

Lake Tohopekaliga Nutrient Reduction Plan

Lake Okeechobee Annual BMAP Meeting

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**CDM
Smith**

Nutrient Reduction Plan Timeline



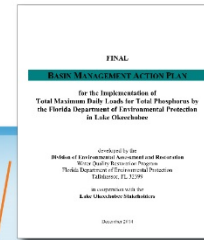
November 2010
Lake Toho Impairment
Adopted Verified List



February 2012
Lake Toho NRP
complete



February 2013
Lake O BMAP
kickoff



December 2014
Lake O BMAP
completion

2010

2011

April 2011
Stakeholders move
forward with NRP

2012

2013

December 2013
UKRB TMDLs
adopted

2014

February 2014
NRP Biennial
Update #1

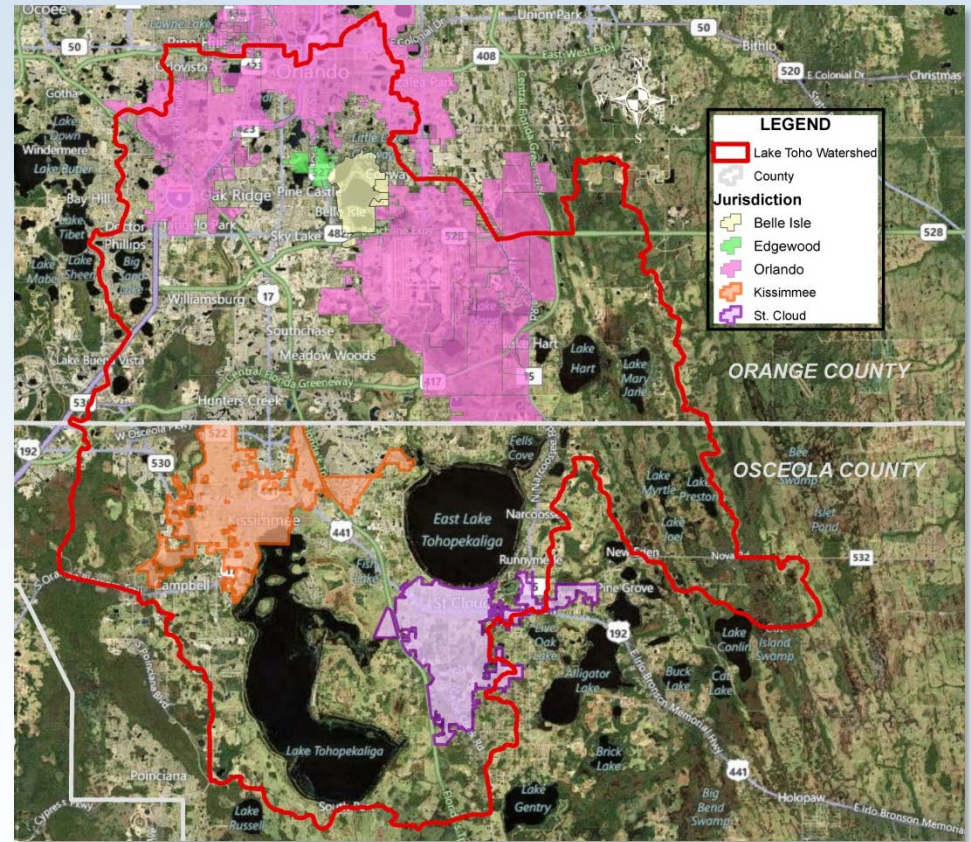
2015

2016

April 2016
NRP Biennial
Update #2

Lake Tohopekaliga (Toho) Background

- Upper Kissimmee River Basin
- Headwaters to the Everglades
- Watershed area = 473 sq. mi.
- Lake = 34 sq. mi.
- Class 3 fresh water lake
- Popular for fishing, hunting, boating, bird watching and sightseeing
- Economic importance



