

Water Conditions Summary

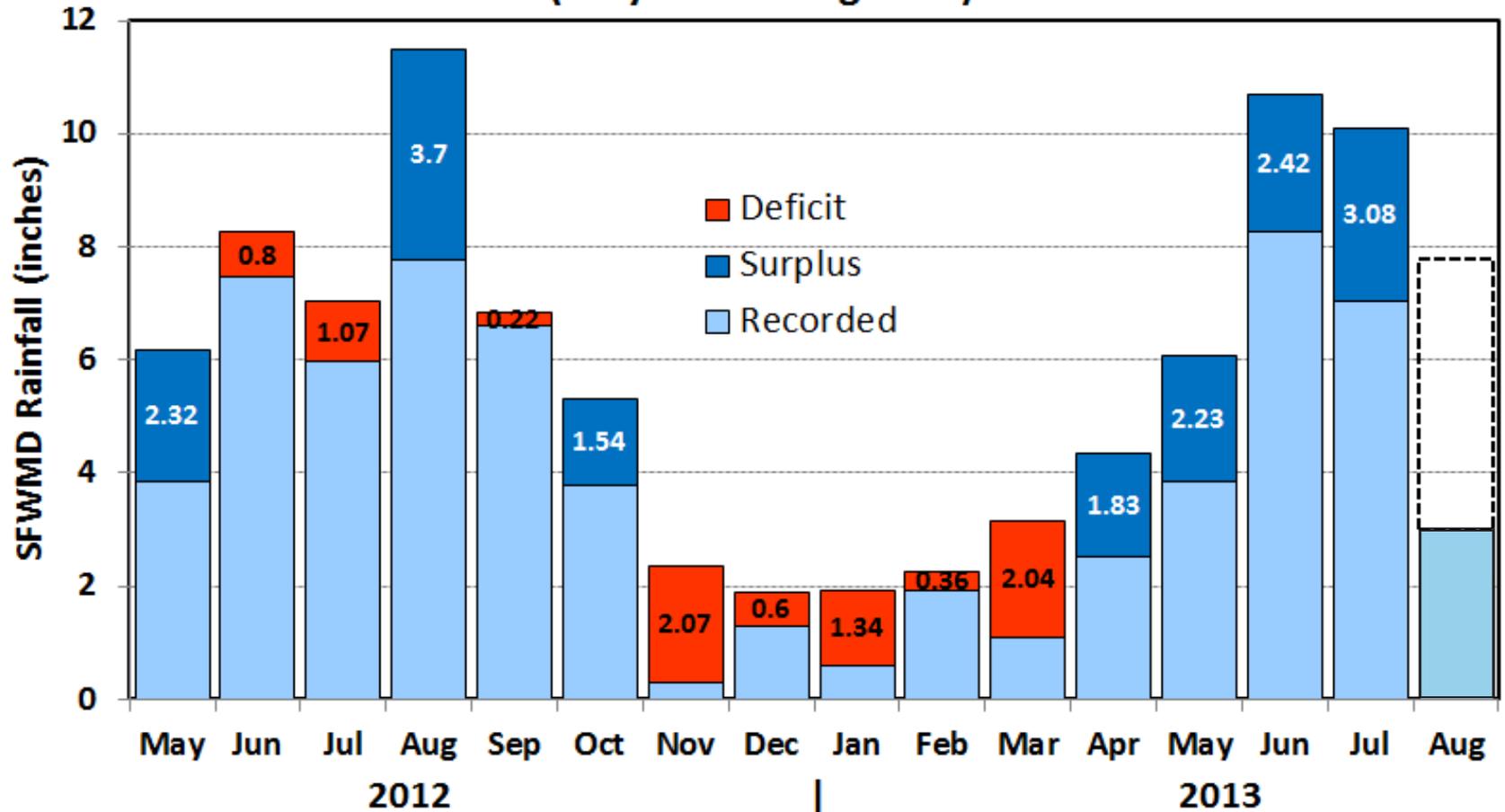
South Florida Water Management District
Governing Board Meeting

August 15, 2013

Tommy B. Strowd, P.E., Assistant Executive Director
Operations, Maintenance & Construction
South Florida Water Management District

SFWMD Rainfall Distribution Comparison

(May 2012 - Aug 2013)



2012 WET SEASON:

- Started early with wet May, followed by dry June and July. TS Isaac brought August rainfall high above average.
- Ended up above average.

2012-13 DRY SEASON:

- Driest November since 1932
- Below average despite April/May being above

2013 WET SEASON:

- May 18th Start
- T.S. Andrea produced 3.1 inches District wide
- Above average so far

SFWMD

July 2013 Rainfall

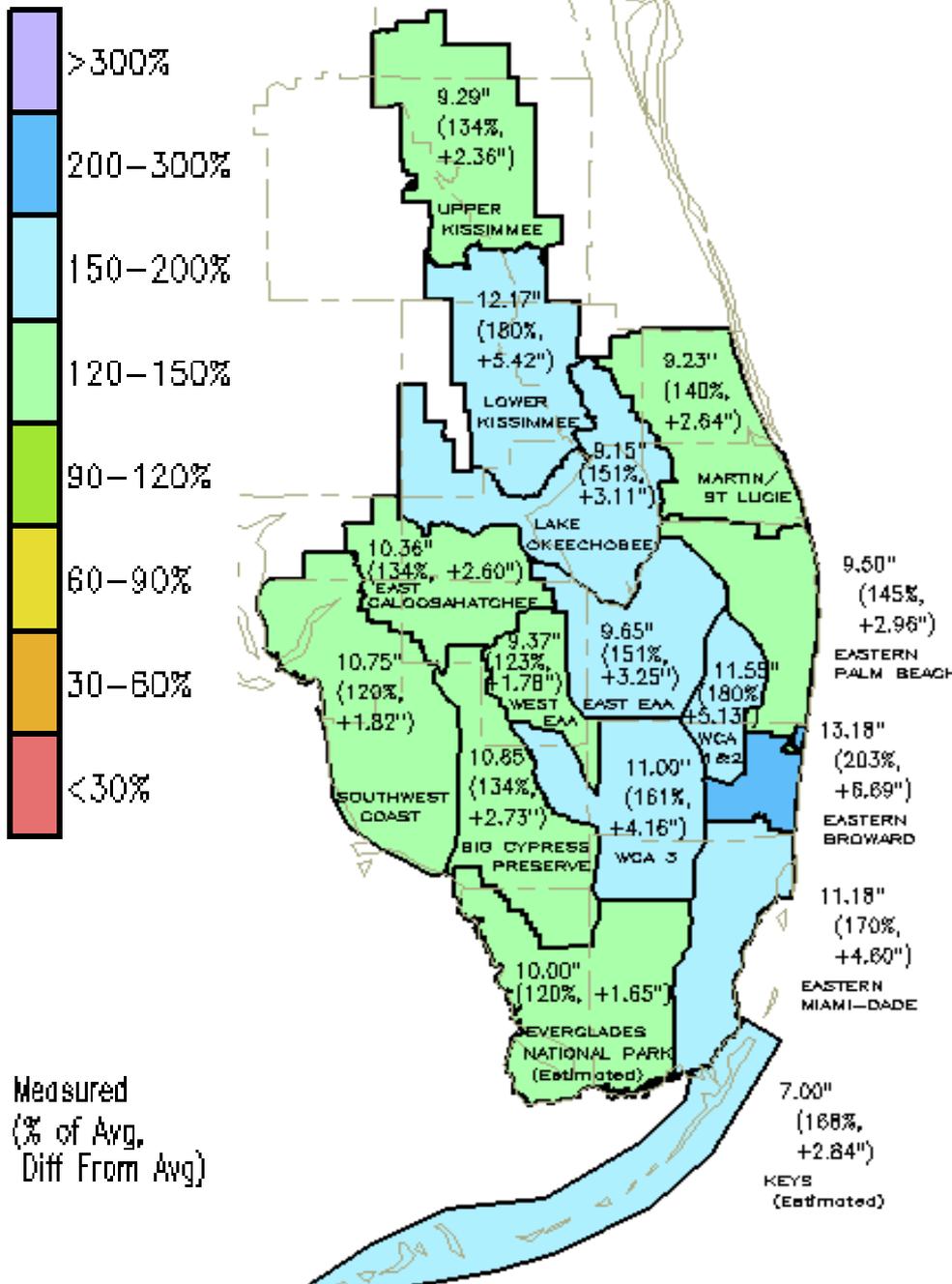
(July 2 through 31, 2013)

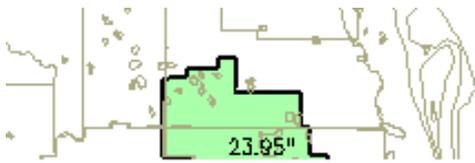
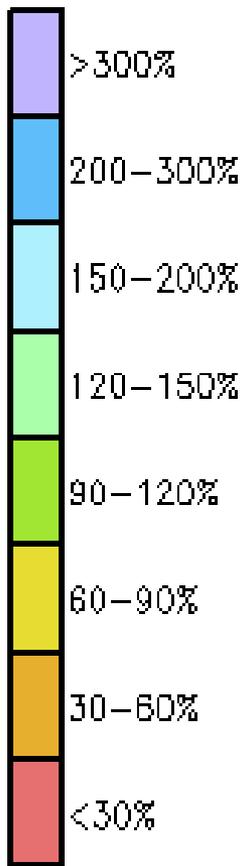
**DISTRICT-WIDE: 10.36"
(147% of Avg, or +3.33")**

Wettest July since 2001

**All basins received above
average rainfall:**

- **E. Broward +6.69"**
- **Lower KS +5.42"**
- **WCA 1 & 2 +5.13"**
- **Mia-Dade +4.60"**
- **WCA 3 +4.16"**
- **Lake & EAA +3.11"**





Measured
 (% of Avg.
 Diff From Avg)

SFWMD

Wet Season Rainfall

May 18 2013 – Aug 13 2013

**DISTRICT-WIDE: 26.69”
 (132% of Avg, or +6.53”)**

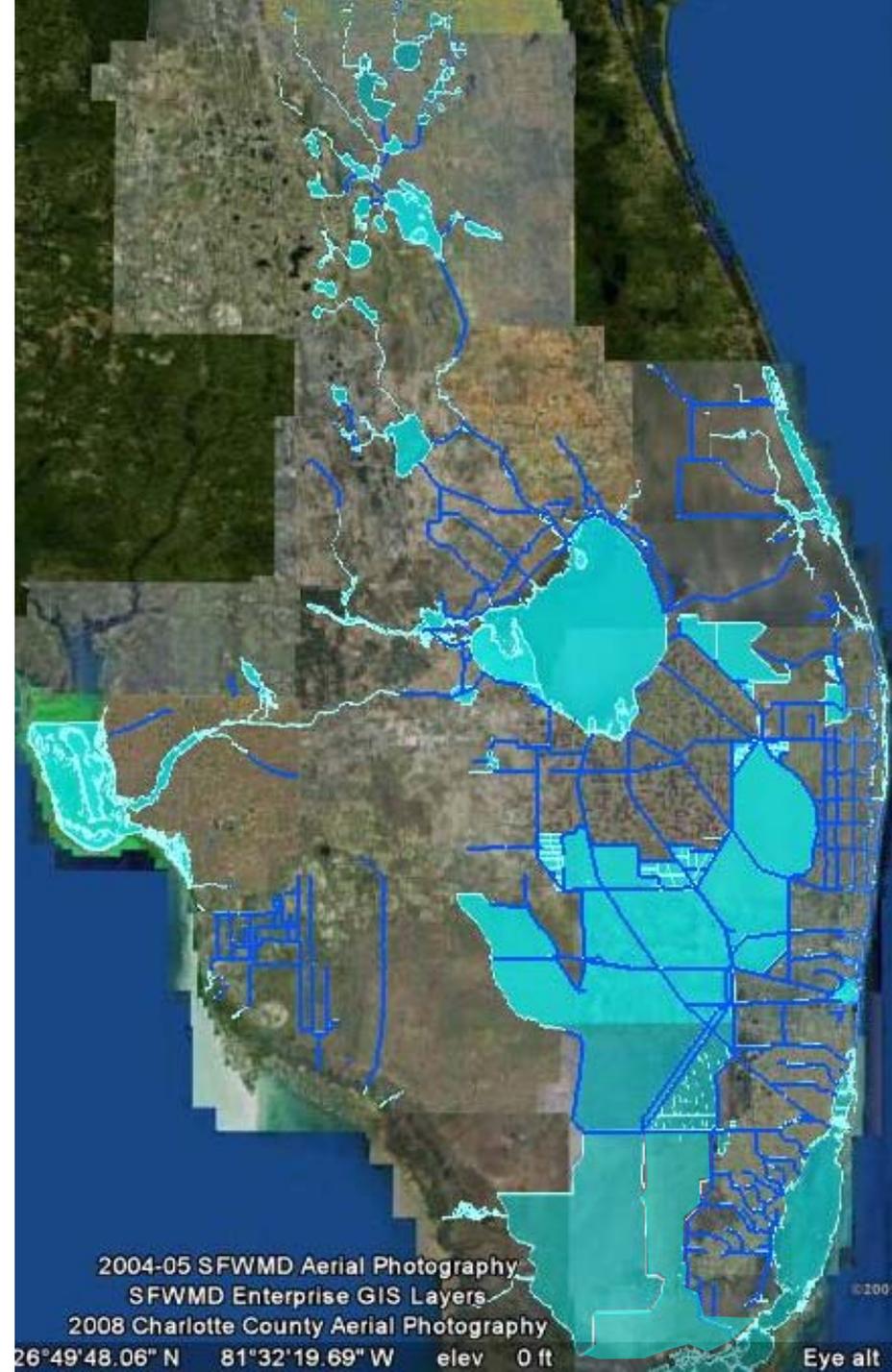
Wet Season Started around May 18th

April was also above normal:

- **Wettest Apr-Jul for eastern Broward (since records began 1955) and WCA 3 (records began 1963)**
- **Second wettest Apr-Jul for the WCA 1&2 (records began 1957)**
- **Third wettest Apr-Jul for the Lower Kissimmee since 1915.**
- **Top 8 wettest Apr-Jul for several basins (EAAE, UK, LO)**

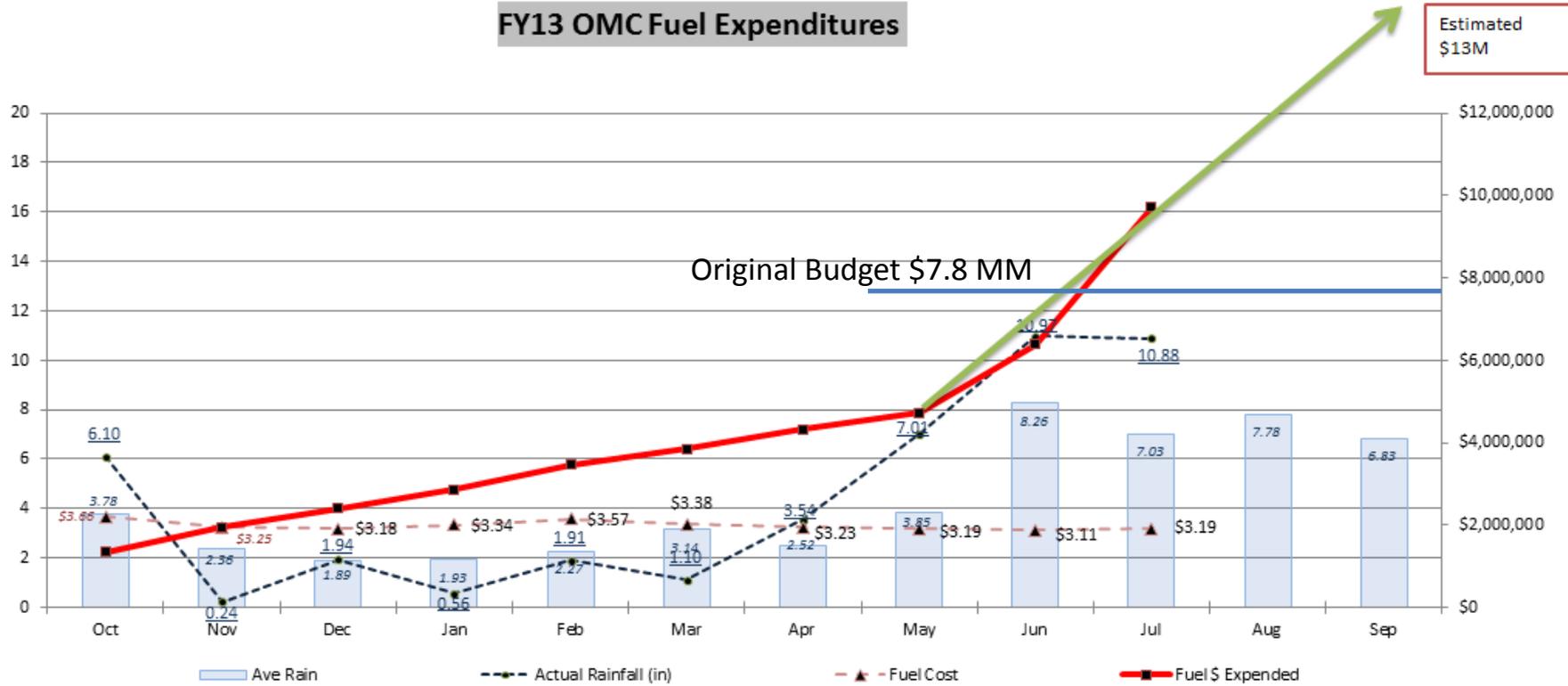
System Storage Status

- Kissimmee Basin
 - All Lakes near or above regulation stage
- Lake Okeechobee
 - Above regulation
- Water Conservation Areas
 - Near or above regulation



