

Lake Okeechobee System Operating Manual

Sanibel-Captiva Conservation Foundation

Conservancy of Southwest Florida

August 31, 2021

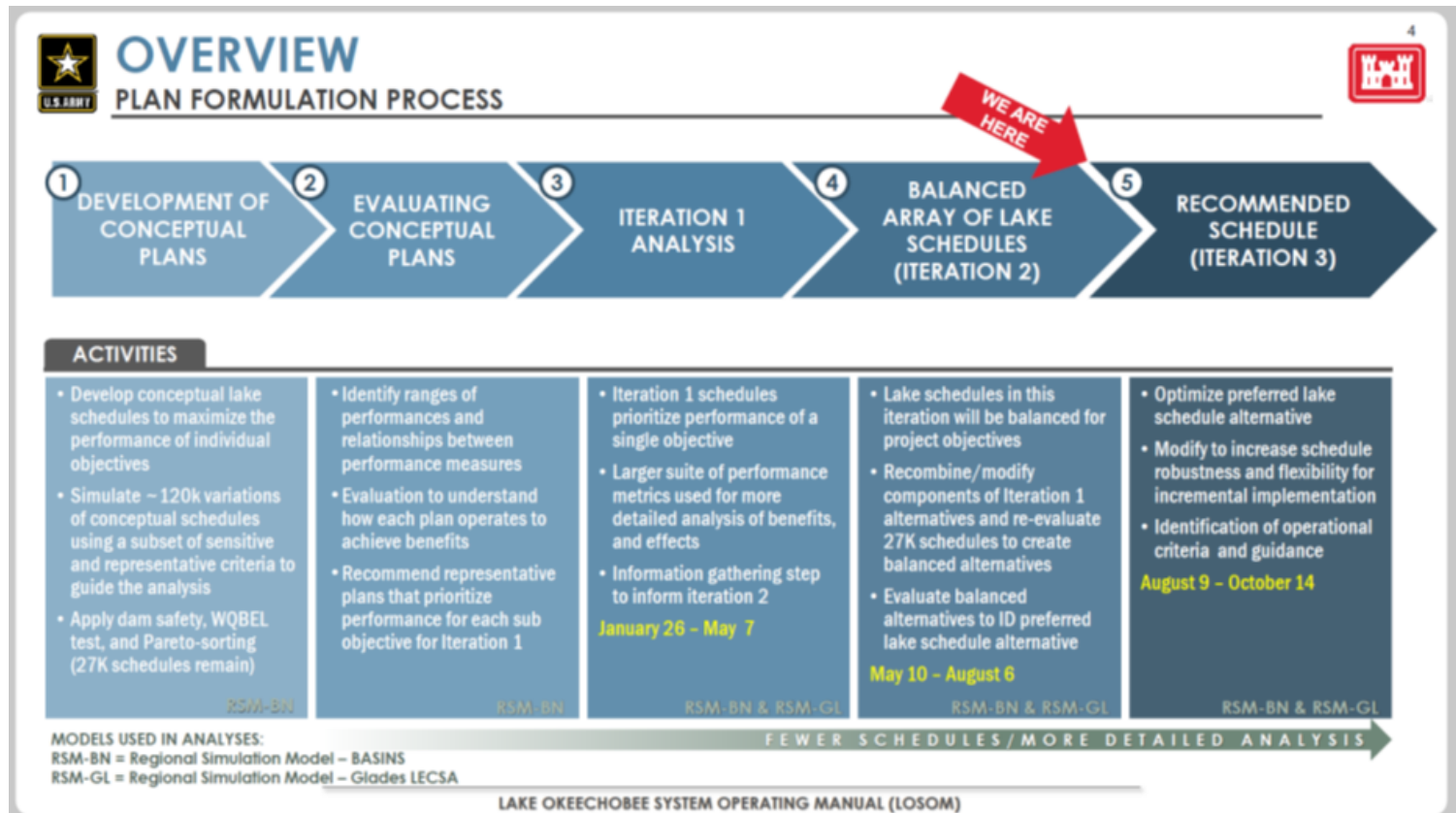


For web version use cursor keys for navigation, press "O" for a slide Overview

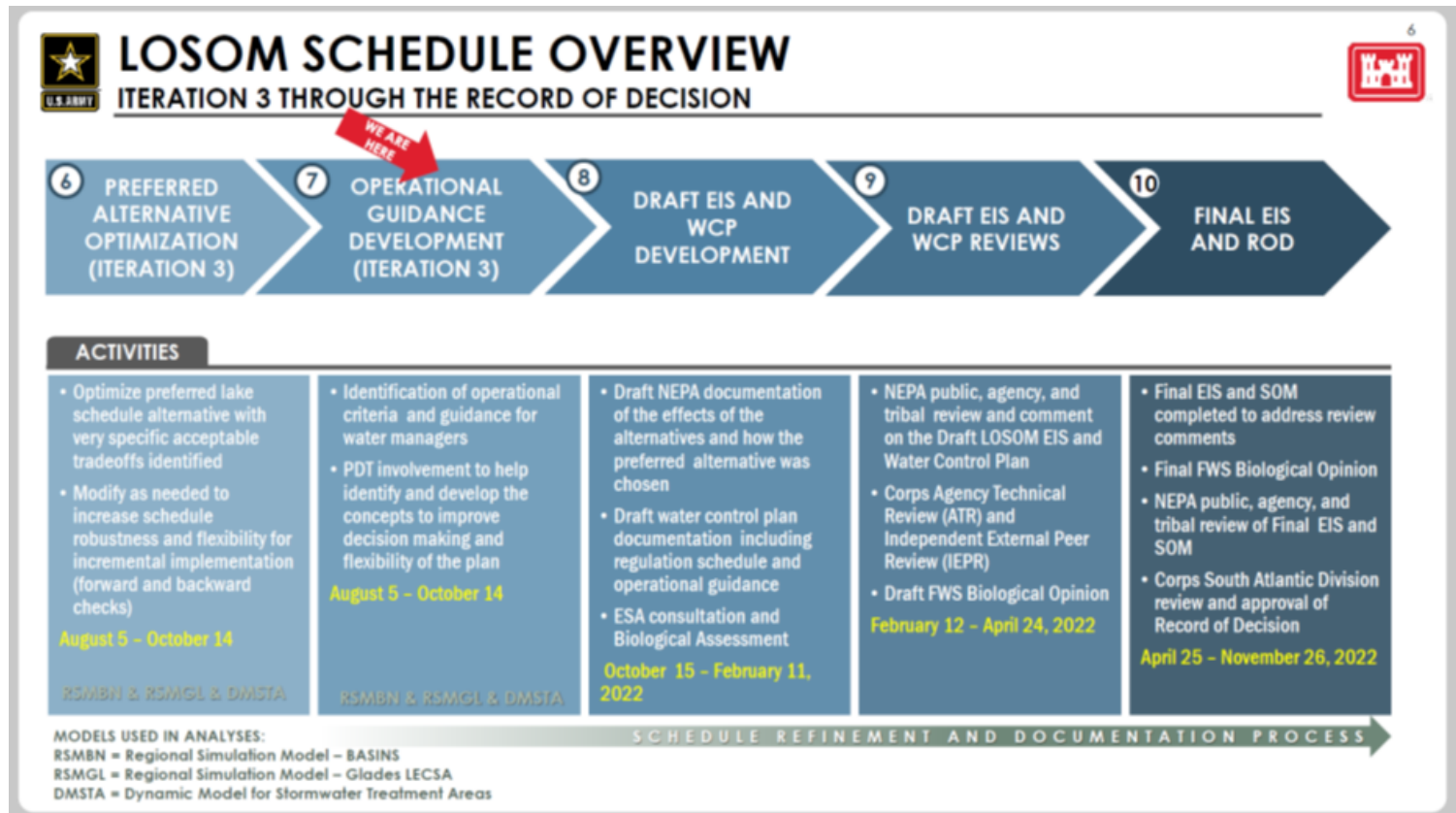
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LOSOM Process and Timeline

- LOSOM process started with Scoping Meetings - Feb 2019
- LOSOM Public Workshops – Sept 2019

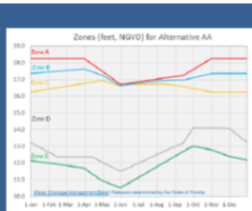


LOSOM Process and Timeline



Iteration 2 - Model Alternative

Alternative AA

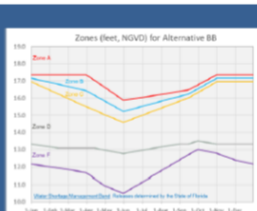


Explores upper and lower lake stages to increase interim storage in the lake to:

- Enhance ecology of St. Lucie Estuary by reducing Lake Okeechobee releases through S-308.
- Improve water supply.
- Enhance Everglades ecology by providing more freshwater south, and
- Enhance Caloosahatchee ecology by providing low and optimal flows.