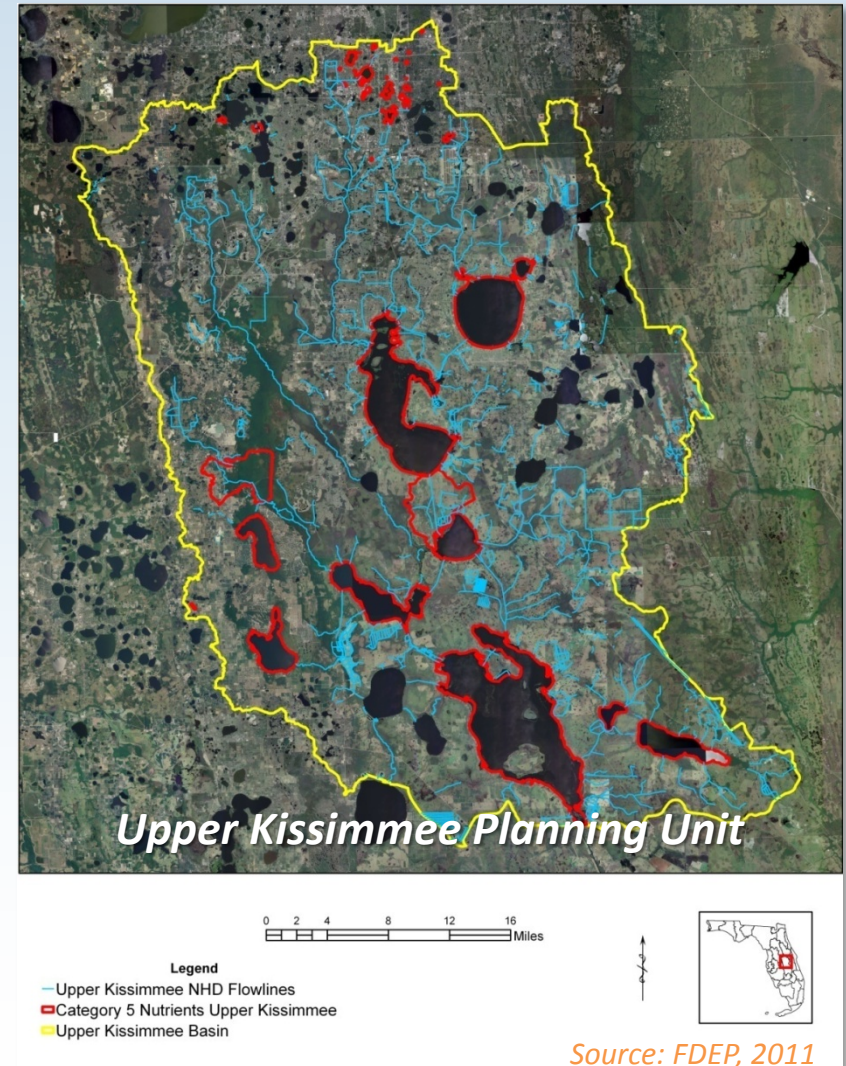
What Makes Lake Toho Unique?

- Highly managed since the 1960s
 - Water level stabilization (1960s)
 - Sewage treatment plant effluent discharges (1940s to 1980s)
 - Major drawdowns to improve habitat (1969, 1979, 1987, 2004)
 - Introduction of Hydrilla species into the lake (1980s)
 - Change in Hydrilla management to support endangered snail kites
- Impact of management activities still not fully understood



Overview of Lake Toho Impairment

- November 2010: Placed on Verified List by FDEP
 - Category 5: Impaired and Total Maximum Daily Load (TMDL) required
 - Initially impaired for nutrients due to increasing trend of Trophic State Index (TSI)
- Osceola County and City of Kissimmee commented
 - Independent analysis showed no TSI Impairment
 - Ambient nutrient concentration not related to algae



Overview of Lake Toho Impairment (*cont.*)



- FDEP reconsidered impairment
 - Agreed more research was needed
 - Imbalance of flora and fauna due to excessive macrophytes (hydrilla)
- December 2011: Nutrient Reduction Plan (NRP) completed
- February 2012: Final Listing
 - Category 4e : Impaired but ongoing restoration activities underway, no TMDL required

<http://www.dep.state.fl.us/water/watersheds/assessment/4e-assess.htm>

What is a Nutrient Reduction Plan?