Financial Impact

FY13 OMC Fuel Expenditures



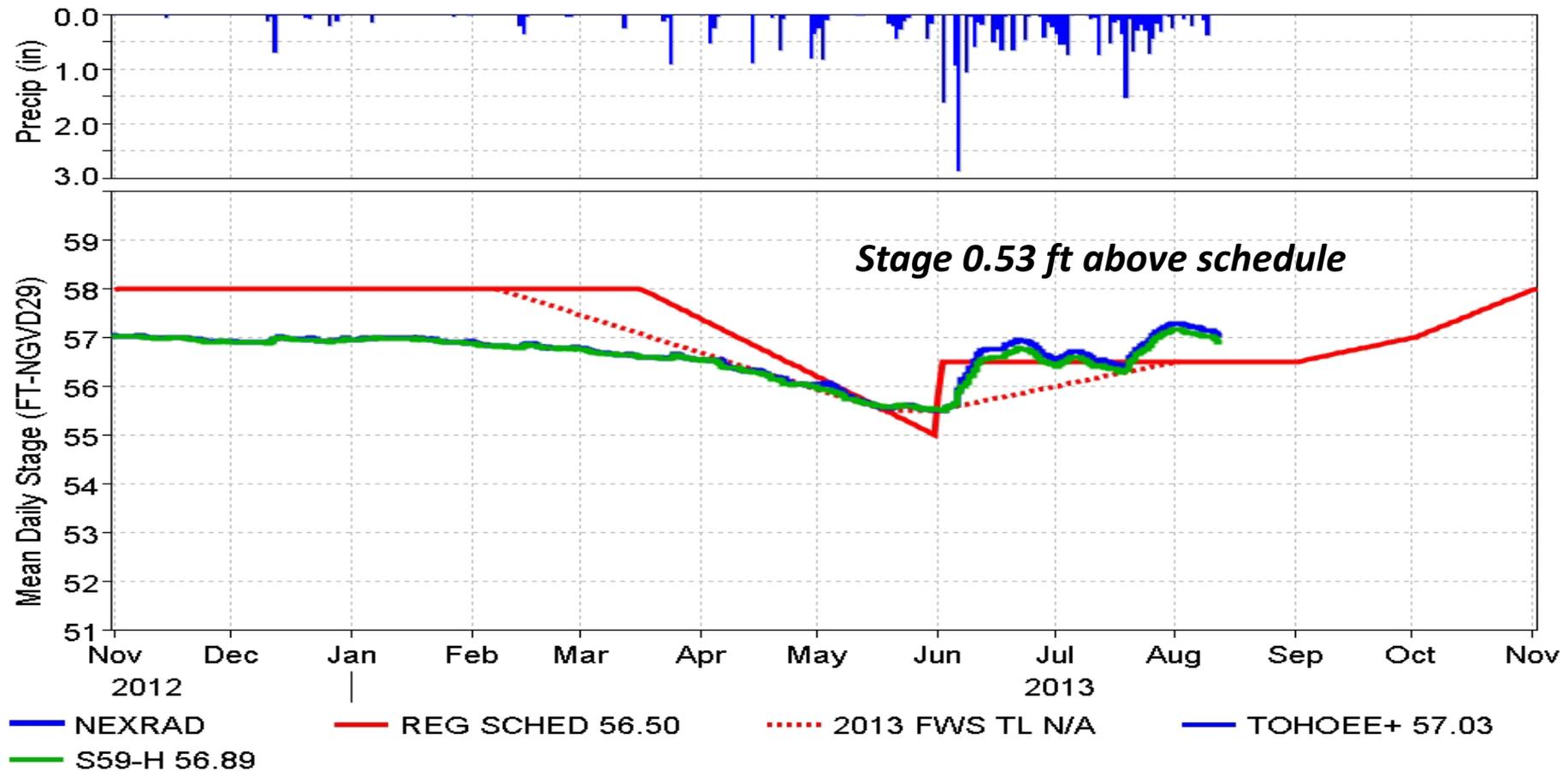
- June 2013 EOG/FDEP/Governing Board approved \$3.0M additional transfer authority
- June & July expended \$4.2M or \$2.0M more during same period
- July 2013 \$1.3M or 186% increase over July 2012
- Estimated \$4.2M August & September
- August 2013 EOG/FDEP/Governing Board request for an additional \$3.0M transfer authority

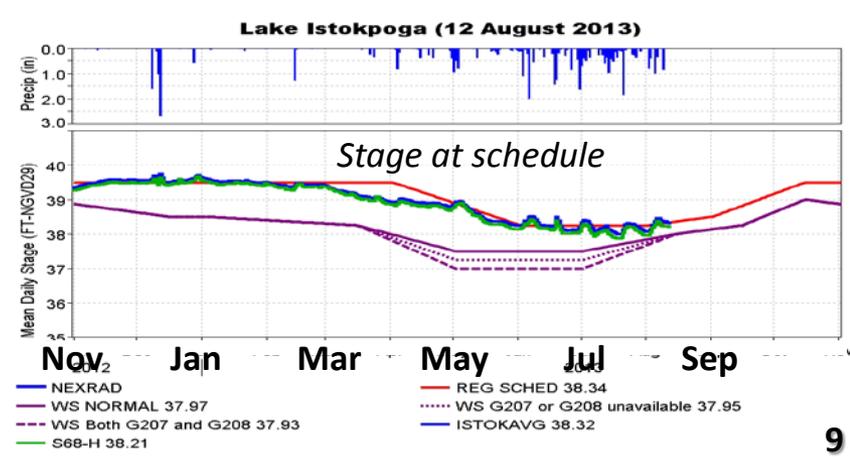
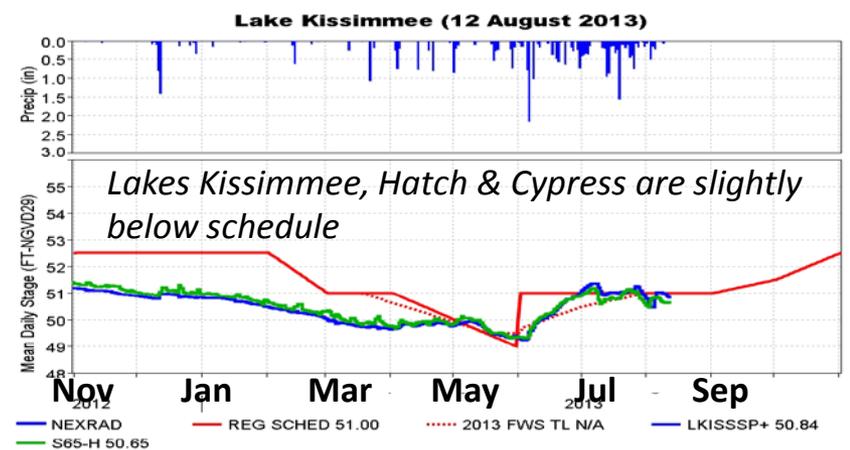
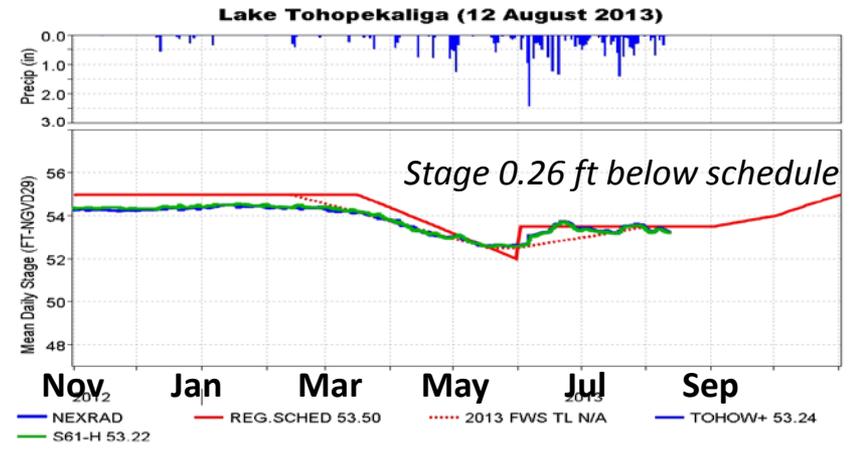
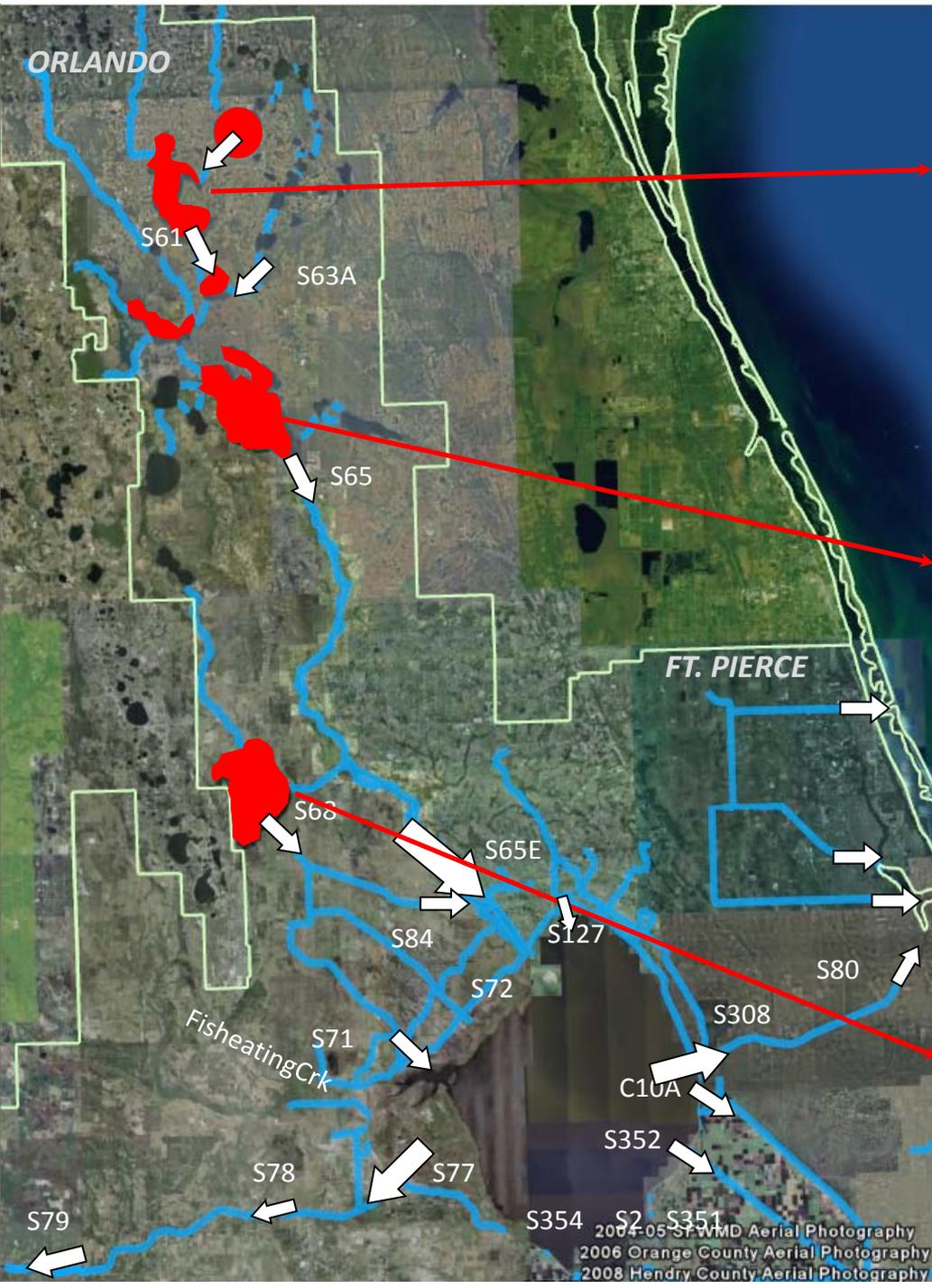
KISSIMMEE BASIN





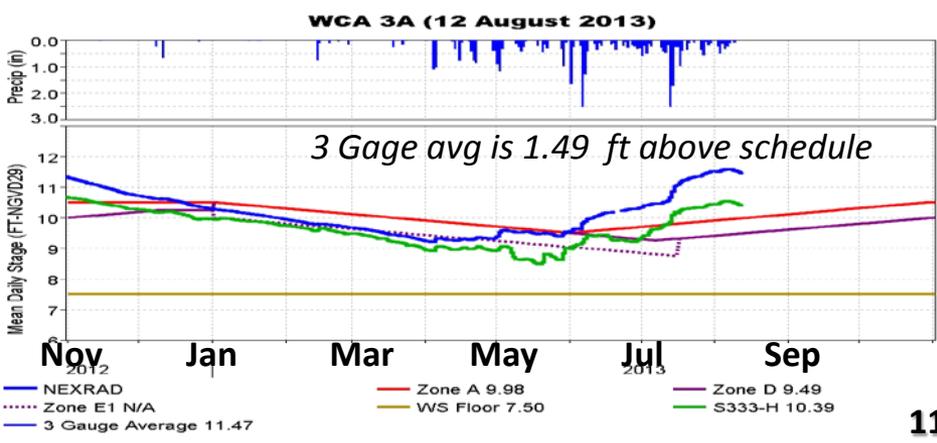
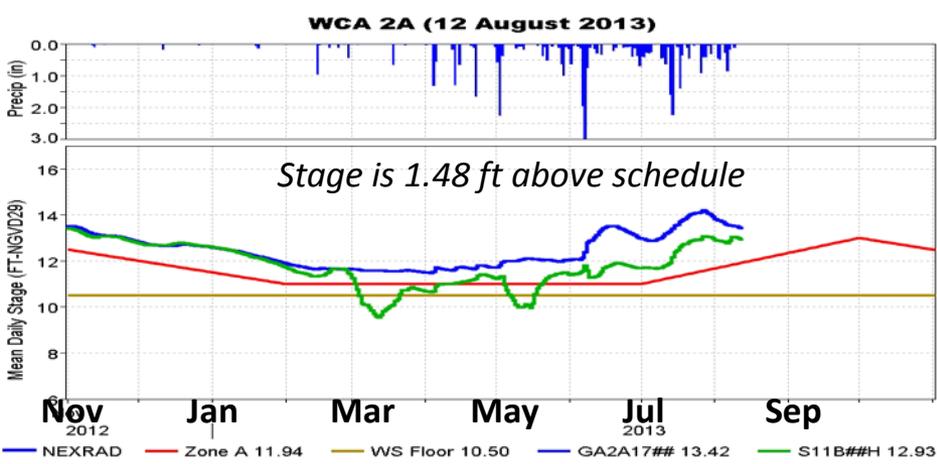
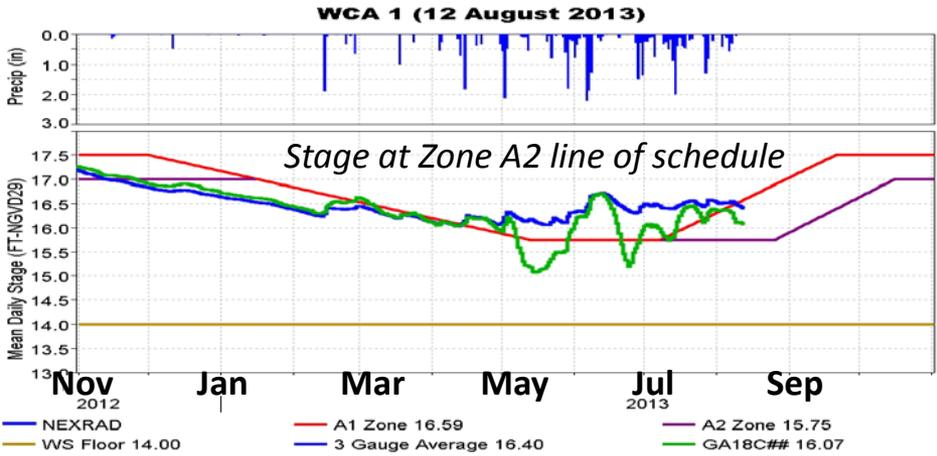
Lake East Tohopekaliga (12 August 2013)





