Jesup Basin, and total TP reductions of 23,061 lbs/yr, or 123 % of the reductions needed to meet the TP TMDL (**Figure 39**).

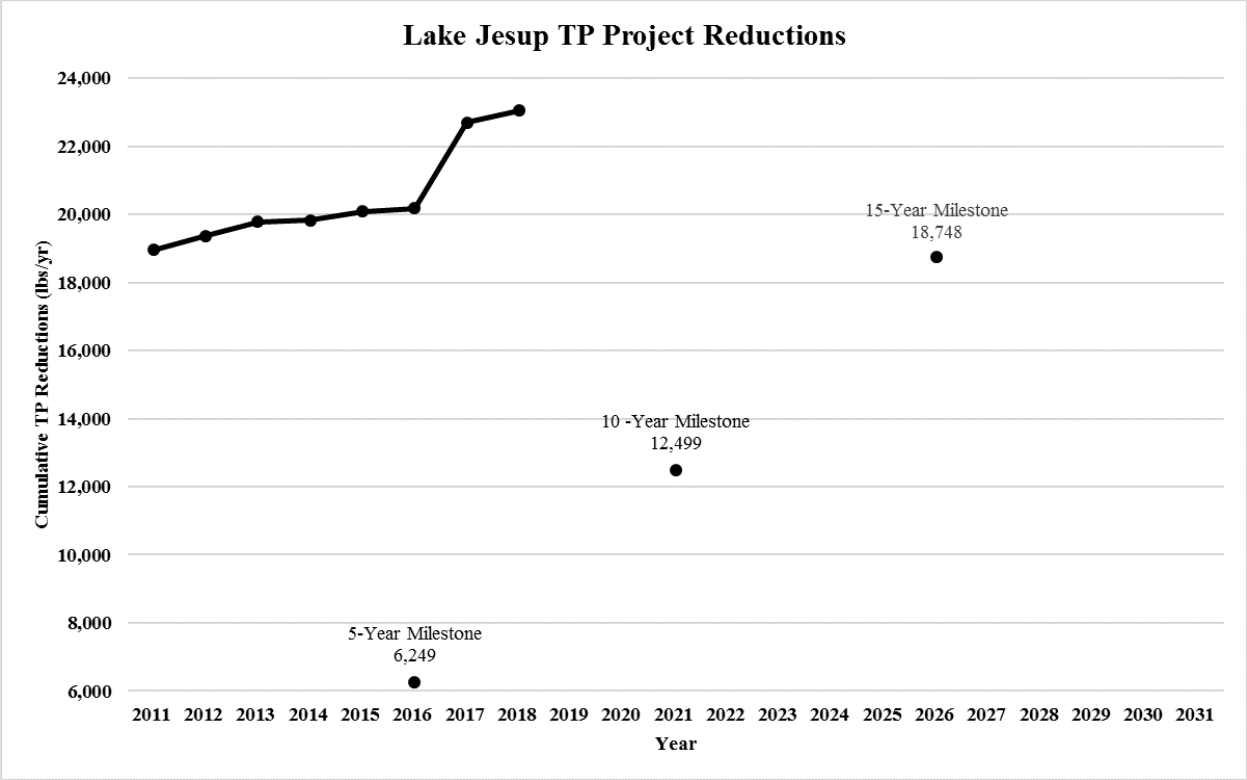



**Figure 39. Lake Jesup TN project reductions progress**

## *Lakes Harney, Monroe, Middle St. Johns River, and Smith Canal BMAP*

### BACKGROUND

The Lakes Harney and Monroe and Middle St. Johns River Basin covers an area of 241,928 acres. It includes the main stem of the Middle St. Johns River between the inlet of Lake Harney and the confluence of the St. Johns River with the Wekiva River. These river segments receive inflows from the Upper St. Johns River and several major tributaries, including the Econlockhatchee River, Deep Creek, and Lake Jesup.

The river segments, including two wide areas of the main stem of the river referred to as Lake Monroe and Lake Harney, were verified as impaired because of excessive nutrients and low DO. In 2009, DEP adopted nutrient and DO TMDLs with reduction targets for TN and TP for the Lakes Harney and Monroe and Middle St. Johns River Basin, including Smith Canal. The Smith Canal Watershed is located in the southern portion of the basin and drains an area of 10 square miles.

The Lakes Harney and Monroe and Middle St. Johns River BMAP was adopted in August 2012 to implement TN and TP reductions for the Lakes Harney and Monroe and Middle St. Johns River Basin to achieve the TMDLs. Since Smith Canal is located mostly in the basin, reductions made to achieve the basin TMDLs should also address the Smith Canal TMDL.

### STATUS OF PROJECTS

Through December 31, 2017, 94 projects were completed. An additional 6 projects that are underway or planned were added to the BMAP. The projects completed to date are estimated to achieve total TN reductions of 103,159 lbs/yr, or 118 % of the reductions needed to meet the portion of the TN TMDL allocated to the Lakes Harney and Monroe and Middle St. Johns River Basin, and total TP reductions of 27,428 lbs/yr, or 155 % of the reductions needed to meet the portion of the TP TMDL (**Figures 40** and **41** show the progress towards TN and TP project reductions, respectively).

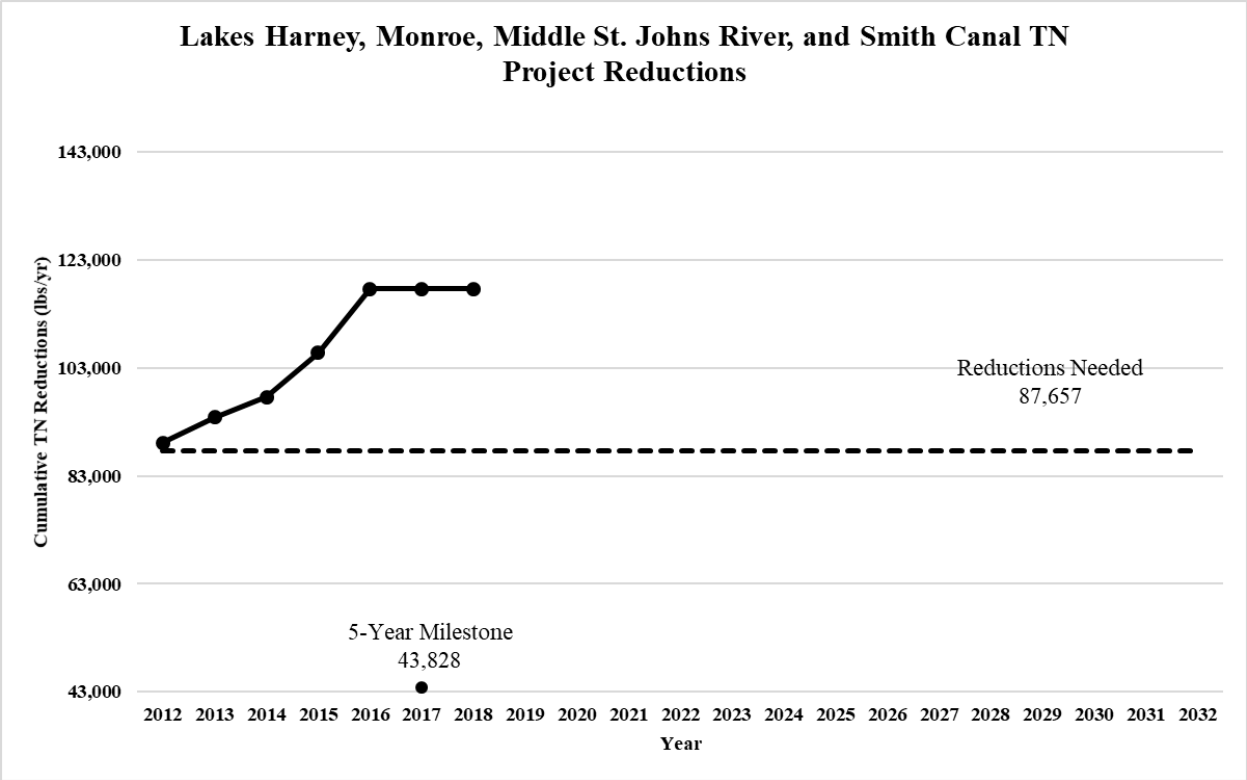



**Figure 40. Lakes Harney, Monroe, Middle St. Johns River, and Smith Canal TN project reductions progress**

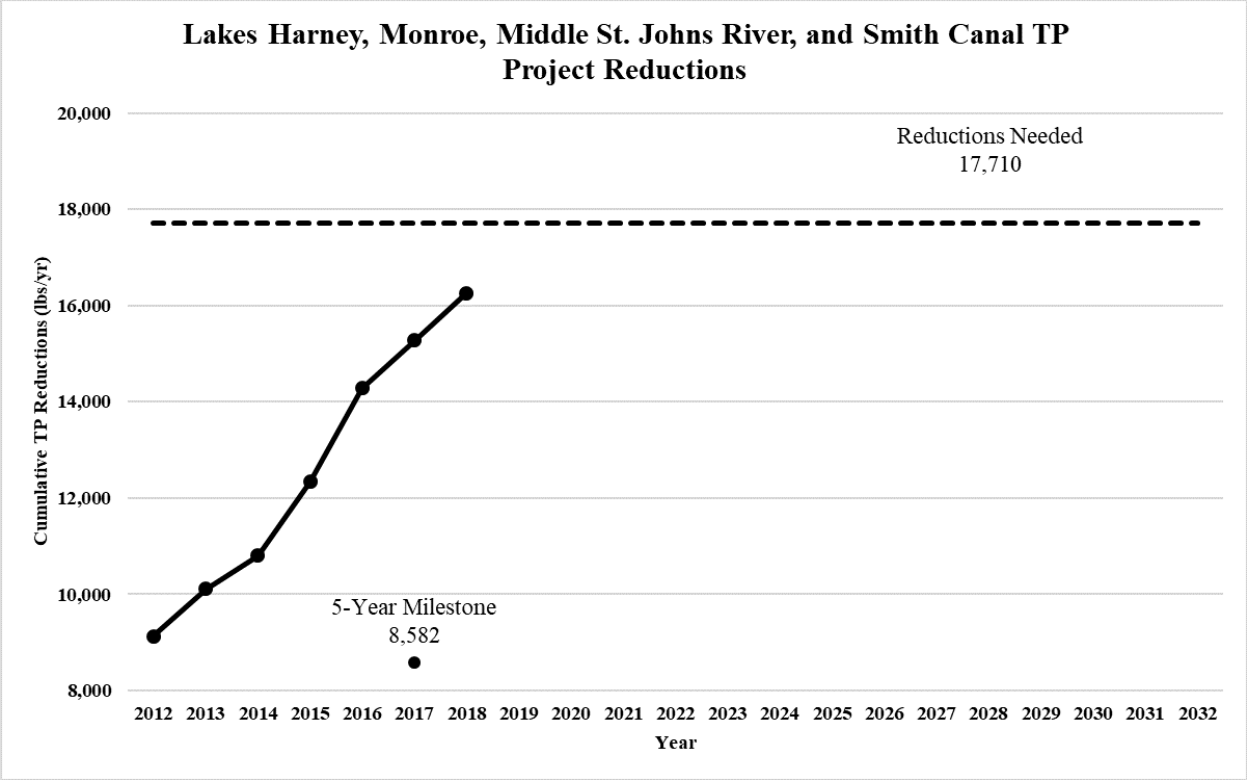



**Figure 41. Lakes Harney, Monroe, Middle St. Johns River, and Smith Canal TP project reductions progress**

## *Lower St. Johns River Main Stem BMAP*

### BACKGROUND

The Lower St. Johns River (LSJR) Main Stem is the 2,750-square-mile drainage area that flows north from the mouth of the Ocklawaha River to the Atlantic Ocean. This reach of the St. Johns River is 101 miles long.

DEP identified the LSJR as impaired for chlorophyll *a* in the freshwater section (Buffalo Bluff to Black Creek) and for DO in the marine section (Black Creek to the Atlantic Ocean near Mayport). DEP adopted TN and TP TMDLs to restore chlorophyll *a* levels in the freshwater section. It also adopted a TN TMDL in the marine section to restore DO levels. The LSJR Main Stem BMAP was adopted in October 2008 to implement these TMDLs.

### STATUS OF PROJECTS

Through December 31, 2018, 306 projects were completed. An additional 47 projects that are underway or planned were added to the BMAP. In the freshwater section, the projects completed to date are estimated to achieve total reductions of 742,260 lbs/yr of TN and 141,331 lbs/yr of TP, or 130 % of the TN reductions and 123 % of the TP reductions needed to meet the freshwater TN and TP TMDLs, respectively (**Figures 42** and **43**). In the marine section, the

projects completed to date are estimated to achieve total TN reductions of 2,556,272 lbs/yr, or 106 % of the TN reductions needed to meet the marine TN TMDL (**Figure 44**).

