Lake Okeechobee System Operating Manual

Iteration 3 - Phase 1 Technical Evaluation

Sanibel-Captiva Conservation Foundation

Conservancy of Southwest Florida

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Iteration 3 Modeling

Phase 1

- Initial sensitivity runs based on Alternative CC & Iteration 3 goals
- Simplify release guidance and reduce dimensionality for optimization
- Test schedule components based on simplified schedule & Iteration 3 goals

Notes

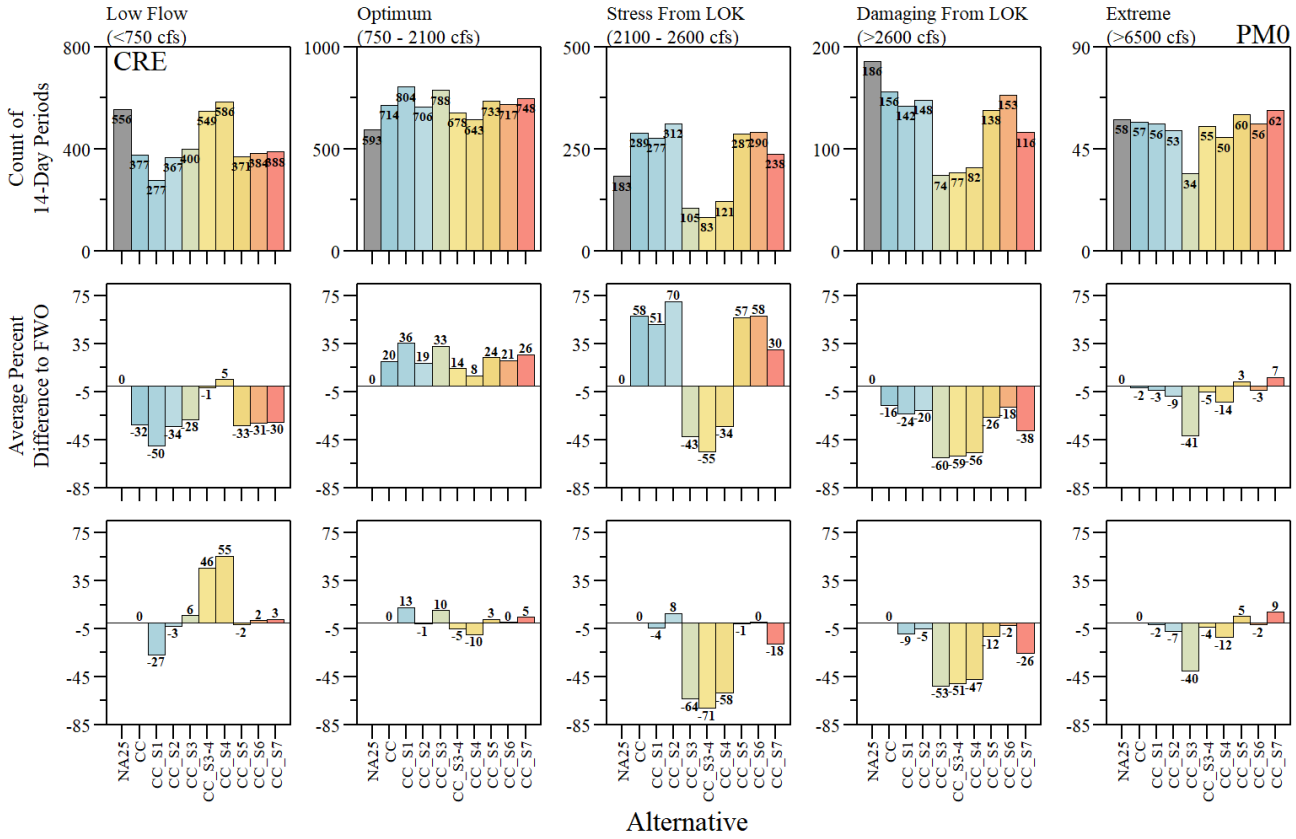
Alternative Naming

- CC == CCTSP
- 2 versions of CCsimp4 - After simp4s1 (*Phase 1 - Test Flows to St Lucie Estuary*) was run it was renamed as CCsimp4. Therefore in this presentation the second CCsimp4 was renamed to CCsimp4(2).

Phase 1 - Initial Sensitivity Runs

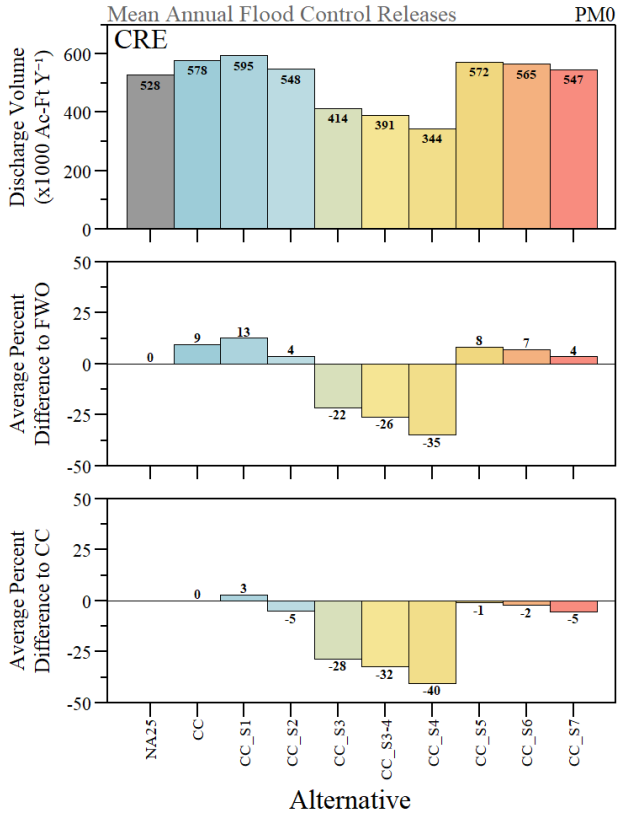
- **S1:** Preserve opportunity to send water out of the lake for longer which addresses the goal of increasing flexibility in the lower portions of the schedule.
- **S2:** Regulate CRE releases by using flows at S-79 in all conditions in all zones except in Zone A
- **S3:** Reduce stress to CRE by incorporating friendly estuary release concepts from 4BC-1
- **S4:** Reduce stress to CRE by incorporating alternating estuary release concept from 4BC-2
- **S3-4:** Combination of friendly estuary release concepts and alternating estuary release concepts
- **S5:** Reduce stress to CRE by reducing maximum up to flows in Zone D
- **S6:** Combine zones B & C
- **S7:** Address algae by incorporating no releases to the Northern Estuaries in the months June –August except in Zone A

Phase 1 - Initial Sensitivity Runs



RECOVER salinity envelope counts (top), % difference to FWO (middle) and % difference to CC (bottom).