WATER CONSERVATION AREAS

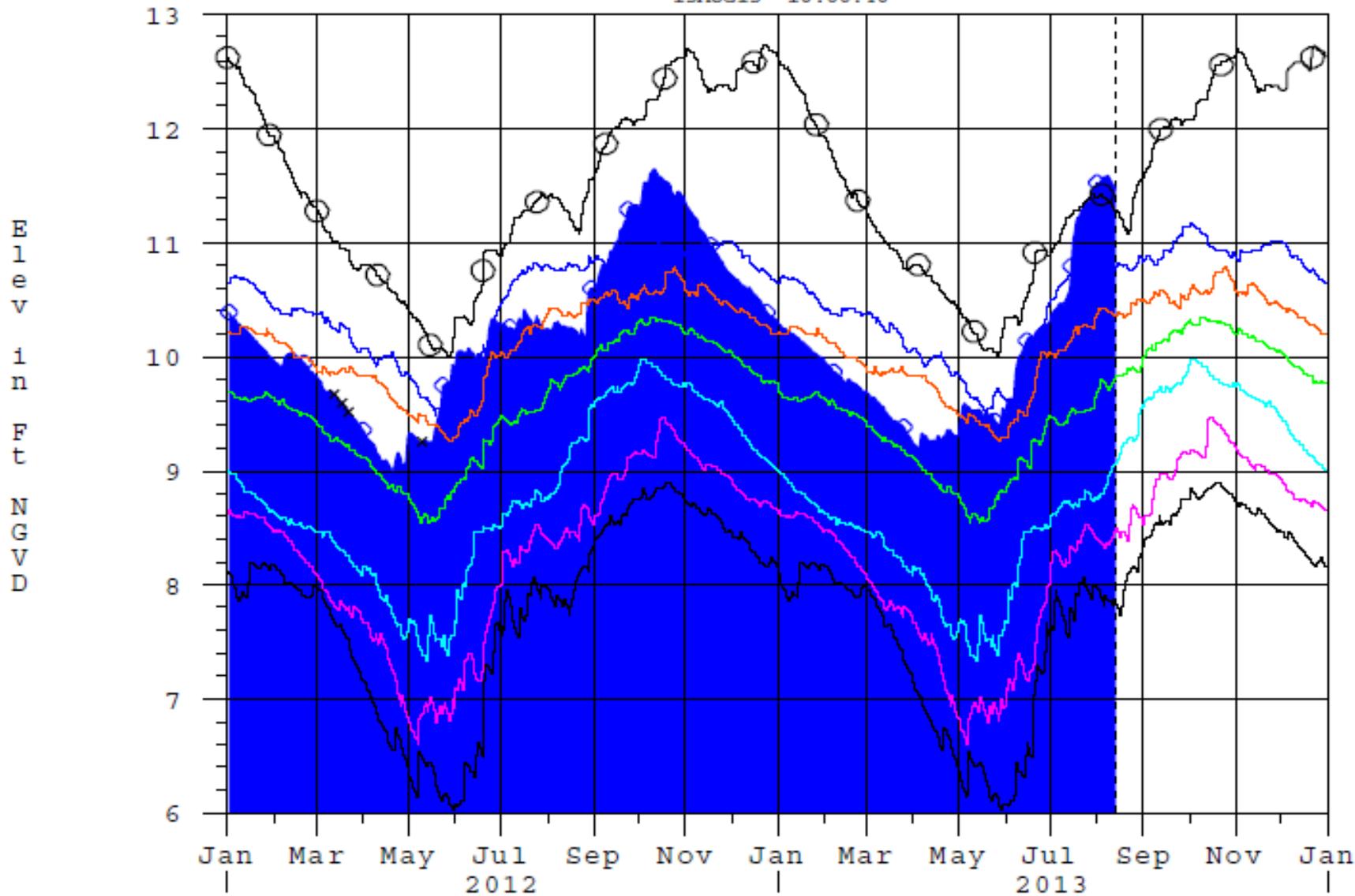




Arrows are not to scale

Water Cons. Area #3A Compared to 1963-2000 Exceedance Statistics

13AUG13 10:00:40

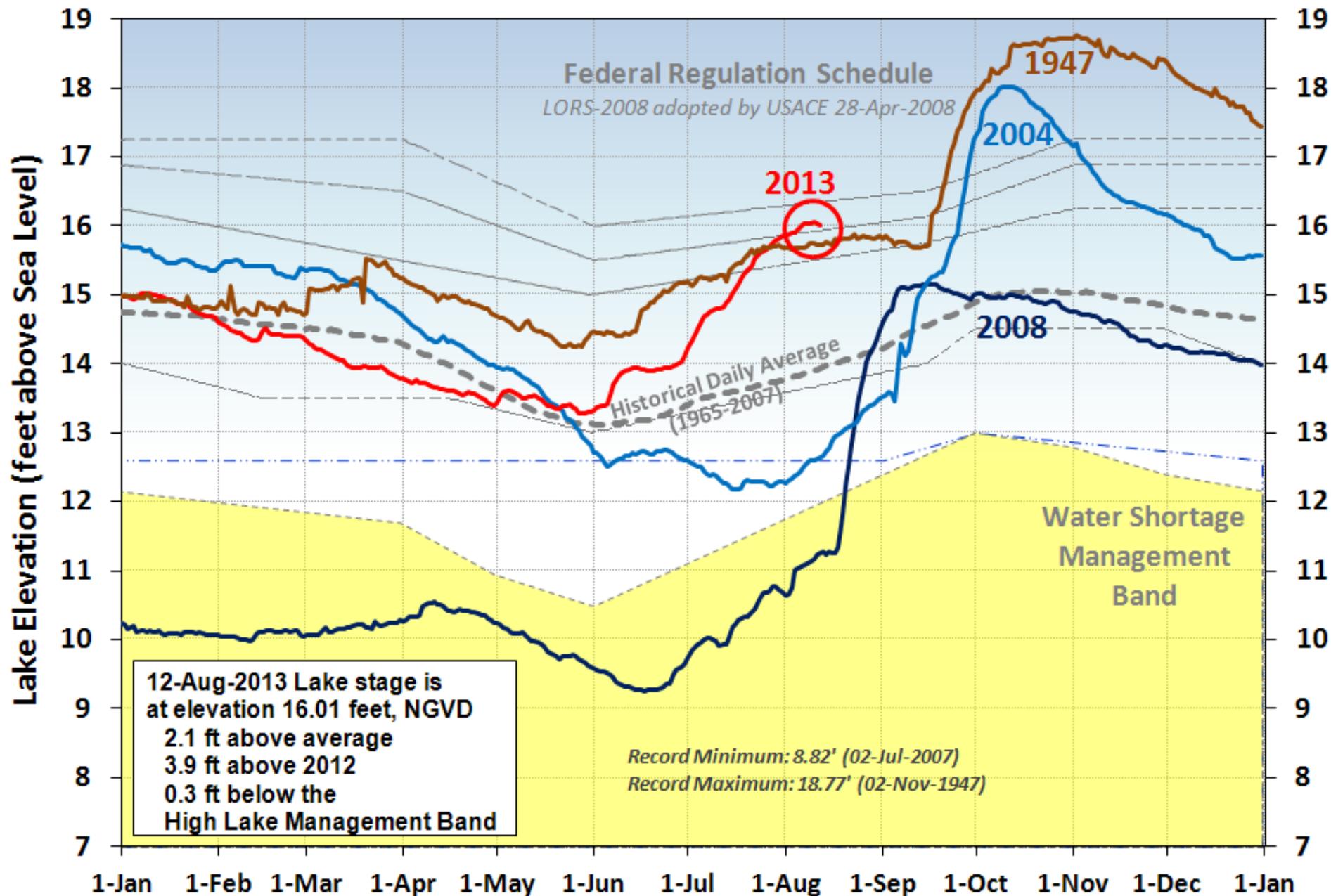


- | | | | |
|-----|--------------------------|-----|------------------|
| —○— | Avg Elev (Site 63,64,65) | — | 25% Exceed Value |
| — | 90% Exceed Value | — | 10% Exceed Value |
| — | 75% Exceed Value | — | Min Exceed Value |
| — | 50% Exceed Value | —○— | Max Exceed Value |

LAKE OKEECHOBEE

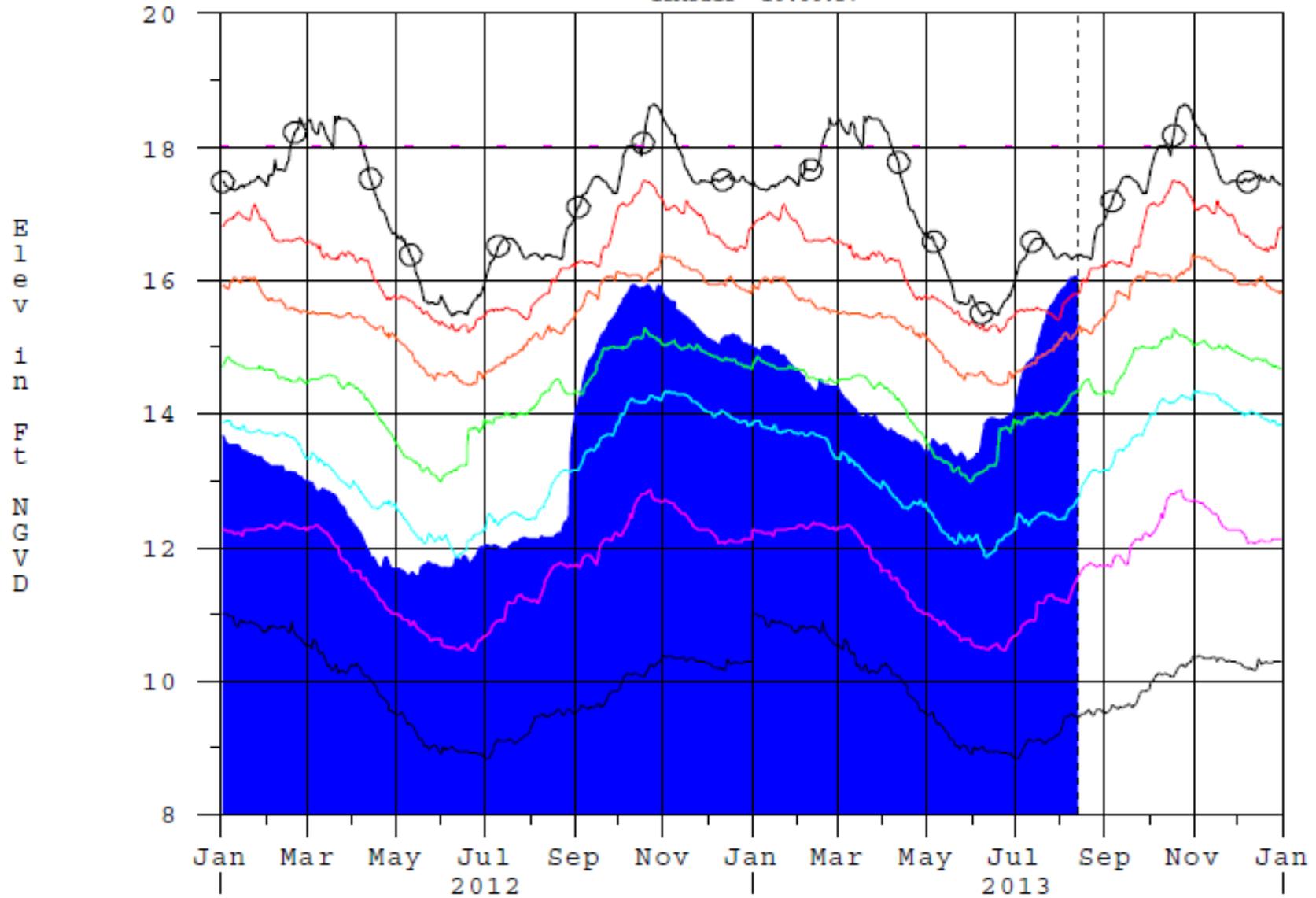


Lake Okeechobee Water Level Comparison



Lake Okeechobee Compared to 1965-2007 Exceedance Statistics

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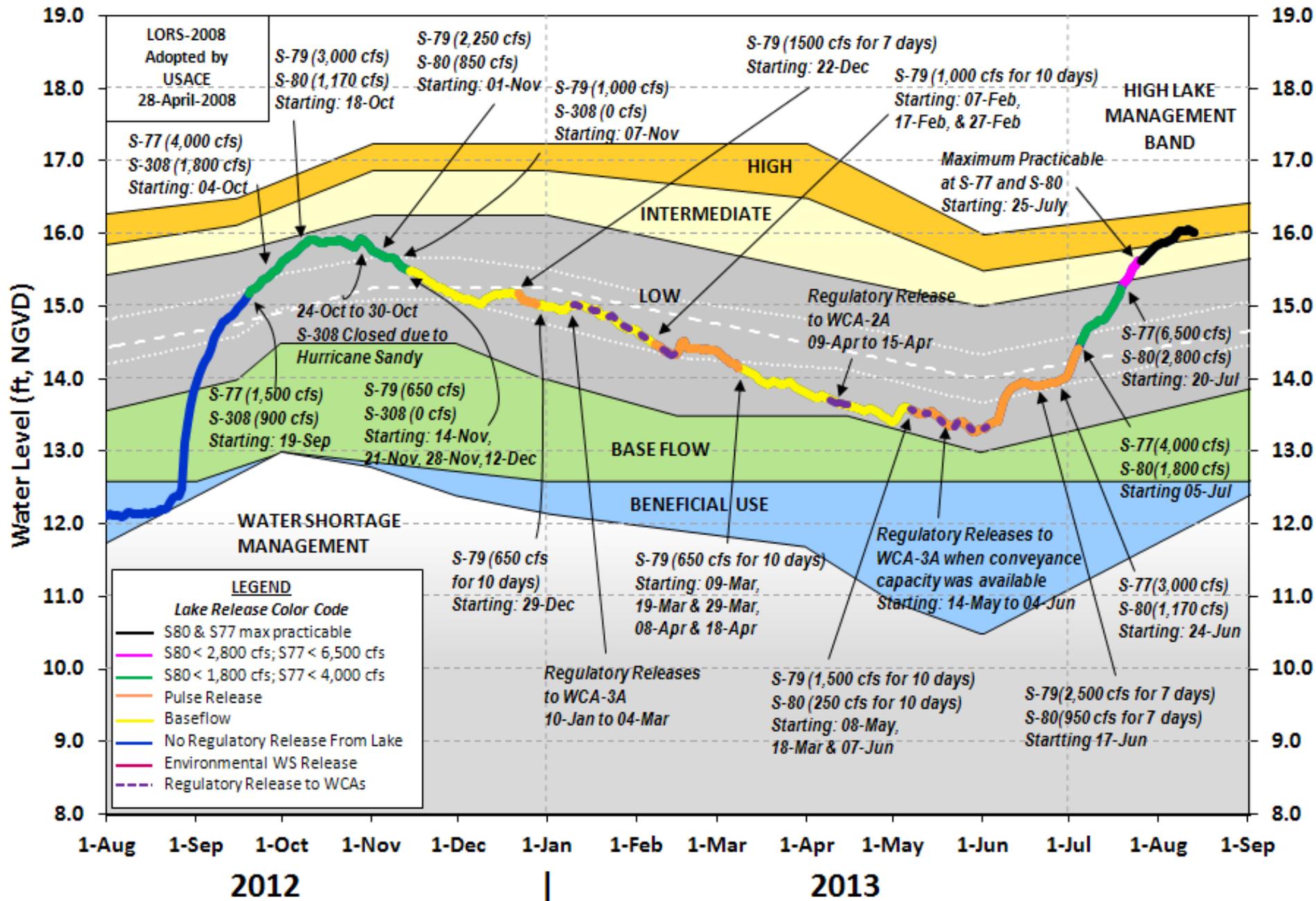


