SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Governing Board Meeting
September 9, 2010

Adaptive Protocols For Lake Okeechobee Operations

Status Update and Governing Board Concurrence

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What are Adaptive Protocols for Lake Okeechobee Operations?

- Opportunity to fine-tune Lake operations
- Clarifies release amounts that are within the "flexibility" provided in the USACE's Lake Okeechobee Regulation Schedule (2008 LORS)
- Operating Guidance used by SFWMD to make release recommendations to the USACE
- SFWMD public process began in August 2009
- Monthly WRAC special issues workshops

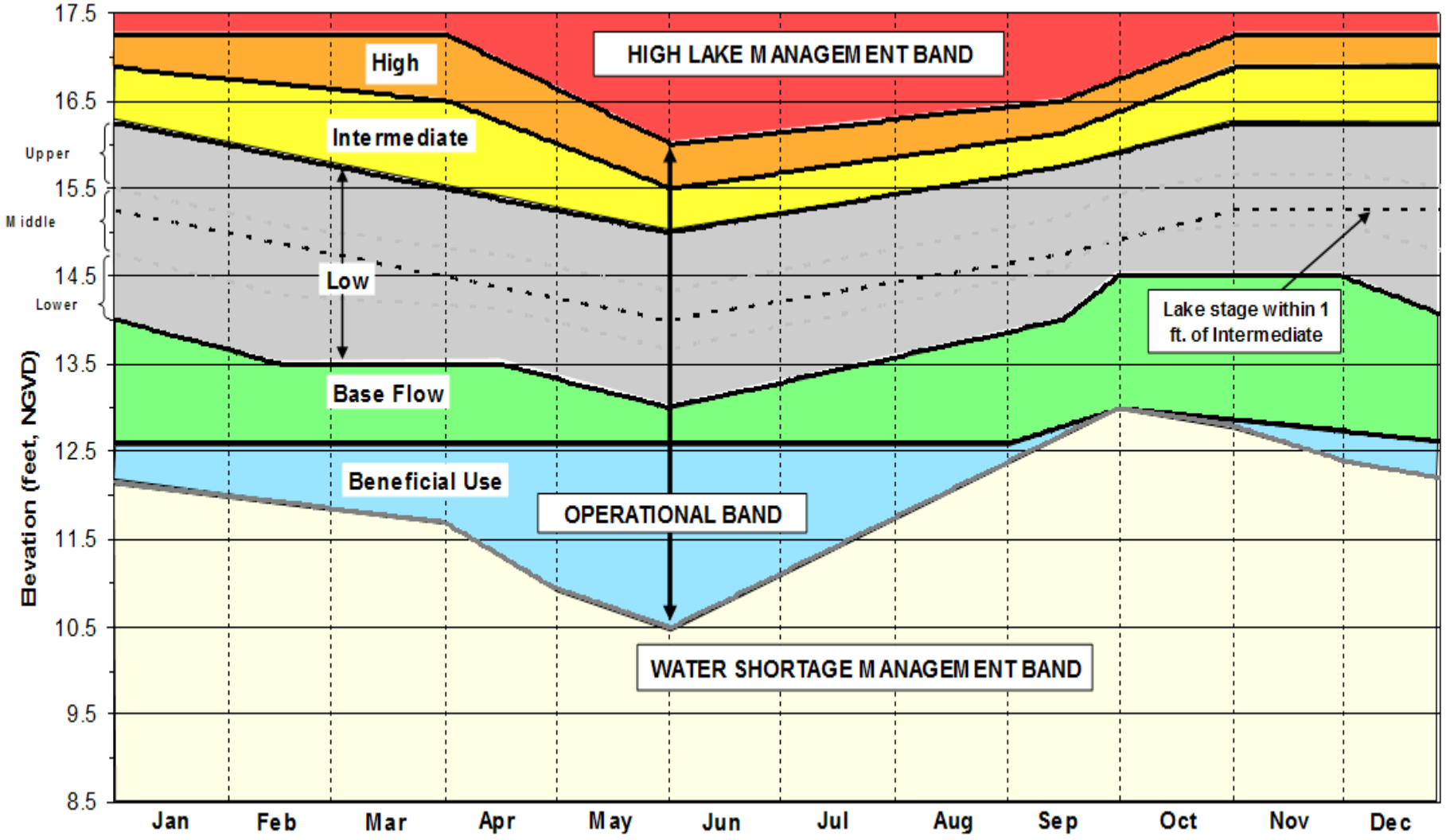
"Boundaries" of the Adaptive Protocol Revisions

