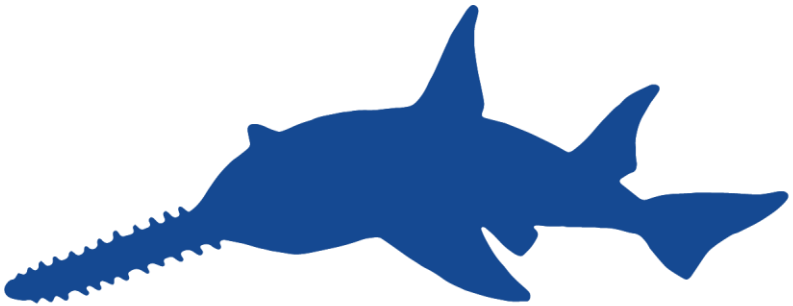


CALUSA

WATERKEEPER®

WATERKEEPER® ALLIANCE

MEMBER


SUNCOAST
WATERKEEPER


CALUSA
WATERKEEPER


EMERALD
COASTKEEPER


LAKE WORTH
WATERKEEPER


COLLIER COUNTY WATERKEEPER
CC
WK
CUSTOS QUIA AQUA MUNDO


TAMPA BAY WATERKEEPER


MATANZAS
RIVERKEEPER

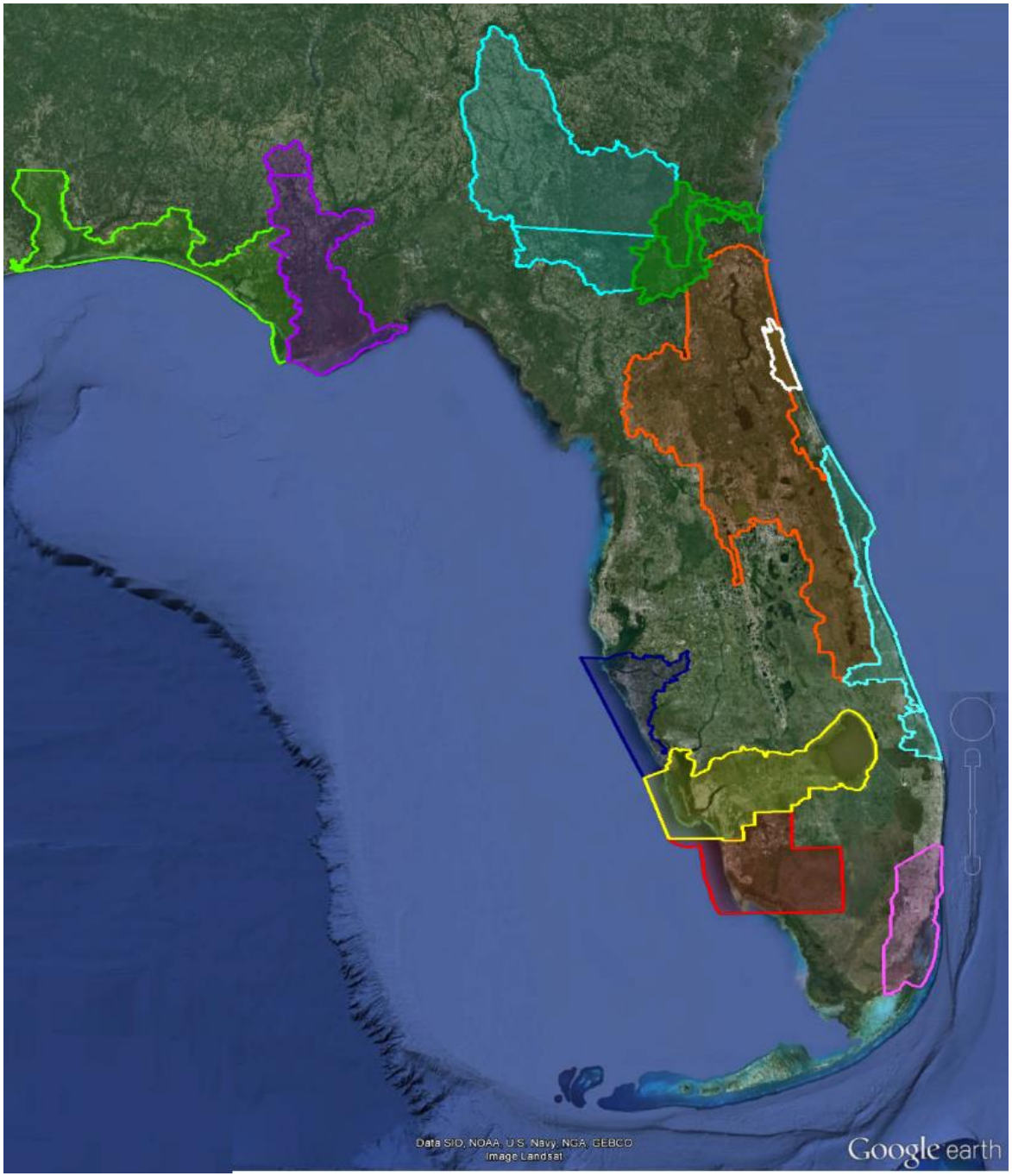

MIAMI
WATERKEEPER

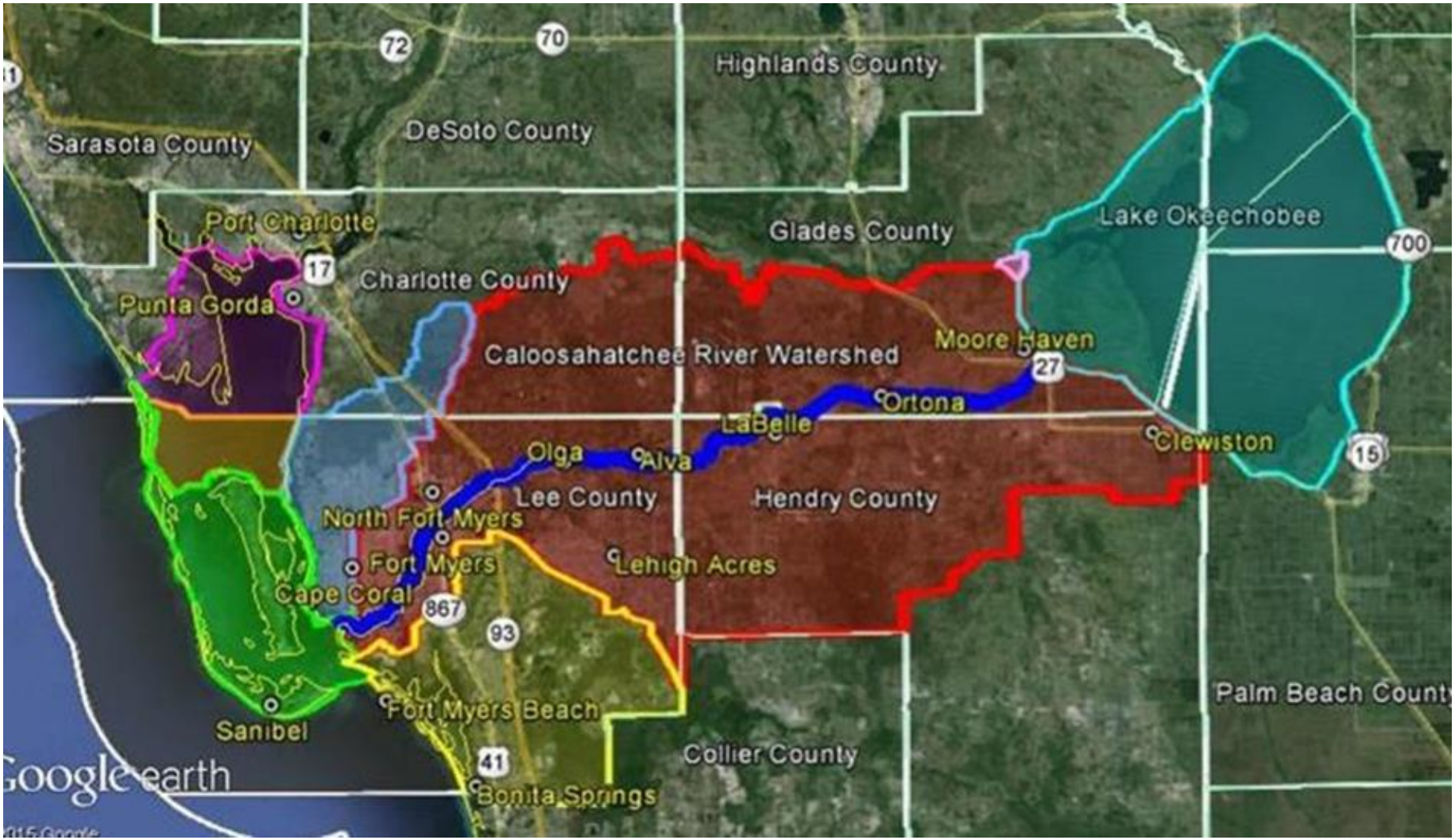

Suwannee
RIVERKEEPER


ST. JOHNS
RIVERKEEPER


Indian
RIVERKEEPER


APALACHICOLA RIVERKEEPER
SAVING AN AMERICAN TREASURE


Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat
Google earth


72
70
Highlands County
Sarasota County
DeSoto County
Port Charlotte
17
Glades County
Lake Okeechobee
700
Charlotte County
Punta Gorda
Caloosahatchee River Watershed
Moore Haven
27
Ortona
LaBelle
Clewiston
Olga
Alva
15
