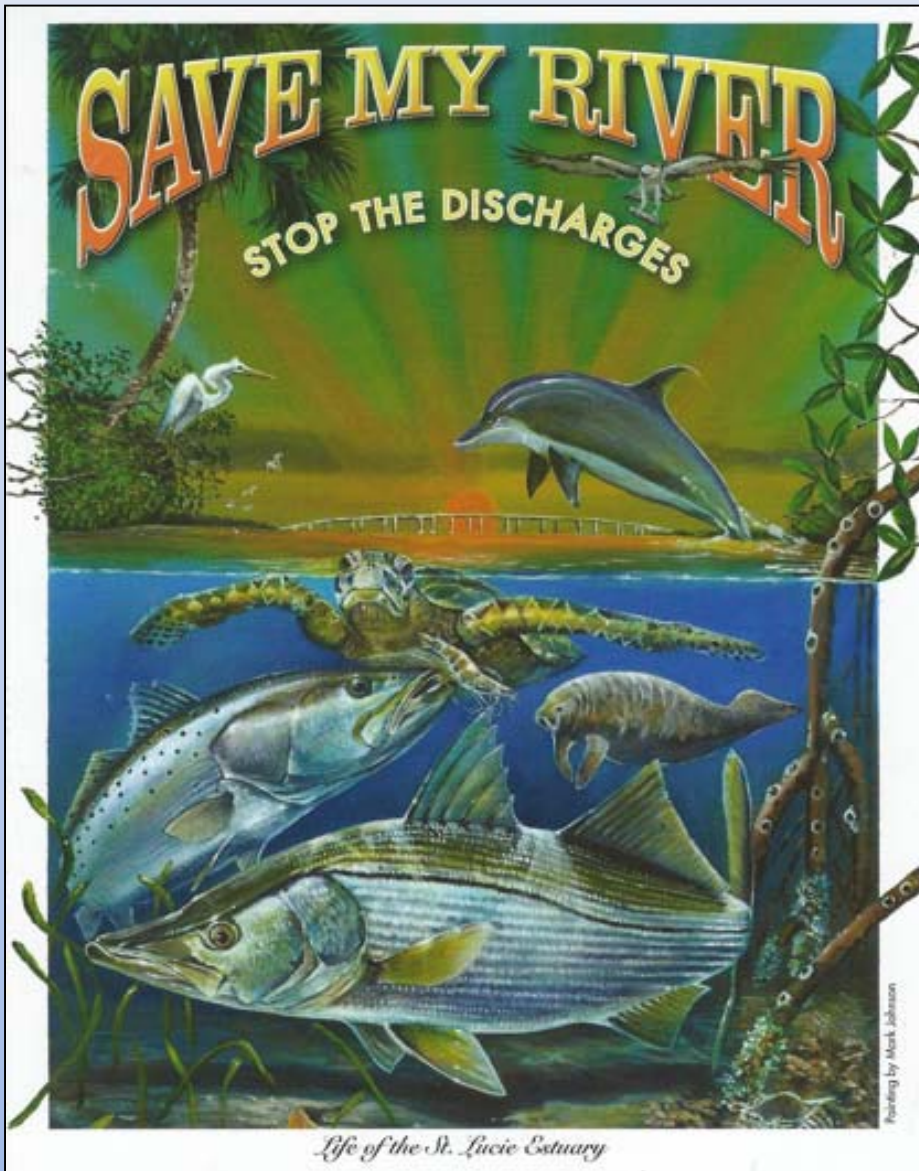




Forum for Discussion of Options to EAA Reservoir/STA Projects

Jay O'Laughlin, Ph.D.

Stuart City Hall | February 21, 2018



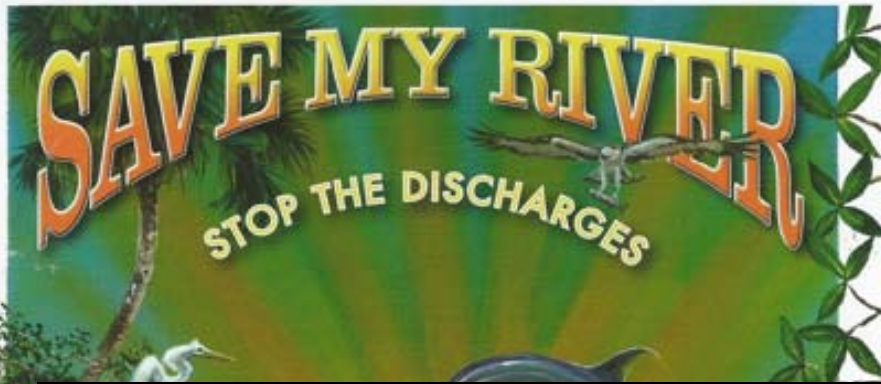
We **MUST** Stop
the Discharges from
LAKE OKEECHOBEE
that **RUIN** the
St. Lucie River **ESTUARY!**

- ✓ Polluted fresh water destroys estuarine life.
- ✓ Oysters & seagrasses are wiped out by large discharges.
- ✓ Fish and birds are killed or driven away.
- ✓ Citizens are exposed to dangerous pathogens.
- ✓ Thousands of tons of goeey muck cover estuary bottom.

BEWARE
The Discharge Horrors are considered certain to return.

HELP NOW!

BC Rivers Coalition
www.riverscoalition.org



We **MUST** Stop
the Discharges from
LAKE OKEECHOBEE
that **RUIN** the
St. Lucie River **ESTUARY!**

- ✓ Polluted fresh water destroys estuarine life.
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OUTLINE

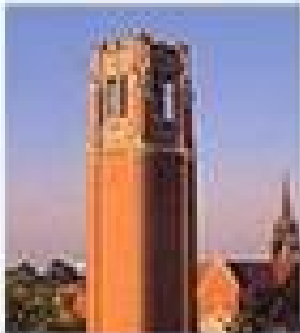
- **Science Findings**
- **Legislative Findings**
- **SFWMD's EAA Reservoir Plan**
- **Reactions to SFWMD Plan**
- **“Outside the Box” Options**
- **Public Health Impacts**

The University of Florida Water Institute



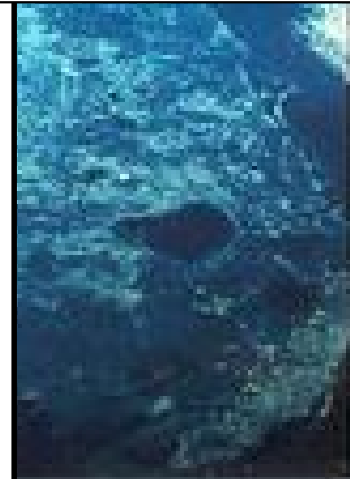
Options to Reduce High Volume Freshwater Flows to the St. Lucie and Caloosahatchee Estuaries and Move More Water from Lake Okeechobee to the Southern Everglades

An Independent Technical Review by the University of Florida Water Institute



March 2015

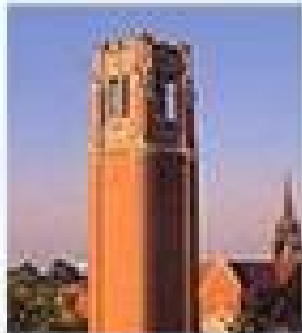
UF | UNIVERSITY of
FLORIDA



The University of Florida Water Institute

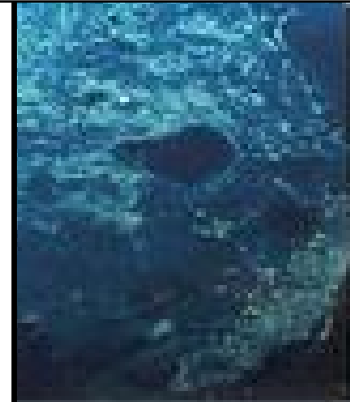


“This report provides a *review of relevant plans, projects* and related technical documents as part of a broader effort to evaluate options *to move more fresh water from Lake Okeechobee to the Everglades.*”



March 2015

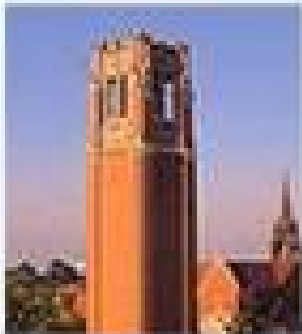
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FLORIDA



The University of Florida Water Institute

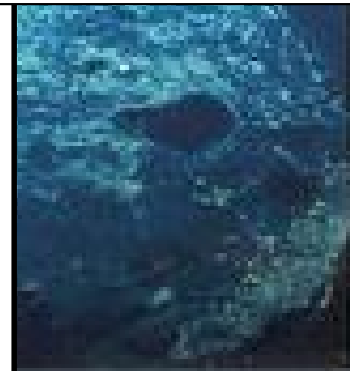


“The *review was stimulated*, in large part, by concern that recent regulatory *releases of fresh water* from Lake Okeechobee to the St. Lucie and Caloosahatchee estuaries have resulted in *substantial negative ecological and economic impacts*.”



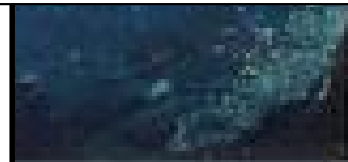
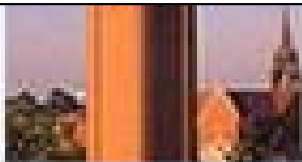
March 2015

UF | UNIVERSITY of
FLORIDA



The University of Florida Water Institute

“... the Technical *Review Team concludes that* relief to the estuaries and the ability to move more water south of Lake Okeechobee can be accomplished using existing technology. *The solution is enormous increases in storage and treatment of water both north and south of the lake.* Existing and currently authorized storage and treatment projects are insufficient to achieve these goals. The path forward *requires significant long-term investment* in the *infrastructure* of the South Florida hydrologic system.



The University of Florida Water Institute

“Achieving substantial reduction in lake-triggered discharges to the estuaries and substantial improvement toward the dry season Everglades demand target will require additional land between the lake and the EPA [Everglades Protection Area], e.g., the current U.S. Sugar land purchase option, lands from other willing sellers, and/or use of existing state-owned land (e.g., Holey Land and Rotenberger Wildlife Management Areas (WMAs)).



