

# Lake Okeechobee System Operating Manual


## POST Iteration 2 Modeling Evaluation

*Sanibel-Captiva Conservation Foundation*

*Conservancy of Southwest Florida*

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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 <sup>3</sup>	Stress Events From Basin <sup>3</sup>	Damaging Events From LOK <sup>4</sup>	Damaging Events From Basin <sup>4</sup>	Regulatory Flows (kacft/yr)	Stress Events From LOK <sup>3</sup>	Stress Events From Basin <sup>3</sup>	Damaging Events From LOK <sup>4</sup>	Damaging Events From Basin <sup>4</sup>
CRE <sup>1</sup>	NA25 <sup>2</sup>	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 <sup>1</sup>	NA25 <sup>2</sup>	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

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

<sup>3</sup> Stressful Flows:

CRE: ≥ 2100 cfs & < 2600 cfs

SLE: ≥ 1400 cfs & < 1700 cfs

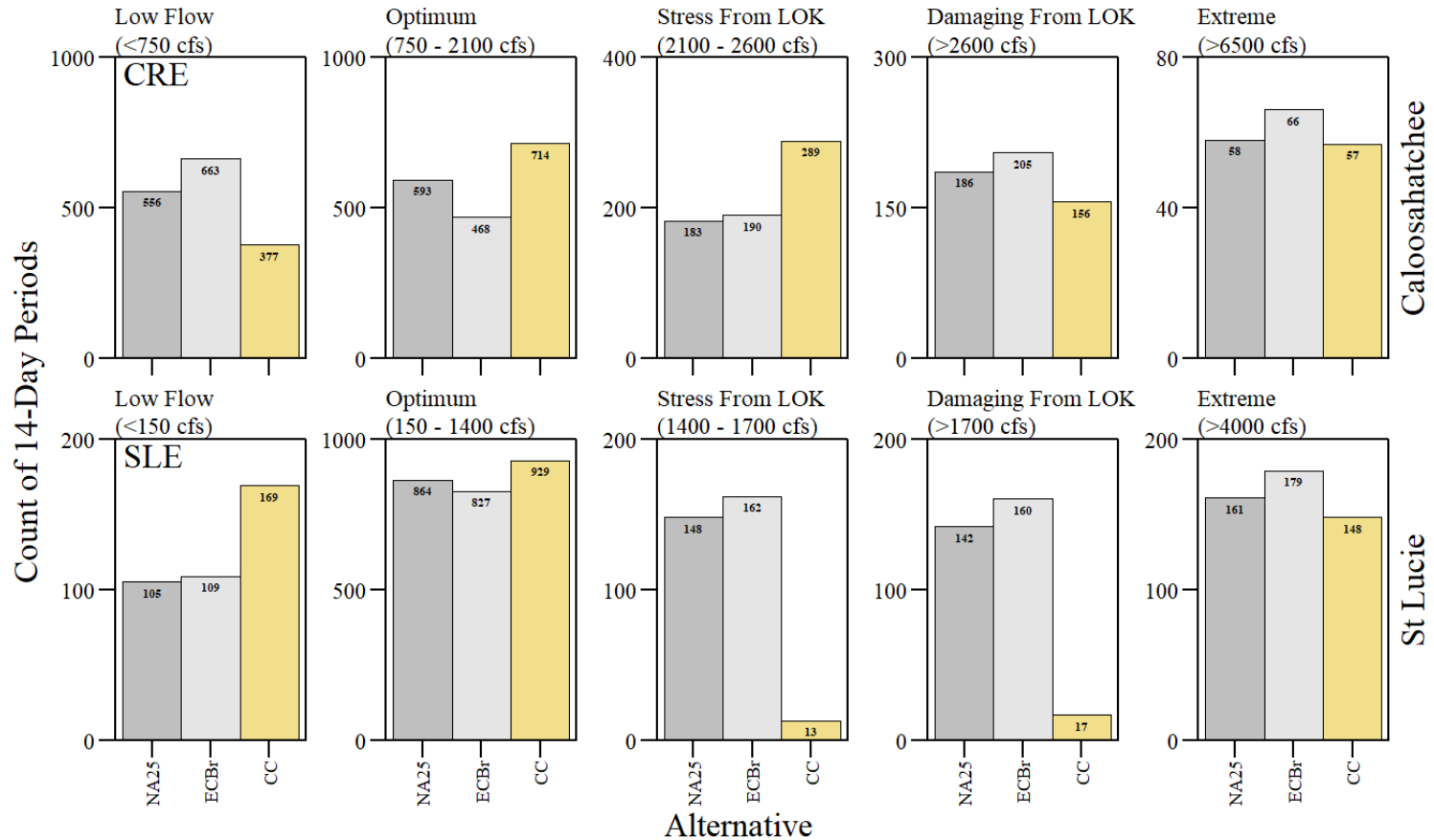
<sup>4</sup> Damaging Flows:

CRE: > 2600 cfs

SLE: > 1700 cfs

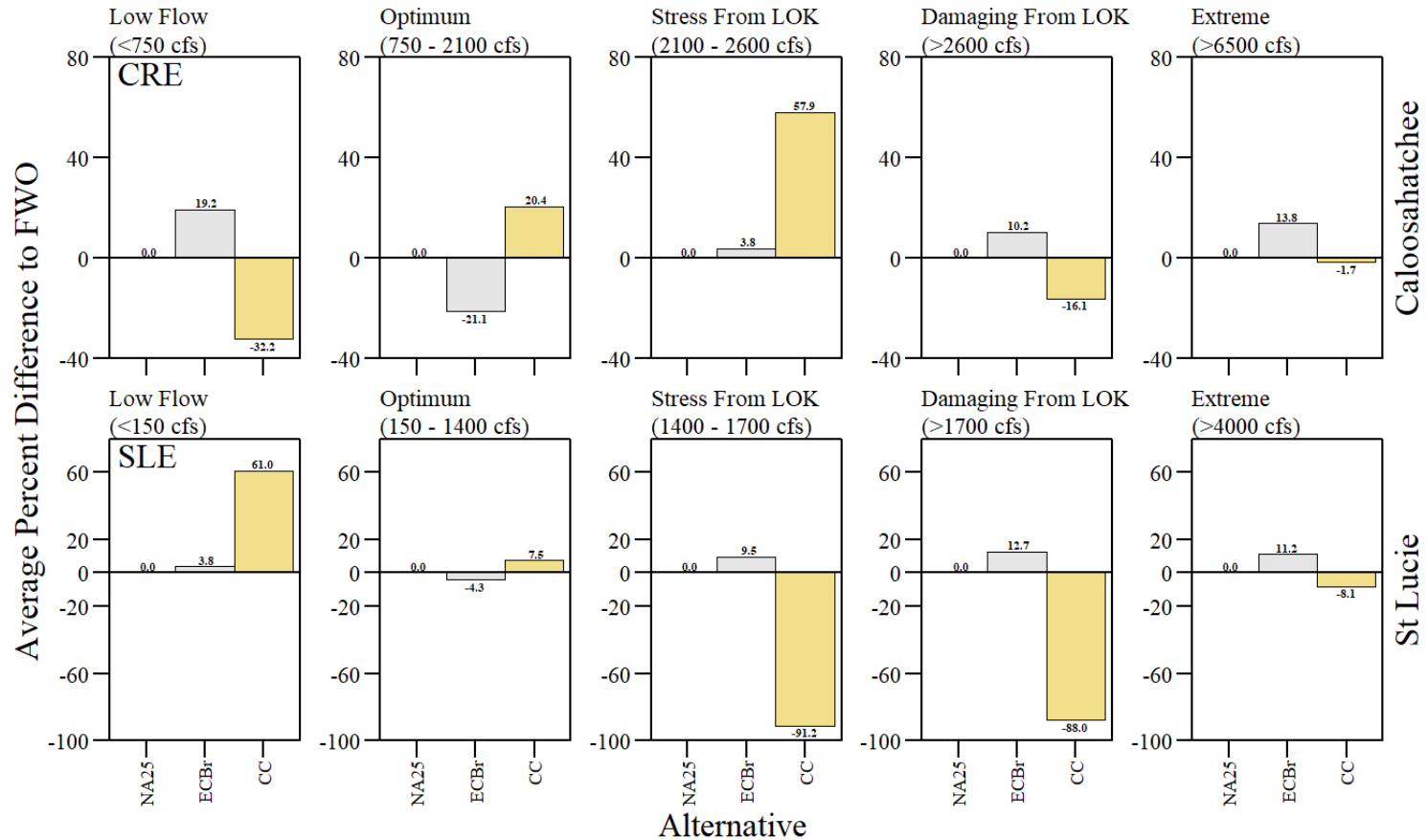
**Data Source:** USACE and SFWMD Interagency Modeling Center

# 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.

## 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	From LOK	From Basin			From LOK	From Basin	Events	Events
CRE <sup>1</sup>	NA25 <sup>2</sup>	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 <sup>1</sup>	NA25 <sup>2</sup>	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