Favors St Lucie & Flows south with benefits to Water Supply

Alternative BB

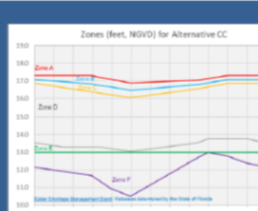


Improves water supply performance to pre-LORS08 as a priority objective and:

- Reduce algal bloom risk
- Increase low and optimal flows to Caloosahatchee Estuary
- Reduce lake releases to St. Lucie Estuary
- Enhancing Everglades ecology by providing more freshwater south.

Favors Recreation & Water Supply

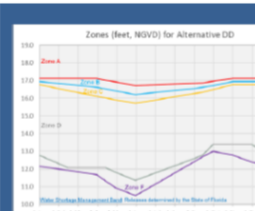
Alternative CC



- Enhancing Caloosahatchee ecology by providing low and optimal flows and reducing extreme high flows >6500 cfs
- Enhancing ecology of St. Lucie Estuary by reducing Lake O releases
- Enhancing Everglades ecology by providing more freshwater south
- Improving water supply performance as compared to the No Action condition

Favors St Lucie & (to some degree) Caloosahatchee

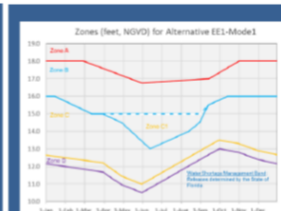
Alternative DD



Honors the perspective on balance that each of the LOSOM objectives should be incrementally improved over LORS08 performance

Similar to LORS08 Favors Lake

Alternative EE1 & EE2



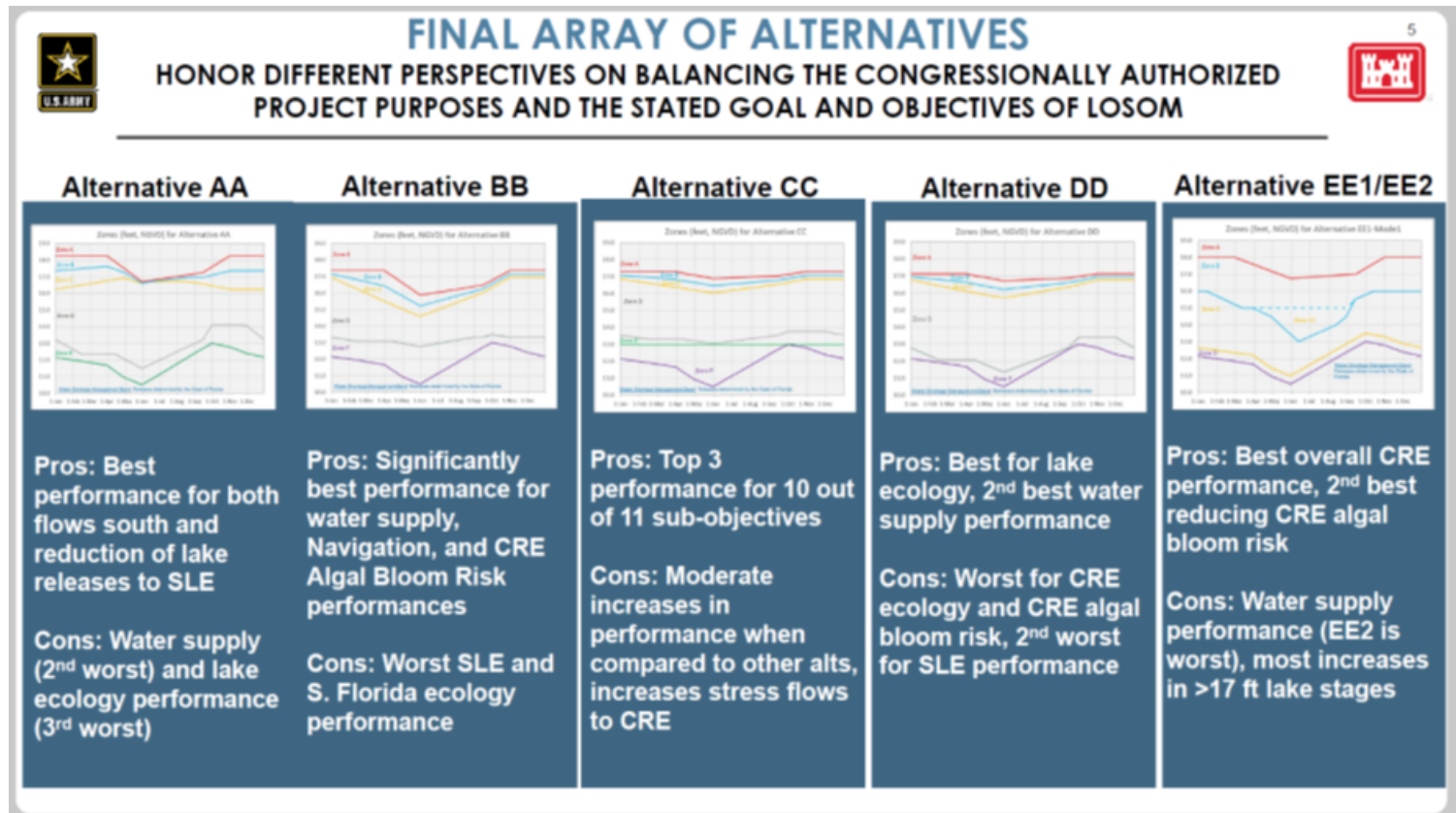
Lake Okeechobee stage target (equation based). Incorporates memory and flexibility by asking key questions at key times to define operational mode:

- Mode 1-Normal
- Mode 2-Conservation
- Mode 3-Recovery

New water management concept – operational flexibility

From SFWMD 08 July 2021 Governing Board meeting presentation

Iteration 2 - Model Alternative



From USACE PDT 19 July 2021 meeting presentation

Average annual regulatory flows (QFC flow tag; CRE: S77; SLE: S308) and stress and damaging events based on RECOVER salinity envelope 14-day event counts for Caloosatchee and St Lucie estuaries.

| Summarized Data | | | | | | | Percent Different from FWO | | | | |
|------------------|-------------------|-----------------------------------|--|--|---|---|-----------------------------------|--|--|---|---|
| Estuary | Alt | Regulatory Flows (kacft/yr) | Stress Events From LOK ³ | Stress Events From Basin ³ | Damaging Events From LOK ⁴ | Damaging Events From Basin ⁴ | Regulatory Flows (kacft/yr) | Stress Events From LOK ³ | Stress Events From Basin ³ | Damaging Events From LOK ⁴ | Damaging Events From Basin ⁴ |
| CRE ¹ | NA25 ² | 528 | 183 | 118 | 186 | 173 | | | | | |
| | ECBr | 515 | 190 | 153 | 205 | 225 | -2.5 | 3.8 | 29.7 | 10.2 | 30.1 |
| | CC | 578 | 289 | 89 | 156 | 174 | 9.5 | 57.9 | -24.6 | -16.1 | 0.6 |
| SLE ¹ | NA25 ² | 187 | 148 | 210 | 142 | 428 | | | | | |
| | ECBr | 231 | 162 | 186 | 160 | 432 | 23.0 | 9.5 | -11.4 | 12.7 | 0.9 |
| | CC | 72 | 13 | 308 | 17 | 469 | -61.7 | -91.2 | 46.7 | -88.0 | 9.6 |

