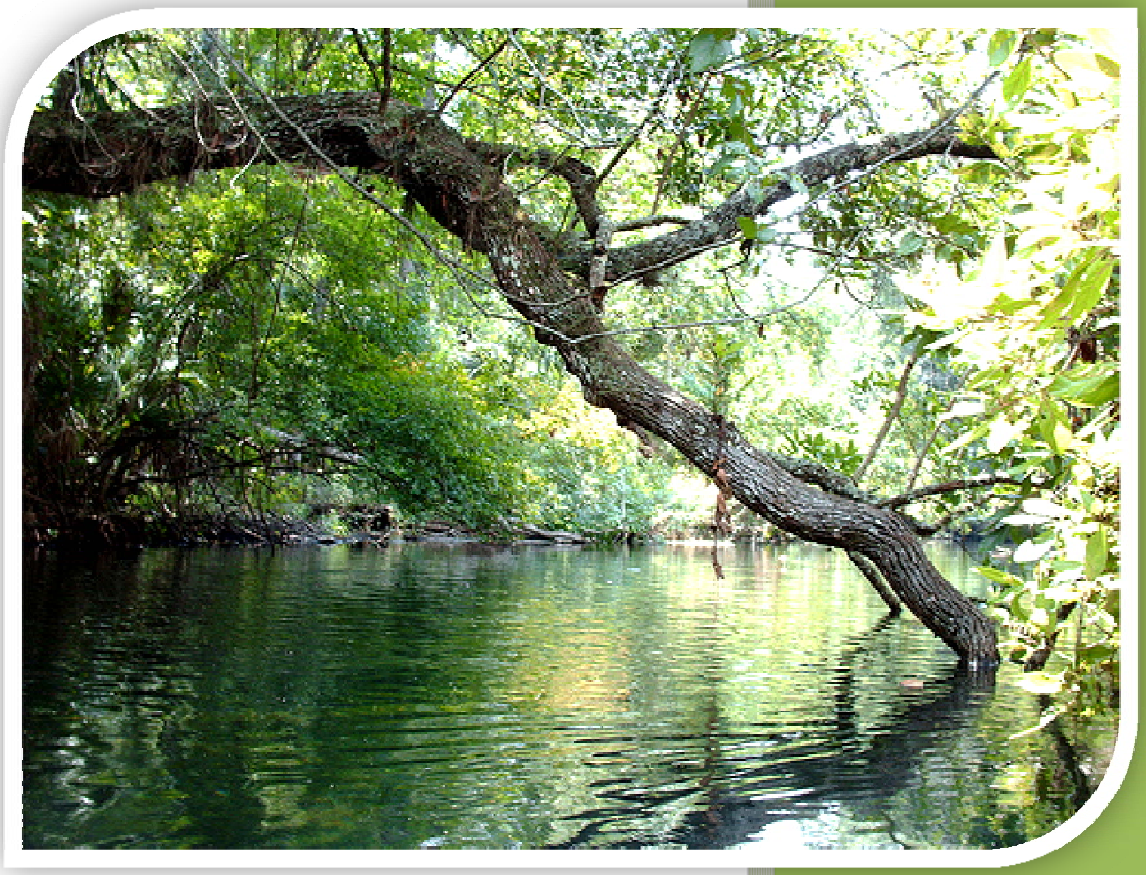
2013

State of Florida Nonpoint Source Management Annual Report



Department of Environmental Protection

Nonpoint Source Management Section

12/19/2013

ACKNOWLEDGEMENTS

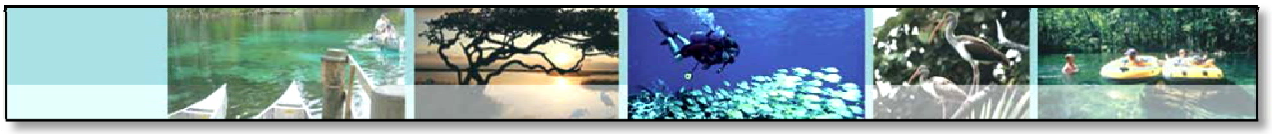
The Nonpoint Source Management Section would like to thank the staff within the Department of Environmental Protection, the Florida Department of Agriculture and Consumer Services, the water management districts, the University of Florida and the Florida Department of Health for their contributions to this report.

Nonpoint Source Management

The Department's Nonpoint Source Management Section is proud to have served the citizens of the State of Florida this past year through the implementation of projects designed to give us cleaner water. We recognize that none of this would be possible without our partners and would like to thank the numerous cities and counties we work with every day; the Florida Department of Agriculture and Consumer Services; the water management districts; the Florida Department of Health and associated county health departments; and the outstanding universities of this great state.

Within this Annual Report, you will find updates in the following areas:

Numeric Nutrient Criteria



As of August 1, 2013, the Department adopted numeric nutrient criteria (NNC) covering the vast majority of Florida waters, including all lakes, spring vents, estuaries, and coastal waters, and flowing waters outside of South Florida (criteria adopted in Chapter 62-302, Florida Administrative Code). EPA has approved the NNC for lakes, streams, spring vents and estuaries from Clearwater Harbor to Miami and the Florida Keys. The criteria for the remaining estuaries and coastal waters are awaiting approval. The NNC are also subject to Federal litigation, and the primary obstacles to the NNC going into effect relate to the litigation.

While the criteria are not yet in effect, the Department has already made significant progress towards their implementation. For example, the Department developed, and adopted by rule, a detailed implementation document titled "Implementation of Florida's Numeric Nutrient Standards" that describes how the criteria will be implemented in NPDES permits and in the 303(d) impaired waters program. The Department has also revised the State's 303(d) assessment methodology, the Impaired Waters Rule (Chapter 62-303, Florida Administrative Code), so that the NNC can be assessed as soon as they go into effect.

In preparation for an increased amount of data needed to fully assess the NNC the Department has also revised its strategic monitoring strategy to collect data over multiple years of the 5-year Basin Management Cycle, rather than in just one year as has been conducted to date. The Strategic Monitoring has also been expanded to collect the additional bioassessment data needed to fully assess the new stream NNC, which incorporate biological information with numeric nutrient thresholds for causal parameters (Total Nitrogen and Total Phosphorus). The Department has also revisited the TMDL development prioritization process and plans to give higher priority to waters impaired for nutrients.

More information about Florida's numeric nutrient criteria rules can be found online at http://www.dep.state.fl.us/water/wqssp/nutrients/.

Basin Management Action Plans

Section 403.067, Florida Statutes, the Florida Watershed Restoration Act directs the Department on the development and implementation of Basin Management Action Plans (BMAP). The TMDL provisions for Florida's ground and surface waters were first enacted by the Florida Legislature in 1999, called the (FWRA). The TMDL provisions in the FWRA coordinate pollution control from point and nonpoint sources, as well as establish a process to identify and list waters impaired by pollution. The FWRA also implements the federal Clean Water Act.

In 2005, the FWRA was updated to include provisions to allow for the development and implementation BMAPs, although BMAPs are not mandatory to implement TMDLs. The BMAPs are adopted by the Secretary of the Department and, by this means, become legally enforceable. Legal requirements can be enforced through National Pollutant Discharge Elimination System (NPDES) wastewater treatment facility (WWTF) permits, NPDES municipal separate storm sewer system (MS4) permits, or through the authority of the adopted BMAP itself.

The FWRA was updated in 2005 with provisions for legally-enforceable BMAPs.

In September 2013 EPA accepted adopted BMAPs as being equivalent to the Nine Element Water Based Plans.

BMAPs are developed and implemented through coordination with other state, regional and local governmental agencies, local watershed groups, non-governmental organizations, and other interested stakeholders.

The Department has adopted 17 BMAPs since 2007, 4 of which were adopted in 2013.

Indian River Lagoon Basin Management Action Plans (February 2013)

There were three Basin Management Action Plans (BMAP) adopted in the Indian River Lagoon Basin. They represent long-term plans to restore deeper water seagrass habitats through the reduction of watershed loadings of total nitrogen (TN) and total phosphorus (TP) (nutrients). The IRL Basin is a 156-mile-long estuary located on Florida's east coast. The impaired portions of the basin start just south of the Ponce De Leon Inlet in Volusia County and end just north of the Fort Pierce Inlet at the Indian River County–St. Lucie County boundary line. Due to the large geographic extent of the IRL Basin and the hydrologic differences throughout the basin, the best way to address the

implementation of projects that would achieve nutrient reductions and restore sea grass was to divide it into three subbasins: (1) North Indian River Lagoon, (2) Central Indian River Lagoon, and (3) Banana River Lagoon. Separate BMAPs were developed for each subbasin.

The management strategies included in the North Indian River Lagoon BMAP will achieve approximately 43% of the TN and 57% of the TP required reductions during the first, five-year BMAP iteration.

The management strategies included in the Central Indian River Lagoon BMAP will achieve approximately 113,000 lbs/yr of TN and 49,000 lbs/yr of TP reductions.

The management strategies included in the Banana River Lagoon BMAP will achieve approximately 21% of the TN and 24% of the TP reductions in the southern portion of the Banana River Lagoon.

St. Lucie River and Estuary (May 2013)

The St. Lucie River and Estuary Basin Management Action Plan represents the collaborative effort of Martin County, Okeechobee County, St. Lucie County; the cities of Fort Pierce, Port St. Lucie, Stuart, and Town of Sewall's Point; Copper Creek Community Development District (CDD), Tradition CDD, Verano CDD; Hobe St. Lucie Conservancy District, North St. Lucie River Water Control District (WCD), Pal Mar WCD, Troup-Indiantown WCD; Florida Department of Transportation; Florida Turnpike Authority; Florida Department of Agriculture and Consumer Services; and South Florida Water Management District to identify and implement the management strategies necessary to achieve the nutrient and dissolved oxygen total maximum daily loads for the St. Lucie River and Estuary Basin.

The management strategies included will achieve approximately 51.0% of the TN 37.4% of the TP required reductions during the first, five-year BMAP iteration.

BMAP Projects

Below are several of the ongoing projects implementing pollutant reductions in adopted BMAPs.

St. Lucie County was approved for 319 funding, $500,000, for a stormwater treatment train project that will reduce nonpoint source pollution entering the North Fork of the St. Lucie River. This project involves the addition of a detention lake, upgrading the stormwater conveyance system and utilizing best management practices to reduce TN,

TP, TSS and BOD loading as well as reducing erosion. This project will assist with the implementation of the St. Lucie River and Estuary Basin Management Action Plan.

Brevard County was approved for 319 funding, $321,393, for construction of a wet detention pond in the area of Fleming Grant Road. This project will assist with the implementation of the Indian River Lagoon Central Basin Management Action Plan by providing treatment of stormwater from a 136 acre drainage basin to reduce TN and TP pollutant loads.

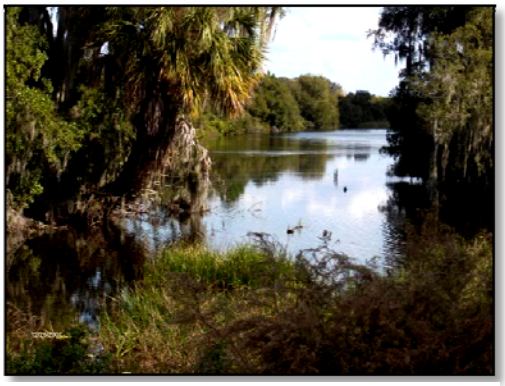
The City of Tavares was approved for 319 funding, $750,000, for stormwater management improvements and public education. The project is designed to reduce TP and TSS loading into Lake Dora which is part of the Upper Oklawaha River Basin Management Action Plan.

The City of Fort Pierce was approved for the State's TMDL Water Quality Restoration Grant funding, $462,000, for phase I, stormwater retrofit projects designed to reduce pollutants to meet the TMDL requirements within the Indian River Lagoon BMAP. The project has two phases. The first phase will treat the Veteran's Memorial Park, adjacent to the Indian River Lagoon and Intracoastal Waterway. The second phase of the plan which is in the 2104 319 Work plan consists of Low Impact Design BMPs which will treat storm water going directly into Indian River Lagoon.

BMAP Development

As of August 2013 there are 10 BMAPs under development throughout the state. These BMAPs will address reducing pollutants in 55 WBIDs that are impaired for nutrients, BOD and fecal coliforms.

