

LAKE OKEECHOBEE REGULATION SCHEDULE (LORS 2008)

Savannah Lacy, P.E.
Water Manager
U.S. Army Corps of Engineers
Jacksonville District
15 October 2019



"The views, opinions and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."



**US Army Corps
of Engineers®**



WHAT WILL YOU LEARN



- The Lake Okeechobee water budget - how much water comes in and out of the lake on an average year and where it goes when it leaves
- What LORS 2008 is and what its purposes are
- How LORS 2008 manages Lake Okeechobee, what parameters and conditions are considered, and what they mean
- What interagency coordination is done as part of managing Lake Okeechobee



WHAT WILL BE COVERED

- Defining LORS
- Central & Southern Florida Project Purposes
- Lake Okeechobee inflows and outflows
- LORS Guidance Part A
- LORS Guidance Part B
- LORS Guidance Part C and overview of Water Conservation Areas
- LORS Guidance Part D
 - Decoding the flow chart
 - Tributary hydrologic conditions
 - Short Term Forecasts
 - Long Term Forecasts
- Other factors considered into decision making process
- Coordination with others
- Key Takeaways
- Questions





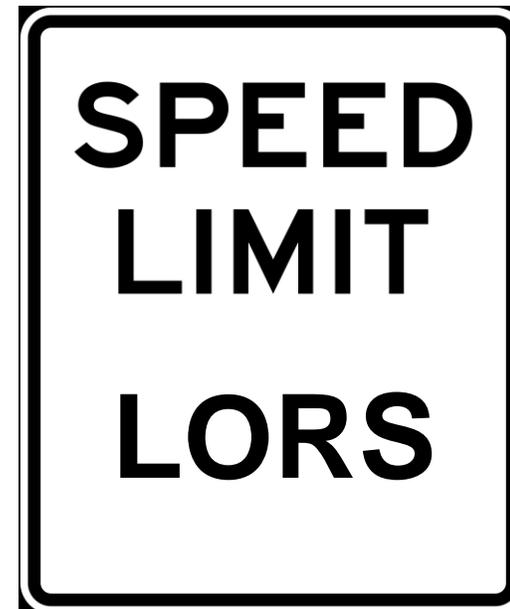
LAKE OKEECHOBEE REGULATION SCHEDULE (LORS) 2008



LORS is the current Water Control Plan for Lake Okeechobee and Everglades Agricultural Area, LOSOM (Lake Okeechobee System Operating Manual) will replace LORS

Establishes: Quantity, timing, and distribution of releases to the WCAs and tide (estuaries)

Intent: Manage water in Lake Okeechobee by making long term, low volume releases to the estuaries and WCAs.

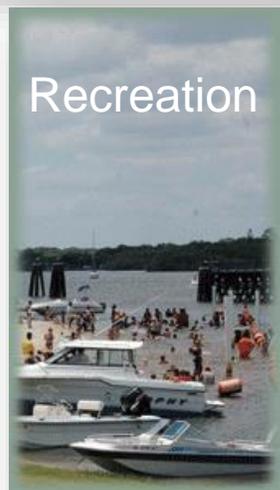
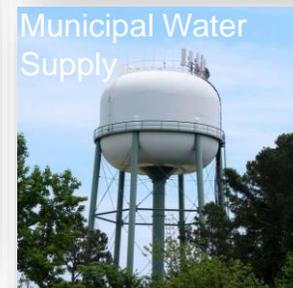
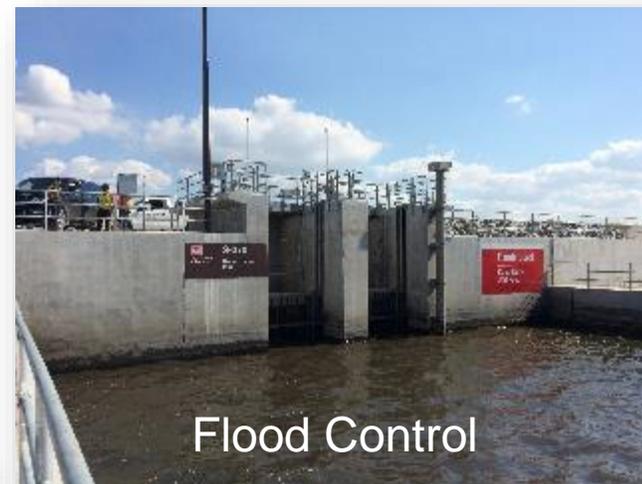
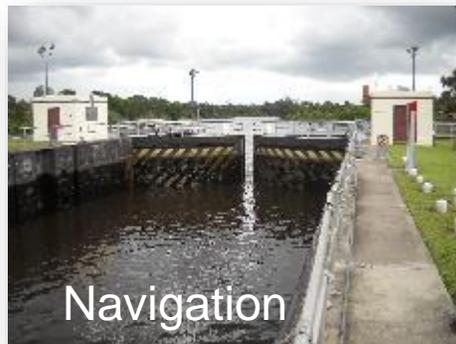




C&SF PROJECT PURPOSES

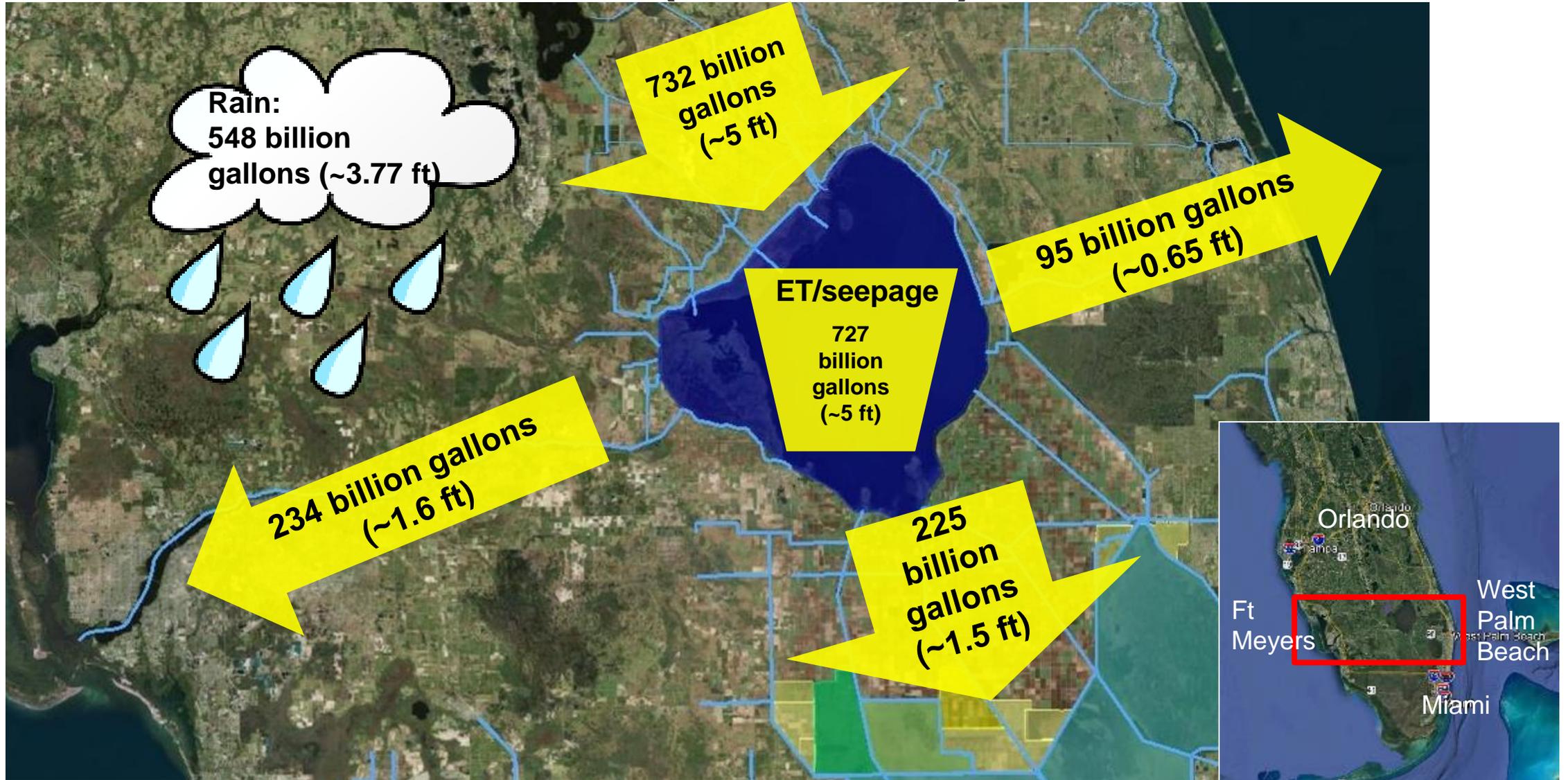


- Flood control
- Navigation
- Enhancement of fish and wildlife
- Recreation
- Water supply for
 - Agriculture
 - Municipalities
 - Industry
 - Everglades National Park
 - Regional groundwater control
 - Salinity control