Lee County
Hendry County
North Fort Myers
Fort Myers
Lehigh Acres
Cape Coral
867
93
Palm Beach County
Fort Myers Beach
Sanibel
Collier County
41
Bonita Springs
Google earth

Calusa Waterkeeper Advocacy

Lake Okeechobee Regulation Schedule (LORS)

- Filed 60 day NOI 12-19-18
- ACOE, USFWS, NMFS

WOTUS Rule Change

- Major Waterkeeper Alliance initiative in opposition to WOTUS proposed change
- Major loss of wetland protection in Florida if revised as proposed

Florida Basin Management Action Plans

- Load reduction allocations are based on outdated land use
- Inadequate flow monitoring to enable loading estimates
- Pollutant trends are largely up
- No clear compliance threshold

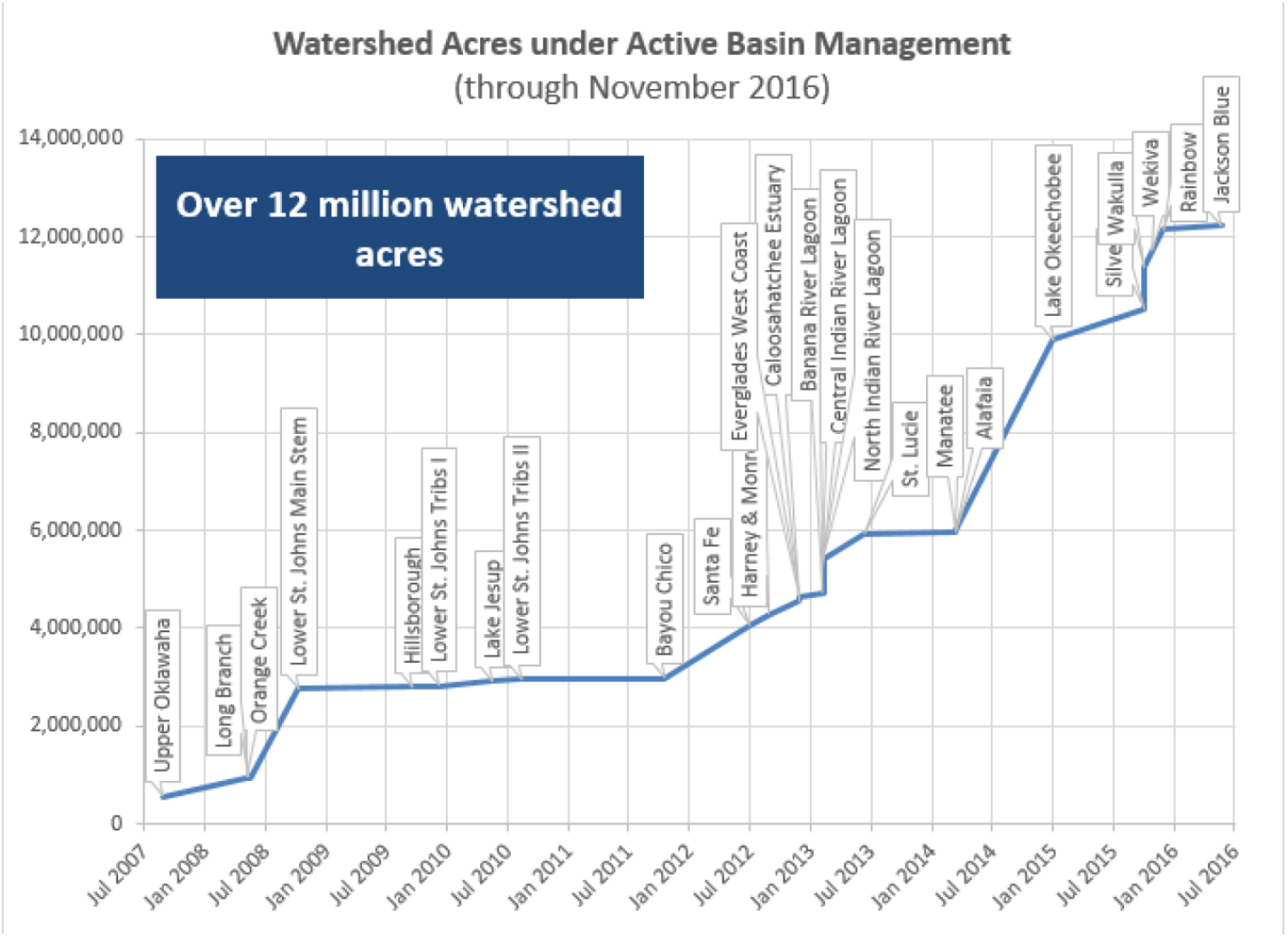
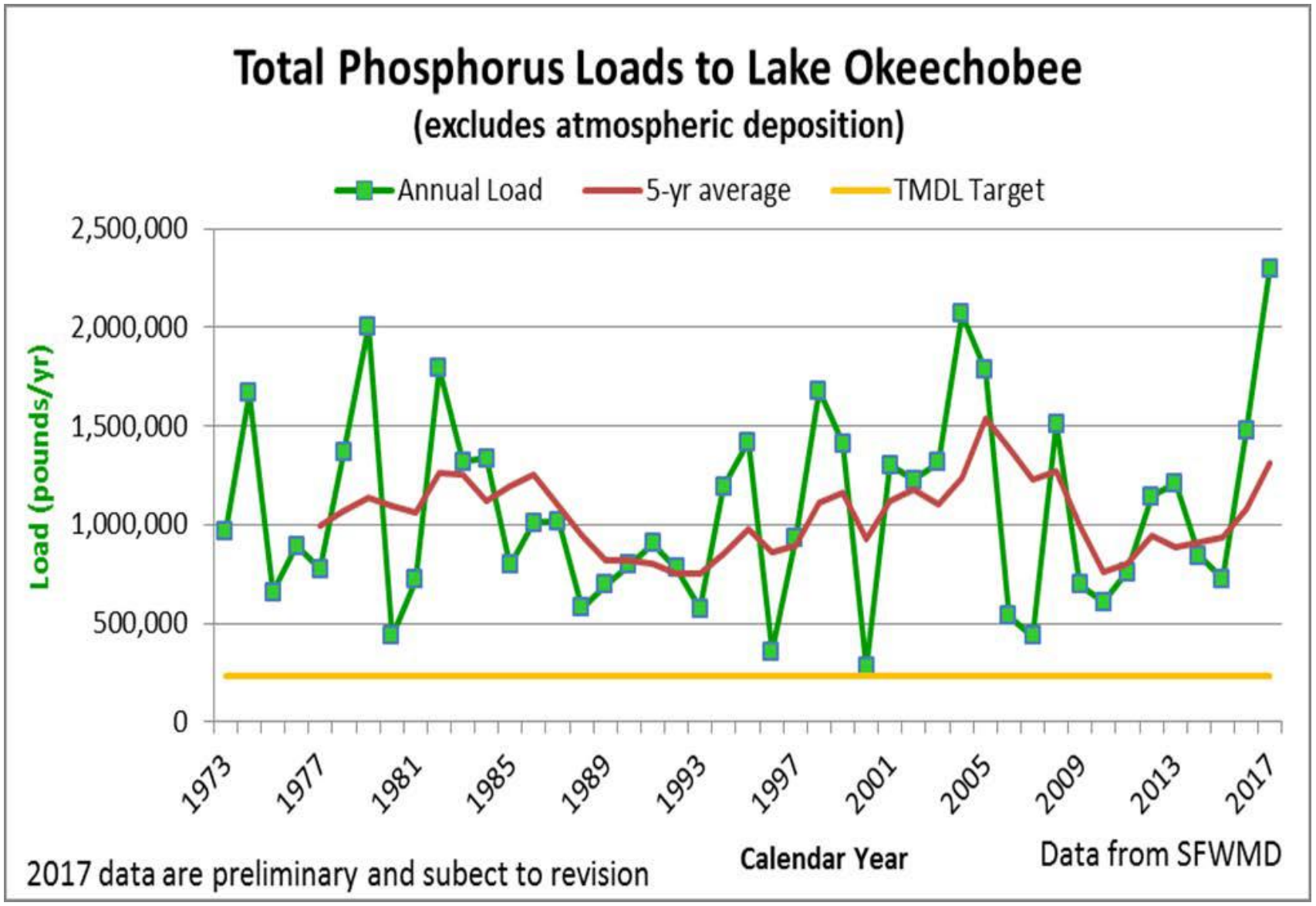
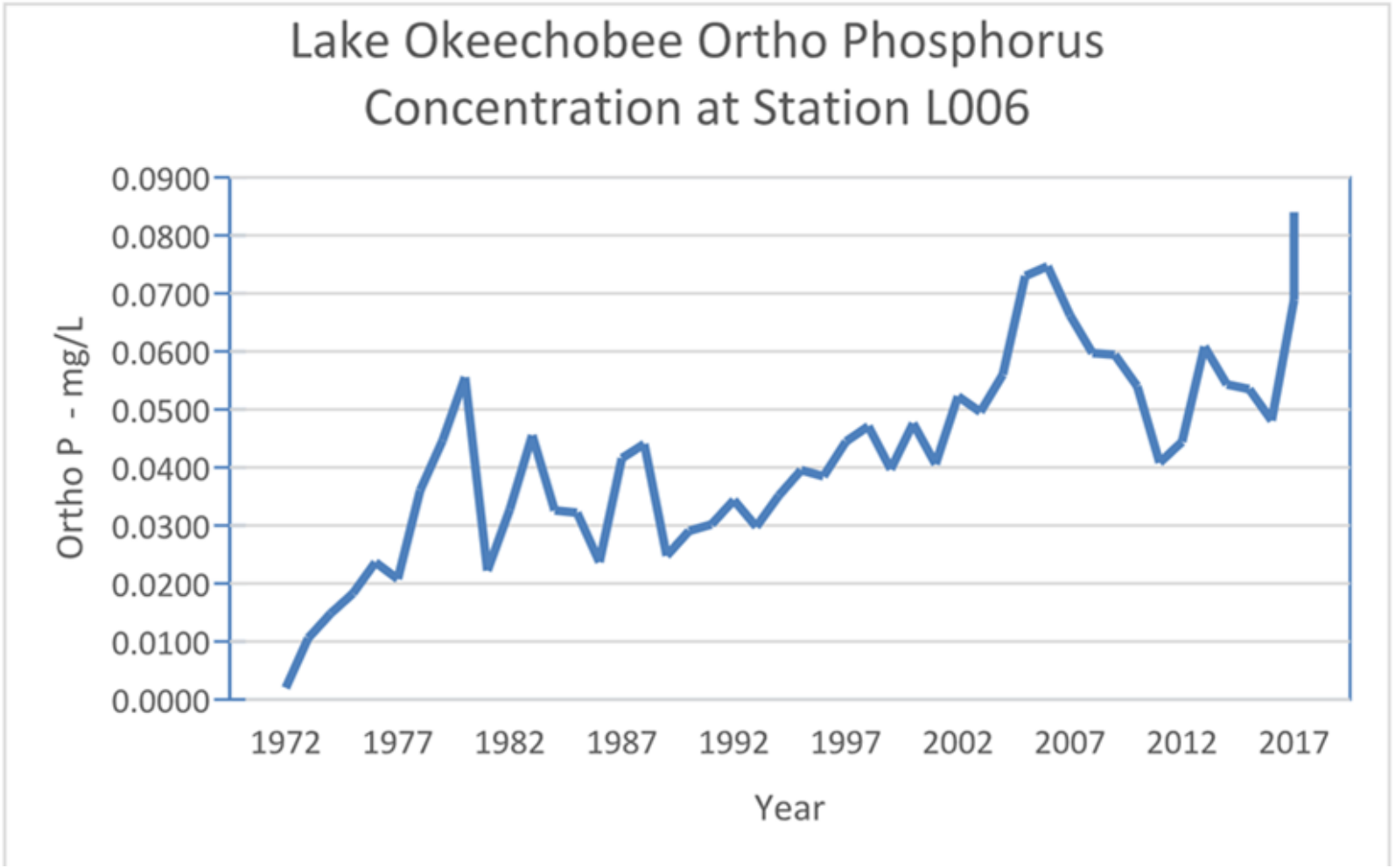