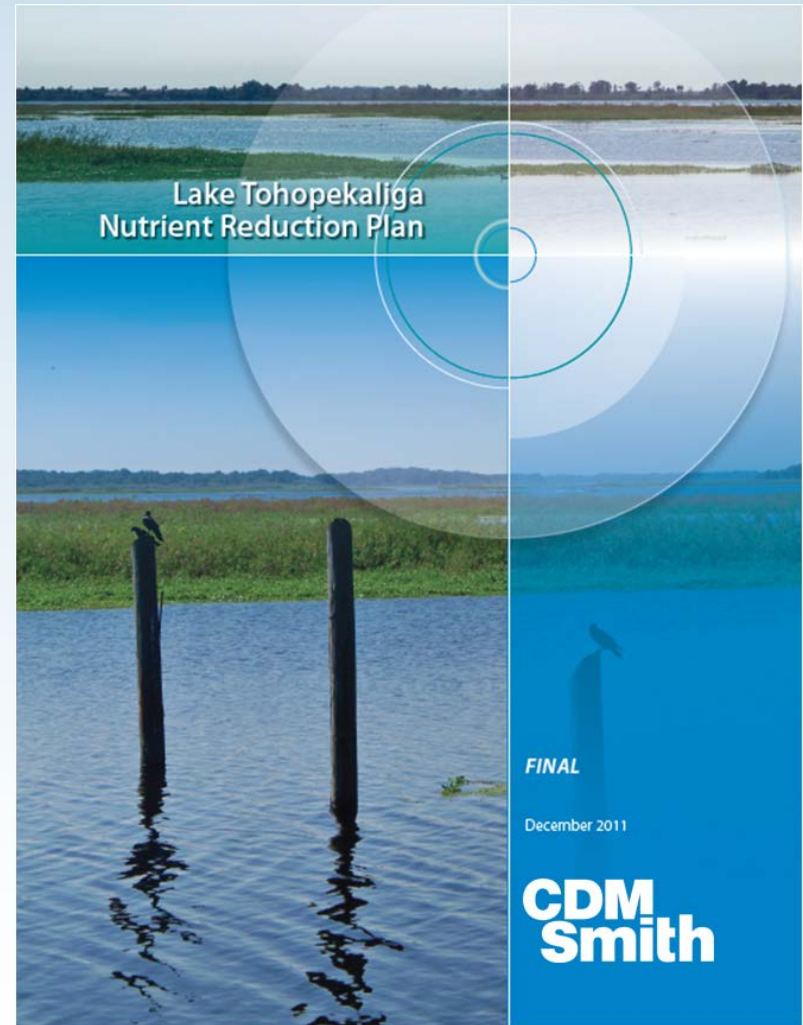
Hybrid of a Basin Management Action Plan (BMAP) and Reasonable Assurance Plan (RAP)

- Key Differences:
 - No water quality “targets” are set
 - No allocation of load reductions
 - Not a long term solution: stepping stone
 - Monitoring plan and research priorities will align to the goals and objectives to determine future targets
 - Plan is not formally “adopted”



2011 Nutrient Reduction Plan Elements

- Pollutant Load Analysis
 - Runoff-based TN and TP Loads by Jurisdiction
- Management Actions
 - BMPs to reduce TN and TP loads
- Research Priorities
 - Hydrilla Literature Review
- Strategic Monitoring Plan
 - Establish monitoring network
- Track Implementation
- Plan Commitment