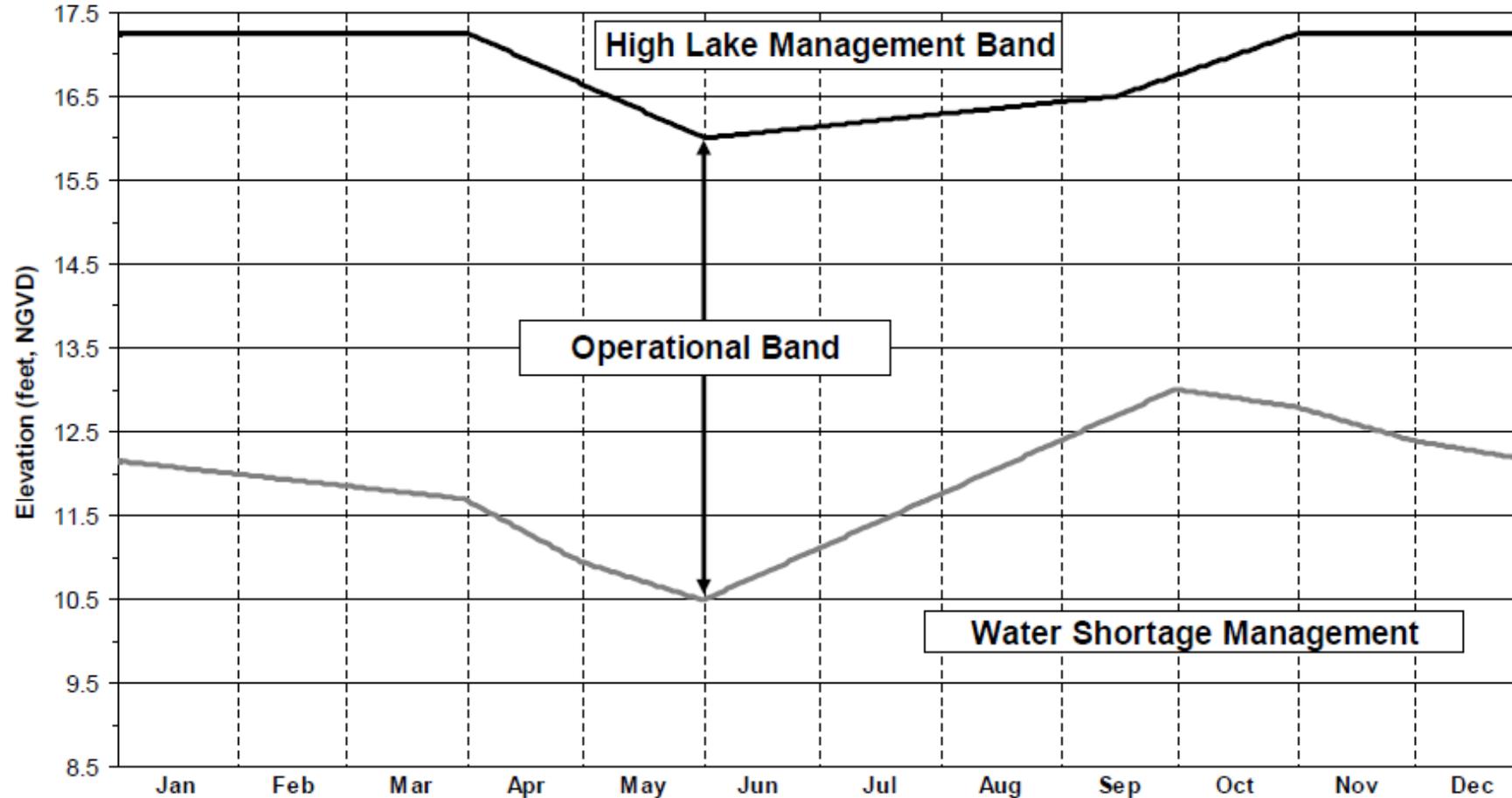


AVERAGE ANNUAL LAKE OKEECHOBEE WATER BUDGET UNDER LORS (2008-2018)





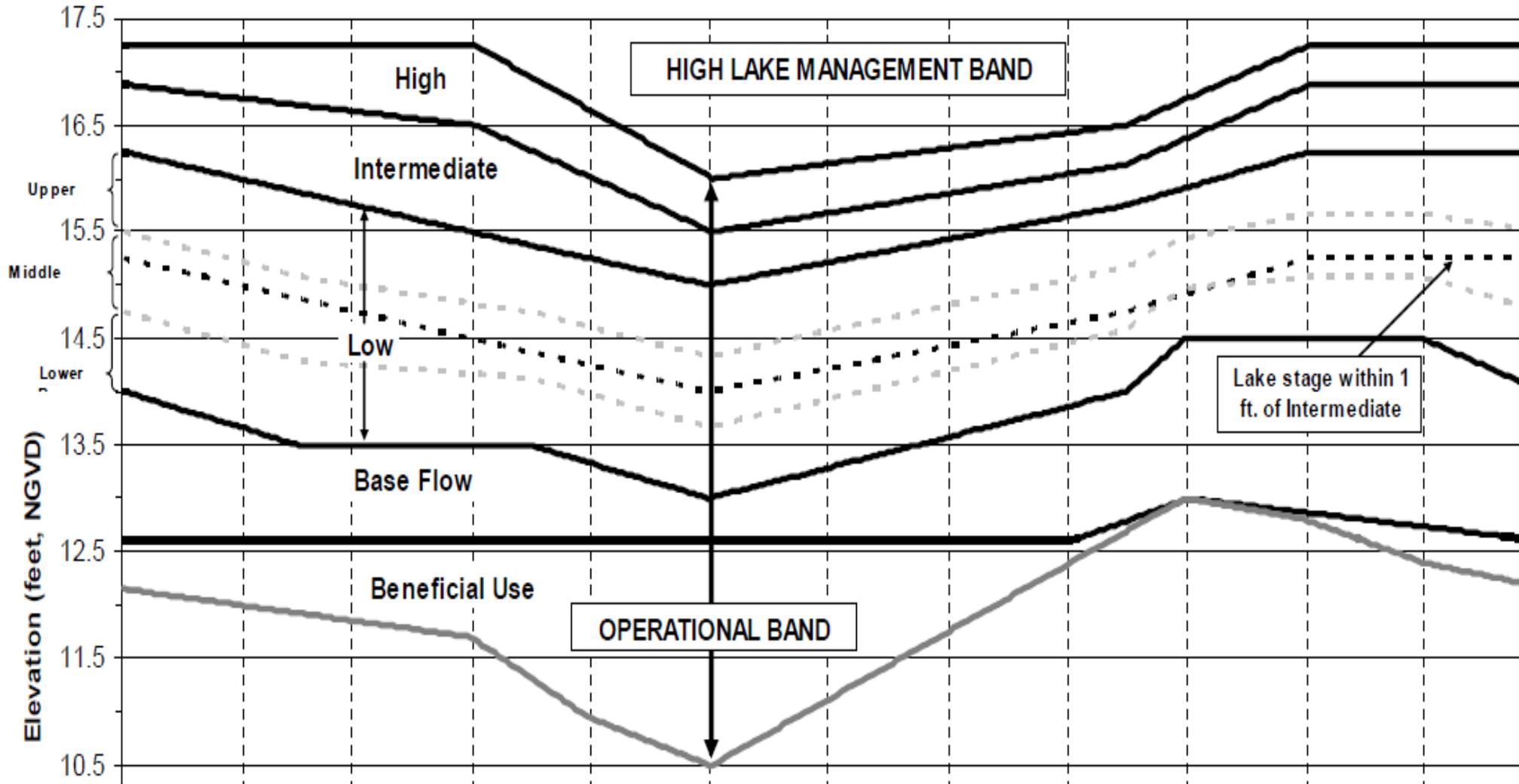
LORS PART A: DEFINES BANDS



Lake Okeechobee water levels historically naturally varied seasonally. Holding Lake Okeechobee at a static level for the duration of the year is operationally impossible.