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

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

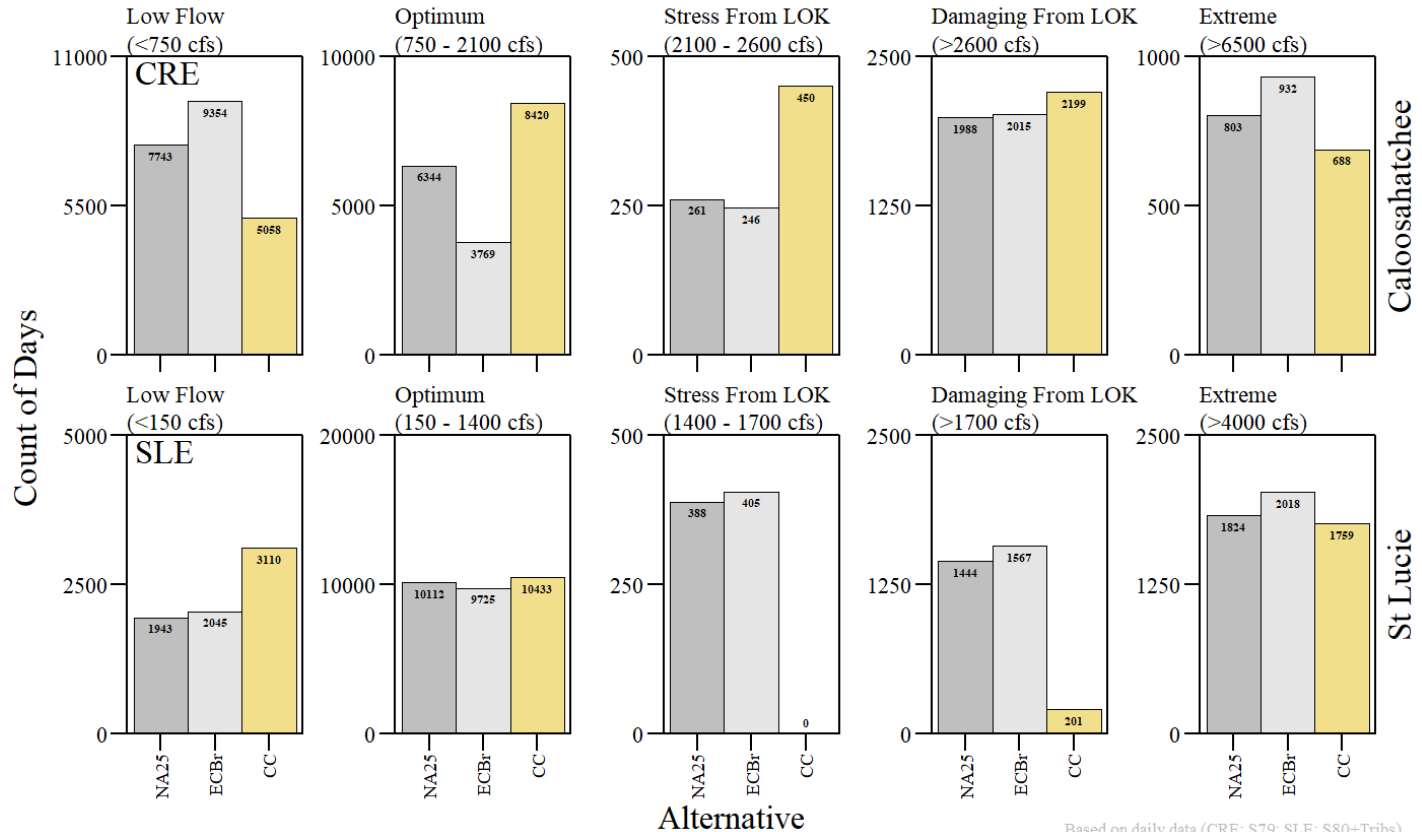
**Optimum Flows** CRE: ≥ 750 cfs & < 2100 cfs; SLE: ≥ 150 cfs & < 1400 cfs