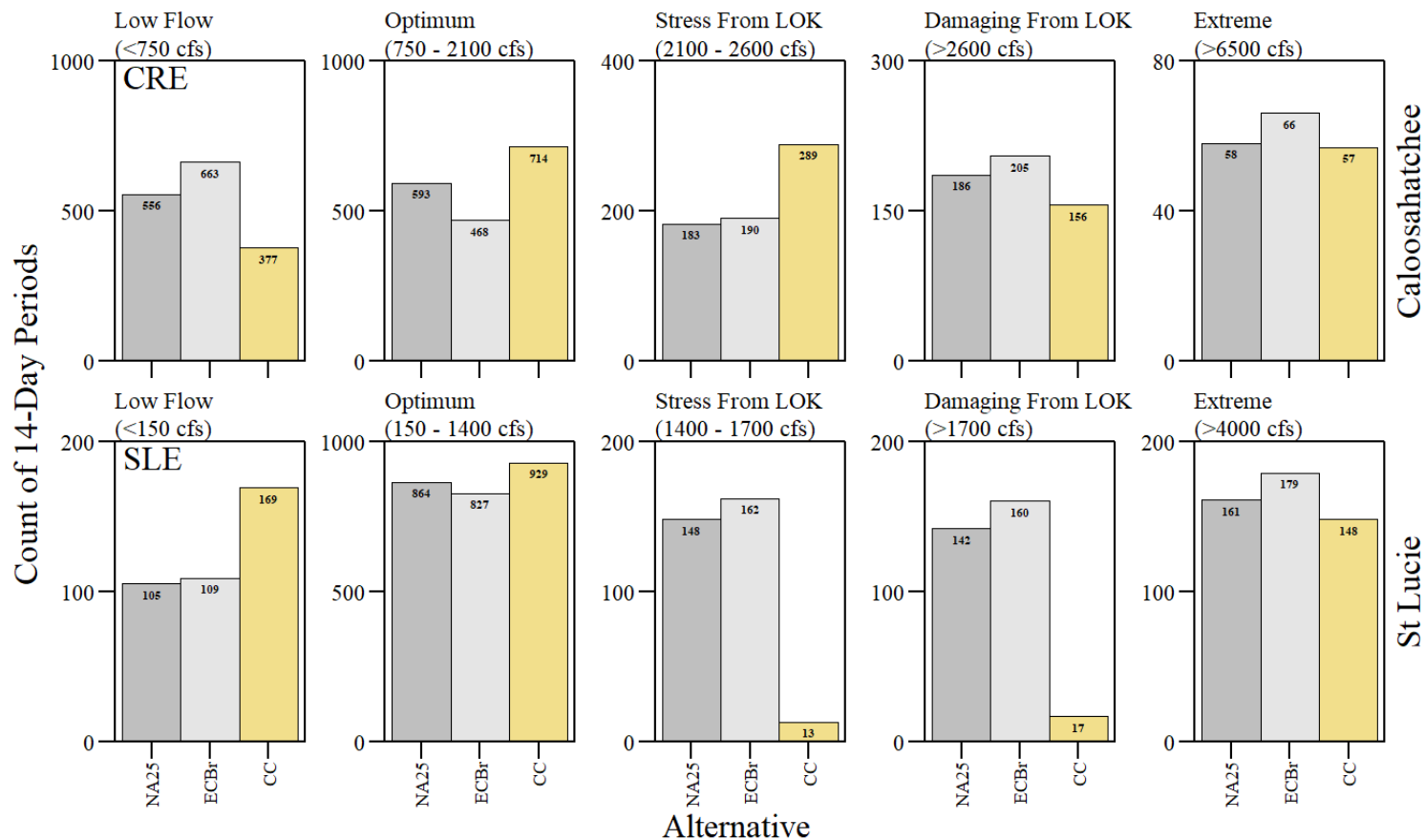
¹ CRE: Caloosahatchee Estuary; SLE: St Lucie Estuary; ² NA25 = Future without project (FWO)

³ **Stressful Flows:** CRE: ≥ 2100 cfs & < 2600 cfs; SLE: ≥ 1400 cfs & < 1700 cfs

⁴ **Damaging Flows:** CRE: > 2600 cfs; SLE: > 1700 cfs

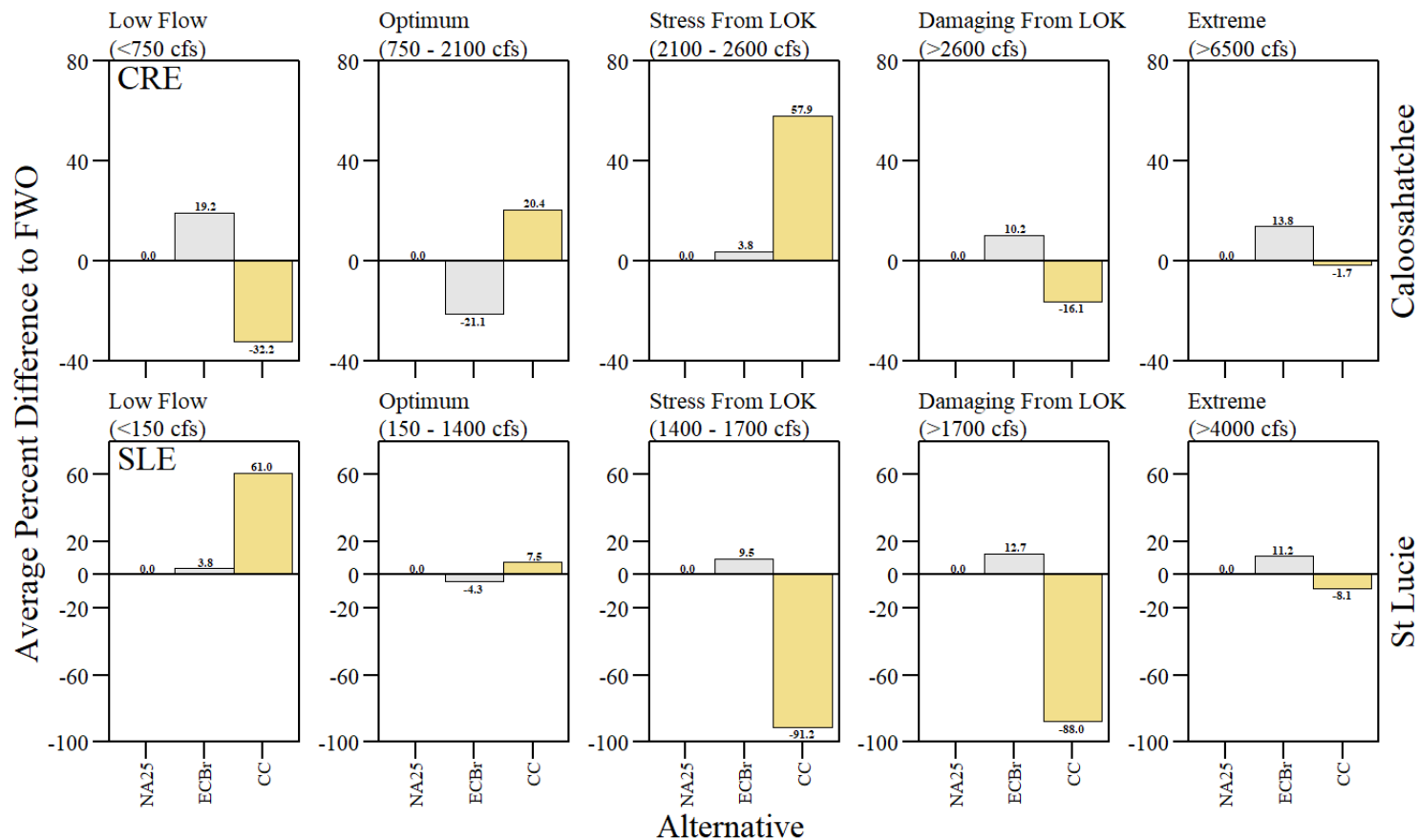
Data Source: USACE and SFWMD Interagency Modeling Center