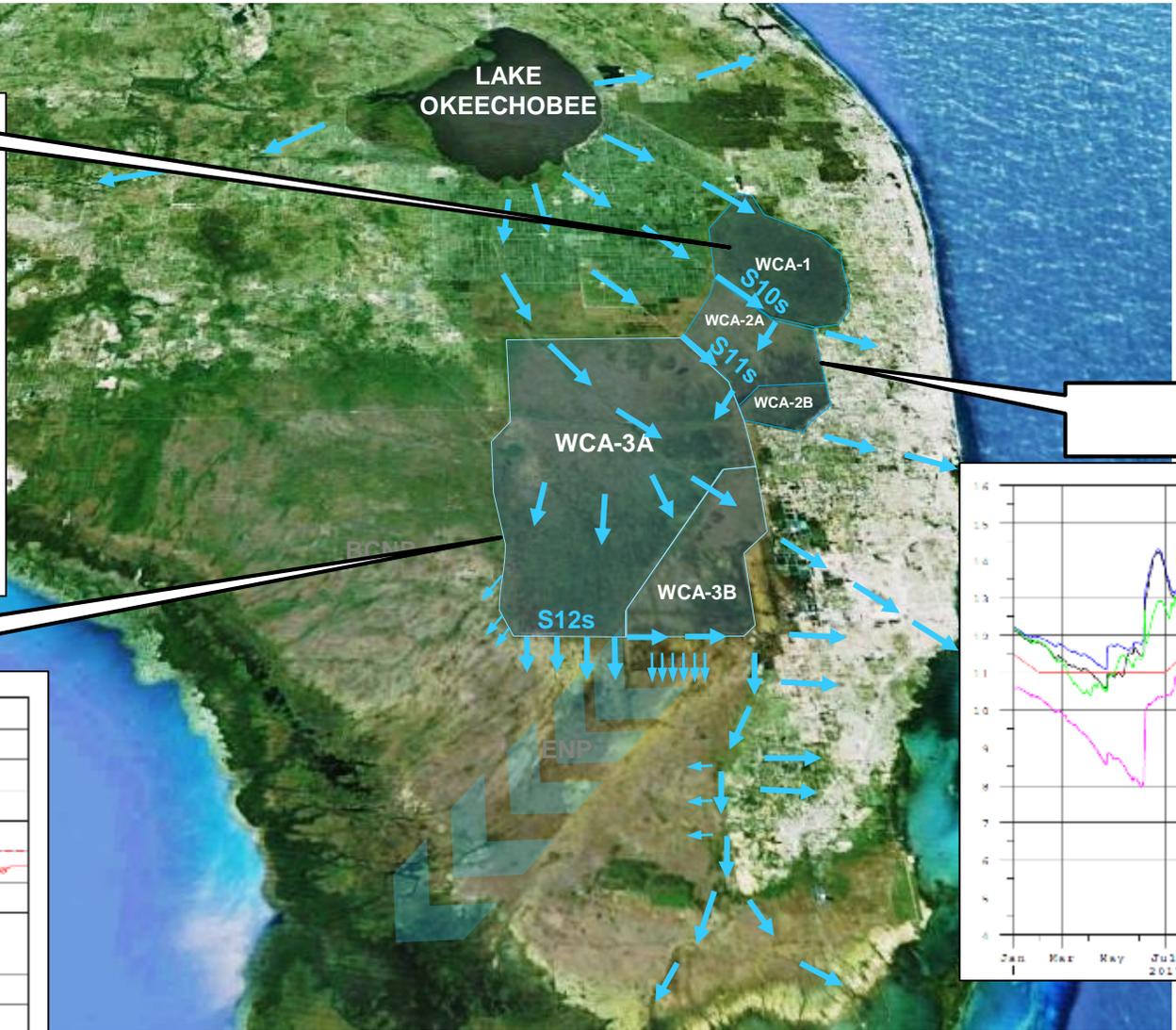
LORS PART B: DEFINES OPERATIONAL SUB-BANDS



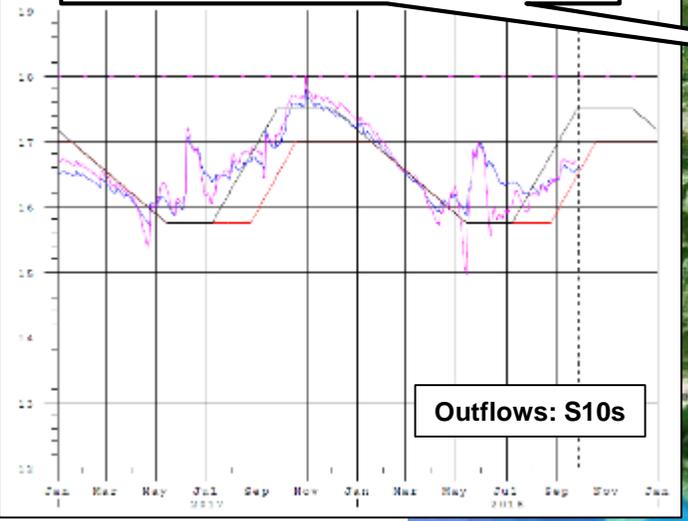
PART C: RELEASE GUIDANCE TO WATER CONSERVATION AREAS