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

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

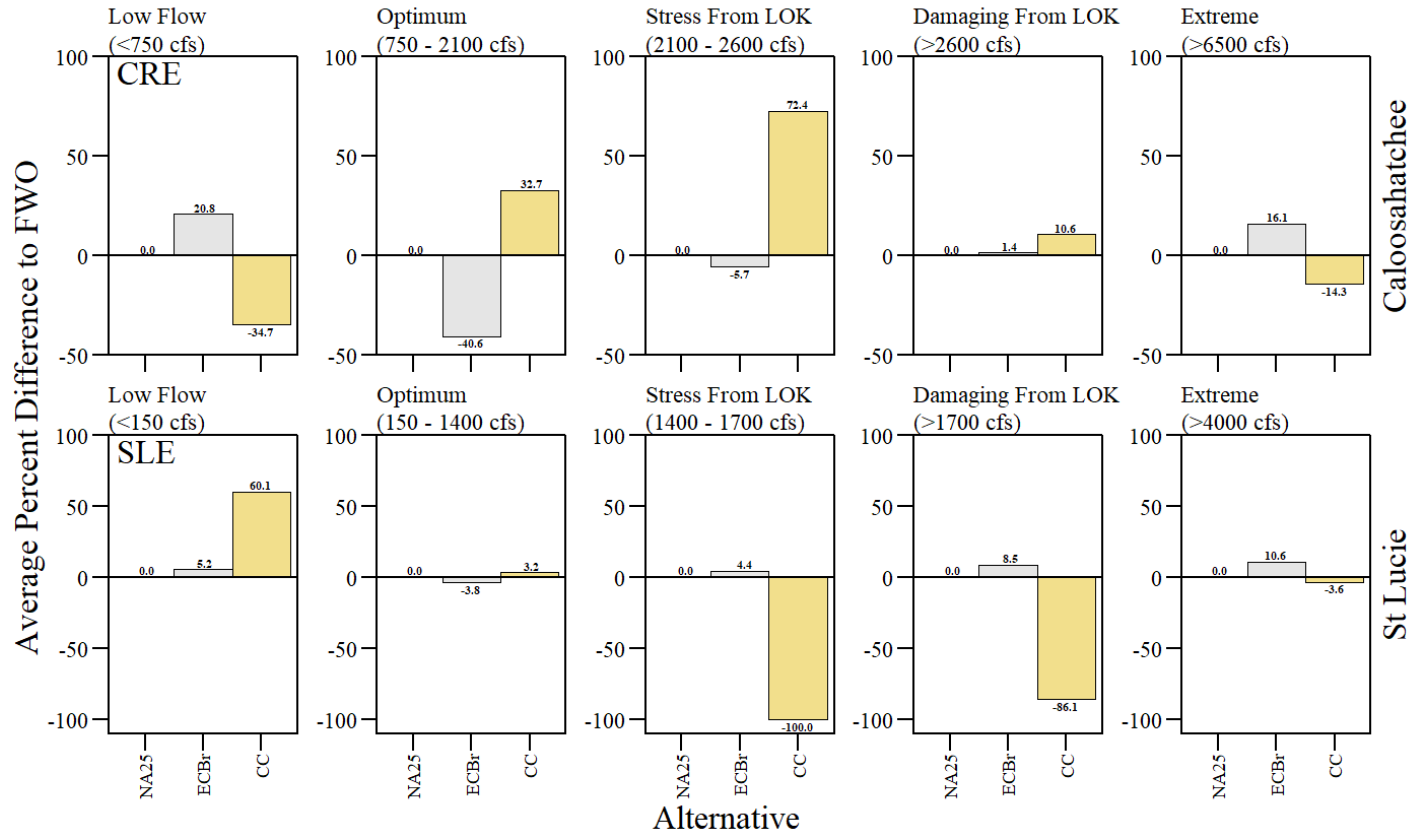
**Data Source:** USACE and SFWMD Interagency Modeling Center