Figure 5.1. Number of acres covered by BMAPs

Lake Okeechobee BMAP

- No progress toward P load reduction
- 2016 legislation SB 552 extended compliance deadline
- Agriculture is largest contributor
- Agriculture BMPs are not working

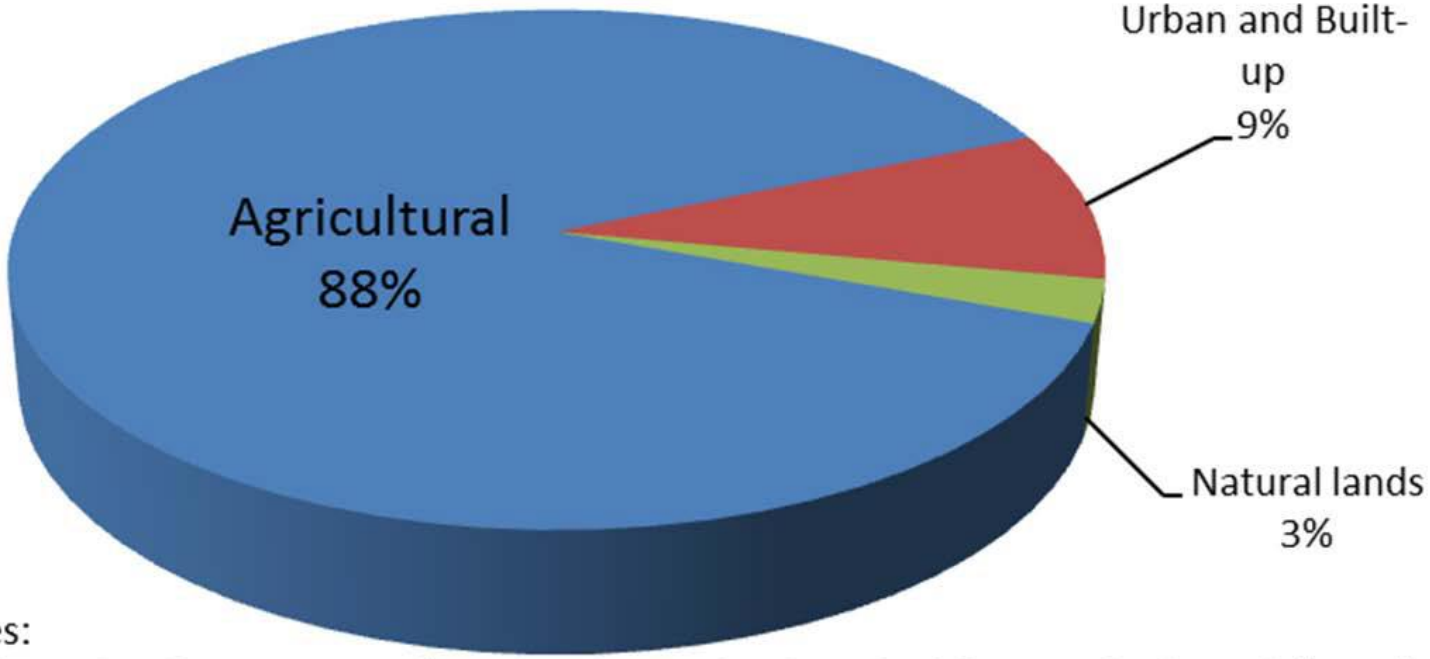

Total Phosphorus Loads to Lake Okeechobee
(excludes atmospheric deposition)
Annual Load
5-yr average
TMDL Target
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Load (pounds/yr)
1973
1977
1981
1985
1989
1993
1997
2001
2005
2009
2013
2017
Calendar Year
2017 data are preliminary and subect to revision
Data from SFWMD