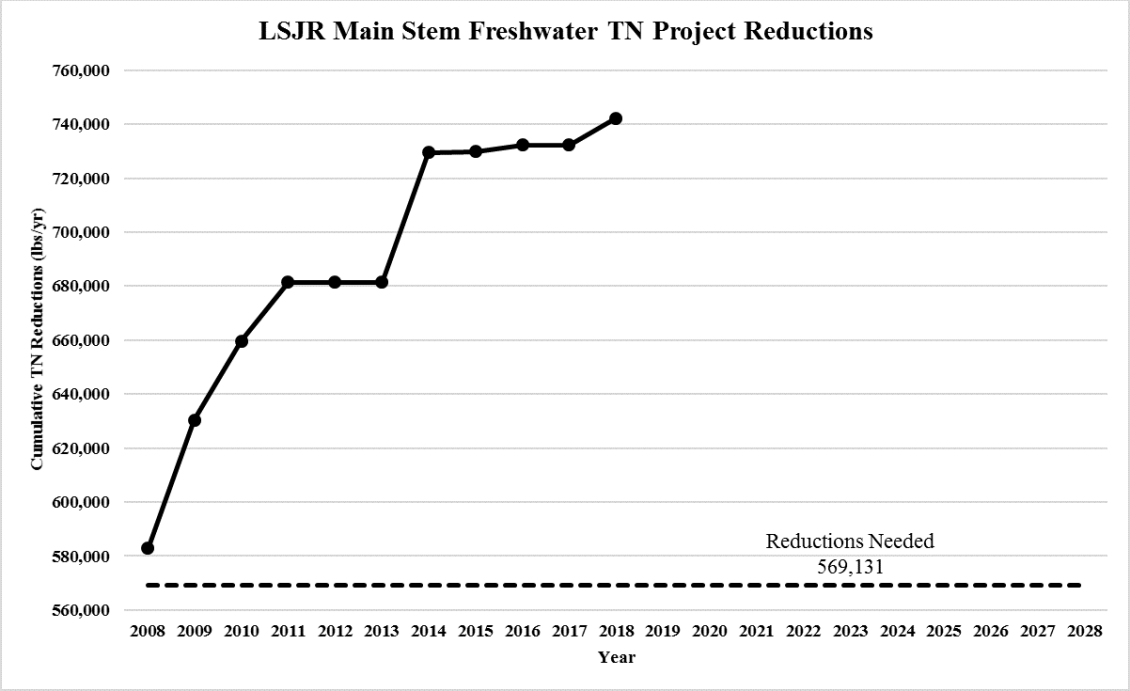



**Figure 42. LSJR Main Stem freshwater TN project reductions progress**

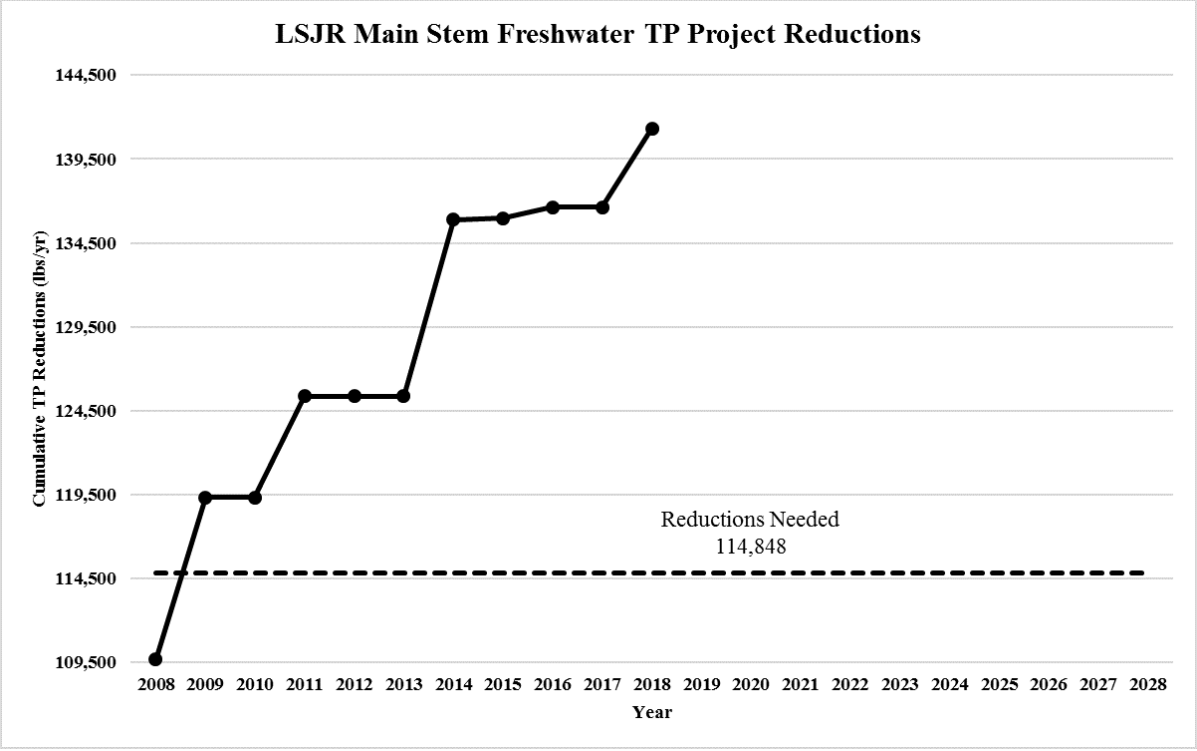



**Figure 43. LSJR Main Stem freshwater TP project reductions progress**

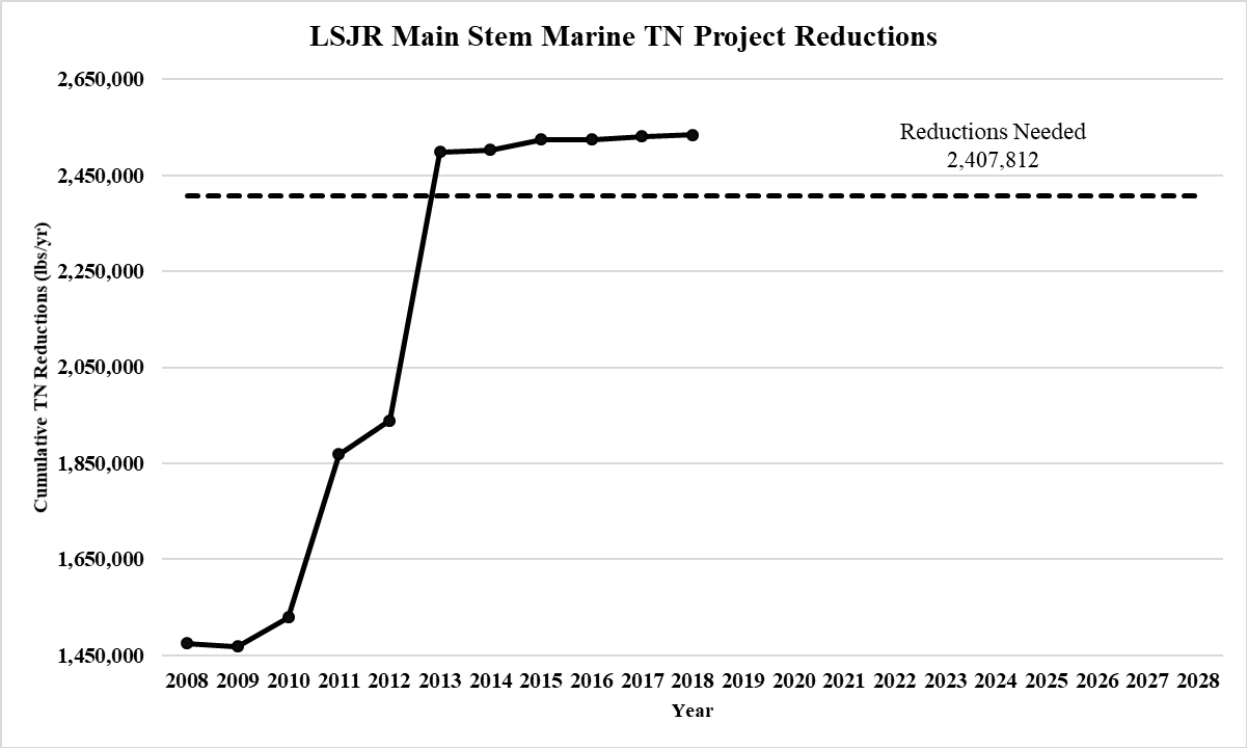



**Figure 44. LSJR Main Stem marine TN project reductions progress**

## *Orange Creek BMAP*

### BACKGROUND

The Orange Creek Basin covers an area of 501 square miles. Located largely in Alachua County, it includes the Paynes Prairie (including Alachua Sink, Tumblin Creek, Sweetwater Branch, and Lake Wauberg), Orange Lake, Newnans Lake, Lochloosa Lake, Hogtown Creek, and Orange Creek Watersheds.

This BMAP addresses TMDLs for 8 waterbodies. DEP identified Orange Lake, Lochloosa Lake, Newnans Lake, and Lake Wauberg as impaired for TP. Alachua Sink and Lochloosa Lake, Newnans Lake, and Lake Wauberg are impaired for TN.

DEP adopted individual TP TMDLs for Orange Lake, Newnans Lake, and Lake Wauberg in 2003 and Lochloosa Lake in 2017. The Alachua Sink TN TMDL was adopted in 2006 and the Lochloosa Lake TN TMDL in 2017. The Phase 1 Orange Creek BMAP was adopted in May 2008, and the Phase 2 BMAP was adopted in 2014. The Orange Creek Basin Amendment includes allocations for Newnans Lake, Orange Lake, and Lochloosa Lake, as well as updated nutrient budgets and project status for Alachua Sink and Lake Wauberg, and is proposed for adoption in 2019 to continue the implementation of the TP and TN TMDLs.

DEP identified fecal coliform impairments for Hogtown Creek, Sweetwater Branch, and Tumblin Creek and adopted fecal coliform TMDLs in 2003.

**STATUS OF PROJECTS**

Through December 31, 2018, 222 projects were completed. An additional 22 projects that are underway or planned were added to the BMAP. With the addition of 2018 projects, the following estimated loading reductions are the result of the completed implementation of stormwater management and agricultural projects in the lake basin, but do not include reductions from upstream inputs:

- 34 lbs/yr of TP and 164 lbs/yr of TN for Lake Wauberg.
- 135,299 lbs/yr of TN and 74,108 lbs/yr of TP for Alachua Sink.
- 3,720 lbs/yr of TP and 6,917 lbs/yr of TN for Orange Lake.
- 912 lbs/yr of TP and 5,090 lbs/yr of TN for Newnans Lake.
- 1,062 lbs/yr of TP and 6,002 lbs/yr of TN for Lochloosa Lake.

An additional 2,304 lbs/yr of TN were removed from Alachua Sink by projects in the Newnans Lake Watershed and 1,567 lbs/yr of TP were removed from Orange Lake by reductions in the Newnans Lake and Lochloosa Lake Watersheds. Total estimated completed project reductions for the Orange Creek Basin, including agricultural projects, were 200,199 lbs/yr of TN and 87,503 lbs/yr of TP (**Figures 45** and **46** show the TN and TP reductions, respectively).

Allocations to local entities are complete for Orange, Newnans, and Lochloosa Lakes. Nutrient reductions associated with projects for each entity will be calculated and aligned with the allocation methodology. Future reports will contain information about TN and TP reductions in the Orange Creek BMAP for each entity after the Amendment is adopted. The Orange Creek BMAP included projects that address fecal coliform TMDLs for urban streams. For 2008 through 2014, a monitoring, evaluation, and remediation protocol adopted for fecal coliform bacteria has resulted in a 59 %, 9 %, and 25 % reduction in the rate of exceedance of fecal coliform standards for Hogtown Creek, Sweetwater Branch, and Tumblin Creek, respectively, compared with their exceedance rates at the time of TMDL adoption.

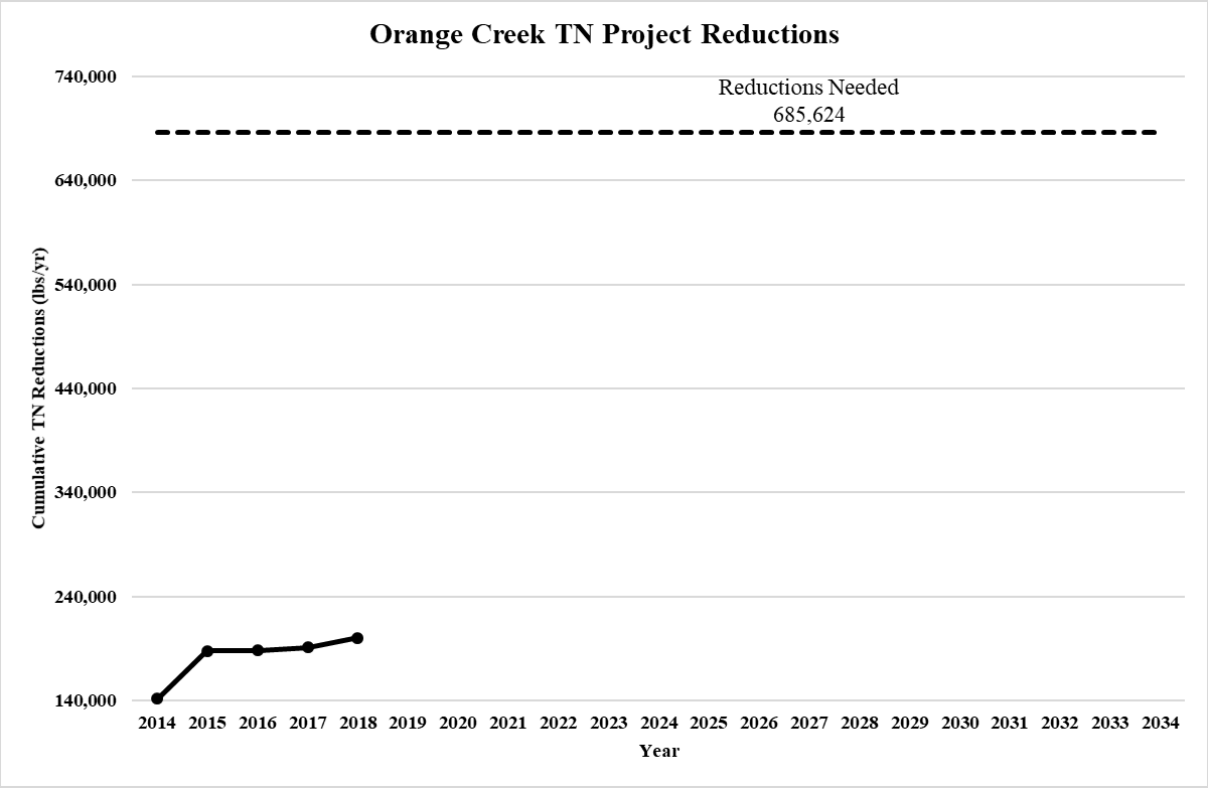



**Figure 45. Orange Creek TN project reductions progress**

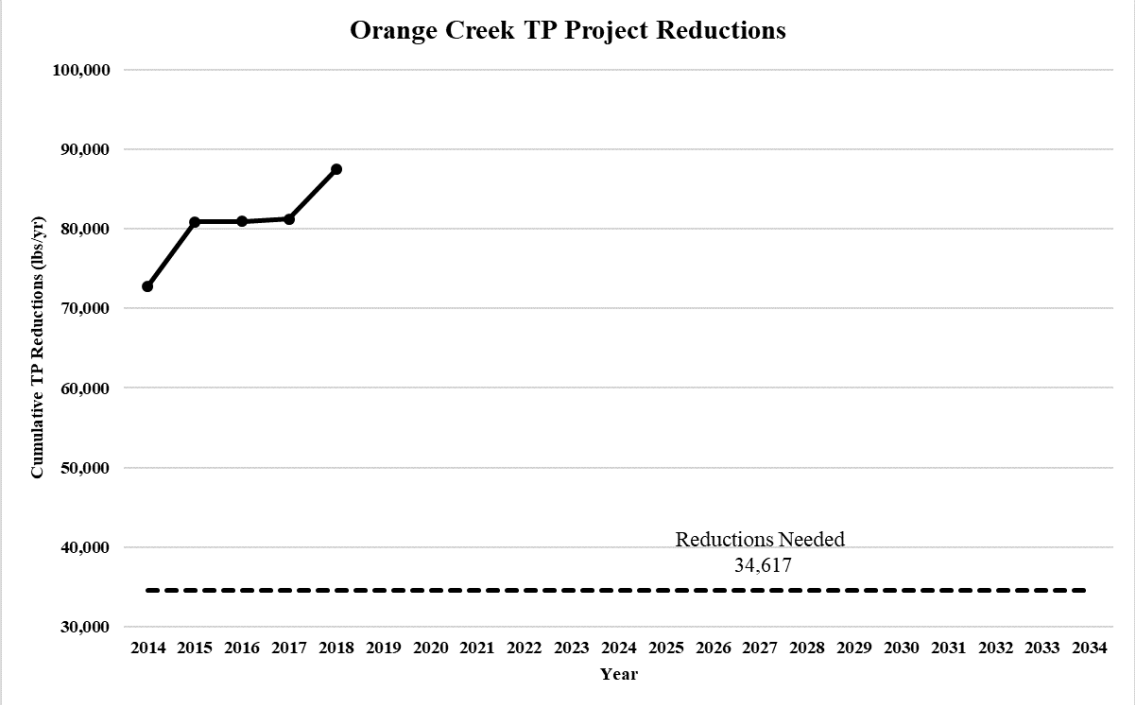



**Figure 46. Orange Creek TP project reductions progress**

## *Upper Ocklawaha BMAP*

### BACKGROUND

The Upper Ocklawaha River Basin covers an area of 878 square miles and includes the watersheds for Lake Apopka, the Palatlakaha River (Clermont Chain of Lakes), the Harris Chain of Lakes, and Lake Griffin, as well as stream segments that connect the lakes. The basin is located largely in Lake County.

The BMAP addresses TMDLs for 13 waterbodies. DEP identified the Palatlakaha River (north of State Road 50), Lake Apopka, Lake Carlton, Lake Beauclair, Lake Dora, Lake Eustis, Trout Lake, Lake Harris/Little Lake Harris, Lake Yale, and Lake Griffin as impaired for TP and adopted individual TP TMDLs in 2003 for all but Trout Lake, for which a TMDL was adopted in 2006. DEP identified Lake Denham, Marshall Lake, and Lake Roberts as impaired for TP and adopted TP TMDLs in 2017. The focus of restoration efforts in the basin is the reduction and management of TP loading. In Trout Lake, Lake Denham, Marshall Lake, Lake Roberts, and the Palatlakaha River, TN contributes to the problem, and BOD is also identified as a pollutant contributing to the impairment in the Palatlakaha River.

The first phase of the Upper Ocklawaha BMAP was adopted in 2007, and a second phase that identified priority waterbodies was adopted in July 2014. An Amendment that includes allocations for priority waterbodies based on updated land use information (updated from 1995 to 2009) and the three 2017 adopted TMDLs, as well as updated project status and nutrient budgets for the remaining waterbodies, is proposed for adoption in 2019 to continue the implementation of the TP TMDLs. Priority waterbodies include Trout Lake, Lake Carlton, the Palatlakaha River, Lake Harris, and Lake Yale.

### STATUS OF PROJECTS

Through December 31, 2018, 360 projects were completed. An additional 39 projects, including agricultural projects, that are underway or planned were added to the BMAP. Many of the projects in the basin are focused on reducing the internal lake recycling of TP. A substantial portion (more than 90 %) of the estimated 177,557 lbs/yr reduction for TP achieved in 2018 for 13 TMDLs is attributed to projects that address in-lake TP recycling. **Figure 47** shows the progress towards TP project reductions. TP loading reductions in subsequent reports will include only watershed reductions of TP. In-lake recycling TP reductions are not directly comparable to loading reductions from the watershed.

Allocations are complete for the Upper Ocklawaha BMAP, and nutrient reductions associated with projects for each entity will be calculated to align with the allocation methodology. Once this is complete, future reports will contain information about TN and TP reductions in the Upper Ocklawaha BMAP for each entity.

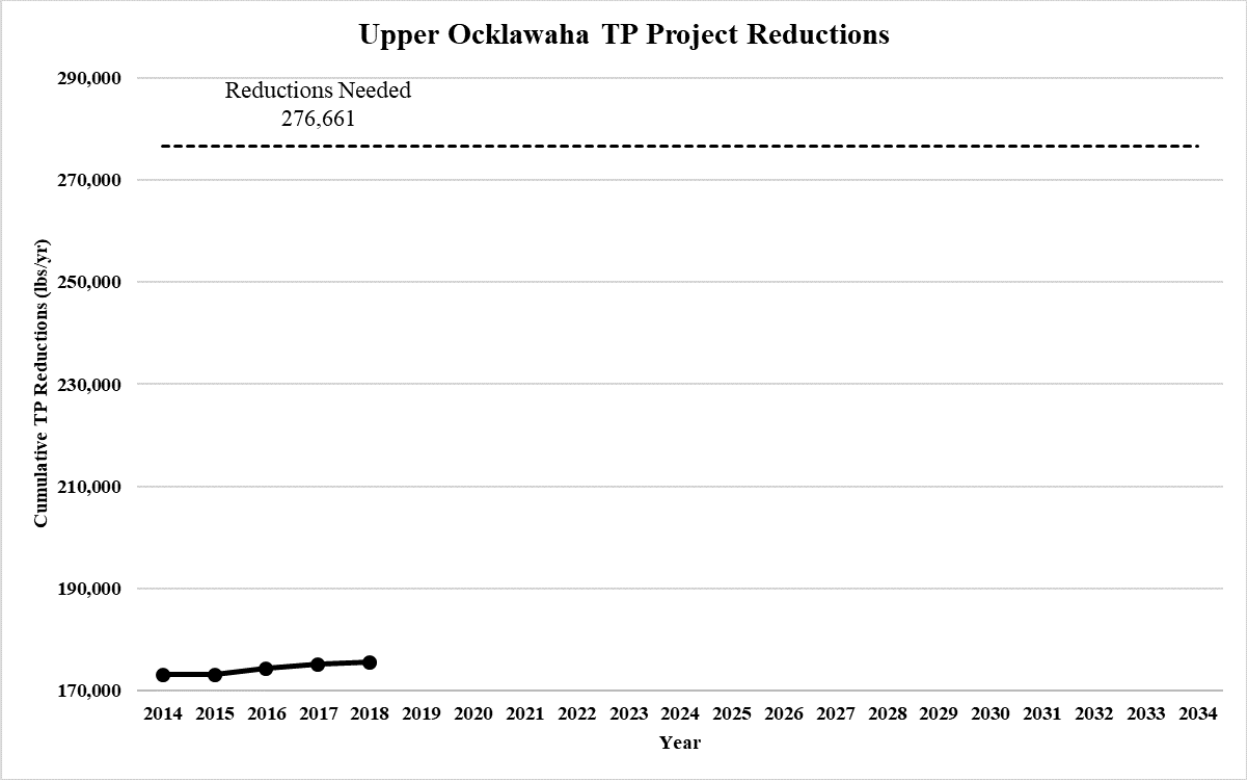



**Figure 47. Upper Ocklawaha TP project reductions progress**

## Fecal Indicator Bacteria BMAPs

### *Introduction*

DEP is dedicated to identifying and reducing human health risks associated with bacteria. Along with the revised standards (**Figure 48**), DEP has coupled fecal indicator bacteria (FIB) analytes with source-specific analytes for impairment determinations. **Figure 49** shows the locations of FIB BMAPs statewide.