- Alafia River Basin - The Alafia is the second largest river watershed that contributes flow to Tampa Bay
- Manatee River Basin - The water bodies in the Manatee River Basin are located in the central portion of Manatee County
- Middle Trout River - The Middle Trout River is a tributary to the Lower St. Johns River Main Stem marine reach.
- Suwannee River - The Suwannee River was designated as an Outstanding Florida Water 1979.
- Upper Peace River, Winter Haven Lakes - The Winter Haven Chain of Lakes system is generally



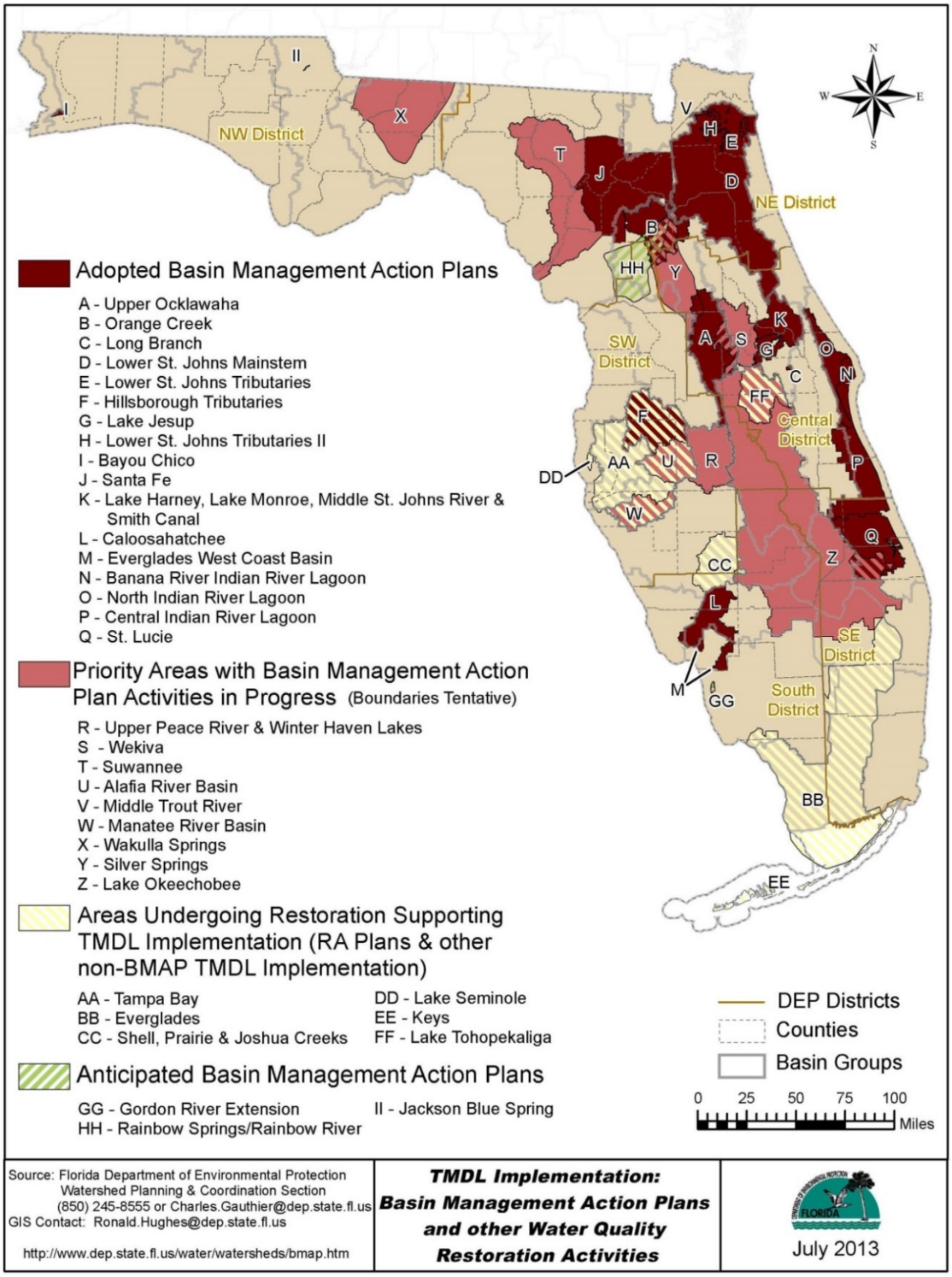
Alafia River

divided into the Northern Chain, consisting of 5 lakes, and the Southern Chain, consisting of 16 lakes.

- Wekiva River, Rock Springs Run, and Little Wekiva Canal - The river is designated by the federal government as an Outstanding Natural Resource Water and a Wild and Scenic River.
- Upper Wakulla River and Wakulla Springs - The Upper Wakulla River and Wakulla Springs are important resources that have been affected by nitrate loading from anthropogenic sources in the basin
- Silver Springs Group and Silver River - The Silver River is designated as an Outstanding Florida Water.
- Lake Okeechobee - Reductions to the lake will help to improve water quality in the St. Lucie and Caloosahatchee Estuaries.
- Rainbow Springs and Rainbow Run - The Rainbow River, whose flow is fed primarily by Rainbow Springs, has been designated as an Outstanding Florida Water

Upper Manatee River

TMDL/BMAP Implementation for 2013



Florida-Friendly Landscaping™ Program Update September 2013

The Florida-Friendly Landscaping™ Program, a partnership between the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) and the Florida Department of Environmental Protection (FDEP), is proud to boast the following successes this year:

Florida-Friendly Landscaping™ Program 2012 Statewide Reach

- In-Person Contacts 864,491
- FFL Workshop Participants 420,863
  (10,422 total workshops)
- Potential Mass Media Contacts 28 Million

Stronach Center Demonstration Garden

Demonstration Gardens

- Stronach Conference Center Demonstration Garden at the UF Plant Science Research and Education Unit (Citra)
- Straughn Center Demonstration Garden (Gainesville)
- Gainesville Regional Utilities Headquarters (Gainesville)

Current Research

Water Savings Quantification

Dr. Michael Dukes researched common water-savings practices and developed a table of estimated savings for each practice, for statewide use documenting water savings related to FFL activities.

Statewide Survey Instruments

An irrigation behavior-change survey that ties to the table developed by Dr. Dukes will be used by Extension agents to quantify water savings across the state. In addition, knowledge-gain and follow-up surveys have been developed and will be ready for statewide release by the end of 2013.

EDIS Fact Sheets Targeted To Homeowners

The FFL team, in collaboration with Drs. George Hochmuth and Laurie Trenholm, helped develop a series of factsheets for homeowners. The topics include urban soils, irrigation management, reclaimed water, conducting a blue dye test, and summer blackouts. The documents are in final review before release.

UF/IFAS Research Unit

This unit on UF/IFAS property will document inputs to a FFL vs. a traditional landscape, including irrigation, nutrient and maintenance requirements. The site will also be an education and demonstration landscape for conferences and workshops, including the FNGLA Great Southern Landscape Field Days.

Extension and Community Training

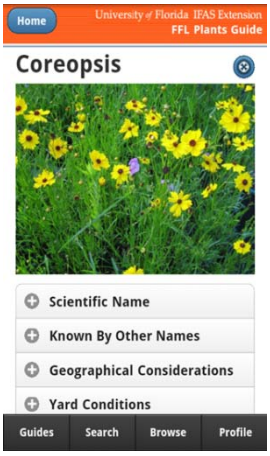
In-Service trainings

The FFL team conducted four In-Service trainings for Extension agents and Master Gardeners in 2012 (in Sarasota and Gainesville), and four in 2013 (in Gainesville, Balm, and Jacksonville).

Home Owner Association Workshops

As a proactive approach to address conflicts between HOAs and residents, the FFL team developed an educational workshop on the adoption of Florida-Friendly Landscaping™ in Florida Statutes section 373.185 (adopted in 2009 in Senate Bill 2080). Workshops were held in central and south Florida, and will continue to be offered across the state to HOAs, property managers, and real estate professionals.

Florida-Friendly Landscaping™ Plant Guide Mobile Web Application



Find the right plant for the right place with detailed information on light, soil, and water requirements. The mobile web application has more than 400 beautiful color photographs of Florida-Friendly trees, shrubs, palms, groundcovers, vines, ferns, annuals, perennials and ornamental grasses. It is ready to launch as soon as it receives final approval from administration.

> *"I thought the website was great – very well organized. The Florida-Friendly Landscaping™ Plant Guide is an excellent resource for designing a landscape plan or sharing plant properties with clients. The online app is easy to use and you can find what you're looking for quickly. It also has the largest index of Florida native and xeric plants available—and now I can access it on my phone for use in the field." Jackie—Landscape Architect*

Other Successes

Documented Water Savings

Tampa Bay Water estimates that smart irrigation controllers (Evapotranspiration or Soil Moisture Sensor controllers) are one of the **top 10 strategies** that are cost effective at conserving water and preventing large future capital costs to meet future demand. Thus, these devices are an economically feasible conservation measure for utilities and are also a key component of FFL. In the last year the Southwest Florida Water Management

District FFL coordinators have been tasked with documenting water savings associated with FFL principles.

In the short time that the water savings metric has been implemented, annual water savings of over 5 million gallons has been achieved from documented implementation of FFL recommendations.

County	Installed Rain Sensor - Gal	Installed Rain Sensor - # of homes	Calibrated to 3/4" - Gal	Calibrated to 3/4" - # of homes	Installed SMS - Gal	Installed SMS - # of Homes	Converted Turf to Bed w/Micro - Gal	Converted Turf to Bed w/Micro - # of Homes	Installed Rain Barrel - Gal	Installed Rain Barrel - # of Homes	Skip A Week - Gal	Skip A Week - # of Homes	Utility Bill Savings - # of Homes	Utility Bill Savings - Gal	Total Extrapolated Savings	Total Savings Utility + Extrapolated
Charlotte	19057.5	1	59565	1					2750	50				0	81372	81372
Citrus																0
Hernando									2255	41				0	2255	2255
Hillsborough																0
Manatee			115,754.65	1					770	14			9	22200	116524	138724
Marion							436812	14			131976	2			568788	568788
Pasco			29000	3	2079191	8								29000	2079191	2108191
Pinellas									3905	71	676988	7	3	49000	680893	729893
Polk													19	490,000		490000
Sarasota	704388	35	356199	9			15589	1							1076167	1076167
Sumter/Villages																0
TOTAL	**723445.5**	**36**	**560518.65**	**14**	**2079191**	**8**	**452401**	**15**	**9680**	**176**	**808964**	**9**	**31**	**590200**	**4605190**	**5195390**

Miami-Dade Success Story

Miami-Dade Parks, Recreation and Open Space Department manages the third largest county park system in the United States, consisting of 263 parks and more than 12,848 acres of land http://www.miamidade.gov/parks/about-parks.asp . The Miami-Dade Extension agent partnered with the Department, to conduct a series of workshops for their North Crew employees. One hundred nine (109) grounds maintenance employees attended a seven-week program in horticulture.

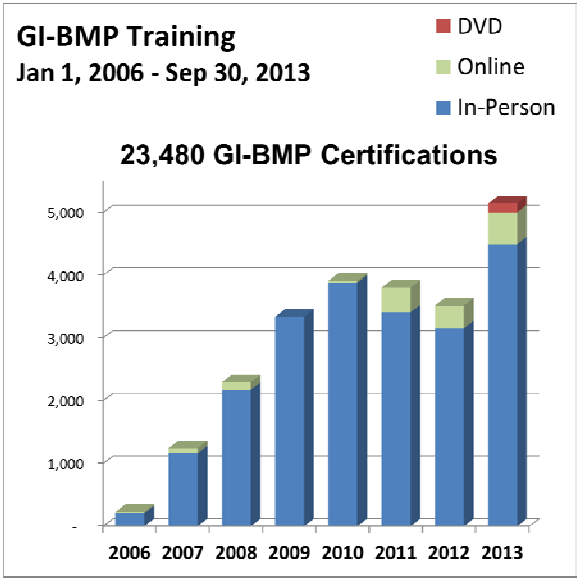
A post-seminar questionnaire indicated that 92% (90 of 98 surveyed) increased their knowledge and 71% (70 of 98 surveyed) would use at least one of the recommended practices in their landscape activities. A six-month follow-up survey to ten participants indicated that 100% (10 of the 10 surveyed) are using personal protection equipment (PPE) when applying pesticides, 90% (9 of the 10 surveyed) understand how to read and interpret the pesticide and fertilizer labels, and 80% (8 of the 10 surveyed) know how to differentiate broadleaf, sedges, and grassy weeds.

The behavior change resulting from training saves County money due to fewer accidents, and employees are better prepared to do the landscape job. Due to the success of the program, additional workshops will train the South Crew during 2013.