Lake Okeechobee Ortho Phosphorus Concentration at Station L006
Ortho P - mg/L
0.0900
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
Year

Total Phosphorus Loading to Lake Okeechobee (2017)

Annual load = 2,298,875 lbs/yr

Draft



Notes:

Land use data from SFWMD (2018); unit area loads revised from Goforth et al. (2013).

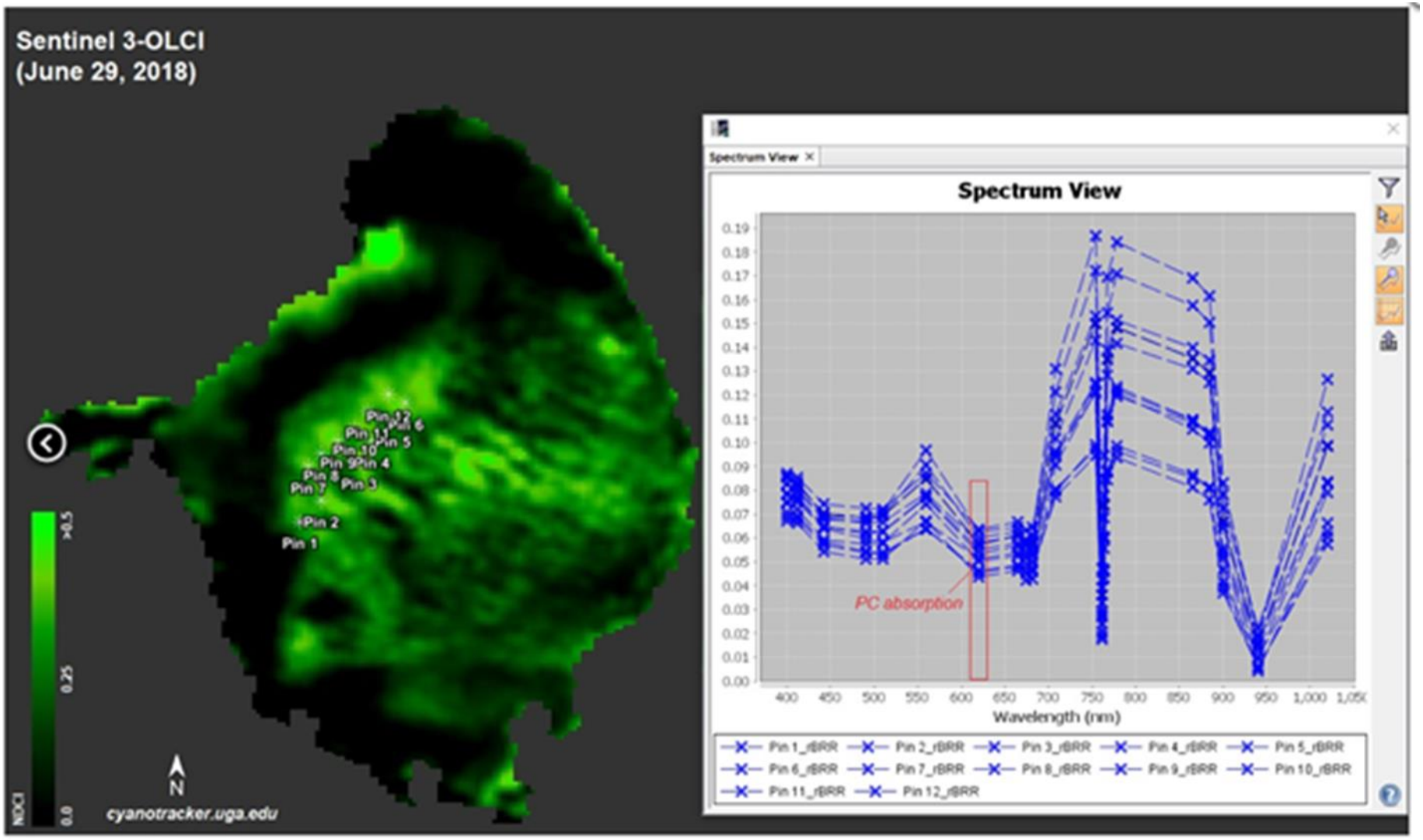
"Agricultural" includes traditional agricultural activies.

"Urban and built-up" includes residential, transportation, communication and utilities.

"Natural lands" includes wetlands, waterbodies, upland forests, rangeland and barren land.

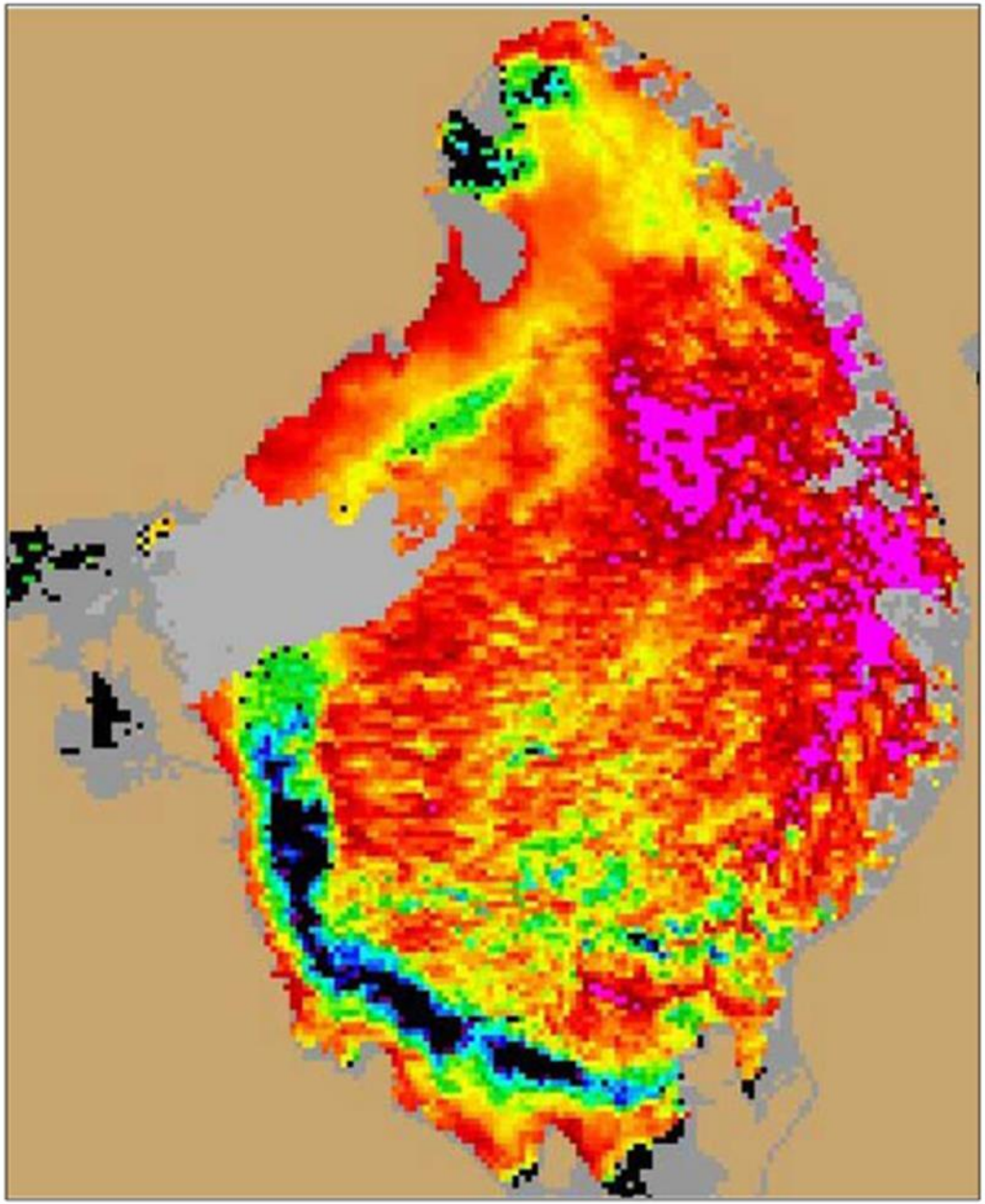
This is only an estimate – since no parcel-specific water quality data are available; this estimate assumes each land use has responded uniformly to load reduction measures since the 2001-2012 Starting Period.

