Florida Department of Environmental Protection

Lake Okeechobee Basin Management Action Plan

November 15, 2013





Agenda

- Project Collection and Stakeholder Outreach
- Update on Model Development
- Basin Management Action Plan (BMAP) Monitoring Plan
- Lake Okeechobee BMAP and Lake Okeechobee Protection Plan

Project Collection and Stakeholder Outreach

Project Collection

- To achieve total phosphorus (TP) reductions, each stakeholder will provide projects and activities that reduce nutrient loads.

- Projects already submitted by:
  - Cities of Kissimmee and Orlando.
  - FDOT Districts 1, 4, and 5.
  - Highlands, Martin, Orange, and Osceola Counties.
  - Istokpoga Marsh Watershed Improvement District.
  - Spring Lake Improvement District.

- Total of 274 projects submitted.

Project Collection, continued

- Funding was recently approved by the Department for the Spring Lake Improvement District stormwater improvements project.
  - Addition of a stormwater treatment area (STA) on more than 70 acres.
- Istokpoga Marsh Watershed Improvement District water storage and treatment cooperative project is being initiated.
- The Department has been coordinating with the South Florida Water Management District (SFWMD) on the information for their projects in the watershed.

Project Collection, continued

- The Department has also been coordinating with the Florida Department of Agriculture and Consumer Services (FDACS) on the agricultural best management practice (BMP) enrollment in the watershed.

- The Department and FDACS are evaluating where owner implemented BMPs and cost-share BMPs have been added in the watershed.
  - The associated load reductions for these BMPs will be calculated.

- This evaluation will also help to identify other areas of the watershed where cost-share BMPs should be implemented to achieve greater reductions.

Project Collection, continued

- Additional project information should be submitted by December 13th.
- Recently completed projects (construction completed within the last 3-4 years) should be submitted.
- In addition, projects planned to be completed during the first BMAP iteration, which goes through 2019, should also be submitted.
- All of the project collection information is posted to the FTP site: http://publicfiles.dep.state.fl.us/DEAR/BMAP/LakeOkeechobee/Meetings/TechMeeting_Aug2013/ProjectCollection/

Stakeholder Outreach

- Since the August meeting, contacts were added to the distribution list for all of the stakeholders in the watershed.
- Thanks to those of you who provided additional contact information.
- The Department has been initiating discussions with individual stakeholders about the BMAP.

Stakeholder Outreach, continued

- Spring Lake Improvement District: Discussions on the district's long-term stormwater improvement plan and the process for BMAP project submittals.

- Okeechobee County and consulting engineer: Discussions on the inclusion of multiple stormwater retrofit projects in the BMAP.

- Lykes Brothers: Discussion on potential BMAP projects.

- Southeast Milk, Inc.: Discussion on dairy projects in the watershed.

Stakeholder Outreach, continued

- Florida Association of Special Districts (FASD): Discussions to participate in their January 2014 quarterly meeting to discuss the Lake Okeechobee BMAP process. Will emphasize projects to:
  - Reduce TP, and
  - Enhance current BMP implementation.

- FDACS: Discussions with representatives in Tallahassee to explore options for the two agencies to involve special districts, consisting primarily of agricultural land uses, in the BMAP process.

Stakeholder Outreach, continued

- FWC: Requested information regarding water-management projects planned for the Three Lakes Wildlife Management Area.
  - The Department will continue to work with FWC and FDACS to capture projects with nutrient-reduction potential.

- FDACS: Discussing project options to address water quality issues proximal to the S-65 structure.

Stakeholder Outreach, continued

- Polk County invited the Department to their regular Phase I MS4 meeting with eight co-permittees (municipalities) to discuss the Lake Okeechobee BMAP and the need for their participation. Highlands County, including the cities of Sebring and Avon Park, were also invited.
  - Project submittal: Discussion of MS4 activities, which are eligible for nutrient reduction credits, and the submittal of stormwater projects for inclusion in the BMAP document.

- Discussed Lake Okeechobee BMAP process with the Highlands County Citrus Growers' Association Board.