RECOVER Metric



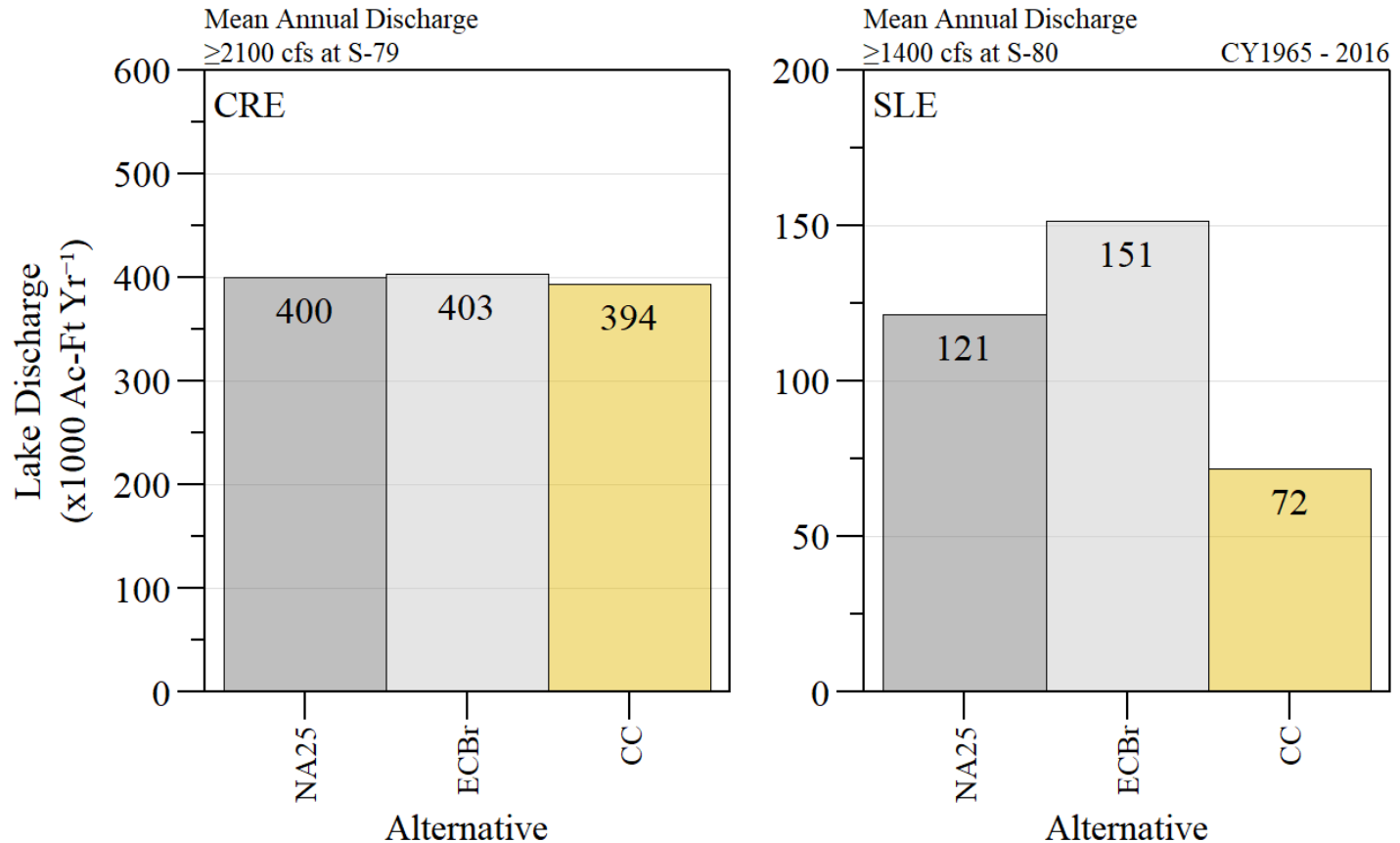
RECOVER salinity envelope evaluation during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries.

RECOVER Metric



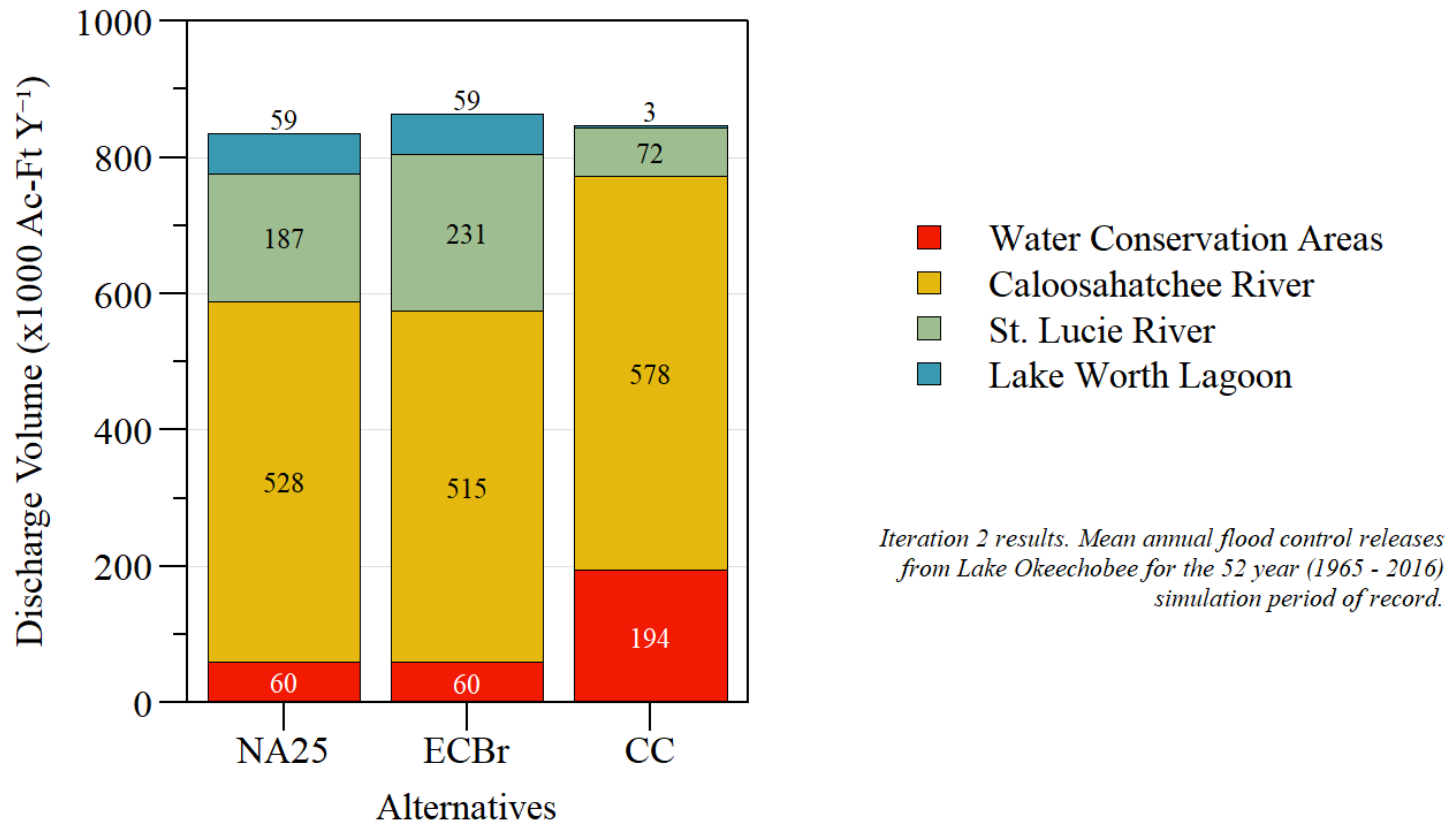
RECOVER salinity envelope evaluation relative to FWO (NA25) during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries.

Lake Discharges



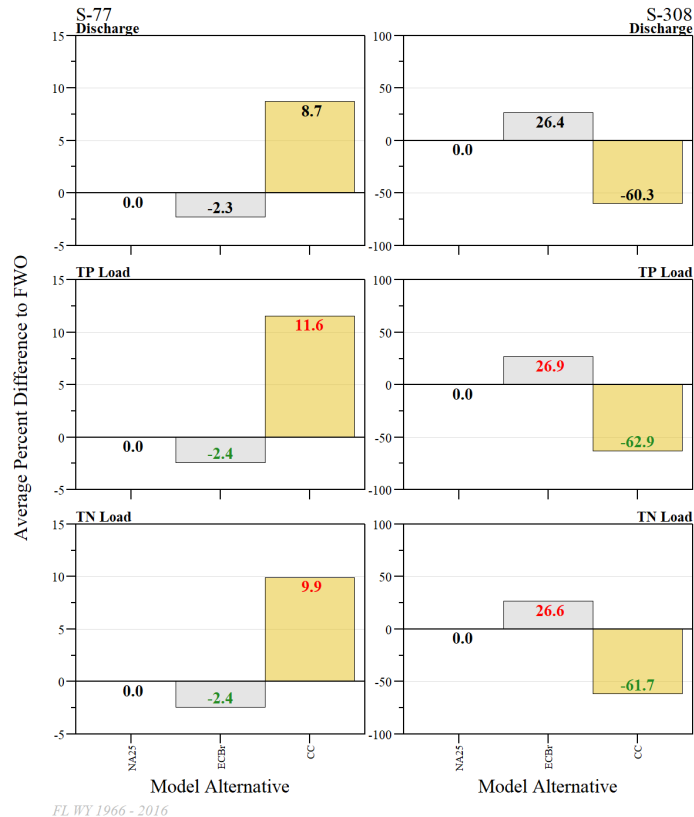
Average annual lake discharge volume over the simulation period of record when stress and damaging discharge at S79 and S80, respectively.