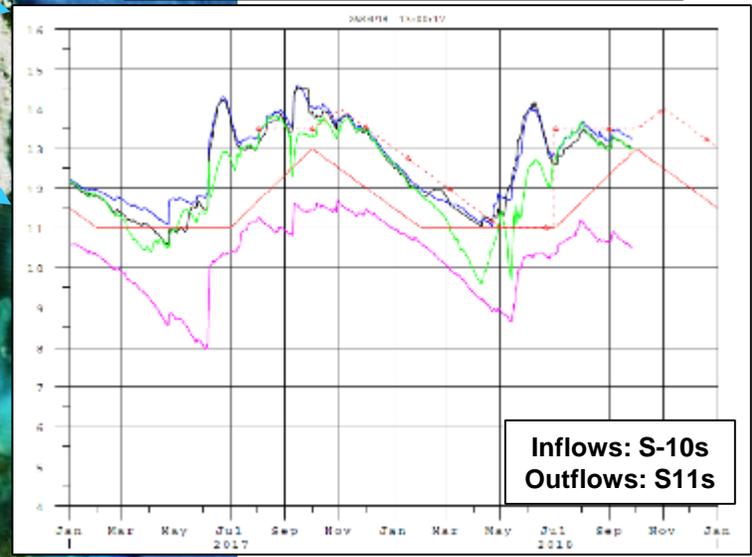
U.S. ARMY



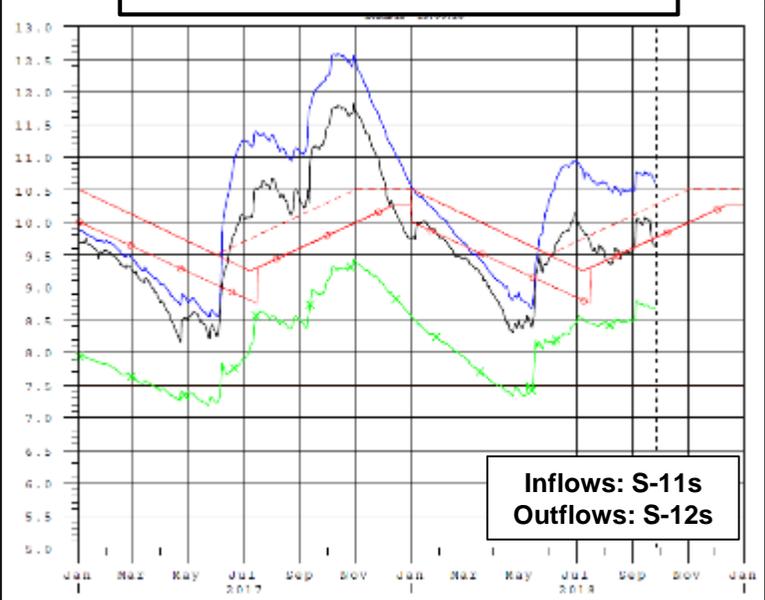
WCA-1



WCA-2A



WCA-3A





PART C: RELEASE GUIDANCE TO WCAS

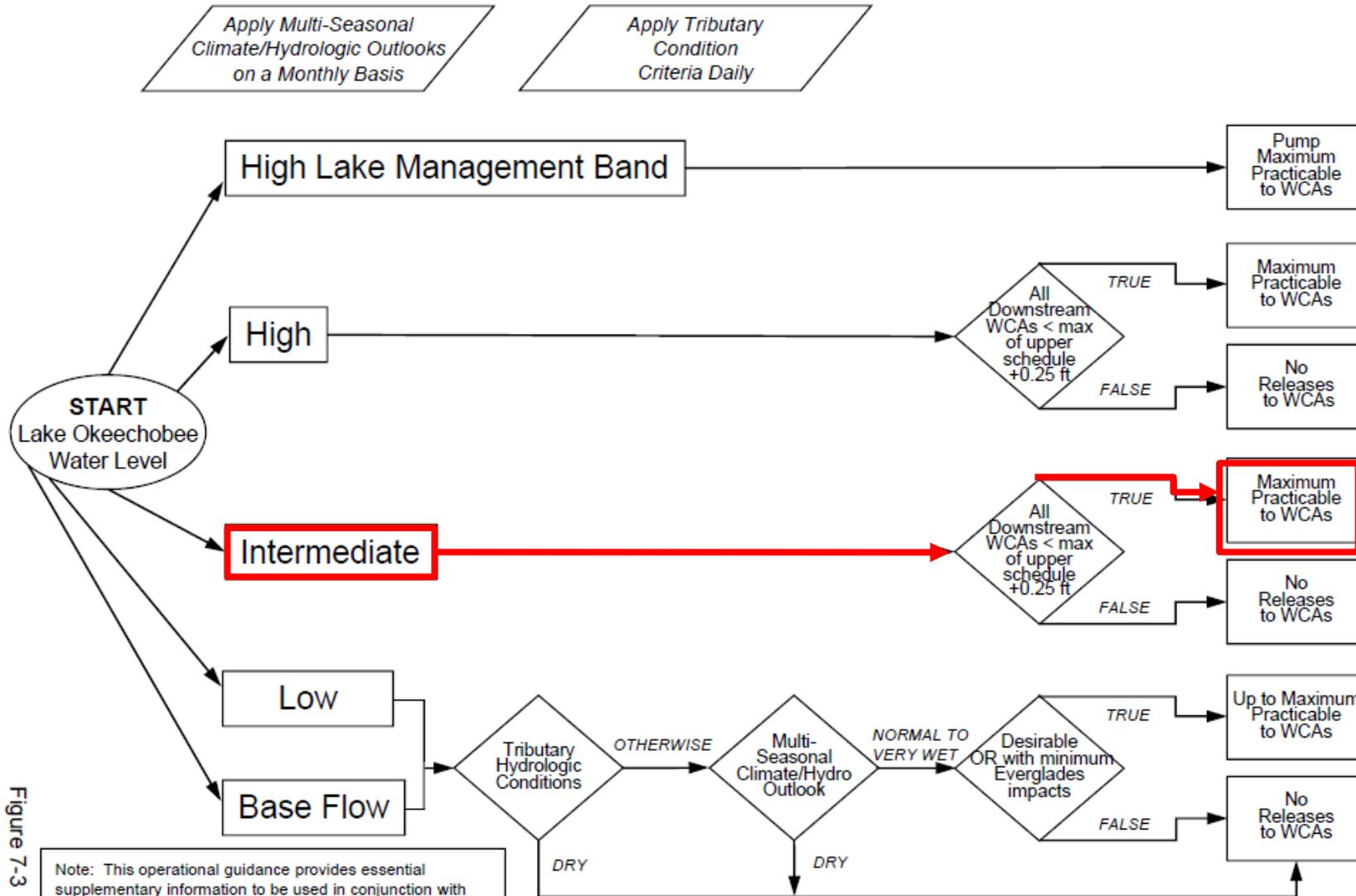


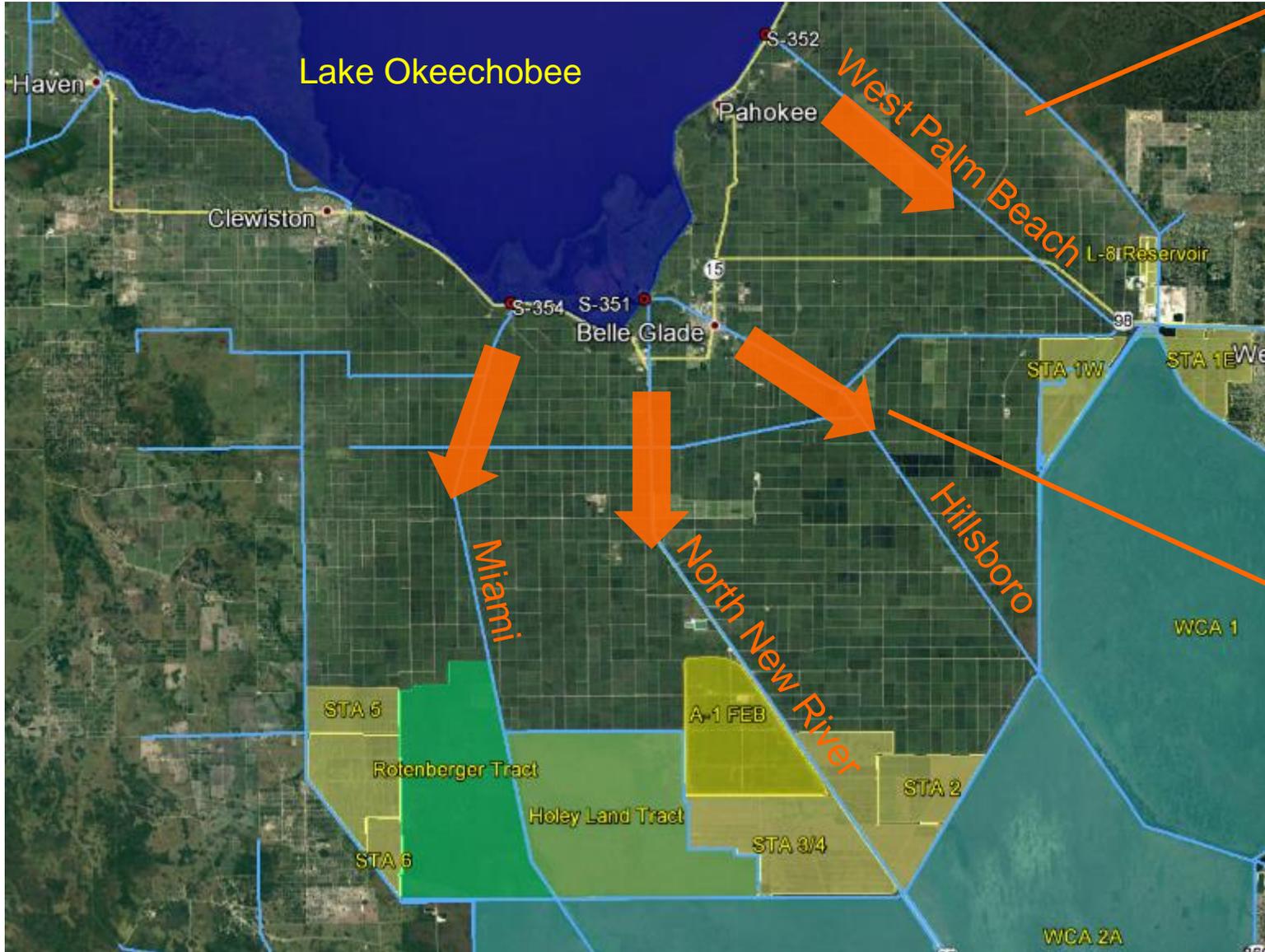
Figure 7-3

Note: This operational guidance provides essential supplementary information to be used in conjunction with other supporting documentation including text within the Water Control Plan.

