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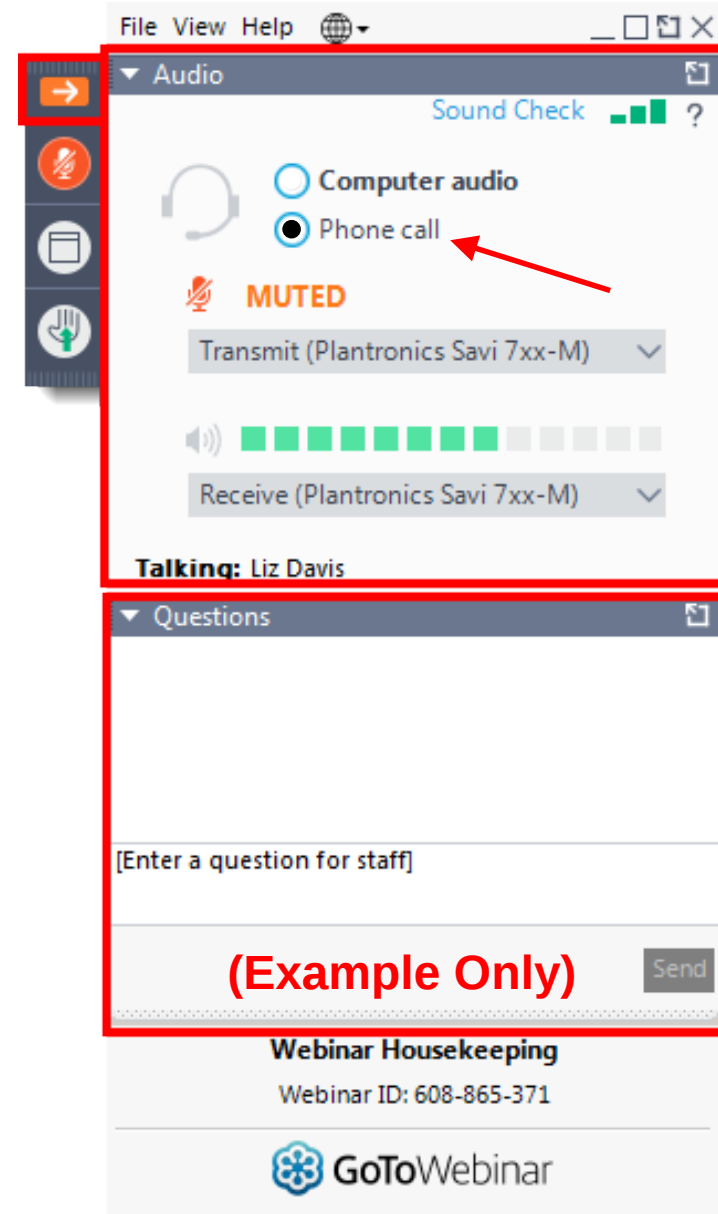
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12/19/2019





Lake Okeechobee Basin Management Action Plan (BMAP) 5-Year Review and BMAP Update Webinar

December 19, 2019



Agenda

- *Background*
- *5-Year Review*
- *Overview of the BMAP Update*
- *Statewide Annual Report*
- *Next Steps*



Background

Lake Okeechobee TMDL

Lake Okeechobee BMAP

5-Year Review

Executive Order 19-12



Background Information

Lake Okeechobee TMDL (Section 1.1)

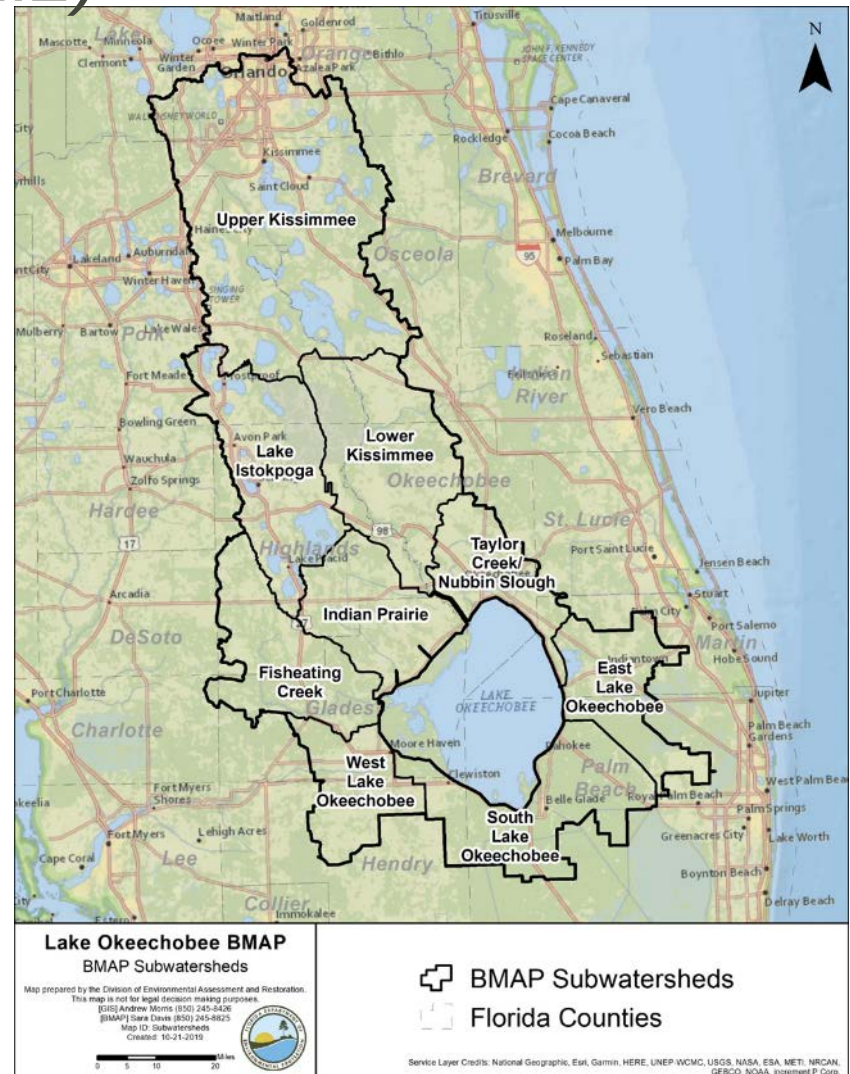
- Total maximum daily load (TMDL) for total phosphorus (TP) adopted in 2001
- TMDL is a TP load of 140 metric tons per year (mt/yr):
 - 35 mt/yr fall directly on the lake through atmospheric deposition
 - Remaining 105 mt/yr allocated to the entire Lake Okeechobee Watershed (LOW)
- TMDL attainment calculated using a 5-year rolling average of the monthly loads calculated from measured flow and concentration values