Flood control discharges



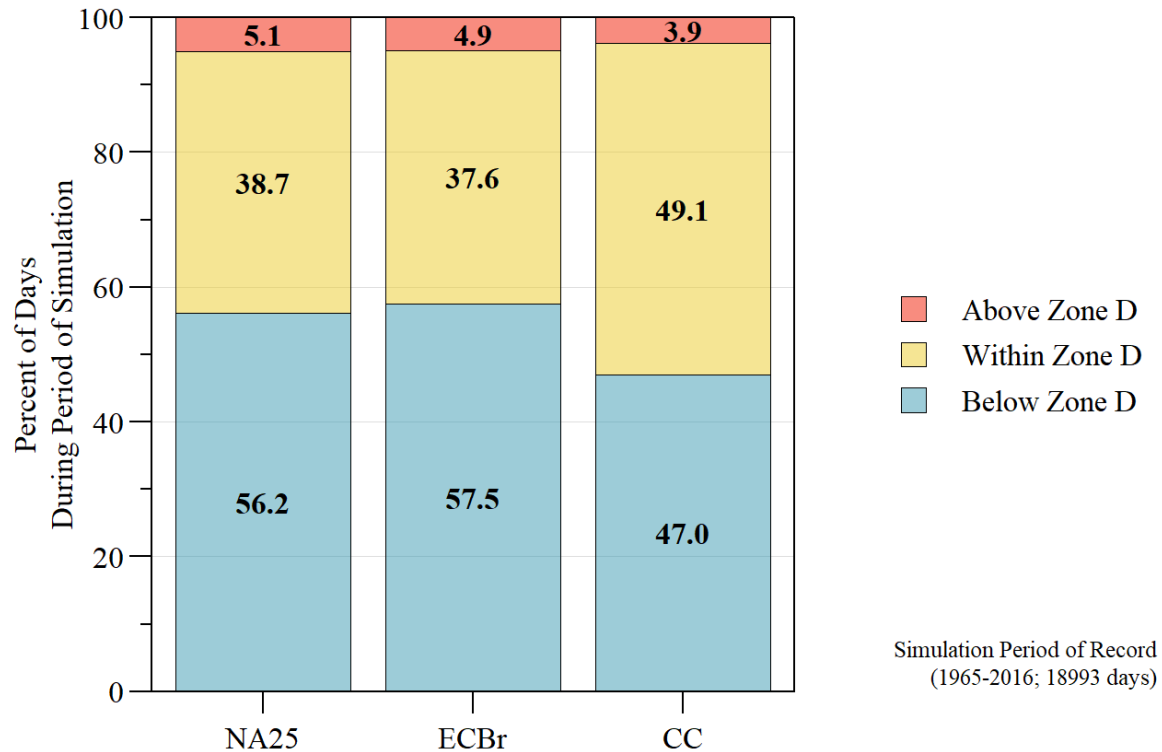
Average annual flood control discharges from Lake Okeechobee to Water Conservation Areas and Northern Estuaries over the simulation period of record.

Load



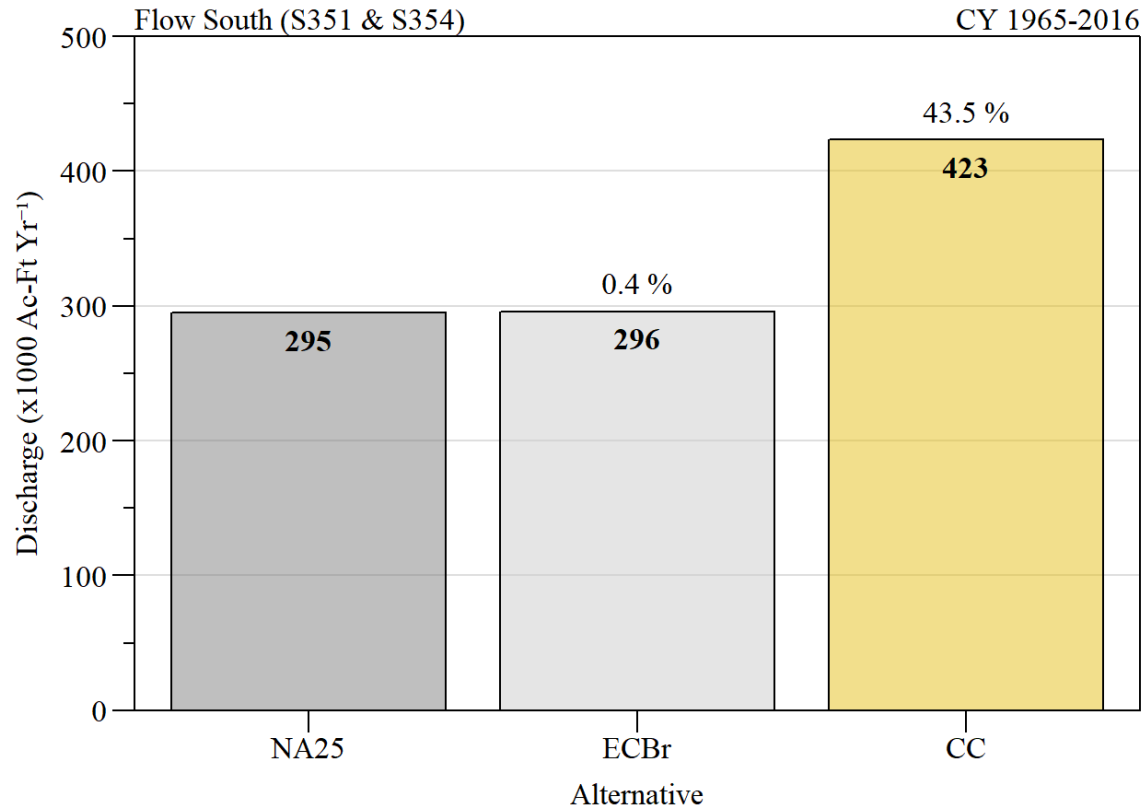
Average percent difference from FWO (NA25) for discharge and estimated nutrient loads over the May 1965 - April 2016 (FL WY 1966 - 2016) period of simulation.

Lake Okeechobee Regulation Schedule



Percent of time above, within, and below Zone D of the regulation schedule.

Flows South



Average annual discharge volume for NA25 (Future Without), ECBR (Existing Condition) and CC (selected alternative) during the simulated period of record.