Stakeholder Outreach, continued

- The Department plans to reach out to municipal, agricultural, and agency stakeholders on a rotational basis around the Lake Okeechobee watershed, in addition to conducting regular public meetings.

Update on Model Development

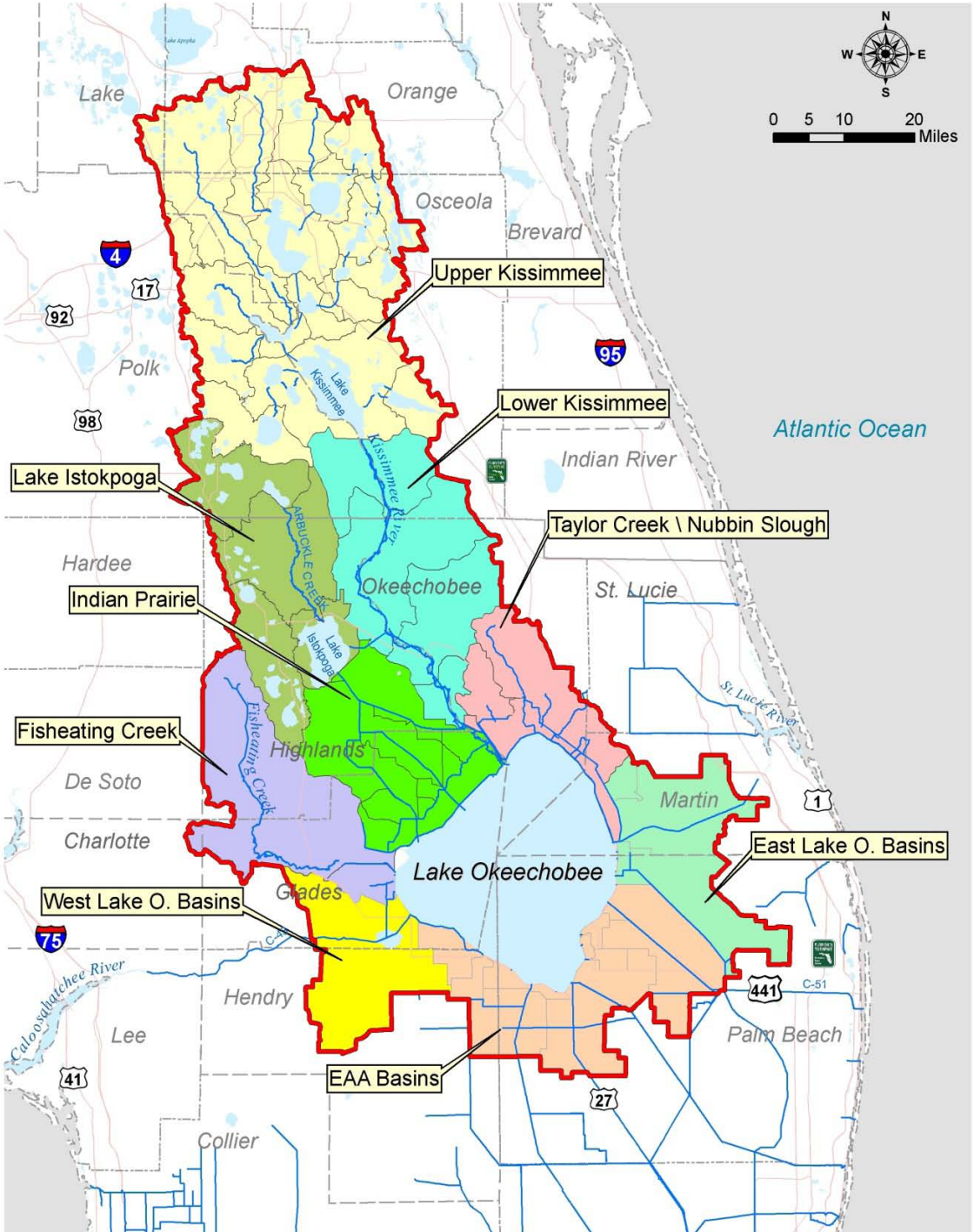
Reductions in the First Phase

- The Department is evaluating projects submitted by the stakeholders.
- Identify where additional reductions are needed.
  - Reductions for each sub-watershed will be established for first BMAP phase based on land use, % natural areas, and BMP implementation.
- Use the Watershed Assessment Model (WAM) to prioritize sub-watersheds and optimize locations and types of projects.