# Daily Metric



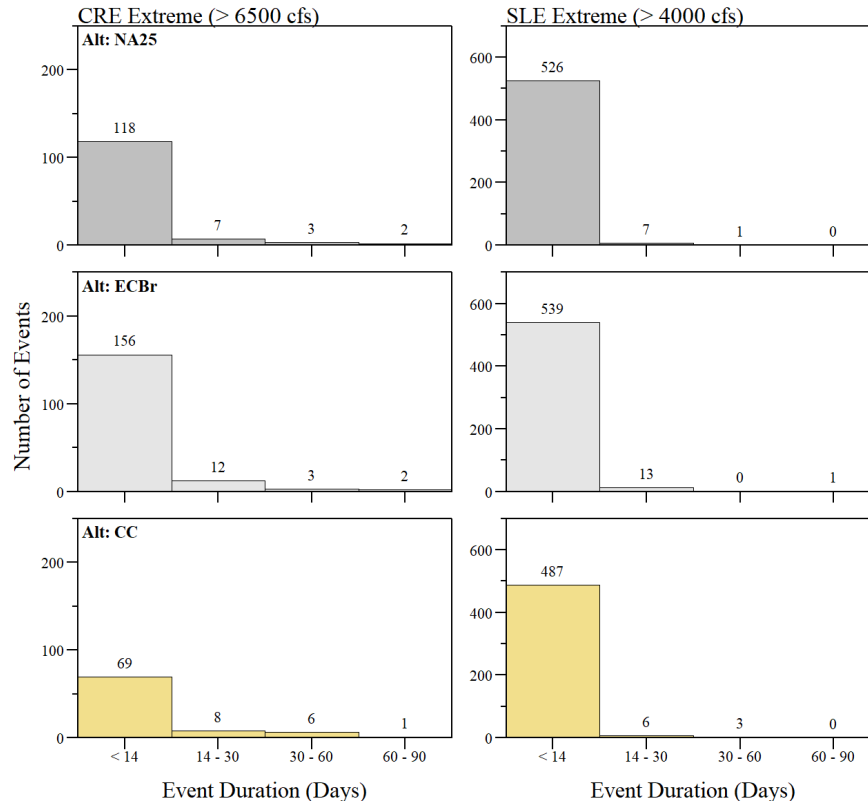
Daily salinity envelope evaluation during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries. Low, Optimum and Extreme events are from all sources.

# 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.

Estuary	Alt	Summarized Data						Percent Different from FWO					
		Low Events	Optimum Events	Stress Events From LOK	Stress Events From Basin	Damaging Events From LOK	Damaging Events From Basin	Low Events	Optimum Events	Stress Events From LOK	Stress Events From Basin	Damaging Events From LOK	Damaging Events From Basin
CRE <sup>1</sup>	NA25 <sup>2</sup>	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 <sup>1</sup>	NA25 <sup>2</sup>	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

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

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

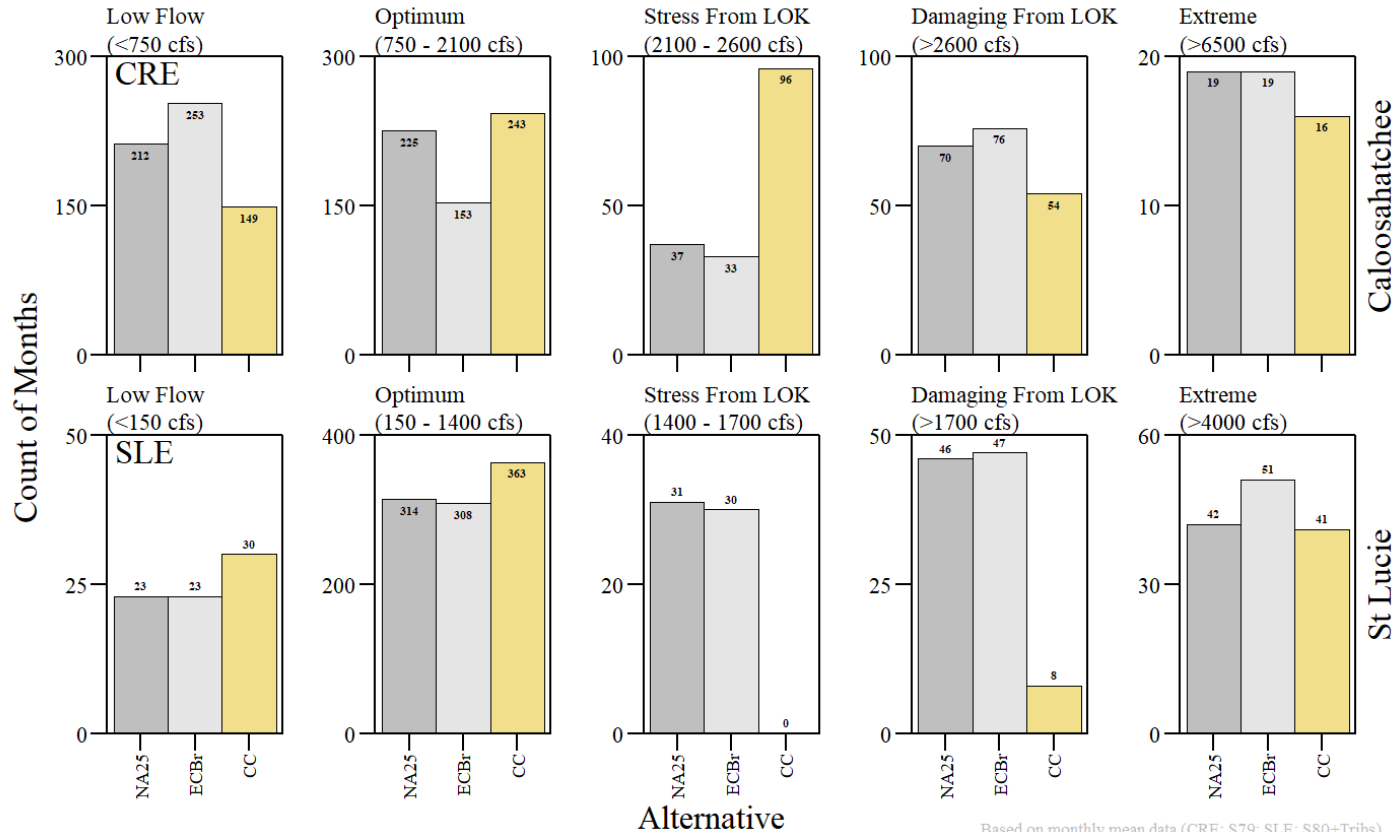
**Optimum Flows** CRE: ≥ 750 cfs & < 2100 cfs; SLE: ≥ 150 cfs & < 1400 cfs