Lake Okeechobee: Current Operations

USACE's Lake O Regulation Schedule (2008 LORS)

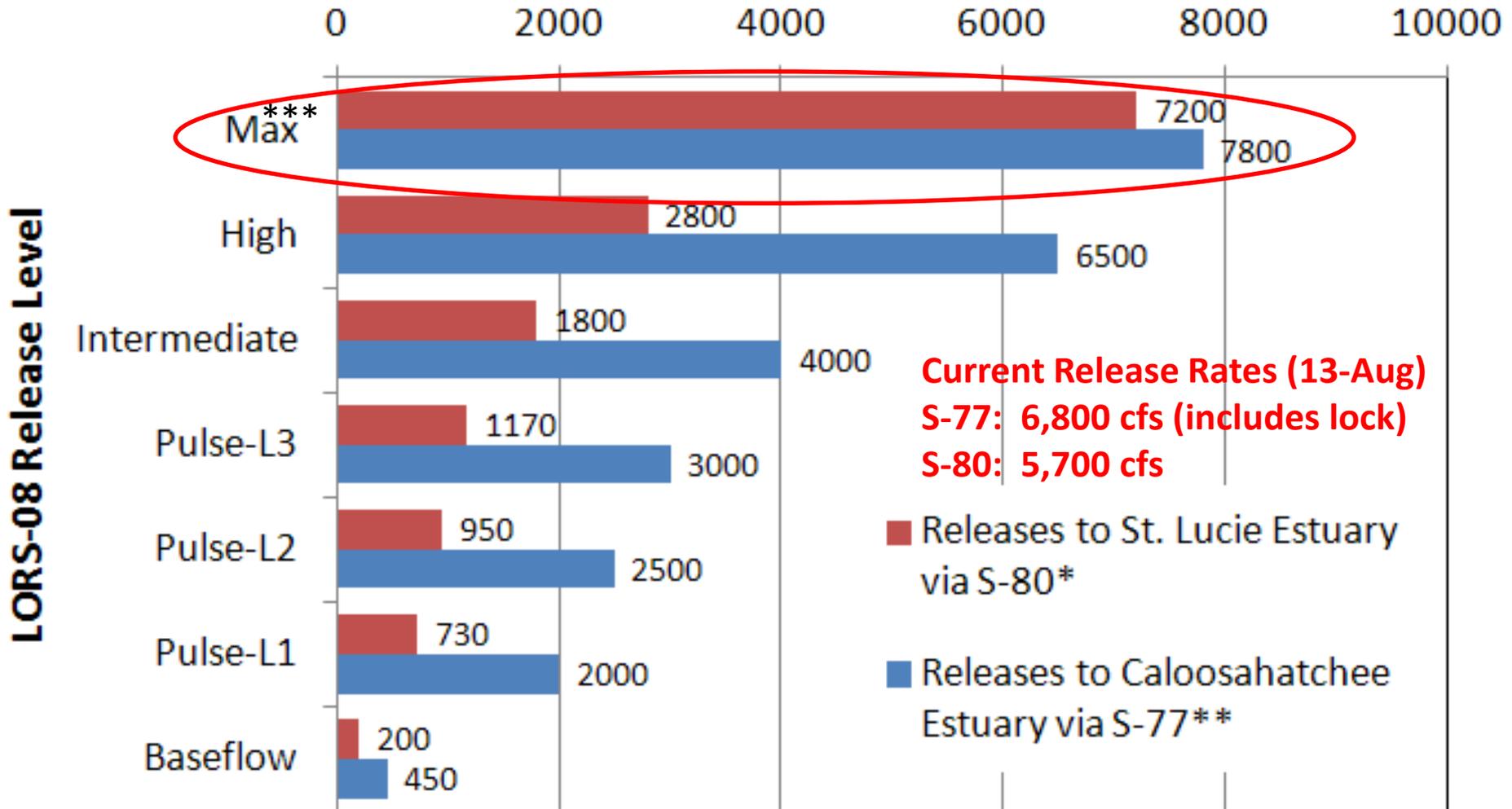
- Stage (~16.0 feet, NGVD) is within 0.3 feet of the High Lake Management Band (top of 2008 LORS)
- Tributary Hydrologic Condition (THC) and the Seasonal Hydrologic Outlook remain in the very wet classifications
- 25-Jul-2013: USACE increased discharges to the maximum allowed by the 2008 LORS and Water Control Plan:
 - Release rates depend on Lake and canal stages
 - 12-Aug release rates (estimated)
 - S-77: 6,600 cfs (S-79: 9,700 cfs)
 - S-308: 4,600 cfs (S-80: 5,500 cfs)
- Current releases to WCA-1 via STAs since stages are below regulation schedule. Others remain above schedule
- C-10A to tide via L-8 & C-51: 450 cfs

Lake Okeechobee Water Level and Release History



Lake Okeechobee Regulation Schedule 2008

Release Rates (cfs)



* Releases at S-308 are limited by C-44 basin runoff

** Baseflow Releases and Pulse Releases at S-77 are limited by C-43 basin runoff

*** Maximum Release rates depend on Lake and canal stages

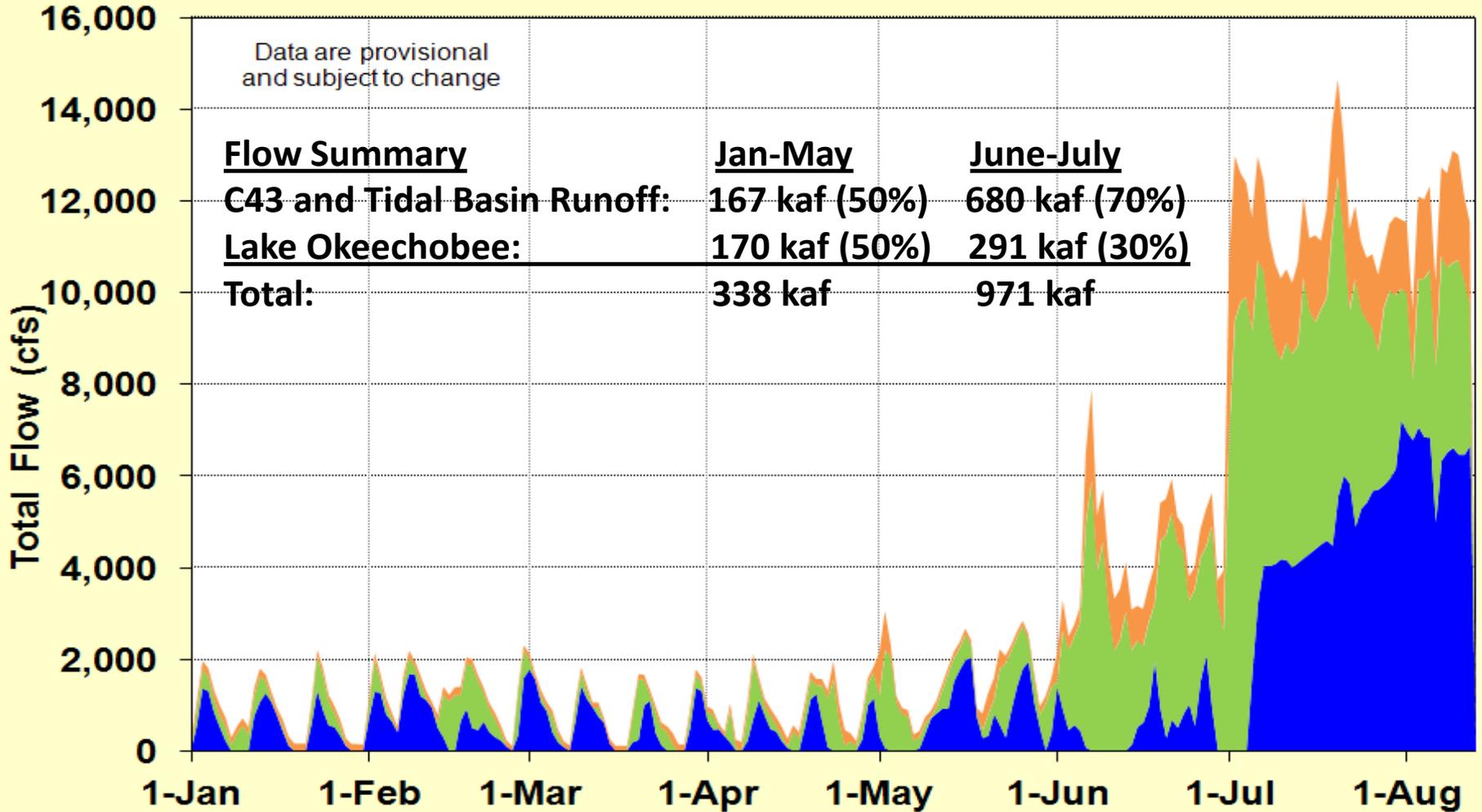
2013 Discharges to the Caloosahatchee Estuary

Data through 12-Aug-2013

Data are provisional
and subject to change

Flow Summary

	<u>Jan-May</u>	<u>June-July</u>
C43 and Tidal Basin Runoff:	167 kaf (50%)	680 kaf (70%)
Lake Okeechobee:	170 kaf (50%)	291 kaf (30%)
Total:	338 kaf	971 kaf



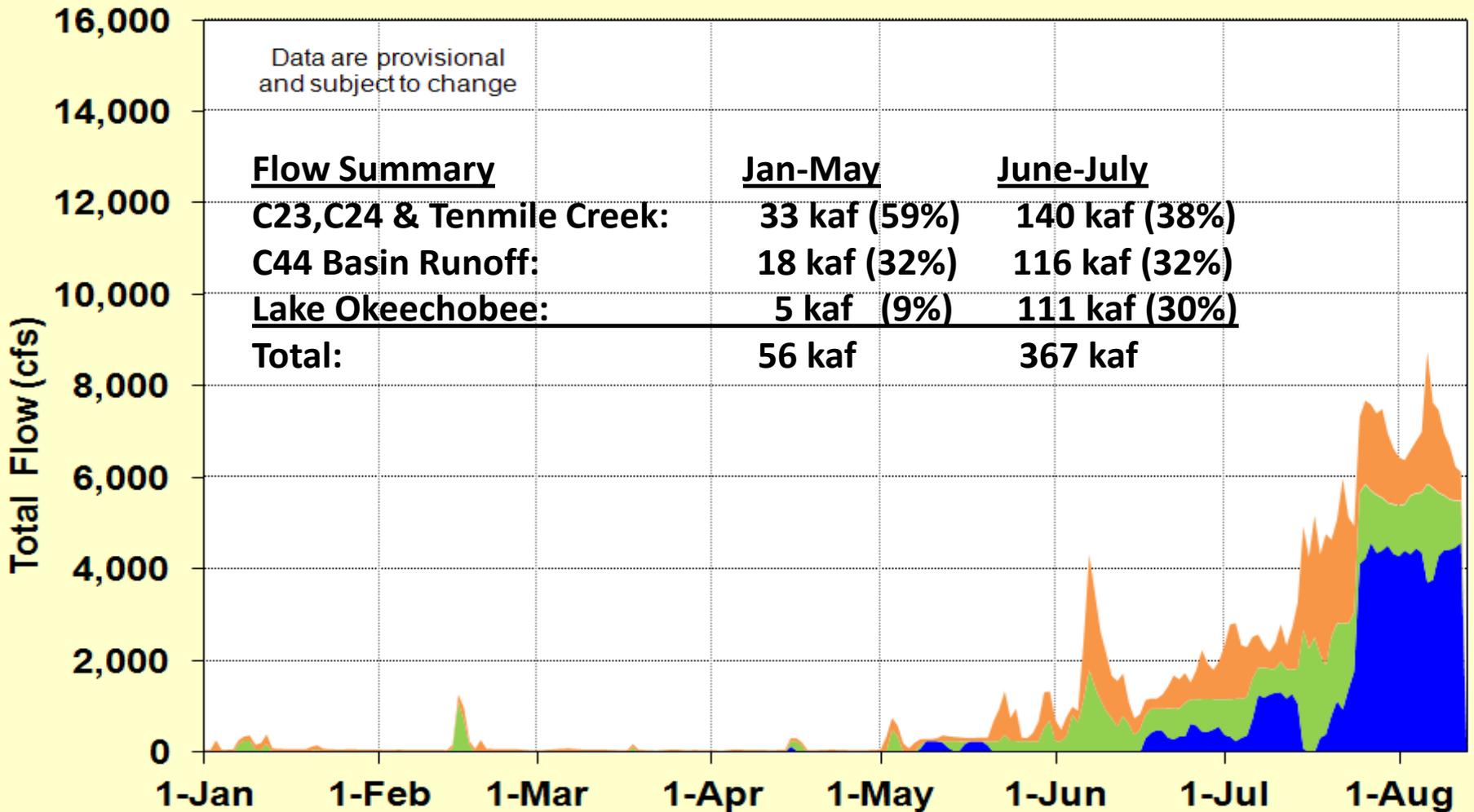
■ Inflow from Lake

■ C-43 Basin Runoff

■ Tidal Basin Runoff (downstream of S-79)

*Data through
12-Aug-2013*

2013 Discharges to the St. Lucie Estuary



- Inflow from C-24, C23, and Tenmile Creek Basins*
- C-44 Basin Runoff
- Inflow from Lake

Data through
12-Aug-2013

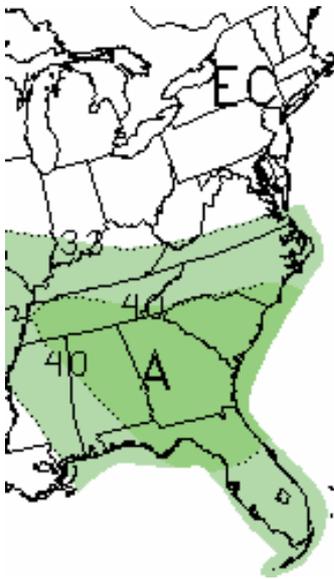
OUTLOOK



U. S. Seasonal Precipitation Outlook

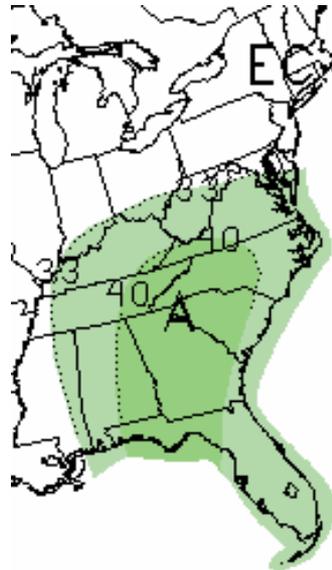
National Climate Prediction Center (CPC)

Aug 2013



Made 31-July-2013

Aug - Oct 2013



Made 18-July-2013

Sep - Nov 2013



Made 18-July-2013

The recent CPC precipitation outlooks for central & southern Florida indicate:

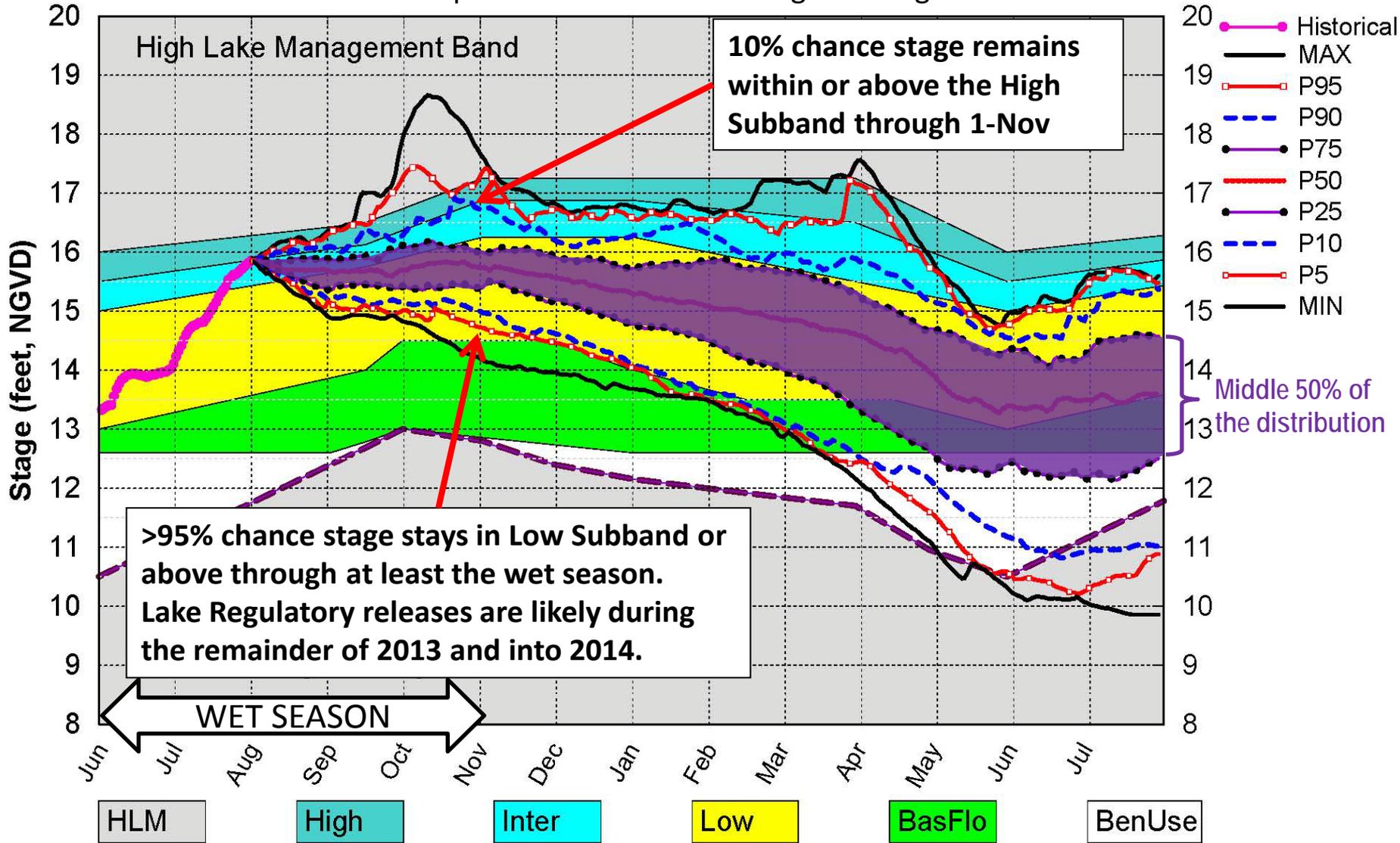
August: Increased chances of Above-Normal (A) rainfall

Aug-Oct: Increased chances of Above-Normal (A) rainfall

Sep-Nov: Equal chances of Above-Normal (A), Normal, and Below-Normal (B)

Lake Okeechobee SFWMM August 2013 Position Analysis

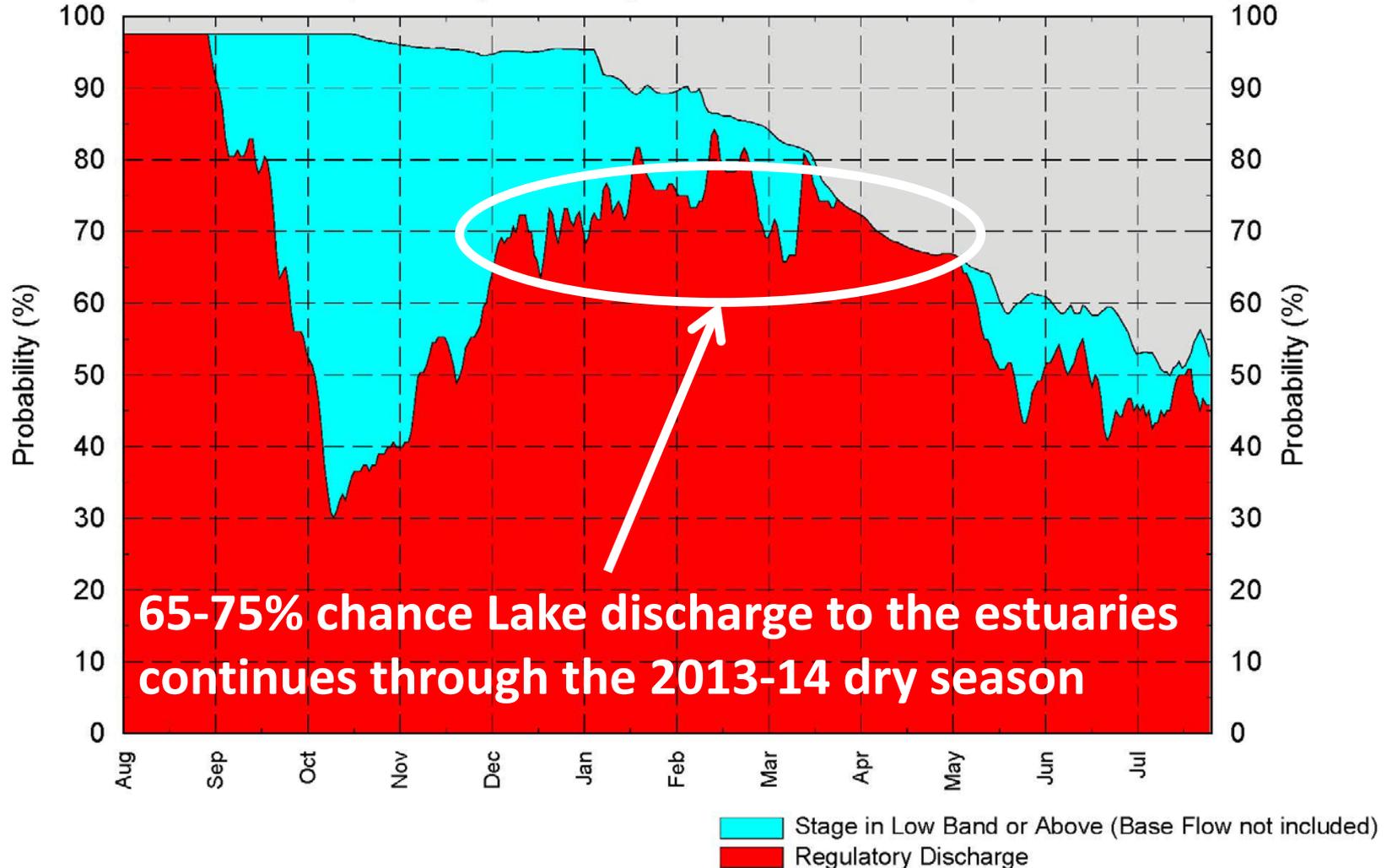
Percentiles based on 41 possible outcomes starting with Aug 1st initialization



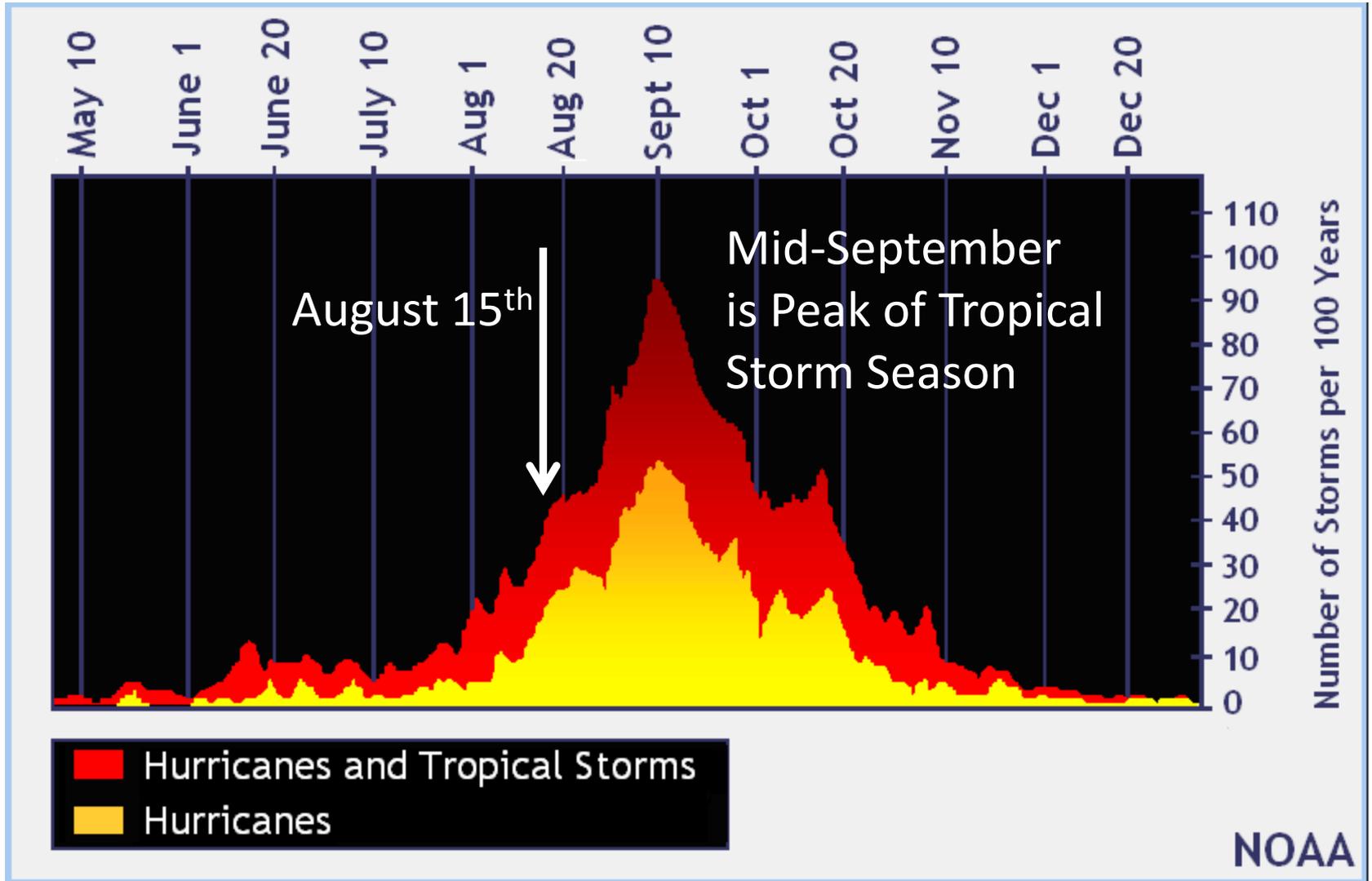
(See assumptions on the Position Analysis Results website)

Lake Okeechobee – LORS2008 Releases to the Estuaries

Unconditional PA Operations (See assumptions on the Position Analysis Results website)