GIS Spreadsheet Model

- Using output from the WAM, a Geographic Information Systems (GIS) spreadsheet model is being developed to calculate loading associated with project treatment areas.

- This model focuses on the sub-watersheds north of the lake:
  - Fisheating Creek.
  - Indian Prairie.
  - Lake Istokpoga.
  - Lower Kissimmee.
  - Taylor Creek/Nubbin Slough.
  - Upper Kissimmee.


Upper Kissimmee
Lower Kissimmee
Lake Istokpoga
Taylor Creek \ Nubbin Slough
Indian Prairie
Fisheating Creek
West Lake O. Basins
East Lake O. Basins
EAA Basins
Lake Okeechobee
Atlantic Ocean
Lake
Orange
Osceola
Brevard
Polk
Indian River
Hardee
Okeechobee
St. Lucie
Highlands
De Soto
Martin
Charlotte
Glades
Hendry
Lee
Palm Beach
Collier
Kissimmee River
Lake Kissimmee
Arbuckle Creek
Lake Istokpoga
Fisheating Creek
St. Lucie River
Caloosahatchee River
C-51
0 5 10 20
Miles
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W
E
S

GIS Model, continued

- WAM modeling for the watershed occurred in three different versions of the model:
  - WAM 3.2.
  - WAM 10.0.
  - WAM 10.1.

- The Department used the most current land use cover (SFWMD 2013) for assigning loads, based upon land use mapping from historic WAM models.

GIS Model, continued

- The model includes the following factors:
  - 2013 land use land cover codes.
  - Area (acres).
  - Average attenuated TP and total nitrogen (TN) for each land use type in each sub-watershed (kg/ha/yr).
  - Percent attenuation of loading for each model domain.

- These factors combined provide a total loading from a land use polygon in the model (kg/yr).

Project Load Reductions

- The areas treated by each of the structural BMPs submitted will be overlaid with the GIS model.
- The project area will be clipped to the GIS model to calculate the total nutrient load running off to the BMP for treatment.
- The BMP efficiency (based on the table previously provided) will be applied to calculate the total load reduction for that project.
- The reductions for all the projects in a sub-watershed will be summed to determine the total reductions that will be achieved through the completed and planned projects.

Application of WAM

- WAM output tied to existing shape files will be utilized to determine the existing loading in each sub-watershed and the allowable loading to achieve the Lake Okeechobee total maximum daily load (TMDL).
- A percentage of the required reductions will be achieved as part of the first BMAP iteration.
- WAM outputs will also be used to identify areas of high TP loading and areas most suitable for different project types in the watershed.

BMAP Monitoring Plan

Purpose of the Monitoring Plan

- A monitoring plan is a required component in a BMAP.

