



Florida Department of Environmental Protection

Water Quality Restoration Program

Caloosahatchee Estuary Basin Management Action Plan Annual Meeting

March 30, 2016

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Agenda

- Overview of the Caloosahatchee BMAP Annual Progress Report
- Activities During the Reporting Period
- Monitoring Program Update
- Modeling Update
- Comments and Next Steps



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Overview of the Caloosahatchee BMAP 2015 Annual Progress Report



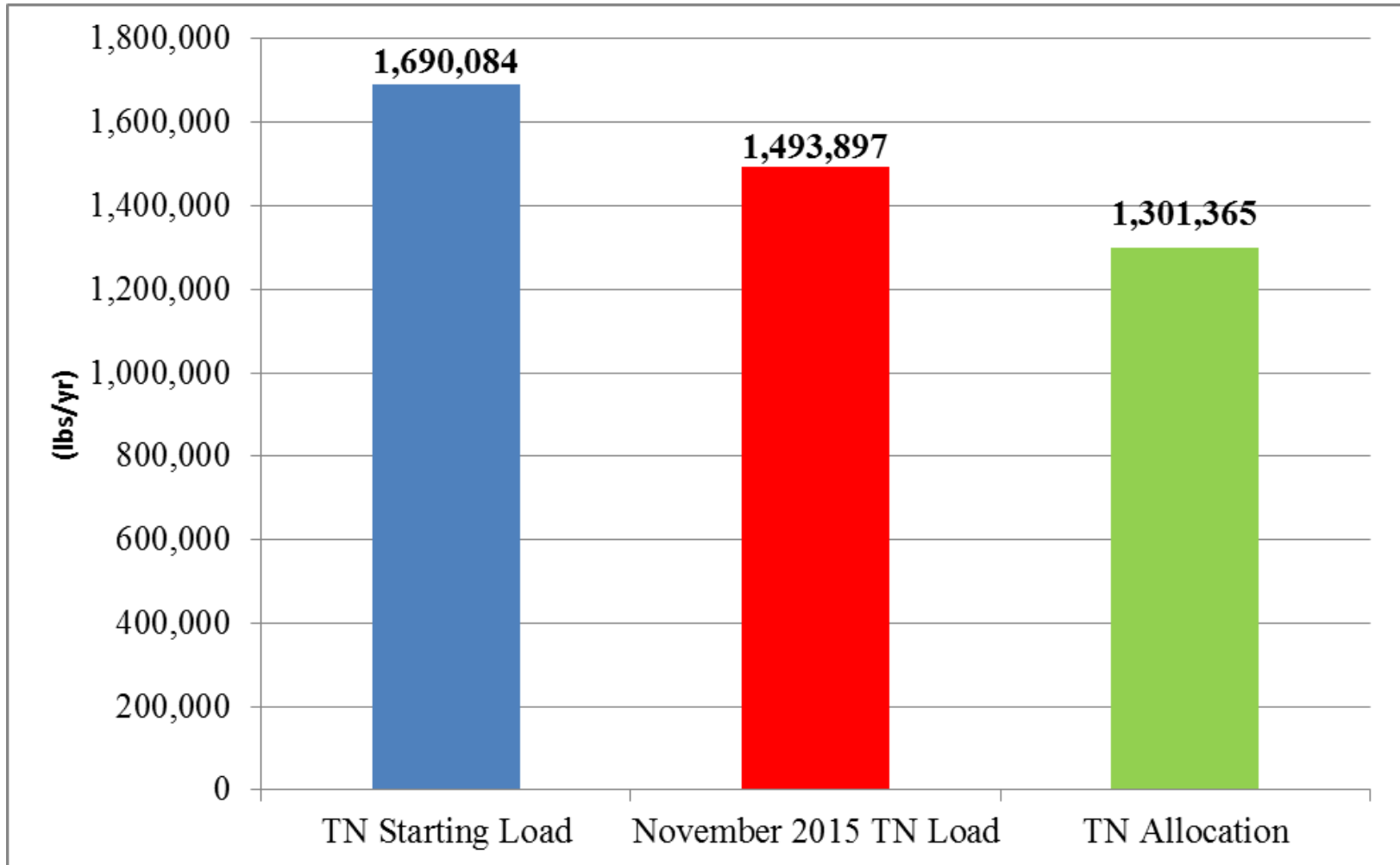


2015 Caloosahatchee Estuary Report

- Total Maximum Daily Load (TMDL) adopted in 2009
- Basin Management Action Plan (BMAP) adopted in 2012
- Third annual progress report compiled
- Reporting period: December 2014 - November 2015
- Project estimates total just over 50% of the necessary reductions for total nitrogen (TN)