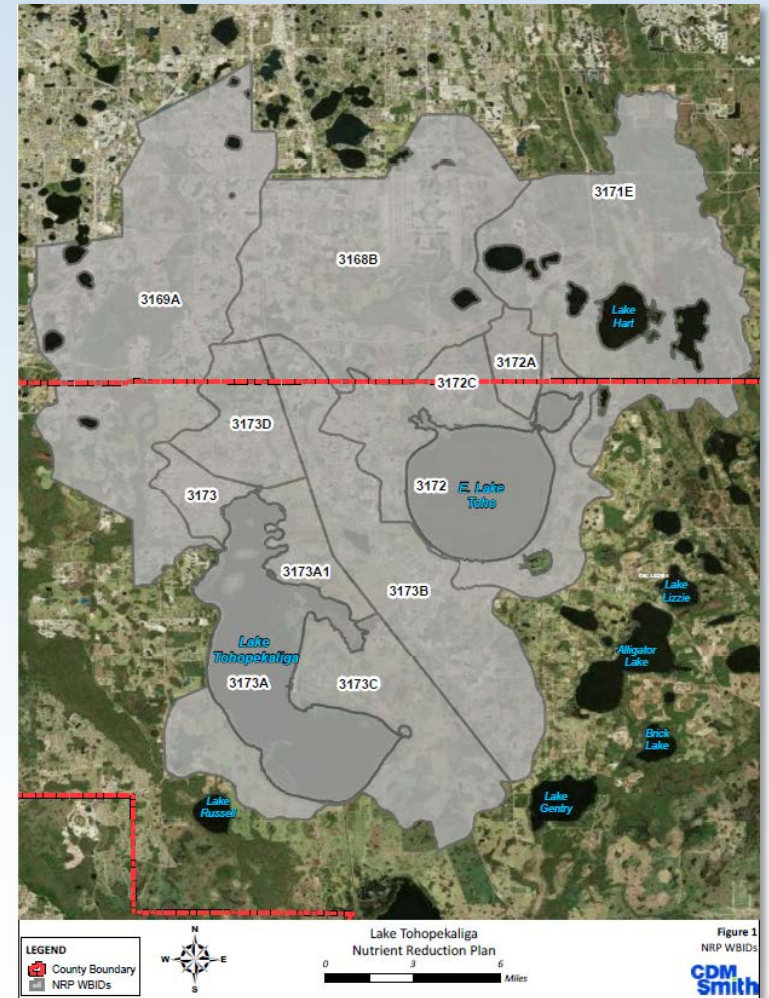
Tracking Implementation – Biennial Update Reports

- Accomplishments by participants
 - Projects
 - Public Education and Outreach
- Research and monitoring
 - Monitoring results and trends
 - Research accomplishments
- Implementation issues
- Future activities
- 2014 Biennial Update
- 2016 Biennial Update submitted and under review