(Arrows are an example)



EVERGLADES AGRICULTURAL AREA & STORMWATER TREATMENT AREAS



Water flowing south out of Lake Okeechobee goes to:

- EAA agricultural and municipal water supply
- East Coast water supply and to prevent saltwater intrusion into wells
- Everglades environmental water supply via STAs and WCAs and eventually ENP and Big Cypress
- To release Lake Okeechobee water

Constraints

- Canal conveyance
- FEB/STA capacity to store and treat water
- WCA capacity
- Ecological conditions
- Levee Safety

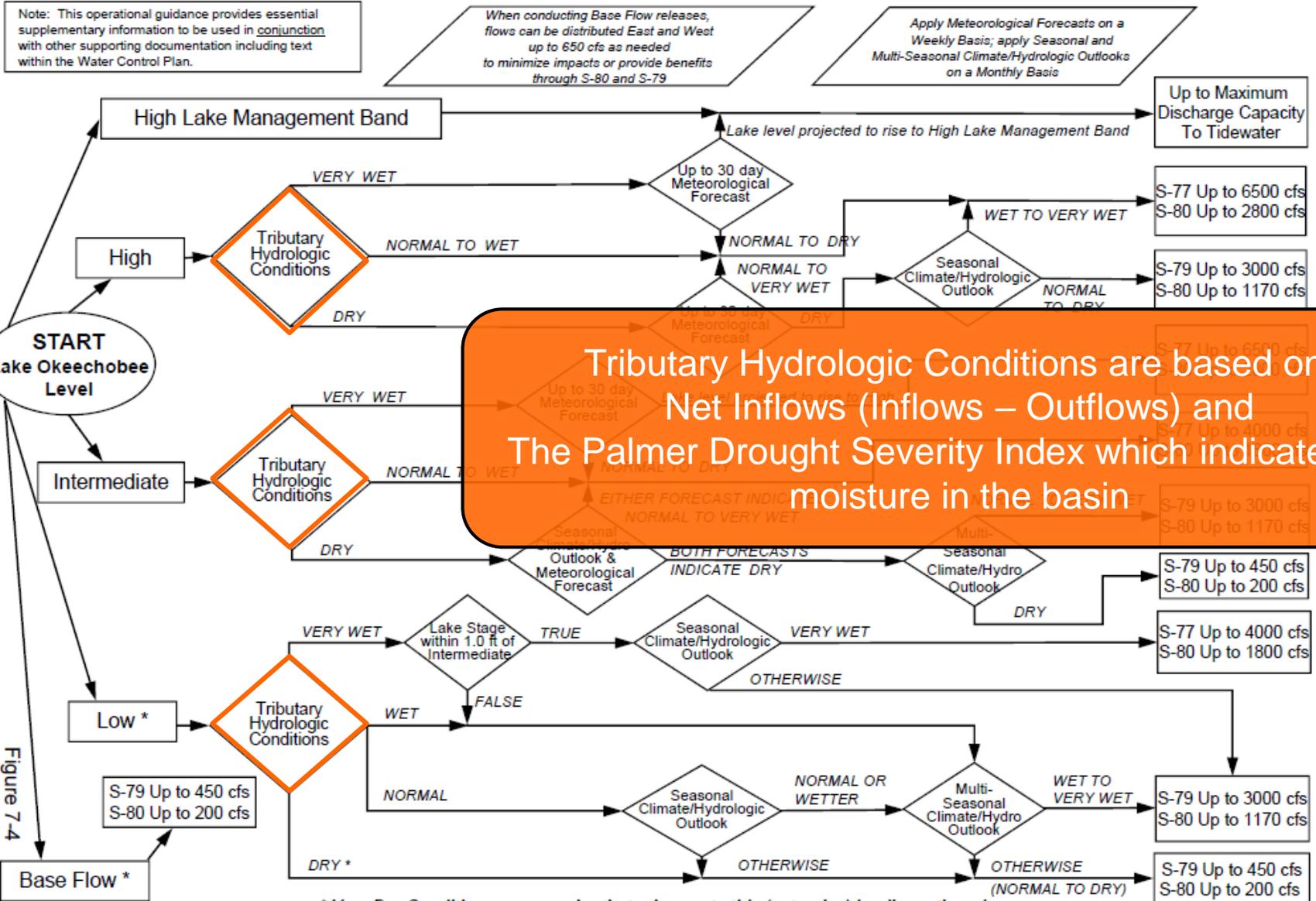


Tributary Hydrologic Conditions



2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)



Tributary Hydrologic Conditions are based on:
 Net Inflows (Inflows – Outflows) and
 The Palmer Drought Severity Index which indicates soil
 moisture in the basin

Figure 7-4

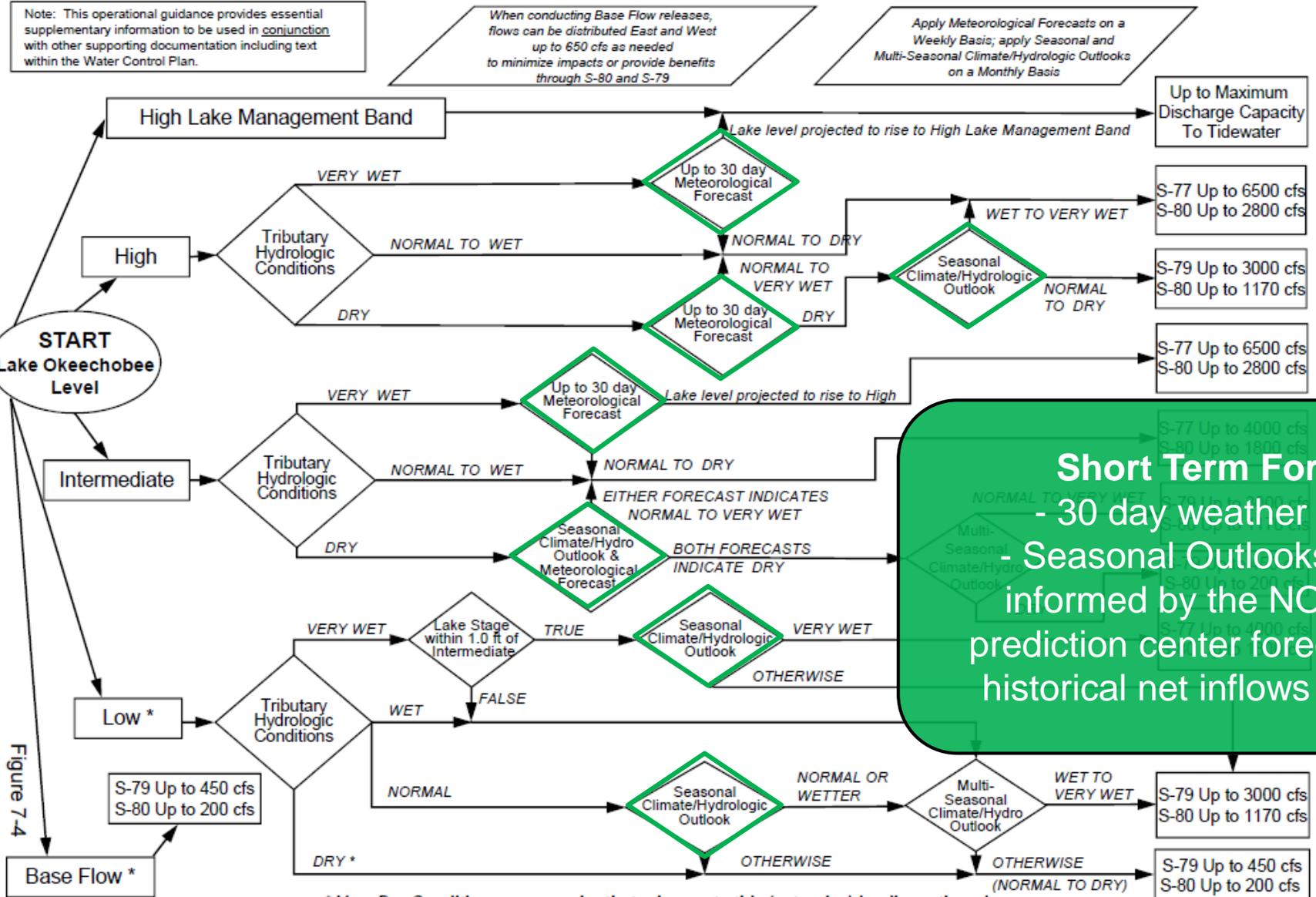
* Very Dry Conditions may require that releases to tide (estuaries) be discontinued