Background Information

BMAP (Section 1.2)

- BMAP adopted in December 2014
- Focus was on project implementation in the six subwatersheds north of Lake Okeechobee
- Project reductions spread over a ten-year time frame:
 - Allows Coordinating Agencies to include long-term projects and develop additional projects to help meet the TMDL





5-Year Review

Reminders

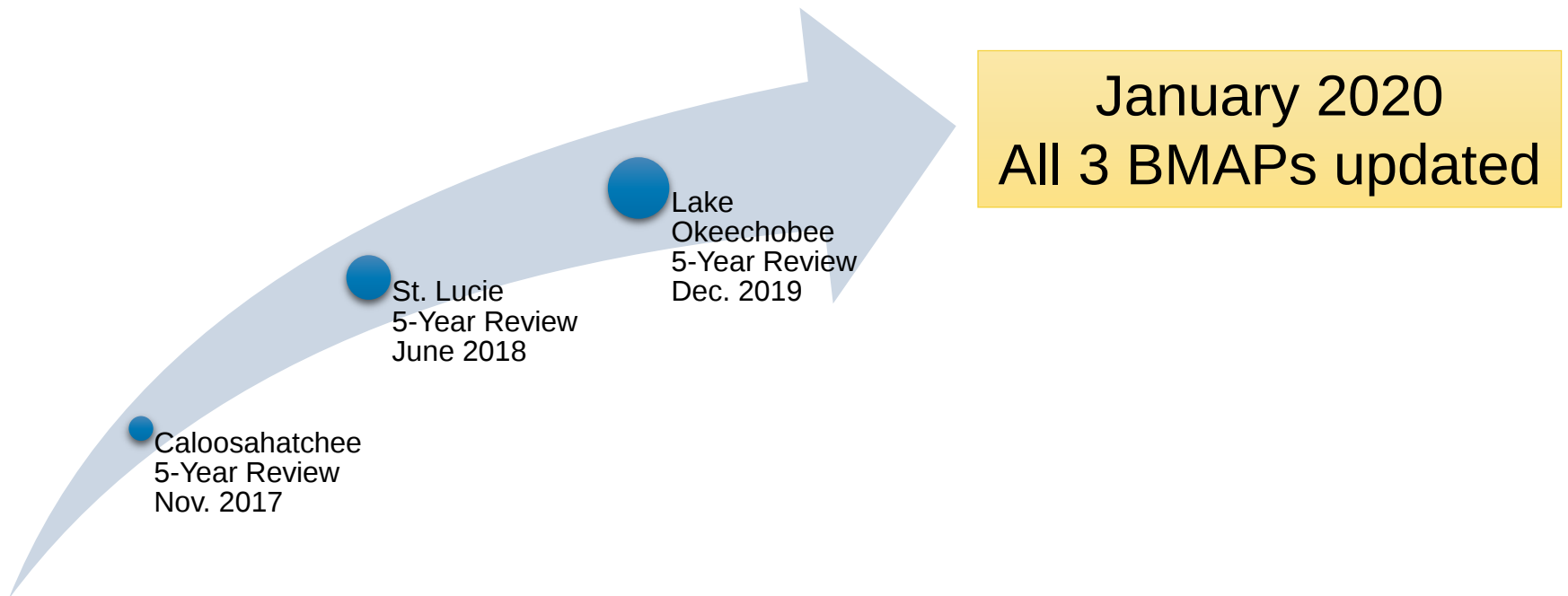
- Legislative Requirements for Northern Everglades and Estuaries Protection Program (NEEPP)
 - *Chapter 373.4595 (4), F.S.*
- 5-Year Review by end of **December 2019**
- Provided to the Governor, the President of the Senate, and the Speaker of the House of Representatives



Executive Order 19-12

BMAP Directives:

- Update restoration plans impacting South Florida communities within the year, including:





5-Year Review (Chapter 2)

2.1. Progress to Date

2.2. BMAP Modeling

2.3. LOW Construction Projects

2.4. Water Quality Analysis

2.5. 5-Year Review Conclusions



5-Year Review

2.1. Progress to Date

- 215 projects completed from January 1, 2009 to June 30, 2019
- Draft estimates from WAM LET
- 51 underway and planned projects
 - ~11 mt/yr (draft)
- Future projects additional reductions TBD

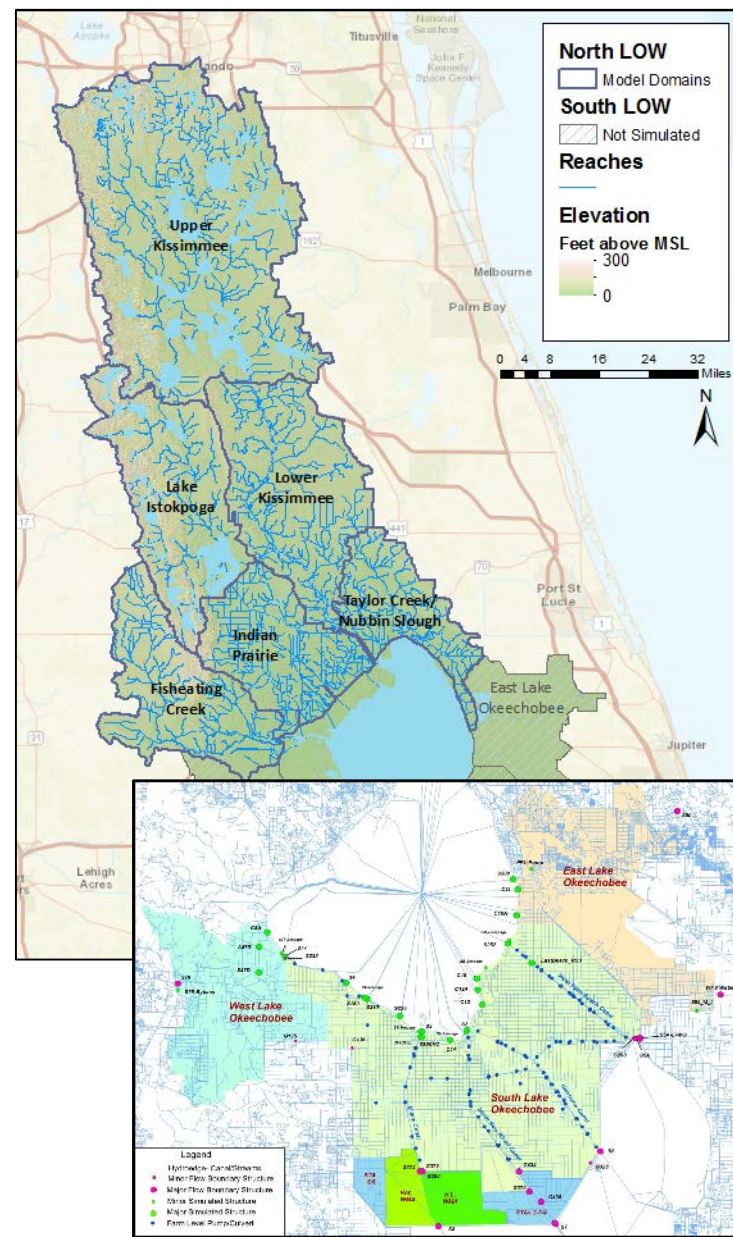
Subwatershed	TP Reduction to Date (mt/yr)
Fisheating Creek	16.11
Indian Prairie	15.72
Lake Istokpoga	2.73
Lower Kissimmee	6.59
Taylor Creek/Nubbin Slough	24.34
Upper Kissimmee	6.81
East Lake Okeechobee	2.20
West Lake Okeechobee	0.37
South Lake Okeechobee	2.88
Total	77.75
Total Required Reductions	493.00
Total Reductions Achieved (%)	15.8 %