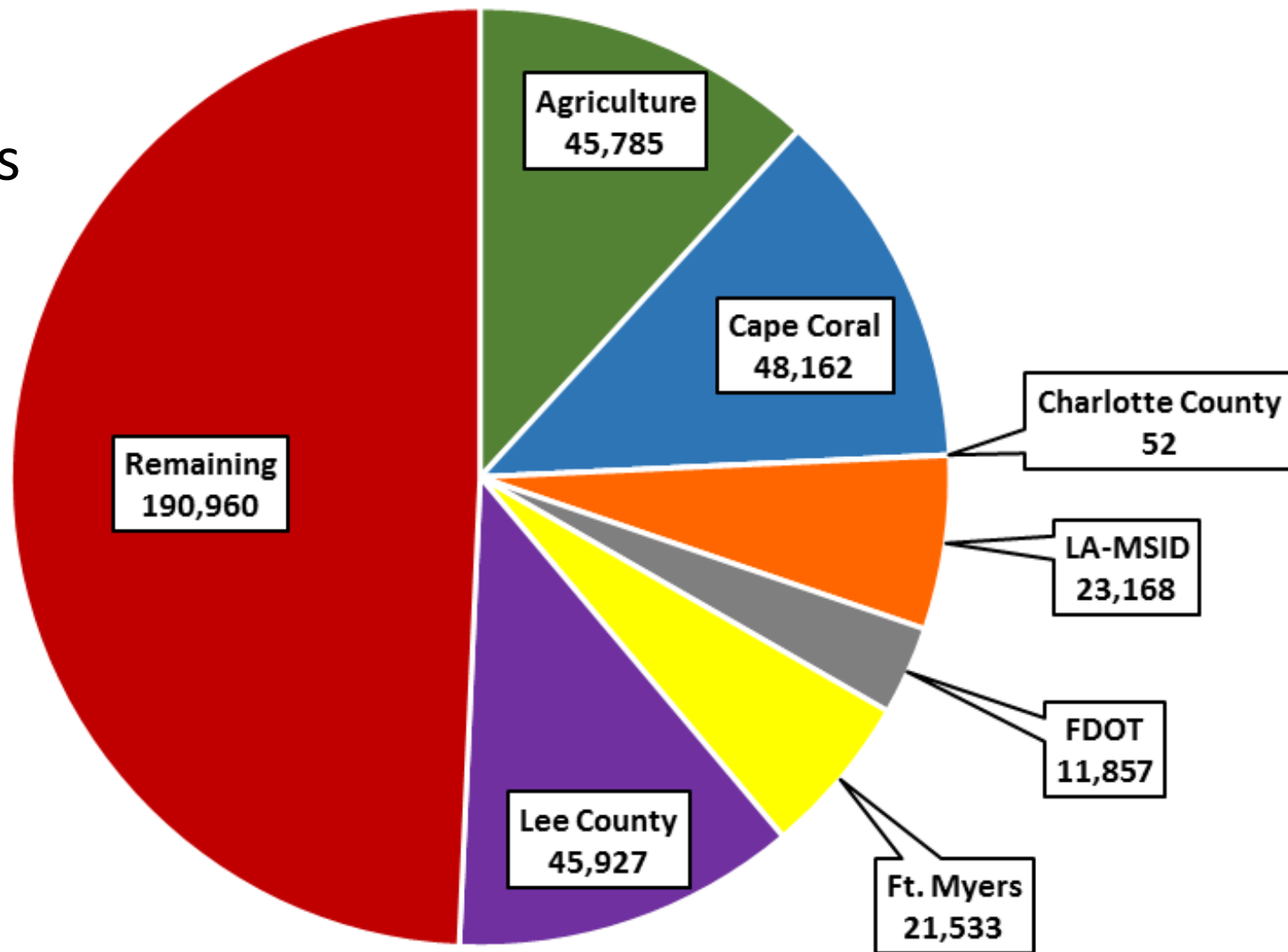
Progress Toward the TN TMDL





Progress (continued)

TN reductions
(lbs/yr)
including
completed
and
submitted
projects





Progress (continued)

Entity	Reductions (lbs/yr)	Required (lbs/yr)	%
Agriculture	45,785	55,597	82
Cape Coral	48,162	103,414	47
Charlotte County	52	943	6
East County Water Control District (ECWCD)/Lehigh Acres Municipal Services Improvement District (LA-MSID)	23,168	37,736	61
Florida Department of Transportation (FDOT)	11,857	9,119	130
Ft. Myers	21,533	40,924	53
Lee County	45,927	140,853	33
Lucaya Community Development District (CDD)	0	132	0
Total	196,484	388,719	51



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Activities During the Reporting Period





2015 Completed Efforts

- Cape Coral: Septic to sewer transition
- Fort Myers: Ford Street Preserve
- Agriculture: Increased enrollment/best management practice implementation
- Various on-going efforts continue and improve:
 - Public education
 - Street sweeping and maintenance
 - Local ordinances for source control



2015 Completed Efforts, cont.

City of Fort Myers Ford Street Diversion Structure

- Completed on November 12, 2015
- 5.81-acre created marsh
- Includes settling area and vegetation
- Water quality treatment for an 811-acre urban area





Examples of On-Going Efforts

“Fertilize Smart” billboard locations in Lee County





Examples of On-Going Efforts

Lee County 2015 Vegetation Harvesting Quantities

PROJECT	AMOUNT HARVESTED
Powell Creek Extension	29 cubic yards
Powell Creek Filter Marsh	76 cubic yards
Popash Creek Preserve Filter Marsh	34 cubic yards
Prairie Pines Preserve	30 cubic yards
Yellow Fever Creek Preserve	3 cubic yards



Public Education



Example of Lehigh Acres MSID Public Education Cards



Illicit Discharge Training

Example of FDOT Illicit Discharge Detection and Elimination Training

Video:

<http://wbt.dot.state.fl.us/ois/EnvironmentalManagementOffice/index.html>





South Florida Water Management District (SFWMD) Projects

- C-43 West Basin Storage Reservoir Project
 - Help capture and store stormwater runoff from the C-43 Basin and Lake Okeechobee discharges during the wet season
 - Provide flows to the Caloosahatchee Estuary during dry periods
- C-43 Water Quality Treatment and Testing Facility Project
 - Demonstrate wetland-based strategies for reducing pollutant loadings to the Caloosahatchee River and Estuary
 - Focuses on the recalcitrant fraction of dissolved organic nitrogen (DON)
 - Phase I kicked off in 2015 and includes bioassays and mesocosms



SFWMD Projects, cont.