It is important to note that swimming beaches enrolled in the Florida Department of Health's Healthy Beaches Program are monitored by that department and assessed differently than other recreational waters. Healthy Beaches meet the state criterion if they are under advisories by the Florida Department of Health for 20 days or less each calendar year (January 1 through December 31) of the 7.5-year verified period. The restoration goal for each FIB BMAP is to meet the state's bacteria standards.

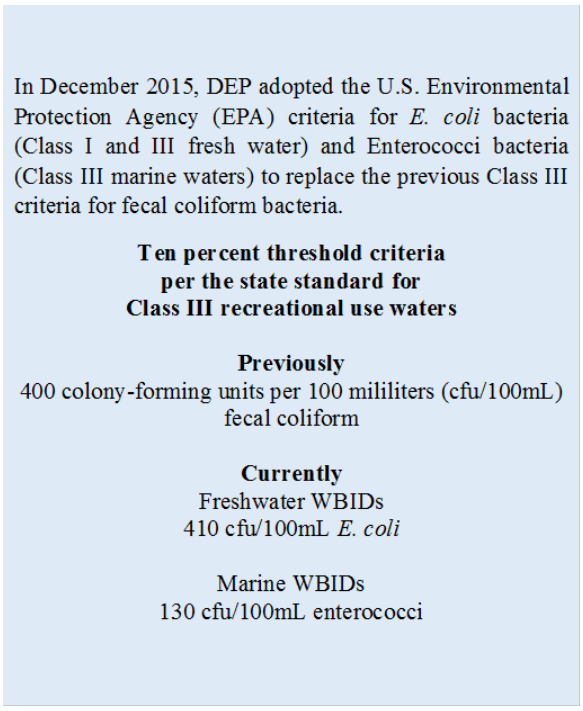



**Figure 48. FIB revised standards**

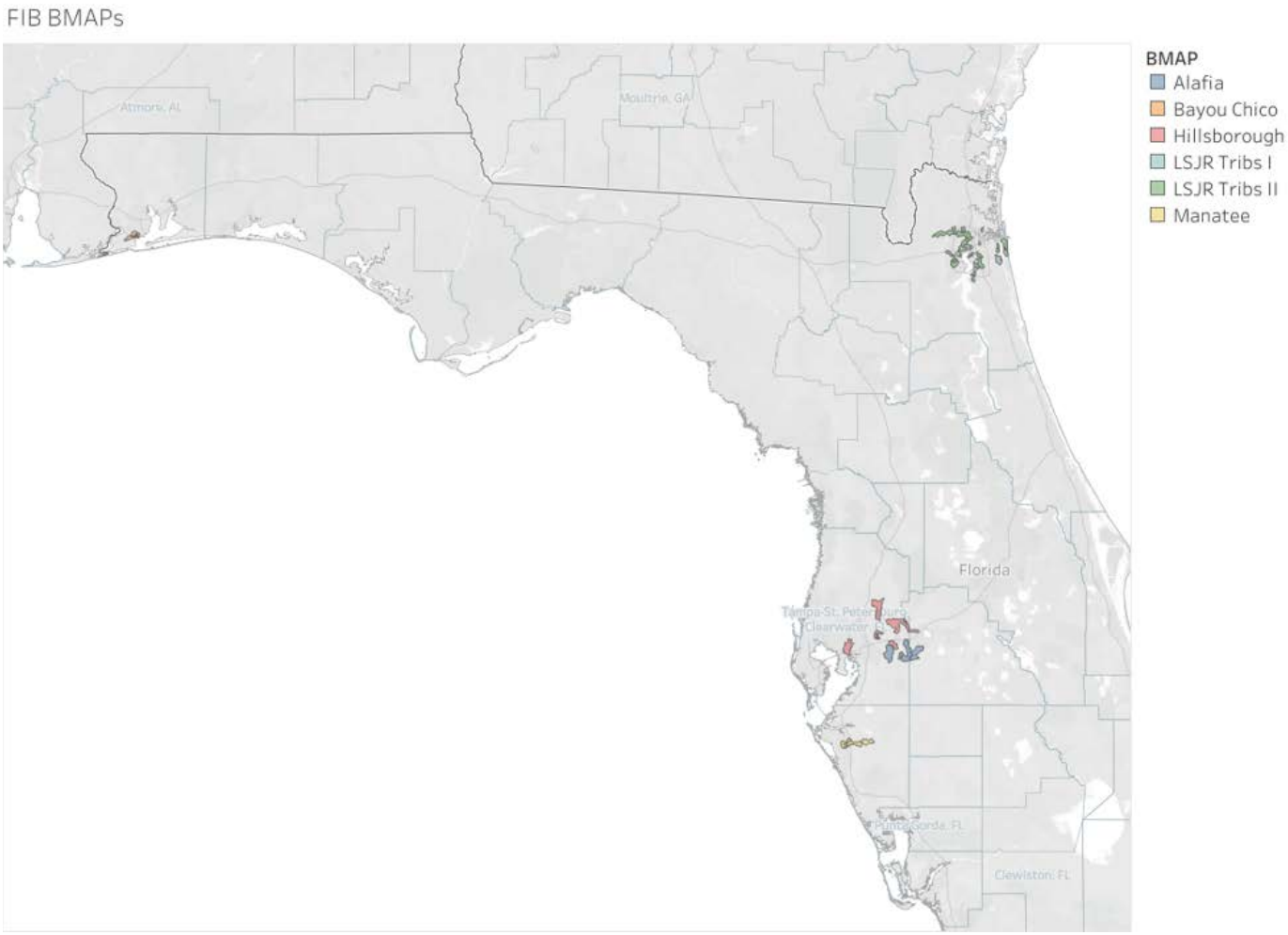



**Figure 49. Map of FIB BMAPs in Florida**

In 2017, DEP piloted an intensive source identification monitoring strategy in six impaired waterbodies across the state. The strategy was designed to identify hot spots and areas in watersheds suspected to contain sources of untreated human waste. The suite of human waste indicators used comprised chemical tracers (sucralose and acetaminophen), a human biological marker (HF-183), a dye called propidium monoazide, and the applicable FIB (*E. coli* or Enterococci).

The study demonstrated that entities can use this strategy to narrow down the size of the contributing watershed suspected of containing sources that are actively contributing FIB to impaired waters. Further investigative techniques such as dye traces, smoke tests, and camera deployment can be used to identify the exact location of some sources. However, some source locations may be more difficult to identify. As anthropogenic sources are identified, they are eliminated through existing remediation policies and processes. Lessons learned from this pilot study are guiding collaborative source investigation and monitoring efforts in FIB BMAPs. This resource-intensive work can be used to guide future decisions about common source types and aims to prevent future fecal waste loading.

To guide future BMAP efforts on high-risk sources of bacteria, DEP gathered source-specific indicator data. In 2018, DEP conducted ambient monitoring of 51 impaired waterbodies comprising the following FIB BMAPs: Bayou Chico (**Figure 50**), Lower St. Johns River Tributaries (**Figure 51**), Hillsborough River Tributaries and Alafia River (**Figure 52**), Manatee River (**Figure 53**). Samples were analyzed for *E. coli* in fresh water, Enterococci in marine water, and chemical tracers of human waste (i.e., sucralose and acetaminophen). As the year progressed, DEP Laboratory capabilities expanded to include testing for ibuprofen, naproxen, and hydrocodone as chemical tracer analyses. Samples for which FIB exceeded the applicable ten percent threshold value were also analyzed for HF-183, an indicator of human waste, which is a high-risk source of bacteria. If HF-183 was not present, then the sample was analyzed for other waste types starting with ruminants (which would indicate livestock as a potential source). If ruminant waste was not present, samples were analyzed for gull and wading bird waste (which would indicate that wildlife contribute to the impairment).

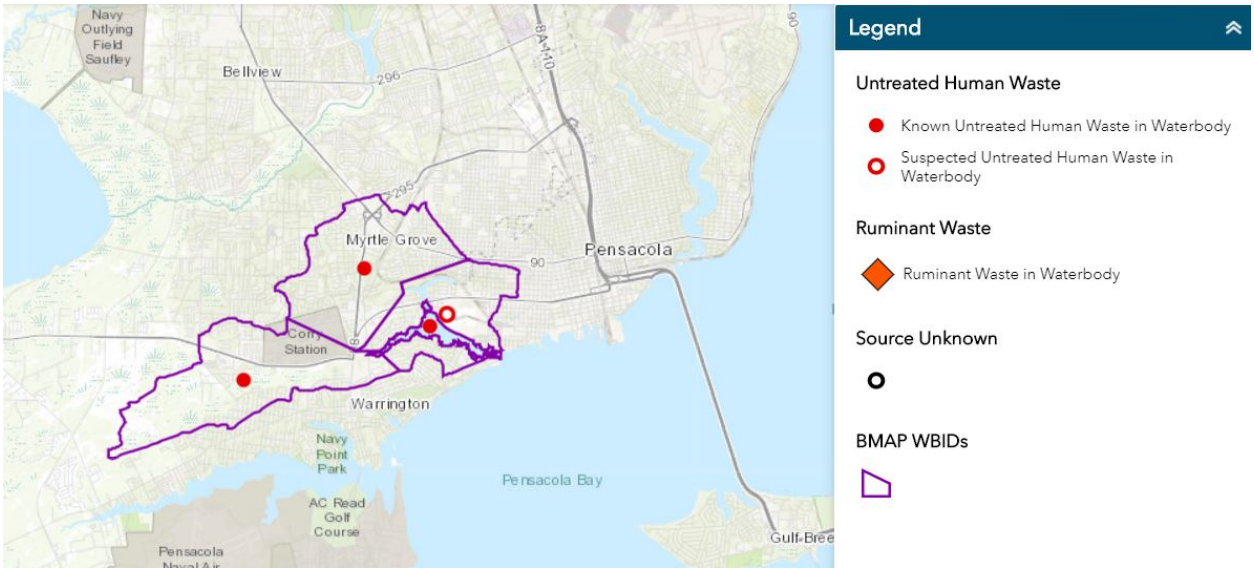



**Figure 50. Bayou Chico FIB source tracking results**

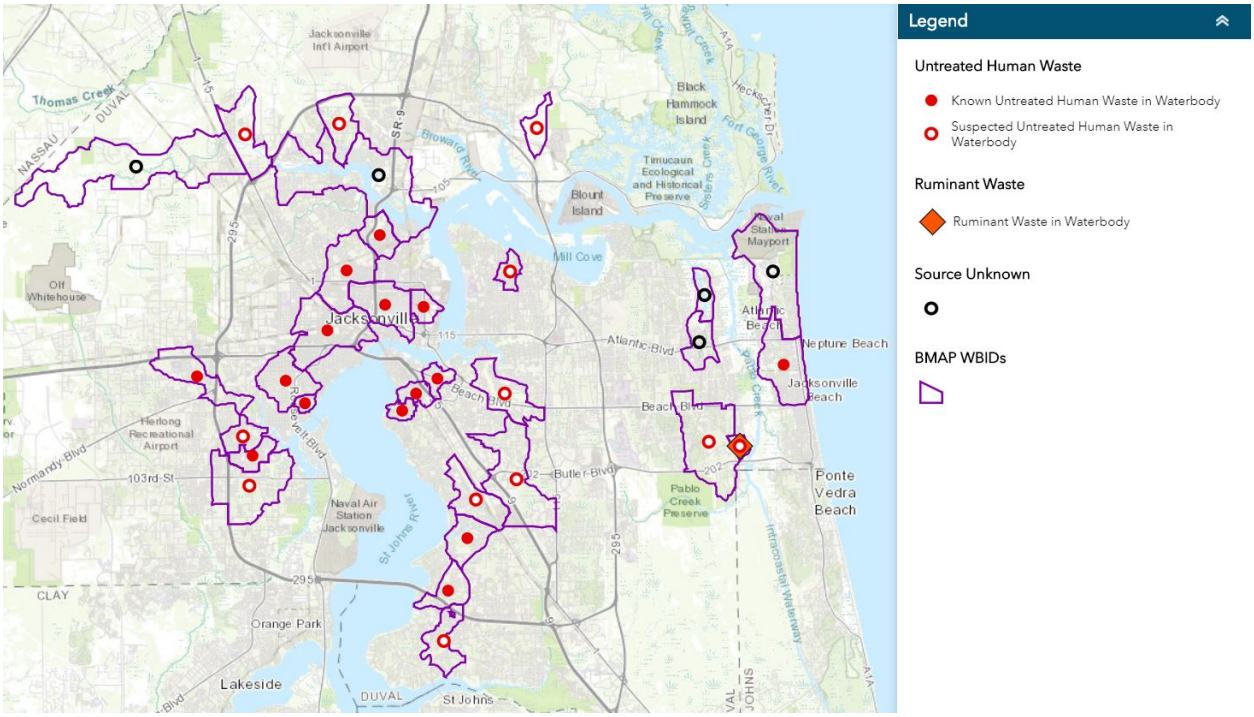



**Figure 51. Lower St. Johns River Tributaries I and II FIB source tracking results**

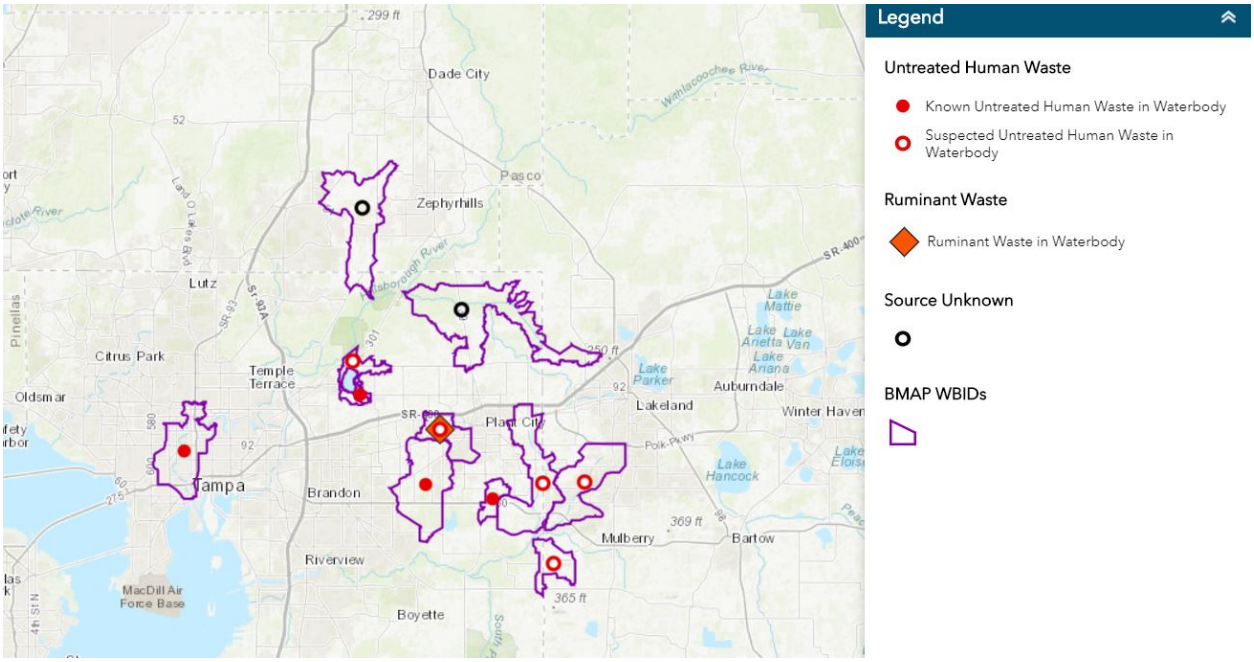



**Figure 52. Hillsborough River Tributaries and Alafia River FIB source tracking results**

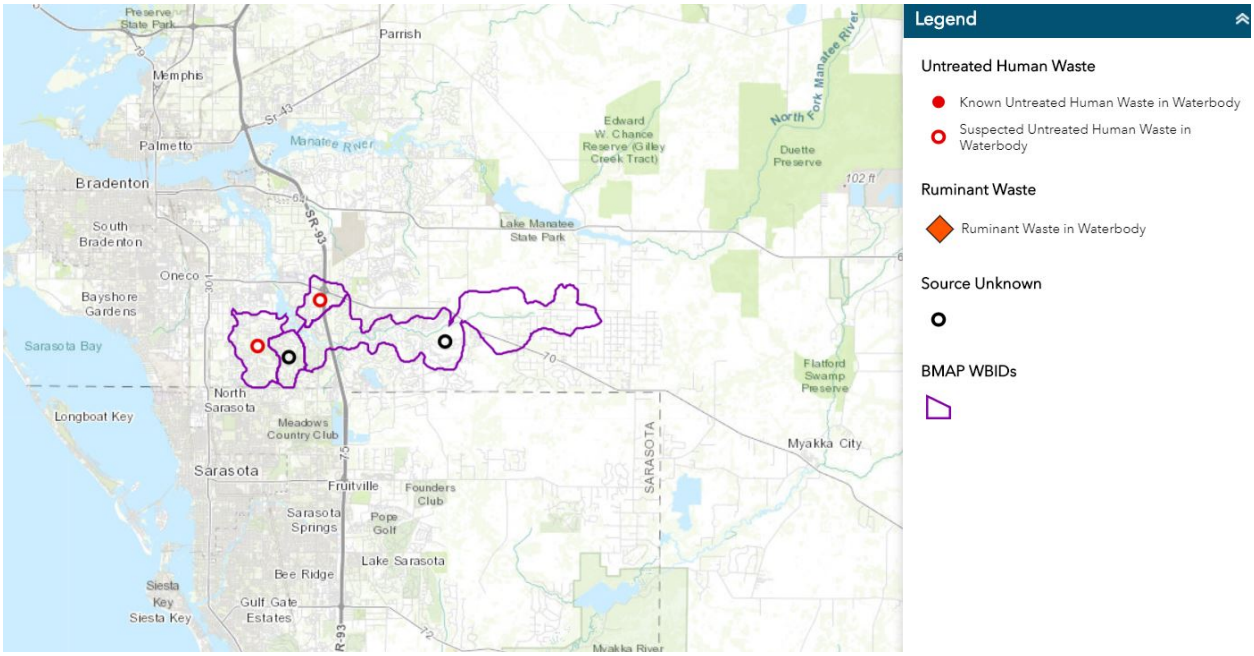



**Figure 53. Manatee River FIB source tracking results**

The figures above condense the 2018 results into a visual representation of whether high-risk sources of bacteria were detected (i.e., human or ruminant waste). If a high-risk waste source was indicated on at least three separate sampling dates or locations in the watershed, the map displays either a solid red circle symbol (known untreated human waste presence) or an orange diamond symbol (ruminant waste presence). Based on these results, DEP is working with corresponding local entities to identify BMAP projects that will focus on locating and eliminating high-risk sources.