5-Year Review

2.2. BMAP Modeling

- Watershed Assessment Model (WAM)
 - Updated inputs and Recalibrated
 - Expanded model domain
 - Predrainage characterization
 - Abatement strategies
- Supports updated BMAP
 - Estimate project baseloads for reductions
 - Calculate attenuation factors
 - Compare loads within subwatersheds and basins





5-Year Review

2.2. BMAP Modeling (continued)

- Draft attenuation factors - compared source loads with loads to the lake for each subwatershed

Table 13. Attenuation factors in the LOW by subwatershed

Subwatershed	TP Attenuation Rate	TN Attenuation Rate
Fisheating Creek	0.38	0.70
Indian Prairie	0.03	0.37
Lake Istokpoga	0.69	0.64
Lower Kissimmee	0.38	0.68
Taylor Creek/Nubbin Slough	0.21	0.40
Upper Kissimmee	0.47	0.67
East Lake Okeechobee	0.66	0.70
South Lake Okeechobee	0.90	0.53
West Lake Okeechobee	0.93	0.90



5-Year Review

2.3. *LOW Construction Project*

- Lake Okeechobee Watershed Protection Plan (LOWPP)
 - Lake Okeechobee Research and Water Quality Monitoring Plan
 - Lake Okeechobee Watershed Construction Project (LOWCP)
 - LOWPP website: <https://www.sfwmd.gov/lowpp>
- LOWCP purpose: provide an overall strategy to protect and restore surface water resources by improving hydrology and water quality
- SFWMD recommended modifications and updates
- **Chapter 4** includes management measures from LOWCP



5-Year Review

2.3.1. Coordinating Agency Projects and Initiatives

- Coordinating Agencies
 - DEP
 - South Florida Water Management District (SFWMD)
 - Florida Department of Agriculture and Consumer Services (FDACS)
- Coordinating additional projects that will also achieve nutrient reductions
- Many of these projects depend on annual legislative funding
- BMAP contains other initiatives to help with water quality





5-Year Review

Table 14. Coordinating Agencies Initiatives

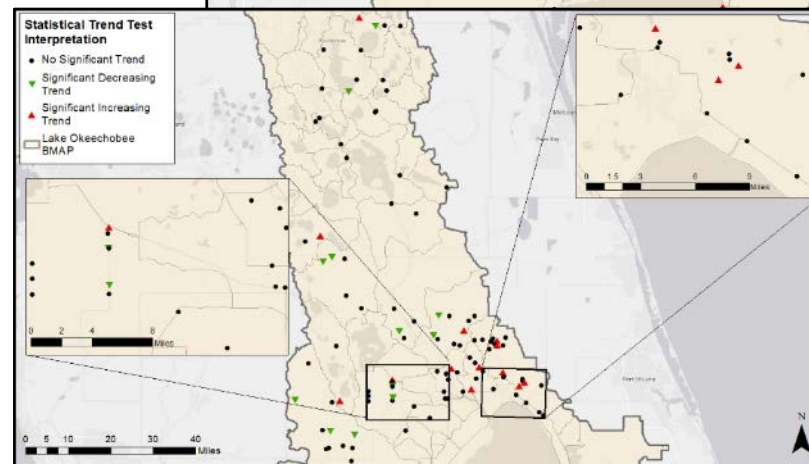
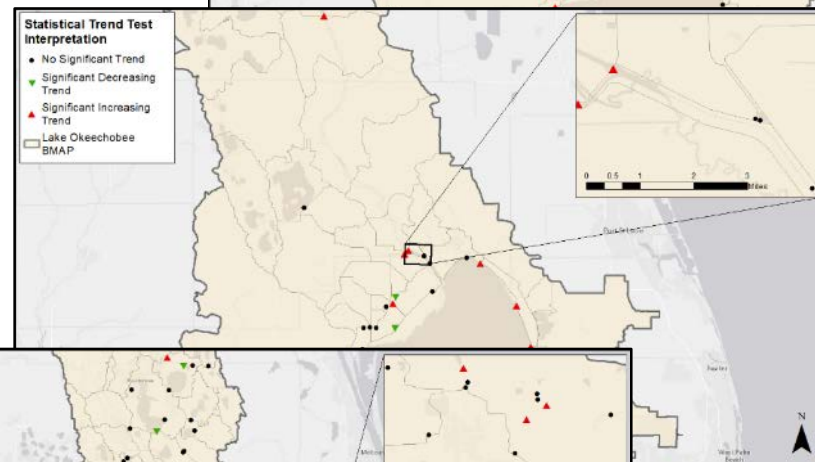
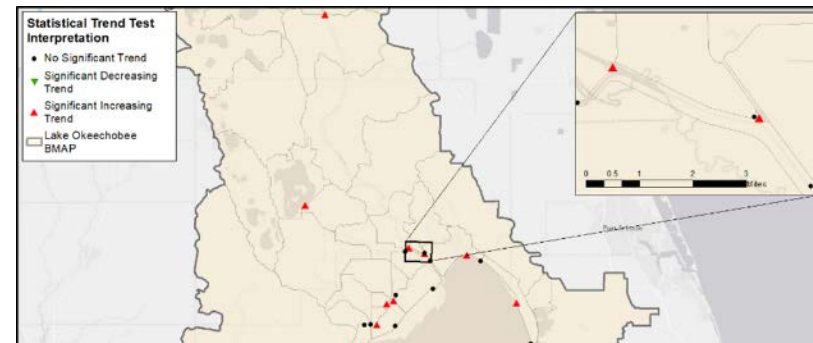
Initiative	Update
Lake Okeechobee Watershed Restoration Project (LOWRP)	SFWMD reinitiated formulation of storage components of LOWRP, with U.S. Army Corps of Engineers (USACE) as federal partner.
Implemented BMP Verification	FDACS and DEP are developing plan for BMP verification.
Cost-Share BMP Effectiveness Review	FDACS and DEP developed approach to evaluate effectiveness of various types of cost-share projects.
SFWMD Regulatory Nutrient Source Control Program	Chapter 40E-61, F.A.C.
Water Quality Monitoring	As DEP develops monitoring plan for BMAP, consideration is being given to areas with on-the-ground projects/ BMPs to evaluate water quality improvements.
In-Lake Strategies: Muck Scraping and Tilling	Initiative during low lake levels in Lake Okeechobee