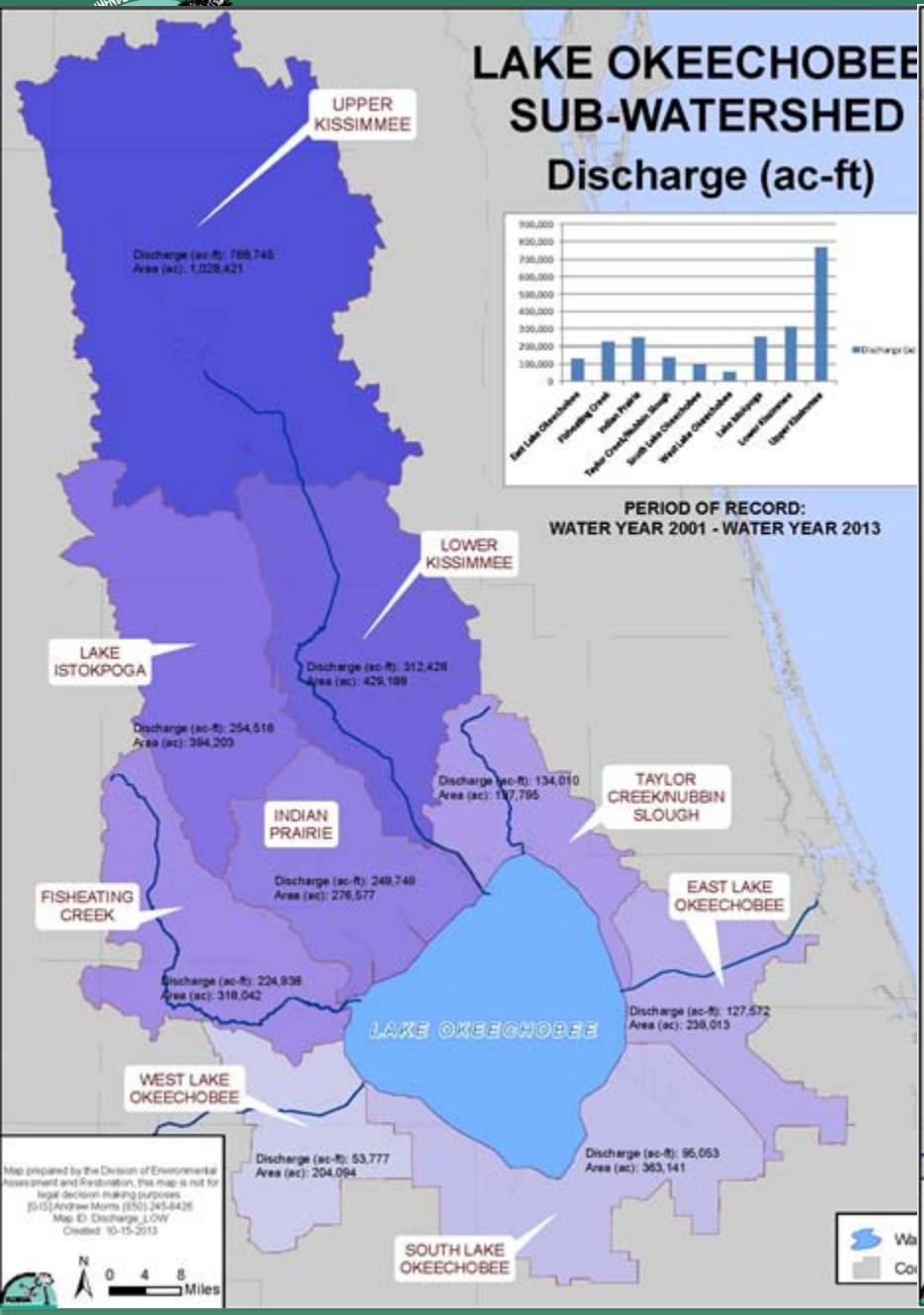
- The main purpose of the monitoring plan is to track trends in water quality to show progress towards achieving the TMDL.