- Tape Grass Restoration Pilot Study
 - Criteria for the current minimum flow and levels (MFLs) for the estuary are based on maintaining tolerable low-salinity conditions for tape grass
 - In-estuary monitoring and research efforts aim to better understand the key factors affecting grass bed reestablishment
- Lake Hicpochee Hydrologic Enhancement—North
 - Objectives: provide shallow water storage, rehydrate a portion of the lake bed to promote habitat restoration, and increase capacity for ancillary water quality enhancements
 - Includes a shallow storage feature and a spreader canal to deliver excess stormwater runoff from the C-19 Canal to the northern portion of Lake Hicpochee



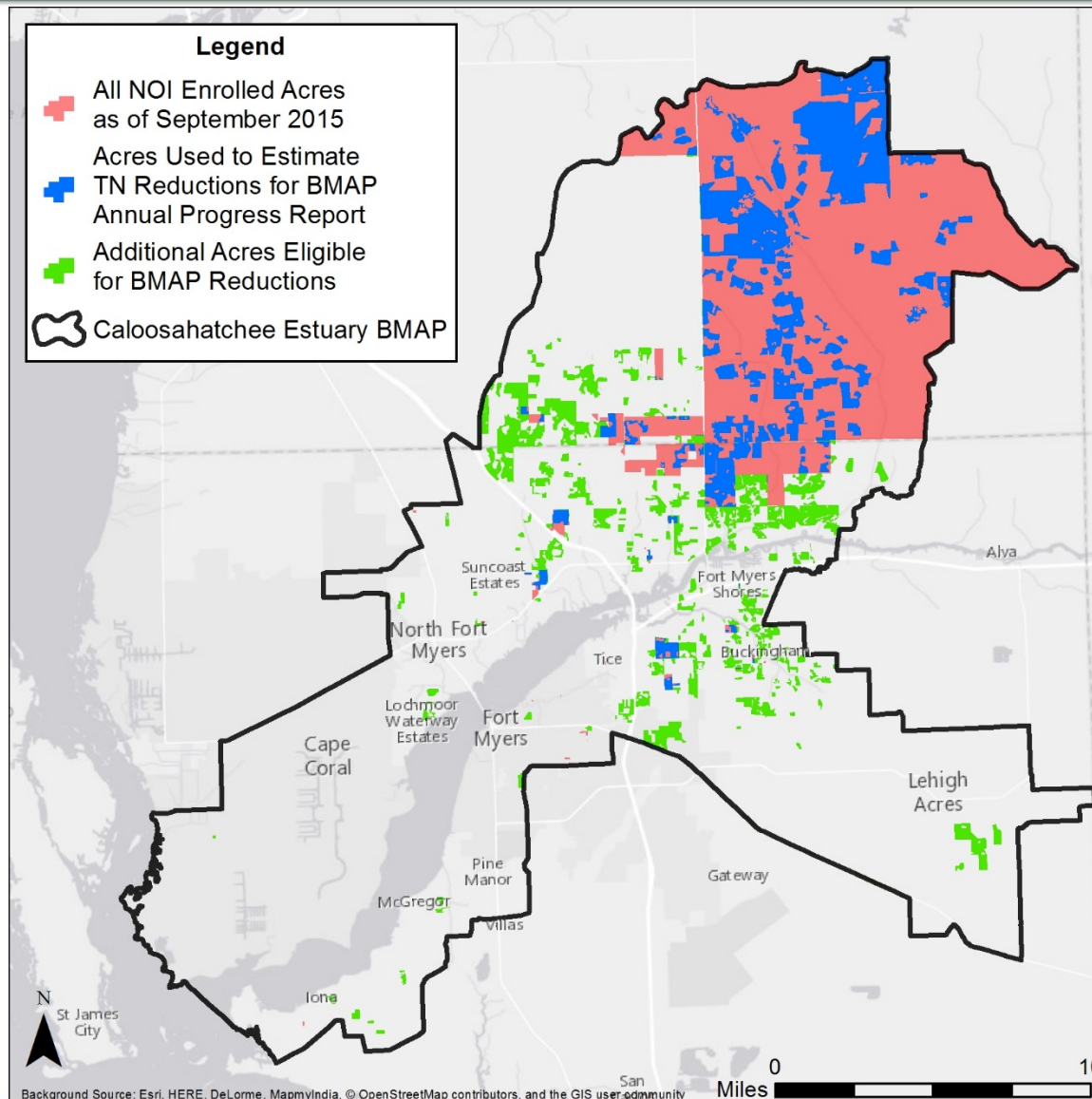
Agricultural Lands Enrollment

CATEGORY	ACRES
Total Agricultural Acres in BMAP	30,049
Enrolled Acres Used for TN Reduction Estimates	18,480
BMAP Phase I FDACS Enrollment Goal (50% of FDACS-adjusted acres)	18,091
BMAP Phase I remaining acres to enroll	0
Total Remaining Acres in BMAP Basin to Enroll	11,569

Estimated TN Reduction 45,785 lbs/yr



Agricultural Lands Enrollment





Summary of Reductions in Reporting Period

December 2014 to November 2015

ENTITY	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)
Cape Coral	CC-15	Septic to Sewer in Southwest 6/7	Not Calculated
Fort Myers	FM-9	Ford Street Preserve	7,293
Agriculture	N/A	Agricultural BMPs – New Reductions	16,696
TOTAL	N/A	TOTAL REDUCTIONS IN REPORTING PERIOD	23,989



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Ford Street Preserve Project Presentation - City of Ft. Myers





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Monitoring Program Update





Monitoring

Water quality monitoring is being conducted by:

- City of Cape Coral
- City of Fort Myers
- DEP-South Regional Operations Center
- Lee County
- SFWMD

• We need to work together to get all pertinent data uploaded for use in future analyses



Lee County sample collection at Stroud Creek



Monitoring

Biological monitoring conducted by SFWMD

- Oysters
- Seagrass (also monitored by DEP)