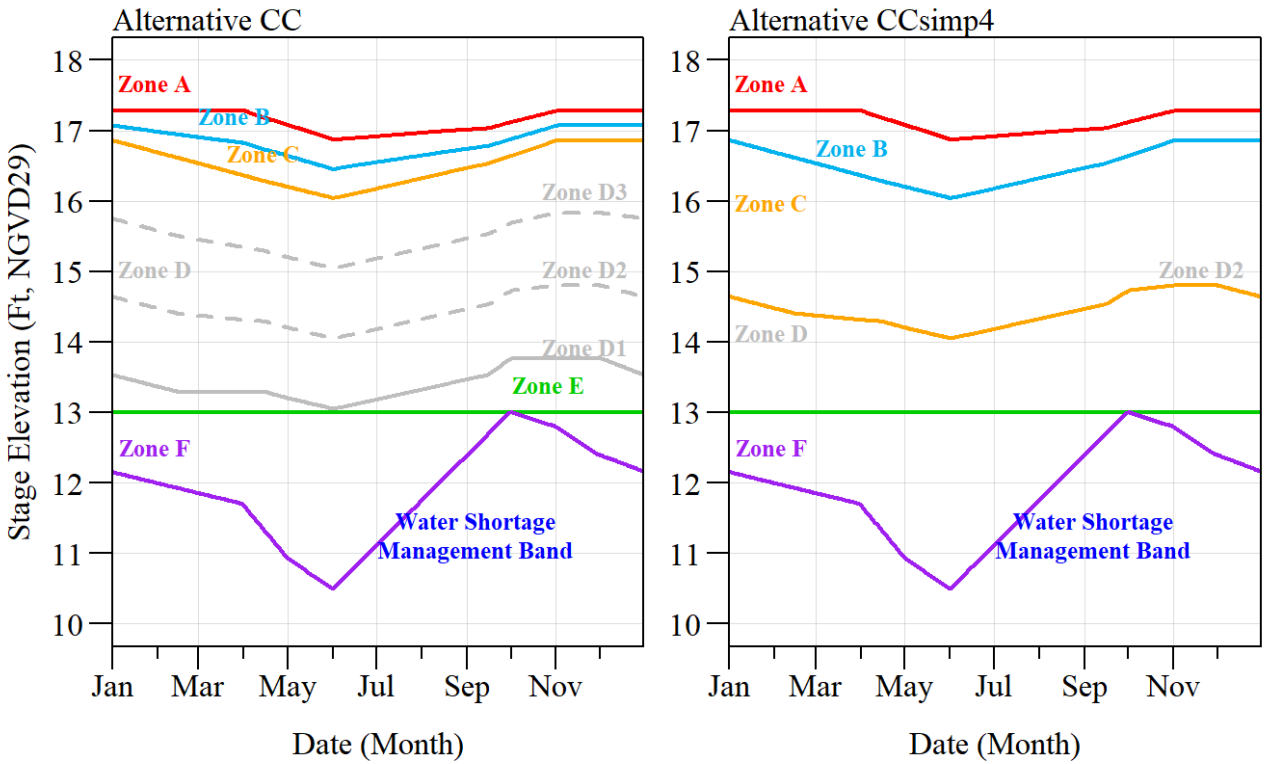
Phase 1 - Initial Sensitivity Runs



Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

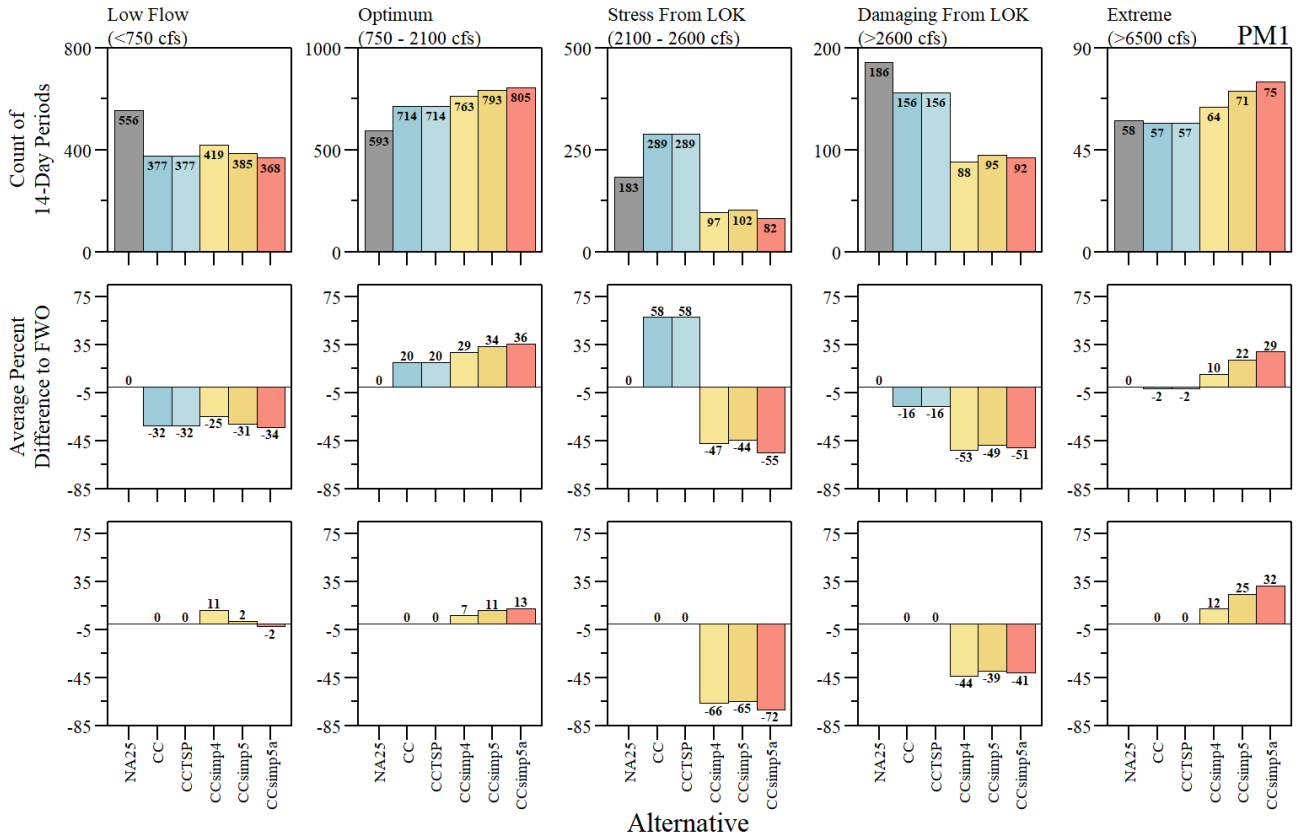
Phase 1 - Simplify Release Guidance

- Combine zones, simplify release guidance flowcharts
- Add complexity where it is needed to meet the goals of Iteration 3 optimization



CC and 'CCsimp4' simplified regulation schedule.