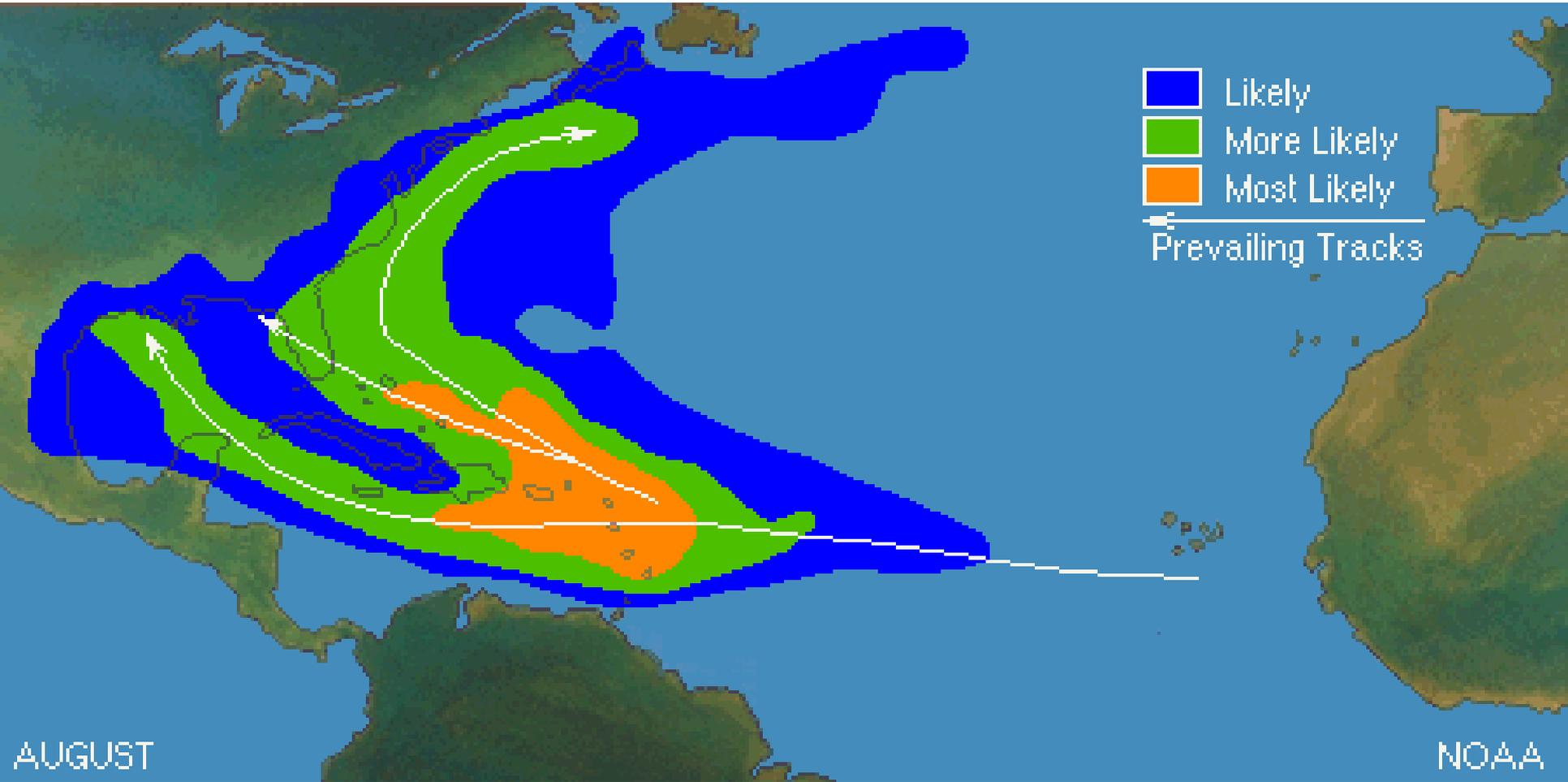


Atlantic Tropical Storm & Hurricane Season 1-June to 30-November



Average Areas of Tropical Activity Origin

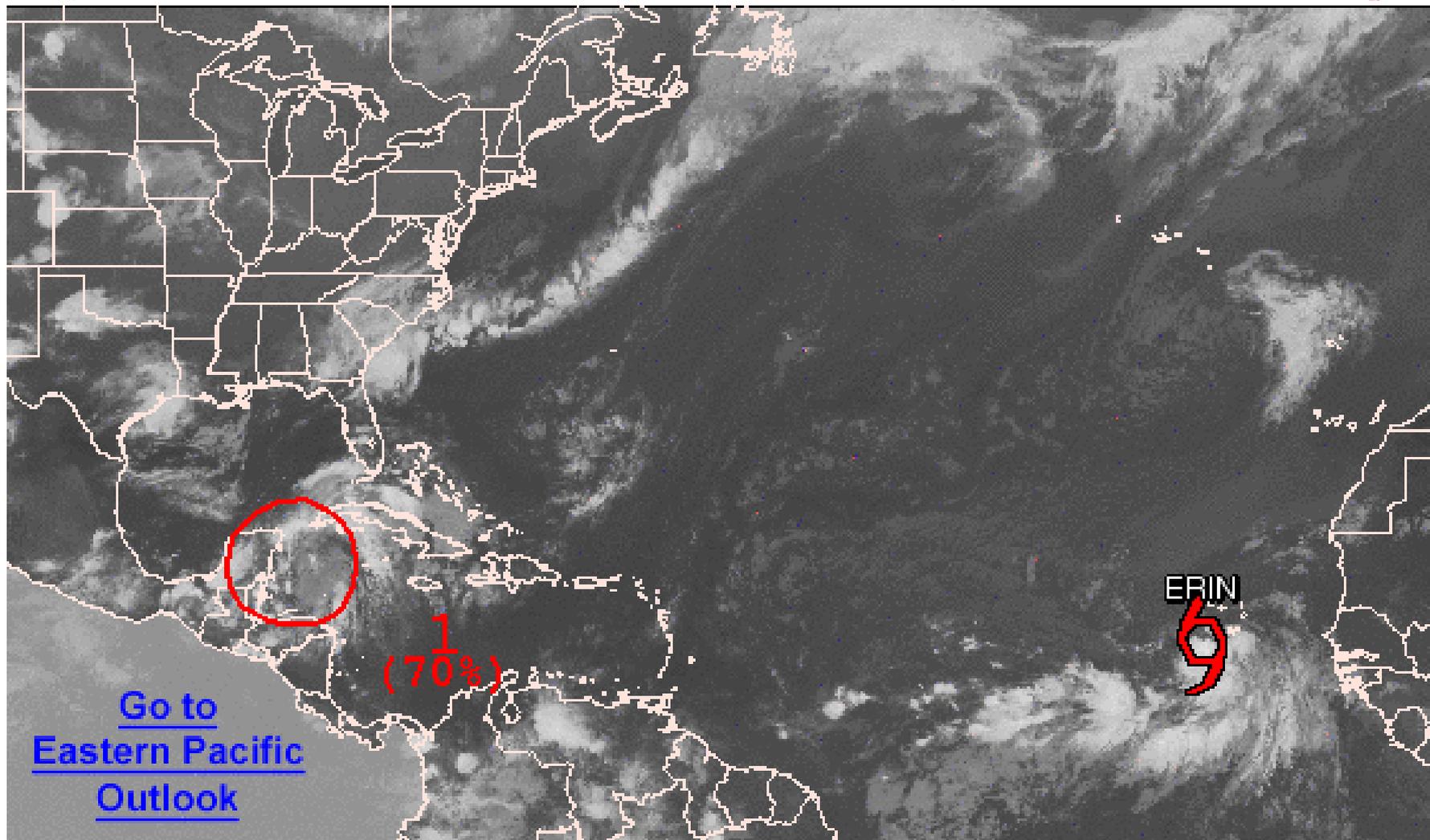
August





Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida



200 AM EDT THU AUG 15 2013

Satellite Image: 1252 AM EDT

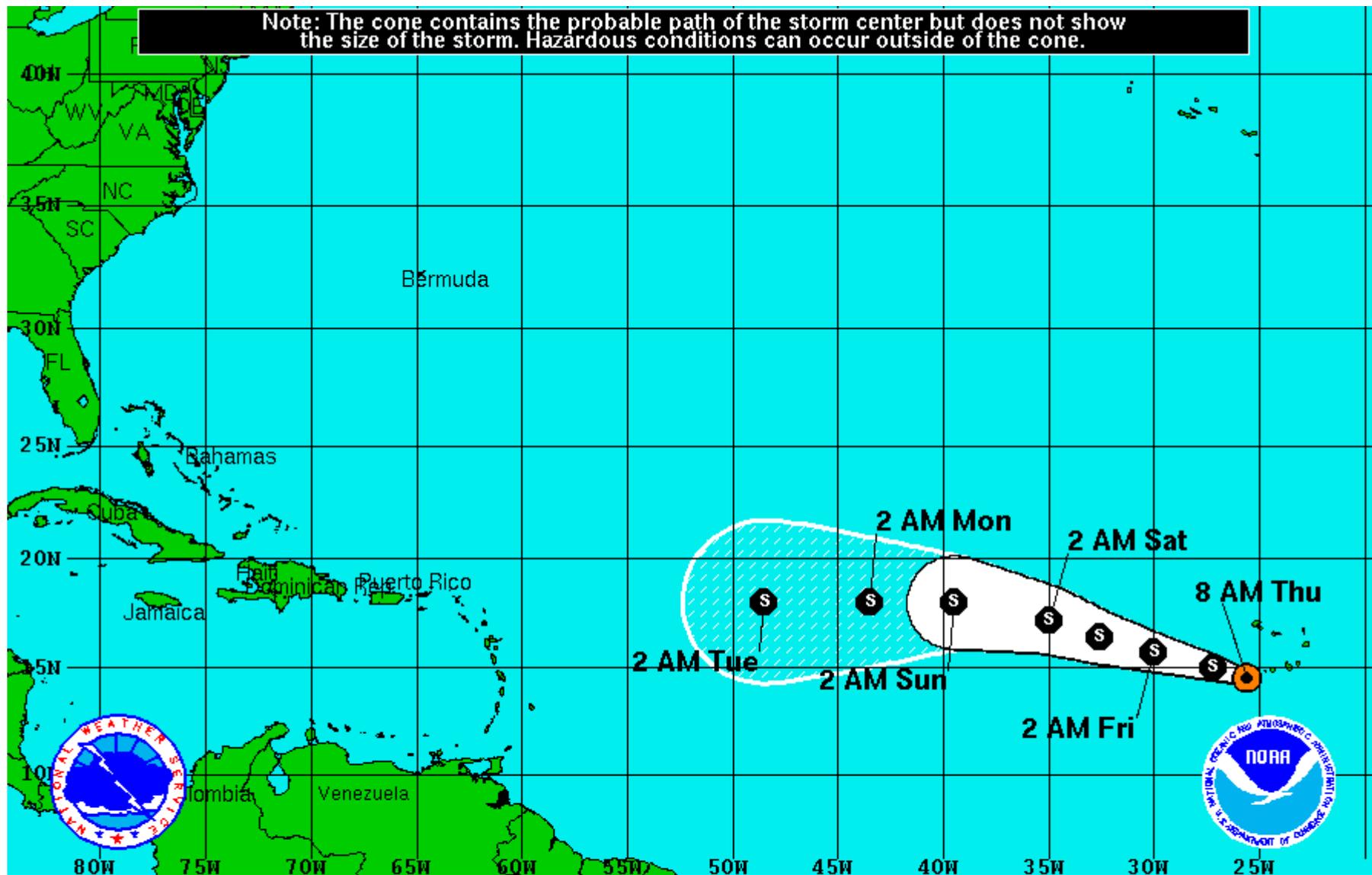
Outlined areas denote current position of systems discussed in the Tropical Weather Outlook. Color indicates probability of tropical cyclone formation within 48 hours.

 Low <30%

 Medium 30-50%

 High >50%

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



Tropical Storm Erin
 Thursday August 15, 2013
 8 AM EDT Intermediate Advisory 2A
 NWS National Hurricane Center

Current Information: 
 Center Location 14.5 N 25.6 W
 Max Sustained Wind 40 mph
 Movement WNW at 16 mph

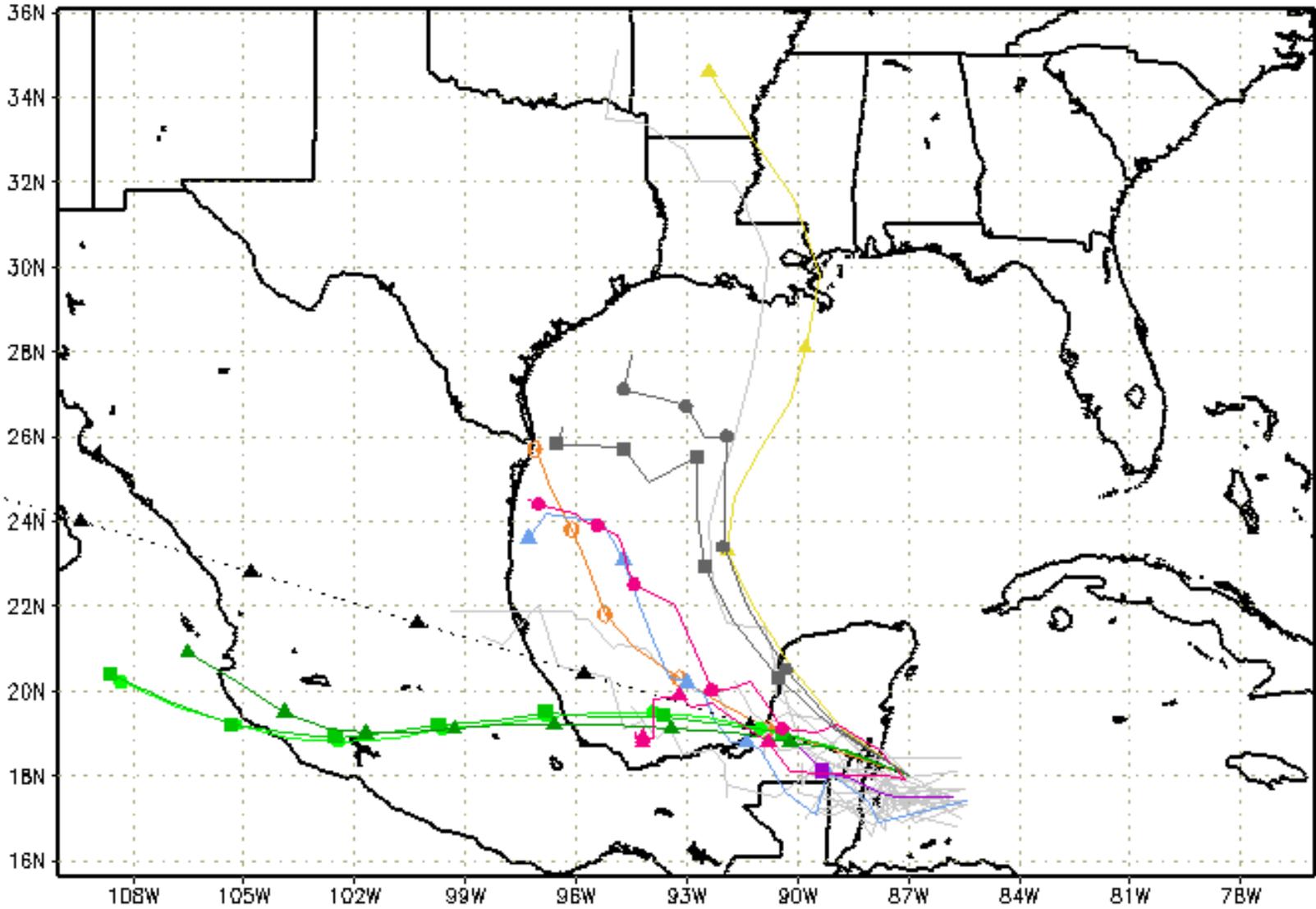
Forecast Positions:
 Tropical Cyclone  Post-Tropical
 Sustained Winds: D < 39 mph
 S 39-73 mph H 74-110 mph M > 110mph

Potential Track Area:
 Day 1-3  Day 4-5

Watches:
 Hurricane  Trop.Storm

Warnings:
 Hurricane  Trop.Storm

- ▲--- XTRP 15/0600Z
- TVCN 15/0600Z
- TV15 15/0600Z
- NHC Not Avail
- ▲--- BAMD 15/0600Z
- BAMM 15/0600Z
- BAMS 15/0600Z
- ▲--- GFDL 15/0600Z
- GFDN Not Avail
- HWRF 15/0600Z
- AHWI 15/0600Z
- ▲--- AVNO 15/0000Z
- AEMN 15/0000Z
- APxx 15/0000Z
- FIM9 15/0600Z
- ▲--- CMC 15/0600Z
- UKM 15/0000Z
- NGPS Not Avail
- GLP5 15/0600Z



storm_92
 sfwmd.gov
 weather@sfwmd.gov
 15-Aug 07:51 EDT

NHC Advisories and County Emergency Management Statements supersede this product. This graphic should complement, not replace, NHC discussions. If anything on this graphic causes confusion, ignore the entire product. For full info, see <http://my.sfwmd.gov/sfwmd/common/images/weather/plots.html>



WET SEASON RESPONSE



Dispersed Water Management Efforts to Reduce Discharges to Estuaries

- Continuing to pursue agreements to pump excess water onto private lands thru reimbursement of direct costs
- Working with other landowners / drainage districts to evaluate options to retain/store water by temporarily modifying their permitted water control structures.
 - Opportunities are limited due to saturated conditions
- Continue operations to maximize storage on District Owned Lands



Ongoing and Emergency Storage Efforts

Ongoing Efforts	Dispersed Water Management Program	61,300 ac/ft average annual
	Regional facilities	72,000 ac/ft average annual
Emergency Storage Efforts	Emergency pumping contracts with landowners	Numerous storage sites- volume stored is being updated continuously (See Website for most current information)
	Pre-project lands emergency storage	
	Other District lands	
	Local Drainage Districts and the EAA	Retaining maximum amount of water possible