March 2015

UF UNIVERSITY of
FLORIDA



It now is known that the natural system was historically much wetter than previously assumed, bringing into question some of the hydrologic goals embedded in the restoration plan. Sea level rise will reduce the footprint of the system, temperature and evaporative water losses are expected to increase, rainfall may become more variable, and more storage would likely be needed to accommodate future changes in the quantity and intensity of runoff. At the same time, over 1 million acre-feet (AF) of the originally envisioned storage has been lost due to design changes, new understanding of project feasibility, and changes to Lake Okeechobee's operating schedule.

PROGRESS TOWARD RESTORING THE EVERGLADES

The Sixth Biennial Review - 2016

OUTLINE



Science Findings



Legislative Findings

Florida Everglades Forever Act 1993

373.4592 Everglades improvement and management.—

(4) Everglades program.

(b) *Everglades water supply and hydroperiod improvement and restoration.*—1. A comprehensive program to revitalize the Everglades shall include programs and projects to improve the water quantity reaching the Everglades Protection Area at optimum times and improve hydroperiod deficiencies in the Everglades ecosystem.

To the greatest extent possible,
wasteful discharges of fresh water
to tide shall be reduced,



Legacy Florida Act 2016

“... requires the Florida Department of Environmental Protection and the SFWMD to "give preference to those Everglades restoration projects that reduce harmful discharges of water from Lake Okeechobee to the St. Lucie or Caloosahatchee estuaries in a timely manner.”



Water Storage Reservoirs Act 2017

“The Legislature declares that an emergency exists regarding the St. Lucie and Caloosahatchee estuaries due to the high-volume freshwater discharges to the east and west of the lake. Such discharges have manifested in widespread algae blooms, public health impacts, and extensive environmental harm to wildlife and the aquatic ecosystem.”



Water Storage Reservoirs Act 2017

“The Legislature finds that increasing water storage is necessary to reduce the high-volume freshwater discharges from the lake to the estuaries and restore the hydrological connection to the Everglades.

CERP projects necessary to reduce the discharges and improve flows to the Everglades should receive priority funding, such as ... the Everglades Agricultural Area reservoir project to the south of the lake.”



Water Storage Reservoirs Act 2017

“... Using the A-2 parcel and the additional land identified pursuant to subsection (4) and without modifying the A-1 parcel, the report must evaluate the optimal configuration of the EAA reservoir project for providing at least 240,000 acre-feet of water storage ... recommendation must include sufficient water quality treatment capacity to meet state and federal water quality standards.”



Water Storage Reservoirs Act 2017

“... The use of eminent domain in the EAA for the purpose of implementing the EAA reservoir project is prohibited. ... If additional land ... is necessary for the EAA reservoir project, the district shall acquire that land from willing sellers of property.”



Water Storage Reservoirs Act 2017

“... The district and the board are authorized to negotiate the amendment or termination of leases on lands within the EAA for exchange or use for the EAA reservoir project. Any such lease must be terminated in accordance with the lease terms or upon the voluntary agreement of the lessor and lessee.”



OUTLINE

- Science Findings
- Legislative Findings
- **SFWMD's EAA Reservoir Plan**



NEWS RELEASE

Feb. 8, 2018

SFWMD Unveils Optimized EAA Storage Reservoir Plan

*Alternative plan reduces harmful discharges to the northern estuaries,
delivers CERP goal for clean water to the Everglades*

- **Sends an annual average of more than approximately 300,000 acre-feet of water south to the Everglades.**



NEWS RELEASE

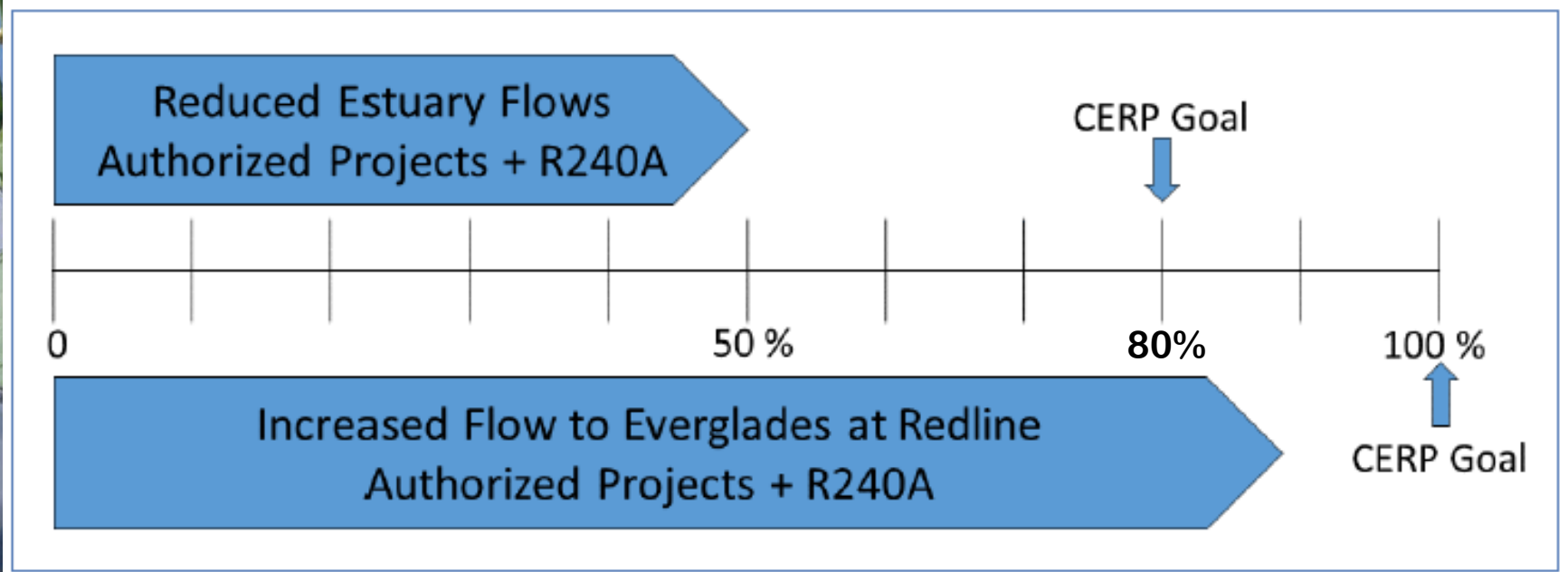
Feb. 8, 2018

SFWMD Unveils Optimized EAA Storage Reservoir Plan

Alternative plan reduces harmful discharges to the northern estuaries, delivers CERP goal for clean water to the Everglades

- Sends an annual average of more than approximately 300,000 acre-feet of water south to the Everglades.
- Achieves a 55 percent reduction in discharge volumes from Lake Okeechobee to the northern estuaries, in conjunction with authorized projects.

Improved Flow Conditions



December 21, 2017

OUTLINE

- Science Findings
- Legislative Findings
- SFWMD's EAA Reservoir Plan
- Reactions to SFWMD Plan
 - Everglades Foundation
 - Community conversation, Jan. 4, 2018, Stuart, FL

December 19, 2017

Mr. Ernie Marks

Executive Director

South Florida Water Management District



... The Foundation would like to offer an alternative concept for the project that is responsive to the concerns that have been raised at public meetings. We propose:

- A 240,000 acre-foot reservoir on 17,000 acres with a water depth of 14 feet; and
- A stormwater treatment area on 13,000 acres to treat new flow, leaving Restoration Strategies [A-1 FEB] untouched.

The above concept is predicated on moving approximately 340,000 acre-feet of new flow to the Everglades on an average annual basis. This is in keeping with the letter and spirit of SB10, which is to present a plan that maximizes benefits to the estuaries, Lake Okeechobee, the Everglades, and Florida Bay. ...

February 7, 2018

Water district board to consider final reservoir plan this week

The plan is due by March 30, the last day of the year's legislative session.

[The proposed project] configurations don't do enough to treat water before it is sent south, according to Everglades Foundation ecologist Tom Van Lent. . . . [He] summarized the push to optimize the reservoir as a balance between increased flow and satisfactory treatment of pollutants. . . . He said, "The flows they are proposing look very positive for then Everglades and Florida Bay, but we have a concern about the water quality. We're trying to find a way that does both."

<https://keysnews.com/article/story/water-district-board-to-consider-final-reservoir-plan-this-week/>



Put simply, more STA = more water that can be re-directed back to the Everglades and less discharges from Lake Okeechobee to the Caloosahatchee and St. Lucie estuaries.



An Analysis of the Proposed
EAA Reservoir Options

Prepared by
The Science Staff at The Everglades Foundation

**Sen. Joe Negron | Jan. 4, 2018
TCPalm “pop-up” community
conversation on the EAA
Reservoir project, Stuart, FL**



“Outside the Box”¹ Options for the EAA Reservoir/STA Project

Florida Senate President Joe Negron said he wanted “state engineers to think *outside the box* and outside the ‘footprint’ they’re considering for a reservoir south of Lake Okeechobee” (interview in *TCPalm*, December 14, 2017, emphasis added).

As yet South Florida Water Management District (SFWMD) engineers have not done so.