Source identification is resource intensive, and it will take a large commitment of time and funding to pursue further source identification efforts (monitoring and investigations) and specialized laboratory analyses. Where septic systems are a suspected source, the Florida Department of Health will communicate with property owners to eliminate discharges. If commercial livestock appear to be contributing waste, the Florida Department of Agriculture and Consumer Services will work with agricultural producers to follow best management practices. In cases where sanitary sewer is a contributor, utilities will take immediate action to repair leaks in utility-owned infrastructure or, where private infrastructure is the source, entities will mandate that property owners make repairs. Note that no action will be taken to reduce waste contributions from native wildlife.

## *Alafia River BMAP*

### BACKGROUND

The Alafia River Basin covers an area of more than 410 square miles in Hillsborough and Polk Counties. In portions of the basin, FIB and nutrients were identified as the primary pollutants causing impairment. In 2004, DEP adopted a TMDL for Thirty Mile Creek (WBID 1639). It later adopted TMDLs for Mustang Ranch Creek (WBID 1592C), Turkey Creek (WBID 1578B),

English Creek (WBID 1552), and Poley Creek (WBID 1583) in 2009, as well as Alafia River Above Hillsborough Bay Tidal Segment (WBID 1621G) in 2011.

The BMAP, adopted in 2014, includes the implementation of FIB source identification efforts such as Walk the Watershed, also known as Walk the WBID. It requires production agricultural operations in BMAP WBIDs to participate in the Florida Department of Agriculture and Consumer Services Best Management Practices Program or elect to perform water quality monitoring of their operations. This BMAP addresses four fecal coliform TMDLs (WBIDs 1578B, 1592C, 1552, and 1583) and three DO and nutrient TMDLs (WBIDs 1621G, 1592C, and 1639).

### STATUS OF PROJECTS

From April 2014 through December 2018, 19 projects were reported as completed. Of these, 13 were implemented prior to BMAP adoption and 10 are ongoing, maintenance activities. During this reporting period, from January 1, 2018, through December 31, 2018, 8 new projects were added to the BMAP.

### FREQUENCY OF EXCEEDANCE

DEP adopted the U.S. Environmental Protection Agency criteria for *E. coli* bacteria (Class I and III fresh water) in waters and Enterococci bacteria (Class III marine water) to replace the existing criteria for fecal coliform bacteria. **Table 2** lists the frequency of exceedance of the ten percent threshold fecal coliform criterion from the Cycle 3 assessment verified period (January 1, 2007, to June 30, 2014) (before BMAP adoption in 2014). The table also shows the frequency of exceedance of the ten percent threshold of fecal coliform and of the new criteria (either *E. coli* or Enterococci) for the period from January 1, 2011, to June 30, 2018. These data are based on the available entries in the WIN on December 31, 2018, used in Impaired Surface Waters Rule (IWR) Run 55. It is likely that more data were collected than what was available at the time of the report preparation, and the numbers listed in the table below are subject to change, pending an analysis of the complete dataset once uploaded to WIN.

**Table 2. Percent exceedance by WBID in the Alafia River BMAP**

| BMAP | WBID | Waterbody Name | January 1, 2007, to June 30, 2014, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance *E. coli* | January 1, 2011, to June 30, 2018, % Exceedance Enterococci |
|---|---|---|---|---|---|---|
| **Alafia** | 1578B | Turkey Creek | 51 | 54 | 63 | N/A |
| **Alafia** | 1592C | Mustang Ranch Creek | 75 | 47 | 57 | N/A |
| **Alafia** | 1552 | English Creek | 42 | 40 | 38 | N/A |
| **Alafia** | 1583 | Poley Creek | 66 | 69 | 33 | N/A |

## *Bayou Chico BMAP*

### BACKGROUND

Bayou Chico has a 10-square-mile drainage area and a water surface area of 0.4 square miles. DEP identified the Bayou Chico Watershed as impaired for fecal coliform bacteria. In February 2008, DEP adopted the Bayou Chico Watershed TMDL, which called for a 61 % reduction in fecal coliform bacteria. The Bayou Chico BMAP was adopted in August 2011 and addresses Bayou Chico (WBID 846), Jones Creek (WBID 846A), Jackson Creek (WBID 846B), Bayou Chico Drain (also known as Maggie's Ditch) (WBID 846C), Bayou Chico Beach (WBID 846CB), and Sanders Beach (WBID 848DA).

### STATUS OF PROJECTS

From August 2011 through December 2018, 83 projects were reported as completed. Of these 83 completed projects, 28 were implemented prior to BMAP adoption and 23 are ongoing, maintenance activities. During this reporting period, from January 1, 2018, through December 31, 2018, 3 new projects were added to the BMAP.

### FREQUENCY OF EXCEEDANCE

DEP adopted the U.S. Environmental Protection Agency criteria for *E. coli* bacteria (Class I and III fresh water) in waters and Enterococci bacteria (Class III marine water) to replace the existing criteria for fecal coliform bacteria.

**Table 3** lists the frequency of exceedance of the ten percent threshold for the old fecal coliform criteria from the Cycle 2 assessment verified period (January 1, 2003, to June 30, 2010) (before BMAP adoption in 2011) for fecal coliform. The table also shows the frequency of exceedance of the new ten percent threshold criteria for Jackson Creek, Bayou Chico, and Bayou Chico Drain. Based on the January 1, 2011, to June 30, 2018 data, these three waterbodies exceed the ten percent threshold criteria for either *E. coli* or Enterococci. After a 2017 evaluation of the salinity data from the original Jones Creek water quality station at the mouth of the river, DEP and Escambia County determined the station is more representative of Bayou Chico, a marine waterbody, than Jones Creek, a fresh waterbody. New, more representative water quality stations are being monitored to provide assessment data for Jones Creek. These data are based on the available entries in the WIN on December 31, 2018, used in IWR Run 55. It is likely that more data were collected than what was available at the time of the report preparation, and the numbers below are subject to change pending an analysis of the complete dataset once uploaded to WIN.

**Table 3. Percent exceedance by WBID in the Bayou Chico BMAP**

| BMAP | WBID | Waterbody Name | January 1, 2003, to June 30, 2010, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance *E. coli* | January 1, 2011, to June 30, 2018, % Exceedance Enterococci |
|---|---|---|---|---|---|---|
| **Bayou Chico** | **846A** | **Jones Creek** | **23** | **N/A** | **67** | **N/A** |
| **Bayou Chico** | **846B** | **Jackson Creek** | **32** | **41** | **33** | **N/A** |
| **Bayou Chico** | **846C** | **Bayou Chico Drain** | **19** | **27** | **N/A** | **38** |
| **Bayou Chico** | **846** | **Bayou Chico** | **19** | **25** | **N/A** | **34** |

**Table 4** lists the number of beach advisories per year from January 1, 2010, through June 30, 2018. Based on these data, Bayou Chico Beach exceeded the number of advisory days allowed (20 days of advisories from January 1 to December 31) each year, and Sanders Beach exceeded the number of advisory days allowed in 2 of the last 7.5 years. **Figure 54** shows, with the exception of 2017, a significant decrease in the number of advisory days since 2010 at Bayou Chico Beach. Since 2006, the number of advisory days at Sanders Beach has often been near or under the 20-day annual maximum. The reason for increases in the number of beach advisory days in 2017 is not known at the time of this report's publication.

**Table 4. Beach advisories for the Bayou Chico BMAP**

[1] Date range: January 1, 2018, to June 30, 2018.
Note: Numbers shaded and in bold exceed the number of advisory days allowed per year.

| WBID | Waterbody Name | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 1 |
|---|---|---|---|---|---|---|---|---|---|
| **848DA** | Sanders Beach | 0 | **21** | 0 | 5 | 18 | 0 | **62** | 5 |
| 846CB | Bayou Chico Beach | **105** | **63** | **71** | **81** | **86** | **57** | **153** | **27** |

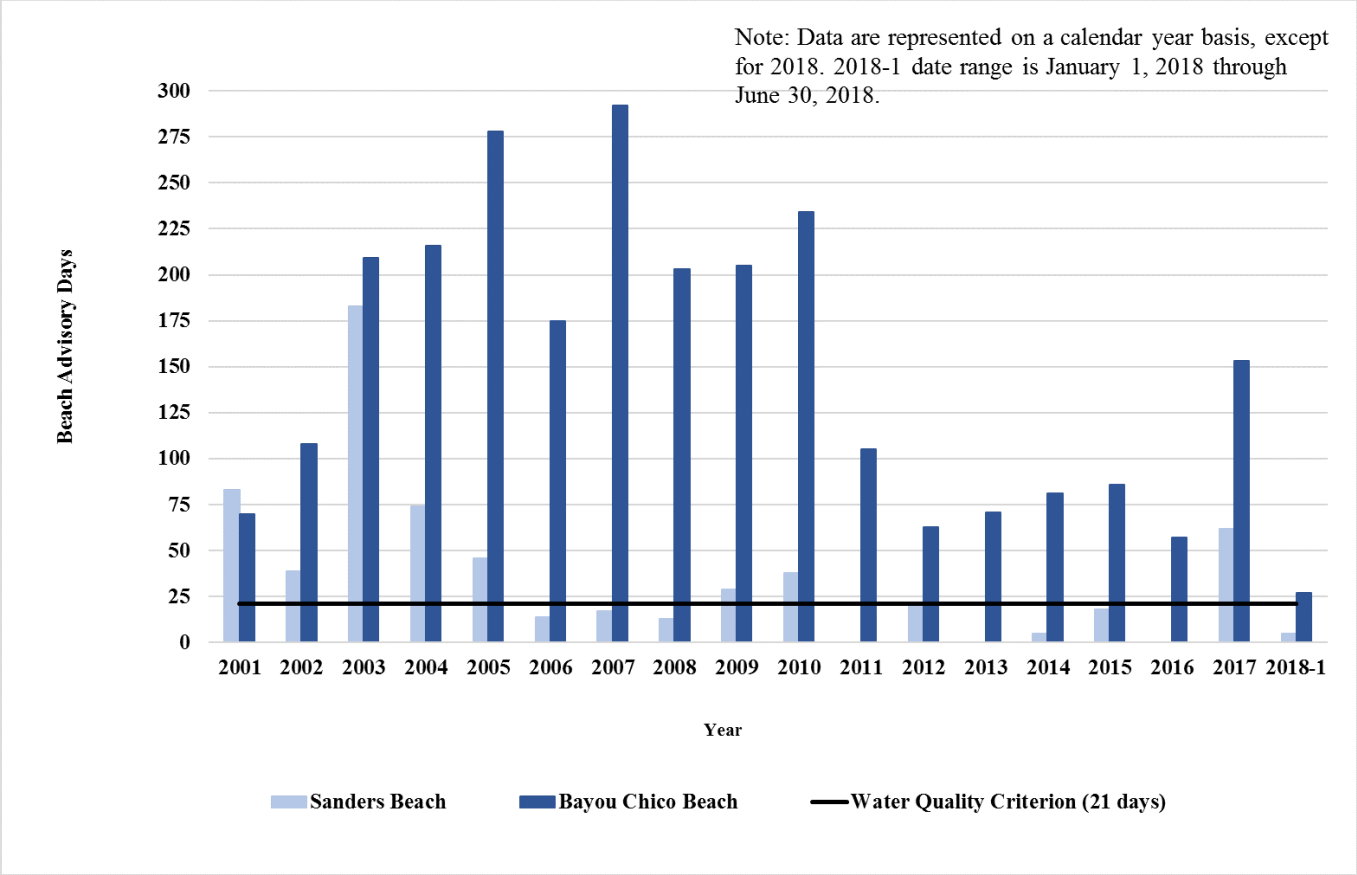



**Figure 54. Beach advisory days in the Bayou Chico BMAP**

## *Hillsborough River BMAP*

### BACKGROUND

The Hillsborough River drains more than 690 square miles. The Hillsborough River BMAP was adopted in 2009 to implement six fecal coliform TMDLs in the Hillsborough River Basin: Lower Hillsborough River (WBID 1443E), and intermittently flowing tributaries Blackwater Creek (WBID 1482), New River (WBID 1442), Spartman Branch (WBID 1561), Baker Creek (WBID 1522C), and Flint Creek (WBID 1522A). The basins addressed by the BMAP include the urban and suburban areas of Tampa, Plant City, and Lakeland, as well as agricultural and natural lands.

### STATUS OF PROJECTS

From June 2009 through December 2018, 170 projects were reported as completed. Of these projects, 55 were implemented prior to BMAP adoption and 106 are ongoing, maintenance activities. During this reporting period, from January 1, 2018, through December 31, 2018, 20 new projects were added to the BMAP.

### FREQUENCY OF EXCEEDANCE

DEP adopted the U.S. Environmental Protection Agency criteria for *E. coli* bacteria (Class I and III fresh water) in waters and Enterococci bacteria (Class III marine water) to replace the existing criteria for fecal coliform bacteria. **Table 5** lists the frequency of exceedance of the ten percent threshold fecal coliform criterion for the Cycle 2 assessment verified period (January 1, 2001, to June 30, 2008) (before BMAP adoption in 2009) and from January 1, 2011, to June 30, 2018. The table also shows the frequency of exceedance of the ten percent threshold under the new criteria (*E. coli*) for the period from January 1, 2011, to June 30, 2018. These data are based on the available entries in the WIN on December 31, 2018 used in IWR Run 55. More data were likely collected than what was available at the time of the report preparation, and the numbers listed in the table below are subject to change pending an analysis of the complete dataset once uploaded to WIN.

**Table 5. Percent exceedance by WBID in the Hillsborough River BMAP**

| BMAP | WBID Number | Waterbody Name | January 1, 2001, to June 30, 2008, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance *E. coli* | January 1, 2011, to June 30, 2018, % Exceedance Enterococci |
|---|---|---|---|---|---|---|
| Hillsborough | 1443E | Lower Hillsborough River | 22 | 16 | N/A | 44 |
| Hillsborough | 1561 | Spartman Branch | 27 | 16 | 25 | N/A |
| Hillsborough | 1522C | Baker Creek | 33 | 13 | 38 | N/A |
| Hillsborough | 1522A | Flint Creek | 25 | 34 | 57 | N/A |
| Hillsborough | 1482 | Blackwater Creek | 25 | 24 | 7 | N/A |
| Hillsborough | 1442 | New River | 43 | 22 | 50 | N/A |

## *Lower St. Johns River Tributaries BMAPs I and II*

### BACKGROUND

Fecal coliform bacteria were identified as the primary pollutant causing impairment in portions of the Lower St. Johns River Basin. In 2006, 2009, and 2010, DEP adopted fecal coliform TMDLs for 25 verified impaired waterbodies in Duval County, all in the Lower St. Johns River Basin. DEP adopted 2 BMAPs to implement the fecal coliform TMDLs in the basin. BMAP I was adopted in December 2009 and addresses the 10 most impaired tributaries. BMAP II was adopted in August 2010 and addresses the remaining 15 impaired tributaries.

### STATUS OF PROJECTS

From December 2009 through December 2018, 189 projects within the BMAP I WBIDs were reported as completed. Of these projects, 103 were implemented prior to BMAP adoption and 97 are ongoing, maintenance activities. During this reporting period, from January 1, 2018, through December 31, 2018, for BMAP I 4 new projects were added.

From August 2010 through December 2018, 530 projects within the BMAP II WBIDs were reported as completed. Of these projects, 351 were implemented prior to BMAP adoption and 152 are ongoing, maintenance activities. During this reporting period, from January 1, 2018, through December 31, 2018, for BMAP II 19 new projects were added.