DWM - Rafter T Ranch



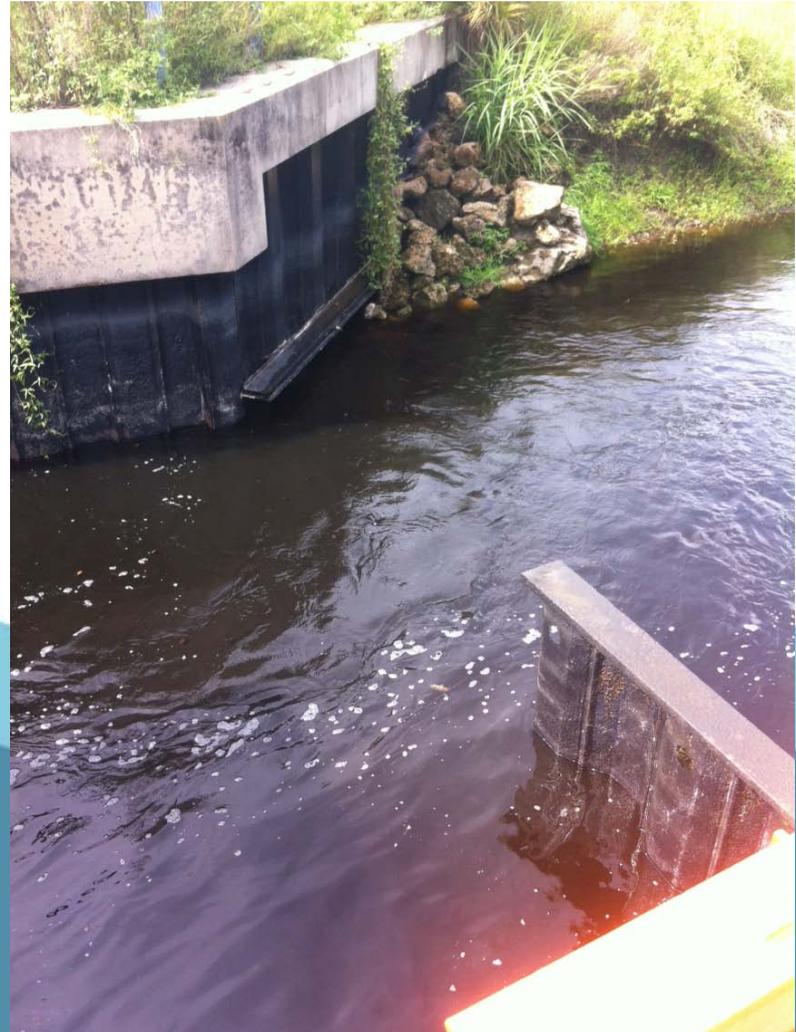
DWM – Dixie Ranch



Kissimmee - Milking R Dairy



Caulkins Citrus Company, LTD



EAA Fallow Fields



Stormwater Treatment Areas



Kissimmee - Grassy Islands Wetlands



Kissimmee Region - Paradise Run



Martin & Palm Beach County - Dupuis Marsh



Martin County – Allapattah Ranch



Martin County - Williamson's Ranch

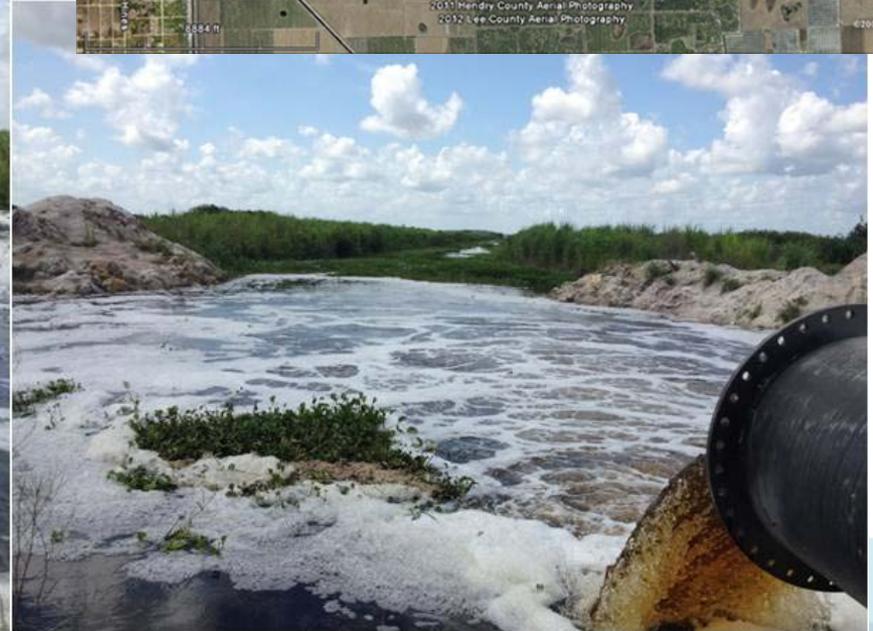
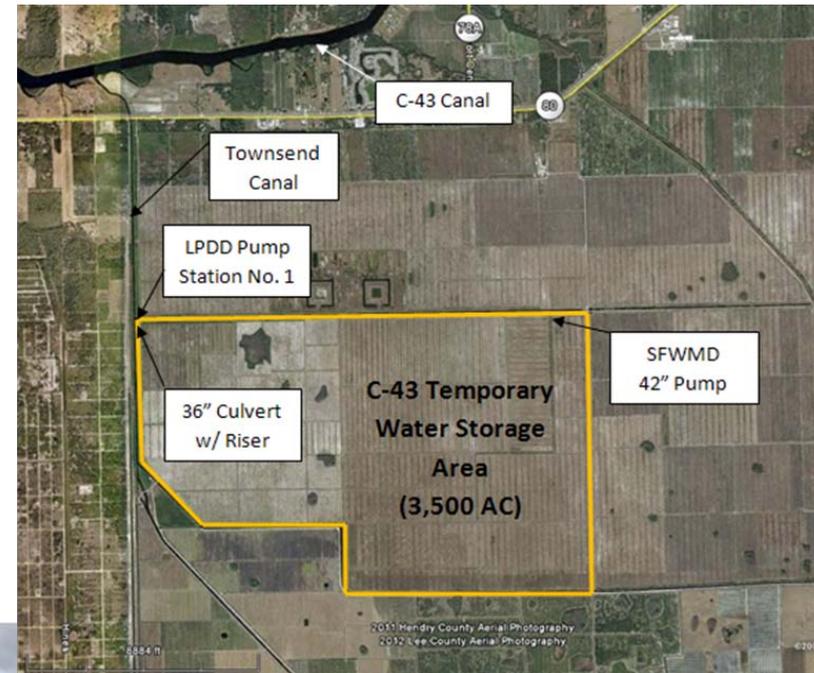


Glades County - BOMA



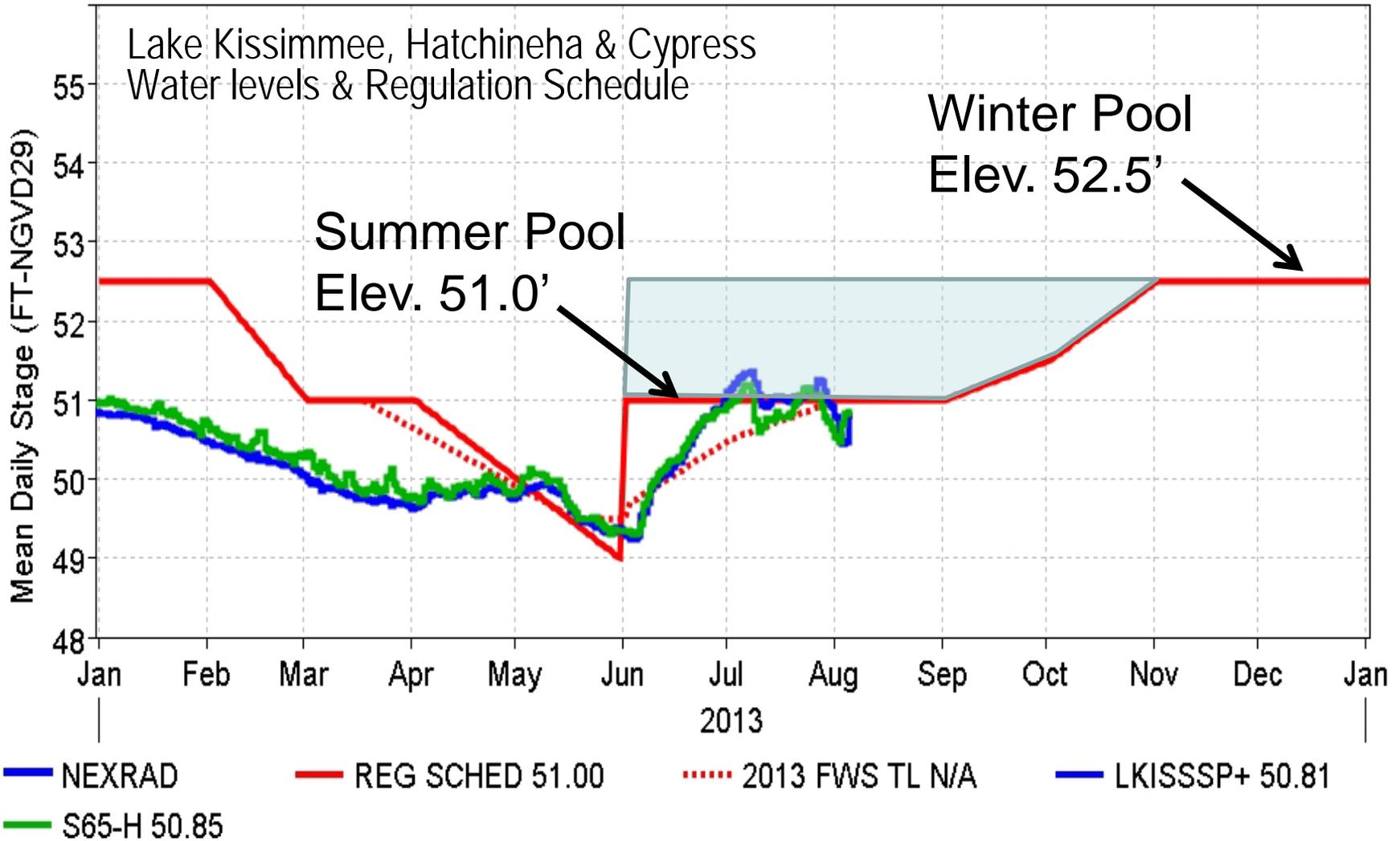
Hendry County - C-43 Reservoir Site

- Pumping started 29-July (estimated 75 cfs)
- 8-hrs per day pumping (estimated volume by 7-Aug approximately 650 acre-feet)
- 2nd pump being installed Friday



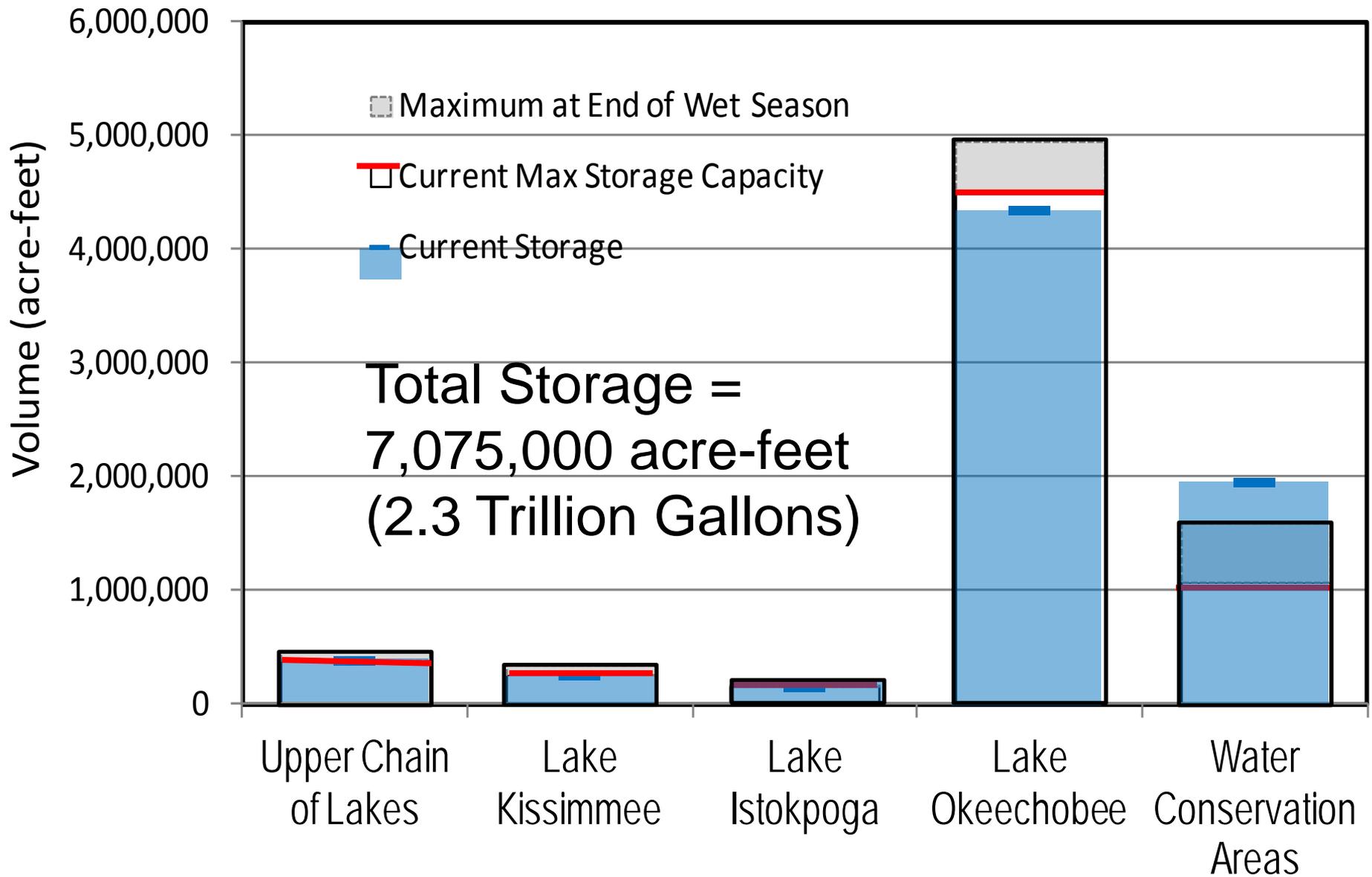
EXISTING SYSTEM LIMITATIONS

Existing Regional Storage Limitations



System Storage Status

5-Aug-2013



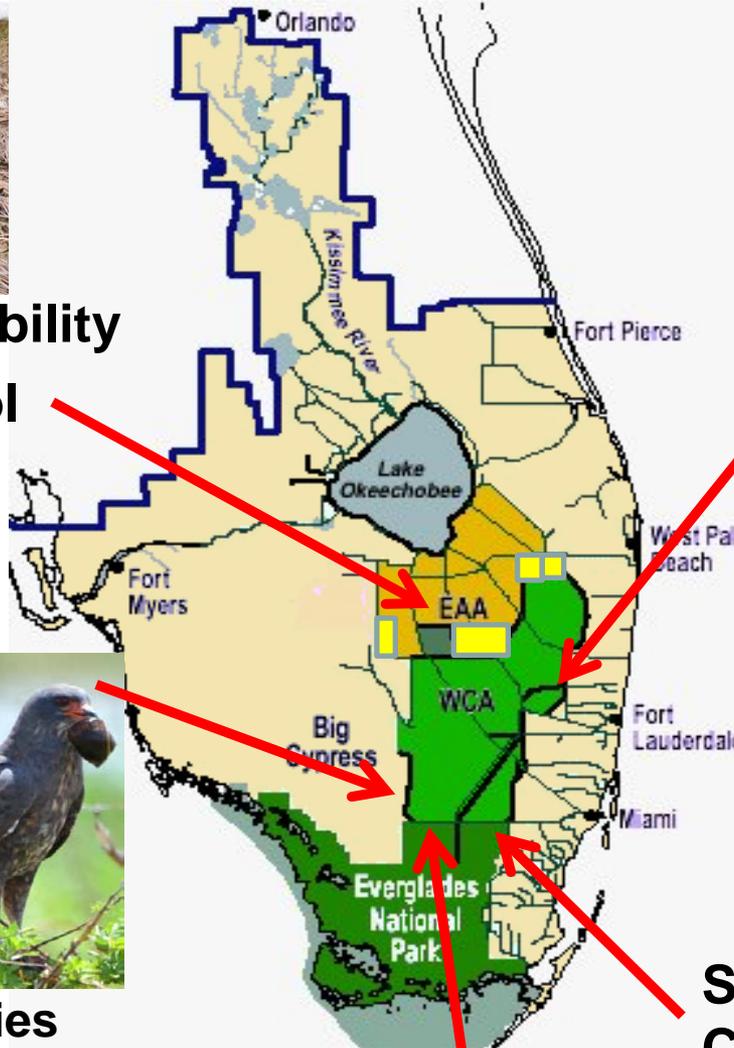
Constraints Limiting Discharge of Excess Water from Lake Okeechobee to the Water Conservation Areas



STA Treatment Capability
EAA Flood Control

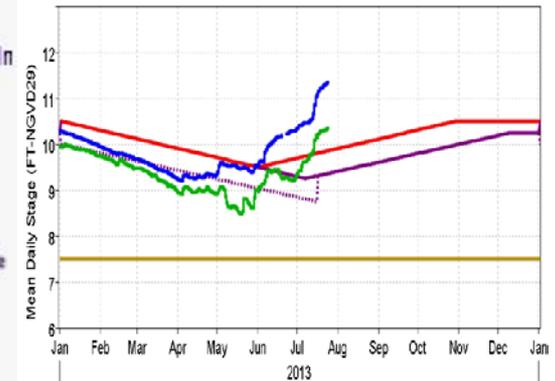


WCA Levee Integrity



Cape Sable Seaside Sparrow, Source: U.S. FWS

Protected Species
(Snail Kite, Black-Necked Stilt & Cape Sable Sparrow)