“Outside the Box”¹ Options for the EAA Reservoir/STA Project

by

Jay O’Laughlin, Ph.D.²

and

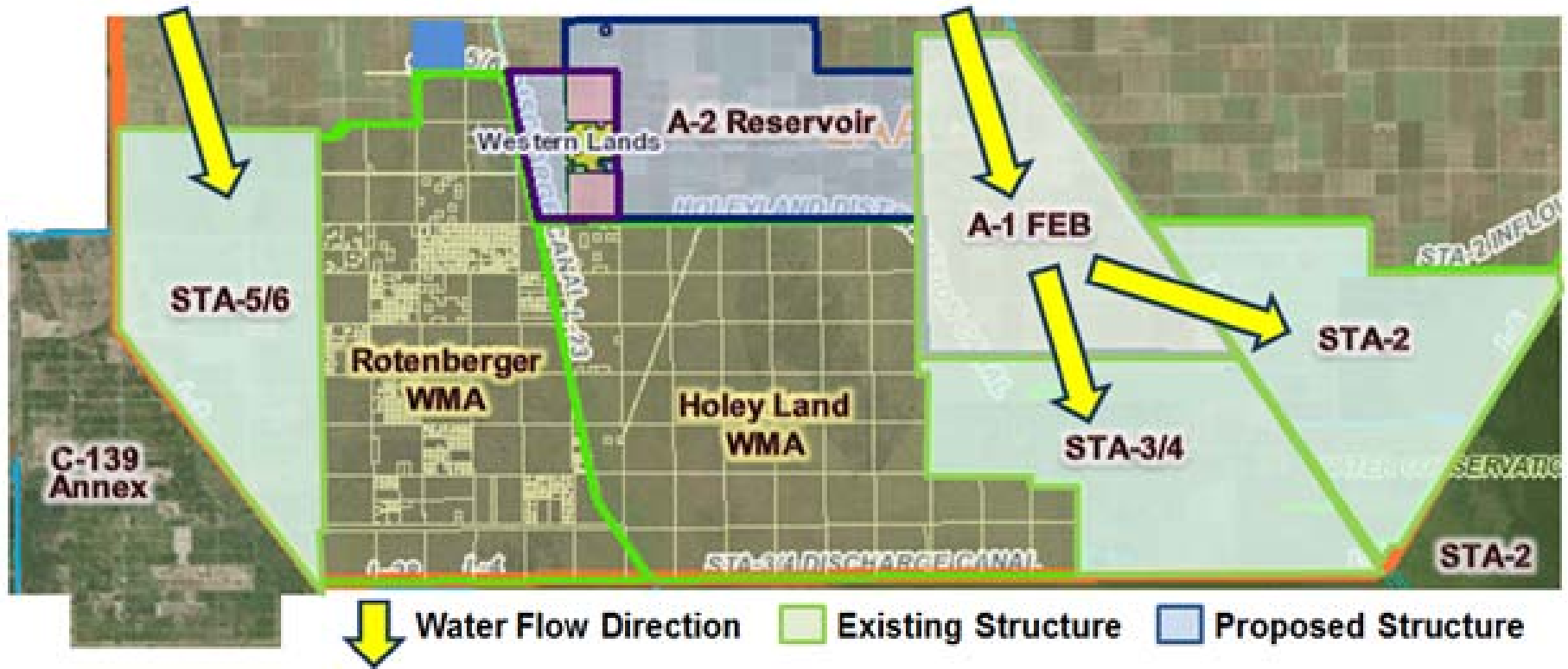
Joseph L. Gilio^{3, 4}

January 22, 2018

(revised from January 4, 2018)

Everglades Agricultural Area (EAA) Reservoir Project Area

“The Box” = A-2 Reservoir + A-1 FEB



FEB = Flow Equalization Basin
STA = Stormwater Treatment Area
WMA = Wildlife Management Area

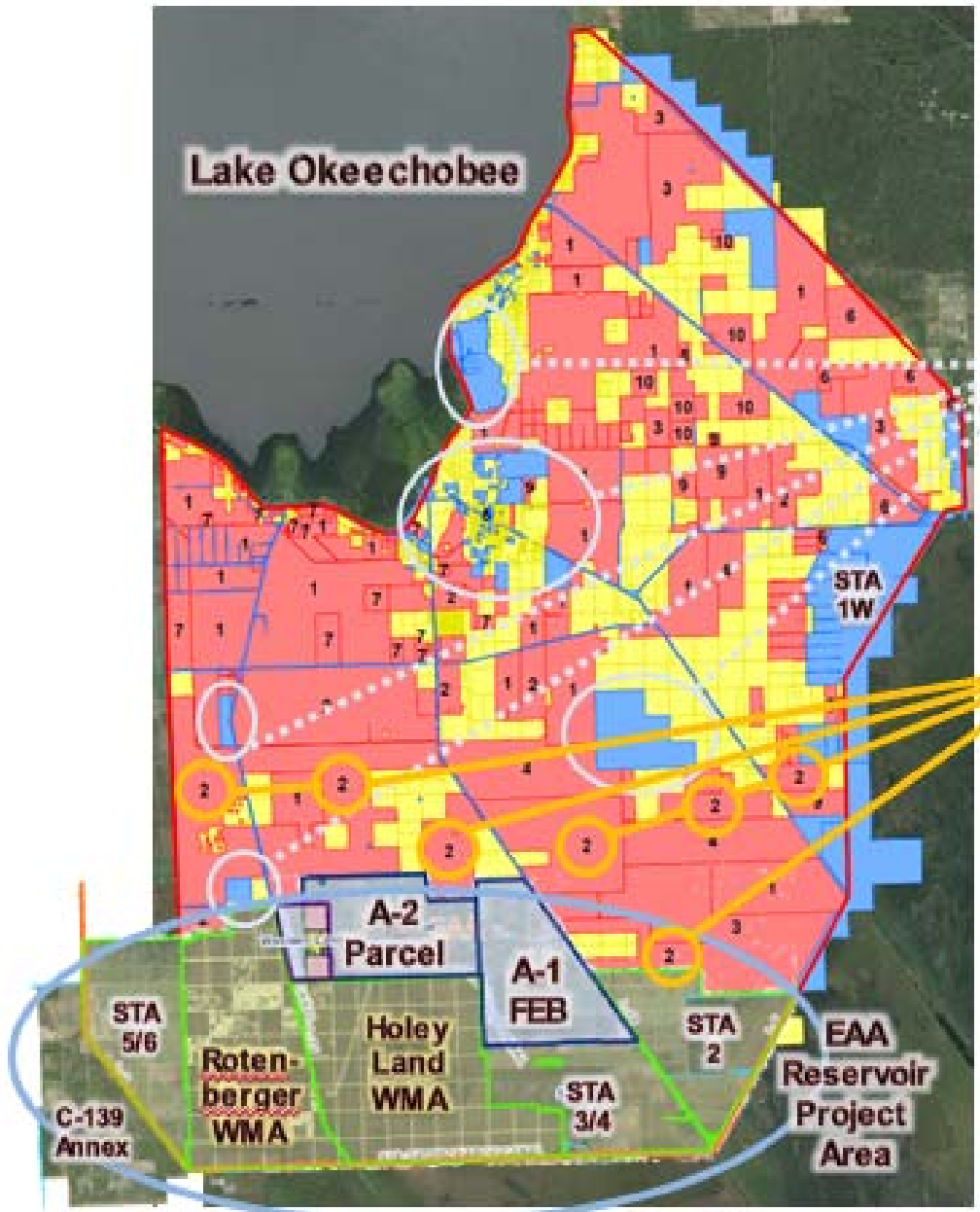
Everglades Agricultural Area

Land Ownership

- Public Ownership
- Private Ownership
- Major Private Ownership (by acreage owned)

- 1, U S SUGAR CORP (115,574)
- 2, OKEELANTA CORP (76,009) *
- 3, NEW HOPE SUGAR CO (33,970)
- 4, KING RANCH INC (19,744)
- 5, WEDGEWORTH FARMS INC (9,901)
- 6, STOFIN CO INC (7,305)
- 7, SBG FARMS INC (6,470)
- 8, CLOSTER FARMS (6,366)
- 9, SUGAR CANE GROWERS (5,710)
- 10, NEW FARM INC (5,683)

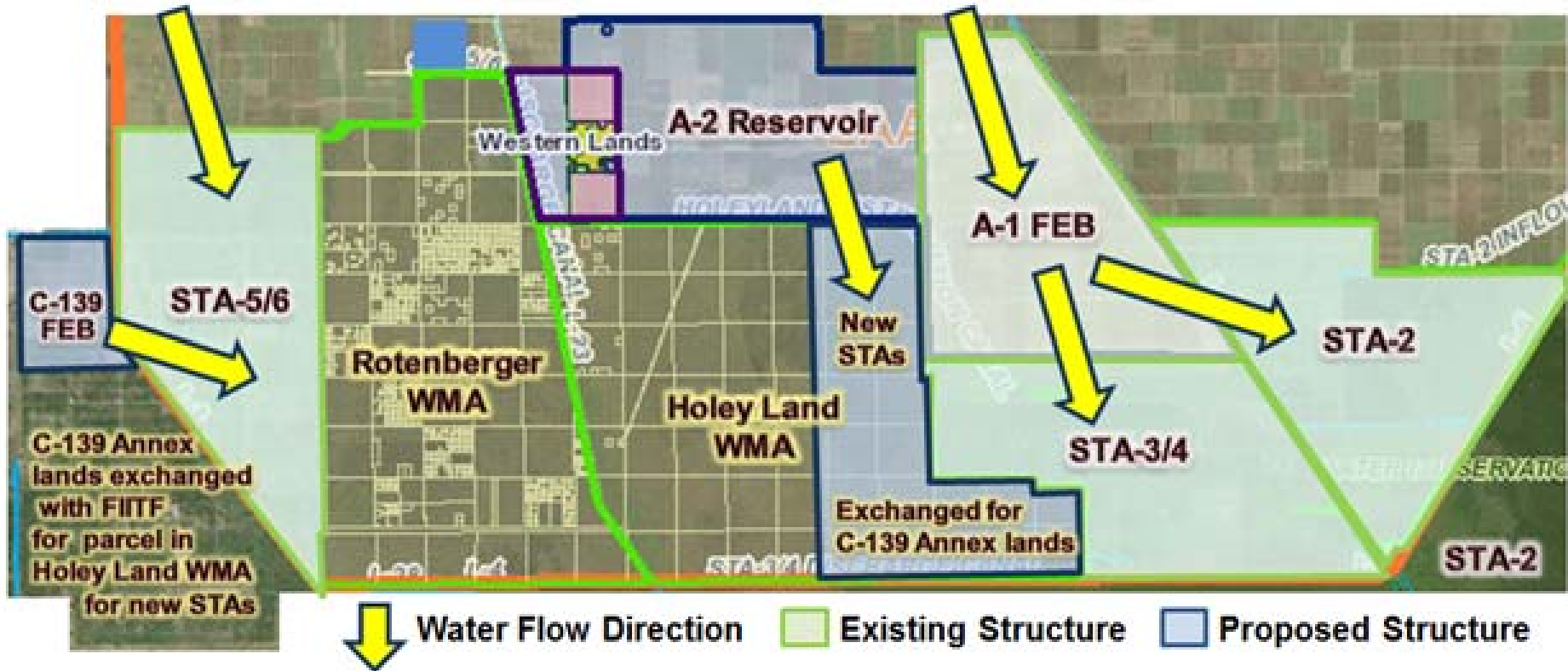
* Subsidiary of Florida Crystals Corp.