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

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

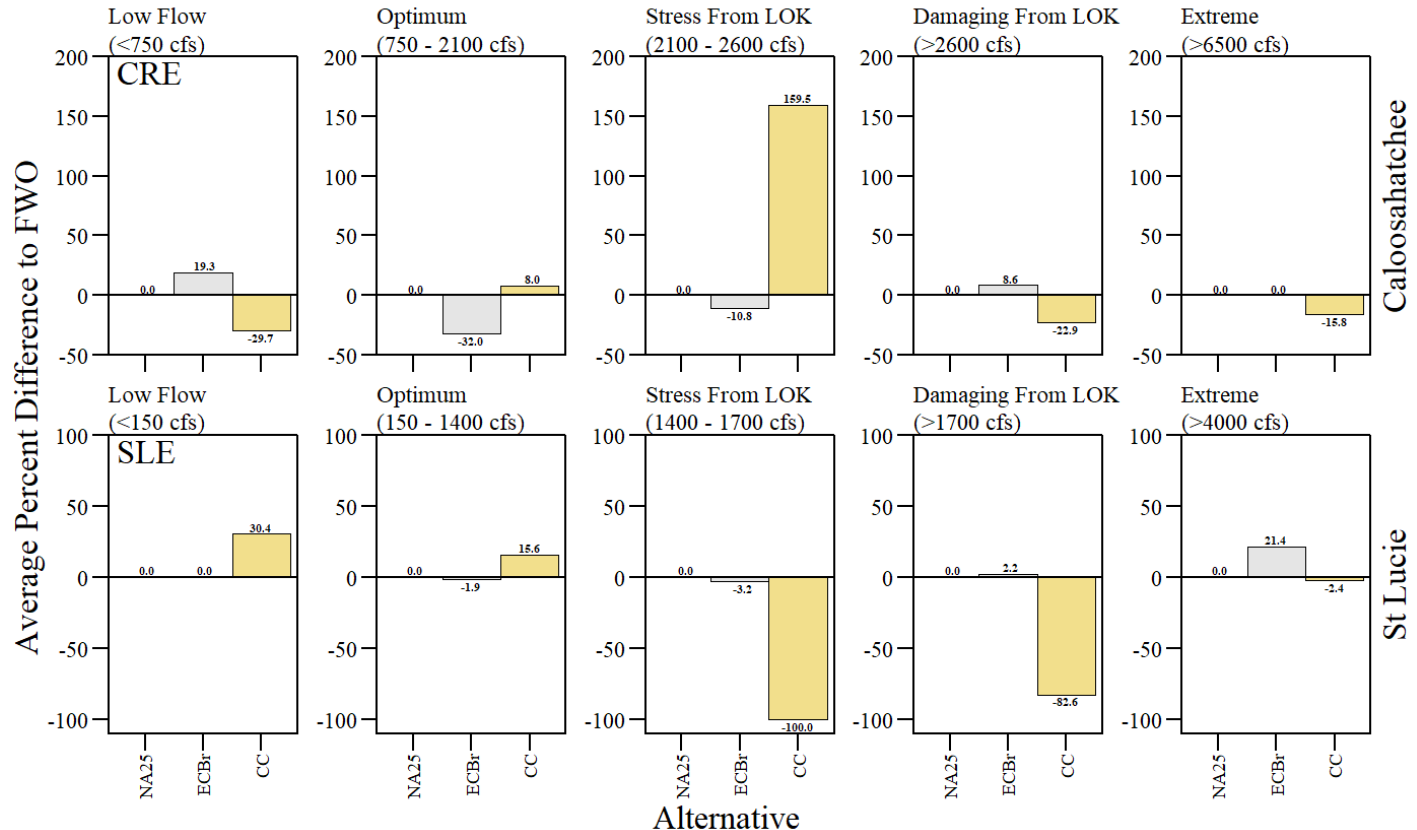
**Data Source:** USACE and SFWMD Interagency Modeling Center