Green Industries Best Management Practices Program Update

GI-BMP Training and Certification - Data Snapshot

Year represents a 12-month period ending Sept 30 of year shown



In-Person Classes

Year	Total Certified	Total Attended	Classes	Ave Class Size
2006	207	245	13	19
2007	1,159	1,336	40	33
2008	2,175	2,446	79	31
2009	3,338	3,903	121	32
2010	3,881	4,636	171	27
2011	3,410	4,217	191	22
2012	3,153	3,953	191	21
2013	4,493	5,456	240	23
TOTAL	**21,816**	**26,192**	**1,046**	**25**

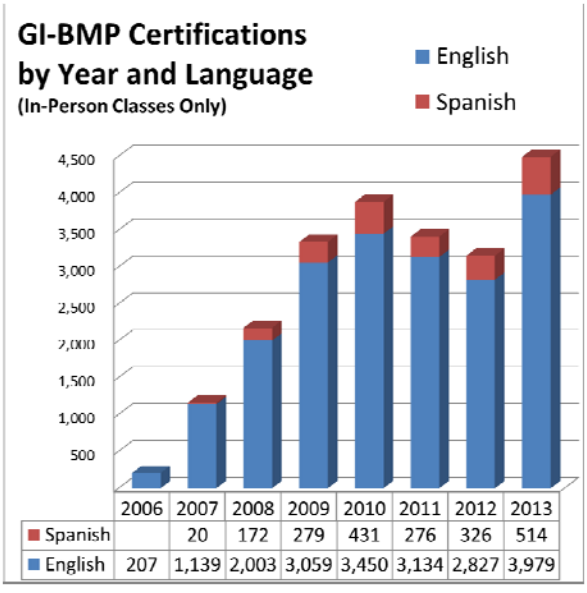
Pass Rates for In-Person Training

	English	Spanish
Overall	91%	70%
2013	91%	74%

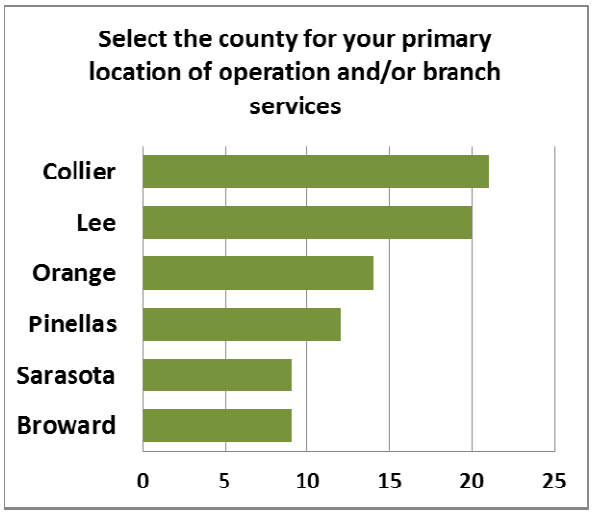
GI-BMP Certified Instructors

43 instructors added in 2013

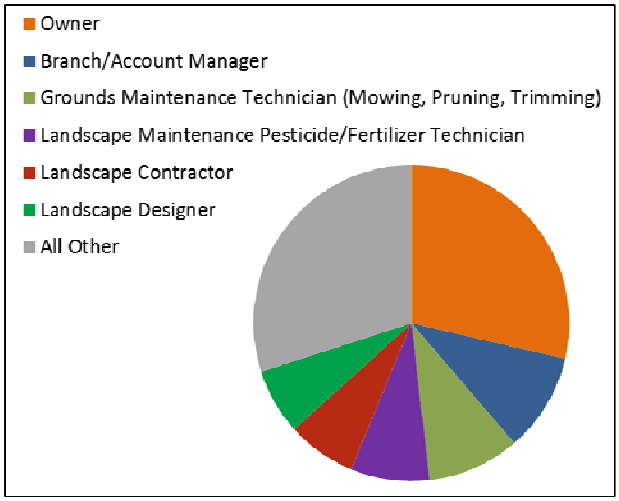
	Total	Active	Spanish
IFAS/Ext	133	96	8
Industry	164	122	13
FDEP/NERR	12	9	4
Other	35	28	
	344	269	30



GI-BMP 2012 Follow-Up Survey –Data Snapshot Results for Company Category: Lawn and Landscape Maintenance



The 2012 follow-up survey results and comments from industry professionals previously GI-BMP certified indicate that GI-BMP training provides useful, practical knowledge, and practices adopted. In addition, responses expressed support and recognition of the value of UF/IFAS Extension services and its programming efforts. A total of 173 out of 528 responded under the category "*Lawn and Landscape Maintenance Company,*" representing 37 out of 67 counties. This category was the highest reporting data set (32.8%) of 14 possible company classifications.



Category Profile at a glance:

- 28.9% of respondents in this category reported being GI-BMP certified less than 1 year, followed by 1-2 years (27.7%), 2-3 years (19.7%), 3-4 years (6.4%), 4-5 years (5.8%) and 5-6 years (11.6%). (n=173)
- Radius of operation from business address was 0-25 miles for 57.8% of respondents, followed by 26-50 miles for 26.0% of respondents. (n=173)
- 30.6% reported having a high school/GED diploma, 27.7% a Bachelor's Degree, 20.2% an Associate Degree, 12.1% a Technical School Certification/Diploma, and 5.8% an M.S or Ph.D. (n=173)

Overall Value of Extension to the Industry

Respondents who reported they Often or Always consulted with UF/IFAS County Extension Agents about lawn/landscape problems **increased from 45% to 70%** after becoming GI-BMP certified. (n=123)

Professional Value

When asked, "What is the **value of the GI-BMP program** to you?"

68.0% responded **knowledge increase** was important/very important.
24.6% indicated it was critical.

60.7% responded **better employment opportunities** was important/very important.
14.8% indicated it was critical.

53.3% responded **more job security** was important/very important.
14.8% indicated it was critical.

56.2% responded **higher income** was important/very important.
13.2% indicated it was critical.

(n=122)

2012 GI-BMP Follow-Up Survey Results Practice Change Summary for Lawn and Landscape Maintenance Companies	Before GI-BMP Training % responding often or always	After GI-BMP Training % responding often or always
Used weather forecasting information to plan a fertilization schedule	68.2	82.8
Established fertilizer free buffer zone around water bodies	70.1	83.7
Used a fertilizer broadcast spreader deflector shield	70.7	79.2
Read the fertilizer label to determine slow- and quick-release nitrogen sources	79.2	84.4
Calibrated fertilizer application equipment	72.0	80.5
Used Personal Protective Equipment (PPE) when handling and/or applying pesticides	67.1	77.2
Used IPM to determine pest control method(s)	62.1	77.8
Monitored pest populations to determine when to apply pesticides	65.0	77.9
Established pesticide application free buffer zones per label instructions	69.3	80.0
Used spill cleanup equipment to clean, control, contain, collect, and store spilled material until proper disposal	60.7	73.6
Reset irrigation controllers/timers seasonally.	70.0	82.3
Ensured irrigation rates to prevent leaching and runoff	64.6	81.5
Applied no more than ½ to ¾ inches of water per irrigation event.	65.4	80.0
Considered over-irrigation harmful to the plant and environment.	70.7	86.1
Educated clients about the importance of IPM.	55.2	79.6
Educated clients about effective irrigation management.	57.7	83.8
Educated clients about proper heights, the need to leave clippings on the lawn, etc.	67.4	87.8
Average Difference before and after training = 14.4% (n=154)	**Average** **66.4%**	**80.8%**
Average increase in number of people using BMPs	**22%**	

Level of Information Provided

GI-BMP Certified Professionals indicated satisfaction with the information provided.

Relevant Information? Very Satisfied/Satisfied: **94.3%**

Easy to Understand? Very Satisfied/Satisfied: **96.8%**

Was Helpful? Very Satisfied/Satisfied: **92.7%**

(n=122)

GI-BMP Program Improvements 2012-2013

Numerous improvements were implemented to enhance program quality and effectiveness, accessibility to target audience, and administrative efficiency.

GI-BMP DVD and Online Training – English and Spanish

- A DVD version of the GI-BMP training (in English) was released in January, 2013.
- A Spanish version of the DVD training is in final production and will be available in the 4th quarter.
- An update to the English online training and new Spanish online training are also planned to roll out this year.

New and Updated Programs Materials

An updated tool box was delivered to Certified GI-BMP instructors in February 2013. This included revised teaching modules and supporting materials:

1. Training Module PowerPoints and Speaker's Notes / Video Scripts (English). REVISED.

- All modules were revised.
- New training videos were produced and embedded in the PowerPoint presentations.
- An Introduction module was added, covering program goals and test instructions.

2. Training Review Worksheets – handouts, answer key and PowerPoint. NEW.

- Worksheets can be used along with the manual as a study guide before attending training or while viewing the DVD training, or incorporated into instructor-led classes.

3. Fertilizer Calculator handout – reference tool to find fertilizer application rates without math. NEW.

4. Approved GI-BMP Training Program Agenda and Protocols for FDACS CEUs. UPDATED.

5. Print Quality GI-BMP Program Brochures (English and Spanish) and GI-BMP Program Logo files

- Consistent materials can be used state-wide to promote the program at a local level.

6. Official Instructor Name Tags were provided and a **Usage Policy** was established.

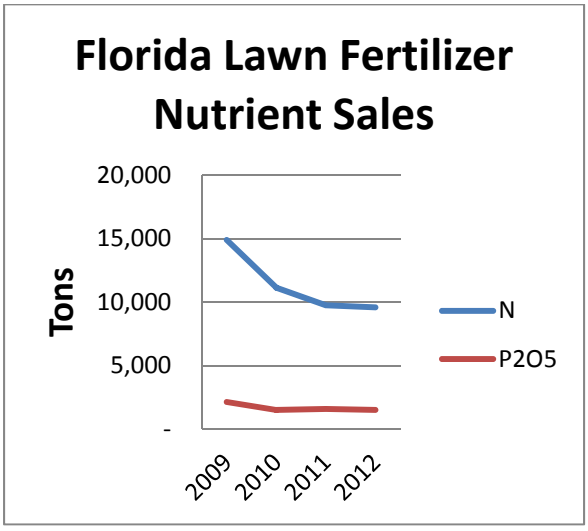
New Online Tools for GI-BMP Training Providers

The Training Provider account for the GI-BMP Training Website (https://gibmp.ifas.ufl.edu) allows access to self-service options for program instructors or authorized staff, including:

- Add, update or cancel class postings directly to the website's statewide schedule of classes.

- Online registration features to let students register from the class schedule (including option to link to a 3rd-party registration site)
- Pre-fill required trainee forms from online or uploaded registration data to streamline paperwork, and submit class attendance data online for faster class processing.

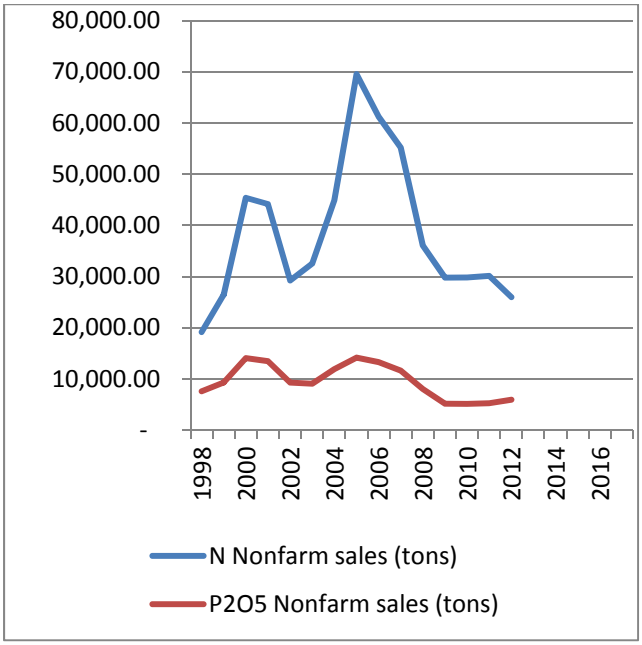
In 2009 the Florida-Friendly Landscaping™ and Green Industry programs, and the FFL fertilizer model ordinance, received formal legislative recognition, including certain statutory requirements for their use. Due in large part to these efforts, nitrogen in lawn fertilizer sales has dropped from 14,896 tons in 2009 to 9,583 Tons in 2012. In addition phosphate sales in lawn fertilizer have dropped from 2,117 tons in 2009 to 1496 tons in 2012.



Note: Non-Farm (Lawn/Turf, Golf/Athletic, Garden, Potted plant soil, and Greenhouse/Nursery) were NOT Reported separately before July 2008. Sharp drops in the 2007-2009 period may have been partially due to economic difficulty in the housing industry in addition to the growing FFL/GI-BMP programs.

Non-Farm Fertilizer tonnage by nutrient sold in Florida.					% Reduct.
Avg N,P	2004-2008		2009-2012		
N	53,376		28,929		46%
P	11,808		5,379		54%

Non-Farm Fertilizer Tonnage by Nutrient Sold



Onsite Sewage Treatment and Disposal Systems

Nearly one-third of Florida's population is served by individual onsite sewage treatment and disposal systems (OSTDS), primarily septic tanks with drainfields. Over 2.5 million onsite systems are in use within the state. Approximately 5,951 new systems were installed in the state last fiscal year (July 1, 2012 – June 30, 2013). Performance-based treatment systems, requiring design by a professional engineer, made up 107 of these. State agencies conducted 171,293 OSTDS inspections in Florida this fiscal year. Of these, 15,028 were for repairs of failing systems. It is estimated that OSTDS in Florida discharge over 450 million gallons of effluent per day. Florida allows no surface water discharges.

The Department has been working with the Florida Department of Health (FDOH) as well as other state and local stakeholders, through 319H grants and as cooperating partners, to reduce the impacts of OSTDS on the environment.

FDOH Florida Onsite Sewage Nitrogen Reduction Strategies Study

The FDOH Passive Nitrogen Reduction Research Project, which evaluates cost effective options to reduce the nitrogen input and load from onsite sewage treatment and disposal systems, particularly in springsheds and other sensitive environmental areas, has continued in 2013. The work includes field sampling of passive systems; quantifying life-cycle costs and the cost-effectiveness of passive systems over costs of conventional and more active systems; field sampling of the soil and groundwater under OSTDS at residential homes throughout Florida and at the test facility to characterize nitrogen removal from effluent; and development of both simple and complex soil transport models. The FDOH last submitted a status report on the project to the legislature and the governor in February 2013.