Ownership information from Treasure Coast Regional Planning Commission
http://www.tcrpc.org/departments/MapGallery/2016/1604a_EAA_Private.pdf

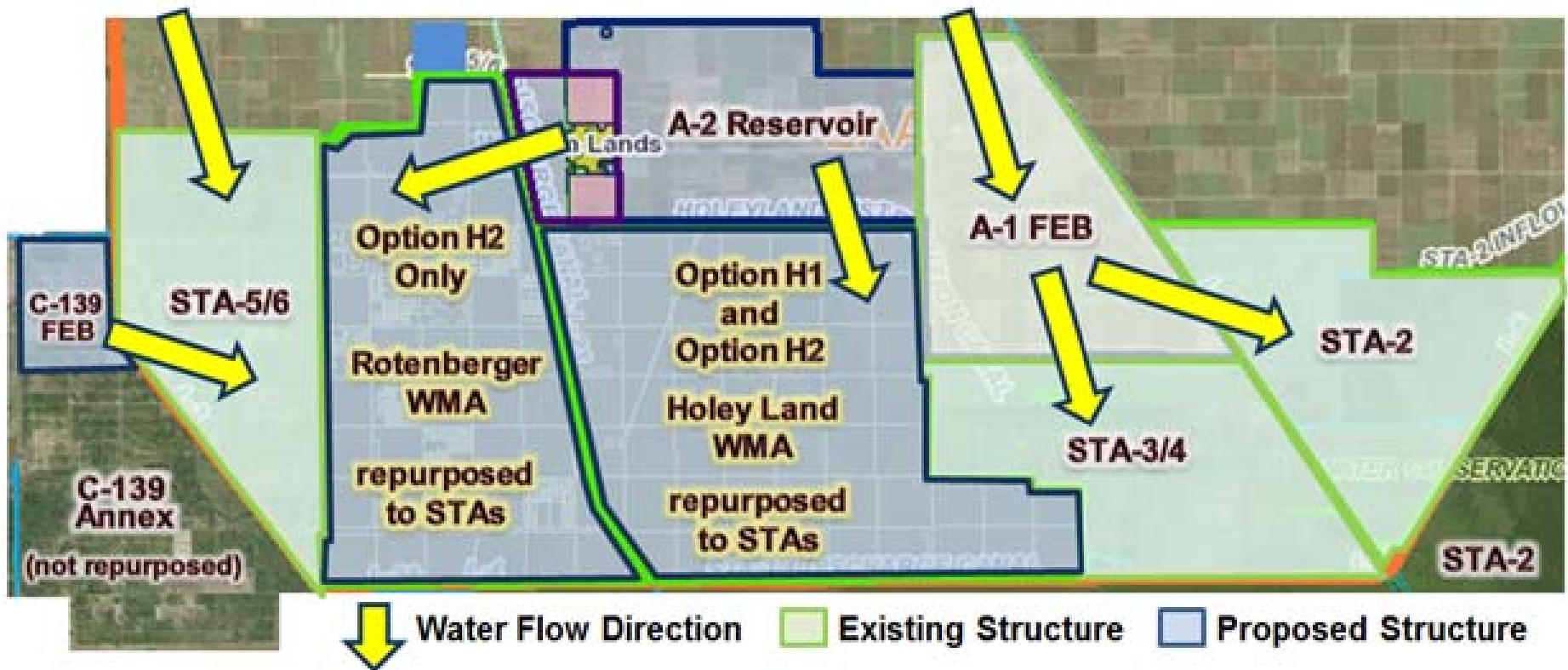
Everglades Foundation Option

- ❑ Use 17,000 acres for reservoir
- ❑ Acquire additional 13,000 acres for STAs



Possibility for unidentified STA footprint: Exchanging 13,000 acres of C-139 Annex lands for easternmost portion of Holey Land WMA for STAs

Hybrid Options R240 H1 and H2 Repurposing Rotenberger and Holey Land Wildlife Management Areas (WMAs)



ASSUMPTIONS

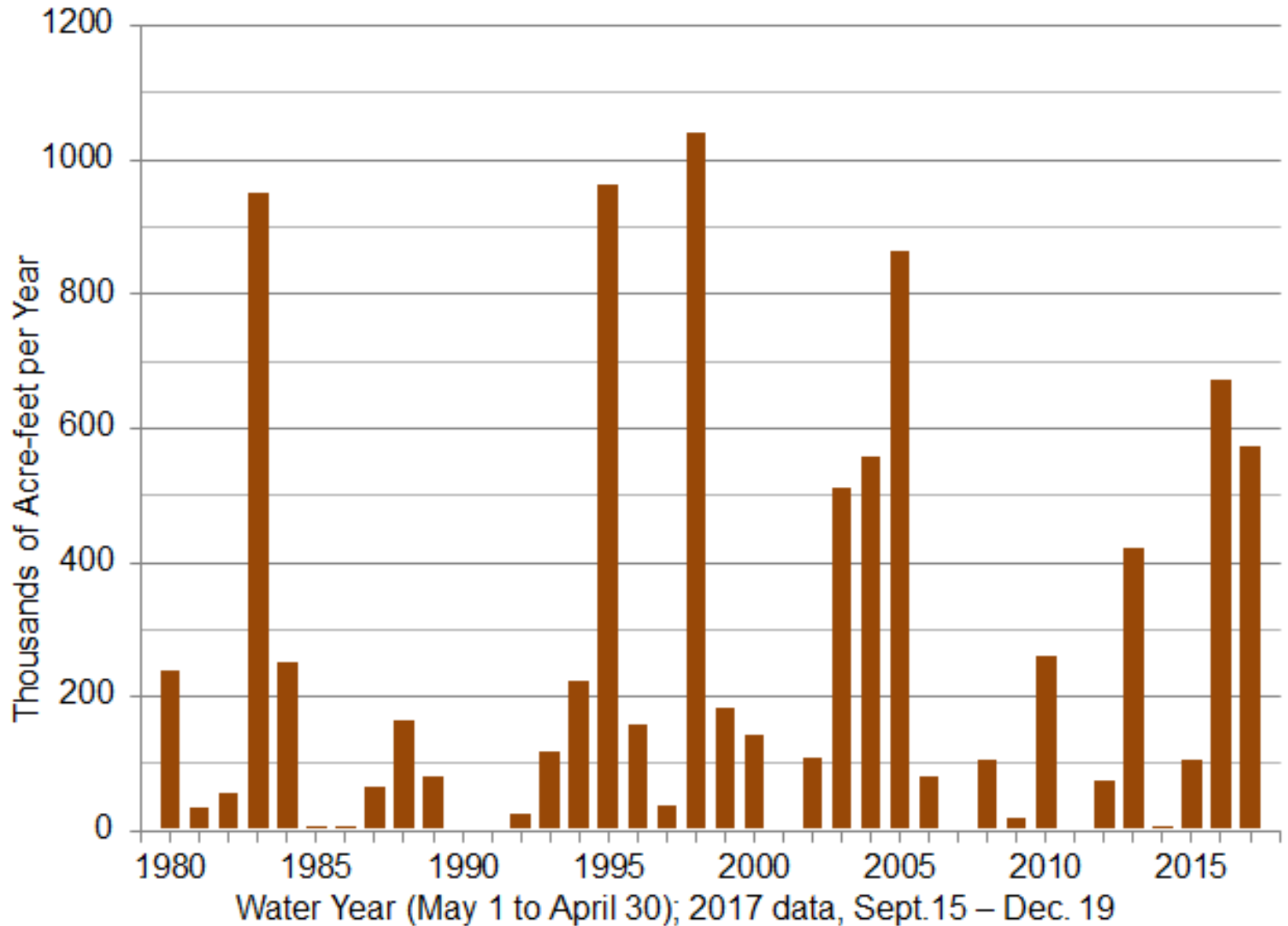
We make several assumptions in this analysis.

- STAs will be filled throughout the year at the depths we specify.
- The Everglades Protection Area can receive all water flowing out of the EAA STAs that meets water quality standards.
- Extending the duration of time water is retained in the STA may increase the uptake of phosphorus by vegetation and sediment in the STA (Chen et al. 2015).

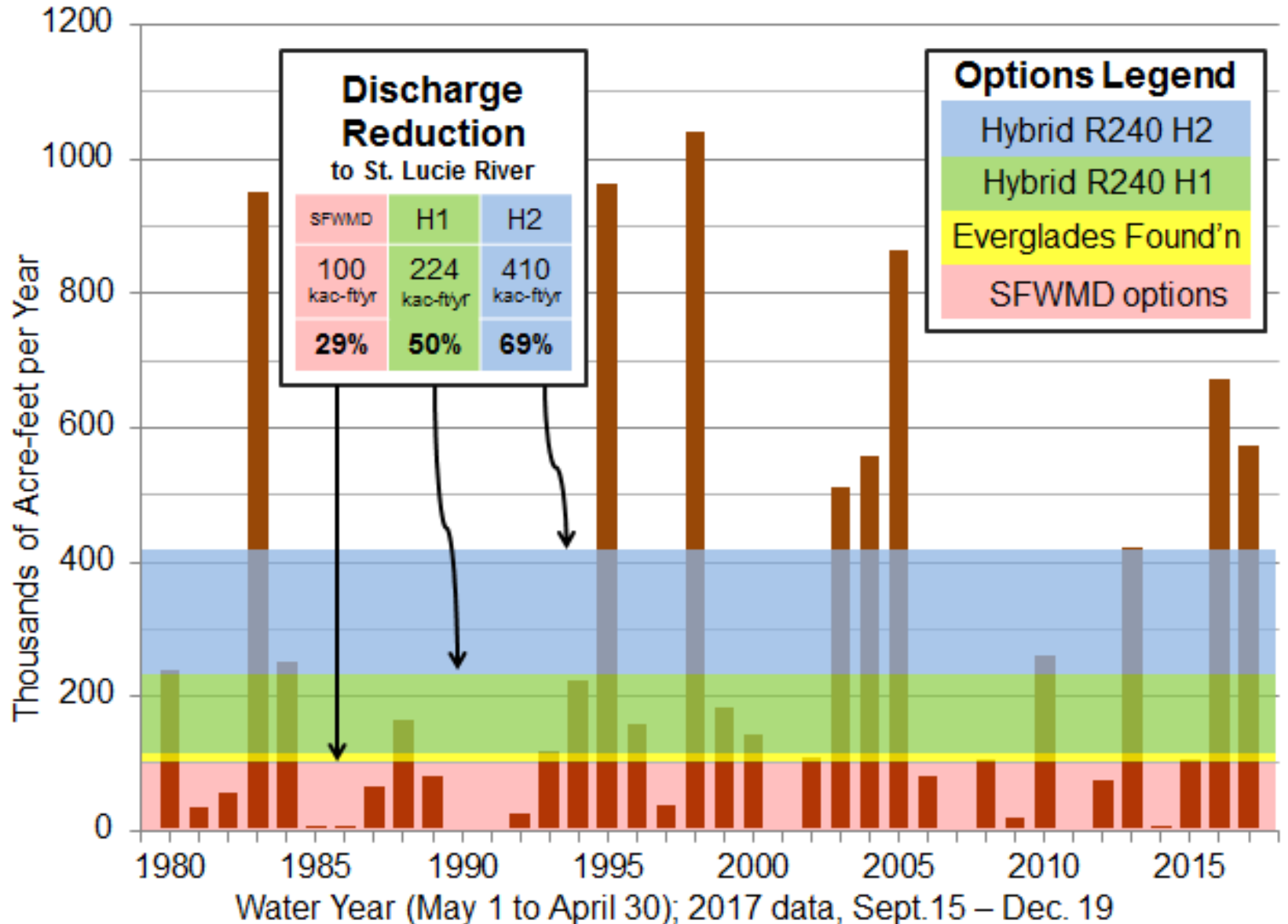
Summary: Flow Improvement by EAA Reservoir Option