- Revisions to be considered within the existing USACE Lake Okeechobee Regulation Schedule (2008 LORS)
- Focus where the schedule allows releases "up to" an amount but does not set specific flow targets or where no release volume described
- Will not revise the USACE Lake regulation schedule
- Will not revise the SFWMD water shortage rule
- Existing SFWMD water supply policy

Lake O Adaptive Protocols
Key Components

- Provide guidance where releases are expressed as a range of volumes, i.e. “up to 2000 cfs”
- Identify opportunities for “win-win” or “win-neutral” improvements
- Provide guidance on releases to the estuaries in the Low, Base Flow and Beneficial Use subbands

2008 Lake Okeechobee Interim Regulation Schedule *(aka 2008 LORS)*



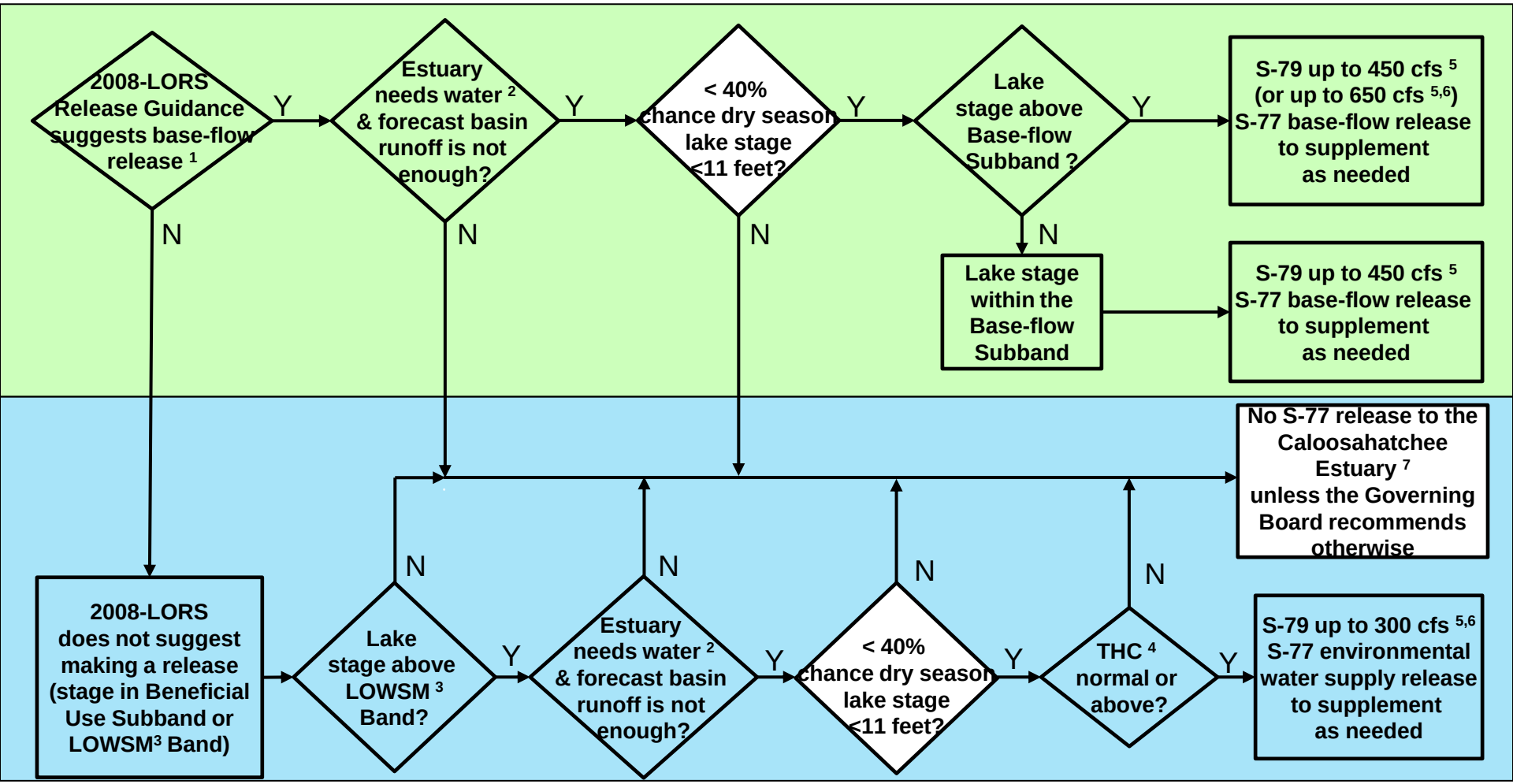