# Monthly Metric



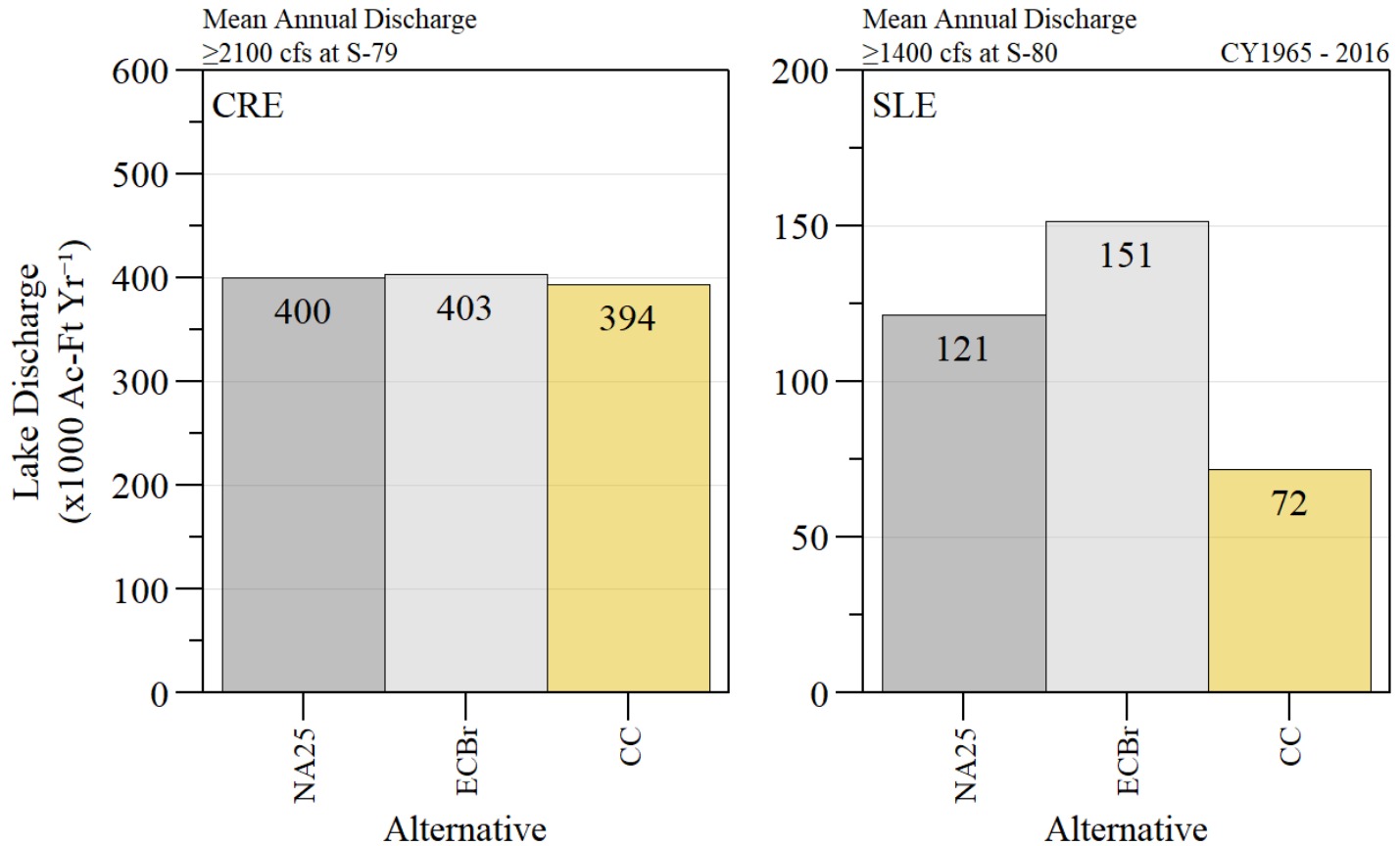
Monthly salinity envelope evaluation during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries. Low, Optimum and Extreme events are from all sources.