Reservoir Features				STA		Project Analysis			
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Option Identifier	Nominal Storage Capacity (ac-ft.)	Acres	Depth (ft.)	Acres	Nominal Capacity at 1.5 ft depth (ac-ft)	Total Acres	Flow Through		Reserv'r Effective Annual Capacity (ac-ft/yr) ³
							STA ¹ (days)	Reserv-voir ² (cycles per year)	
SFWMD R240A	240,000	10,100	23	6,500	9,750	16,600	12	1.25	300,000
Everglades Found'n	240,000	17,000	14	13,000	19,500	30,000	21	1.42	340,000
Hybrid R240 H1	240,000	17,000	14	35,000	52,500	52,000	28	2.85	684,000
Hybrid R240 H2	240,000	17,000	14	64,000	96,000	81,000	28	5.21	1.25 mm
					at 4 ft depth				
SFWMD R240A	240,000	10,100	23	6,500	26,000	16,600	32	1.25	300,000
Everglades Found'n	240,000	17,000	14	13,000	52,000	30,000	56	1.42	340,000
Hybrid R240 H1	240,000	17,000	14	35,000	140,000	52,000	76	2.80	672,000
Hybrid R240 H2	240,000	17,000	14	64,000	256,000	81,000	76	5.12	1.23 mm

Discharges of Excess Lake Okeechobee Water to St. Lucie River, 1980-2017



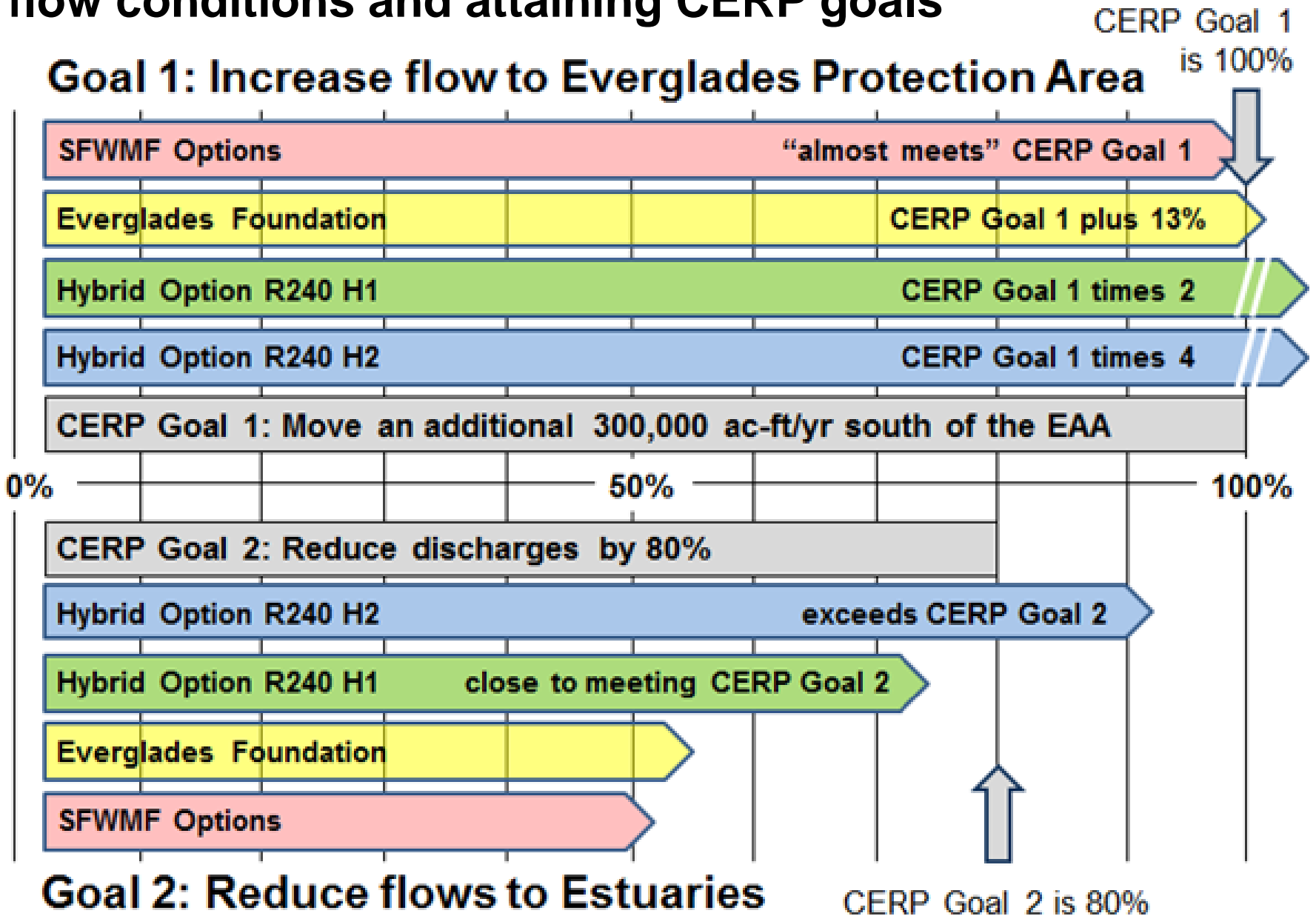
Reduction in Discharges to St. Lucie River by EAA Reservoir Options, 1980-2017



Summary: Discharge Reduction by EAA Reservoir Option

Option Name	Reservoir Area (acres)	Storm Water Treatment Areas (STAs) (acres)	Reservoir Flow Through Cycles per Year	Effective Annual Reservoir Capacity (acre-feet/yr)	Avg. Annual Reduction in Lake O Discharges to St. Lucie (acre-feet/yr)	Actual Reduction in Lake O Discharges, 1980-2017 (percent)
(at 1.5 foot STA depth)						
SFWMD R240A	10,100	6,500	1.25	300,000	100,000	29%
Everglades Found'n	17,000	13,000	1.42	340,000	113,333	32%
Hybrid R240 H1	17,000	35,000	2.80	672,000	228,000	51%
Hybrid R240 H2	17,000	64,000	5.20	1.2 million	410,000	69%
(at 4 foot STA depth)						
SFWMD R240A	10,100	6,500	1.25	300,000	100,000	29%
Everglades Found'n	17,000	13,000	1.42	340,000	113,333	32%
Hybrid R240 H1	17,000	35,000	2.50	672,000	224,000	50%
Hybrid R240 H2	17,000	64,000	5.33	1.3 million	417,000	69%

Performance of EAA Reservoir options for improving flow conditions and attaining CERP goals



Don't do half-baked job on Everglades reservoir | Our view (editorial board)

... proposals drafted by the South Florida Water Management District would provide some relief to our region during wet years, cutting discharges from Lake Okeechobee — water sometimes laden with blue-green algae that proliferates into toxic blooms downstream — by more than 50 percent.

That's not nothing. But for a region too often choked by those toxic algae blooms, it simply isn't enough.

February 2, 2018

Don't do half-baked job on Everglades reservoir | Our view (editorial board)

...With all due respect to the South Florida Water Management District, 'good' simply isn't good enough. Half the discharges still harm our environment; half the algae still harms our businesses and our people. This is an historic opportunity. Let's not get it half-right."

<https://www.tcpalm.com/story/opinion/editorials/2018/02/02/dont-do-half-baked-job-everglades-reservoir-our-view/1082534001/>

OUTLINE

- Science Findings
- Legislative Findings
- SFWMD's EAA Reservoir Plan
- Reactions to SFWMD Plan
- **“Outside the Box” Options**
 - Guardians of Martin County
Position Statement
 - Reactions to Using WMAs

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The South Florida Water Management District's (SFWMD) preferred alternative for the Everglades Agricultural Area (EAA) Reservoir project to be sub-optimal and insufficient to ensure survival of the Indian River Lagoon.

The SFWMD estimates that its preferred alternative (C240A) will reduce discharge volumes by 55% when all approved projects have been constructed.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The project needs to be redesigned so that the Comprehensive Everglades Restoration Plan (CERP) goal of reducing by 80% the discharges of excess Lake Okeechobee water to the St. Lucie and Caloosahatchee estuaries can be attained.

The Guardians continue to strongly support the construction of a water storage reservoir in the EAA, but it must have adequate areas for water quality treatment before water can be sent south of the EAA.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

Every gallon of water sent south is a gallon that is not discharged into the northern estuaries.

More than 35,000 acres of additional land is needed to meet the CERP discharge goal.