### FREQUENCY OF EXCEEDANCE

DEP adopted the U.S. Environmental Protection Agency criteria for *E. coli* bacteria (Class I and III fresh water) in waters and Enterococci bacteria (Class III marine water) to replace the existing criteria for fecal coliform bacteria. The frequency of exceedance of the ten percent threshold fecal coliform criterion for the Cycle 2 assessment verified period (January 1, 2001, to June 30, 2008) (before BMAP adoptions in 2009 and 2010) and from January 1, 2011, to June 30, 2018, for the BMAP I (see **Table 6**) and BMAP II (see **Table 7**) waterbodies. The table also shows the frequency of exceedance under the ten percent threshold of the new criteria (either *E. coli* or Enterococci) for the period from January 1, 2011, to June 30, 2018. These data are based on the available entries in the WIN database on December 31, 2018, used in IWR Run 55. It is likely that more data were collected than what was available at the time of the report preparation and the numbers below are subject to change pending an analysis of the complete dataset once uploaded to WIN.

**Table 6. Percent exceedance by WBID in the Lower St. Johns River Tributaries I BMAP**

| BMAP | WBID Number | Waterbody Name | January 1, 2001, to June 30, 2008, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance *E. coli* | January 1, 2011, to June 30, 2018, % Exceedance Enterococci |
|---|---|---|---|---|---|---|
| **LSJR Tribs I** | 2326B | Goodbys Creek (Marine Segment) | 62 | 48 | N/A | 30 |
| **LSJR Tribs I** | 2256 | Deer Creek | 60 | 56 | N/A | 75 |
| **LSJR Tribs I** | 2299A | Open Creek (Marine Segment) | 54 | 59 | N/A | 67 |
| **LSJR Tribs I** | 2326A | Goodbys Creek (Freshwater Segments) | 46 | 62 | 56 | N/A |
| **LSJR Tribs I** | 2299 B | Open Creek (Fresh Segment) | 73 | 66 | 57 | N/A |
| **LSJR Tribs I** | 2304 | Miramar Creek | 94 | 76 | 74 | N/A |
| **LSJR Tribs I** | 2235 | Newcastle Creek | 80 | 74 | 62 | N/A |
| **LSJR Tribs I** | 2204 | Terrapin Creek | 71 | 73 | 70 | N/A |
| **LSJR Tribs I** | 2280B | Big Fishweir Creek (Marine Segment) | 88 | 73 | N/A | 25 |
| **LSJR Tribs I** | 2252 | Hogan Creek | 78 | 77 | 69 | N/A |
| **LSJR Tribs I** | 2287 | Miller Creek | 86 | 89 | 100 | N/A |
| **LSJR Tribs I** | 2322 | Butcher Pen Creek | 92 | 89 | 76 | N/A |
| **LSJR Tribs I** | 2280A | Big Fishweir Creek (Freshwater Segment) | 82 | 95 | 67 | N/A |

**Table 7. Percent exceedance by WBID in the Lower St. Johns River Tributaries II BMAP**

| BMAP | WBID Number | Waterbody Name | January 1, 2001, to June 30, 2008, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018, % Exceedance *E. coli* | January 1, 2011, to June 30, 2018, % Exceedance Enterococci |
|---|---|---|---|---|---|---|
| **LSJR Tribs II** | 2203A | Trout River Lower Reach | 21 | 22 | N/A | 0 |
| **LSJR Tribs II** | 2265C | Pottsburg Creek (Freshwater Segment) | 27 | 37 | 29 | N/A |
| **LSJR Tribs II** | 2203 | Trout River Middle Reach (Freshwater Segment) | 44 | 33 | 29 | N/A |
| **LSJR Tribs II** | 2240B | Greenfield Creek (Freshwater Segment) | 48 | 43 | 63 | N/A |
| **LSJR Tribs II** | 2265D | Pottsburg Creek (Marine Segment) | 35 | 47 | N/A | 30 |
| **LSJR Tribs II** | 2227 | Sherman Creek | 36 | 45 | N/A | 37 |
| **LSJR Tribs II** | 2381 | Cormorant Branch | 56 | 48 | 69 | N/A |
| **LSJR Tribs II** | 2324 | Fishing Creek | 64 | 50 | 50 | N/A |
| **LSJR Tribs II** | 2203B | Trout River Middle Reach (Marine Segment) | 67 | 46 | N/A | 38 |
| **LSJR Tribs II** | 2282 | Wills Branch (North Prong) | 51 | 54 | 100 | N/A |
| **LSJR Tribs II** | 2228B | Moncrief Creek (Freshwater Segment) | 54 | 58 | 40 | N/A |
| **LSJR Tribs II** | 2207 | Blockhouse Creek | 65 | 64 | 60 | N/A |
| **LSJR Tribs II** | 2257 | McCoy Creek | 67 | 63 | 66 | N/A |
| **LSJR Tribs II** | 2266 | Hopkins Creek | 62 | 70 | N/A | 77 |
| **LSJR Tribs II** | 2361 | Deep Bottom Creek | 88 | 73 | 92 | N/A |
| **LSJR Tribs II** | 2316 | Williamson Creek | 73 | 84 | 58 | N/A |
| **LSJR Tribs II** | 2297 | Craig Creek | 83 | 95 | 94 | N/A |
| **LSJR Tribs II** | 2228A | Moncrief Creek (Marine Segment) | 63 | 80 | N/A | 36 |

## *Manatee River BMAP*

### BACKGROUND

The Manatee River drains an area of 360 square miles, flowing 45 miles westward and discharging to Lower Tampa Bay. The Manatee River BMAP was adopted in 2014 and addresses four fecal coliform TMDLs adopted in 2009 for Rattlesnake Slough (WBID 1923), Cedar Creek (WBID 1926), Nonsense Creek (WBID 1913), and Braden River above Evers Reservoir (WBID 1914), as well as two DO and nutrient TMDLs for Nonsense Creek (WBID 1913) and Braden River above Evers Reservoir (WBID 1914).

The BMAP includes the implementation of FIB source identification efforts, such as Walk the WBID, and requires production agricultural operations in BMAP WBIDs to participate in the Florida Department of Agriculture and Consumer Services Best Management Practices Program or elect to perform water quality monitoring of their operations.

### STATUS OF PROJECTS

From April 2014 through December 2018, 10 projects were reported as completed. Of these projects, 5 were implemented prior to BMAP adoption and 4 are ongoing, maintenance activities. During the reporting period, from January 1, 2018, through December 31, 2018, 3 new projects were added to the BMAP.

### FREQUENCY OF EXCEEDANCE

DEP adopted the U.S. Environmental Protection Agency criteria for *E. coli* bacteria (Class I and III fresh water) in waters and Enterococci bacteria (Class III marine water) to replace the existing criteria for fecal coliform bacteria. **Table 8** lists the frequency of exceedance of the ten percent threshold fecal coliform criterion for the Cycle 3 assessment verified period (January 1, 2007, to June 30, 2014) (before BMAP adoption in 2014) and from January 1, 2011, to June 30, 2018. The table also shows the frequency of exceedance of the ten percent threshold under the new criteria (*E. coli*) for the period from January 1, 2011, to June 30, 2018. These data are based on the available entries in the WIN on December 31, 2018 used in IWR Run 55. It is likely that more data were collected than what was available at the time of the report preparation, and the numbers below are subject to change pending an analysis of the complete dataset once uploaded to WIN.

**Table 8. Percent exceedance by WBID for the Manatee River BMAP**

| BMAP | WBID | Waterbody Name | January 1, 2007, to June 30, 2014 % Exceedance | January 1, 2011, to June 30, 2018 % Exceedance Fecal Coliform | January 1, 2011, to June 30, 2018 % Exceedance *E. coli* |
|---|---|---|---|---|---|
| **Manatee** | 1923 | Rattlesnake Slough | 26 | 16 | 100 |
| **Manatee** | 1926 | Cedar Creek | 63 | 49 | 57 |
| **Manatee** | 1913 | Nonsense Creek | 41 | 51 | 22 |
| **Manatee** | 1914 | Braden River above Ward Lake | 14 | 20 | 13 |

# Minimum Flows and Minimum Water Levels

Florida Statutes define minimum flows and minimum water levels (MFLs) as the limits at which further water withdrawals would be significantly harmful to the water resources or ecology of the area.

As a part of fulfilling their mission and statutory responsibilities, the state's water management districts (Districts) establish MFLs for priority waterbodies within their boundaries.

MFLs are used in planning for future water uses and in regulating water withdrawals.

## A Brief Overview

### *What Are MFLs?*

Minimum flows and minimum water levels (MFLs) are the limits at which further water withdrawals would be significantly harmful to the water resources or ecology of the area.

MFLs are adopted into the rules of the state's five water management districts or DEP.

### *How Many MFLs Does Florida Have?*

As of March 1, 2019, Florida has adopted 426 MFLs statewide. **Figure 55** shows their locations and status. Every year, the state's five water management districts develop a Priority List and Schedule identifying the waterbodies for which the districts intend to adopt an MFL in the next few years.

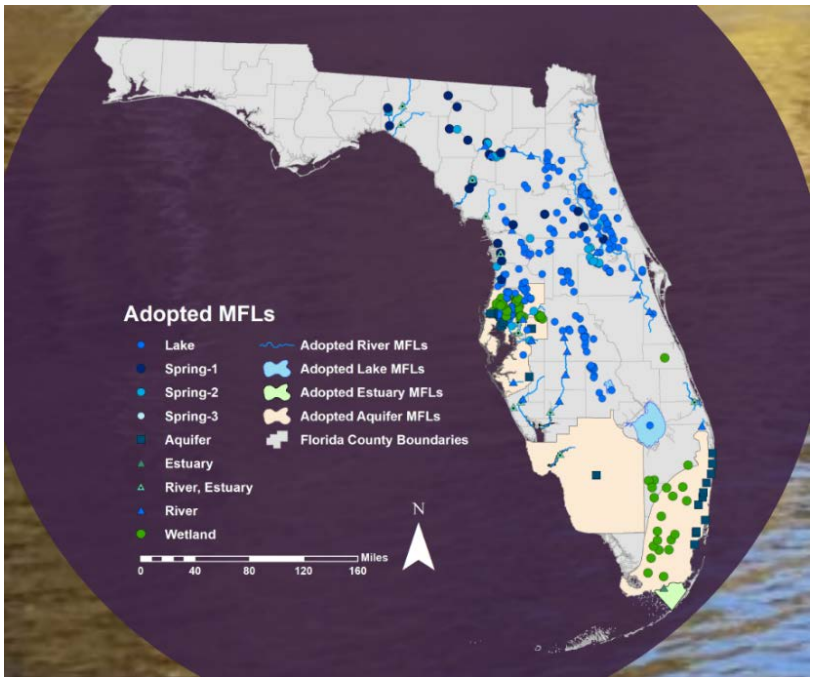



**Figure 55. Statewide map of adopted MFLs**

### *How Are MFLs Used?*

The districts use MFLs to review applications for water withdrawal permits and environmental resource permits.

MFLs are also used as environmental constraints as the districts plan for future water needs.

### *How Are MFLs Developed?*

MFLs are developed using the best available information. Districts look at the effects of reduced flows and levels on fish and wildlife habitat, fish passage, recreation, water quality, navigation, and other environmental values.

### *What Happens if an MFL Is Not Being Met?*

Recovery and prevention strategies identify projects that can help restore and protect MFL waterbodies and provide water for future users.

A recovery strategy is developed if the MFL is not currently being met.

A prevention strategy is developed if the MFL is currently being met, but is projected to not be met in the next 20 years.

## Status of MFLs

As of March 1, 2019, 426 MFLs have been adopted statewide for all waterbody types, including the following:

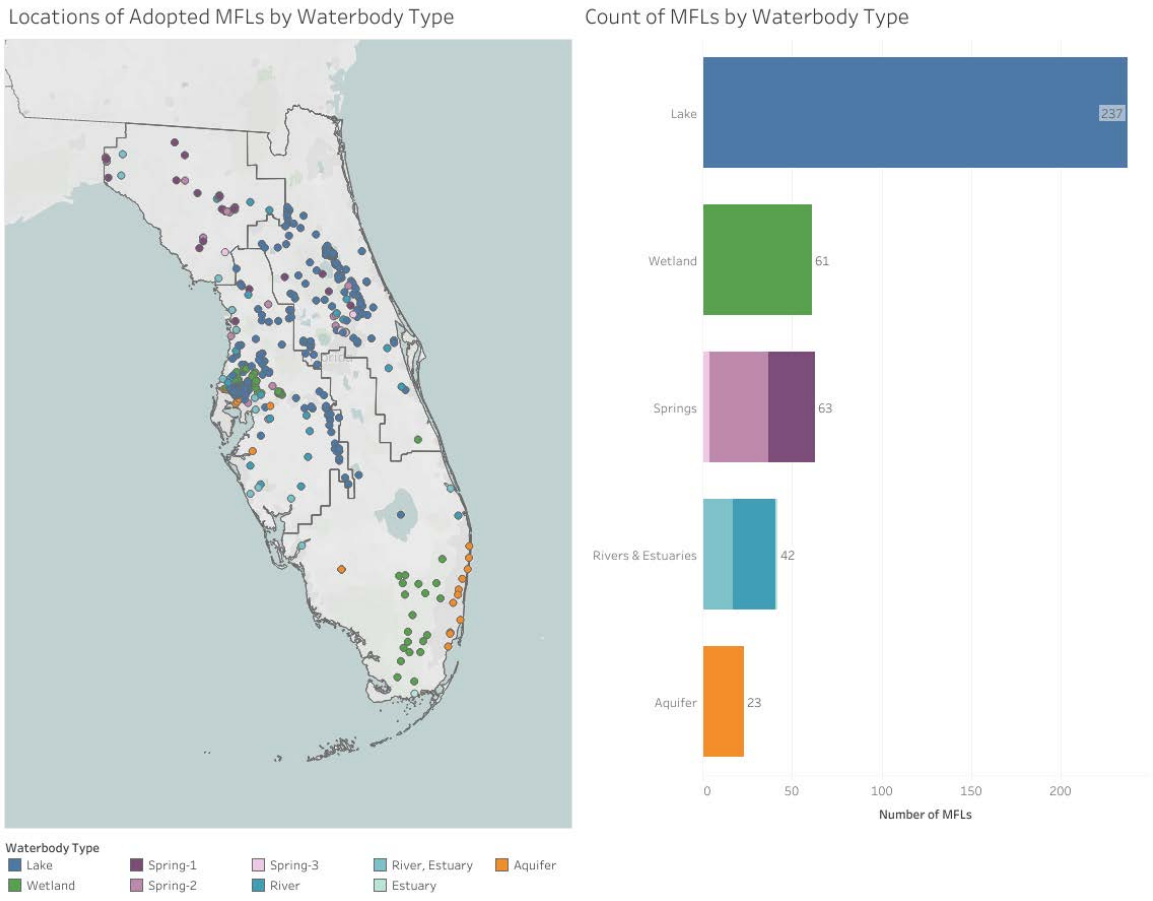
- 237 lakes.
- 61 wetlands.
- 63 springs (27 of which are OFS).
- 42 rivers and estuaries (which includes 18 total estuaries).
- 23 individual MFLs within 5 aquifer systems.

The map and graph in **Figure 56** show the locations of MFLs by waterbody type.

Since March 1, 2019, additional MFLs have been adopted or are in the process of being adopted, including the first MFL adopted by the Northwest Florida Water Management District (NWFWMD) for the St. Marks River Rise (anticipated to be effective June 2019). Though not included in the numbers listed above, it demonstrates the dedication of the NWFWMD in taking significant steps to protect water resources within its boundaries.

To view a map of all adopted MFLs as a separate application, please visit DEP's Statewide Adopted MFLs.

**Figure 56. Locations of adopted MFLs and count of MFLs by waterbody type**



# Recovery and Prevention Strategies

For each waterbody where flows or water levels are below their adopted minimum flows and minimum water levels (MFL), or are projected to fall below the MFL within 20 years, the respective water management district is required to implement a recovery or prevention strategy to ensure the MFL is recovered and maintained over the long term. Strategies may include, but are not limited to, the identification of water resource and water supply development projects, funding assistance, environmental restoration projects, conservation programs, water shortage plans, and regulatory provisions.

## Status of Recovery and Prevention Strategies

Of the 426 MFLs adopted to date, 123 are identified as being in either recovery or prevention. **Figure 57** shows the locations of the adopted MFLs and the number of MFLs in each stage of recovery or prevention.

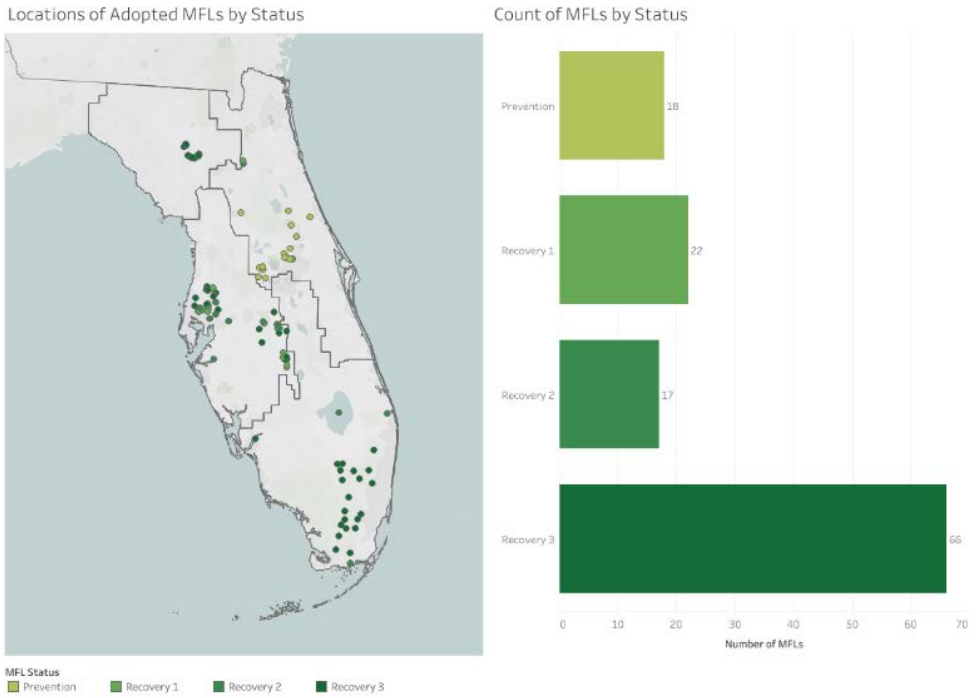



**Figure 57. Locations of adopted MFLs and count of MFLs by status**

To obtain information on the status of these waterbodies for this report, each waterbody for which an MFL was adopted was evaluated by the adopting water management district. The waterbodies were identified as either meeting their adopted MFL(s), being in prevention, or being in recovery. Those in recovery were further rated as Recovery-1, Recovery-2, or Recovery-3. This rating was based on two factors: the magnitude of the violation and the regional significance of the waterbody. The magnitude of the violation was based on whether the waterbody was close, moderately close, or not close to meeting the MFL.