DEP monitoring

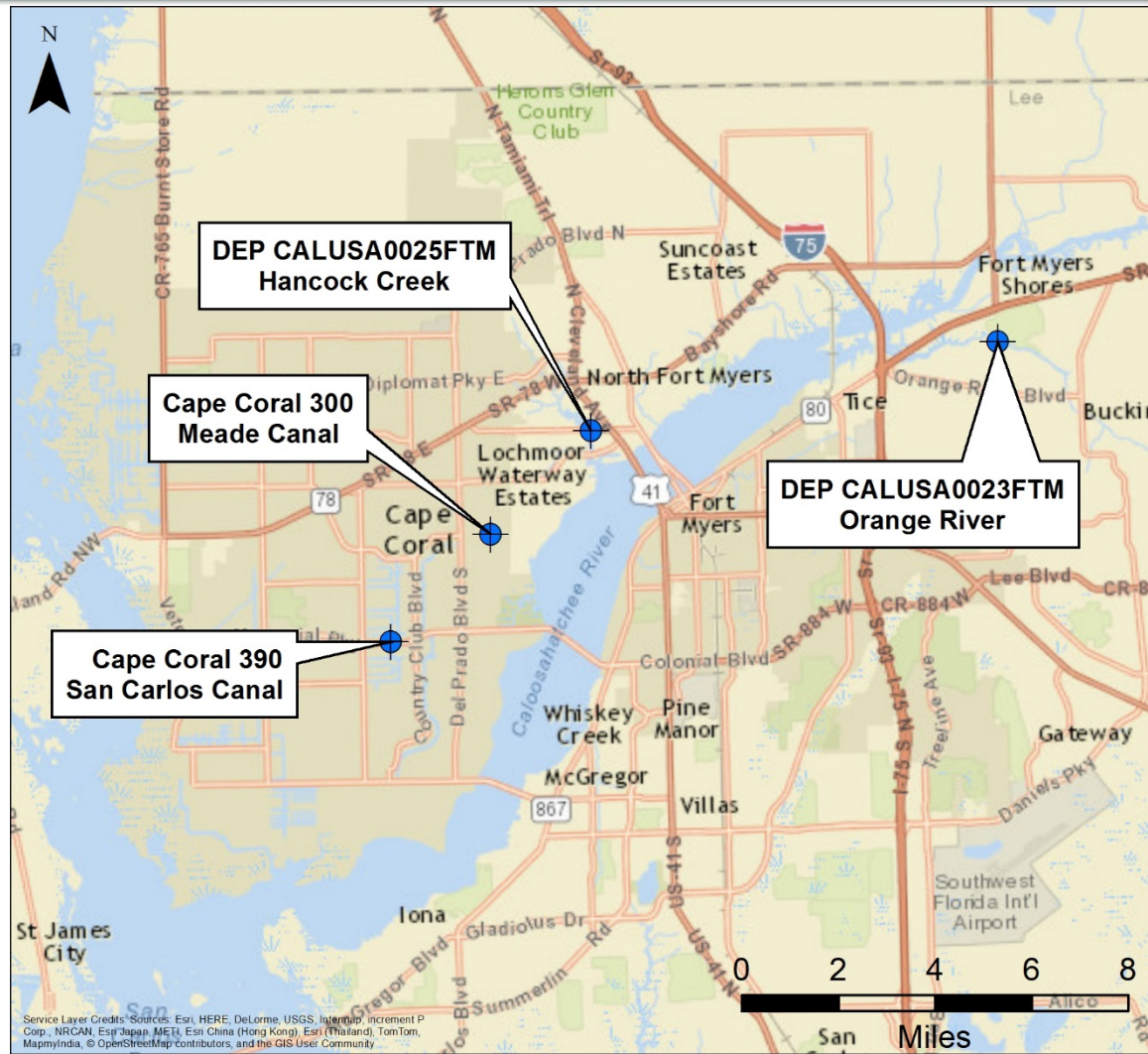


SFWMD monitoring



Water Quality (WQ) Analyses

- Time series and trend analyses of monthly total nitrogen (TN) concentration data were conducted for Caloosahatchee Estuary Stations with adequate available data



Caloosahatchee BMAP
Selected Monitoring Locations



WQ Analyses Approach

- All data were filtered to only include surface water grab samples, which included water depths between 0.1 meters (m) and 0.6 m
- All non-detect TN data were converted to $\frac{1}{2}$ *minimum detection limit (MDL)
- Monotonic trend analyses used the non-parametric Mann-Kendall test to identify trends in a statistically rigorous way



WQ Analyses Approach

- Annual geometric means (AGMs) were calculated using monthly values for each year in the period of record (POR) for data available since 1/2000
- AGMs are less sensitive to outliers than annual arithmetic mean and more appropriate for comparing to targets/standards
- AGMs were overlaid on top of the long term time series and trend results