Experimental product for discussion only



The recent Sentinel 3 scene captured Lake Okeechobee bloom, which revealed that ~70% of the lake is covered by on-going massive harmful algae bloom.

Figure 1. On July 2, 2018, 90 Percent of Lake Okeechobee Was Covered with blue-green algae Bloom (from NOAA)




6-22-18

Caloosahatchee Estuary Impacts
Early July – September 2018

Risk From Recreational Exposure – Primary Contact


CAUTION
ALLIGATORS INHABIT FLORIDA WATERS
SWIM WITH CAUTION AND IN
DESIGNATED AREA
REPORT ALLIGATORS TO PARK STAFF
blue green algae?
dodge it!

Health Risks to Animals

- Domestic animals and wildlife are also subject to poisoning by cyanotoxins
- Dogs are particularly vulnerable due to habit of swimming in or drinking contaminated water
- 58% of occurrences were fatal (Backer et al. 2013)
- Impacts of cyanotoxins on domestic and wild animals is significantly under-recognized.

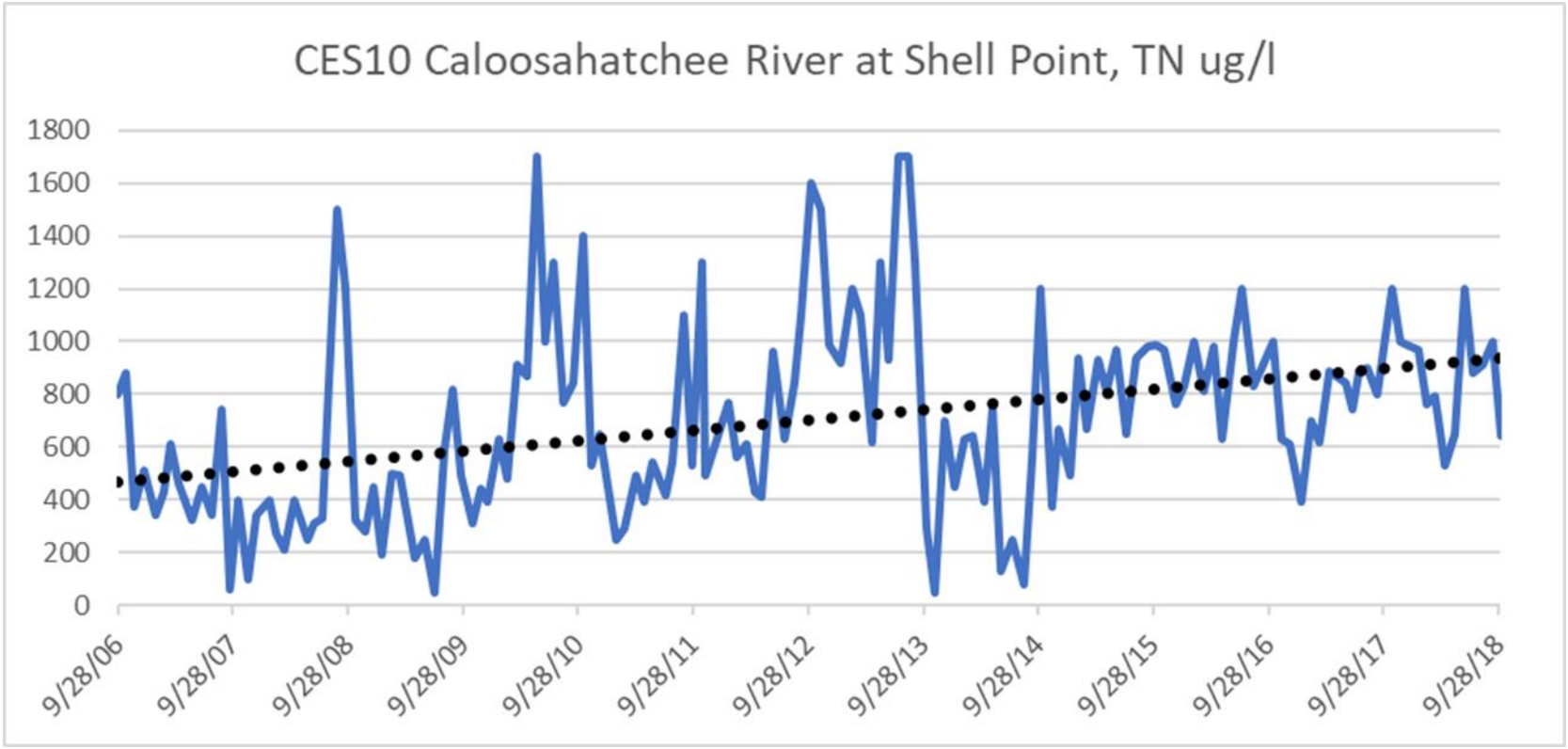
Caloosahatchee cyanobacteria frequency and severity index