Extra Information

Daily count of low, optimum, stress and damaging flow events for Caloosatchee and St Lucie estuaries.

| Summarized Data | | | | | | | | Percent Different from FWO | | | | | |
|------------------|-------------------|---------------|-------------------|-------------|---------------|-------------|---------------|----------------------------|-------------------|-------------|---------------|-------------|---------------|
| Estuary | Alt | Low Events | Optimum Events | Stress | Stress | Damaging | Damaging | Low Events | Optimum Events | Stress | Stress | Damaging | Damaging |
| | | | | Events | Events | Events | Events | | | Events | Events | Events | Events |
| | | | | From LOK | From Basin | From LOK | From Basin | | | From LOK | From Basin | From LOK | From Basin |
| CRE ¹ | NA25 ² | 7743 | 6344 | 261 | 488 | 1988 | 2169 | --- | --- | --- | --- | --- | --- |
| | ECBr | 9354 | 3769 | 246 | 706 | 2015 | 2903 | 20.8 | -40.6 | -5.7 | 44.7 | 1.4 | 33.8 |
| | CC | 5058 | 8420 | 450 | 519 | 2199 | 2347 | -34.7 | 32.7 | 72.4 | 6.4 | 10.6 | 8.2 |
| SLE ¹ | NA25 ² | 1943 | 10112 | 388 | 593 | 1444 | 4513 | --- | --- | --- | --- | --- | --- |
| | ECBr | 2045 | 9725 | 405 | 516 | 1567 | 4735 | 5.2 | -3.8 | 4.4 | -13.0 | 8.5 | 4.9 |
| | CC | 3110 | 10433 | 0 | 759 | 201 | 4490 | 60.1 | 3.2 | -100.0 | 28.0 | -86.1 | -0.5 |

¹ CRE: Caloosahatchee Estuary; SLE: St Lucie Estuary; ² NA25 = Future without project (FWO)

Low Flows CRE: < 750 cfs; SLE: < 150 cfs

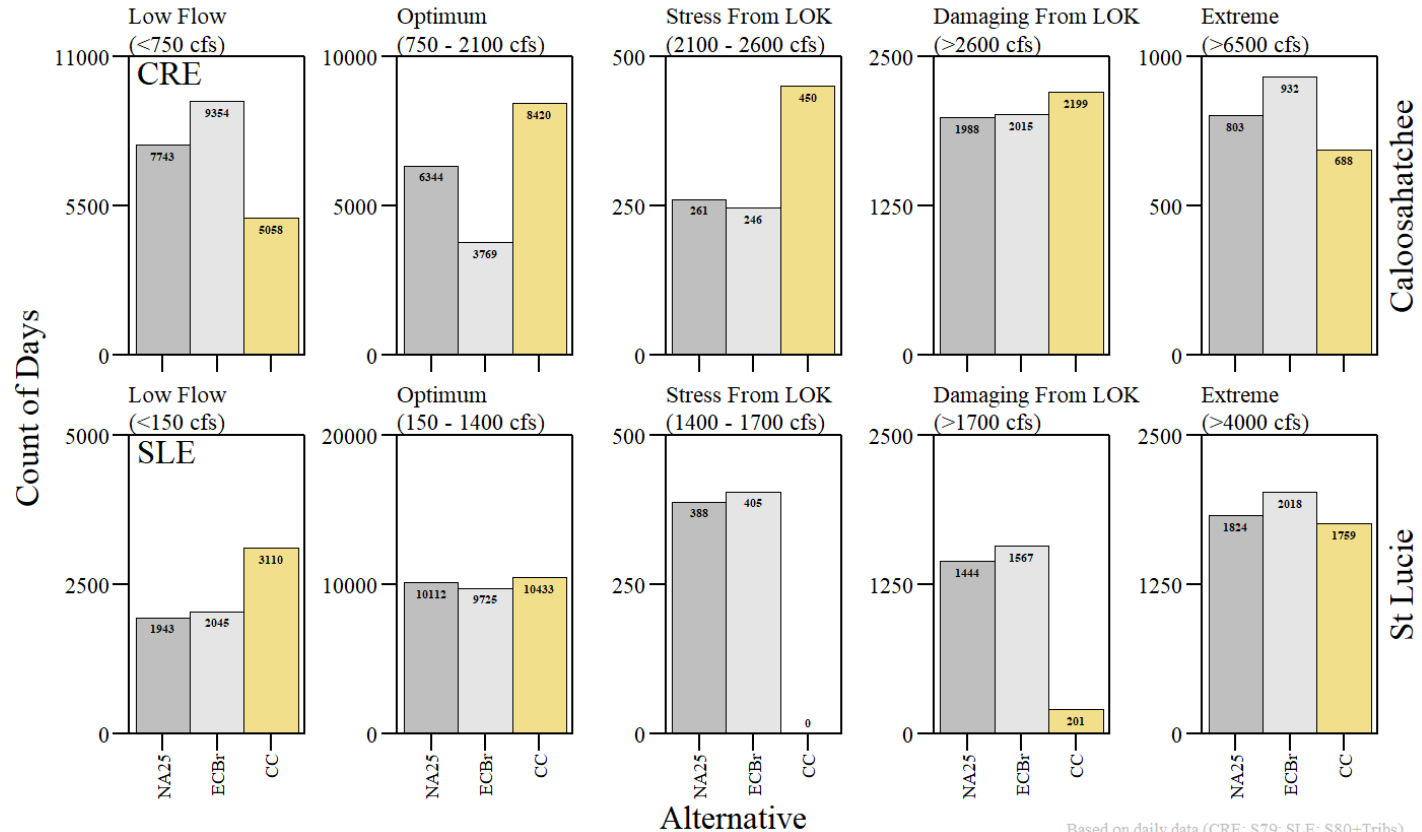
Optimum Flows CRE: ≥ 750 cfs & < 2100 cfs; SLE: ≥ 150 cfs & < 1400 cfs

Stressful Flows CRE: ≥ 2100 cfs & < 2600 cfs; SLE: ≥ 1400 cfs & < 1700 cfs

Damaging Flows CRE: > 2600 cfs; SLE: > 1700 cfs

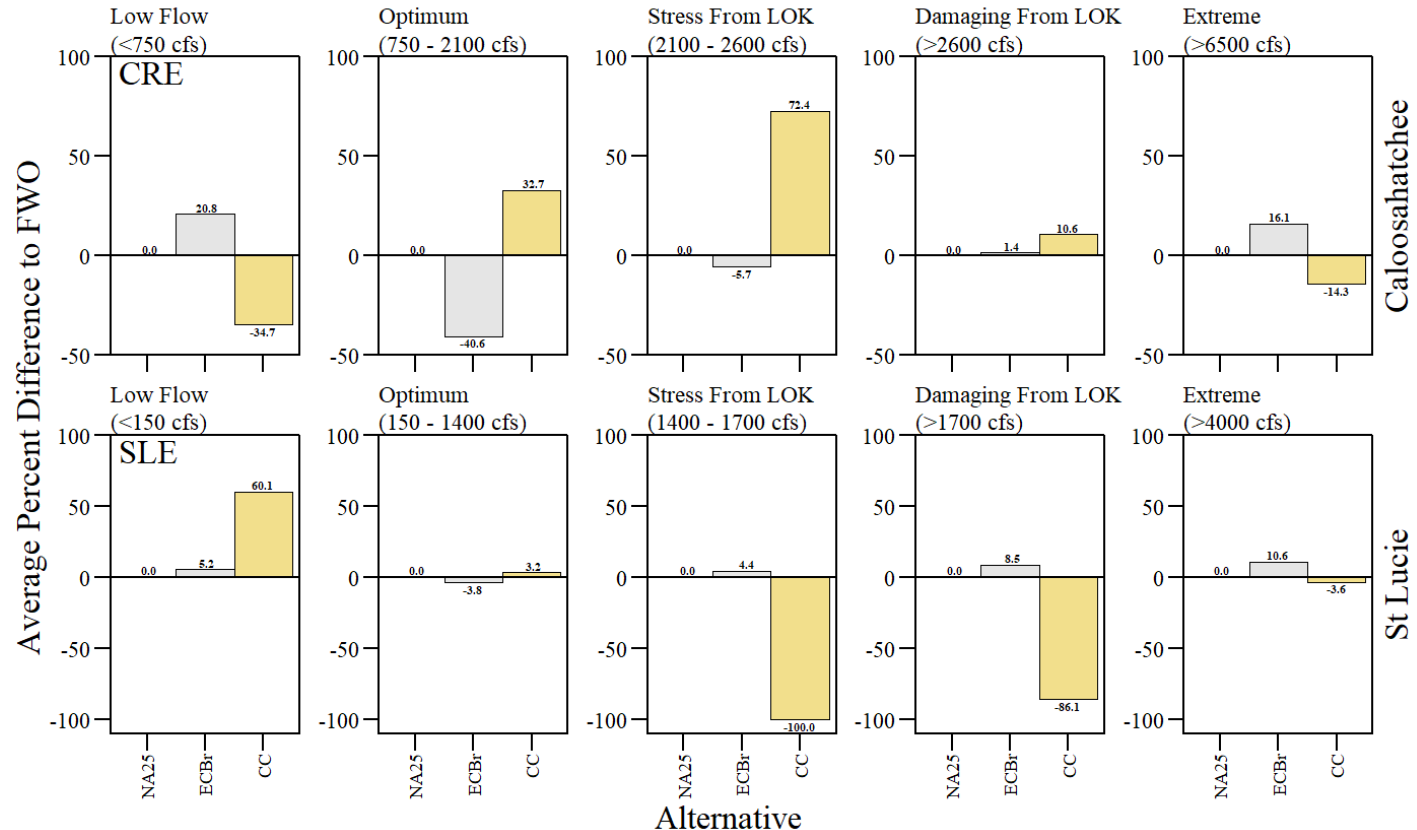
Data Source: USACE and SFWMD Interagency Modeling Center