Web-based OSTDS Maintenance Tracking and Management Program

In its fifth year of a Section 319 funded contract, the Carmody, Inc. program continues to be a useful tool for county health department staffs and OSTDS service providers that are intent on keeping up with the OSTDS in their jurisdictions. The voluntary Carmody program operating in parallel with, but not substituting for, the FDOH OSTDS database, offers broader opportunities for local programs to monitor the advanced and special area OSTDS by means of tracking mandatory service provider and state inspections, permit renewals, and maintenance contracts. Many more OSTDS records are housed in the public access database known as Septic Search. Use of the web-based programs encourages increased inspections and maintenance of OSTDS statewide.

Assessment of the Performance and Management of Advanced Onsite Sewage Systems in Florida

FDOH used 319 grant funding for a statewide evaluation of the performance and management of advanced onsite systems in Florida. Advanced systems, such as aerobic treatment units and performance-based treatment systems, provide a higher level of treatment than conventional septic systems. A comprehensive evaluation of the advanced systems currently permitted in Florida was performed. This included developing an inventory of advanced systems in Florida to determine system numbers, types, and locations and performing a detailed review of a subset of identified systems, conducting detailed site evaluations for 550 sites throughout Florida, creating a monitoring protocol, sampling 350 advanced systems in at least one location along the treatment train, surveying various user groups regarding their perceptions of the systems, and documenting best management practices. The evaluation stressed the importance of keeping agency and service provider paperwork up-to-date. The main problems encountered during field visits were issues related to mechanical aeration, e.g., systems that were turned off or aerators not working. The sampling results showed that these mechanical aeration issues had a direct effect on the performance levels of the advanced systems. Best management practices identified during the evaluation suggested key steps to improve recordkeeping, system maintenance, enforcement, and communication between parties involved in the use and care of systems. A draft final report presenting the current condition of advanced systems in Florida and identifying recommended best management practices was submitted to FDEP in 2013 for review.

OSTDS Concerns in Developing BMAPs

The FDEP staff continue to work with local stakeholders in both the Wekiva and Wakulla Springs basins where BMAP activities include addressing nitrogen loading from OSTDS. In the Wekiva basin there are at least 19,409 OSTDS. Through the TMDL and BMAP processes, progress has been made in connecting existing onsite sewage systems to central sewer. The Department intends to further address the nutrient loading following BMAP adoption through a proactive process.

A BMAP is under development for Wakulla Springs, and OSTDS have been identified as an important contributor to excessive nitrates at the springs. As with the Wekiva, the Department intends to work to discourage the installation of new OSTDS and promote connection of existing OSTDS to sewers, where practical in the most vulnerable areas on the Woodville Karst Plain.

The Lower St. Johns Tributaries and the Lower St. Johns Tributaries II BMAPs both address fecal coliform impaired waters. The FDOH - Duval County has used Section 319 grant funding over the last few years to actively pursue door-to-door inspections, enforcement of failing systems, and education of all OSTDS users in areas with high potential for OSTDS impacts on the nearby or adjacent St. Johns River and its tributaries. The work in the state's waterbody identification codes (WBIDs) embodied by these two BMAPs has been completed by the health department. The department continues to address other WBIDs verified as impaired by fecal coliforms through their intensive program.

FDOH Program Review of Additives for Use in OSTDS

FDOH staff reviews the composition of products (additives) for use in OSTDS to ensure standards specified in Chapters 120 and 381.0065(4)(m), *Florida Statutes* (FS) and 64E-6.0151, *Florida Administrative Code* (FAC), are met. The laws indicate that no product sold in Florida for use in OSTDS may contain any substance in concentrations that would interfere with or prevent the successful operation of such systems, or that would cause discharges from such systems to violate applicable ground or surface water quality standards. Since March 2000, the Department of Health has reviewed 251 products for compliance with the minimum water quality standards established by the state. It is important to stress that the Department's compliance determination is not an endorsement or approval with respect to the benefit, effectiveness, or performance of any system additive. In 2012, 13 products were identified for review. As of October 2013, the Department had approved and published a list of 94 products that are in compliance with law or rule.

Erosion and Sedimentation Control

The Nonpoint Source Management Section has been responsible for implementing the Florida Stormwater, Erosion, and Sedimentation Control Inspector Training Program throughout the State of Florida. In 2013 1,996 attendees were trained as qualified inspectors and FDEP trained and approved 45 new instructors who will voluntarily teach the program curriculum. The training program was established in March 1999, and as of September 2013, over 29,645 attendees have become qualified inspectors.

Part of the program's success relies on the partnerships with federal, state and local entities. The program's DEP coordinator works closely with the water management districts, city and county governments, soil conservation districts, U.S. Navy, U.S. Air Force and the Seminole Indian Nation.

The Inspector Training Program was designed to increase knowledge and improve proper design, construction and maintenance of erosion and sediment control Best Management Practices (BMPs) utilized during and after construction.

In 2013 a new outdoor workshop, the Muddy Water Blues, was implemented. The first event was a tremendous success with over 150 participants. The agency has received many requests for additional outdoor events in other locations throughout Florida. The outdoor workshop provides a greater opportunity for contractors, designers, inspectors, and citizens to learn about BMPs using a hands-on approach. More of these events are being scheduled for 2014.

Currently, a more updated electronic format for the class registration is being evaluated. The DEP coordinator is also looking into updating the classroom training to include webinars and on-line classes and exams.

Agricultural Report

The Florida Department of Agriculture and Consumer Services (FDACS) develops and adopts Best Management Practices (BMPs) by rule for different types of agricultural operations, addressing both water quality and water conservation on a site-specific, regional, and watershed basis. Most of the BMPs are outlined in commodity-specific manuals.[1] FDACS's Office of Agricultural Water Policy (OAWP) takes the lead for FDACS in the development of BMPs. The OAWP works cooperatively with agricultural producers and industry groups, the Florida Department of Environmental Protection (FDEP), the university system, the Water Management Districts, and other interested parties to develop and implement BMP Programs that are economically and technically feasible. As a significant part of this effort, the office participates in statewide programs to implement the Federal Clean Water Act's Total Maximum Daily Load (TMDL) requirements for agriculture.

Statewide OAWP BMP Enrollment

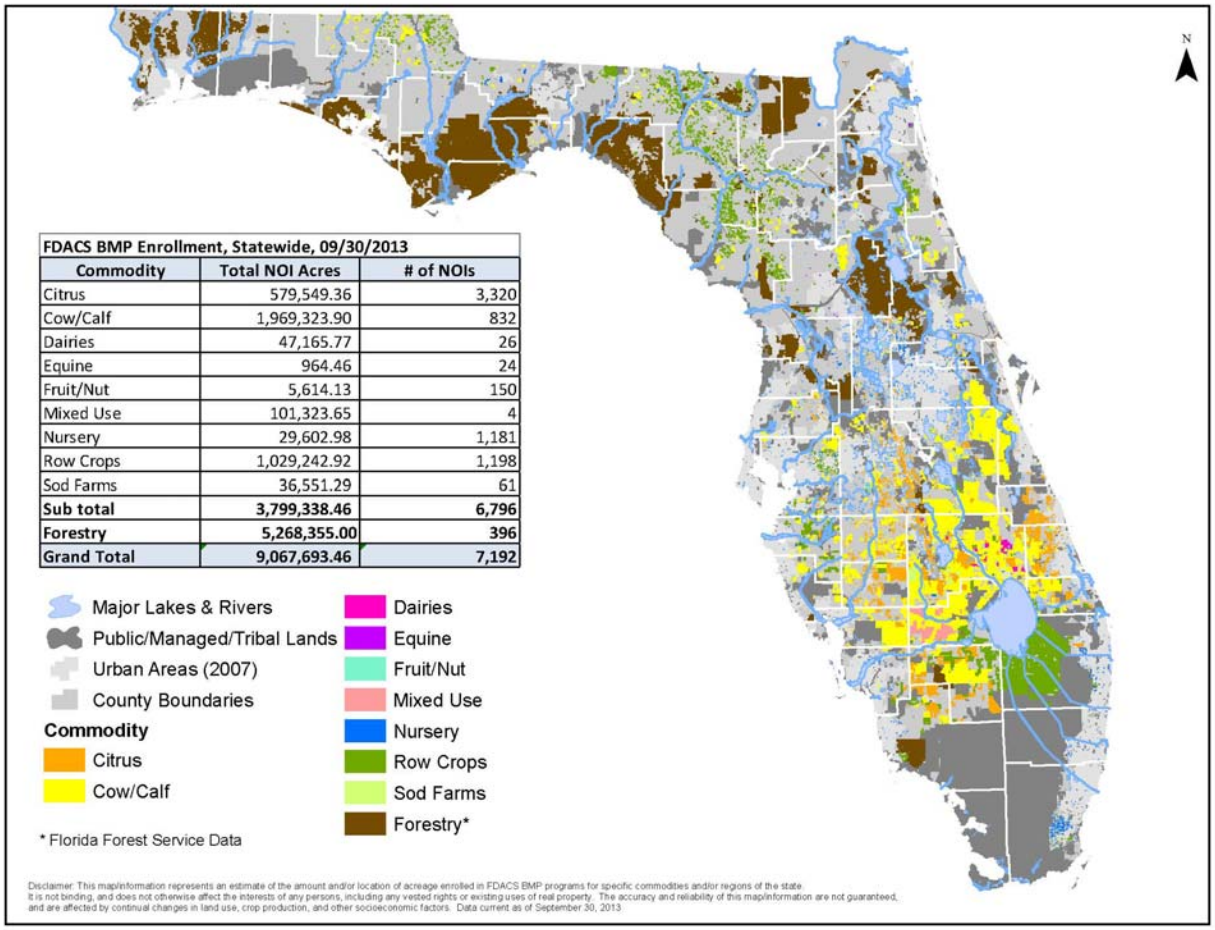
In 2013, the FDACS OWAP enrolled 488,994 acres of agricultural lands in citrus, sod, vegetable/agronomic crops, container nurseries, and cow/calf BMPs, with 252,386 acres of that in cow/calf BMPs. Agricultural producers have enrolled more than nine million acres in FDACS BMPs statewide, including almost 5.3 million in silviculture and 1.6 million in fruits and vegetables. Within the last few years, FDACS has conducted written BMP surveys of enrolled citrus, vegetable/agronomic crop, container nursery, and sod operations. Survey results[2] show that the producers who responded are implementing BMPs at a high rate. A survey of cow/calf operations is scheduled for 2014. In addition to the written surveys, FDACS OAWP staff and contractors conduct field visits to follow up with producers to evaluate and provide technical assistance with BMP implementation.

[1] These BMP manuals may be found online at http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs/BMP-Rules-Manuals-and-Other-Documents.

[2] Survey response rates were about 70% for the Ridge citrus and Peace River citrus BMP enrollees; 53% for Indian River citrus; 50% for Gulf citrus; 40% for vegetable and agronomic crops; and 32% for container nurseries.

OAWP 2013 BMP Program Enrollment	
Program/Manual	**Enrolled Acres**
Citrus - Indian River	1,401.36
Citrus - Statewide	85,124.42
Container Nurseries	1,035.08
Specialty Fruit & Nut	1,801.20
Statewide Equine	448.61
Statewide Cow/Calf	252,386.09
Statewide Sod	3,550.63
Vegetable & Agronomic Crops	143,246.49
Total Newly Enrolled Acres in 2013	**488,993.88**

OAWP Total BMP Program Enrollment	
Program/Manual	**Enrolled Acres**
Citrus - Gulf	98,705.53
Citrus - Indian River	180,381.52
Citrus - Peace River	76,508.72
Citrus - Ridge	84,533.27
Citrus - Statewide	85,124.42
Container Nurseries	29,263.49
Lake Okeechobee Protection Program	631,825.28
Specialty Fruit & Nut	5,614.13
Statewide Equine	889.78
Statewide Cow/Calf	1,553,766.72
Statewide Sod	33,154.09
Vegetable & Agronomic Crops	1,019,571.51
Total Enrolled Acres	**3,799,338.46**



Note: A significant amount of forestry lands is not included in this map, due to lack of tax parcel number information.

OAWP counts the following among its many successes:

- Conducted 94 site visits in the Suwannee and Okeechobee basins to follow up on BMP implementation for dairy, poultry, and cow/calf operations.
- Published the 4th BMP Implementation Assurance Report.
- Administered more than $3 million in DACS and water management district cost share to producers for the installation of structural BMPs to store water and reduce phosphorus loads in the Northern Everglades.
- Assisted growers in participating in the Northern Everglades Payment for Environmental Services program funded by the SFWMD.
- Provided coordination and administration for the Tri-County Agricultural Area Water Management Partnership, covering Flagler, Putnam, and St. Johns Counties. Among other things, this involved administering $2.25 million in funds from the St. Johns River WMD to provide cost share to growers for more efficient irrigation systems and nutrient management practices.
- Completed the statewide Citrus BMP Manual, which replaced four regional citrus BMP programs and updated and clarified the citrus practices. This manual was adopted in early January 2013.
- Initiated updates to the container nursery and vegetable/row crop BMP manuals. The container nursery manual will be expanded to include in-ground nurseries and leatherleaf ferns.
- Developed a standardized BMP Implementation Assurance site visit form for use by field staff and contractors to collect information and provide feedback to growers on the implementation of key nutrient management, irrigation management, and sediment and erosion control practices. This program will assist OAWP in evaluating and improving its BMP programs and help growers enhance their implementation of BMPs.
- Collaborated with FDEP on the establishment of a pilot Restoration Focus Area (RFA) in the Santa Fe BMAP area. The RFA approach is intended to focus resources (staff and funds) more effectively to implement and monitor the impacts of both urban and agricultural BMPs. An RFA is chosen based on a variety of factors, including the existence of water quality data, the potential for BMP implementation, priority designations, available resources, and others. If the RFA concept proves sound, it will be used in other areas.