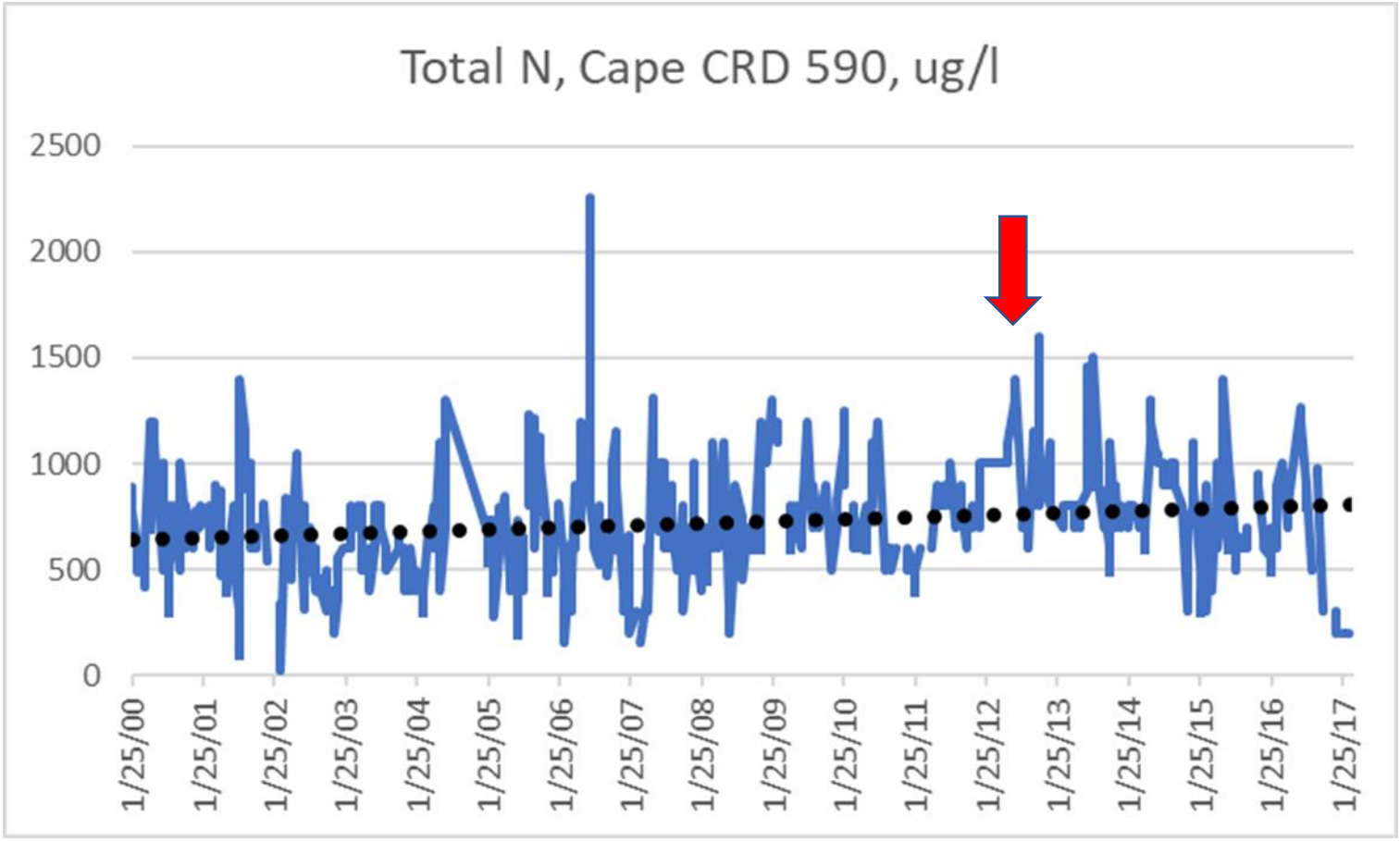
Cyanobacteria

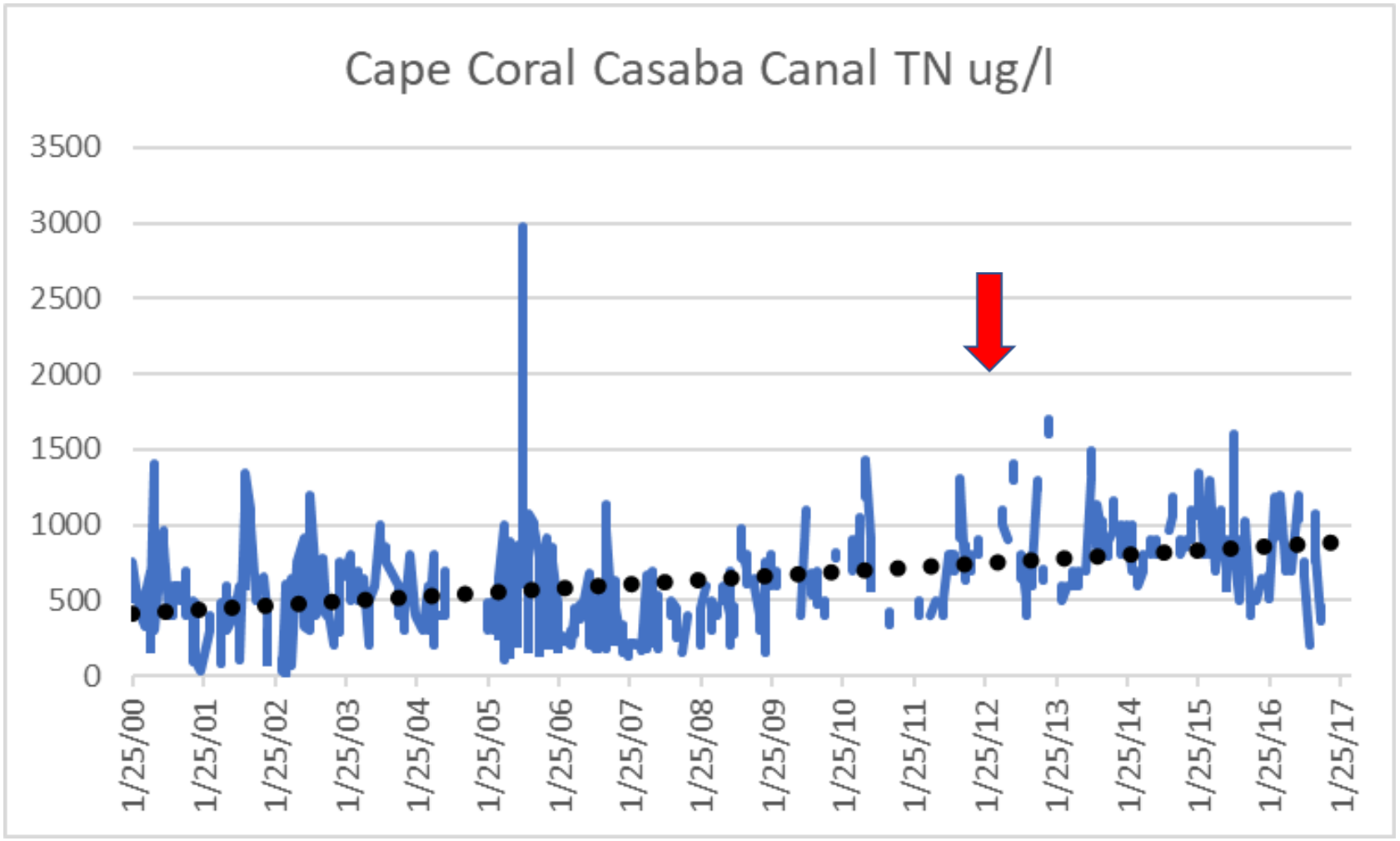
- HAB Task Force
- Better monitoring and prediction
- Public Health Risk Notice
- Stormwater regulations need updating and retrofits may be necessary
- Costs implications are enormous, e.g. public health, property values, tourism

Caloosahatchee Estuary
Basin Management Action Plan

- Adopted in 2012
- Resource TMDL
- Flow measurements terminated in 2013
- No measured loading estimates
- Load allocations based on 2004/2005 land use
- No updated load allocations
- 2018 FDEP Integrated Water Quality Report (59% reduction in TN)


CES10 Caloosahatchee River at Shell Point, TN ug/l
1800
1600
1400
1200
1000
800
600
400
200
0
9/28/06
9/28/07
9/28/08
9/28/09
9/28/10
9/28/11
9/28/12
9/28/13
9/28/14
9/28/15
9/28/16
9/28/17
9/28/18


Total N, Cape CRD 590, ug/l
2500
2000
1500
1000
500
0
1/25/00
1/25/01
1/25/02
1/25/03
1/25/04
1/25/05
1/25/06
1/25/07
1/25/08
1/25/09
1/25/10
1/25/11
1/25/12
1/25/13
1/25/14
1/25/15
1/25/16
1/25/17