There is an adequate amount of land owned by the state in the vicinity of the reservoir project area to do that. But because these lands are designated as wildlife management areas, Florida's executive agencies have thus far been reluctant to consider repurposing these lands.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions:

- Construct a reservoir with a storage capacity of 240,000 acre-feet on the 17,000 acre A-2 parcel, as per the SFWMD's Option C240A.
- Use all 17,000 acres of the A-2 parcel for a reservoir with 14-foot walls to reach the water storage goal (this is what the Everglades Foundation has proposed).
- Begin construction of the A-2 Reservoir as soon as possible.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions [continued]:

- Repurpose the Holey Land Wildlife Management Area (35,000 acres) as a stormwater treatment area (STA), which by itself would reduce discharge volumes by 50%;
- adding the Rotenberger WMA (29,000 acres) would reduce discharges by 69%;

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions [continued]:

- adding the discharge reductions from other authorized projects, as the SFWMD does, would add another 26% to reduce discharge volumes, for total reductions of 76% if only the Holey Land WMA is repurposed, or 95% if Holey Land and Rotenberger WMAs are repurposed.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions [continued]:

- Identify in the very near future lands within the South Florida Water Management District that could be acquired with Land Acquisition Trust Fund ("Amendment One" of 2014) monies and added to the state's WMA inventory.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



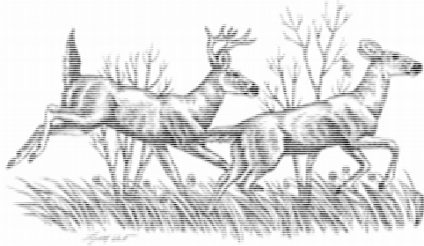
Position Statement of the Guardians of Martin County — February 14, 2018

The Guardian

- Identify in Florida Water acquired by ("Amendment state's WM



Allapattah Flats
Wildlife Management Area

Regulations Summary and Area Map
July 1, 2017 - June 30, 2018



A cooperative public wildlife and recreational area

South Florida Water Management
District
Martin County



MyFWC.com
Discover #WMAzing places at MyFWC.com/wma75

Following actions [continued]:

are lands within the South District that could be position Trust Fund monies and added to the

>50 deer/yr.
>80 hogs/yr.
12 turkeys/yr.



EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions [continued]:

- If repurposing the Holey Land and Rotenberger wildlife management areas (WMAs) is infeasible, then amend the Water Storage Reservoirs Law of 2017 (a.k.a. SB10, now Florida Statutes 373.4598) so that private lands in the vicinity of the reservoir site could be acquired by eminent domain.

EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges



Position Statement of the Guardians of Martin County — February 14, 2018

The Guardians support the following actions [continued]:

- Recognize that it will take time, money, and political will to identify adequate water quality treatment areas; meanwhile, start building the A-2 Reservoir portion of the project.

Time to talk about third rail of Everglades restoration | Guest column

Jay O'Laughlin Published 10:27 a.m. ET Jan. 30, 2018



(Photo: CONTRIBUTED PHOTO BY JAY O'LAUGHLIN)

Unless the South Florida Water Management District includes considerably more land for water quality treatment areas in its design for the Everglades Agricultural Area Reservoir south of Lake Okeechobee, the harmful and wasteful discharges of excess lake water to the St. Lucie and Caloosahatchee estuaries will continue.

The law mandating this project says the district cannot condemn private land, but can terminate leases on state-owned lands and trade them.

Private lands, however, are unnecessary because the state already owns two wildlife management areas ideally situated at the southern edge of the Everglades Agricultural Area. They could be repurposed to store and treat enough water to eliminate almost all of the discharges. Construction costs would be relatively small because the Rotenberger (29,000 acres) and Holey Land (35,000 acres) wildlife management areas are bordered by levees and abut the lands the law identifies as potential reservoir sites.

<https://www.tcpalm.com/story/opinion/contributors/2018/01/30/time-talk-third-rail-everglades-restoration-guest-column/1074603001/>

January 30, 2018

Office of Governor Rick Scott
Tallahassee, FL 32399-0001

Subject: EAA Reservoir Project

Dear Governor Scott:

I am among those who believe that neither of the two EAA Reservoir project footprints proposed by the South Florida Water Management District (SFWMD) comes close to being the “optimal configuration” called for in SB10. At 50% and 54%, they both fall short of the Comprehensive Everglades Restoration Plan (CERP) goal of reducing by 80% the discharges of excess Lake Okeechobee water to the “northern estuaries” (i.e., St. Lucie and Caloosahatchee).

Letter to Gov. Rick Scott, Jan. 30, 2018, continued

If additional lands were used as water quality treatment areas, more water could be sent south out of the EAA and the reservoir could be emptied and refilled several times during the year. This would help ensure taxpayers are getting their money's worth from this project.

Additional land, of course, has been the sticking point all along. Good news: the project footprint can be expanded substantially by repurposing the state-owned wildlife management areas in the vicinity of the reservoir site. These lands (Rotenberger and Holey Land WMAs) are owned by the Internal Improvement Trust Fund. The Board of Trustees (you and your cabinet) “has a duty to hold lands in trust for the use and benefit of the people of the state” (Florida Statutes 253.001).

/s/ Jay O’Laughlin, Ph.D.

February 2, 2018

Uncooperative Florida Crystals holds key to Lake Okeechobee reservoir expansion

Several environmental groups have criticized the plans, saying the project needs to stretch out onto more land to be effective. The proposed project site is bordered ... to the south by the Holey Land Wildlife Management Area and a stormwater treatment area.

The only way to expand the project without crossing a major canal or interlope on public land already in use is to go north. And most of the land north of the site is owned by Okeelanta Corp., a subsidiary of Florida Crystals.



February 2, 2018



[Replying to a comment posted by Gayla]: This is a lot simpler than you are making it out to be. We build reservoirs all over the planet. We clean polluted water — and are doing it as we speak out in the EAA with a number of STAs that are performing better than expected (thanks to the taxpayers!).

And we are telling you that if this is NOT done in the EAA, they will be gunning for Holey Land and Rotenberger. They're already laying the groundwork for that move. We are fighting to save the Everglades. If you think for one split second we would advocate sending filth and poison into it, you don't know us

Saving the Everglades shouldn't mean disrupting our wildlife areas | Guest column

Martha Musgrove Published 2:51 p.m. ET Feb. 12, 2018



(Photo: CONTRIBUTED PHOTO FROM MARTHA MUSGROVE)

Get involved in Florida politics, and it's not hard to find electrified "third rails." Yet never in my wildest imagination would I have predicted two of South Florida's outdoor-recreational areas — the 35,000-acre Holey Land and the 29,000-acre Rotenberger Wildlife Management Areas — would be declared the "third rails" of Everglades Restoration (["Time to talk about third rail of Everglades restoration."](#) [\(/story/opinion/contributors/2018/01/30/time-talk-third-rail-everglades-restoration-guest-column/1074603001/\)](#) TCPalm Jan. 30).

Floridians voted back in the 1970s to tax themselves to buy the Holey Land and Rotenberger lands. Housing developments and the urban population were rapidly spreading westward from South Florida, spurring widespread concern that we were just one more developer and drainage project away from losing all contact with the watery wilderness of the Everglades. If we didn't act, we could be left with no place to boat, fish, hunt, camp, try out new cameras or just sit quietly and "watch birds."

We weren't prescient, we were defensive. This land is our land, right?

OUTLINE

- Science Findings
- Legislative Findings
- SFWMD's EAA Reservoir Plan
- Reactions to SFWMD Plan
- "Outside the Box" Options
- **Public Health Impacts**

Water Storage Reservoirs Act 2017

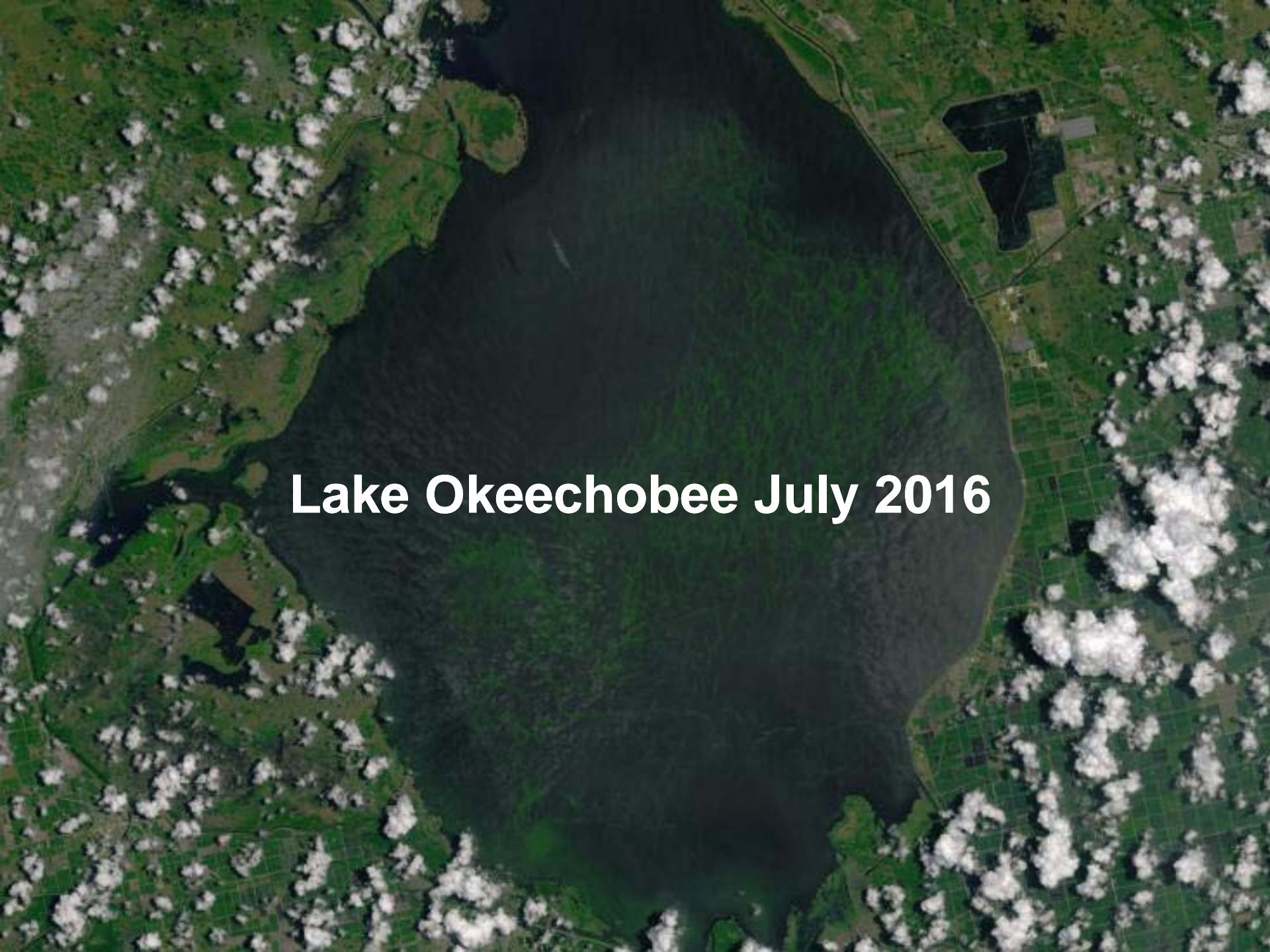
“The Legislature declares that an emergency exists regarding the St. Lucie and Caloosahatchee estuaries due to the high-volume freshwater discharges to the east and west of the lake. Such discharges have manifested in widespread algae blooms, **public health impacts**, and extensive environmental harm to wildlife and the aquatic ecosystem.