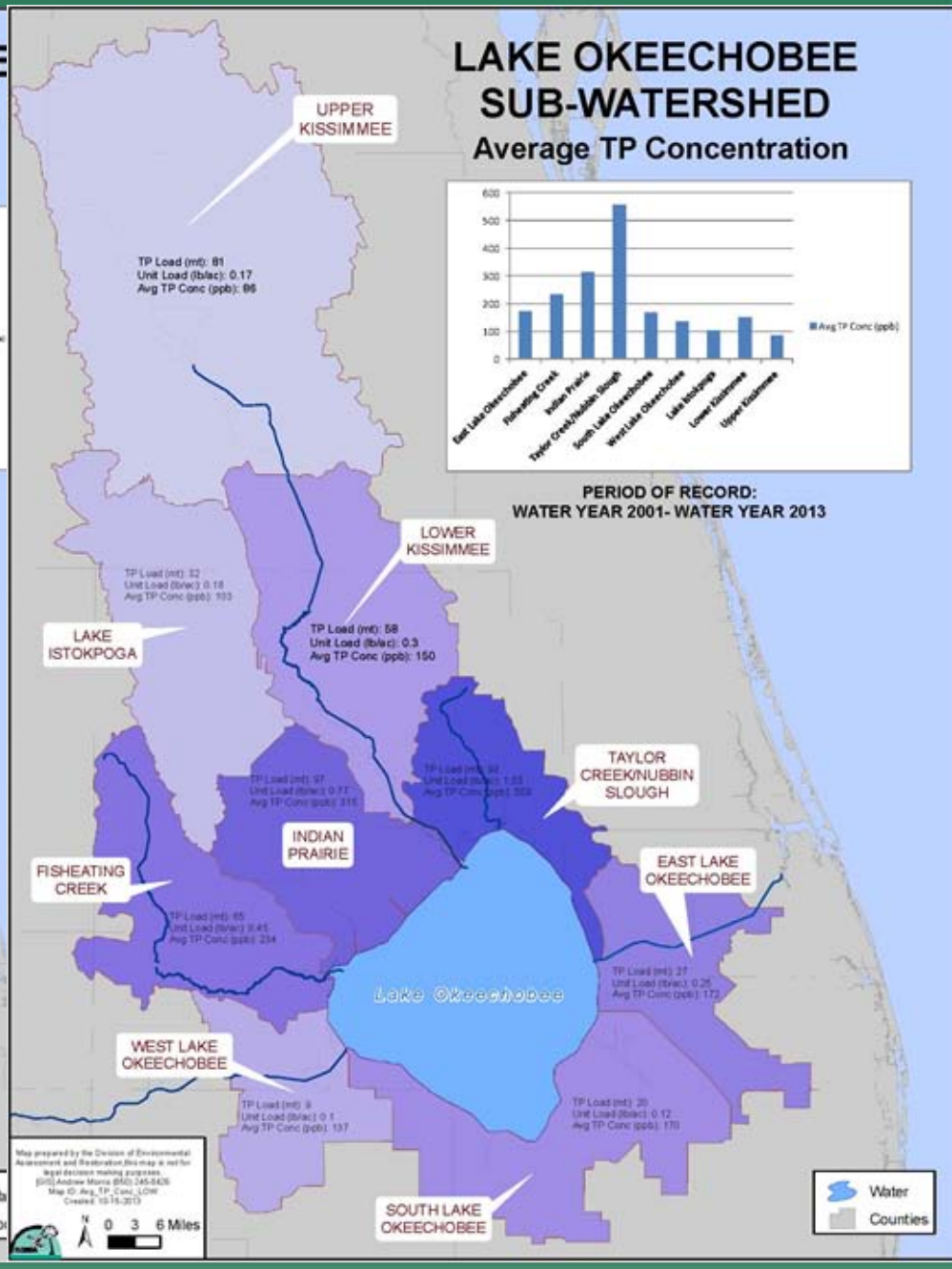
Existing Monitoring in the Basin

- To develop the monitoring plan, the existing monitoring in the watershed must be identified.
- The existing monitoring locations will be compiled into maps for discussions on which stations are key for the BMAP monitoring network and to identify where there are gaps in the network.
- A spreadsheet was provided to submit monitoring station information.

Existing Monitoring, continued

- Review the monitoring collection sheet:
  - Sampling Entity
  - Station Number
  - Station Name
  - Lat/Long
  - Begin Date/End Date
  - Currently Sampled (yes/no)
  - Station Type (water quality, biological, storm event, grab, continuous)
  - Sampling Frequency
  - Sampling Parameters
- Information on existing monitoring stations is due by December 13th.


LAKE OKEECHOBEE
SUB-WATERSHED
Discharge (ac-ft)
UPPER KISSIMMEE
Discharge (ac-ft): 788,745
Area (ac): 1,028,421
LOWER KISSIMMEE
Discharge (ac-ft): 312,428
Area (ac): 429,189
LAKE ISTOKPOGA
Discharge (ac-ft): 254,516
Area (ac): 394,203
INDIAN PRAIRIE
Discharge (ac-ft): 134,010
Area (ac): 197,795
TAYLOR CREEK/NUBBIN SLOUGH
Discharge (ac-ft): 249,749
Area (ac): 276,577
FISHEATING CREEK
EAST LAKE OKEECHOBEE
Discharge (ac-ft): 224,938
Area (ac): 318,042
LAKE OKEECHOBEE
Discharge (ac-ft): 127,572
Area (ac): 238,013
WEST LAKE OKEECHOBEE
Discharge (ac-ft): 53,777
Area (ac): 204,094
Discharge (ac-ft): 95,053
Area (ac): 363,141
SOUTH LAKE OKEECHOBEE
PERIOD OF RECORD:
WATER YEAR 2001 - WATER YEAR 2013
East Lake Okeechobee
Fisheating Creek
Indian Prairie
Taylor Creek/Nubbin Slough
South Lake Okeechobee
West Lake Okeechobee
Lake Istokpoga
Lower Kissimmee
Upper Kissimmee
0 4 8 Miles