Cape Coral Casaba Canal TN ug/l
3500
3000
2500
2000
1500
1000
500
0
1/25/00
1/25/01
1/25/02
1/25/03
1/25/04
1/25/05
1/25/06
1/25/07
1/25/08
1/25/09
1/25/10
1/25/11
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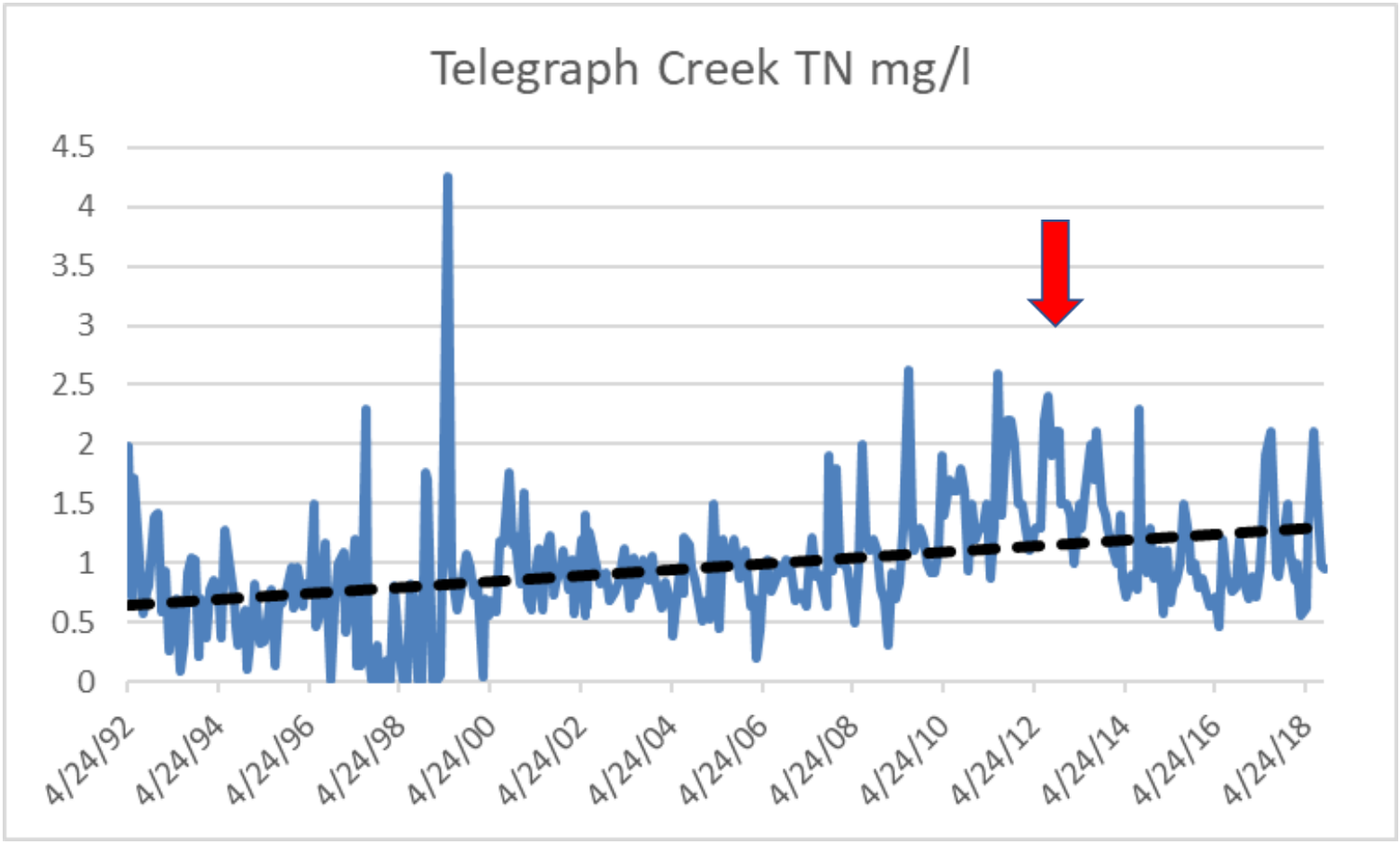
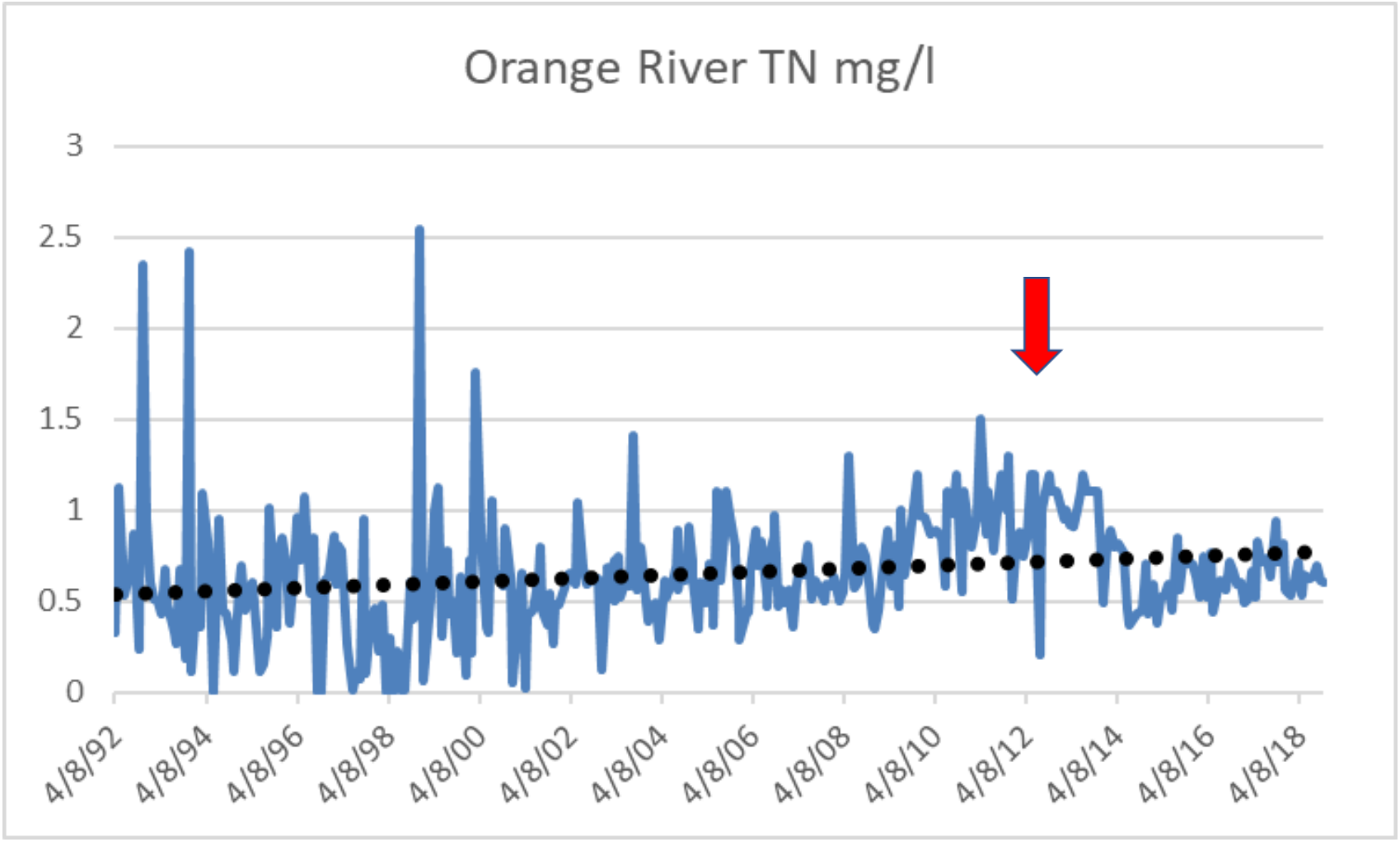
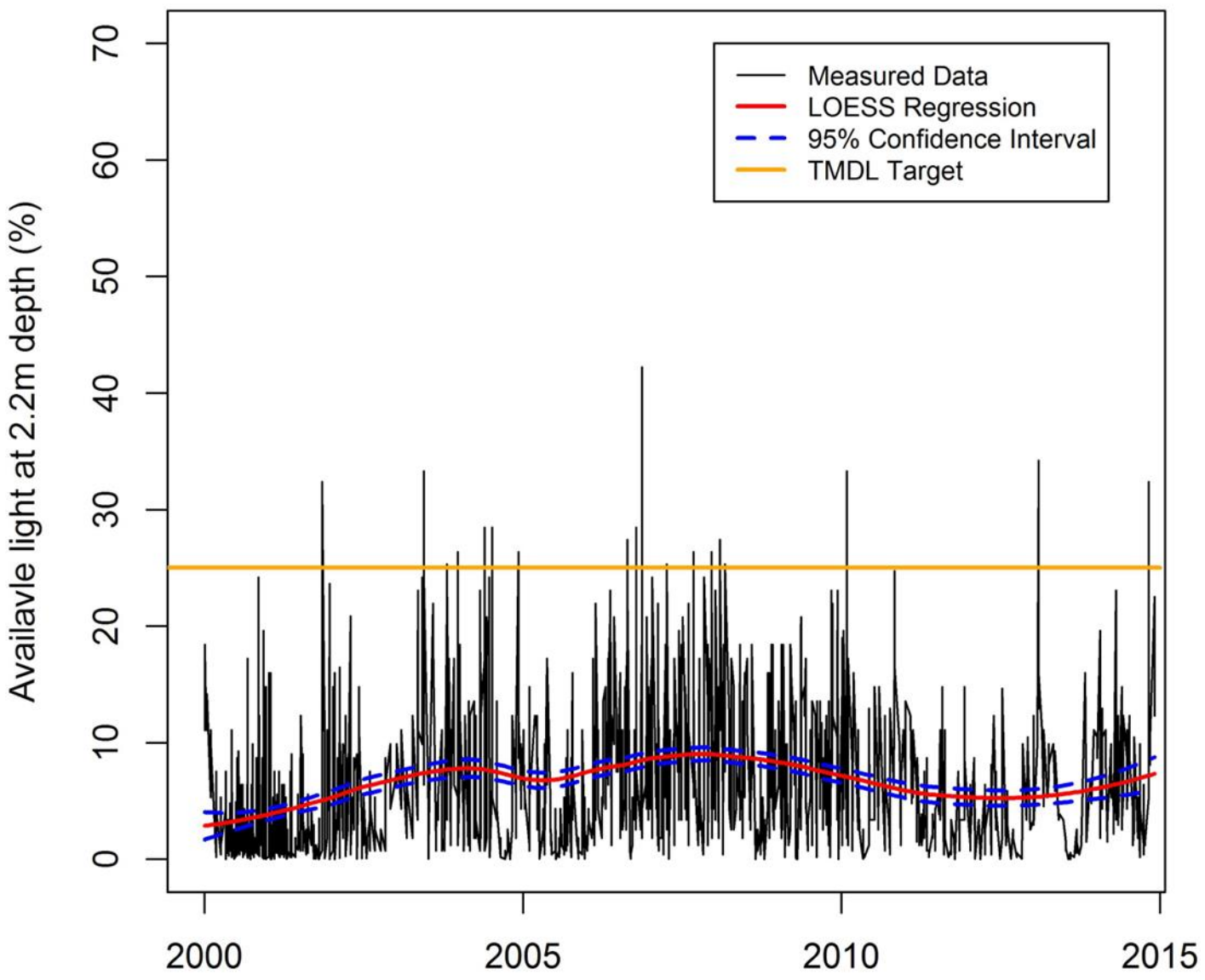
1/25/13
1/25/14
1/25/15
1/25/16
1/25/17