REPEAT

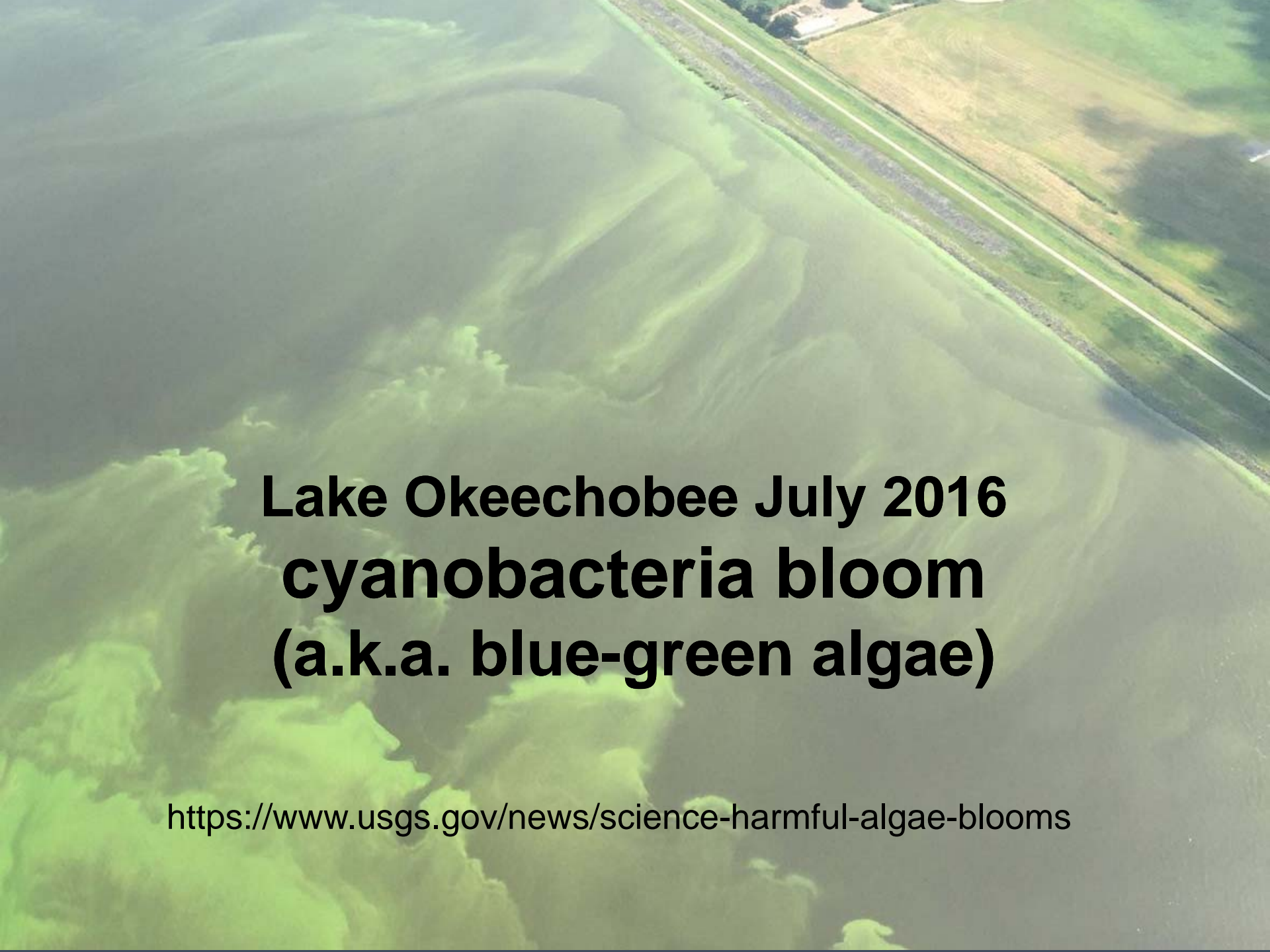


Environmental Problems

- **Lake O polluted — nutrients and sediment**
- **Lake O discharges in summer include algae**

An aerial satellite photograph of Lake Okeechobee, a large, dark green body of water. The lake is surrounded by a dense forest of green trees, with many white clouds scattered across the landscape. In the upper right quadrant, there is a distinct, dark, irregularly shaped area that appears to be a wetland or a small reservoir. The overall scene is a natural, undisturbed landscape.

Lake Okeechobee July 2016



**Lake Okeechobee July 2016
cyanobacteria bloom
(a.k.a. blue-green algae)**

<https://www.usgs.gov/news/science-harmful-algae-blooms>



ALGAE CRISIS

**ALGAE
CRISIS**

**ALGAE FEARS BLOOMING AFTER DISCHARGES INCREASED
MARTIN COUNTY**



7:04 76°

“This shows the flow from the lake to the St. Lucie Lock to the St. Lucie River. THIS CAN'T BE GOOD!”



Johann Hoffend @Chopper5WPTV 21 Jun 2016
pic.twitter.com/GxhnD2pRZ7

Harmful Algal Blooms (HABs)

- occur when colonies of algae—simple plants that live in the sea and freshwater—grow out of control
- produce toxic or harmful effects on people, fish, shellfish, marine mammals, and birds









Environmental Problems

- Lake O polluted — nutrients and sediment
- Lake O discharges in summer include algae
- **Estuaries east and west get too much fresh water, adversely affecting ecosystems**



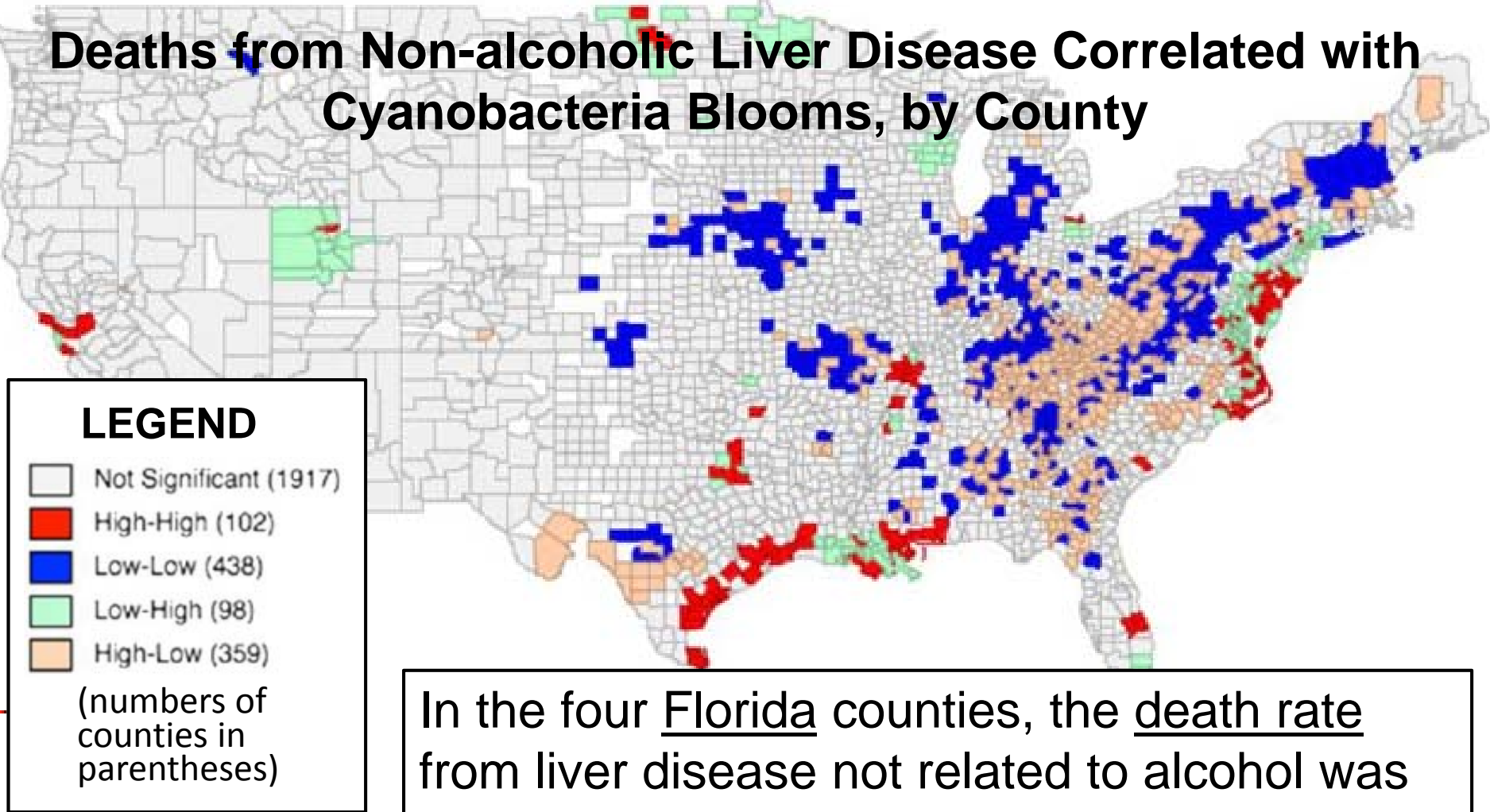
Harmful Algal Blooms (HABs)

- occur when colonies of algae—simple plants that live in the sea and freshwater—grow out of control
- produce toxic or harmful effects on people, fish, shellfish, marine mammals, and birds
- **human illnesses, though rare, can be debilitating or even fatal**

Public Health Problems

- **Harmful Algal Blooms (HABs) revisited**
- **Cyanobacteria (a.k.a. blue-green algae)**
 - **produce microcystins**
 - **liver toxin**
 - **harmful to large mammals**

Deaths from Non-alcoholic Liver Disease Correlated with Cyanobacteria Blooms, by County



In the four Florida counties, the death rate from liver disease not related to alcohol was nearly twice as high as the national rate during the 12 years of the Ohio State Univ. study. Study time span did not include blooms that coincided with high-volume Lake Okeechobee discharges in 2013 and 2016.