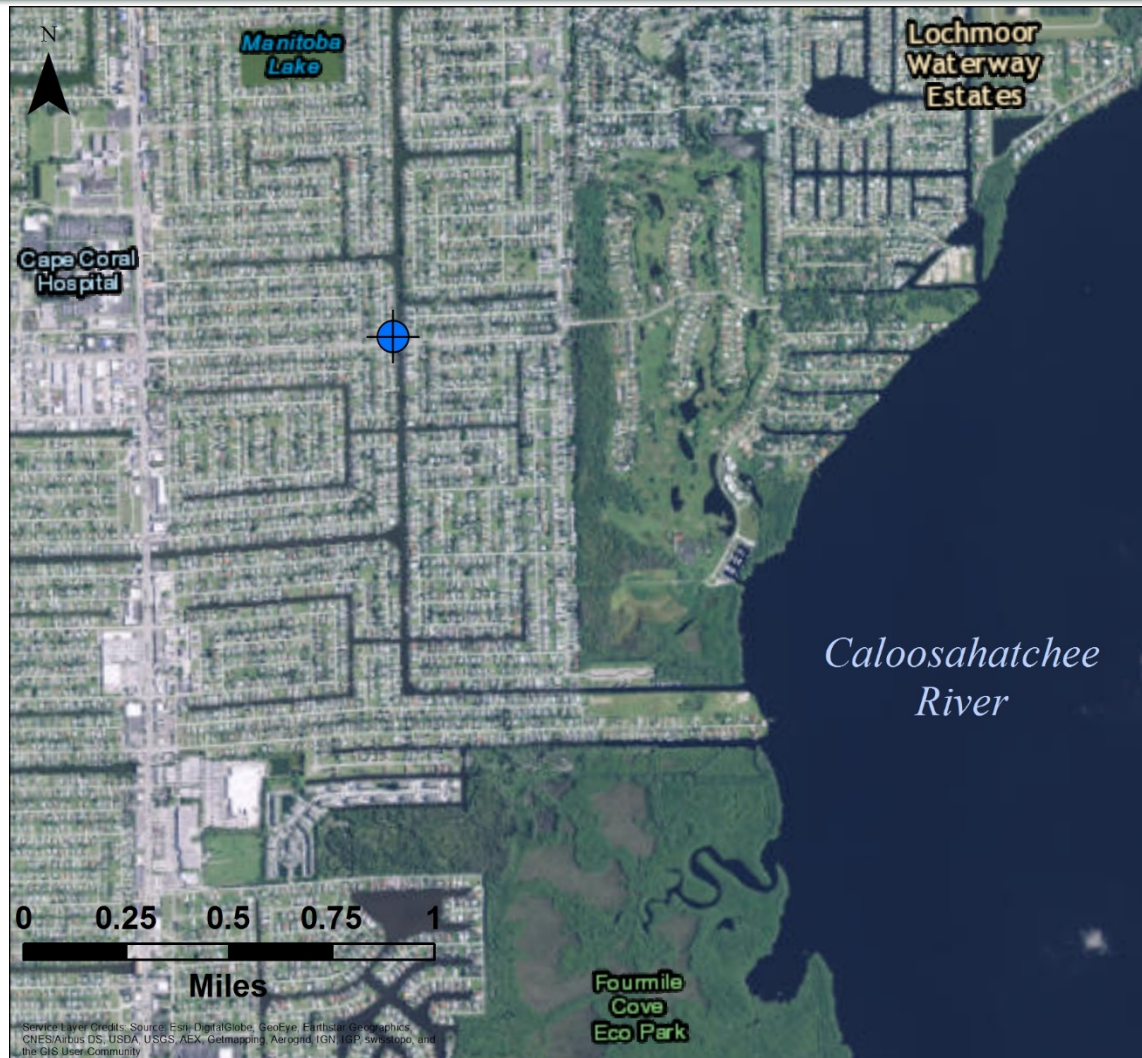
Annual Geometric Means

TN Annual Geometric Means				
Year	Station			
	CC 300	CC 390	CALUSA0023FTM	CALUSA0025FTM
2000	0.61	0.76	-	-
2001	0.58	0.51	-	-
2002	0.57	0.42	-	-
2003	0.42	0.53	-	-
2004	0.35	0.27	-	-
2005	0.64	0.43	-	-
2006	0.53	0.53	-	-
2007	0.37	0.36	-	-
2008	0.64	0.60	-	-
2009	0.70	0.87	-	-
2010	0.68	0.52	-	-
2011	0.78	0.65	0.79	0.97
2012	0.63	0.83	0.74	0.98
2013	0.59	0.64	0.74	0.98
2014	0.55	0.47	0.66	0.96
2015**	0.48	0.46	0.70	1.03

**Data for Cape Coral sites 300 and 390 only through October of 2015.



Cape Coral 300



Cape Coral 300
Meade Canal



Cape Coral 390



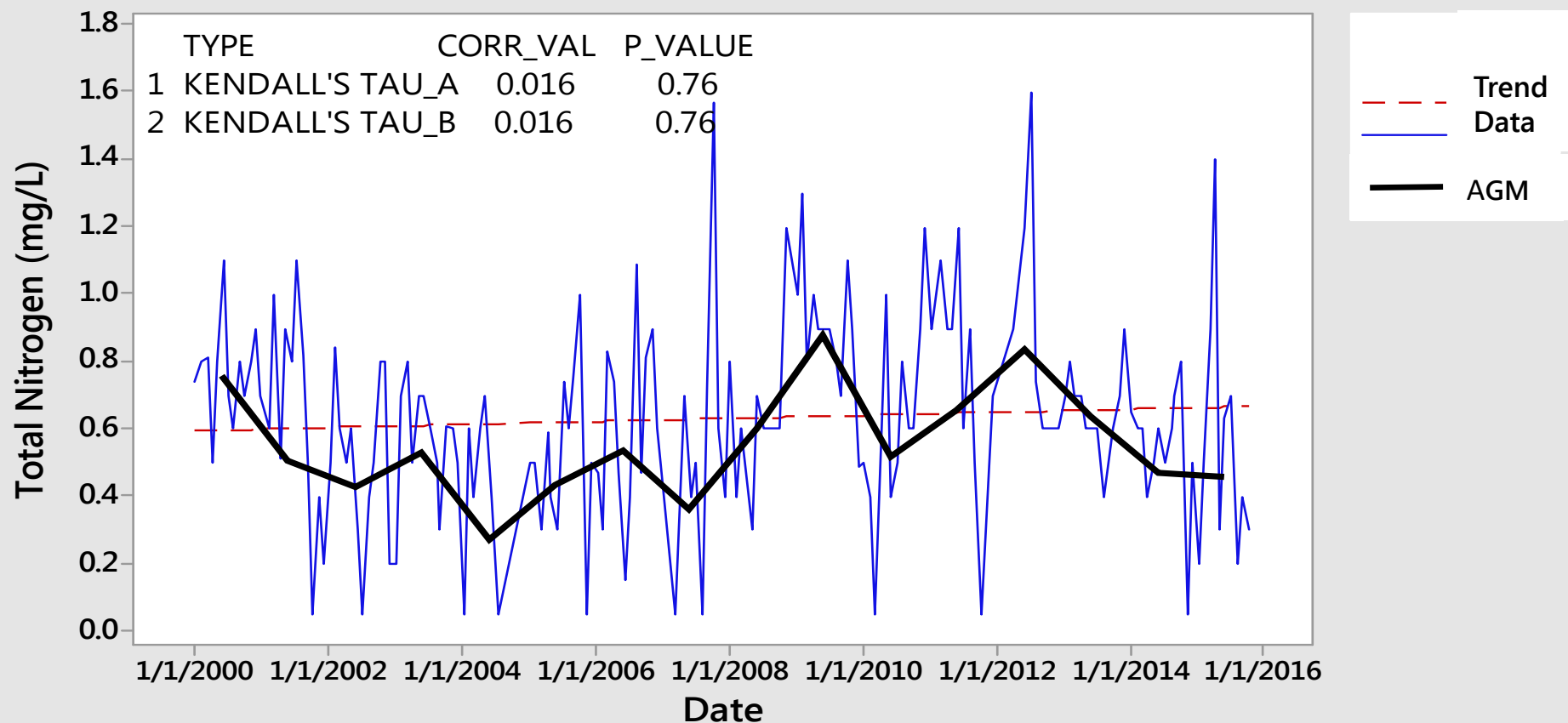


Cape Coral 390

Mann-Kendall Test for Trend (Station 390)