SFWMD Staff Proposed Protocol

- Objective: provide guidance to improve benefits of baseflow releases (& environmental water deliveries) and improve or have minimal impacts on Lake Okeechobee water levels & permitted water supply users
- 2 Parts to the Proposed Protocol

  (1) Low Subband Dry Season Guidance:
  50% of max release in Low Subband during dry season

  (2) Baseflow & Beneficial Use Subband Guidance:
  Flowchart to Guide release recommendations for Baseflow & Environmental Water Supply

Flowchart to Guide Recommendations for Lake Okeechobee Releases to the Caloosahatchee Estuary for 2008-LORS Base Flow & for Environmental Water Supply



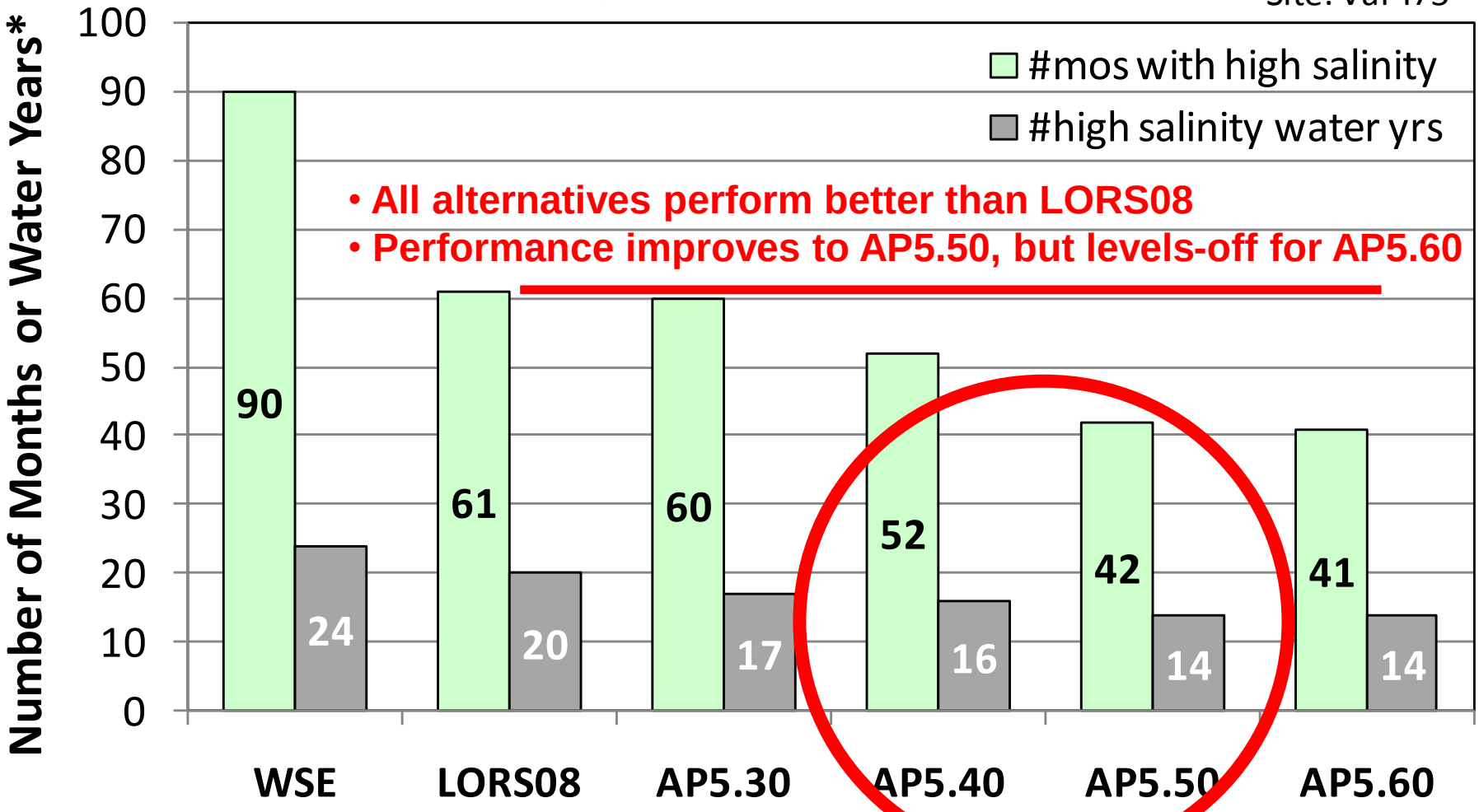
[1]The 2008-LORS Release Guidance (Part D) can suggest base-flow releases in the Intermediate, Low, or Base-flow Subbands.
[2]Estuary "needs" water when the 30-day moving average salinity at I-75 bridge is projected to exceed 5 practical salinity units (psu) within 2 weeks.
[3]LOWSM = Lake Okeechobee Water Shortage Management.
[4]Tributary Hydrologic Condition (THC) is based on classification of Lake Okeechobee Net Inflow and Palmer Index.
[5]Can release less than the "up to" limit if lower release is sufficient to reach or sustain desired estuary salinity; cfs = cubic feet per second.
[6]After reviewing conditions in Water Conservation Areas (WCAs), Stormwater Treatment Areas (STAs), ENP, St. Lucie Estuary and Lake Okeechobee.
[7]Should this condition be reached, the Governing Board will be briefed at their next regularly scheduled meeting as part of the State of the Water Resources agenda item.