5-Year Review

2.4. Water Quality Analysis

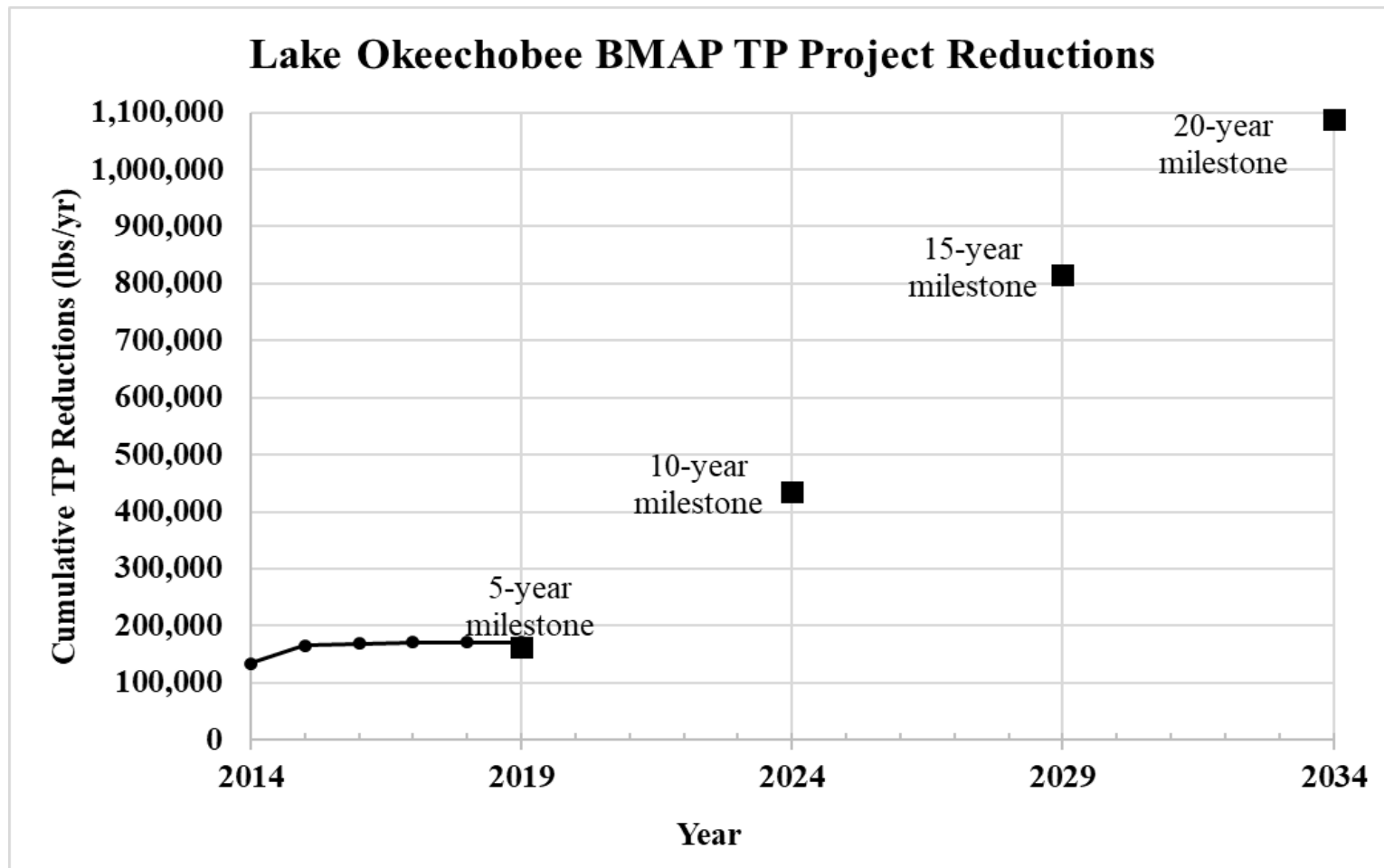
- SFWMD provided pre-processed data
- Tier 1 Stations - Analyzed trends in **loads** and flow weighed means (**FWMs**)
- Tier 2 Stations - Analyzed trends in **TP concentrations**





5-Year Review

2.5.1. Milestones (Draft)





Questions & Comments





BMAP Update

Restoration Approach - Chapter 3

Subwatersheds - Chapter 4

Summary - Chapter 5

Appendices A through E



Restoration Approach

3.1. Basinwide Sources Approach

Addressing nutrients from various source categories through programmatic and policy updates

- Agriculture
- Septic Systems
- Stormwater
- Wastewater Treatment



Restoration Approach

3.1. Basinwide Sources (Continued)

- **Agriculture**

- Provide list of all unenrolled landowners within one year
- Perform onsite inspections every two years
- Update and reevaluate existing BMP manuals and revise rules as necessary within five years
- Implement additional agricultural projects or practices