FDEP verifies BMPs for the Citrus Industry

Florida is the number one citrus producer in the country, with the bulk of oranges used for juice processing and the bulk of grapefruit, tangelos and tangerines grown for the fresh market. The citrus industry has faced many challenges in the past two decades, with exotic diseases and weather-related impacts. However, the industry remains strong.

The citrus industry has had a long-standing role in BMP implementation, beginning in 1998. Following the industry-led development and FDACS adoption in 2002 of BMPs for the Indian River Lagoon area, FDACS worked with producers to adopt BMPs in three other citrus regions, the Gulf citrus area, the Peace River and Manasota basins, and the Ridge soils areas.

Over the years, the need for a consolidated, statewide citrus manual became evident, and FDACS OAWP began to work with the various industry associations and producers to accomplish this, while making some updates and clarifications to existing practices. FDEP was an integral part of this process, and had the statutory role of providing initial verification that the practices in the new manual are effective in reducing nutrient impacts.

FDACS received the FDEP letter of initial verification, dated April 23, 2012. The initial verification was based on FDEP participation in the BMP development process; a review of relevant literature/research; and expert advice, technical assistance, and/or data provided by the University of Florida, Cooperative Extension Service, and United States Department of Agriculture, Florida water management districts, U.S. Environmental Protection Agency, and others. This initial verification means that growers who enroll in and implement the FDACS-adopted BMPs applicable to their operation have a presumption of compliance with state water quality standards.

UF/IFAS BMP Implementation Team

The UF/IFAS Agricultural BMP Implementation team, which operates under UF/IFAS with input from FDEP and FDACS, was paid for in part with section 319 grant funds. Below is a description of some of the UF/IFAS Implementation team activities in 2012.

- Enrolled approximately 18,000 acres of agricultural lands in FDACS BMPs
- Made more than 500 contacts to provide information and/or technical assistance to agricultural producers
- Made almost 300 referrals to various state and federal cost-share and technical assistance programs, including the Mobile Irrigation Labs
- Conducted or participated in more than a dozen grower workshops, demonstrations, or worker training sessions regarding BMP implementation

- Continued to implement the Progressive Farms program in the Suwannee River Water Management District region, to demonstrate to growers various practices and technologies to save fertilizer and water, and thereby reduce their impacts to water resources

One of the growers the IFAS team worked with installed irrigation monitoring equipment at his own expense, and the IFAS team helped him install the equipment and interpret the data to enhance irrigation decision-making. The grower realized that he had been overwatering his corn crop and estimated that he would save about 173 million gallons of water for the growing season.

Another grower benefiting from IFAS team assistance was a citrus nursery. Through the use of leaf tissue analysis and leachate sampling the nursery manager saw that fertilizer application rates were excessive. He estimated that he has reduced his annual fertilizer rate by 40%.

The BMP Implementation Team works with an area farmer to show them the procedures for using a GPS unit in their tractor. This unit is used to more accurately apply fertilizers on the farm.

A farmer uses BMP tools including a soil moisture sensor to more efficiently manage water and nutrients.

A farmer installs a soil moisture sensor on his farm. This tool allows him to monitor soil moisture continuously to make better informed irrigation decisions.

Farmers tour a farm to learn about BMPs.

Silviculture

The Florida Forest Service (FFS), which is part of the Florida Department of Agriculture and Consumer Services, is responsible for administering Florida's Silviculture Best Management Practices (BMPs) Program, Rule 5I-6 F.A.C. Forestry Rule 5I-6 F.A.C. was established in 2004 as a voluntary program established to provide incentives for landowners to follow forestry BMPs during forestry operations. The Notice of Intent is a commitment to follow BMPs during all forestry operations, and has no fees or waiting period. The incentive is a presumption of compliance with state water quality standards, where BMPs are applied. Compliance with rule 5I-6 involves submitting a Notice of Intent to the FFS. To date, 5,280,780 acres of private and public land have been enrolled in the program. The private sector represents 52% of the total (2,798,813 acres) and 47% in the public sector (2,481,967 acres).

Voluntary Silviculture BMP Courtesy Checks were performed on 29 individual landowners throughout Florida where bona-fide ongoing forestry operations have occurred.

In 2013, the FFS Hydrology Section conducted a total of 26 BMP training workshops. These workshops were presented to a variety of entities including the Florida Master Logger Program, the Southeastern Wood Producers Association, forestry consulting companies, and internal training for Forest Service firefighters, and workshops open to the general public. Collectively, these workshops trained 572 individuals.

BMP Effectiveness Monitoring – Fertilization Effects on Ground Water

- A silvicultural fertilization BMP effectiveness monitoring project was conducted for four and a half years (October 2008 to March 2013), at two study locations having contrasting leaching potential, to observe the environmental fate of nitrogen and phosphorus applied at various amounts relative to BMP guidelines.

  - Poor or negative pine stand responses were observed for DAP fertilization at both sites.
  - Nitrate leaching through the soil profile was observed at both sites following each of two sequential annual fertilizations, but was greater after the second fertilization.
  - Peak NO_x-N concentrations at the deepest monitored depth (60-72") were observed at six months after the second application of the highest DAP rate (641 lb/acre) at Live Oak and at nine months at Blountstown. At these times, peak NO_x-N concentrations in the deepest monitored depth were 2.75 mg/kg at Live Oak and 1.29 mg/kg at Blountstown, significantly greater than the non-fertilized control. Concentrations remained elevated at that depth until one year after the second fertilization at Live Oak and two years after the second fertilization at Blountstown.
- Groundwater NH_4-N, TKN, and TP concentrations observed for wells monitoring the fertilized area did not increase when compared to pre-fertilization baseline levels or distant control wells through the 52 month monitoring period at either study site.
- At the sandy Live Oak site where depth to groundwater ranged from 32.9 to 42.4 ft, NO_x-N concentrations were below the PQL over the 52 month monitoring period, and averaged 0.19 mg/L, near the 0.148 mg/L MDL value.

At the clayey Blountstown site where depth to groundwater was only 3.0 to 13.5 ft, NOx-N was elevated by fertilization but concentrations were also related to well drawdown/recharge periods following fertilization. Peak treatment well NO_x-N concentrations were greater than the reference well concentrations by 1.2 mg/L following the first fertilization and by 1.4 mg/L at the time of the second fertilization.

However, the maximum NO_x-N concentration during the 52 month monitoring period was 1.6 mg/L and did not exceed state water quality standards. Treatment well NO_x-N concentrations gradually returned to baseline levels by approximately 43 months after the first fertilization.

Best Management Practices (BMPs) Recommendation

Current Practices

For established pine stands, fertilization with a combination of N and P is typically recommended. Diammonium phosphate (DAP), urea, superphosphates and ground rock phosphate are the most widely used fertilizers in Southeastern forestry, and are commonly applied to provide 150-200 lb/acre elemental N and 25-50 lb/acre P_2O_5 (11-22 lb elemental P). Typical growth responses in Florida are 50 ft^3/acre/yr or more, and the response generally lasts for 6-8 years (Jokela and Long 2012). The cost of nitrogen fertilizers has increased dramatically in the past decade. At present, almost all N used to fertilize pine plantations in the Southern USA is applied in the form of urea. Urea is not only less expensive than DAP, but it is readily available, is highly soluble, and because of its high N concentration (46%N) it is easy to transport and apply in the forest. Fertilization with urea is recommended for January through May to avoid significant volatile losses of N.

This study evaluated the effectiveness of silvicultural BMPs for a wide range of rates of DAP; which has historically been one of the most widely used fertilizers in southern forestry, largely because it conveniently provides both N and P. It is often combined with urea to achieve the desired proportion of N plus P. A very common treatment is the application of 400 lb/acre urea plus 125 lb/acre DAP, which provides 208 lb/acre N and 62 lb/acre P_2O_5.

General Implications

As expected, the fate of applied nitrogen differed at the clayey, somewhat poorly drained Blountstown site versus the excessively drained, deep sandy Live Oak site, illustrating the need for site-specific recommendations. At present, Florida Silviculture BMPs (2008) recognize this need in the "Fertilizer Application Limits" section. The current silvicultural fertilization BMPs recommend a "nutrient management plan based on soil, water, plant and organic matter sample analysis, along with expected or desired yields"; and to "see Florida Extension Service Circular 1230" (Using soils to guide fertilizer recommendations for southern pines, Jokela and Long, 2012).

Fertilization resulted in poor or negative pine stand responses at both sites. Except for increased four-year pine diameter growth at Blountstown and increased four-year dominant and co-dominant pine height growth at Live Oak, all pine stand attributes either showed no response to fertilization or responded negatively to increasing fertilization rate. Fertilization caused significant pine mortality at both sites.

Our surveys indicated that about half of Florida pine straw growers are fertilizing to increase pine straw yield (Chevasco and Minogue, 2012), which can double with fertilization on some sites (Morris et al. 1992). Even though we observed a trend of increased yield with the medium (384 lb/acre) and high (641 lb/acre) DAP fertilization rates, the effect was significant only at Blountstown at three years after the first application and for the four-year average, when the high and medium DAP rates resulted in greater pine straw dry weight and bale count than the low rate or non-fertilized control. However, the increased yield at that site appears to be due in part to increased pine mortality and resultant needle cast observed with the medium and high rates. Mean pine straw dry weights and bale counts at Live Oak did not show significant differences between DAP fertilization treatments. However, at the sandy Live Oak site we observed a weak trend of increased pine straw yield with the medium and high fertilization rate.

Poor responses to fertilization are not unusual during mid-rotation when pine straw harvesting occurs. In a region-wide study of fertilization and vegetation control in mid-rotation slash and loblolly pines at 13 sites in the southeast, only 54% responded positively in volume growth (Albaugh et al., 2012). The current BMPs address this point "it should be understood that not all silvicultural strategies require or can benefit from forest fertilization".

BMP Effectiveness Monitoring – Fertilization Effects on Surface Water

In response to the initiation of numeric nutrient standards in Florida, this project is designed to evaluate the effectiveness of the forest fertilization BMPs to protect surface water resources and aquatic ecosystems during fertilization operations. This phase of the overall work focuses on three foundational aspects: 1) identify and finalize paired watershed monitoring locations and obtain permission for the installation of flow and water quality sampling infrastructure, 2) enhance the analysis of benchmark streams for stream nutrient criteria to include the role of stream flow, which is currently not explicitly part of the numeric standards, and 3) initiate baseline water quality sampling using deployable sensors and discrete water collection at the two watershed sites. Ultimately, results from this project will provide forest resource managers and regulatory agencies with an expanded understanding of both direct and indirect effects of forest fertilization on aquatic ecosystems, and provide a quantitative measure of BMP effectiveness toward

that end. To date, the project sites have been identified, the stream instrumentation has been completed and pre-treatment data is now being collected. Once the calibration period (one year) is completed, forest fertilization treatments will be applied to the sites and data collection will continue for at least two additional years. Both water chemistry data and biological data will be collected at the sites.

Bioassessment

The Nonpoint Source program helped organize a Biocriteria meeting funded with section 319 grant funds in Ponte Vedra Beach, Florida October 23-25, 2012. Over 50 people attended the meeting, including DEP staff and staff from the U.S. EPA and local governments. The group discussed the new dissolved oxygen (DO) standard for Florida, numeric nutrient criteria implementation, updates in bioassessment standard operating procedures, stressor identification tools, and progress on marine bioassessment method development. The group conducted a field sampling exercise comparing fyke nets, beach seines, and beam trawls as methods for marine organism collection.

The Florida DEP is utilizing bioassessment tools in the assessment of impaired waters, development of site specific alternative criteria (SSAC), use attainability analyses for waterbody reclassification petitions, and in conjunction with numeric nutrient criteria. During 2012-2013, the stream condition index (SCI) and lake vegetation index (LVI) were approved as biological assessment criteria in Florida's Impaired Waters Rule, 62-303, Florida Administrative Code (F..A.C.), and as support for numeric nutrient criteria or nutrient SSACs in the Surface Water Quality Standards, 62-302, F.A.C. These methods are conducted by DEP, local governments, and consulting firms, so DEP has increased its efforts to provide training and auditing to all governmental and non-governmental staff that will collect these data for use by DEP. The DEP Aquatic Ecology and Quality Assurance Section within the Water Quality Standards Program in Tallahassee is primarily responsible for training and auditing of bioassessment methods. Staff in the DEP District offices primarily collect samples for the Strategic Monitoring Program (SMP) for impaired waters determination, and assist with LVI sampling for the Integrated Water Resource Monitoring (IWRM or Ambient) Status Network lakes. They also conduct local

and regional projects, and provide local training as needed. Below are summaries of bioassessment activities in FY 2012-2013, organized by workgroup.