LAKE OKEECHOBEE
SUB-WATERSHED
Average TP Concentration
UPPER KISSIMMEE
TP Load (mt): 81
Unit Load (lb/ac): 0.17
Avg TP Conc (ppb): 86
LOWER KISSIMMEE
TP Load (mt): 58
Unit Load (lb/ac): 0.3
Avg TP Conc (ppb): 150
LAKE ISTOKPOGA
INDIAN PRAIRIE
TAYLOR CREEK/NUBBIN SLOUGH
FISHEATING CREEK
EAST LAKE OKEECHOBEE
Lake Okeechobee
WEST LAKE OKEECHOBEE
SOUTH LAKE OKEECHOBEE
PERIOD OF RECORD:
WATER YEAR 2001- WATER YEAR 2013
Avg TP Conc (ppb)
East Lake Okeechobee
Fisheating Creek
Indian Prairie
Taylor Creek/Nubbin Slough
South Lake Okeechobee
West Lake Okeechobee
Lake Istokpoga
Lower Kissimmee
Upper Kissimmee
0 3 6 Miles
Water
Counties

Monitoring Plan Development

- Establish objectives.
- Identify core and supplemental water quality parameters.
- Determine the monitoring network to achieve the objectives.
- Identify mechanisms for quality assurance/control and storage and retrieval.

Monitoring Plan Objectives

- The first step in developing the monitoring plan is to determine the objectives of the plan.
- Draft primary and secondary objectives were prepared for discussion.
- Primary objectives are necessary to evaluate success of the BMAP.
- Secondary objectives contribute to this evaluation, can help interpret data collected, and provide information for potential future refinements of the TMDL and/or BMAP.

Draft Monitoring Plan Objectives

- The following objectives were drafted for discussion.

- Primary Objective:
  - Track inputs and trends in TP loads and concentrations by sub-watershed.

- Secondary Objective:
  - Identify areas within the watershed with high TP loading to better focus management efforts.

Lake Okeechobee BMAP and Lake Okeechobee Protection Plan (LOPP)

Relationship in Statute

- 373.4595(3)(a) *Lake Okeechobee Watershed Protection Plan.—In order to protect and restore surface water resources, the district, in cooperation with the other coordinating agencies, shall complete a Lake Okeechobee Watershed Protection Plan in accordance with this section and ss. 373.451-373.459. The plan shall identify the geographic extent of the watershed, be coordinated with the plans developed pursuant to paragraphs (4)(a) and (b), and contain an implementation schedule for subsequent phases of phosphorus load reduction consistent with the total maximum daily loads established in accordance with s. 403.067.*

Purpose of Each Plan

- BMAP Purpose:
  - Water quality: Meet the Lake Okeechobee TP TMDL.
- LOPP Purpose:
  - Water quality: Meet the Lake Okeechobee phosphorus TMDL.
  - Water quantity/storage.

Projects in Each Plan

- The BMAP will include a list of recently completed and planned projects and programs to reduce TP loading.
  - The projects in the BMAP are enforceable, and each stakeholder has a responsibility to achieve the reductions shown in the BMAP.
  - The reductions listed in the BMAP for these projects will occur by the end of the first five year iteration.

Monitoring in Each Plan

- The BMAP will include a monitoring plan that is designed to determine progress towards achieving the TP TMDL.

- The LOPP monitoring encompasses several aspects, with water quality as one aspect.

Questions

- Send project and monitoring information and questions to:

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