- **Septic Systems**

- Develop master wastewater treatment feasibility analyses to identify specific areas to be sewerred within 20 years
 - Urbanized areas and urban clusters
- Identify alternative methods to address loads from septic systems in areas not targeted for sewerred
- Identify sources of funding to address nutrient loading from septic systems



Restoration Approach

3.1. Basinwide Sources (Continued)

- **Stormwater**

- BMAP designates all U.S. Census–designated urban clusters as a regulated Phase II municipal separate storm sewer system (MS4)
- Update the stormwater design and operation requirements in Environmental Resource Permit rules
 - Incorporate the most recent scientific information available to improve nutrient reduction benefits

- **Wastewater Treatment**

- BMAP sets TP and TN effluent limits for individually permitted wastewater facilities and activities
- 254 individually permitted facilities or activities in LOW
 - 26 NPDES permits authorize discharge directly to surface waters



Restoration Approach

3.2. TRA Approach

- **3.2.1. Overview**

- Used measured data to evaluate TP and TN concentrations, as well as flow
- Compared with benchmarks to identify highest priority basins
 - Benchmarks not intended to measure progress towards restoration; only to prioritize resources

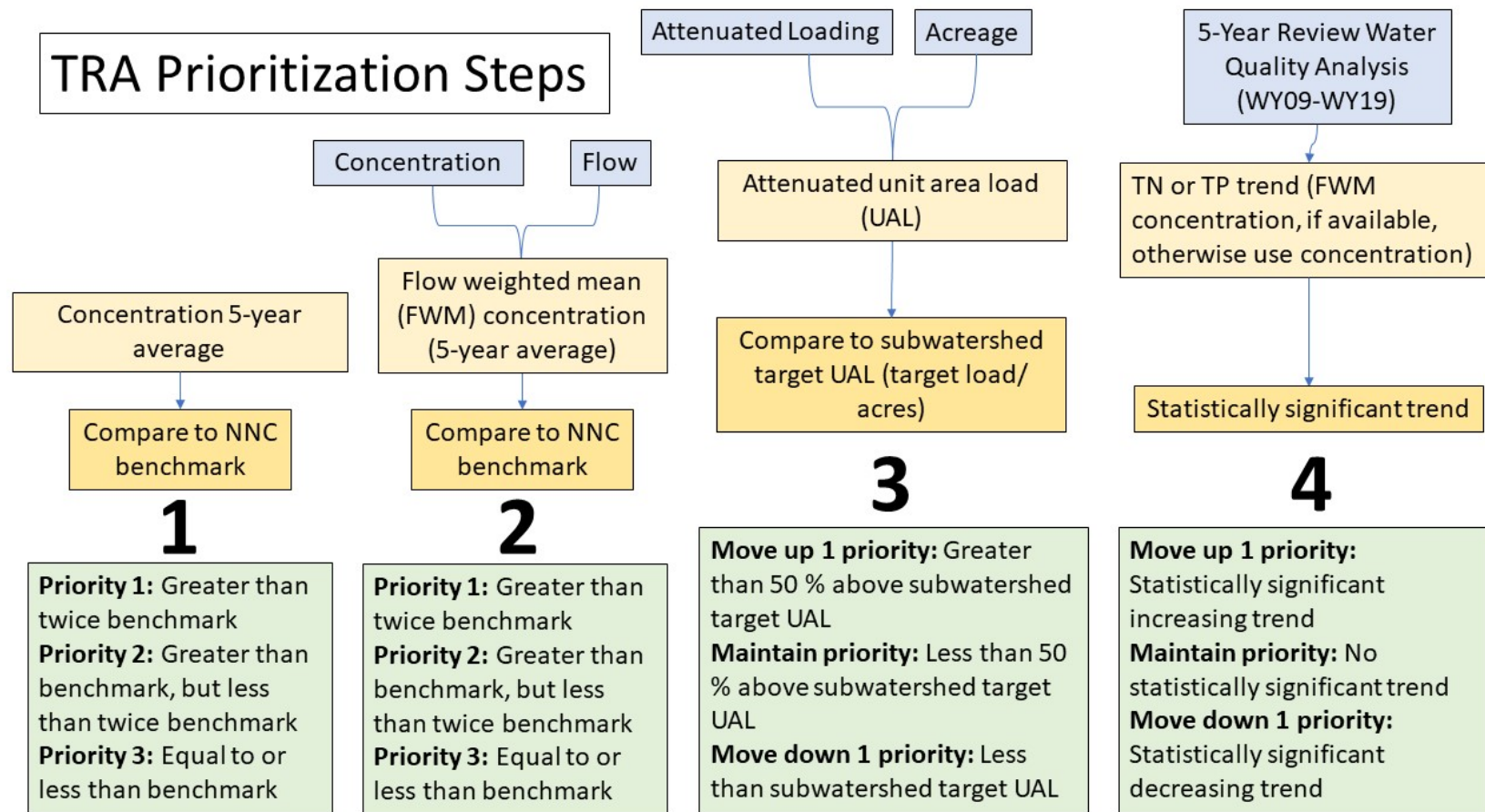
- **3.2.2. Evaluation**

- Assessed and prioritized systematically



Restoration Approach

3.2. TRA Approach (Continued)





Restoration Approach

3.3. Water Quality Monitoring

- **3.3.1. Objectives, Parameters, and Frequency**
 - Primary Objective: track trends in TP loads and concentrations by subwatershed and basin
 - Secondary Objectives: track TN, better focus management efforts, measure the effectiveness of individual or collective projects
- **3.3.2. Monitoring Network**
 - 272 stations, including representative of basins
 - Tiered network, 3 tiers
- **3.3.3. Data Management and Quality Assurance**
 - Upload once every six months to WIN