Daily Metric



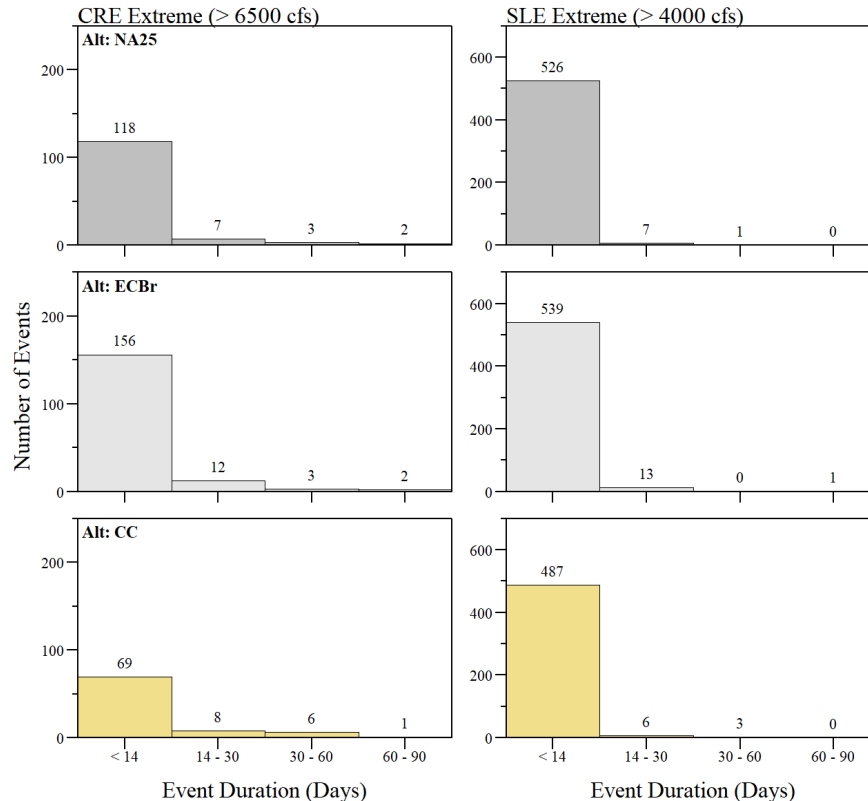
Daily salinity envelope evaluation during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries. Low, Optimum and Extreme events are from all sources.

Daily Metric



Daily salinity envelope evaluation relative to FWO (NA25) during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries. Low, Optimum and Extreme events are from all sources.

Daily Metric - Extreme Events



Number and duration of events where daily discharge for CRE and SLE fall within the extreme (CRE: >6500 cfs; SLE: >4000 cfs).

Monthly count of low, optimum, stress and damaging flow events for Caloosatchee and St Lucie estuaries based on monthly mean discharge data.

| | | Summarized Data | | | | | | Percent Different from FWO | | | | | |
|------------------|-------------------|-----------------|-------------------|-------------|---------------|-------------|---------------|----------------------------|-------------------|-------------|---------------|-------------|---------------|
| Estuary | Alt | Low Events | Optimum Events | Stress | Stress | Damaging | Damaging | Low Events | Optimum Events | Stress | Stress | Damaging | Damaging |
| | | | | Events | Events | Events | Events | | | Events | Events | Events | Events |
| | | | | From LOK | From Basin | From LOK | From Basin | | | From LOK | From Basin | From LOK | From Basin |
| CRE ¹ | NA25 ² | 212 | 225 | 37 | 19 | 70 | 61 | --- | --- | --- | --- | --- | --- |
| | ECBr | 253 | 153 | 33 | 25 | 76 | 84 | 19.3 | -32.0 | -10.8 | 31.6 | 8.6 | 37.7 |
| | CC | 149 | 243 | 96 | 15 | 54 | 67 | -29.7 | 8.0 | 159.5 | -21.1 | -22.9 | 9.8 |
| SLE ¹ | NA25 ² | 23 | 314 | 31 | 35 | 46 | 175 | --- | --- | --- | --- | --- | --- |
| | ECBr | 23 | 308 | 30 | 26 | 47 | 190 | 0.0 | -1.9 | -3.2 | -25.7 | 2.2 | 8.6 |
| | CC | 30 | 363 | 0 | 47 | 8 | 176 | 30.4 | 15.6 | -100.0 | 34.3 | -82.6 | 0.6 |

¹ CRE: Caloosahatchee Estuary; SLE: St Lucie Estuary; ² NA25 = Future without project (FWO)