Short Term Forecasts

2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)



Short Term Forecasts:

- 30 day weather forecasts
- Seasonal Outlooks – which is informed by the NOAA climate prediction center forecasts and the historical net inflows into the lake

Figure 7-4

* Very Dry Conditions may require that releases to tide (estuaries) be discontinued



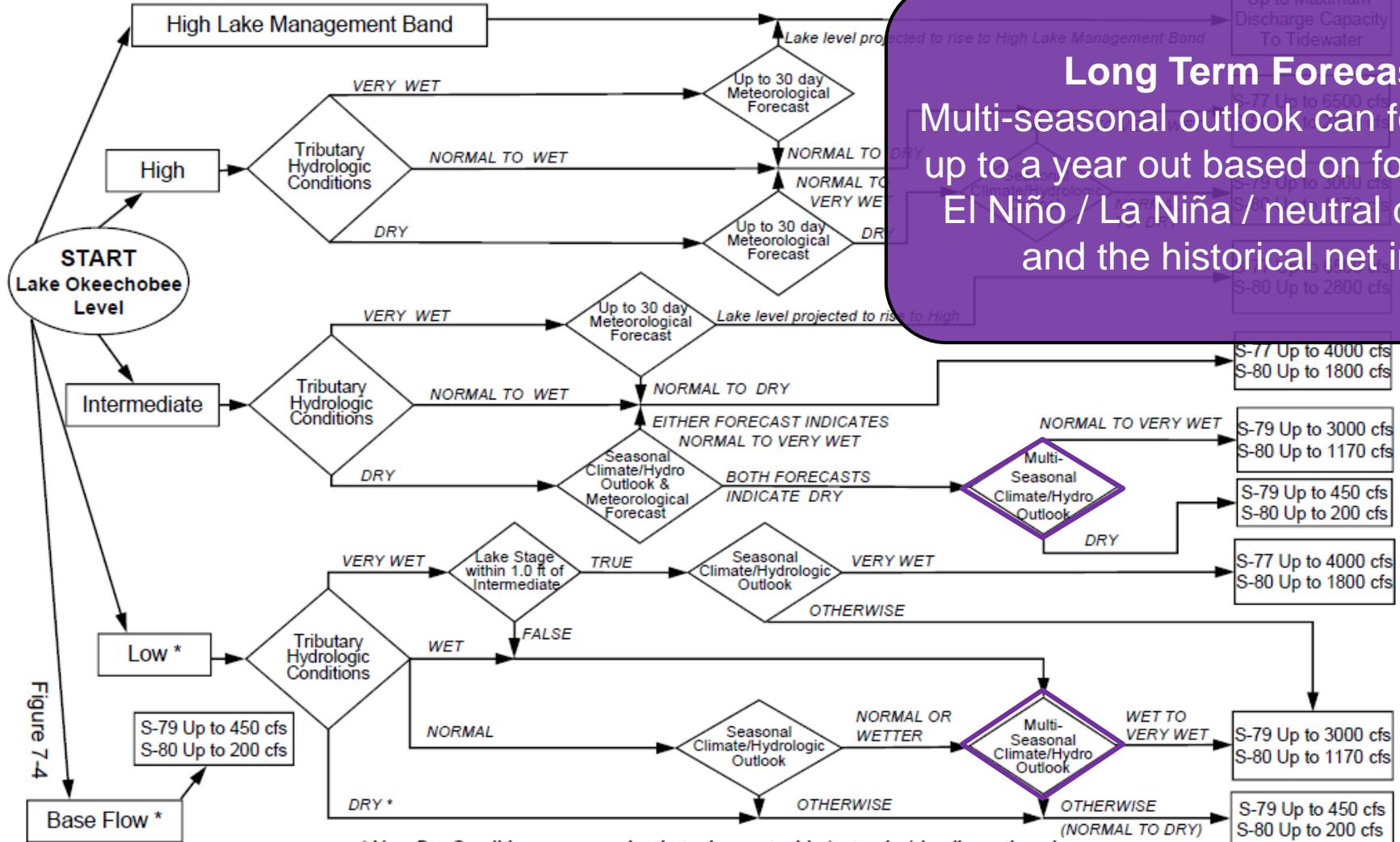
2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)

Note: This operational guidance provides essential supplementary information to be used in conjunction with other supporting documentation including text within the Water Control Plan.

When conducting Base Flow releases, flows can be distributed East and West up to 650 cfs as needed to minimize impacts or provide benefits through S-80 and S-79

Apply Meteorological Forecasts on a Weekly Basis; apply Seasonal and Multi-Seasonal Climate/Hydrologic Outlooks on a Monthly Basis



Long Term Forecast:
Multi-seasonal outlook can forecast out up to a year out based on forecasts for El Niño / La Niña / neutral conditions and the historical net inflow

Figure 7-4

* Very Dry Conditions may require that releases to tide (estuaries) be discontinued