WCA Water Levels

South Dade Flood Control

S-12 Discharge Capacity

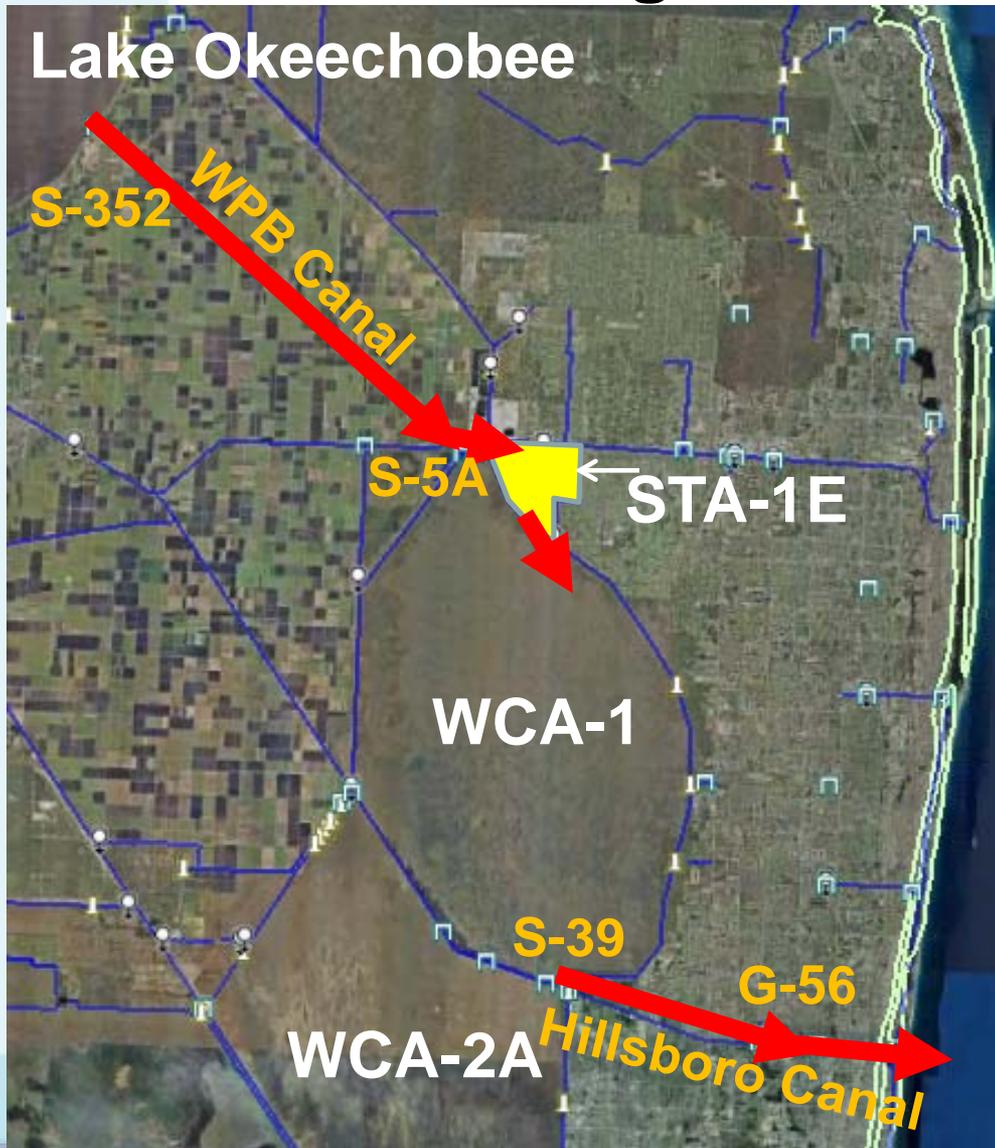


WCA-1 Regulatory Discharge to tide through the LWDD



- When capacity is available in the LWDD Boynton Canal
- Release from WCA-1 via G-94C to SFWMD C-16 discharge from C-16 to tide via S-41
- Discharges through C-51 Canal from Lake O. started in October 2012 with construction of L8 FEB

Lake Okeechobee Regulatory Discharge to tide through STA-1E & WCA-1



- With WCA-1 stage below top of regulation schedule:
 - Release from Lake O to WPB Canal via S-352
 - S-5A pumps water into STA-1E (via G-311) which is subsequently pumped into WCA-1 by S-362
- A volume equal to (or larger) is released from WCA-1 by S-39
- Requires sufficient conveyance capacity in the Hillsboro Canal



Western C-11 Basin Pumping to Tide (reduces inflows to WCA-3A)



When eastern C-11 basin conveyance capacity is available:

- Direct western C-11 Basin flow eastward via S-13AW
- Pump S-13 continuously to provide capacity for S-13AW discharges
 - Cost of \$43,000/month for ~11,000ac-ft or \$3.94/ac-ft
- Results in less C-11 West Basin water pumped into WCA-3A

Maximizing WCA-3A Regulatory Discharge to tide through South Dade Conveyance System



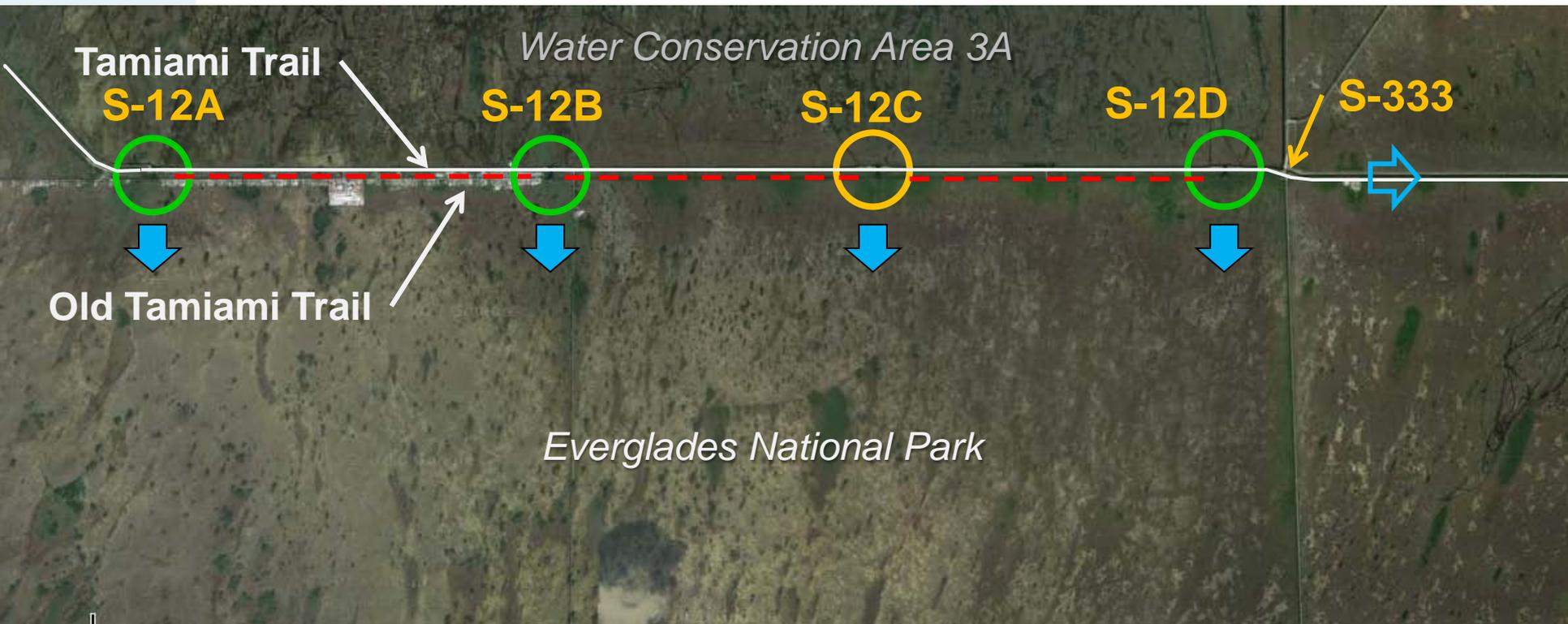
When capacity is available:

- Partially open S-197 to release excess water sufficient to maximize S-331 pumping (3rd pump) & maintain drainage
- Release additional flow from WCA-3A via S-333 and S-334 to L-31N Canal
- Maximize pumping at S-331 to L-31N and C-111
- Maximize pumping to C-111 detention areas



Maximizing WCA-3A Regulatory Discharge to Everglades National Park via the S-12s

- Physical limitations to discharge via S-12s
 - Downstream Vegetation
 - Old Tamiami Trail



Tamiami Trail

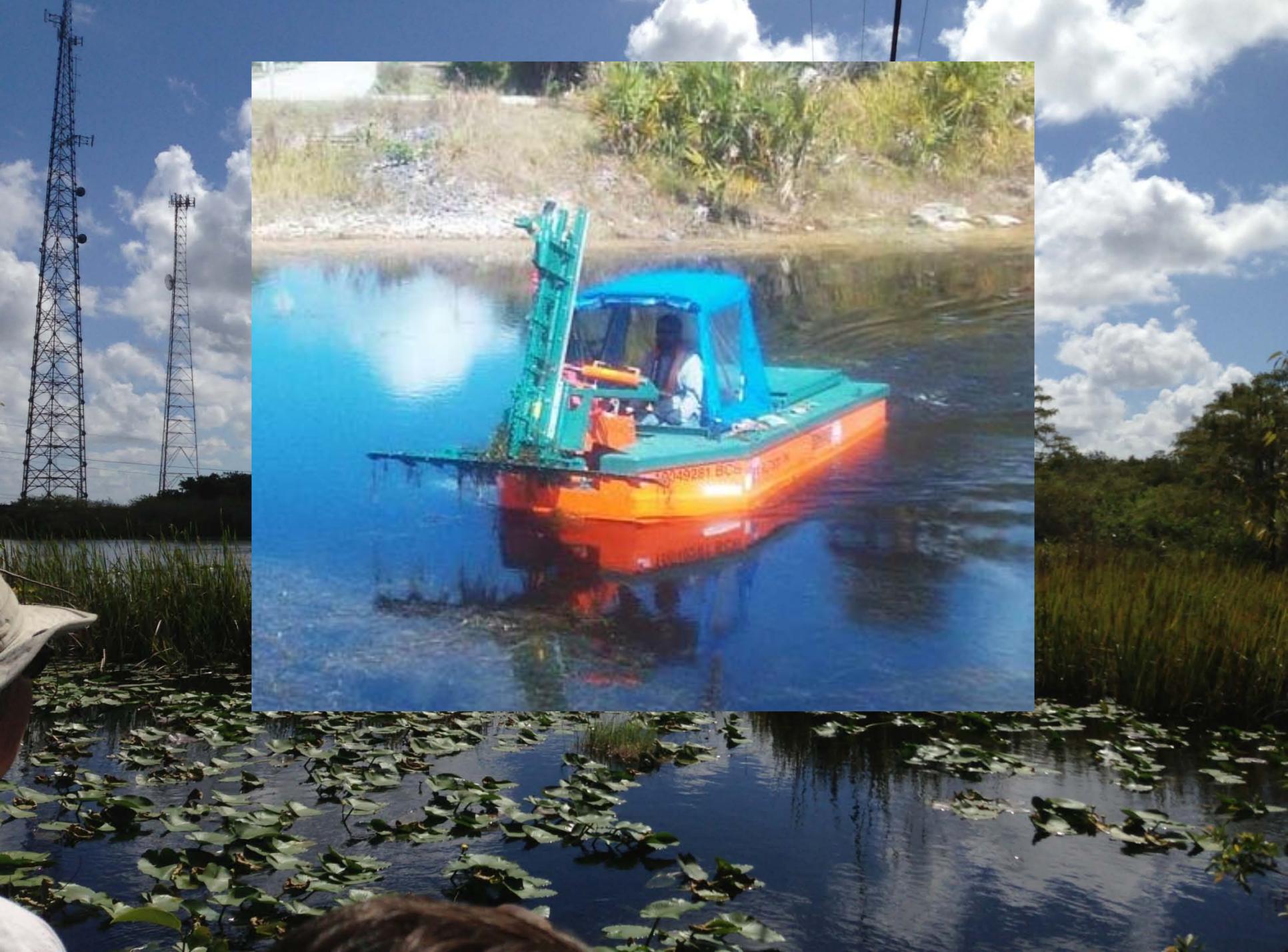
S-12A



Old Tamiami Trail



**Vegetative Resistance
To Flow**



Tamiami Trail

S-12A



**Remove Vegetation ONLY
To create improved flow paths**

Old Tamiami Trail



Less than 1,500 ft.





Tamiami Trail

S-333

L-29 Canal

S-12E (Abandoned)

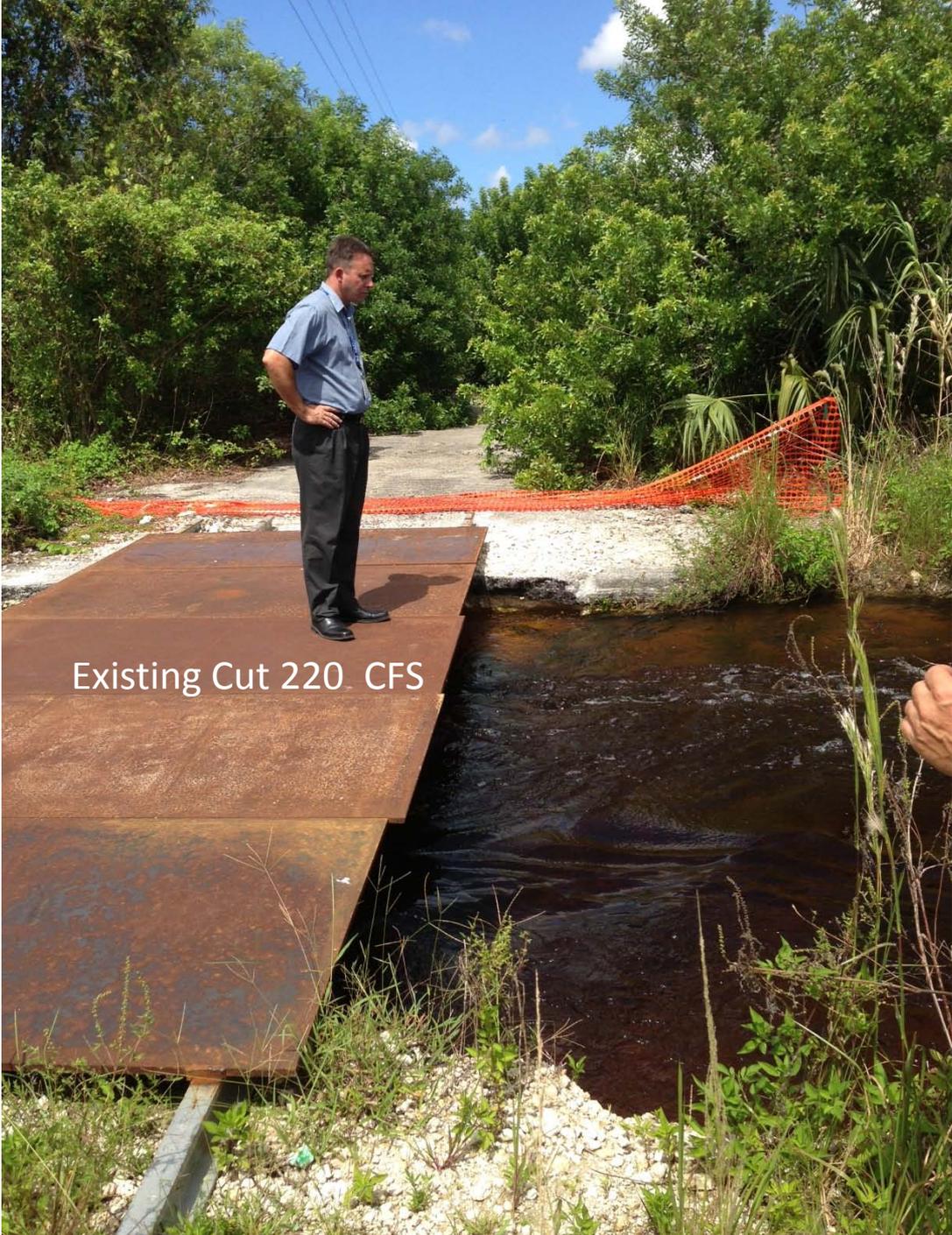
Existing Culverts

Flow from S-12D

Old Tamiami Trail

Old Tamiami Trail
Temporary Gap

Proposed New
Temporary Gap



Existing Cut 220 CFS



Discussion

www.sfwmd.gov/storage