SEN-THEIL-KENDALL LINE

SLR LINE





DEP CALUSA0023FTM



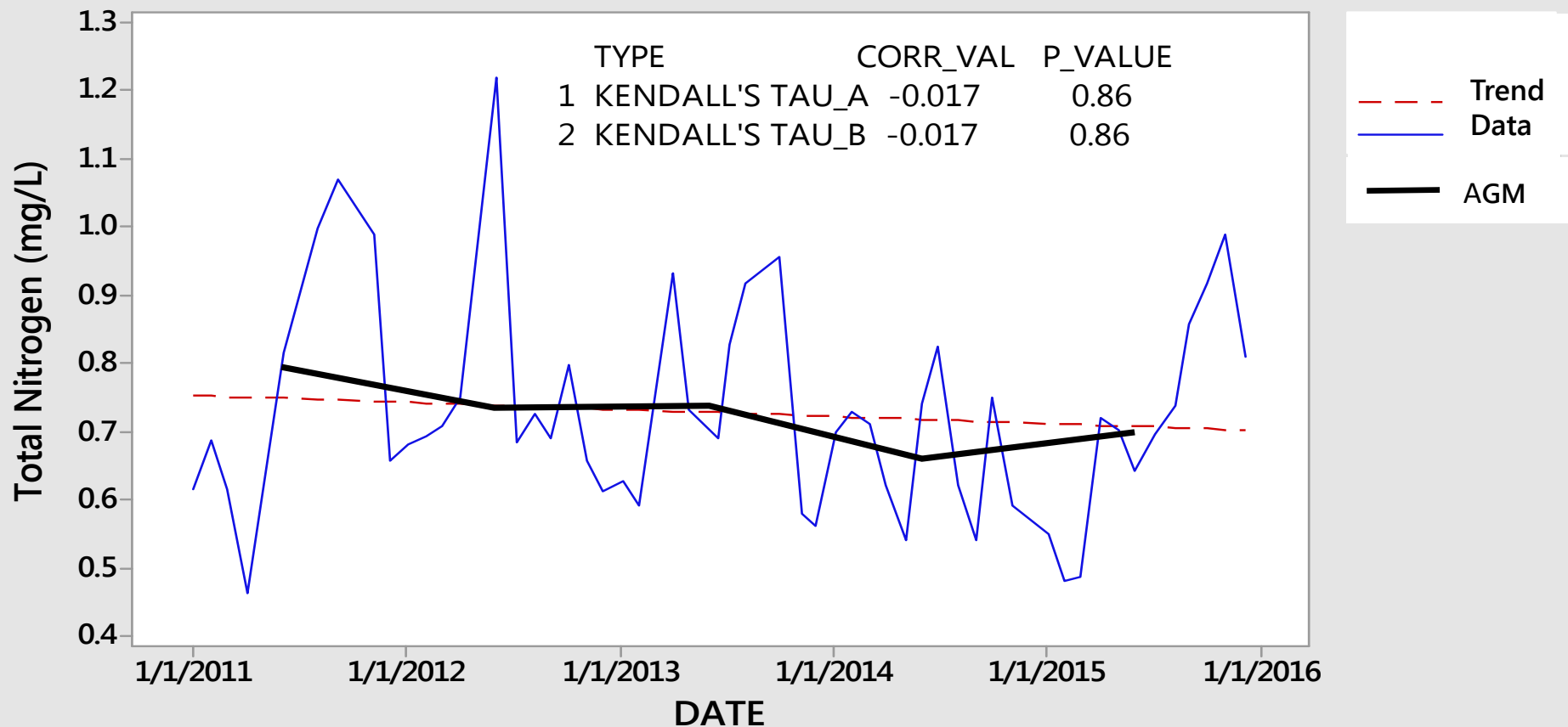


DEP CALUSA0023FTM

Mann-Kendall Test for Trend (Station CALUSA0023FTM)