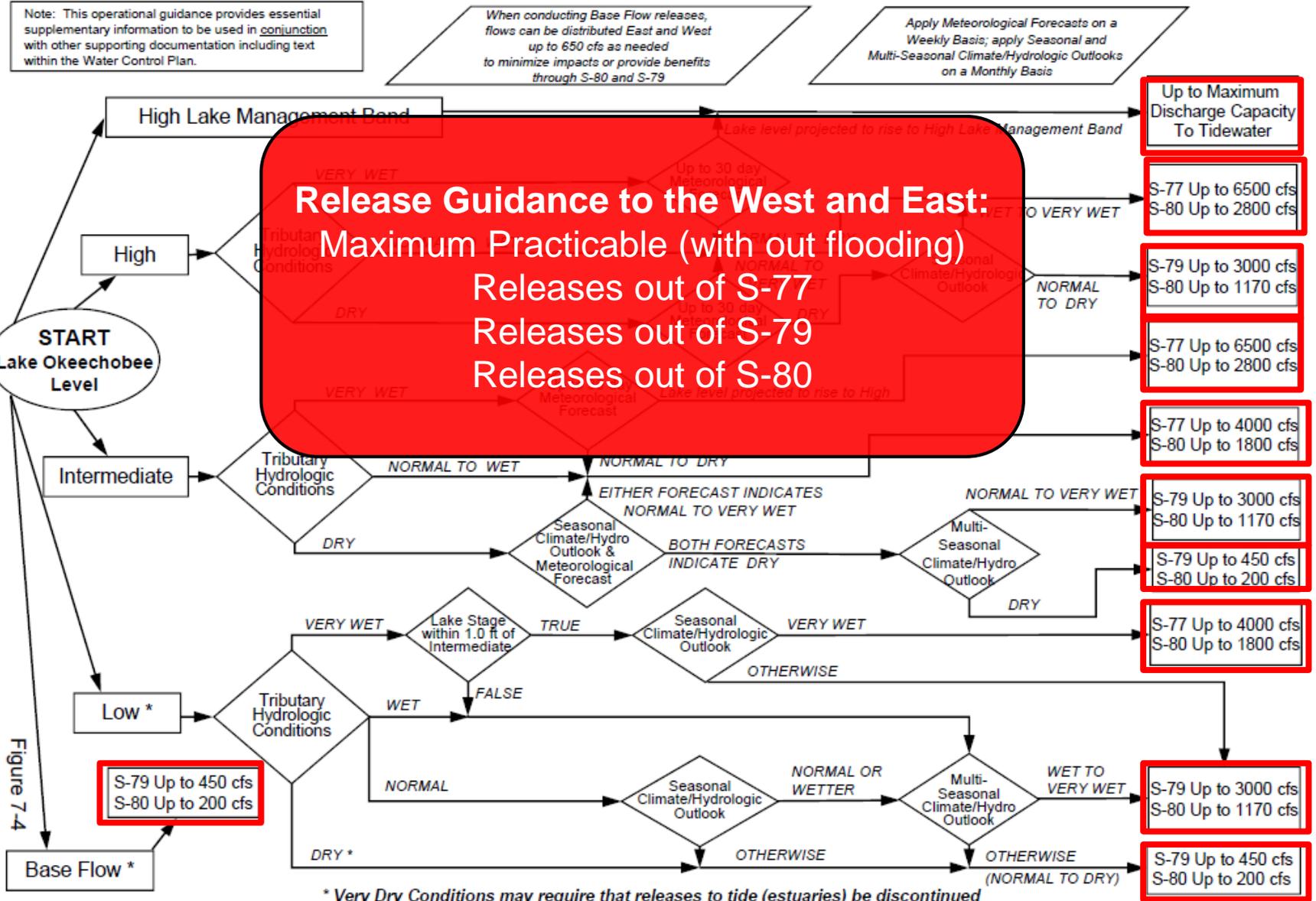


Release Guidance



2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)



Up to Maximum Discharge Capacity To Tidewater

S-77 Up to 6500 cfs
S-80 Up to 2800 cfs

S-79 Up to 3000 cfs
S-80 Up to 1170 cfs

S-77 Up to 6500 cfs
S-80 Up to 2800 cfs

S-77 Up to 4000 cfs
S-80 Up to 1800 cfs

S-79 Up to 3000 cfs
S-80 Up to 1170 cfs

S-79 Up to 450 cfs
S-80 Up to 200 cfs

S-77 Up to 4000 cfs
S-80 Up to 1800 cfs

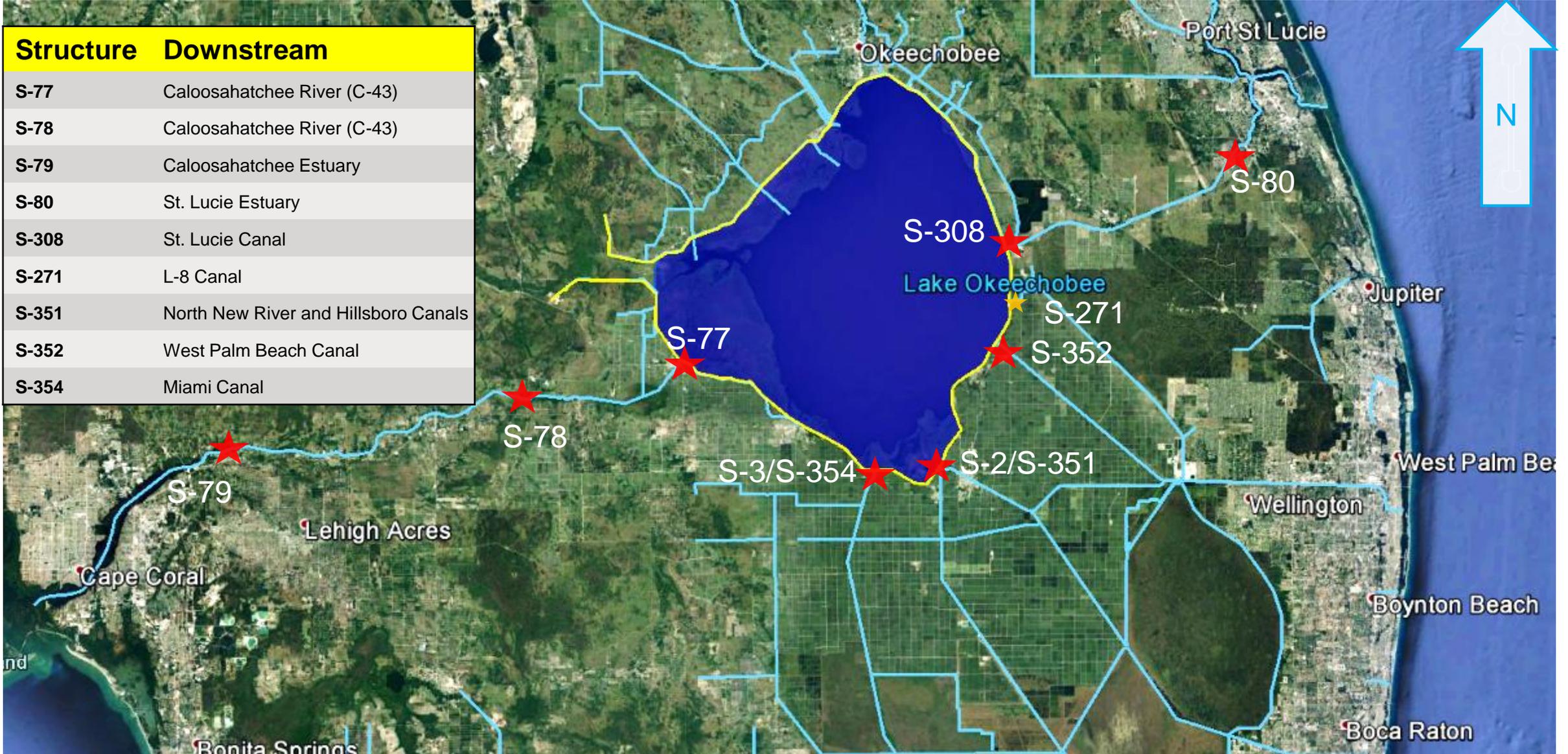
S-79 Up to 450 cfs
S-80 Up to 200 cfs

S-79 Up to 3000 cfs
S-80 Up to 1170 cfs

S-79 Up to 450 cfs
S-80 Up to 200 cfs



STRUCTURES USED TO MANAGE LAKE OKEECHOBEE



Structure	Downstream
S-77	Caloosahatchee River (C-43)
S-78	Caloosahatchee River (C-43)
S-79	Caloosahatchee Estuary
S-80	St. Lucie Estuary
S-308	St. Lucie Canal
S-271	L-8 Canal
S-351	North New River and Hillsboro Canals
S-352	West Palm Beach Canal
S-354	Miami Canal