Phase 1 - Simplify Release Guidance



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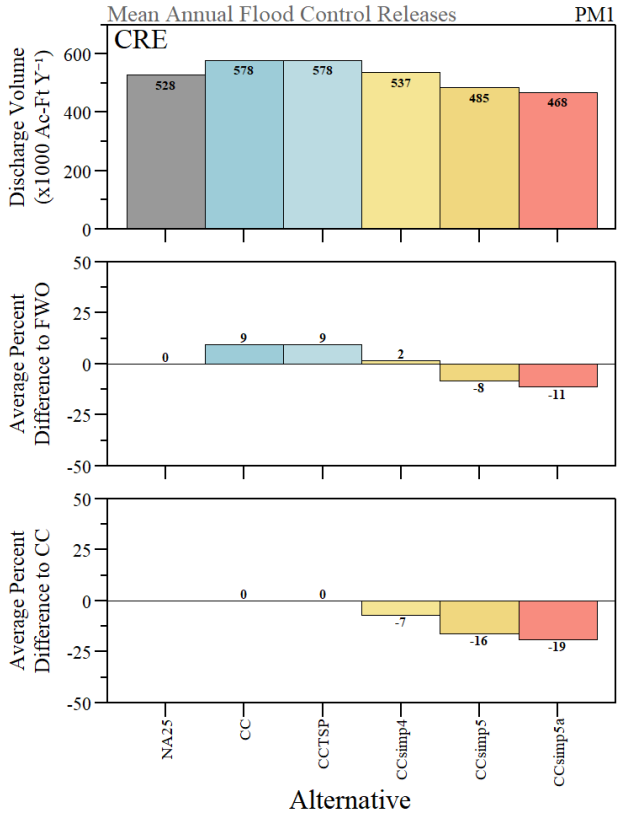
Phase 1 - Simplify Release Guidance



Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Test Schedule Components – CCsimp4

- Flows to St. Lucie Estuary (simp4 and simp4s1)
- Increased flexibility in lower portion of the schedule (smp4ZFS, smp4ZFW, smp4ZFSW)
- Opportunity to send desirable dry season flows to Lake Worth Lagoon (271DS, 271DSZC)
- Zone B regulation point for CRE (S77 vs S79) (ZB_S77)

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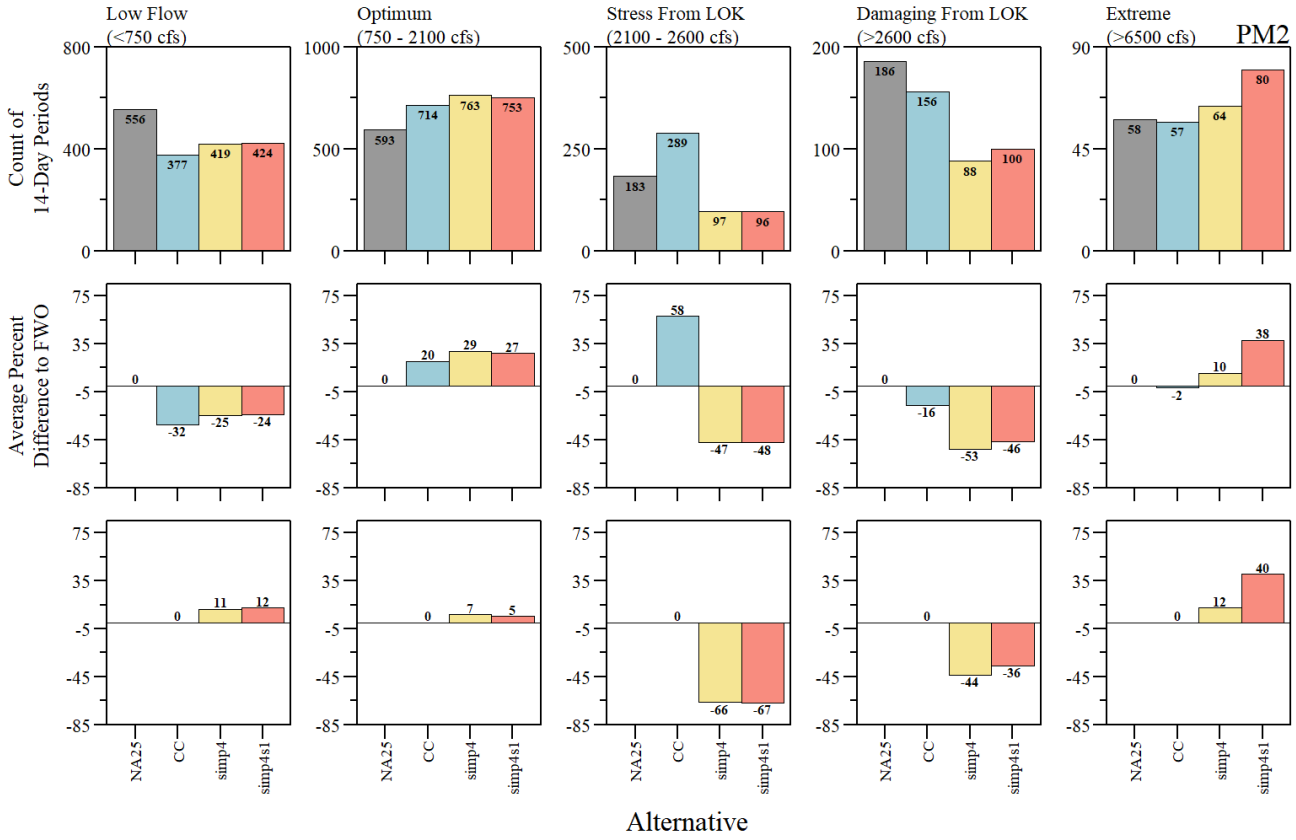
Flows to St. Lucie Estuary (simp4 and simp4s1)



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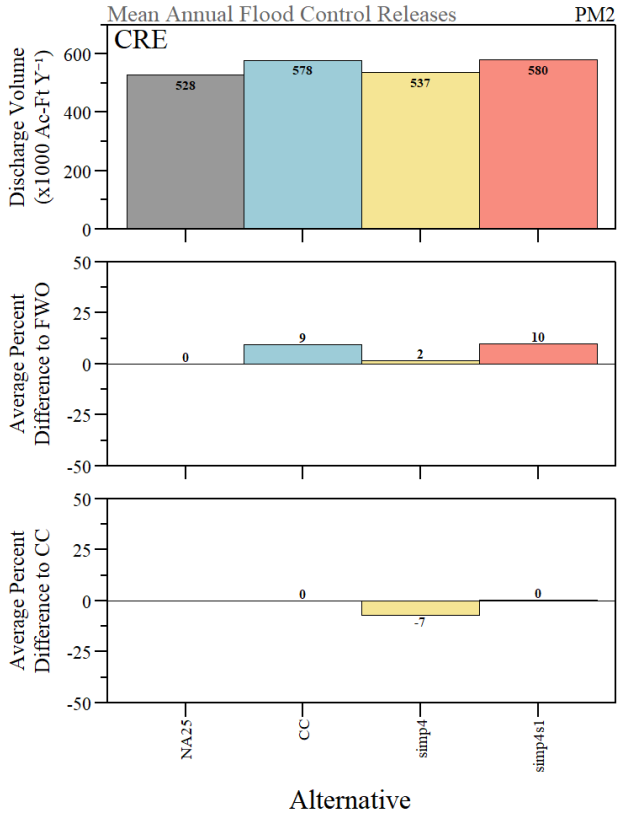

Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

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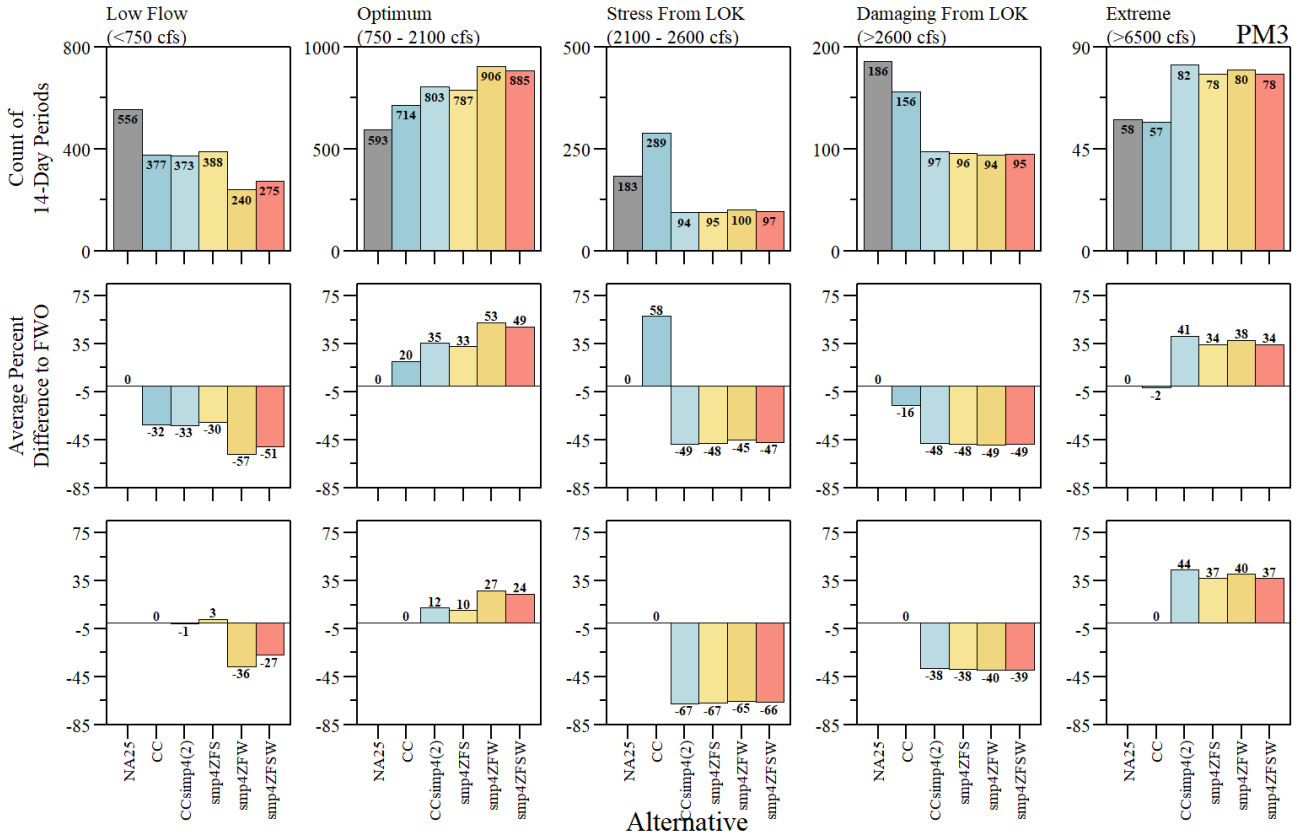