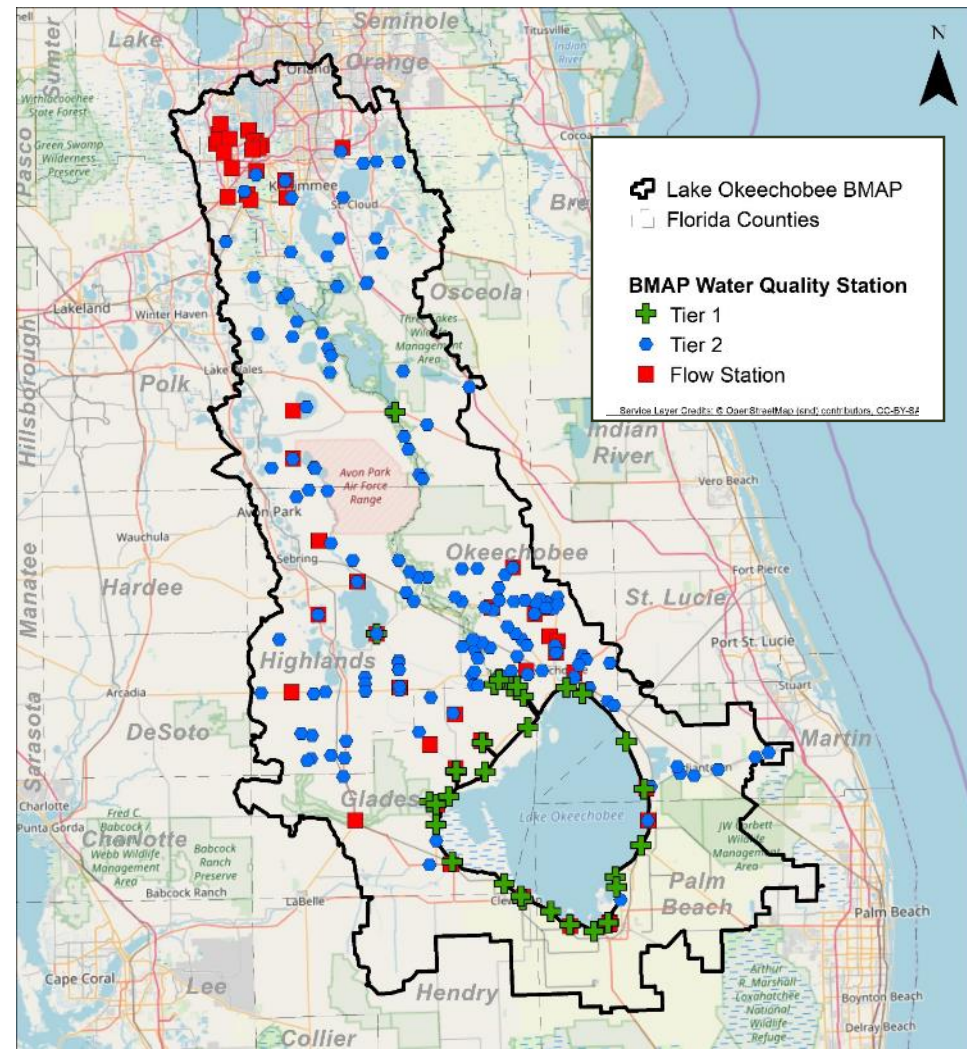


Restoration Approach

3.3. Water Quality Monitoring (Continued)

- 272 stations
 - 89 original
- Sampled by:
 - Local entities
 - DEP
 - SFWMD
 - USGS
- Tiers 1, 2, 3

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Subwatersheds

Chapter 4

- **Section 4.1 through Section 4.10**
- Land use summaries based on WAM
- Monitoring network stations
- Priority results of the TRA evaluation
- Project tables
 - Existing and Planned
 - Future



Subwatersheds

(Continued)

Table 21. Summary of land uses in the Fisheating Creek Subwatershed

Level 1 Land Use Code	Land Use Description	Acres	% Total
1000	Urban and Built-Up	5,581	1.8
2000	Agriculture	174,019	54.7
3000	Upland Nonforested	14,163	4.5
4000	Upland Forests	45,809	14.4
5000	Water	1,050	0.3
6000	Wetlands	75,623	23.8
7000	Barren Land	1,025	0.3
8000	Transportation, Communication, and Utilities	774	0.2
	Total	318,044	100.0





Subwatersheds

(Continued)

Table 23. Basin evaluation results for the Fisheating Creek Subwatershed

TRA ID	Basin Name	TN (mg/L) (Benchmark – 1.54)	TP (mg/L) (Benchmark – 0.12)	Flow
3	Nicodeumus Slough North	1.61	0.073	No
4	Fisheating Creek/L-61	1.79	0.166	Maybe

Table 24. TRA evaluation results for the Fisheating Creek Subwatershed

Basin	Station	TP Priority	TN Priority	Flow Priority
Fisheating Creek/L-61	FECSR78	1	1	2
Nicodemus Slough North	CULV5	3	1	3



Summary

5.1. TRA Evaluation Results

Table 73. Summary of the TRA evaluation results

*SFWMD determined that additional investigations are needed regarding whether water quantity is an issue.

Insufficient data = Available data were not at the frequency needed for evaluation.

Subwatershed	Basin	Station	TP Priority	TN Priority	Flow Priority
Fisheating Creek	Fisheating Creek/L-61	FECSR78	1	1	2
Fisheating Creek	Nicodemus Slough North	CULV5	3	1	3
Indian Prairie	C-40	S72	1	1	2
Indian Prairie	C-41	S71	1	1	2
Indian Prairie	C-41A	S84	1	1	2
Indian Prairie	L-48	S127	1	2	3
Indian Prairie	L-49	S129	3	3	3
Indian Prairie	L-59E	L59E	2	1	2
Indian Prairie	L-59W	L59W	2	2	2
Indian Prairie	L-60E	L60E	1	2	2
Indian Prairie	L-60W	L60W	1	1	2
Indian Prairie	L-61E	L61E	1	1	2
Indian Prairie	S-131	S131	2	3	3
Lake Istokpoga	Arbuckle Creek	30854	3	3	*
Lake Istokpoga	Josephine Creek	LI02362923	3	Insufficient Data	*
Lake Istokpoga	Lake Arbuckle	ARBUCKLE1-274119812344	3	3	*
Lake Istokpoga	Lake Istokpoga	30853	2	1	*

(continued in report)



Summary

5.2. *RFI Responses*

- RFI process generated 34 responses
 - Mainly from the private sector
- Submittals included:
 - On-the-ground projects, such as STAs
 - Technologies that could be implemented in both aquatic and terrestrial environments
- All submittals were reviewed and included in **Appendix E**
 - Additional details on all responses are on file with DEP and may be considered as opportunities arise in the future



Summary

5.3. *Future Growth*

- New development categories
 - Urban development
 - Agriculture
- Addressed through a variety of mechanisms as well as other provisions of Florida law
- BMAP specific elements to address all current and future WWTF effluent, septic systems, and stormwater sources
- Any additional loading will be evaluated during future BMAP review efforts
 - Additional restoration actions may be required to remediate impacts



Summary

5.4. Compliance

- Monitoring and working to achieve subwatershed targets
- Used to identify problem areas and sources
- Key component to the ultimate strategy for restoring the lake