OTHER FACTORS



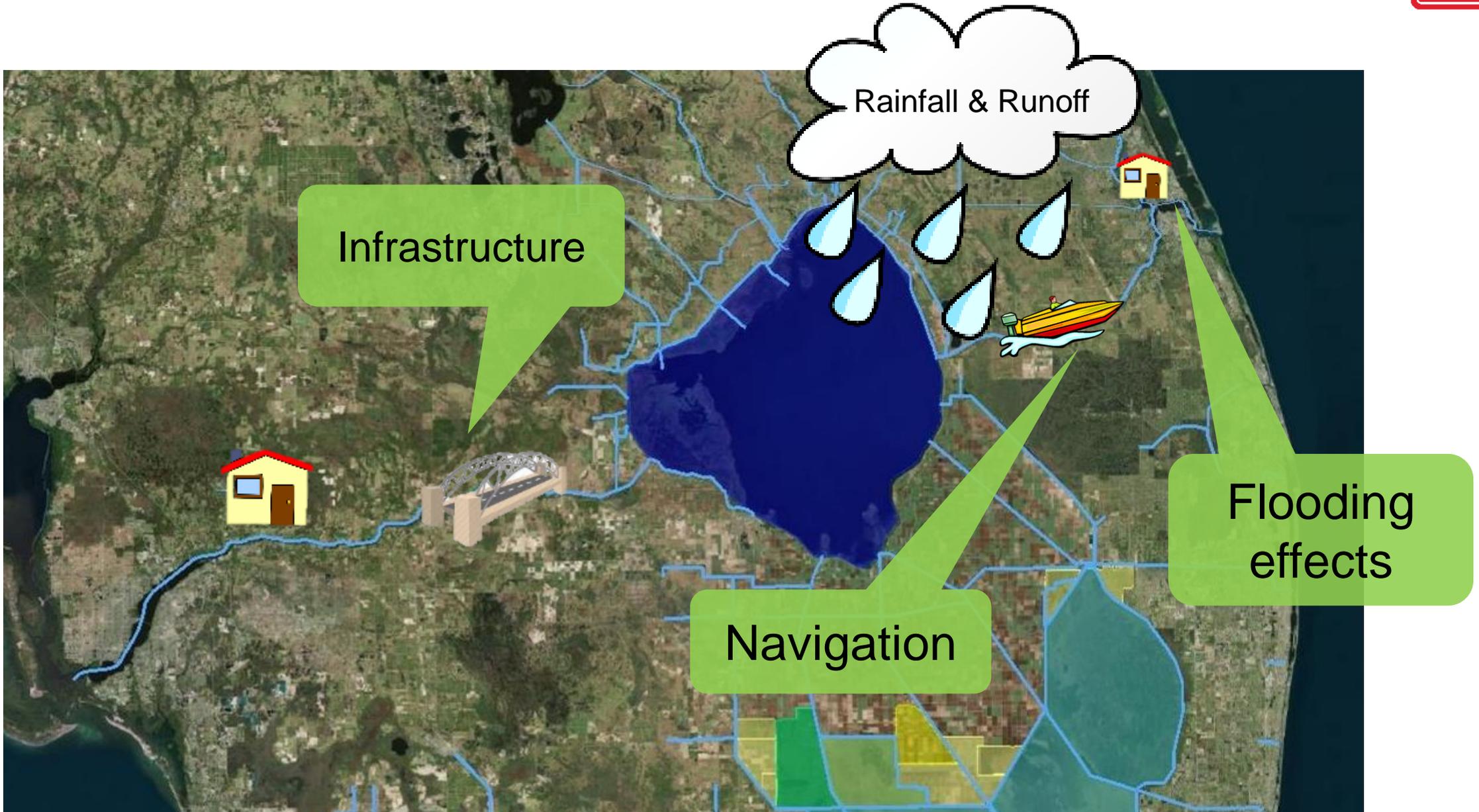
Quantity, timing, and duration of potential releases includes consideration of:

- Estuary Conditions/Needs (salinity, turbidity, algae)
- Lake Okeechobee Ecology Conditions/Needs
- Stormwater Treatment Capacity/Availability
- Water Supply Conditions/Needs (agricultural and municipal)
- Construction Activities
- Deviations in Water Control Plans within the C&SF Project
- Waterway Navigation
- Saltwater Intrusion
- Canal Elevations in EAA, C-44, and C-43





CONSTRAINTS ON RELEASES WEST/EAST





COORDINATION / INFORMATION GATHERING



Local governments



MICCOSUKEE
TRIBE OF INDIANS OF FLORIDA

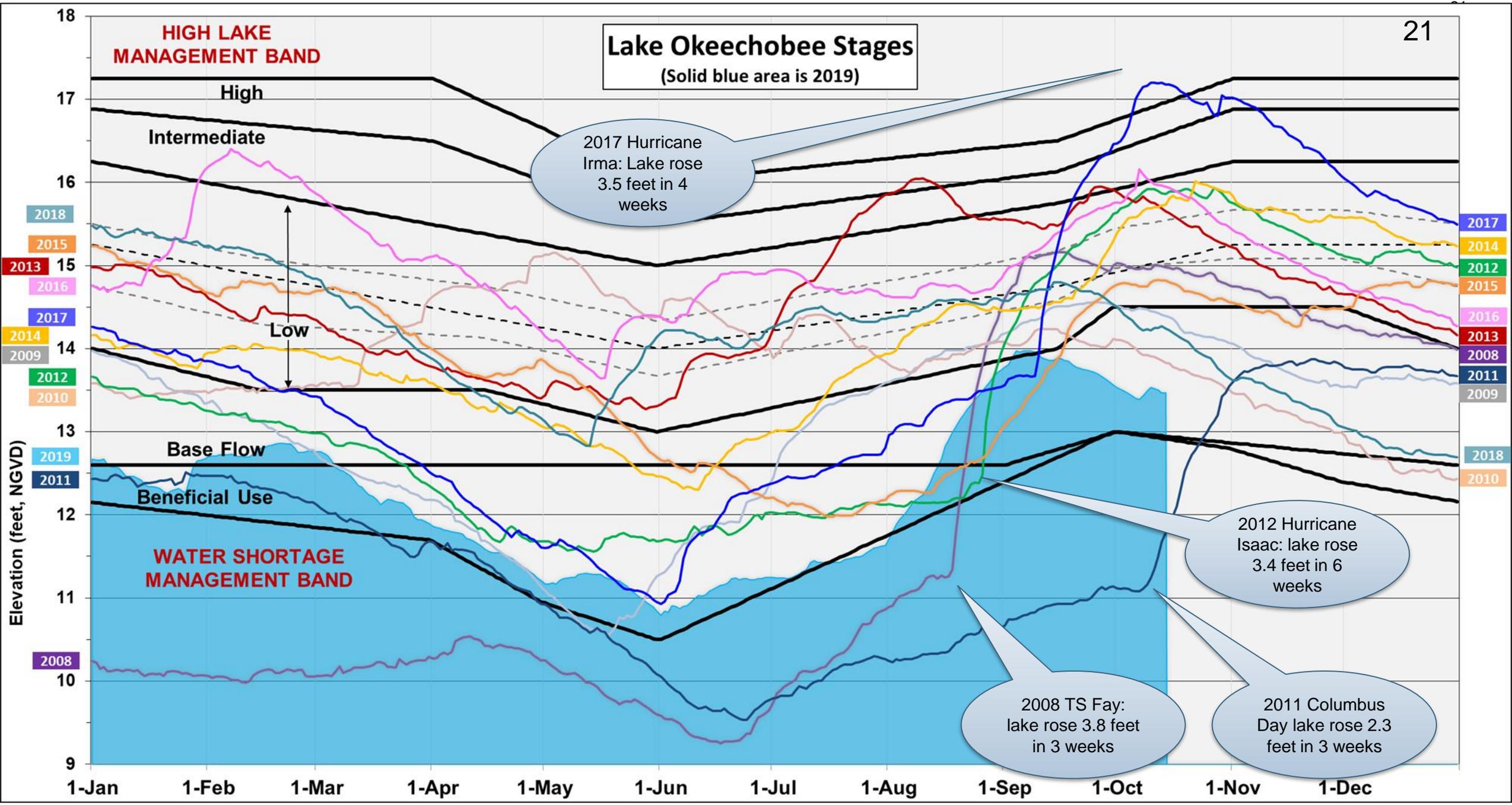


Non-Governmental Agencies



Lake Okeechobee Stages

(Solid blue area is 2019)





KEY TAKEAWAYS



- The Lake Okeechobee water budget will generally remain constant
- LORS 2008 makes long term, low volume release to the estuaries and to the WCAs.
- Project purposes of Lake Okeechobee and the C&SF Project are all *considered*.
- LORS 2008 manages Lake Okeechobee using a combination of metrics and parameters
- Stakeholders should understand how LORS 2008 works and evaluate its successes and faults when looking forward to LOSOM.





LAKE OKEECHOBEE CURRENT OPERATIONS



2008 Lake Okeechobee Regulation Schedule (LORS)

- **Operational Flexibility** authorized under existing LORS
 - **Why?** To lower the lake for ecological recovery and provide dry season flows to Caloosahatchee
 - **How?** Released more water during this last dry season within bounds of LORS
 - **Did it Work?** Yes, we lowered the lake around 1 foot and we have seen great improvement in submerged aquatic vegetation in the lake and salinities in the Caloosahatchee stayed within optimal ranges
- **Proposed Deviation to LORS**
 - **Why?** Optimized lake management with harmful algal blooms (HABs)
 - **How?** Release more water when risk of impacts to HABs is low, release less water when risk is high as amendment to LORS
 - **When?** Out for public comment until 20 September



Photo: Savannah Lacy (USACE)
Submerged aquatic vegetation in Lake Okeechobee

QUESTIONS

Savannah Lacy, P.E.

USACE Lake Okeechobee Water Manager

SAVANNAH.H.LACY@USACE.ARMY.MIL

904-232-2840