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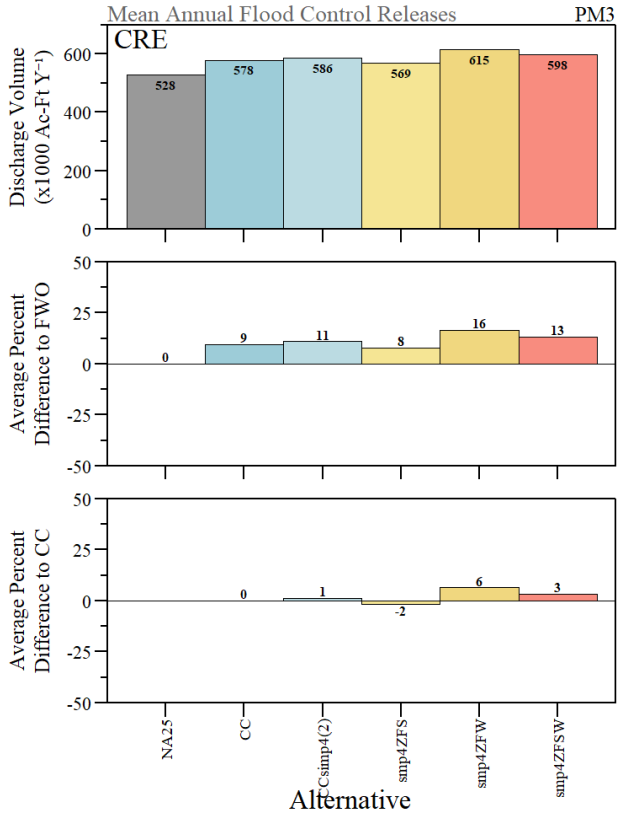
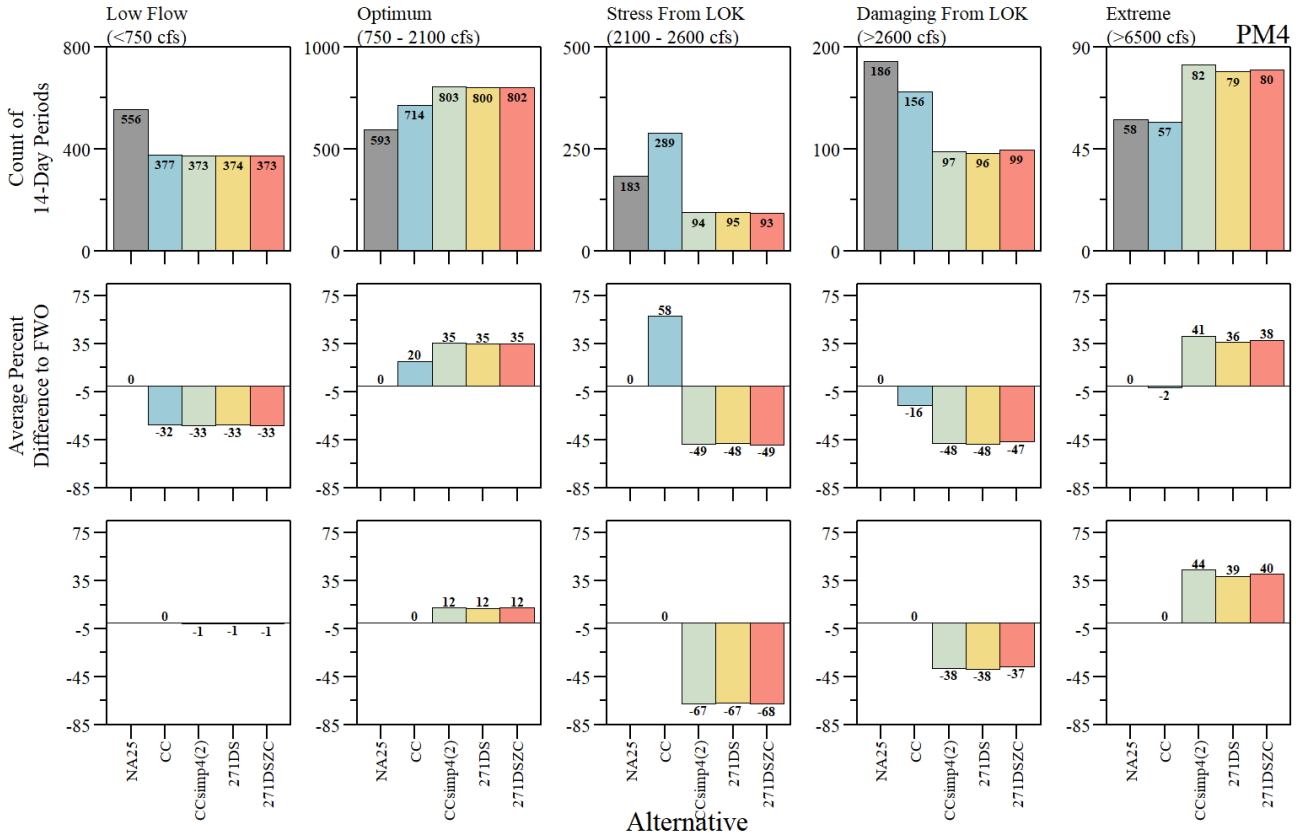


Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Test Schedule Components – CCsimp4

Opportunity to send desirable dry season flows to Lake Worth Lagoon (271DS, 271DSZC)



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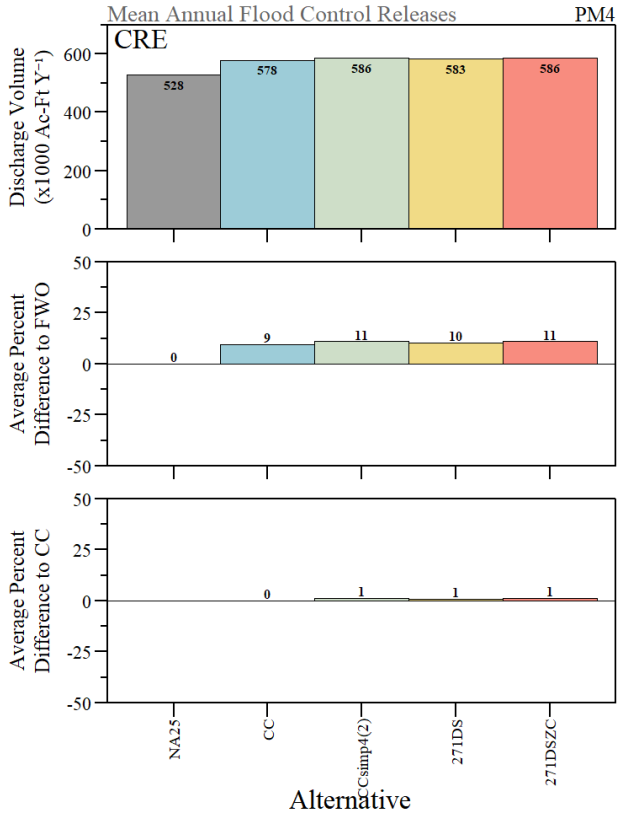
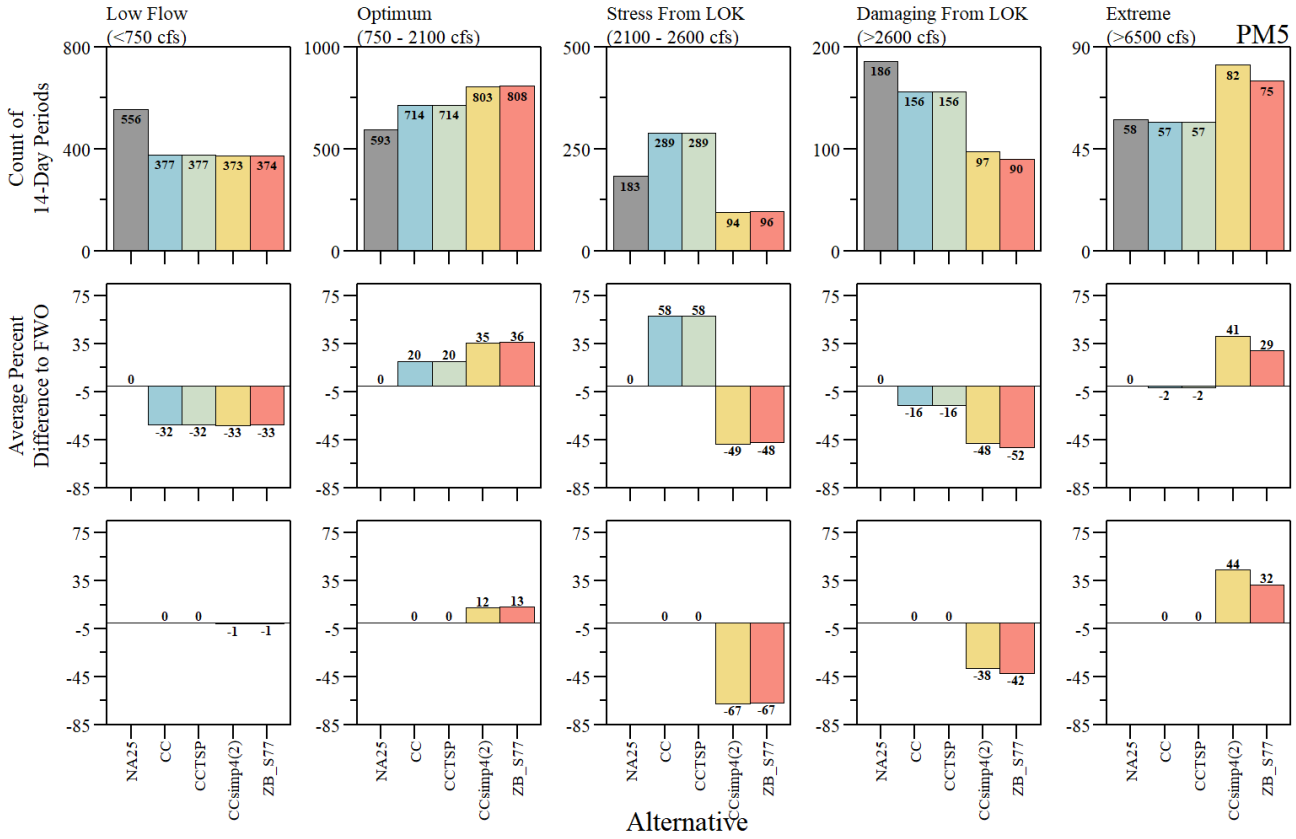


Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Test Schedule Components – CCsimp4

Zone B regulation point for CRE (S77 vs S79) (ZB_S77)



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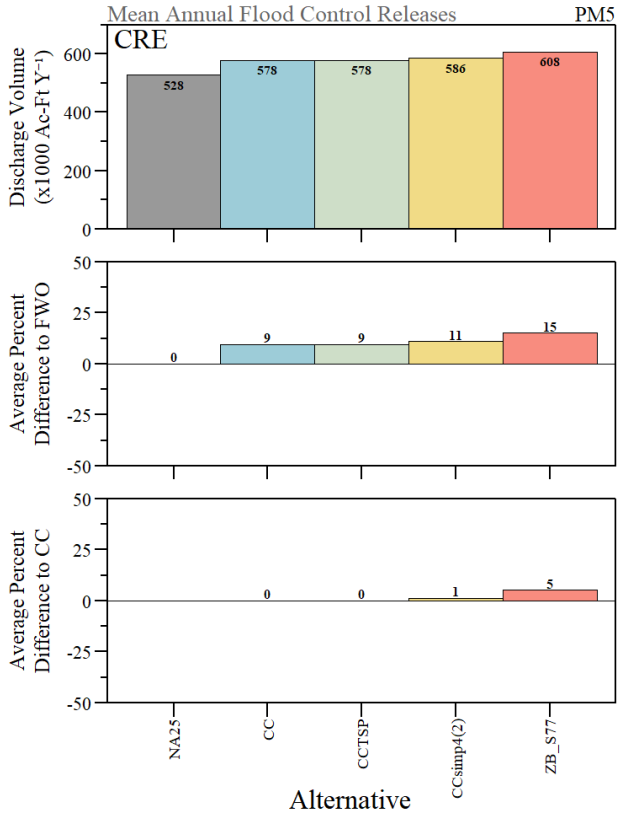


Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Test Schedule Components – CCR1

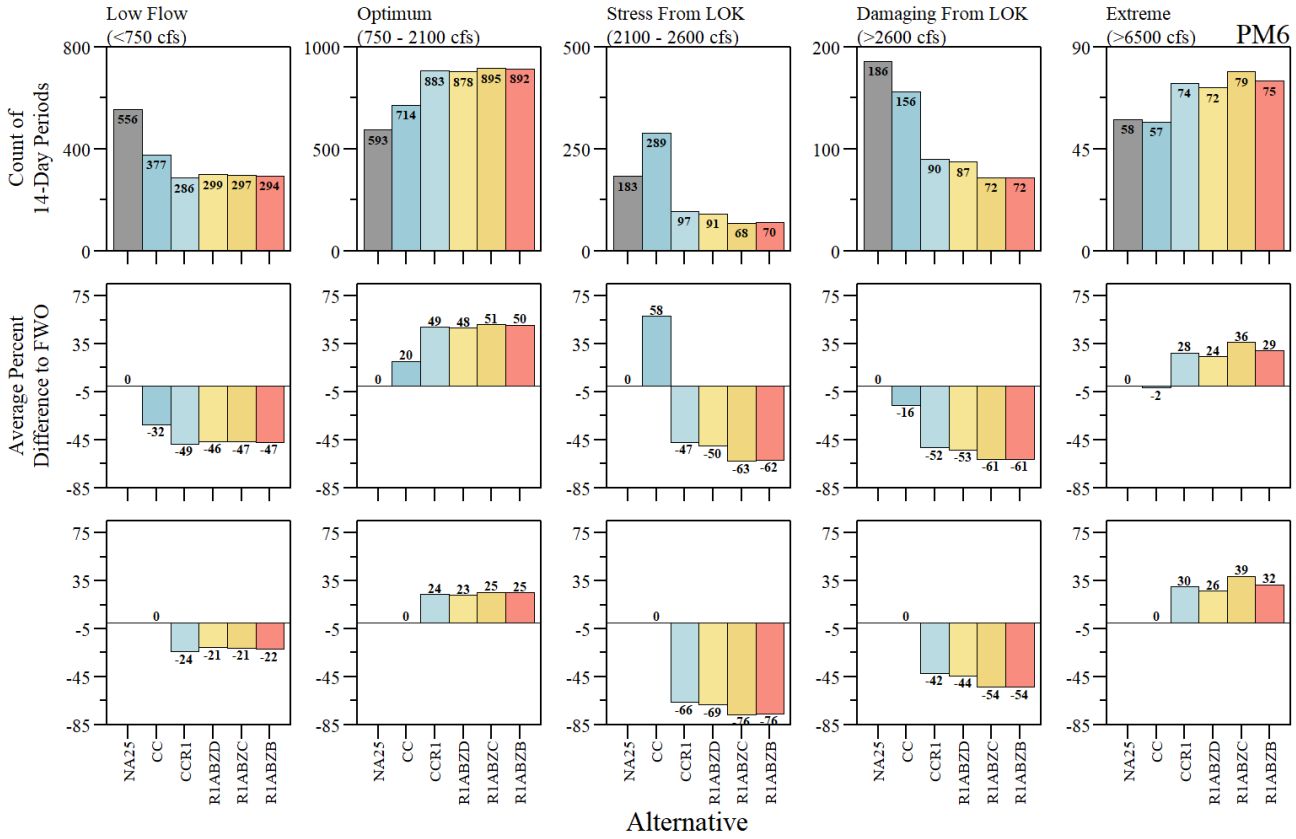
- CCR1 used CCsimp4 as base and incorporated features from smp4ZFSW, 271DS and ZB_S77

Evaluated:

- Opportunities to reduce algal bloom risk in the northern estuaries (R1ABZD, R1ABZC, R1ABZB)
- Opportunities to improve lake health by incorporating extreme and moderate recovery operations (CCR1ED, CCR1MD1, CCRMD2)
- Opportunities to address water supply performance by modifying operations in lower portions of the schedule (R1WSEN, R1WSMF)

Phase 1 - Test Schedule Components – CCR1

Reduce algal bloom risk in the northern estuaries (R1ABZD, R1ABZC, R1ABZB)



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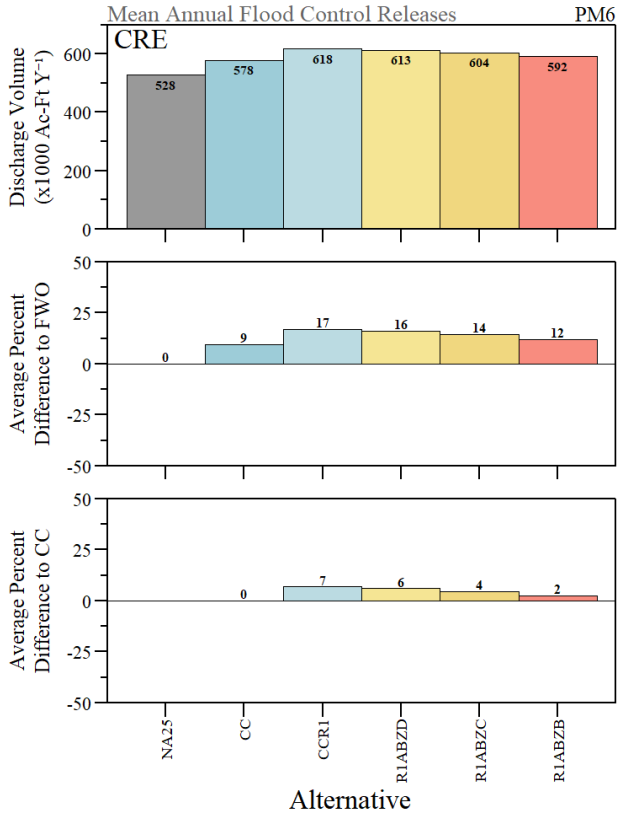
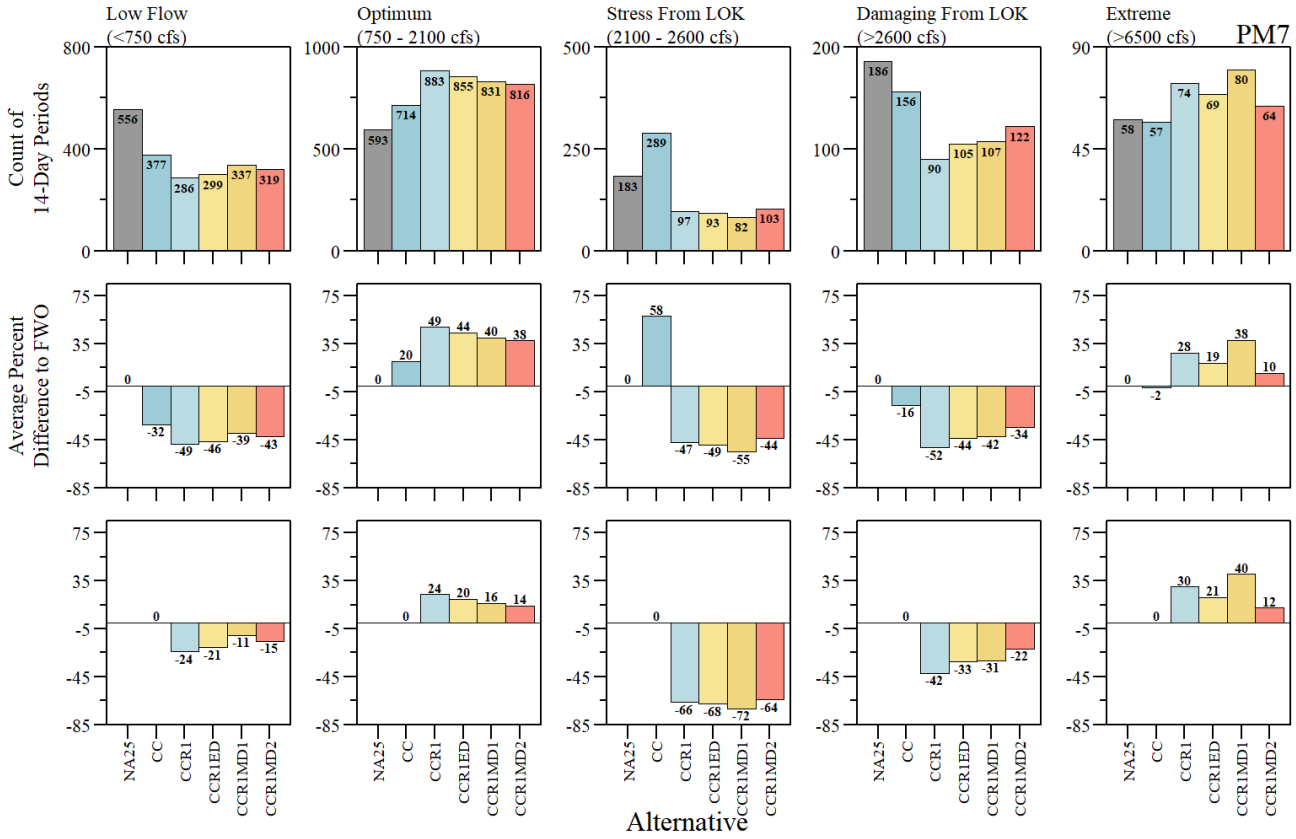


Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Test Schedule Components – CCR1

Incorporating extreme and moderate recovery operations (CCR1ED, CCR1MD1, CCRMD2)



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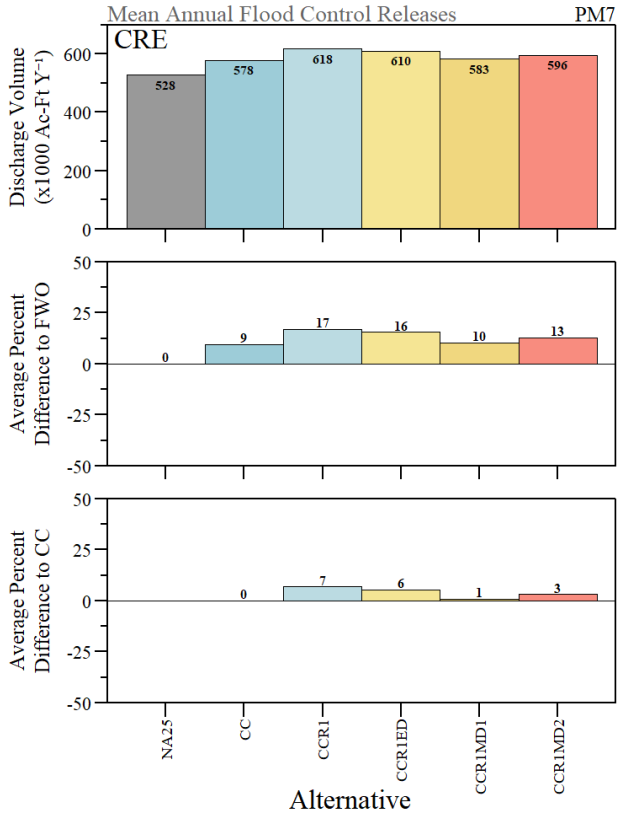