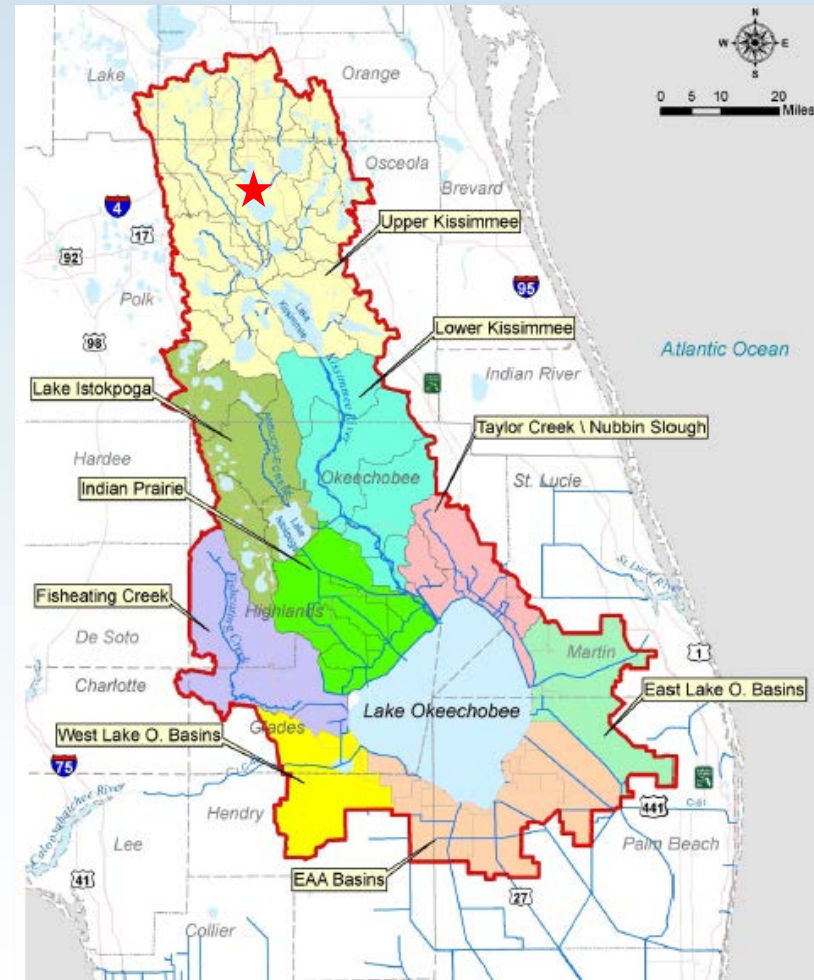
Lake Tohopekaliga Monitoring

- Builds on existing efforts by municipal stakeholders and SFWMD
- Data evaluated by WBIDs
- Consistent with FDEP approach under Impaired Waters Rule
- Analyze statistical long-term trends in Biennial Updates
- Tributary monitoring
- Continued in-lake monitoring



How does Lake Toho fit in with the Lake O BMAP?

- Lake Toho Watershed
 - Located in Upper Kissimmee Sub-Watershed
 - 11% of the area in Lake O Northern Tributary Sub-Watersheds
 - Contains the majority of the urban area (MS4)
 - Lake Toho NRP Average TP: 0.05 mg/l (Lake O Target is 0.04 mg/l)



Source: SFWMD, 2011

TP Loading Summary for Six Northern Sub-Watersheds

Sub-Watershed	Area (ac)	TP Watershed Load (MT/Year)	% TP Load
Fisheating Creek	318,042	79	18%
Indian Prairie	276,577	72.7	16%
Lake Istokpoga	394,203	26.2	6%
Lower Kissimmee	429,188	103	23%
Taylor Creek/Nubbin Slough	196,733	100.8	22%
Upper Kissimmee*	1,028,421	66.6	15%
Total (Northern LOW)	2,643,165	448.3	100%

*Lake Toho located in Upper Kissimmee Sub-watershed

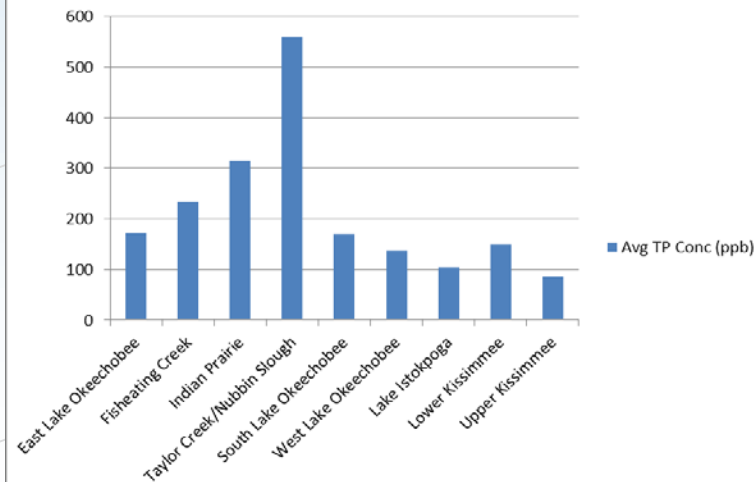
** Loads shown represent modeled loads as shown in Table 13 of the Lake Okeechobee BMAP (FDEP, 2014)