Telegraph Creek TN mg/l
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
4/24/92
4/24/94
4/24/96
4/24/98
4/24/00
4/24/02
4/24/04
4/24/06
4/24/08
4/24/10
4/24/12
4/24/14
4/24/16
4/24/18


Orange River TN mg/l
3
2.5
2
1.5
1
0.5
0
4/8/92
4/8/94
4/8/96
4/8/98
4/8/00
4/8/02
4/8/04
4/8/06
4/8/08
4/8/10
4/8/12
4/8/14
4/8/16
4/8/18


Available light at 2.2m depth in
San Carlos Bay (WBID #2065H) from 2000 to 2014
Availavle light at 2.2m depth (%)
0
10
20
30
40
50
60
70
2000
2005
2010
2015
Measured Data
LOESS Regression
95% Confidence Interval
TMDL Target

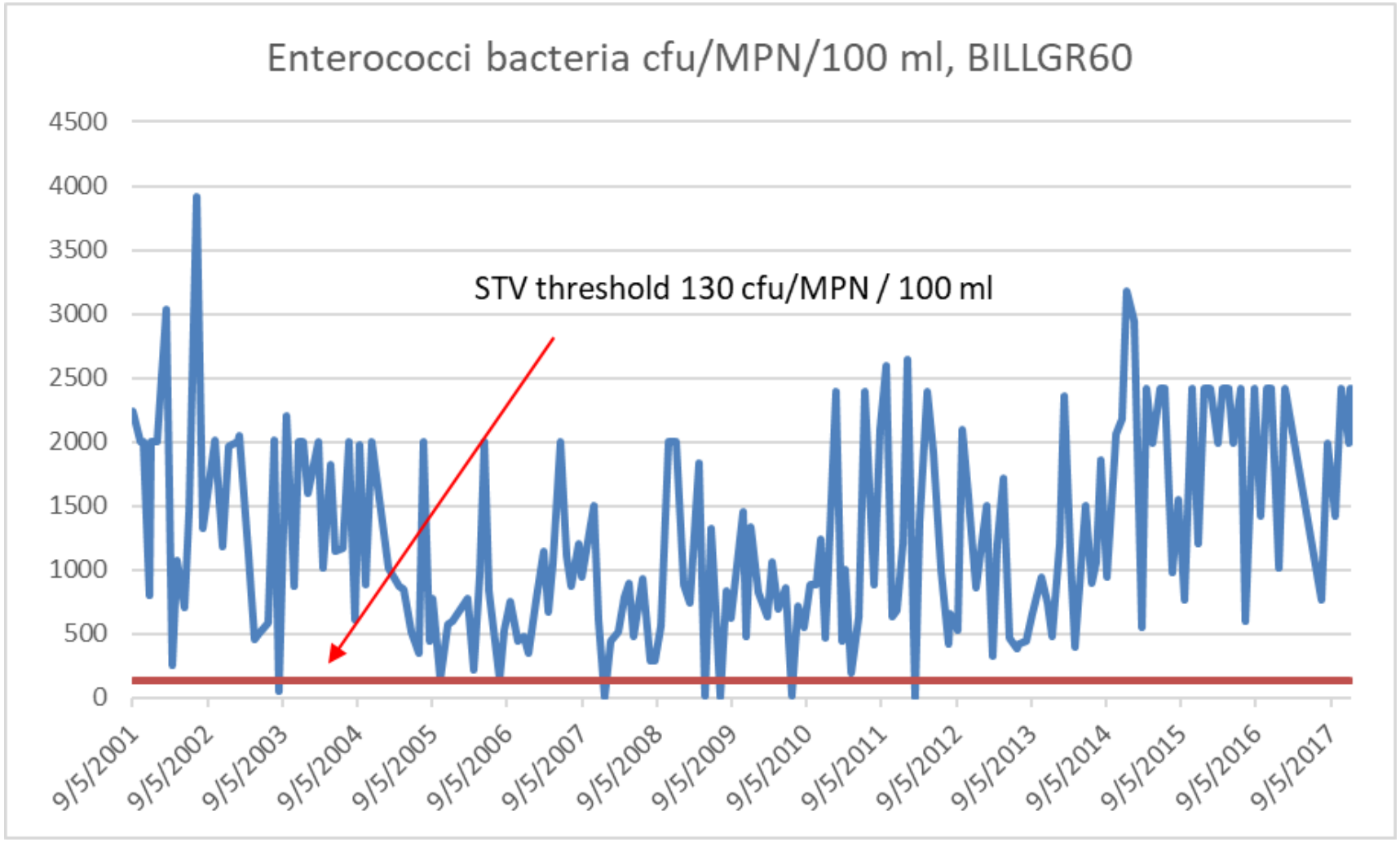
CERP / C-43

- ACOE adopted PIR in 2010 and authorized by Congress in 2014
- State is funding, fed cost share credited
- Water quality treatment component needed for attainment of WQBEL
- Cyanobacteria became dominant in the test cell study
- Supplemental flows from Lake O. may not be available after completion
- Project online in 2024?
- Reservoir is estimated to meet the 400 cfs flow target 97% of time
- 400 cfs will not maintain the salinity envelope defining the MFL
- Restoration is uncertain

Enteric Bacteria Impairments are Widespread

- 46% of OFW WBIDs in 4700 square mile CHNEP project area are impaired for bacteria

- Latest 303d list adds additional WBIDs impaired including Estero Bay Tributaries (OFWs)


Enterococci bacteria cfu/MPN/100 ml, BILLGR60
4500
4000
3500
3000
2500
2000
1500
1000
500
0
STV threshold 130 cfu/MPN / 100 ml
9/5/2001
9/5/2002
9/5/2003
9/5/2004
9/5/2005
9/5/2006
9/5/2007
9/5/2008
9/5/2009
9/5/2010
9/5/2011
9/5/2012
9/5/2013
9/5/2014
9/5/2015
9/5/2016
9/5/2017


1:26 / 1:55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WATERKEEPER®
WATERKEEPER® ALLIANCE
MEMBER
Let's all work for
clean water that is
- swimmable
- drinkable
- fishable