In evaluating the degree of MFL violation, the water management districts considered the extent of the variance from the MFL, the magnitude of the ecological impact, the time frame for recovery, and the time frame for completion of the projects. In evaluating the regional significance of a waterbody, the waterbody was rated as Tier 1, Tier 2, or Tier 3 (with Tier 1 being the highest rating). In defining regional significance, the water management districts considered the waterbody's size and geographical extent, ecological importance, recreational uses, navigation, threatened and endangered species, wildlife use, aesthetics, and historical and archaeological significance.

**Table 9** lists the definitions of MFL status and the various classifications for recovery and prevention strategies.

**Table 9. Definitions of MFL status and recovery and prevention strategies**

| Status | Definition | |
|---|---|---|
| **Meeting** | This status is assigned for any MFL that was determined to be meeting its MFL at the time of its adoption or during its last status evaluation. | |
| **Prevention** | This status is assigned if the waterbody is meeting the MFL, but is projected to not meet the MFL within 20 years. | |
| | **Relative Magnitude of the MFL Violation** | **Regional Significance of Waterbodies in Recovery** |
| **Recovery 1** | Close | Tier 2 or 3 |
| | Moderately Close | Tier 3 |
| **Recovery 2** | Close | Tier 1 |
| | Moderately Close | Tier 2 |
| | Not Close | Tier 3 |
| **Recovery 3** | Moderately Close | Tier 1 |
| | Not Close | Tier 1 or 2 |

## Recovery and Prevention Strategies—Background and Progress

### *Lower Santa Fe and Ichetucknee River and Priority Springs Recovery Strategy*

In 2014, DEP adopted the regulatory components of the Lower Santa Fe/Ichetucknee River and Priority Springs (LSFIR) Recovery Strategy due to the cross-boundary nature of the MFLs, while the nonregulatory components were approved by the Governing Boards of the Suwannee River and St. Johns River Water Management Districts.

The purpose of the recovery strategy is to develop near-term managerial practices to address these streamflow impacts and provide a framework to implement long-term water management strategies, water resource development projects, and conservation measures, which are designed to recover and maintain flows in these waterbodies at the proposed minimum flow criteria.

**Figure 58** represents cumulative data for the implementation of the LSFIR Recovery Strategy since its adoption in 2014. This includes reuse and nonreuse projects that are complete or currently underway.

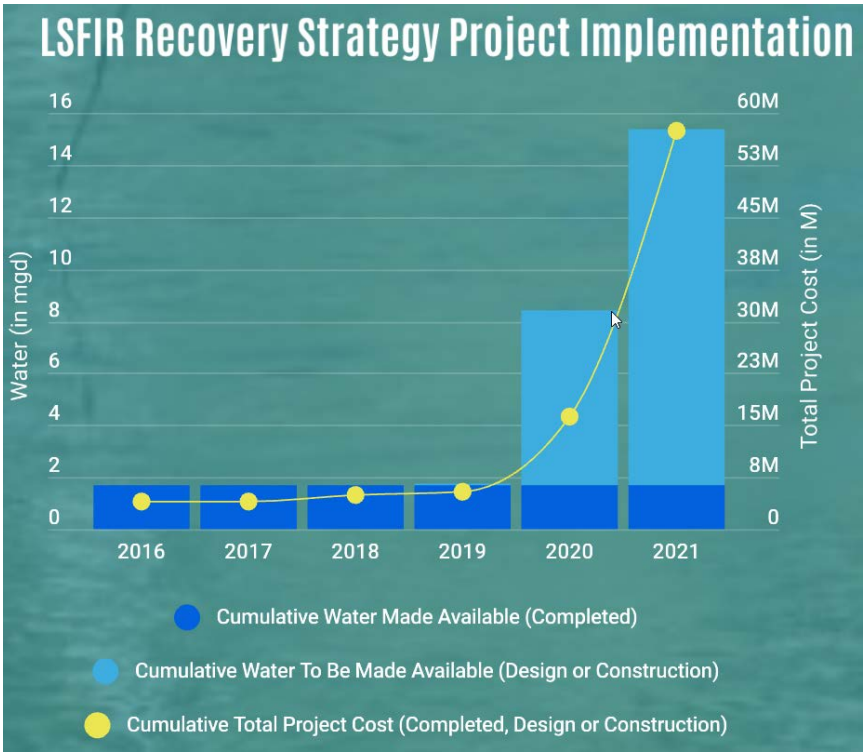



**Figure 58. Graph of LSFIR Recovery Strategy project implementation**

## *Volusia Recovery and Prevention Strategy*

The Prevention/Recovery Strategy for Implementation of Minimum Flows and Levels for Volusia Blue Spring and Big, Daugharty, Helen, Hires, Indian, and Three Island Lakes (Volusia Strategy) was initially approved in November 2013. In March 2019, the St. Johns River Water Management District completed the 2018 Volusia Strategy 5-year assessment, which evaluated the status of 16 lake MFLs and 3 springs MFLs in Volusia County through the 2040 planning horizon. Since 2013, MFLs have been adopted for 2 new waterbodies (Gemini Springs and DeLeon Springs), and MFLs for 1 system (Lake Purdom) have been re-evaluated and adopted.

The projects and measures proposed in the Volusia Strategy, in conjunction with projects identified in the 5-year strategy assessment, are designed to ensure the MFLs for Blue Spring and affected lakes continue to be achieved while meeting future water demands for utilities and other water users throughout Volusia County through 2040.

**Figure 59** represents cumulative data for the implementation of the Volusia Strategy since its adoption in 2013. This includes reuse and nonreuse projects that are complete or currently underway.

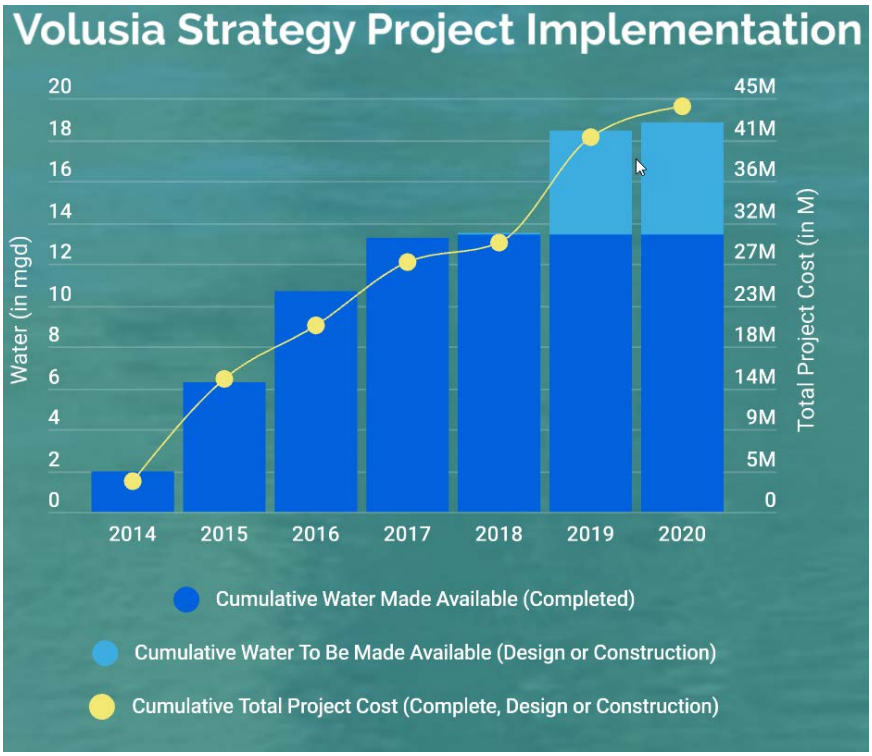



**Figure 59. Graph of Volusia Recovery and Prevention Strategy project implementation**

## *Silver Springs Prevention Strategy*

An MFL for Silver Springs, an OFS, was adopted by the St. Johns River Water Management District in 2017 based on criteria developed from river floodplain (vegetation, soils, and topographic) data and instream (velocity and depth) data. The MFL will maintain 94 % of the long-term mean annual flow of Silver Springs and protect the structure and function of wetlands and aquatic habitats, as well as other ecological functions and values of the spring and associated run.

Currently, the MFL for Silver Springs is being achieved. However, because the MFL is projected to not be met by 2025, the Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels (Silver Springs Prevention Strategy) was adopted in 2017. The strategy identified alternative water supplies, water conservation, and regulatory measures designed to achieve the MFL while meeting future water demands for utilities and other water users through a 20-year planning horizon.

**Figure 60** represents cumulative data for the implementation of the Silver Springs Prevention Strategy since its adoption in 2016. This includes projects that are complete or currently underway.

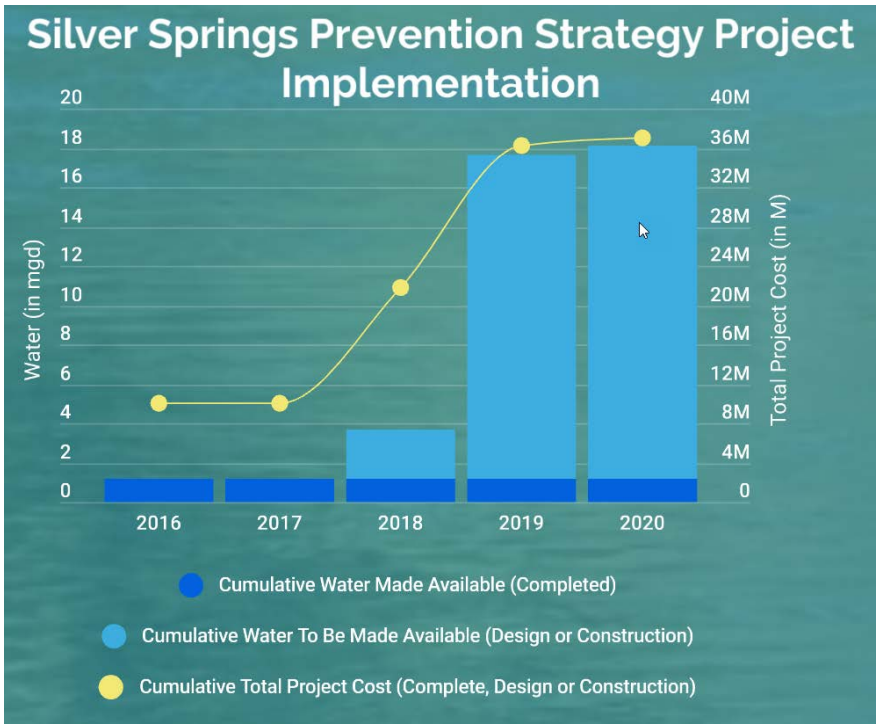



**Figure 60. Graph of Silver Springs Prevention Strategy project implementation**

## *Southern Water Use Caution Area Recovery Strategy*

The Southwest Florida Water Management District adopted the Southern Water Use Caution Area (SWUCA) Recovery Strategy in 2006 and is implementing it over a 20-year period.

The recovery strategy includes regulatory and project-based components. Principal goals to achieve by 2025 include: restore minimum flows to the upper Peace River; restore minimum levels to priority lakes in the Lake Wales Ridge area; reduce the rate of saltwater intrusion in coastal Hillsborough, Manatee, and Sarasota counties by achieving a minimum aquifer level for saltwater intrusion; and ensure there are sufficient water supplies for existing and projected reasonable and beneficial uses.

As of 2018, the recovery strategy is applicable to 22 waterbodies in Highlands, Hillsborough, Manatee, Polk, and Sarasota Counties where MFLs are not being achieved.

**Figure 61** represents cumulative data for the implementation of the SWUCA Recovery Strategy since its adoption in 2006. This includes reuse and nonreuse projects that are complete or currently underway. Additional projects are planned or being implemented to provide for water through 2039.

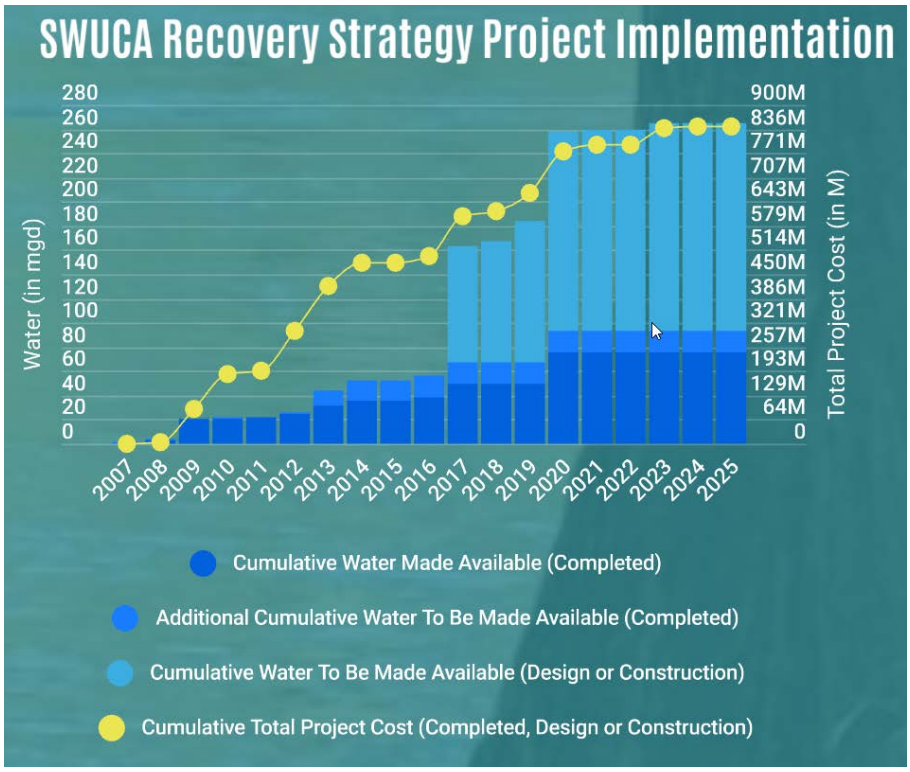



**Figure 61. Graph of SWUCA Recovery Strategy project implementation**

## *Northern Tampa Bay Water Use Caution Area Recovery Strategy*

The first phase of the Southwest Florida Water Management District's Northern Tampa Bay Water Use Caution Area (NTBWUCA) Recovery Strategy was adopted in 2000 and called for a phased reduction in pumping from Tampa Bay Water's regional wellfields, and financial incentives for construction of alternative water supply projects. A second phase of the recovery strategy, adopted in 2010 for implementation through 2020, includes a comprehensive plan that addresses continued monitoring and evaluation of environmental mitigation for withdrawal impacts and continued water conservation activities by Tampa Bay Water's member governments.

As of 2018, the recovery strategy is applicable to 37 waterbodies in Hillsborough and Pasco counties where MFLs are not being achieved.

**Figure 62** represents cumulative data for the implementation of the NTBWUCA Recovery Strategy since project data began being submitted in 2005. This includes projects that are complete or currently underway.

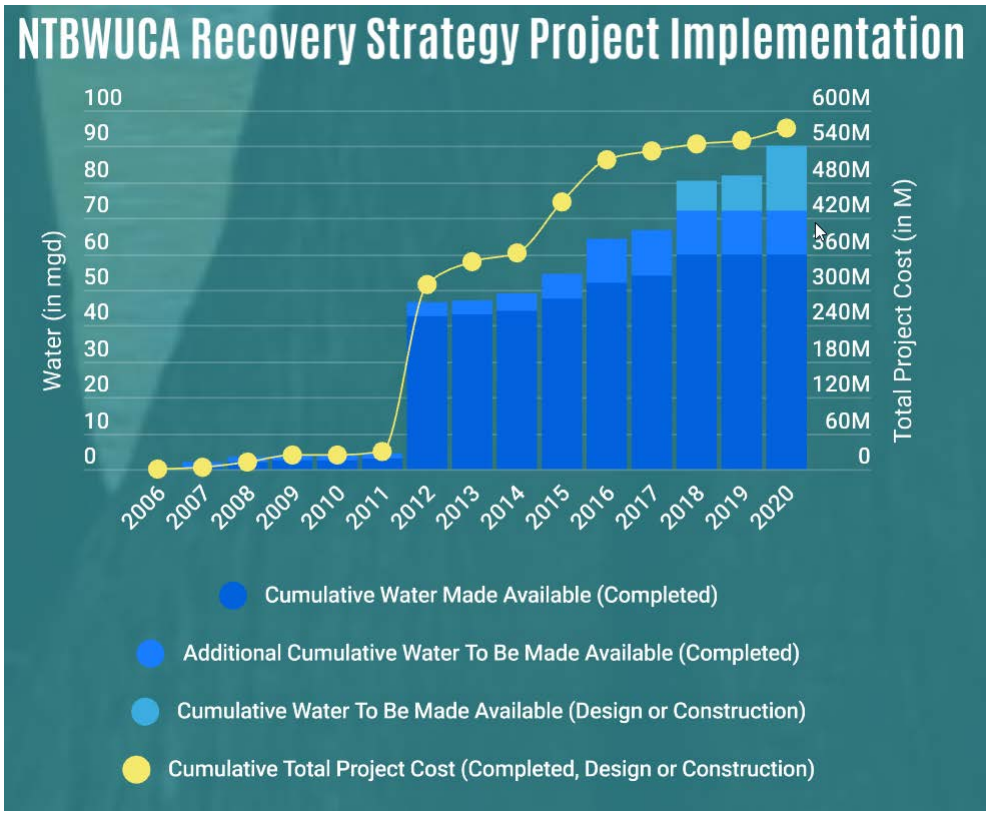



**Figure 62. Graph of NTBWUCA Recovery Strategy project implementation**

## *Lower Hillsborough River Recovery Strategy*

Because the minimum flow was not being achieved in the Lower Hillsborough River in 2000 and the revised minimum flows adopted in 2007 were similarly not being met, the recovery strategy for the lower portion of the river was included in both the first and second phases of the NTBWUCA Recovery Strategy adopted by the Southwest Florida Water Management District in 2000 and 2007, respectively.