Upper Kissimmee Sub-Watershed

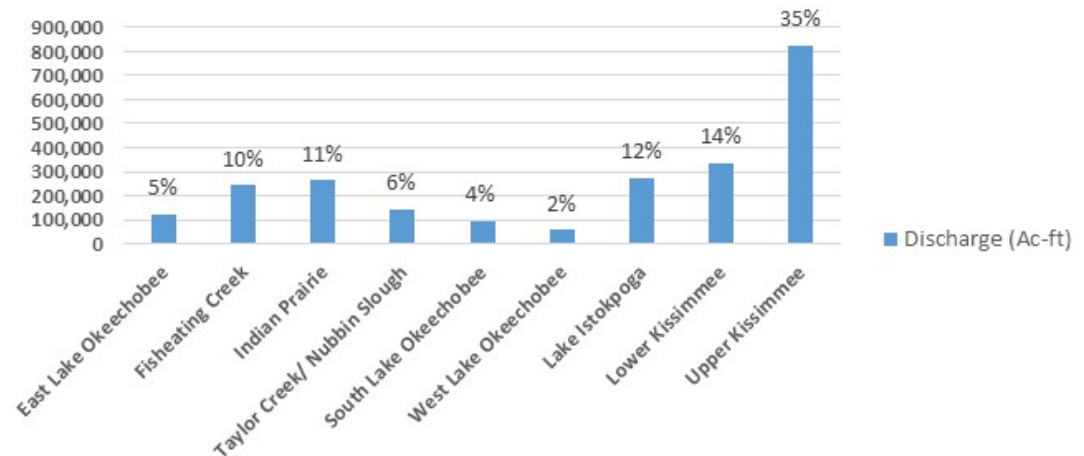
- Upper Kissimmee Sub-Watershed
 - Lowest average TP concentration (86 ppb)
 - **2005 to 2013 Lake Tohopekaliga average TP concentration (50 ppb or 0.05 mg/l)**
 - Highest Discharge (826,015 ac-ft)

Water Years 2001-2012

Avg TP Conc (ppb)



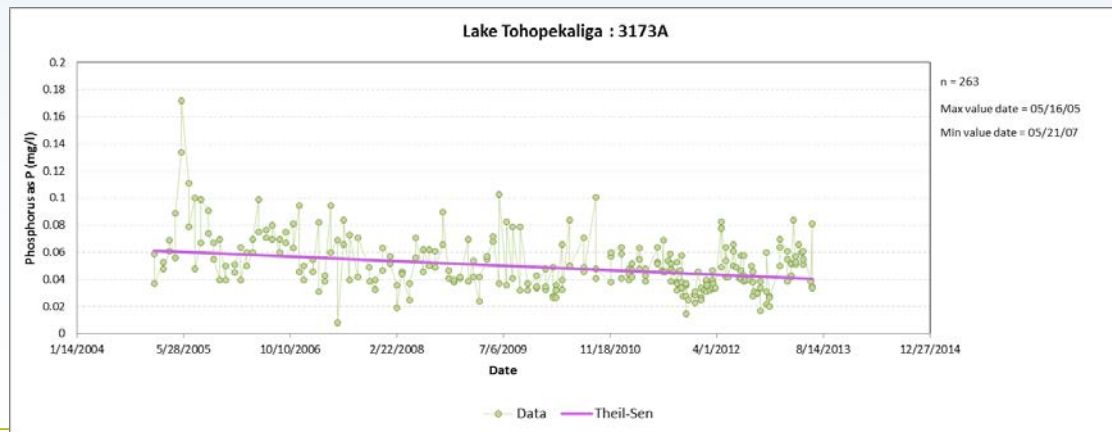
Discharge (ac-ft)



Source: FDEP, 2014

Benefits of the Lake Toho NRP and Applicability to Lake O BMAP

- Gives NRP stakeholders a “head start”
 - Plan development is locally controlled
 - Postponed the development of a TMDL by moving straight to restoration activities
 - Stakeholders already have projects and implementation underway
- Strategic monitoring already in place
- Demonstrated TP has been consistently decreasing in Lake Toho



Questions???



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