The **Aquatic Ecology and Quality Assurance Section** in Tallahassee conducted the following bioassessment training events, audits, and sampling events during FY 2012-2013.

- Stream Condition Index (SCI) and Stream and River Habitat Assessment (HA) training provided at two locations to 84 total participants.
- Numeric Nutrient Criteria (NNC) implementation training, which included stream floral bioassessment standard operating procedure (SOP) training, provided at four locations to 153 total participants from government agencies and consulting firms.
- Lake Vegetation Index (LVI) and stream floral bioassessment method training to nine participants during the June 2013 Florida Lake Management Society conference.
- LVI team proficiency testing during June 2013 in which 29 teams, including 14 DEP and 15 non-DEP teams, sampled one of three lakes to show concurrence with other teams' scores.
- Initial field proficiency audit for the SCI for twenty DEP staff and five non-DEP staff.
- SCI refresher audit (conducted every 5 years) for five DEP staff and two non-DEP staff.
- Stream and river habitat assessment proficiency testing for approximately forty total DEP and non-DEP staff.
- Macroinvertebrate round robin quality assurance exercise for DEP taxonomists throughout Florida.
- Numerous field trips conducted as apprenticeship experiences for DEP staff for SCI, HA, and stream floral bioassesssment method sampling.
- Conducted LVI sampling at 14 IWRM Status Network lakes (Z1-SL-6019, Z1-SL-6027, Z1-SL-6012, Z1-SL-6024, Z1-SL-6028, Lake Hall, Lake Jackson, Z1-SL-7011, Z1-SL-7015, Z1-SL-7010, Z1-SL-7022, Z1-SL-7026, Z1-SL-7012, Z1-SL-7028).
- Conducted LVI Proficiency sampling at Lake Butler and Lucas Lake.
- Technical and editorial review of 35 DEP Ecosummary reports
- Online tests for LVI and SCI were developed and managed. These tests are required QA exercises for sampler proficiency
- Two plant taxonomic training events provided to DEP and non-DEP staff for QA in conducting LVI and stream floral bioassessment methods.

Biology Lab - Tallahassee

- IWRM: LVI performed for 25 lakes (No Name Pond, Lanford Pond, Sand Pond, Lake Alice, Bonnet Pond, Cravy Lake, Z1-SL-6028, Lake Talquin, Lake Wimico, Lake

Jackson, Lake Munson, Lake Seminole, Cherry Lake, Palestine Lake, Swift Creek Pond, Ocean Pond, Three Mile Pond, Knighting Lake, Lake Frances, No Name Pond, Summer Camp Pond, Sand Pond, Langford Pond, Z2-SL-7027, Z2-SL-7016)
- SMP biological assessments: SCI, RPS,LVS, HA performed for 12 sites (Woods Creek, Little River, Choctawhatchee River)
- Stream sampling to assist NW District Fifth Year Inspections: SCI, RPS, LVS, HA performed for 3 facilities
- Stream sampling to examine temporal effects of changing water levels and flows on the SCI; 37 SCIs and HAs total from 6 sites (Tallahassee, Yon, Mule, Stokes Branch, Big Branch, and Yellow Creek)
- Algal Bloom Response: 9 sites on the Santa Fe River and 1 site at Lake Munson
- QA biological method compliance: LVI proficiency testing at Lake Lucas and an SCI refresher audit at Mule Creek
- Attended 2 trainings on site selection for Numeric Nutrient Criteria biological assessments

Northwest District

- 12 LVI, and HA surveys in support of TMDL, IWRM, and QA/QC.
- 48 SCI, HA, RPS, and LVS surveys conducted in support of TMDL, Fifth Year, and other programs.
- 4 Wetland Qualitative Index Surveys in support of Fifth Year Programs.
- 4 Marine Suverys in support of Marine Fifth Year Inspection Program.
- 1 Estuary Sampling Survey.
- 1 Biorecon Survey and HA.
- 16 Dipnet Surveys.
- 49 Regional Plecoptera Survey.
- Weekly water quality monitoring of swimming areas in Escambia and Santa Rosa Counties.
- Approximately 15 Complaint Responses.
- Monthly water quality monitoring of St. Andrews and West Bay, Panama City with Baywatch.
- Assistance given to monthly water quality monitoring programs by Okaloosa County Environmental Council (AQUALAB) and Bream Fisherman Association.
- Training on Numeric Nutrient Criteria Protocols.
- 3 Outreach events.
- Attended annual Biocriteria meeting.
- 12 Ecosummary Reports written.

Northeast District

- IWRM Status lakes LVI sampling events for Suwannee areas and St. Johns areas (17 lakes include small lakes Paradise lake, Gum Slough Pond, Horse Pond,

Sheelar lake, Holy Oaks Lake, as well as large lakes Santa Fe Lake, Crescent lake, Sunshine lake, Sampson Lake, and Kerr Lake)

- Lake sampling at six lakes for Auburn University Algal study
- Lake sampling for SMP, LVI sampling for Hampton Lake, two special project LVIs for the Environmental Resource Permitting Compliance group.
- Completed one lake ecosummary report
- Stream sampling: SCIs performed for the SMP biological assessments at 6 locations in the St. Mary's and Nassau River Basin, including Pigeon creek, Mid prong St. Mary's, Unnamed creek at 125.
- Stream Sampling: SCIs performed for the SMP biological assessments at approximately 20 sites, including Julington creek, Black Creek, Sampson Creek, Bradley Creek, and Mcgirts creek.
- Fifth year SCIs for two facilities, as well as special project SCIs for one of the facilities for compliance assistance.
- Fyke net deployment and report for developing a BMAP or SSAC on Trout River for Dissolved Oxygen.
- 12 Ecosummary Reports written.

Central District

- Completed 8 published ecosummaries (5 lakes, 3 streams)
- Performed 269 biological assessments including 21 LVS, 25 SCI, 74 LVI, 41 stream HA, 74 lake HA, 1 LCI and 33 RPS in support of SMP, Trend Monitoring, Benchmark Site, Reference Site, Status Network, BMAP and Central District projects
- Added a total of 45 specimens to the Central District herbarium making a total of 294 different species and 429 total specimens
- Responded to 27 complaints regarding fish kills, algae blooms and others
- Provided field assistance to other programs and agencies 17 times
- Performed assessment of invasive aquatic species clogging canals in the Lake Jesup watershed. Results of this assessment were used to calculate benefits of harvesting rather than spraying the vegetation resulting in nutrient loads entering the Lake.
- Designed and started the Spring Monitoring project in Seminole State Forest. The project includes quarterly water quality monitoring and semiannual HA, LVS, RPS of 11 springs in remote areas. Data will be used as background data for the Wekiwa River watershed.
- Designed and started monitoring of Long Branch in east Orange County. The project consists of 20 water quality samples, diel DO study, and two stream assessments (SCI, HA, RPS). Its purpose is to provide a basis for DEP's TMDL reassessment of Long Branch. As of 10/15/2013 half of data was collected.

Long Branch

Dragonfly at Seminole State Forest

Southeast District

- Conducted LVIs at five lakes (Lake Mangonia, Lake Clarke, Clear Lake, Lake Osborne, Lake Ida)
- RPS and LVS sampling at four canal sites (Fort Pierce Farms Canal, C-25 Canal, Acme North Sector Canal, E-2 Canal)
- Provided training and assistance on numerous occasions for SCI, RPS, LVS, and other sampling to staff collecting data for the South Florida Canal Study.

Southwest District

- 42 Stream Habitat Assessments/Rapid Periphyton Surveys/Linear Vegetation Surveys
- 40 Stream Condition Index Surveys, including 2 Algal Gradient/low DO studies, , , 2 benchmark studies, 36 TMDL studies, 33 Lake Vegetative Index studies, including 8 TMDL studies and 25 nutrient criteria studies. Toxic algal samples were collected at all but 2 lakes for a Harmful Algae Study conducted by Dr. Alan Wilson, Auburn University, Auburn, Alabama
- 8 studies utilizing Fyke nets, seine nets and beam trawls (marine organisms) for a Use Attainability Study at Cross Bayou Canal, in conjunction with Pinellas County
- 8 Ecosummary Reports: (Hillsborough River, Manatee River, Pierce Branch, Cypress Creek (Hillsborough CO), Poley Creek, Lake Marion Creek, Pithlachascottee River, and Snell Creek);
- Participated in Cedar Creek "Walk the Wbid" event
- Assisted in water collection for several SMP monitored sites

South District

- 65 Habitat Assessment/Rapid Periphyton Surveys/Linear Vegetation Surveys
- 26 Stream Condition Index Surveys
- 3 Lake Vegetation Index Surveys

- 6 sampling events for the reclassification of 3 separate water bodies used for drinking water
- 42 seagrass surveys at in the Caloosahatchee River estuary in partnership with the Charlotte Harbor NEP
- Consistent water quality and YSI monitoring of the North Spreader Canal as well as comprehensive data analysis and reporting from data collected over the last 2 years
- Collected and pressed over 150 plant specimen to add to the in house herbarium
- Conducted over 8 outreach events to share information about biological monitoring with the public
- Collected water samples for the Charlotte Harbor Flatwoods study over the past year in partnership with various local environmental organizations
- Responded to 8 or more complaints regarding fish kills, algae blooms, and others
- Completed 4 Ecosummary reports
- Attended necessary trainings and testing events to acquire and maintain necessary certifications to conduct biological sampling, as well as several additional trainings
- Participated in the macroinvertebrate round robin quality assurance exercise for DEP taxonomists throughout Florida.

Education

Providing information to the public on NPS pollution and management is a major focus of FDEP staff. The NPS program's web site includes a listing of publications and reports. http://www.dep.state.fl.us/water/nonpoint/index.htm. Some of the more popular publications are those produced as training tools for certification programs described elsewhere in this report. Each year thousands of requested publications are distributed by the FDEP Nonpoint Source Management Section staffs. Referrals to partner agencies, universities, and programs help further the distribution of materials beyond what FDEP alone can handle. Newer materials also are being made ADA compliant.

The septic systems recordkeeping file folders continue to be distributed by health department staff, industry contractors, builders, and realtors. Additionally, "A Homeowner's Guide to Septic Systems" brochures continue to be distributed for use at different events and meetings throughout the year. These have been useful at Basin Management Action Plan stakeholder meetings, especially where septic systems are thought to be contributors of the pollution of impaired waters.

EPA materials on onsite wastewater systems, as noted in the previous paragraph, and stormwater management materials continue to be a part of the FDEP outreach efforts.

The FDEP Nonpoint Source Management Section staffs continue to be knowledgeable resources for the public and professionals seeking to locate appropriate materials and contacts for most every NPS pollution management need. FDEP headquarters and district staffs make presentations at a variety of venues where requested.

The EnviroScape models (the nonpoint sources model, coastal model, wetlands model, and hazardous wastes model) never seem to fall out of demand. There are requests throughout the year by church and school groups for science and special topic events, including state park event days, Project WET training sessions, Project Learning Tree school events, FDEP *Learning in Florida's Environment* (LIFE) field-based, environmental-science education programs across the state, and Earth Day at the Capitol and throughout Florida. With all FDEP district offices, the National Estuarine Research Reserves, and nearly all water management district offices in possession of one or more EnviroScape models, it is easy to use these educational tools to get the NPS pollution prevention messages out, as well as put on demonstrations about watersheds, wetland functions, soil erosion, and water

quality and quantity issues. FDEP NPSM and BMAP staffs learned how versatile the models could be in October when the hazardous waste model was transformed with labels and signage to represent the historic railroad and school of Woodville in the Wakulla Springs springshed at a communitywide celebration. The railroad and historic school were featured against a backdrop of Tallahassee skyline accompanied by sewers and the county's more rural development area shown with septic systems, a hot topic in the Basin Management Action Plan's development.

2013 TMDL Water Quality Restoration Grant Awards and Other State Funded Projects

In 2013, the state awarded 3.9 million dollars under the TMDL Grant for stormwater retrofit and restoration projects. These projects were competitively selected.

Rio St. Lucie Stormwater Quality Project

Grant: $240,000 Match: $250,000

The proposed project entails the construction and installation of exfiltration trench within County road right-of-way, along NE Rio Avenue, NE Spencer and Alice Streets, and NE Waverly Terrace to provided 1" of water quality treatment over an approximately 45-acre basin. Additionally, nutrient separating baffle boxes are proposed at the downstream end of the collector swales exfiltration system at NE St Lucie Boulevard and NE River Terrace prior to discharging directly into the middle section of St Lucie Estuary, that has been identified as an impaired water body, and has an adopted TMDL, approved by the EPA.

Brevard County Baffle Box Upgrades

Grant: $117,000 Match: $117,000

This project proposes to retrofit 17 existing first generation baffle boxes with screens in order to convert them to second generation baffle boxes and obtain increased nutrient removal efficiency.

In the 1990's, Brevard County installed many first generation Baffle Boxes as retrofit projects to reduce pollutant loads from drainage pipes discharging directly into the Indian River Lagoon. Subsequent research by FDEP (Smith and England, 2010) showed that first generation Baffle Boxes are ineffective for reducing nutrients from stormwater runoff. However, second generation Baffle Boxes with debris collecting trash screens were demonstrated to provide 19.1% reduction for TN and 15.5% reduction for TP by removing organic debris from the water column.