The Lower Hillsborough River Recovery Strategy outlines six projects and a timeline for their implementation. Four projects are being jointly funded by the District and the City of Tampa, and two are being implemented by the District.

As of 2018, the recovery strategy continues to be applicable to the Lower Hillsborough River, where minimum flows are not being achieved.

**Figure 63** represents cumulative data for the implementation of the Lower Hillsborough River Recovery Strategy since its update in 2007. This includes projects that are complete or currently underway.

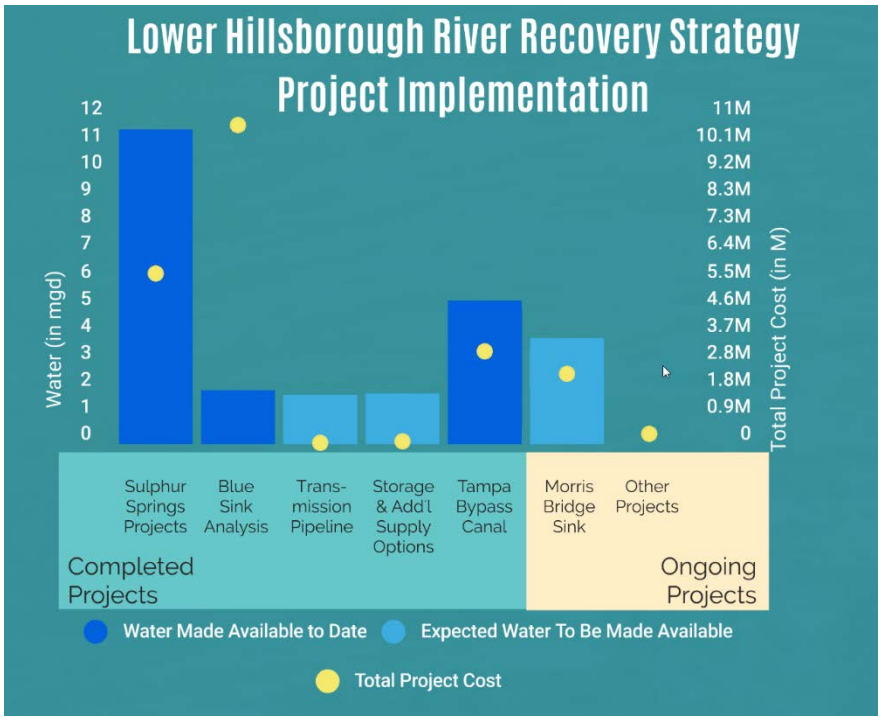



**Figure 63. Graph of Lower Hillsborough River Recovery Strategy project implementation**

## *Dover/Plant City Water Use Caution Area Recovery Strategy*

In 2011, based on impacts associated with freeze protection withdrawals, the Southwest Florida Water Management District established the Dover/Plant City Water Use Caution Area (DPCWUCA) and its recovery strategy. The DPCWUCA covers a 256-square mile area located in northeast Hillsborough County and eastern Polk County and overlaps with portions of both the SWUCA and NTBWUCA recovery strategy areas.

The objective of the recovery strategy is to reduce groundwater withdrawals used for frost/freeze cold protection by 20 percent from January 2010 withdrawal quantities by January 2020. Recovery mechanisms identified in the strategy include nonregulatory and regulatory approaches.

## *Lower Alafia River Recovery Strategy*

In 2010, while establishing minimum flows for the Lower Alafia River system in Hillsborough County, the Southwest Florida Water Management District determined that flow rates under certain conditions were below the proposed minimum flows because of withdrawals from Lithia and Buckhorn Springs by a single user.

The district subsequently incorporated conditions associated with a phased recovery strategy into a water use permit issued to that user and included the recovery strategy in its regional water supply plan.

Compliance with conditions included in the water use permit has supported the achievement of minimum flows established for the Lower Alafia River system.

### *Comprehensive Everglades Restoration Plan*

The Comprehensive Everglades Restoration Plan (CERP) proposes major modifications to the Central and Southern Florida Flood Control Project (C&SF Project), a massive flood control system constructed by the U.S. Army Corps of Engineers. These modifications are intended to restore the quantity, quality, timing, and distribution of water to the natural system while providing flood control and water supply.

CERP has identified a multitude of different projects. These projects are expected to deliver benefits to improve the ecological functions of over 2.4 million acres of natural areas.

CERP serves as a recovery or prevention strategy for 25 MFL monitoring sites in different waterbodies in the South Florida Water Management District within the greater Everglades ecosystem, including Lake Okeechobee, Northwest Fork of the Loxahatchee River, Caloosahatchee River, Florida Bay, and Everglades. Annually, the district provides for the status of these projects as part of its South Florida Environmental Report (SFER).

**Figure 64** shows the status of project implementation for the MFLs in the South Florida Water Management District.

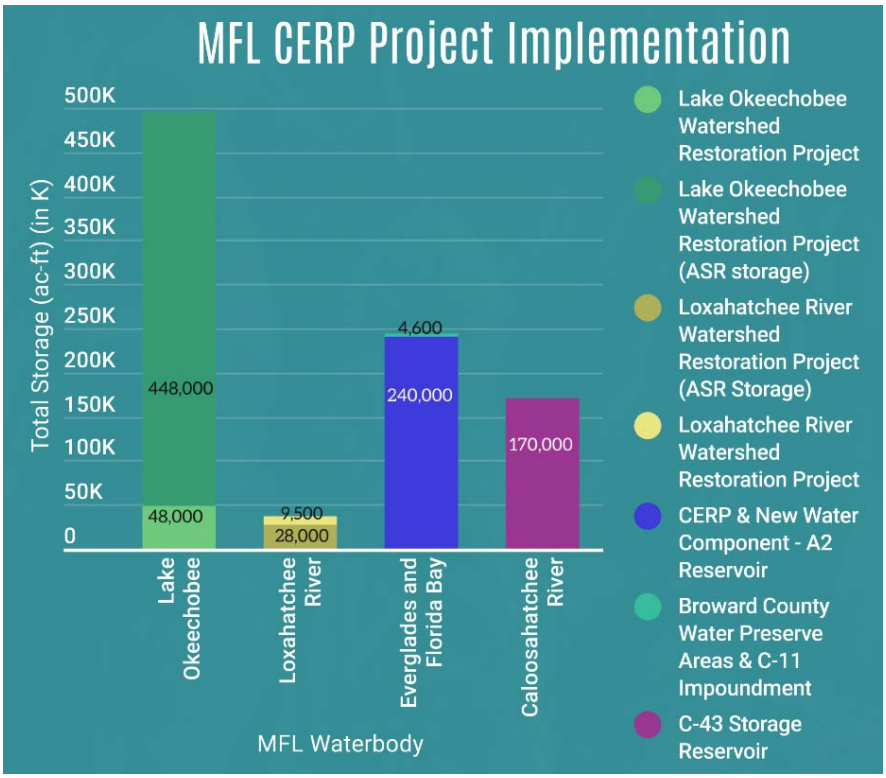



**Figure 64. Graph of MFL CERP project implementation**

## Status of Projects Identified to Achieve the MFLs

Recovery and prevention strategies identify project options that may be used to benefit a waterbody with an established MFL (or MFLs) while ensuring adequate sources of water for existing and future reasonable–beneficial uses. The project options listed in a recovery or prevention strategy may be mutually exclusive to another identified project and, in total, may exceed the volume of water that must be created to meet the MFL(s).

For projects benefiting a recovery or prevention strategy that are complete or currently underway, upon full completion, approximately 376 million gallons per day (mgd) of water (reuse and nonreuse) will have been made available since 2005–06. This does not include projects identified to achieve the MFLs in the South Florida Water Management District that are a part of CERP.

The map and graph in **Figure 65** show the project locations and water quantity benefits.

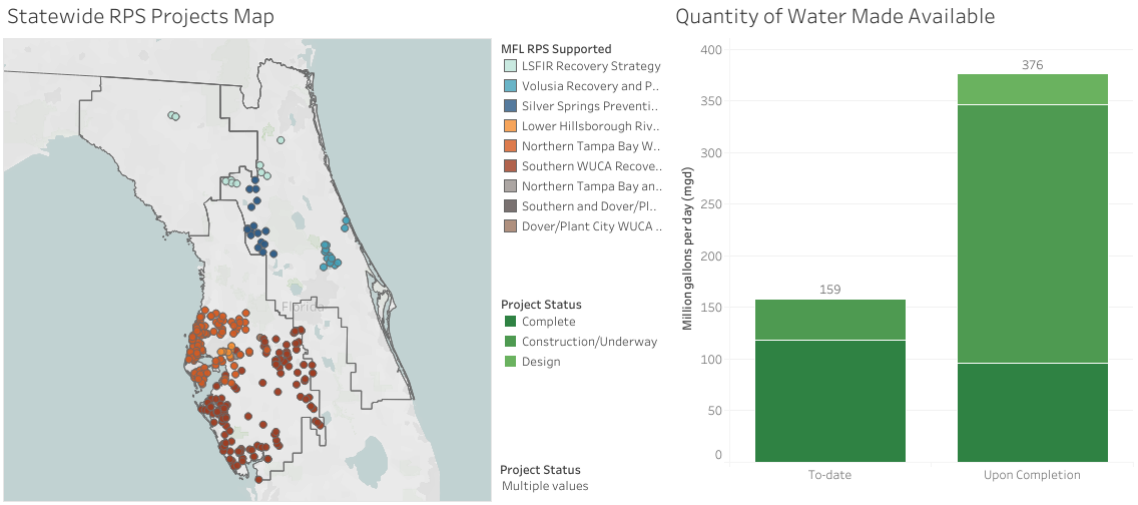



**Figure 65. Statewide map of projects designed to achieve the MFLs and graph of water quantity benefits from projects**

### *Suwannee River Water Management District*

The Suwannee River Water Management District, in coordination with the St. Johns River Water Management District and DEP, identified 18 waterbodies as being in recovery, and together with the St. Johns River Water Management District, has approved the Lower Santa Fe and Ichetucknee River and Priority Springs Recovery Strategy as the means to recover these waterbodies.

- **Lower Santa Fe and Ichetucknee River and Priority Springs (LSFIR) Recovery Strategy –** For projects that are complete or currently underway, upon full completion, approximately 16 mgd of water (reuse and nonreuse) will have been made available since 2014 in the Suwannee River and St. Johns River Water Management Districts in support of these MFLs. In

addition, 500,000 gallons per day were made available prior to the approval of the strategy, yet support the strategy. The map and graph in **Figure 66** show the project locations and water quantity benefits.

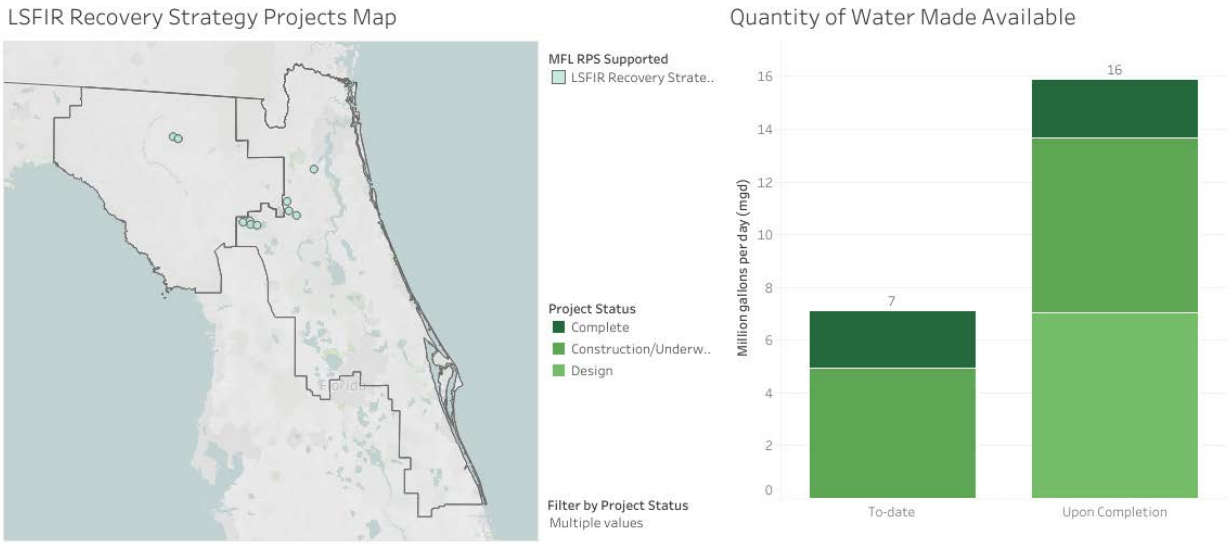



**Figure 66. Map of LSFIR Recovery Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

## *St. Johns River Water Management District*

The district has identified 21 waterbodies as being in recovery or prevention within its jurisdiction (including those that are located outside the district but are impacted by withdrawals within the district). Four of these waterbodies are included in a regional strategy known as the Prevention/Recovery Strategy for Implementation of Minimum Flows and Levels for Volusia Blue Spring and Big, Daugharty, Helen, Hires, Indian, and Three Island Lakes (Volusia Strategy). The 2018 Volusia Strategy 5-year assessment identified additional projects to ensure the MFLs are achieved for these 4 waterbodies at the 2040 planning horizon. An MFL associated with Silver Springs is included in the Prevention Strategy for the Implementation of Minimum Flows and Levels for Silver Springs. The St. Johns River Water Management District has worked in coordination with the Suwannee River Water Management District and DEP to identify 18 waterbodies associated with the LSFIR as being in recovery. The recovery of these waterbodies is being accomplished using regulatory and nonregulatory measures.

- **Volusia Strategy –** For projects that are complete or currently underway, upon full completion, approximately 19 mgd of water (reuse and nonreuse) will have been made available since 2013. The map and graph in **Figure 67** show the project locations and water quantity benefits.

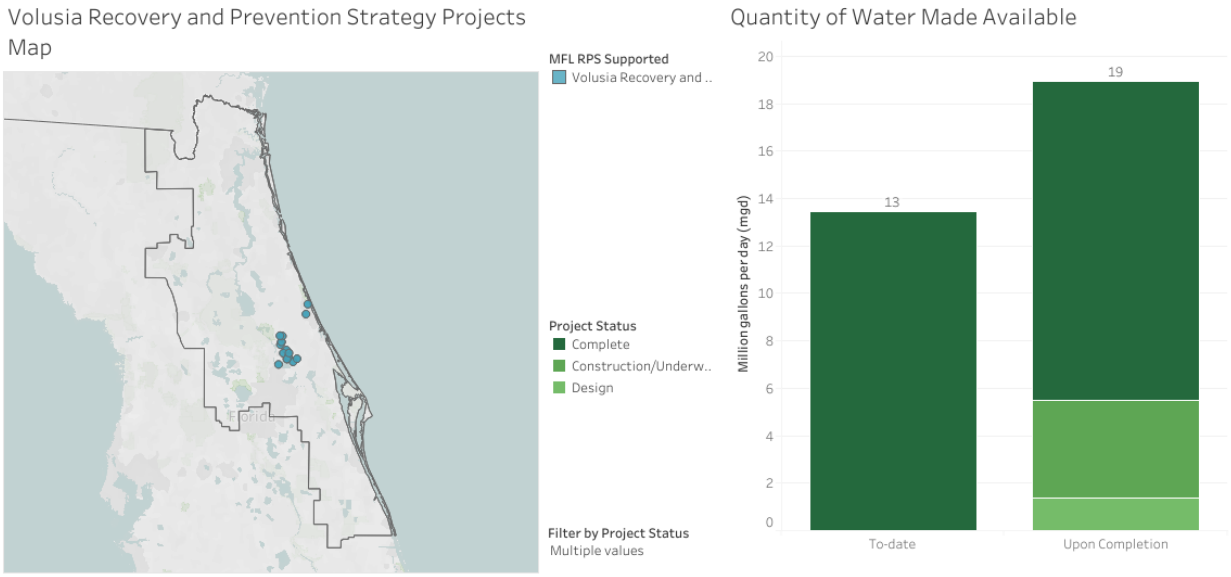



**Figure 67. Map of Volusia Recovery and Prevention Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

- **Silver Springs Prevention Strategy –** For projects that are complete or currently underway, upon full completion, approximately 20 mgd of water (reuse and nonreuse) will have been made available since 2017. In addition, 2.7 mgd of water were made available prior to the approval of the strategy, yet support the strategy. The map and graph in **Figure 68** show the project locations and water quantity benefits.