Table 74. Load reductions and targets by subwatershed

Subwatershed	WY2014– WY2018 TP Load (mt/yr)	% Contribution of Load	TP Load Required Reduction (mt/yr)	TP Target (mt/yr)
Fisheating Creek	72.4	12	59.7	12.7
Indian Prairie	102.5	17	84.5	18.0
Lake Istokpoga	47.7	8	39.3	8.4
Lower Kissimmee	125.9	21	103.8	22.1
Taylor Creek/Nubbin Slough	113.6	19	93.7	19.9
Upper Kissimmee	90.5	15	74.6	15.9
East Lake Okeechobee	16.8	3	13.9	2.9
West Lake Okeechobee	0.0	0	0.0	0.0
South Lake Okeechobee	29.0	5	23.9	5.1
Total	598.4	100	493.4	105.0



Appendix A

BMAP Projects Supporting Information

- Provides additional details for the project tables included in Chapter 4
- Explains the standardized categories for the project status
- Includes definitions of the terms used in the tables



Appendix B

Agricultural Enrollment and Reductions

- Language provided by FDACS
 - FDACS role in BMP implementation and followup
 - Adopted BMAP agricultural land use and enrollment
 - Enrollment information by subwatershed
 - Unenrolled agricultural acreage
 - Recommended updates to land use
 - Potential site-specific nutrient management measures

Table B-2. Agricultural land use acreage enrolled in the BMP Program in the Lake Okeechobee BMAP by subwatershed

Subwatershed	Total Agricultural Acres	Agricultural Acres Enrolled	% of Agricultural Acres Enrolled
Fisheating Creek	189,488	171,662	91
Indian Prairie	221,785	182,376	82
Lake Istokpoga	118,901	93,115	78
Lower Kissimmee	219,817	175,318	80
Taylor Creek/Nubbin Slough	140,181	118,761	85
Upper Kissimmee	260,175	126,633	49
East Lake Okeechobee	101,510	56,644	56
South Lake Okeechobee	333,231	292,512	88
West Lake Okeechobee	143,204	118,151	83
Total	1,728,292	1,335,172	77



Appendix C

Water Quality Data Processing and Analysis Methods

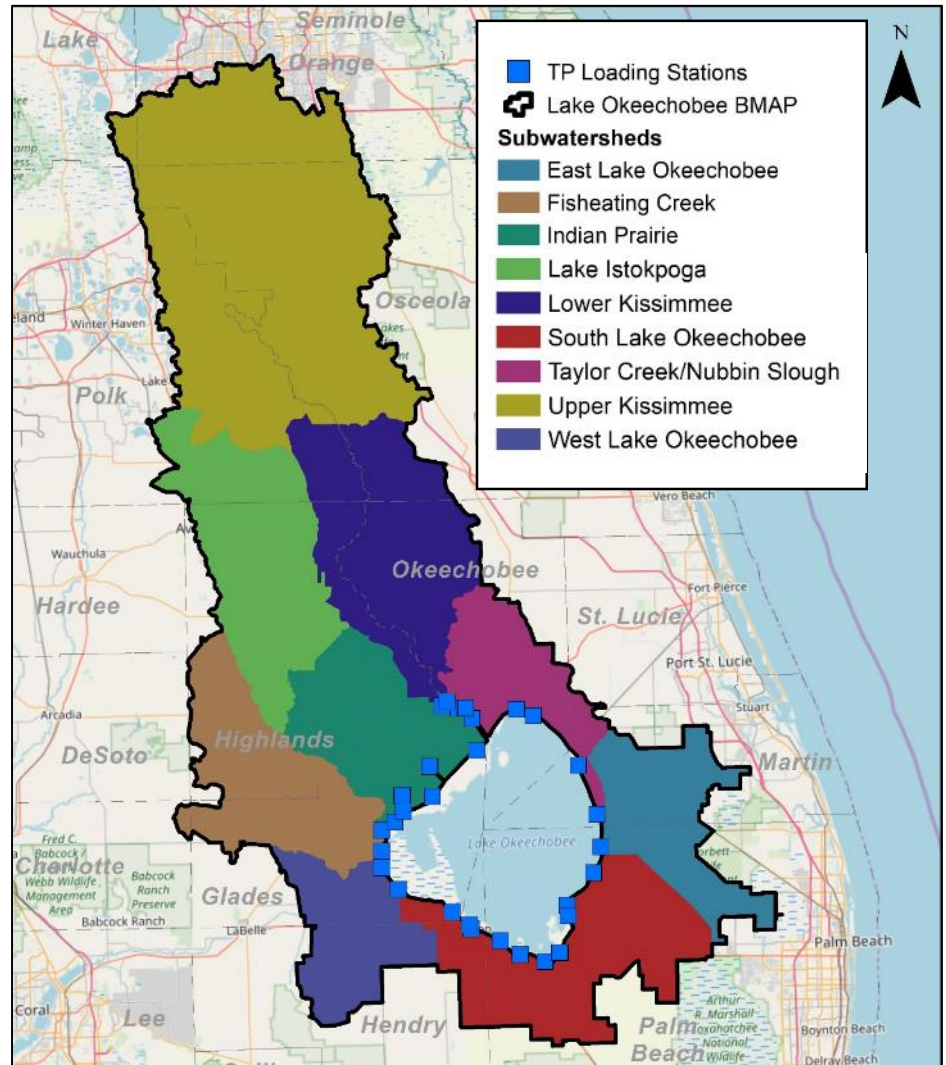
- Data Management and Processing
- Statistical Analyses
- Data Download
- Data Processing
- Trend Analysis



Appendix D

Stations Used in Five-Year Rolling Average TP Load Calculation

- [2019 SFER \(SFWMD\)](#)
- Volume I, Chapter 8B
- Volume III, Appendix 4-1





Appendix E

RFI Responses

- **Table E-1** summarizes the submittals.
- Location Information
 - References TRA IDs and basin names in **Chapter 4** maps
- Submitted by
 - Name of company that submitted RFI
- Project Name
 - DEP assigned project name based on RFI information
- Project Type
 - DEP assigned project type based on RFI information

Table E-1. Summary of responses received for RFI 2020012

Location Information	Submitted by	Project Name	Project Type
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Questions & Comments





Statewide Annual Report (STAR)