Railroad Ave Corridor Exfiltration Project

Grant: $188,500 Match: $188,500

The Railroad Avenue Corridor Exfiltration Project will help to advance Martin County's goal of reducing nutrient latent storm water runoff from reaching the Manatee Pocket. The project will also aid in addressing the receiving water body's impaired status. Affected waterways within the project catchment area are Willoughby Creek and an unnamed channel flowing to Manatee Pocket (WBID 3208). Presently, these contributing

drainage basins receive no water quality treatment prior to discharge to the receiving water body.

Paynes Prairie Sheetflow Restoration – PH 3

Grant: $500,000 Match: $864,207

This project is to remove excess total nitrogen (TN) identified in the Nutrient TMDL for Alachua Sink. The proposed Sweetwater Branch/Paynes Prairie Sheetflow Restoration Project (PPSRP) is a nutrient reduction project whose best management practices (BMP) include a 1) water reclamation plant upgrade, 2) Sweetwater Branch channel improvements to stabilize the channel, capture sediment and trash, 3) create a 125 acre treatment wetland that reduces TN to 3 mg/l or less for achieving TMDL requirements, 4) construct a mile and a quarter long sheetflow distribution channel to rehydrate 1300 acres of stressed prairie habitat, and 5) back fill almost two miles of existing canal to eliminate short circuiting.

7th Ave Underground Stormwater Treatment

Grant: $608,384 Match: $602,051

The City of Mount Dora is in the process of implementing a multi-phased stormwater treatment project designed to address a significant portion of the downtown area constructed prior to the existence of stormwater treatment regulations. Stormwater runoff from these areas was historically piped directly to Lake Dora via inadequate and aging conveyance systems as well as overland flow. Retrofitting these aging stormwater systems will provide treatment to help reduce pollutant loading to the receiving water. The project area is within the Upper Ocklawaha River Basin (UORB) which is a "Priority I" basin and was the first basin in Florida to have an adopted Basin Management Action Plan (BMAP). Elements of this project are included as part of the BMAP.

Brevard Co – C-1 Rediversion Project

Grant: $273,910 Match: $285,090

The C-1 Canal was originally constructed to drain natural wetlands for agricultural use and has been maintained for flood protection in the Upper St, Johns River (SJR) Basin. Over the years, this canal has conveyed large quantities of nutrient and sediment laden fresh water, causing substantial nutrient loading, muck deposition and low salinity levels in receiving waters of the Indian River Lagoon (IRL). In 2011, Phase 1 of the C-1 Rediversion Project was constructed to redirect approximately 28% of the historical flow back toward the St. Johns River and away from the IRL. While Phase 2 has been planned for the future, an intermittant phase is proposed, in this application, to divert an

additional 14% of freshwater flow toward the SJR by upgrading existing pump stations in the C-1 Canal.

Sebastian Presidential Street TMDL Reduction

Grant: $90,000 Match: $140,000

This project is a part of a Basin Management Action Plan (BMAP) to reduce nutrient loadings from storm water runoff into the Indian River Lagoon. The project includes the construction of storm water drainage systems. The systems will include: drainage pipes, shallow grass swale treatment, and an adopted Best Management Practices (BMP) 2nd generation nutrient separating baffle box with Bold and Gold filtration media to treat and reduce pollutants before discharging into the Indian River. The Indian River Lagoon is listed as an impaired water body and has an adopted Basin Management Action Plan.

Fortenberry Regional Stormwater Mgmt Syst.

Grant: $341,955 Match: $355,912

The Fortenberry Regional Stormwater Management System is a multi-phased project and, upon completion, will provide water quality treatment and flood control for a 156.8 acre watershed consisting of primarily commercial property. The primary goal of the project is to provide water quality treatment for the existing and highly impervious drainage basin; however, the project is unique in that it will provide an opportunity to commericial properties within the watershed to purchase and utilize stormwater credits provided within the new regional stormwater pond. The overall project includes diverting stormwater runoff from an urban drainage basin into a new 22.3 acre wet detention system pond, constructing two overflow weirs, and increasing the capacity of the upstream stormwater conveyance system.

Highland Ave Parking Lot, Eau Gallie, Melbourne

Grant: $103,000 Match: $190,000

This proposed project will reduce stormwater pollutant loadings to the North Indian River Lagoon in Brevard County by creating an exfiltration trench and underground retention basin in a community redevelopment area (CRA) with little stormwater treatment currently provided. This project will provide full retention of 3 inches of rainfall over 1.41 acres.

Ft. Pierce Phase I Veteran's Memorial Park Stormwater Improvements

Grant: $462,000 Match: $541,500

This stormwater retrofit project is located within state impaired waters and is in need of stormwater cost share funding in order to meet the locally- and state-adopted TMDL and BMAP. Veteran's Memorial Park is located in Fort Pierce, north of the downtown area adjacent to the Indian River Lagoon and Intracoastal Waterway. The City of Fort Pierce is planning a two-phase project with a treatment train in each phase.

Pollution Control (PC) South Algal Turf Scrubber (ATS) System

Grant: $1,000,000 Match: $7,891,768 TMDL Category $1,226,900

Indian River County has a very progressive stormwater treatment program. In order to address stormwater pollution loadings to the Indian River Lagoon "Narrows' portion of the estuary, the county will construct a regional treatment system pulling stormwater from the South Relief Canal to be combined with RO concentrate disposal from the south county RO plant, route this nutrient-rich water over a 4.6 acre innovative, and proven effective, algal turf scrubber (ATS) system for removal of nitrogen and phosphorous before returning the treated water to the canal. Public education will also be provided to discuss things residents can do to decrease their negative impact on the Lagoon and our environment.

Other State Funded Projects

In 2013 the state also chose to fund other projects including a $10,000,000 appropriation for ten projects designed to reduce pollutant loads to Florida springs. The water management districts along with local partners are also funding the project. Several of the springs projects are described below.

Silver Springs

A $798,000 appropriation to reduce effluent disposal close to the spring (up to 1.5 mgd) and provide reuse much further from the spring at the Golf and Country Club. Retire the Club's consumptive use permit to improve spring flow and relocate disposal to reuse to improve spring water quality.

Wekiva Springs

A $700,704 appropriation to construct reclaimed water transmission main to expand the City of Apopka's reclaimed water service into a high recharge area for Wekiwa and Rock Spring, which feeds the Wekiva River. Utilizing this reclaimed water reduces and eliminates discharges to the Wekiva River system which affects water quality while also providing spring flow benefits through aquier recharge.

Suwannee River Springs

$1,548,000 - An estimated 3 billion gallons of surface water storage will be recharged into the surficial aquifer improving spring flows along the middle Suwannee River basin. Roughly 1,500 acres of sand ponds and 4,000 acres of wetlands will also be hydrated recreating the natural hydrologic conditions and recharge. Enhanced aquifer recharge features like drainage wells at strategic locations within Mallory Swamp or adjacent public lands will also increase aquifer recharge.

Rainbow, Kings Bay, Homosassa, Chassahowitzka, Weeki Wachee Springs

A $175,000 appropriation for advanced agricultural best management practices (BMPs) to conserve agricultural water use while reducing nutrient loss, specifically nitrogen. BMP implementation can result in average reductions up to 90%, depending upon the initial operating conditions and the levels of BMPs involved.

Kings Bay

$1,000,000 - This project will connect several private package plants and 250 existing septic tanks to the force main that will result in an estimated load reduction of 6,272 lb N/yr. This project will generate approximately 90,000 gallons per day of reclaimed water that will be used by the Black Diamond Golf Course, thus reducing groundwater withdrawals.

Water Management Districts

South Florida Water Management District

The South Florida Water Management District had many accomplishments and successes throughout the year, including the following highlights:

- Overall, the Everglades Stormwater Treatment Areas (STA) performed well in Water Year 2012 (May 1, 2011–April 30,2012) in terms of outflow TP concentrations and TP load removal. During the year, the STAs received a total of 712,331 acre-feet (ac-ft) of inflow and retained 80.7 metric tons (mt) of TP. This equates to an average of 83 percent TP load reduction and a decrease in flow-weighted mean (FWM) TP concentration from 111 to 19 parts per billion (ppb).
- Numerous efforts have been conducted under the Lake Okeechobee Watershed Construction Project, including (1) completion of the Lakeside Ranch Stormwater Treatment Area (STA) Phase I construction, which is designed to remove phosphorus (P) from stormwater runoff in the Taylor Creek/Nubbin Slough Basin before it enters the lake; (2) two pilot-scale STAs in Taylor Creek and Nubbin Slough; (3) hybrid wetland treatment technology (HWTT), which represents a combination of chemical and wetland treatment technologies to remove TP at sub-basin and farm scales; (4) dispersed water management projects, which include both public and private landowners participating in a variety of efforts that spread excess water across the landscape and require little new construction to retain large cumulative volumes of water; and (5) feasibility studies at the sub-watershed level, which are identifying sub-watershed planning targets and identifying preferred plans to achieve those targets.
- The Everglades Agricultural Area (EAA) achieved a 71 percent [154 metric tons (mt)] TP load reduction for WY2012 compared with the predicted load from the pre-BMP baseline period adjusted for rainfall. The total cumulative reduction in TP loads due to BMP implementation since WY1996 is 2,565 mt, which represents a long-term reduction of 55 percent overall.

For more on South Florida and Everglades updates, see the 2013 South Florida Environmental Report at:
http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2013_sfer/v1/vol1_table_of_contents.html

Southwest Florida Water Management District

- From 1987-2013, the SWFWMD's Surface Water Management and Improvement (SWIM) program and its cooperators completed over 250 habitat restoration and water quality improvement projects, which restored over 10,500 acres of habitat and provided water quality treatment for over 55,000 acres of watershed. In 2013, the Clam Bayou Ecosystem Restoration and Stormwater Treatment Project on Tampa Bay won first place in the Natural Resource/Environment category at the 2013 Future of the Region awards hosted by the Tampa Bay Regional Planning Council. This project, which is a collaborative effort between the SWFWMD and the cities of St. Petersburg and Gulfport, involves the restoration of 121 acres of habitat and provides stormwater treatment for approximately 2,600 acres of watershed.
- In April 2013, construction of the Lake Hancock Lake Level Modification Project was completed. Completion of the Lake Hancock Outfall Treatment Project is scheduled for the fall of 2013. The Lake Hancock projects are two initiatives that are critical to the SWFWMD's recovery strategy for improving water quality in the Peace River, meeting the minimum flow requirements in the upper Peace River and protecting Charlotte Harbor.
- The water quality trend for springs in the SWFWMD shows an increase in nitrate contamination. Efforts to address this include the creation of an internal SWFWMD springs working group charged with examining and discussing pertinent issues, and the support of funding partnerships for restoration projects in spring basins.
- By the end of FY2013, the SWFWMD had adopted Minimum Flows and Levels (MFL) criteria for 200 lakes, wetlands, rivers/streams, springs and aquifers. In FY2013, new MFLs were adopted for lakes Bonable, Hooker, Little Bonable, Raleigh, Rogers, Tiger, Tooke and Whitehurst Pond; and the Homosassa and Chassahowitzka river systems, which include the rivers, Blind Spring, and other springs that contribute flow to the Chassahowitzka River, Homosassa River, Southeast Fork of the Homosassa River, Hidden River and Halls River.
- In FY2013, the SWFWMD approved 10 new FARMS projects and 7 amendments which are projected to provide 1.6 mgd in annual average daily and 1.37 mgd in frost-freeze protection groundwater offsets. FARMS projects represent a variety of agricultural industry commodities and are designed to serve as an incentive to the agricultural community to install and maintain irrigation best management practices (BMPs) addressing water quality and quantity aspects.
- By the end of FY2013, a total of 4,461 detrimental abandoned artesian wells had been plugged under the SWFWMD's Quality of Water Improvement Program (QWIP). Plugging these abandoned wells eliminates the waste of water at the surface and prevents mineralized groundwater from contaminating surface water bodies. Historically, the QWIP has proven to be a cost-effective method to prevent waste and contamination of potable ground and surface waters.

- Other notable SWFMWD accomplishments by the end of FY2013 included monitoring of more than 4,600 acres of wetlands through new Environment Resource Permits and completion of 56 watershed management plans .

St. Johns River Water Management District

In 2009, SJRWMD implemented the pilot "Pay-For-Performance" (PFP) project, which pays a pre-negotiated rate for each pound of TP removed from the water column, exported off-site, properly disposed of, and verified by another independent contractor funded by the District. Payment is based on complete removal of biomass from the contributing basin and the contractor is paid $227 for each pound of TP removed and verified. The project implemented has resulted in the removal of 6,194 lbs of TP from the Lake Jesup as of mid-July 2013. This pilot project ends in April and the process will be available to Lake Jesup TMDL stakeholders as a regional treatment project at that time.

Tri-County Agricultural Area Water Management Partnership

In 2008 the FDEP adopted a related basin management action plan (BMAP) containing actions to reduce pollutant loadings to the river. Among other things, the BMAP identifies needed agricultural load reductions.

In late 2010, FDACS proposed a partnership in which the growers, agencies, IFAS, and others would collaborate on the means to reduce impacts without threatening the viability of agriculture. The agencies and growers agreed to work together to install and demonstrate water management and nutrient management projects and practices through cost-share funding, education, and technical assistance. This effort was dubbed the TCAA Water Management Partnership (TCAA-WMP).