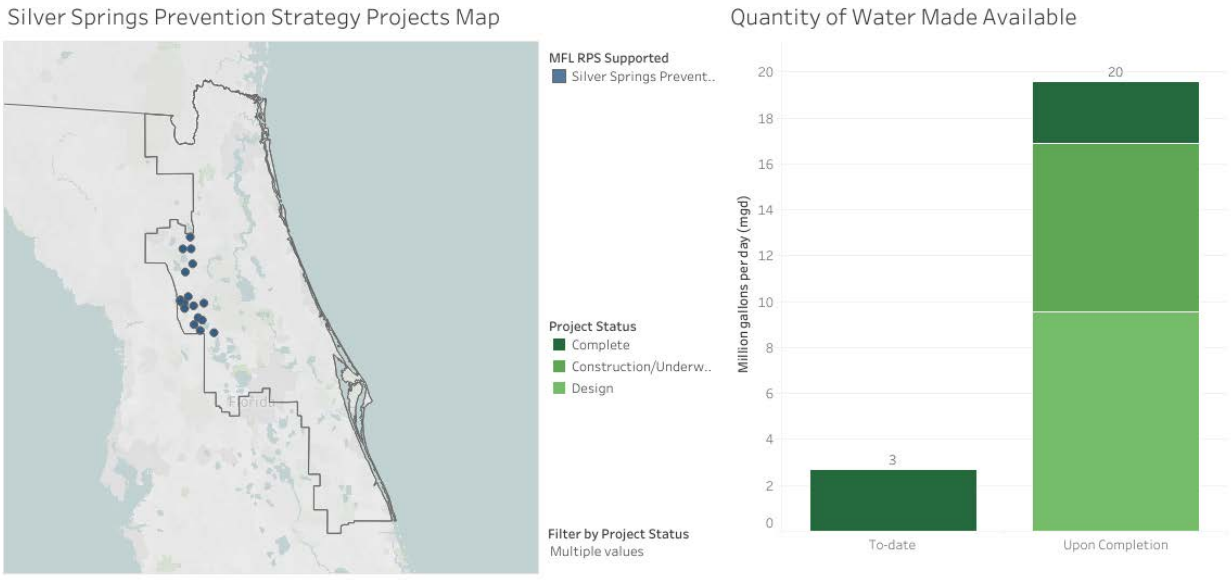



**Figure 68. Map of Silver Springs Prevention Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

- **Lower Santa Fe and Ichetucknee River and Priority Springs (LSFIR) Recovery Strategy –** For projects that are complete or currently underway, upon full completion, approximately 16 mgd of water (reuse and nonreuse) will have been made available since 2014 in the Suwannee River and St. Johns River Water Management Districts in support of these MFLs. In addition, 500,000 gpd of water were made available prior to the approval of the strategy, yet support the strategy. The map and graph in **Figure 69** show the project locations and water quantity benefits.

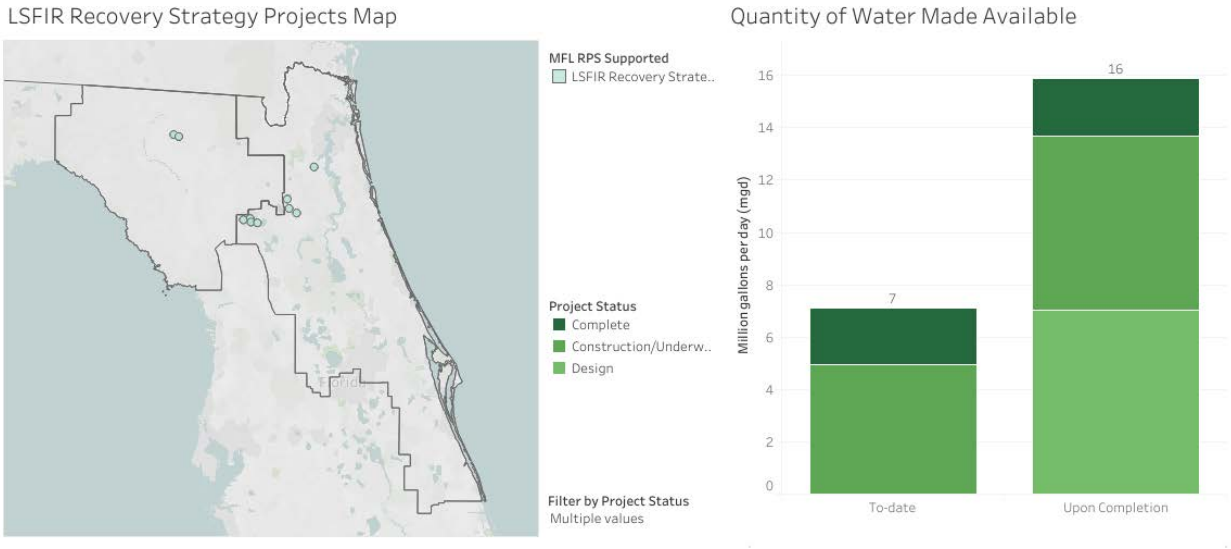



**Figure 69. Map of LSFIR Recovery Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

## *Southwest Florida Water Management District*

Through March 1, 2019, the district has established 209 MFLs for its waterbodies and identified 60 of those as being in need of recovery. These waterbodies are all included in 3 regional and 2 waterbody-specific recovery strategies, which are listed below.

- **Southern Water Use Caution Area (SWUCA) Recovery Strategy –** For projects that are complete or currently underway, upon full completion, approximately 145 mgd of water (reuse and nonreuse) will have been made available since 2006. The map and graph in **Figure 70** show the project locations and water quantity benefits.

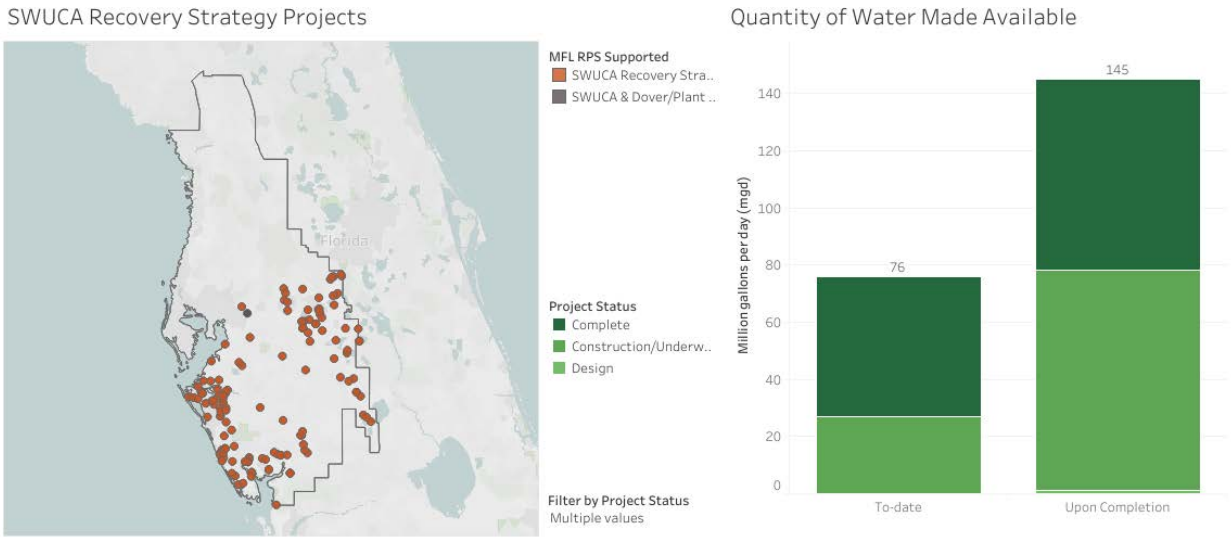



**Figure 70. Map of SWUCA Recovery Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

- **Northern Tampa Bay Water Use Caution Area (NTBWUCA) Recovery Strategy –** For projects that are complete or currently underway, upon full completion, approximately 64 mgd of water (reuse and nonreuse) will have been made available since 2005. The map and graph in **Figure 71** show the project locations and water quantity benefits.

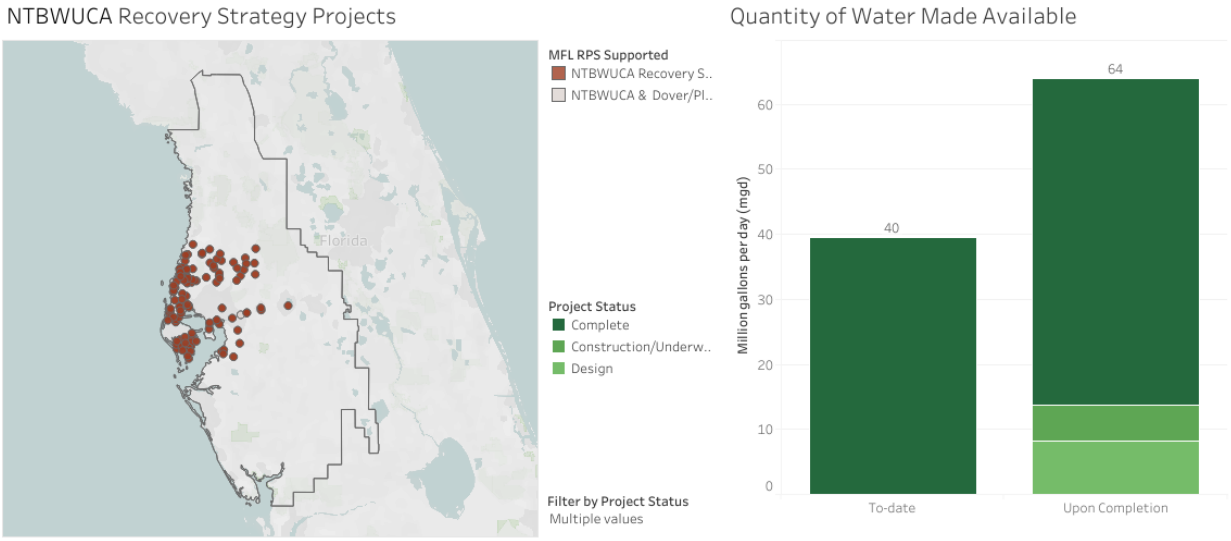



**Figure 71. Map of NTBWUCA Recovery Strategy projects designed to achieve the MFLs and graph of water quantity benefits from projects**

- **Lower Hillsborough River Recovery Strategy –** For projects that are complete or currently underway, upon full completion, approximately 27 mgd of water (reuse and nonreuse) will have been made available since 2002. This

includes water from Sulphur Springs, which was first used in 2002 to recover minimum flows in the Lower Hillsborough River prior to the update of the Recovery Strategy in 2007. **Figure 72** shows the water quantity benefits (in mgd) from projects implemented under the Recovery Strategy.

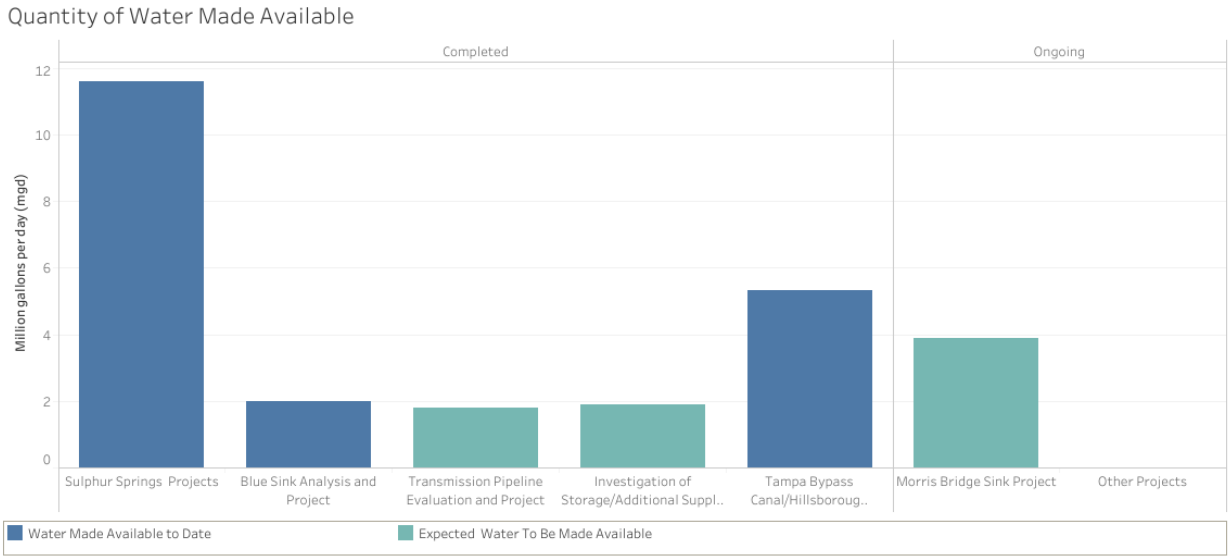



**Figure 72. Graph of water quantity benefits from projects in the Lower Hillsborough River Recovery Strategy**

- **Dover/Plant City Water Use Caution Area Recovery Strategy –** The Dover/Plant City Water Use Caution Area Recovery Strategy consists predominately of regulatory measures related to frost/freeze cold protection. For that reason, no map or graph is applicable.
- **Lower Alafia River Recovery Strategy –** The Lower Alafia River Recovery Strategy is wholly based on regulatory measures associated with the permitted augmentation of the river with groundwater to offset withdrawals from Lithia and Buckhorn Springs by a single water user. Compliance with conditions included in the water use permit has supported the achievement of minimum flows established for the Lower Alafia River system.

## *South Florida Water Management District*

The district has identified 5 waterbodies as being in recovery and has identified the Comprehensive Everglades Restoration Plan (CERP) as the means to the recovery and protection of these waterbodies, which include the Everglades, Florida Bay, Lake Okeechobee, Loxahatchee River, and the Caloosahatchee River. The water management district has identified 948,100 acre-feet of storage to come from projects currently planned, in design, or under construction, as shown in **Figure 73**. For more information on CERP, visit the district website at https://www.sfwmd.gov/our-work/cerp-project-planning.

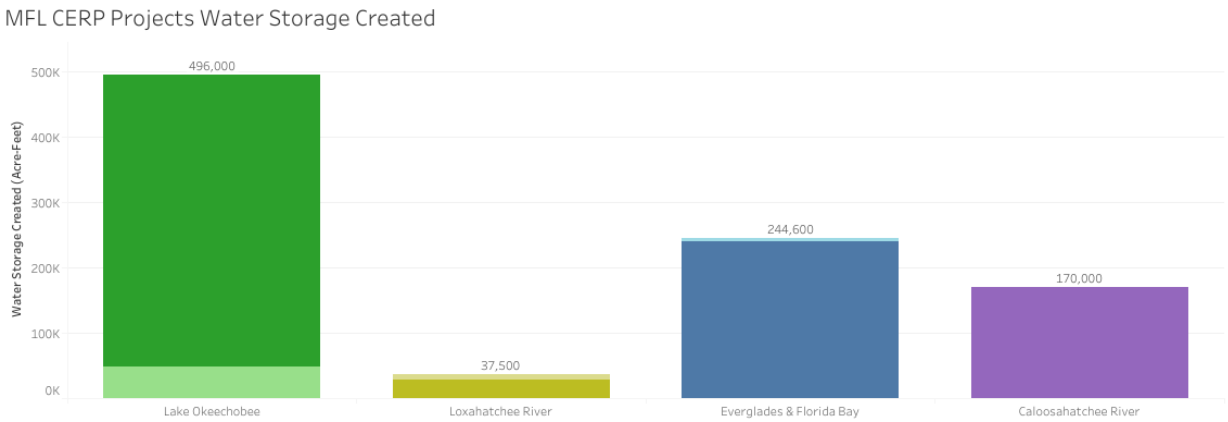



**Figure 73. Graph of water quantity benefits from MFL projects associated with CERP**

# Contacts and Data

Thank you for your interest in the Florida Statewide Annual Report. For more information about each of the report sections, please contact:

Total Maximum Daily Loads:
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Basin Management Action Plans:
Kevin Coyne, 850-245-8555

Minimum Flows and Levels & Recovery and Prevention Strategies:
Stephen James, 850-245-3150

For your convenience, additional information can be found as downloads in the links below. Data used as the basis for this report are provided in Excel format:

Adopted BMAP Projects

Adopted MFLs and Recovery and Prevention Strategies

Status of Projects Designed to Achieve the MFLs

# List of Acronyms and Abbreviations

| | |
|---|---|
| BMAP | Basin Management Action Plan |
| BMP | Best Management Practice |
| BOD | Biochemical Oxygen Demand |
| CERP | Comprehensive Everglades Restoration Plan |
| DEP | Florida Department of Environmental Protection |
| DO | Dissolved Oxygen |
| EPA | U.S. Environmental Protection Agency |
| FIB | Fecal Indicator Bacteria |
| F.S. | Florida Statutes |
| gpd | Gallons Per Day |
| IRL | Indian River Lagoon |
| IWR | Impaired Surface Waters Rule |
| lbs/yr | Pounds Per Year |
| LSFIR | Lower Santa Fe and Ichetucknee River and Priority Springs |
| LSJR | Lower St. Johns River |
| MFL | Minimum Flow and Level |
| mgd | Million Gallons Per Day |
| mg/L | Milligrams Per Liter |
| MSJR | Middle St. Johns River |
| N/A | Not Applicable |
| NTBWUCA | Northern Tampa Bay Water Use Caution Area |
| OFS | Outstanding Florida Spring |
| SWUCA | Southern Water Use Caution Area |
| TBD | To Be Determined |
| TMDL | Total Maximum Daily Load |
| TN | Total Nitrogen |
| TP | Total Phosphorus |
| WBID | Waterbody Identification (Number) |
| WIN | Watershed Information Network |