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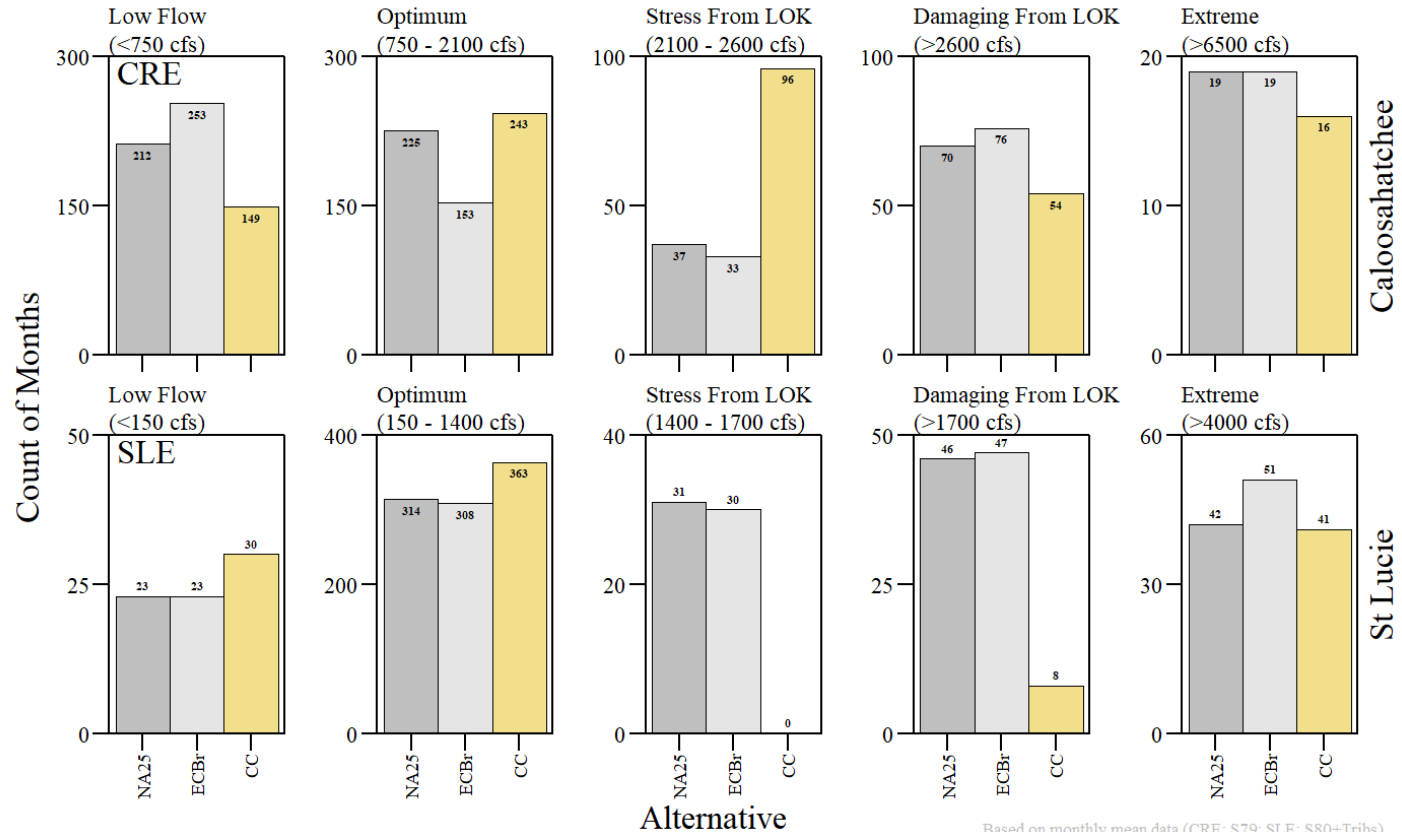
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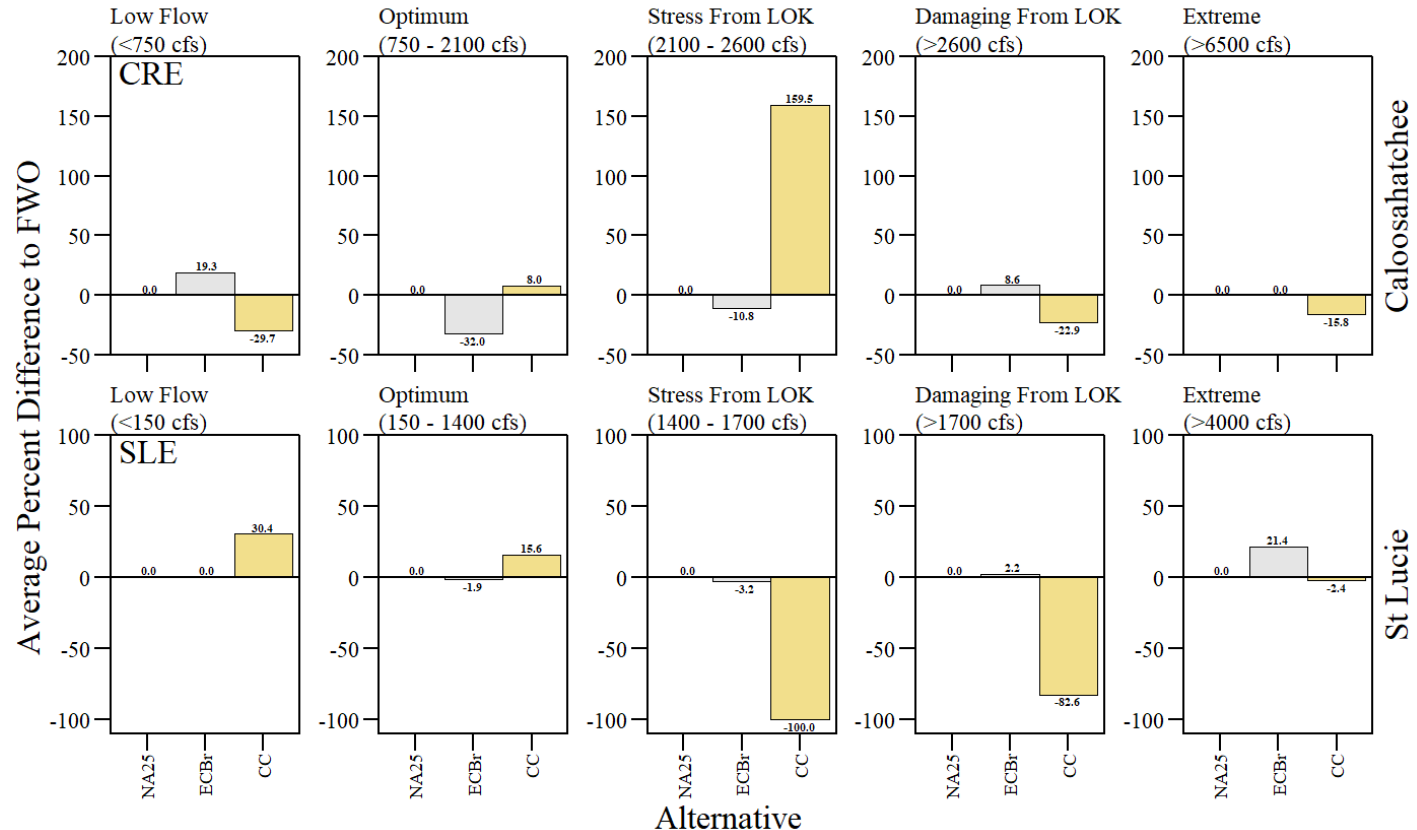
Data Source: USACE and SFWMD Interagency Modeling Center

Monthly Metric



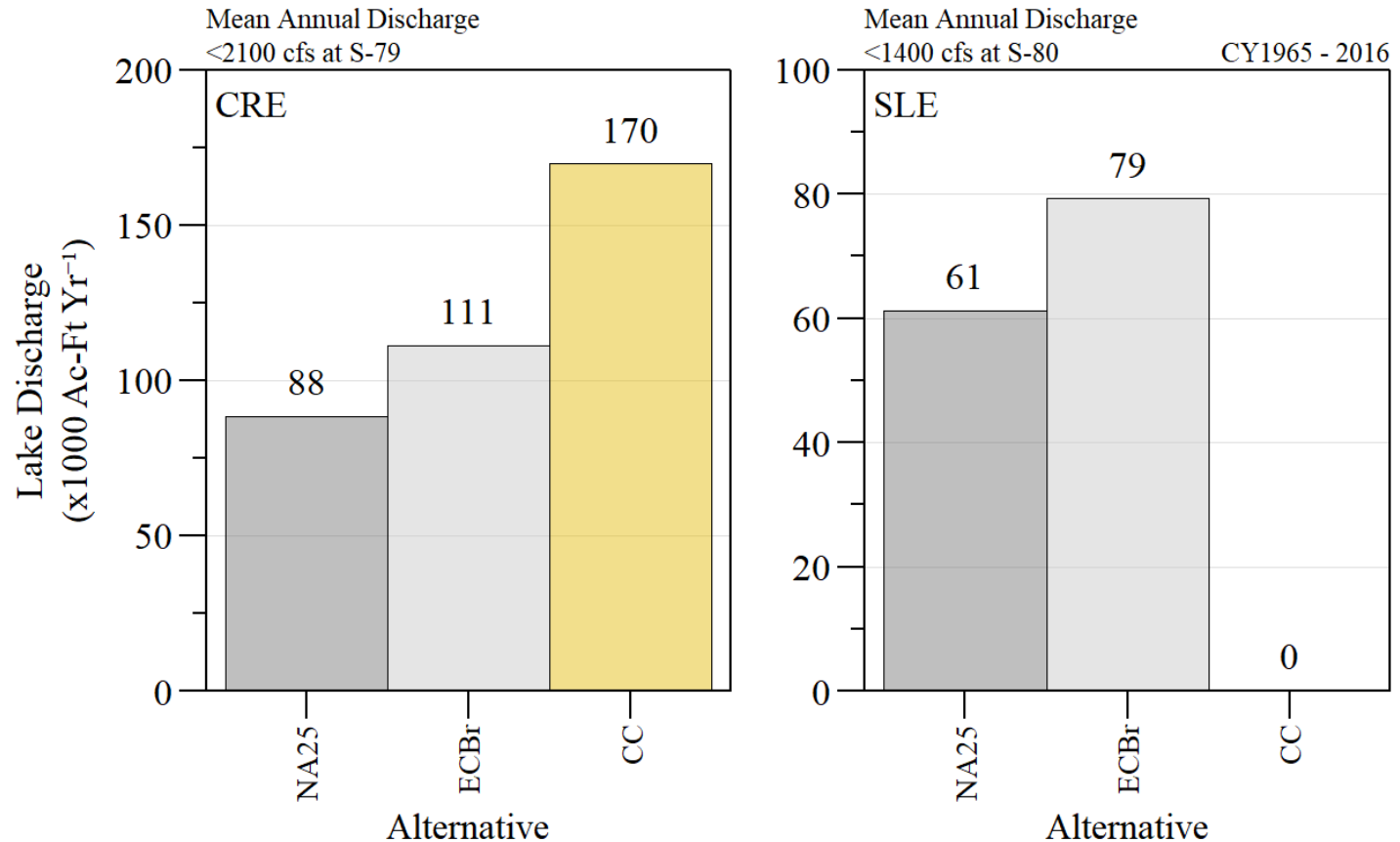
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Lake Discharges



Average annual lake discharge volume over the simulation period of record when low and optimum discharge at S79 and S80, respectively.