STAR Background

STAR 2019 Progress

STAR 2020 Timeline



STAR Background

- Requirement under Section 403.0675 Florida Statutes (F.S.) to provide an annual update to the Governor and Legislature
- Summarizes accomplishments in the BMAPs statewide
- Reports on restoration projects and management strategies
- All BMAP reporting periods align with calendar year
- Submitted to the Governor and the Legislature by July 1 of each year
- Annual meetings → opportunity to highlight stakeholder activities

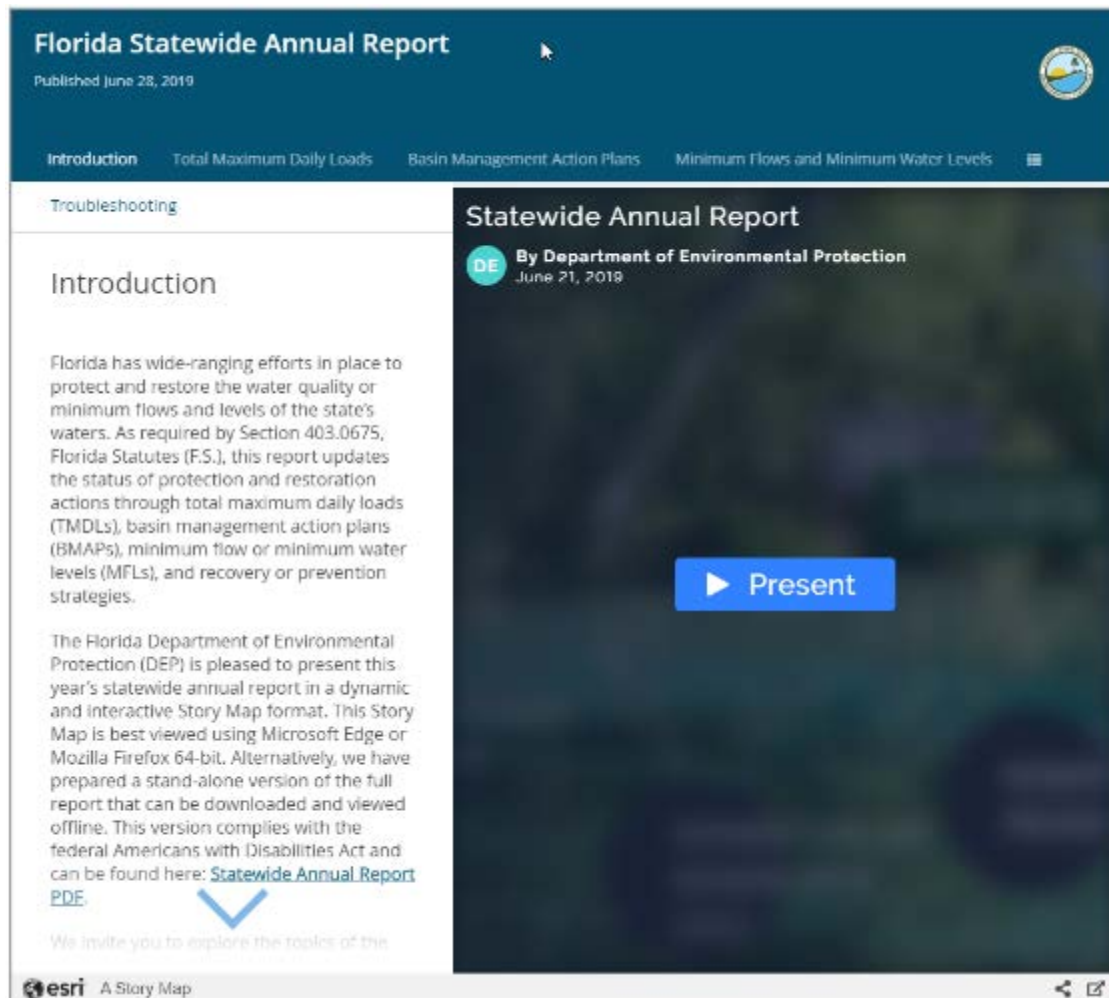


STAR

Second STAR submitted to the Governor and the Legislature June 28, 2019

Viewable as interactive story map

<https://floridadep.gov/STAR>





STAR Timeline





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GovDelivery Notifications

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Once at the address above, the paragraph below should appear:

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Thank you for your interest in the Florida Department of Environmental Protection's Basin Management Action Plan Program. To receive notifications on upcoming public meetings and the department's activities related to the development and implementation of BMAPs, please enter your email address at our [subscriber page](#) and you will be taken to the subscription page. You may update your subscription preferences at any time. Below is a brief description of each distribution list.

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12/19/2019

Basin Management Action Plans (BMAP) Updates/Notifications Topics	Notifications on upcoming public meetings and the department's activities related to the development and implementation of BMAPs
<u>All Updates/Notification</u>	For all BMAPs statewide
<u>Bacteria BMAPs</u>	For Bacteria (pathogen) BMAPs statewide
<u>Central Florida</u>	For waters in the Central Florida region including the Lake Harney, Lake Monroe, Middle St. Johns River, and Smith Canal, Lake Jesup Watershed, Ocklawaha River, Orange Creek, and Wekiva River BMAPs.
<u>Indian River Lagoon</u>	Indian River Lagoon Basin
<u>Northeast Florida</u>	For waters in the Northeast Florida region including the Lower St. Johns BMAP
<u>Northern Everglades</u>	For waters in the Northern Everglades region including the Caloosahatchee River and Estuary, Lake Okeechobee, and St. Lucie River and Estuary BMAPs.
<u>Northwest Florida</u>	For waters in the Northwest Florida region including Apalachicola River, Chipola River, Choctawhatchee Bay, St Andrews Bay, Pensacola, and Perdido Bay BMAPs
<u>Southeast Florida</u>	For waters in the Southeast Florida region including Lake Worth Lagoon, Palm Beach Coast, Southeast Coast, and Biscayne Bay BMAPs
<u>Southwest Florida</u>	For waters in the Southwest Florida region including the Everglades West Coast BMAP, Charlotte Harbor Basin, Sarasota River, Peace River, Myakka River, and Upper Peace Chain Of Lakes.
<u>Springs</u>	For Springs BMAPs statewide



Questions & Comments





Next Steps

- Submit comments on draft BMAP by **January 10, 2020** to Sara.C.Davis@floridadep.gov
- Submit STAR project updates by **January 15, 2020**
- Public meeting late **January 2020**
- Updated BMAP **January 2020**



Contact Information

Sara Davis, Environmental Manager

850-245-8825

Sara.C.Davis@floridadep.gov



Questions & Comments