Simulated Performance

- Simulation modeling conducted to evaluate benefits and impacts from proposed protocols
- Comparisons made with simulations of WSE and 2008-LORS, both with the current Lake O Water Shortage Management Plan (2007-LOWSM)
- Wide range of performance measures analyzed
- Analysis demonstrated two key performance trade-offs:
  1. CE high salinity vs LOSA water shortage frequency
  2. CE high salinity vs Lake O MFL rule exceedences

Caloosahatchee Estuary
Simulated High Salinity Months & Years

Site: Val-I75



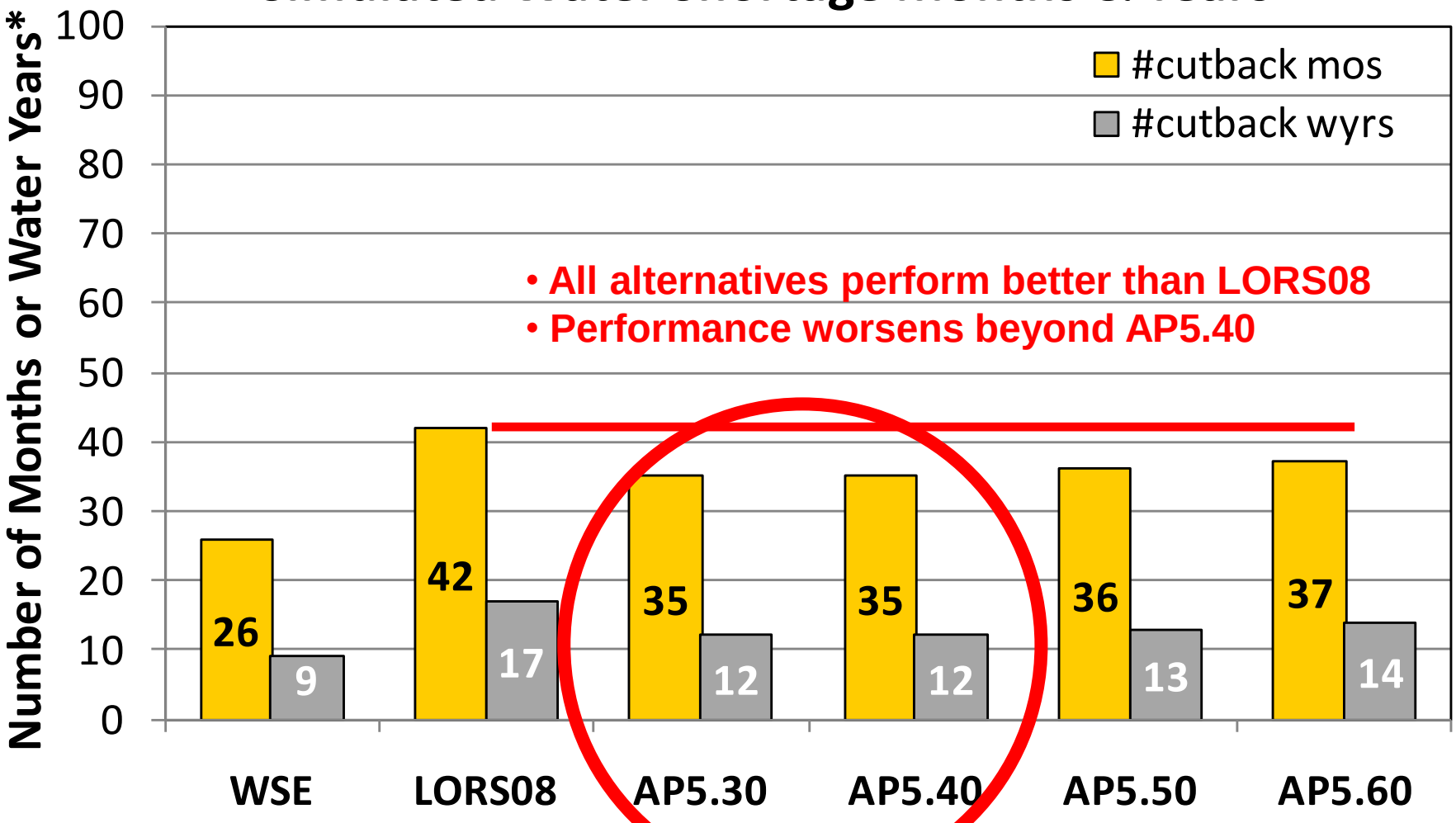
A high salinity event is: 30-day moving average salinity > 10 psu for duration ≥ 7days

The #months with high salinity = (#days 30-day moving avg salinity > 10 psu) /30.4

*A high salinity water year is a water year (Oct-Sep) with at least one high salinity event

LOOPS Model (daily time-step) simulation period: 492 months, 41 calendar yrs, (40 water yrs)