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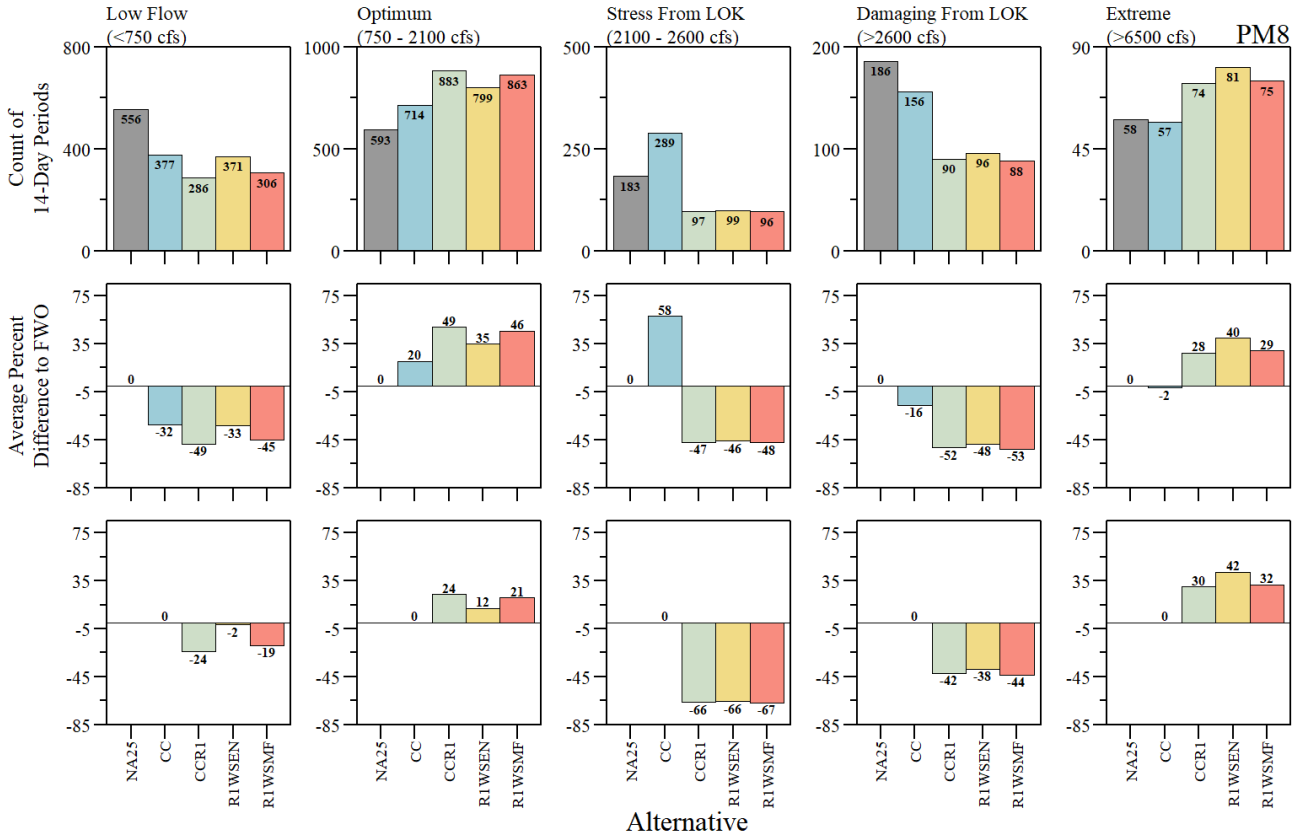
Phase 1 - Test Schedule Components – CCR1

Address water supply performance (R1WSEN, R1WSMF)



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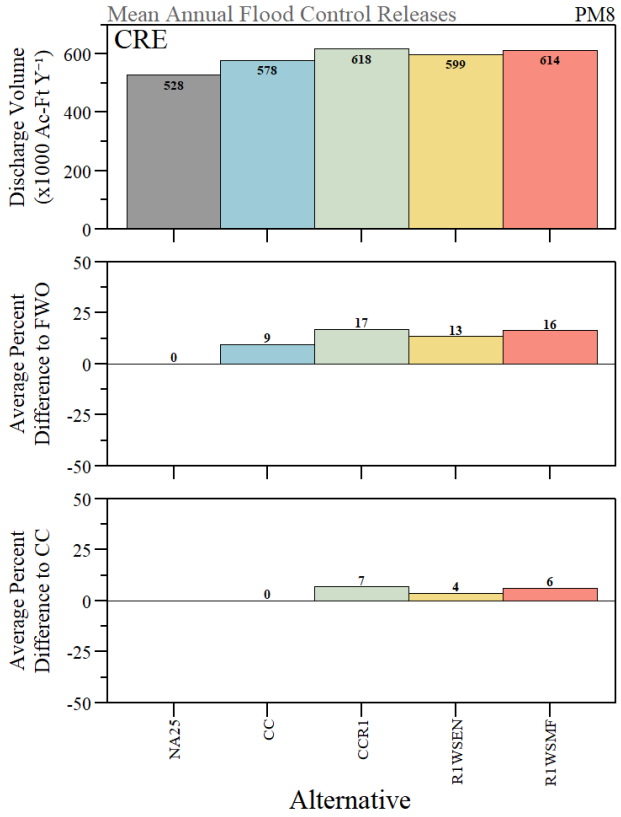

Average annual regulatory discharges to the Caloosahatchee during the simulation period of record.

Phase 1 - Inital Summary

- The alternative that reduces the number of extreme events (i.e. >6500 cfs at S79) the most is CC_S3 (from initial Sensitivity Runs) relative to FWO (-41.4%).
    - **S3:** Reduce stress to CRE by incorporating friendly estuary release concepts from 4BC-1
- Meanwhile, CC_S4 (from initial Sensitivity Runs) reduces the regulatory discharges to the Caloosahatchee the most relative to the FWO (-34.8%).
    - **S4:** Reduce stress to CRE by incorporating alternating estuary release concept from 4BC-2
- Other aspects need to be evaluated for sensitivity run suitability (i.e. increased optimal; reduce low, stress and damaging; Lake ecological envelope performance and; SLE/LWL salinity envelope performance)
- MCDA approach could can be used to screen sensitivity runs.