Zang et al. 2015. Cyanobacteria blooms and non-alcoholic liver disease: evidence from a county level ecological study in the United States.
Environmental Health 14:41

Public Health Problems

- **Harmful Algal Blooms (HABs) revisited**
- **Cyanobacteria (a.k.a. blue-green algae)**
 - produce microcystins
 - liver toxin
 - harmful to large mammals
 - produce BMAA
 - neurotoxin
 - possible link to neurodegenerative diseases (ALS, Alzheimer's, etc.)

WARNING: ALGAE ALERT

STAY OUT OF WATER



**NO DRINKING
BY HUMANS OR ANIMALS**



NO EATING FISH



**FOR MORE INFORMATION:
CALL (239) 274-2204**

LEE COUNTY HEALTH DEPARTMENT



BREAKING NEWS

CALOOSAHATCHEE HEALTH ALERT

LEE COUNTY

5:03 90°

WINKO
NEWS

<http://www.winknews.com/2015/05/28/health-dept-issues-alert-for-caloosahatchee-river-due-to-bacteria-in-algae/>



ADVISORY

**HIGH BACTERIA
AND BLUE-GREEN ALGAE
AVOID CONTACT WITH THE WATER**



MARTIN CO. HEALTH DEPT. (772) 221-4090
www.martincountyhealth.com





Martin County tests show algae toxins in St. Lucie River blooms also contaminate air



COVERING MARTIN COUNTY

f wptv5

TEST RESULTS CONFIRM TOXINS IN ALGAE
HEALTH OFFICIALS POST SWIMMING ADVISORIES



6:11 89°

Public Health Problems

- **Harmful Algal Blooms (HABs) revisited**
- **Cyanobacteria (a.k.a. blue-green algae)**
- **“State of Emergency” declared**
 - **4 counties June 30, 2016**
 - **Local beach closures**



CRIEL LOVETT/PALM BEACH POST, VIA AP

Reeking Algae Closes South Florida Beaches

Competing Forces That Define the State Merge Into an Environmental Nightmare

By LES NEUHAUS

STUART, Fla. — A rancid smell penetrated the front Marisa and Duncan Baskin's one-story house, which sits less than 100 feet from an inlet of the St. Lucie River this tourist hamlet just inside the Atlantic coastline it bills itself as "America's Happiest Seaside Town."

But the Baskins — whose 22-month-old daughter, like Baskin, suffers from asthma — and their neighbors not so happy these days. In the water of the inlet of their subdivision in Northriver Shores, an inch-thick layer of bubbling ooze and slime emits a stench so overwhelming that none of the neighbors go outside.

In fact, the Baskins were preparing Friday to stay friends across town for the weekend just to get away from the green and blue algae bloom that has overtaken small neighborhood marina, from which most



RYAN STONE FOR THE NEW YORK TIMES

A green and blue algae bloom has overtaken

blame. This isn't the first time this has happened, but definitely the worst."

At play are many of the forces that define modern Florida: competing environmental, residential and cultural interests, a failure by state officials to iron out managing the demands of growth, finger pointing between state and federal officials. The result has been an environmental nightmare playing out here, about 100 miles from the source of the problem in Lake Okechobee.

There, an aging dike system forces the Army Corps of Engineers to release controlled discharges of water through channel locks east and west from the lake to nearby towns from flooding. However, those discharges, which carry pollutants from agricultural lands into the lake from the north, pour into rivers and streams downstream, which eventually dump into the Gulf of Mexico. The result is a massive, uncontrolled discharge from Okechobee

STATE OF FLORIDA OFFICE OF THE GOVERNOR EXECUTIVE ORDER NUMBER 16-156

(Emergency Management - Lake Okeuchobee Outbreak)

WHEREAS, on June 29, 2016, Executive Order 16-155, was issued declaring a state of emergency in Martin and St. Lucie Counties following the presence of algal blooms in both waterways, and

WHEREAS, the affected areas also include Lee and Polk Beach Counties, and

NOW, THEREFORE, I RICK SCOTT, as Governor of Florida, by virtue of the authority vested in me by Article IV, Section 1(a) of the Florida Constitution and by the Florida Emergency Management Act, as amended, and all other applicable laws, promulgate the following Executive Order, to take immediate effect:

Section 1. Because of the foregoing conditions, I declare that the state of emergency is extended to include Lee and Polk Beach Counties.

Section 2. Except as amended herein, Executive Order 16-155 is nullified and nullified.

IN TESTIMONY WHEREOF, I have herein set my hand and signed the Great Seal of the State of Florida in the office, at Tallahassee, this 30th day of June, 2016.

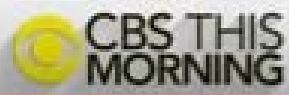


Rick Scott
GOVERNOR

OFFICE OF THE GOVERNOR
STATE OF FLORIDA
TALLAHASSEE, FLORIDA 32399-0001
PH: 904.488.1100
WWW.FLORIDA.GOV



**Governor
Rick Scott
(R) Florida**



A GROWING CONCERN

THICK, SMELLY, TOXIC ALGAE INVADERS FLORIDA BEACHES



1:14 / 3:13



STATE OF FLORIDA
OFFICE OF THE GOVERNOR
EXECUTIVE ORDER NUMBER 16-156
(Emergency Management - Lake Okechobee Algae)

WHEREAS, on June 25, 2016, Executive Order 16-156, was issued declaring a state of emergency in Martin and St. Lucie Counties following the presence of algal blooms in both waterways; and

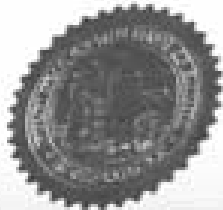
WHEREAS, the affected area also includes Lee and Palm Beach Counties; and

NOW, THEREFORE, I RICK SCOTT, as Governor of Florida, by virtue of the authority vested in me by Article IV, Section 1(a) of the Florida Constitution and by the Florida Emergency Management Act, as amended, and all other applicable laws, promulgate the following Executive Order, to take immediate effect:

Section 1. Because of the foregoing conditions, I declare that the state of emergency is extended to include Lee and Palm Beach Counties.

Section 2. Except as amended herein, Executive Order 16-156 is notified and notified.

IN TESTIMONY WHEREOF, I have signed my hand and caused the Great Seal of the State of Florida to be affixed, at Tallahassee, this 26th day of June, 2016.



Rick Scott
GOVERNOR

OFFICE OF THE GOVERNOR
TALLAHASSEE, FLORIDA 32301
PHONE: 904.488.1100
FAX: 904.488.1101
WWW.FLORIDA.GOV

WHEREAS, the release of these waters and the algae blooms has increased the potential of harm to the health of our citizens; by producing harmful toxins that can cause adverse health effects; and ... the issuance of health advisories including the closures of recreational areas has caused economic losses in the adjacent communities, ...

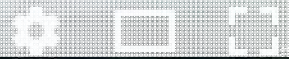
CBS THIS MORNING

A GROWING CONCERN

THICK, SMELLY, TOXIC ALGAE



1:14 / 3:13



STATE OF FLORIDA
OFFICE OF THE GOVERNOR
EXECUTIVE ORDER NUMBER 16-156
(Emergency Management - Lake Okeechobee Discharge)

WHEREAS, on June 26, 2016, Executive Order 16-156, was issued in response to an emergency in Martin and St. Lucie Counties following the treatment of wastewater and

WHEREAS, the affected area also includes Lee and Palm Beach Counties, and NOW, THEREFORE, I, RICK SCOTT, as Governor of Florida, by virtue of the authority vested in me by Article IV, Section 1(a) of the Florida Constitution and by the Florida Emergency Management Act, as amended, and all other applicable laws, promulgate the following Executive Order, to take immediate effect:

Section 1. Because of the ongoing conditions, I declare that the state of emergency is expanded to include Lee and Palm Beach Counties.

Section 2. Except as amended herein, Executive Order 16-156 is certified and reaffirmed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Florida to be affixed, at Tallahassee, this 26th day of June, 2016.



Rick Scott
GOVERNOR

16-156
JUN 26 2016 10:53 AM
P11.60

Lake Okeechobee
St. Lucie
Martin
Lee
Palm Beach

CBS THIS MORNING

A GROWING CONCERN

THICK, SMELLY, TOXIC ALGAE INVADES FLORIDA BEACHES

CBS THIS MORNING



1:20 / 3:13



Harmful Algal Blooms (HABs)

- occur when colonies of algae—simple plants that live in the sea and freshwater—grow out of control
- produce toxic or harmful effects on people, fish, shellfish, marine mammals, and birds
- human illnesses, though rare, can be debilitating or even fatal
- **affect not only the health of people and marine ecosystems, but also the “health” of local and regional economies**

NEXT STEPS

March 1, 2018: SFWMD Water Resource Advisory Coalition meeting, West Palm Beach, FL

March 8, 2018: SFWMD Governing Board meeting, West Palm Beach, FL

March 30, 2018: Deadline for SFWMD and US Army Corps of Engineers to submit draft Post-Authorization Change Report to Assistant Secretary of the Army

October 1, 2018: Deadline for final Post-Authorization Change Report to be sent to Congress