SEN-THEIL-KENDALL LINE

SLR LINE



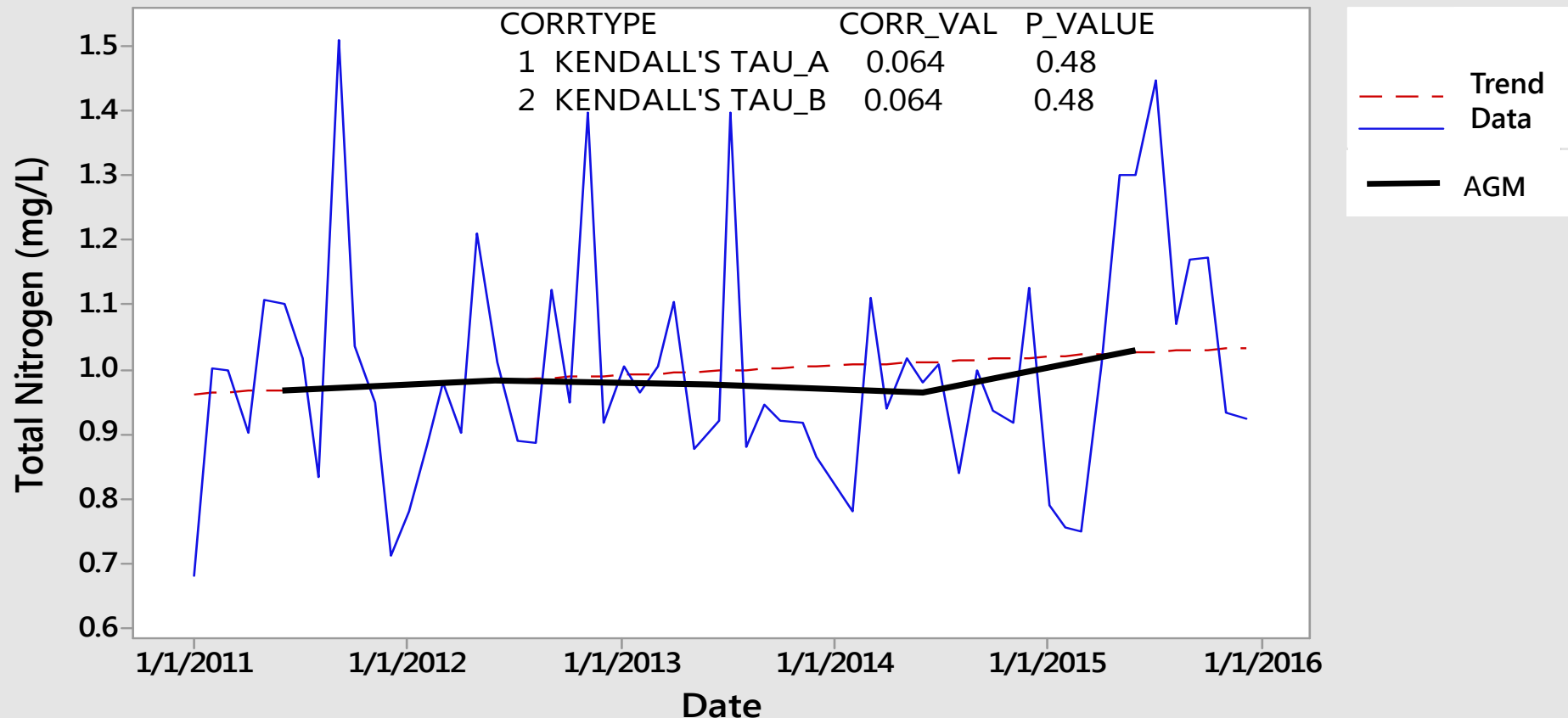


DEP CALUSA0025FTM

Mann-Kendall Test for Trend (Station CALUSA0025FTM)

SEN-THEIL-KENDALL LINE

SLR LINE





SFWMD - 2016 SFER

- 2016 South Florida Environmental Report (SFER) is now available
- Volume 1, Chapter 10 includes information on the Caloosahatchee basin



<http://my.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports>



Questions About Monitoring?





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Modeling Update





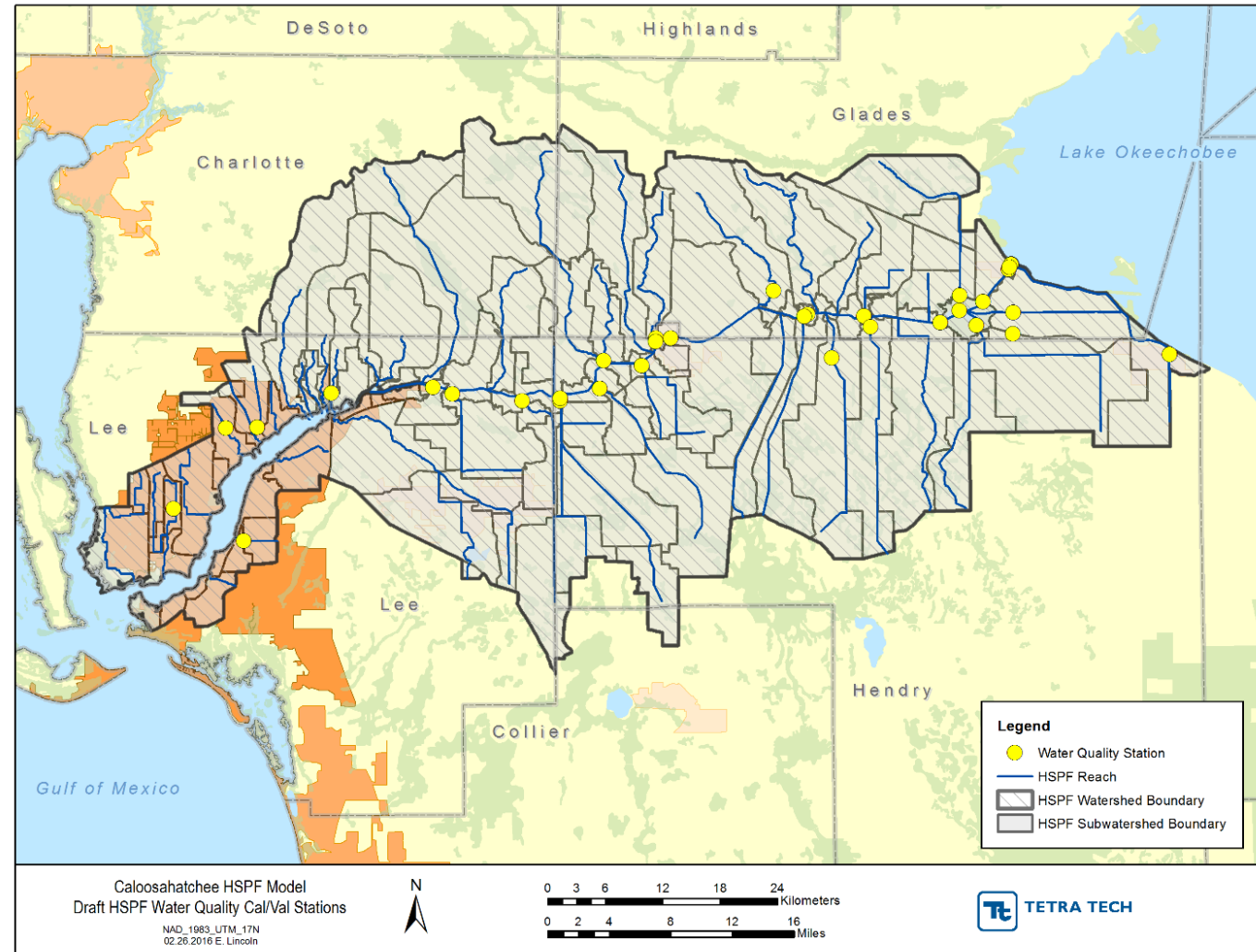
Background

- During BMAP development, the stakeholders had concerns about the models used for the TMDLs:
 - Agricultural pumping for irrigation
 - Streams with reversing flows
 - Model time period
 - Stations for calibration
 - Outdated land use coverage
- Tetra Tech and AMEC were contracted by DEP to evaluate and revise the existing models