Lake Okeechobee Service Area
Simulated Water Shortage Months & Years

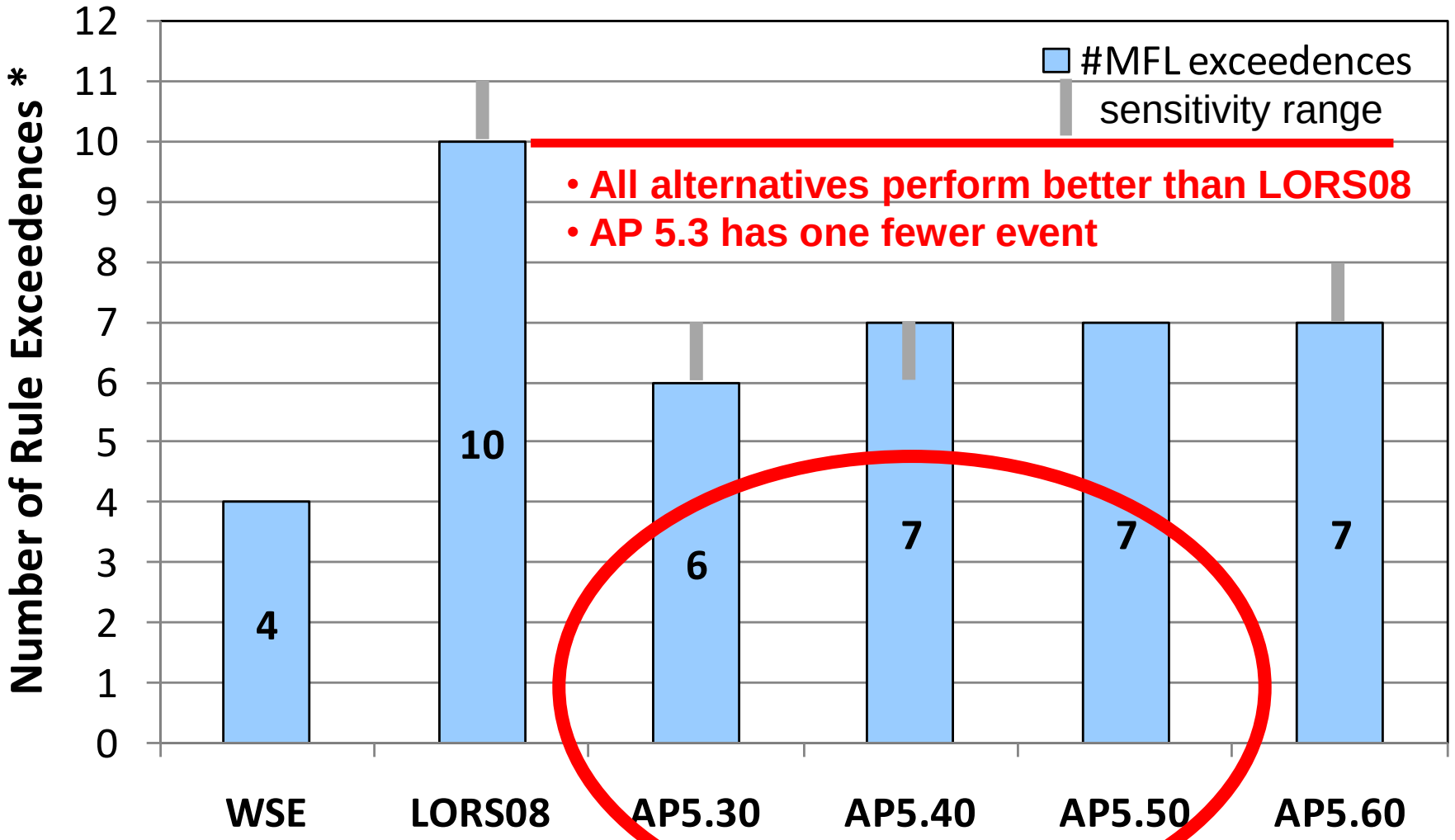


A cutback month has: (1) duration ≥ 7days, (2) cutback ≥ 13,000 af, cutback/demand ≥ 10%

*A cutback water year is a water year (Oct-Sep) with at least one cutback month

LOOPS Model (daily time-step) simulation period: 492 months, 41 calendar yrs, (40 water yrs)

Lake Okeechobee Simulated MFL Rule Exceedences



*An MFL violation occurs in Lake Okeechobee when an exceedance, as defined herein, occurs more than once every six years. An "exceedance" is a decline below 11 feet NGVD for more than 80, non-consecutive or consecutive days, during an eighteen month period. The eighteen month period shall be initiated following the first day Lake Okeechobee falls below 11 feet NGVD, and shall not include more than one wet season, defined as May 31st through October 31st of any given calendar year.

LOOPS Model (daily time-step) simulation period: 492 months, 41 calendar yrs, (40 water yrs)

Summary & Conclusions

- Staff recommends AP5.40 as a logical compromise between AP5.30 and AP5.50
  - improvements for all water resources dependent on the Lake
  - AP5.40 restricts releases to the Caloosahatchee Estuary if the chance is > 40% that the dry season Lake stage falls below elevation 11.0 ft, NGVD
- Should the condition be reached in the flowchart where the recommendation is for no releases from S-77 to the Caloosahatchee Estuary:
  - Staff will brief the Governing Board at their next regularly scheduled meeting during the State of the Water Resources agenda item
  - Staff will recommend that the Governing Board issue a “water shortage warning” for all users dependant upon the lake to begin conserving water as the potential for a water shortage has increased

THANK YOU