The primary resource concern is the movement of phosphorus off of farm lands into the LSJR and its tributaries, although nitrogen movement is also a concern.

TCAA WMP Partners:

- TCAA growers (including the North Florida Growers Exchange)
- FDACS (coordinating entity)
- Florida Department of Environmental Protection (FDEP)
- UF-IFAS
- St. Johns County
- Floridan Resource Conservation and Development Council
- Florida Fruit and Vegetable Association Florida
- Farm Bureau

- SJRWMD
- United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS)

In 2011, the SJRWMD backed the Partnership by allocating $1.5 million for water management projects, and in 2012 provided an additional $750,000 specifically for fertilizer banding equipment. FDACS has administered these cost-share funds, and provides staff time to coordinate Partnership activities. To date, all but about $435,000 of the $2.25 million in SJRWMD funds has been expended or obligated, and more projects are under development.

The FDEP will be funding water quality monitoring of grower projects to determine their nutrient reduction benefits. The USDA-NRCS has designated the TCAA as a priority for cost share, and has obligated more than $450,000 to TCAA projects in the past year. The FDEP and FDACS plan to provide additional funding for grower projects in the next year.

Information from FDACS – Office of Agricultural Water Policy – 7/8/13

Northwest Florida Water Management District

The NWFWMD has many ongoing projects related to reducing nonpoint source pollution. A number of them are described here.

Cascades Park Watershed Restoration Project

The Blueprint 2000 Intergovernmental Agency constructed watershed restoration components of the Cascades Park project, a major effort of the City of Tallahassee and Leon County to develop a multiuse park within a historic area of downtown Tallahassee. Activities completed include construction of stormwater ponds and associated drainage facilities, restoration of a naturally functioning stream reach, and implementation of best management practices (BMPs), to include wetland treatment systems and an alum stormwater treatment system. The overall concept of the park itself is a nonpoint source pollution abatement BMP, as the park is designed to flood, staging up during heavy rain events to provide water quality treatment and flood improvement.

Apalachicola Bay Stormwater Treatment Projects

The Northwest Florida Water Management District has entered into agreement with the City of Apalachicola to fund three additional stormwater treatment projects within downtown Apalachicola. These also will provide water quality improvements for Apalachicola Bay, as well as improving flood protection for the residents of the city. These projects are located within urbanized Apalachicola, and will provide treatment within three sub-basins of approximately 119 acres, 46 acres, and 138 acres, respectively.

Lisenby Avenue retrofit pond (Panama City; Bay County)

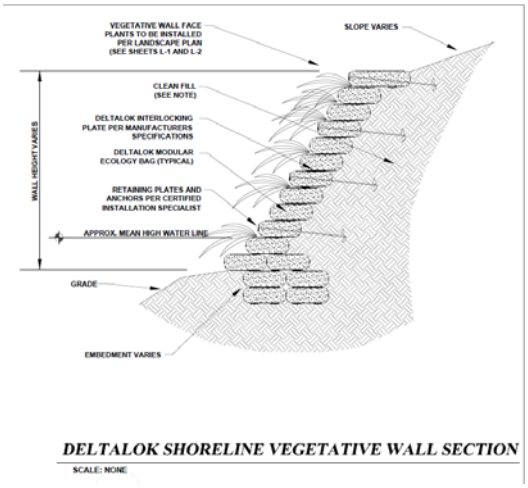
Bay County will construct a stormwater treatment facility, with funding assistance from the Northwest Florida Water Management District, to improve water quality in St. Andrew Bay. The Lisenby Avenue Stormwater Retrofit Project will include design and construction of a stormwater retrofit facility to provide water quality treatment and wetland restoration to help address water quality in both Lake Caroline and St. Andrew Bay. With an annual projected stormwater runoff of over 118 million gallons, the facility is expected to remove an additional 193,000 lbs. of petroleum hydrocarbons, 865 lbs. of total nitrogen, total phosphorous, copper and zinc, and 5,100 lbs. of BOD load from the runoff. This retrofit project will have direct restoration benefits on the water quality and ecological health of the receiving waters – Lake Caroline and the St. Andrew Bay estuary.

Water Quality Monitoring

A revenue agreement with the Florida Department of Environmental Protection (DEP), will allow the District to continue a monitoring program to assess water quality on major rivers and streams throughout the panhandle. The data is used by DEP and the District to develop and implement management strategies to improve water quality and minimize negative impacts on surface water resources.

Devil's Hole Swallet Sediment Control Project

Devil's Hole Swallet is a karst window in Washington County, Florida, with exposed groundwater, and it is experiencing significant bank erosion and sedimentation due to adverse impacts caused by unregulated public use on sensitive slope areas. The project will stabilize highly erodible slopes while providing public access and recreation at this site on the Econfina Creek WMA.



Cross Section of Vegetated Wall

Devil's Hole Sinkhole/Swallet

Suwannee River Water Management District

The SRWMD created a District-wide Agricultural cost-share program in Fiscal Year (FY) 2013. The program goal is to reduce groundwater pumping by increasing uniformity/efficiency of overhead irrigation. The program also provided advanced irrigation management tools to the local producers. Those practices included: upgraded controller panels, GPS end-gun shut offs, soil moisture sensors, weather stations and features allowing for the remote control/monitoring of irrigation systems.

- Through the first year, the SRWMD has achieved an estimated groundwater savings of 5.2 million gallons per day (mgd). The SRWMD funded 70 irrigation retrofits, 211 advanced irrigation scheduling tools, and 8 special projects.

The SRWMD initiated the RIVER (Regional Initiative Valuing Environmental Resources) cost-share program in FY 2013. The program provides funding assistance for water supply, water quality, flood protection, and natural system projects for governmental entities.

- The District funded 3 RIVER projects that are estimated to reduce 401 cubic feet of sediment from entering into the Suwannee River, provide 3,472 square feet of bank stabilization along the Suwannee River, provide water quality treatment for

over 20.5 acres of previously untreated areas in Spring Creek, remove 500 septic tanks, and eliminate 15 tons of nitrates per year in District water bodies.

The Suwannee River Partnership (SRP) has been working with agriculture since 1999 to conserve water and enhance water quality in the Suwannee River Basin.

- An additional 393 BMP Notices of Intent (NOI) were signed with agricultural producers representing 102,962 acres. The SRP program has a total of 720 NOIs encompassing 277,962 acres in the SRWMD.
- Cost share for BMP Tools was made available to 150 farm operations and has allowed for these operations to use new technology and more efficient application equipment to apply fertilizer and irrigation water.
- BMP tools assist producers in efficiently applying fertilizer and irrigation water and include global positioning systems for fertilizer application equipment, nutrient level analyses equipment, soil moisture sensors for scheduling irrigation events, automated irrigation controllers, weather stations, and rain gauges.
- Increased BMP enrollment for this year has resulted in approximately 2,574 fewer tons of fertilizer being applied in the basin due to more efficient use of nutrients.
- The demand for Mobile Irrigation Lab (MIL) services required adding a new lab in the Suwannee Basin. The MILs performed 225 evaluations to determine irrigation system application efficiency and distribution uniformity. Efficiency recommendations were provided to producers based upon their soil and crop types.
- Based upon MIL recommendations agricultural producers retrofitted 100 center pivot irrigation systems with cost share assistance from the SRP. Retrofit equipment included new nozzles, regulators, gaskets, and irrigation controllers to conserve more than 102,000 gallons per acre per crop grown. Water savings associated with implementation of the MILs recommendations have resulted in water savings of more than 18 million gallons per pivot each year based upon multiple crops per year.

The SRWMD partnered with the Department of Environmental Protection (DEP) to implement a cost-share program in the Basin Management Action Plan (BMAP) areas to assist producers in reducing their water use and reduce nutrients applied.

- Funding was used to incorporate fertigation systems on farms using precise applications. In the Santa Fe River Basin 51 fertigation systems were installed with estimated nutrient reduction of 919,000 pounds. In the Suwannee River Basin 23 fertigation systems were installed with an estimated nutrient reduction

of 441,000 pounds. The total nitrogen reduction for the program is 1.36 million pounds annually (74 fertigation systems).

- There were 61 irrigation retrofits in the Santa Fe River Basin with estimated groundwater savings of 2.65 mgd.
- There were 33 irrigation retrofits in the Suwannee River Basin with estimated groundwater savings of 1.45 mgd.
- Total funds obligated during FY 2013 were $803,000 for the Santa Fe River Basin and $434,750 for the Suwannee River Basin.

319 FY14 Solicitation and Project Selection

Projects selected for the FY14 draft workplan total a grant request of $6,019,779 and, if funded, will represent nutrient reductions totaling 4,293 lbs/yr of total nitrogen and 1,193 lbs/yr representing total phosphorus.

Project Number	Title	Watershed	319 Funding	TP Reduction lbs/yr	TN Reduction lbs/yr
1	Sanibel Sewer System Expansion Phase IV	Lower Charlotte Harbor	$600,000	159.1	405.6
2	Fort Pierce Veteran's Memorial Park Stormwater Improvement	Indian River Lagoon	$345,500	23.07	113.88
3	Bayou Chico Stormwater Retrofit Project	Bayou Chico/ Jones River – Pensacola Bay	$755,563	600.2	198.2
4	Use of Submerged Aquatic Vegetation as Bio-Filters in Field Ditches to Reduce Farm P Load	Everglades	$150,479	200	—
5	Draa Field Stormwater Park	North Indian River Lagoon	$388,825	87	404
6	Demonstration & Technology Transfer of Denitrification Bioreactors to Reduce Nitrogen Loads within the Santa Fe Basin	Sante Fe Watershed	$305,432	—	2849
7	All American Ditch Retrofit	St. Lucie River/Basin	$1,125,000	42.6	210.7
8	Minutemen Causeway LID SW Treatment Trains – Phase 2	Indian River Lagoon	$544,540	13.92	66.87

Project Number	Title	Watershed	319 Funding	TP Reduction lbs/yr	TN Reduction lbs/yr
9	Tulip Drive Stormwater Improvement Project	Central Indian River Lagoon	$186,840	8.8	44.4
10	Lake Yale Subbasin 4 Stormwater Reuse Project	Lake Yale	$1,617,600	58.2	_

319 FY07 Load Reductions

The majority of the 2007 319 stormwater reduction projects were completed for construction prior to the end of 2013. Post construction monitoring is still continuing for a number of the projects. The grant also provided funding for numerous programmatic efforts, including UF/IFAS' Florida-Friendly Landscaping program and associated Green Industries BMP program as well as University of Central Florida's Stormwater Management Academy's educational Pointless Personal Pollution campaign, onsite sewage treatment and disposal system outreach, the creation and refinement of bioassessment tools, and the continuation of the state's erosion and sediment control training program. The table below represents a summary of the projects funded by the FY07 grant.

Project Number	Title	Watershed	31907 Funding	TN Reduction lbs/yr	TP Reduction lbs/yr
1	NPS Program Administration	Statewide	$431,168	n/a	n/a
2	Stormwater, Erosion, and Sedimentation Control Certification Program	Statewide	$130,548	n/a	n/a
3	NPS Bioassessment Quality Assurance Program	Statewide	$148,000	n/a	n/a
4	Continuation of the Florida Yards and Neighborhoods Program	Statewide	$375,620	n/a	n/a
5	Stormwater Management Academy Pollution Prevention Education	Statewide	$431,000	n/a	n/a
6	CZARA -Continuation of OSTDS County Outreach Project	Selected Counties	$200,000	n/a	n/a
7	Effectiveness of Siliviculture BMPs for Forest Fertilization in Pine Straw Production	Calhoun and Suwannee Counties	365,000	n/a	n/a
8	Lake Seminole Project	Pinellas County	$800,000	1,720	579
9	Sarasota Alligator Creek Stormwater Treatment Trains	Sarasota County	$1,000,000	1,584	1,209
10	Hillsborough Hillgrove &Stearns Stormwater Facilities, Phases 2 & 3	Hillsborough County	$1,000,000	2,972	17,972

Project Number	Title	Watershed	31907 Funding	TN Reduction lbs/yr	TP Reduction lbs/yr
11	Venice Stormwater System Lining & Public Awareness Project	City of Venice	$96,318	18,767*	2,483*
12	Satellite Beach Cassia Watershed Treatment Process, Phase 3	City of Satellite Beach	$885,370	185	16.5
13	Brevard Valkaria Lakes	Brevard County	$103,801	1,903	330
14	Sebastian Main Street/Twin Ditch Stormwater Improvements	City of Sebastian	$500,000	504	59
15	City of Key West Stormwater Improvements	City of Key West	$490,000	1,841	174
16	Brevard Beach Outfalls Retrofit Project	Brevard County	$273,000	4,444	722
17	Vero Beach Date Palm Ditch Nutrient Separation Baffle Box	City of Vero Beach	$87,000	274	6.7*
18	Demonstration of Water Management Alternatives for Phosphorus and Water Retention in the Lake Okeechobee Basin	Lake Okeechobee Basin	$111,027	24,974*	104,468*
19	DOH Lower St. Johns	Lower St. Johns River	$167,259	n/a	n/a

*Actual load reductions. Other reductions provided are the estimated reductions.