Modeling Update - HSPF

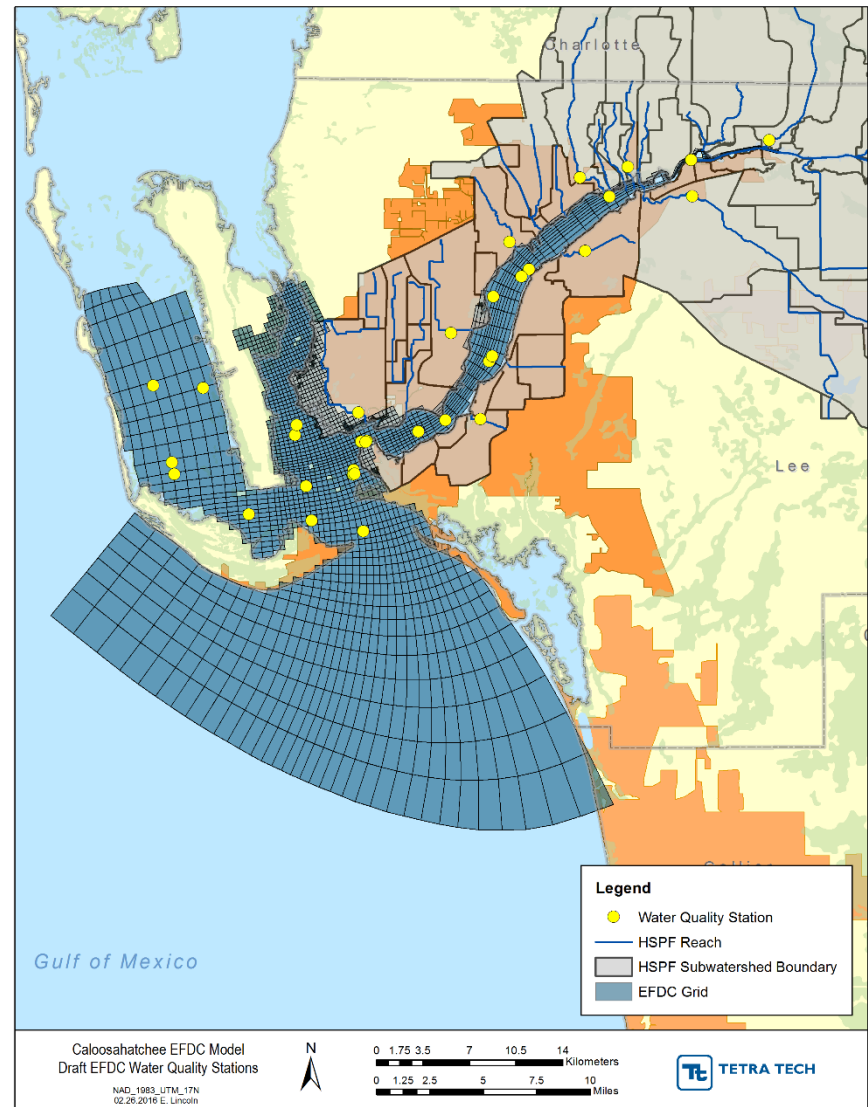
- Hydrologic simulation program - FORTRAN (HSPF)





Modeling Update - EFDC

- Hydrodynamic/river model: Environmental Fluid Dynamics Code (EFDC)





Project Tasks

- Task 1: draft memo circulated for comment, includes the evaluation of the HSPF and EFDC modeling integrity and development of project templates
- Tasks 2 & 3: evaluate HSPF calibration and recalibrate
- Tasks 4, 5, & 6: EFDC update and calibration
- Task 7: background scenario model run
- Tasks 8, 9, & 10: communications, reporting, and training



Modeling Update Next Steps

- Model results expected by March 2017
 - Existing TMDL refinements possible
 - New TMDLs possible
- BMAP area upstream expansion likely
- Some upstream projects already underway



DEP TMDL Contacts

Florida Department of Environmental Protection
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Next Steps





New Requirements

- Revisions to Section 373.4595, Florida Statutes (F.S.) during 2016 Legislative session
- New requirements for Northern Everglades watersheds
 - Lake Okeechobee
 - Caloosahatchee
 - St. Lucie
- Enhanced integration of WMD protection plans and BMAPs
- Additional reporting
 - 5-year BMAP progress reports
 - Annual Northern Everglades Coordinating Agencies Report



New Requirements

New elements for Northern Everglades and Estuaries Protection Program (NEEPP) BMAPs

- Projects to achieve the TMDL in 20 years
- 5-year milestones to measure progress
- 5-year progress report

New elements for all new or revised BMAPs

- Additional project information
- Additional funding information



- [illegible]



Project Information Collection

- To date, received information on 18 projects
- Project Types: Aquatic Plant Harvesting, Water Farming, Managed Aquatic Plant Systems (MAPS), Stormwater Treatment Areas (STAs), Baffle Boxes, Dispersed Water Management (DWM), and Alum Treatment
- Schedules: April 2016 through April 2028
- Cost: \$75,000 to \$124,000,000
- Annual O&M: \$1,500 to \$5,500,000
- Acres Treated: 14.5 to 35,000
- Estimated TN Reductions: 0 to 110,025 lbs/yr
- Estimated TP Reductions: 1 to 18,471 lbs/yr



Action Items

- Comments on the draft annual report due Friday, April 8th, 2016
- Storage and Retrieval (STORET) database uploads completed
- Continue water quality analyses
- Model results in March 2017
- Next annual meeting Spring 2017
- Development of Phase II BMAP
- Continue project information collection
- Muddy Water Blues event April 26, 2016



Contact Information

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