# Monthly Metric



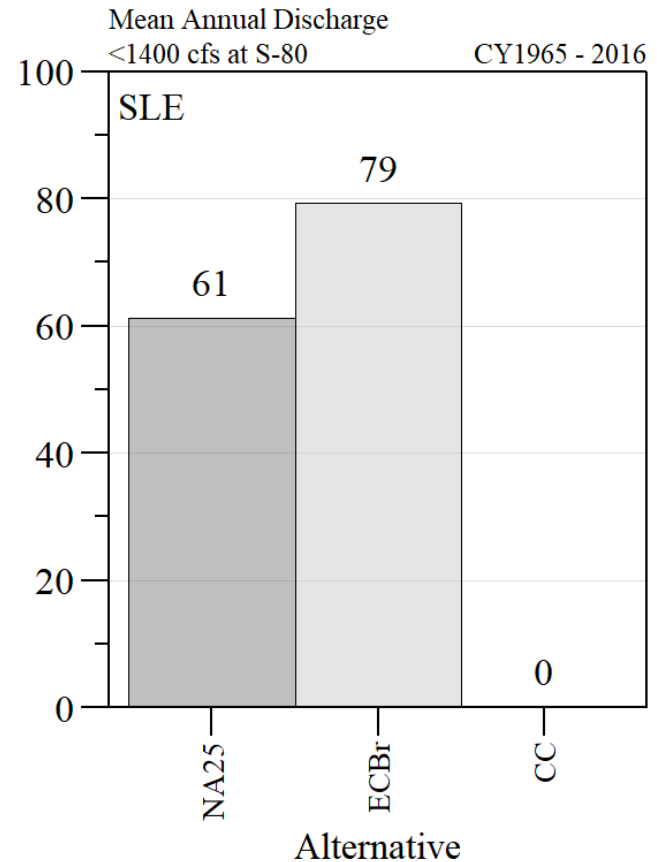
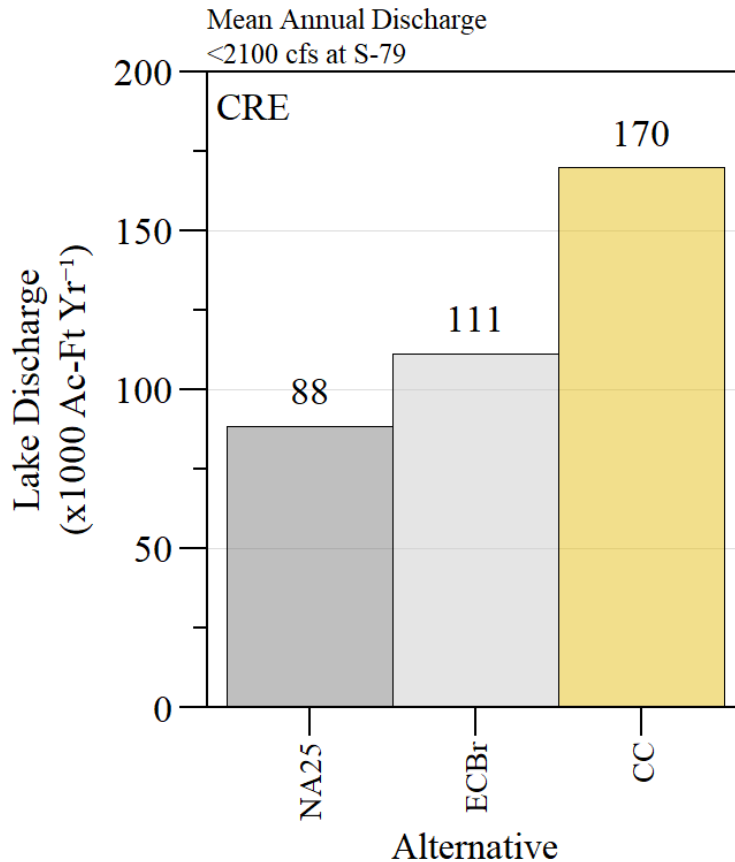
Monthly salinity envelope evaluation relative to FWO (NA25) during the simulation period of record for Caloosahatchee (top) and St Lucie (bottom) estuaries. Low, Optimum and Extreme events are from all sources.

# Lake Discharges



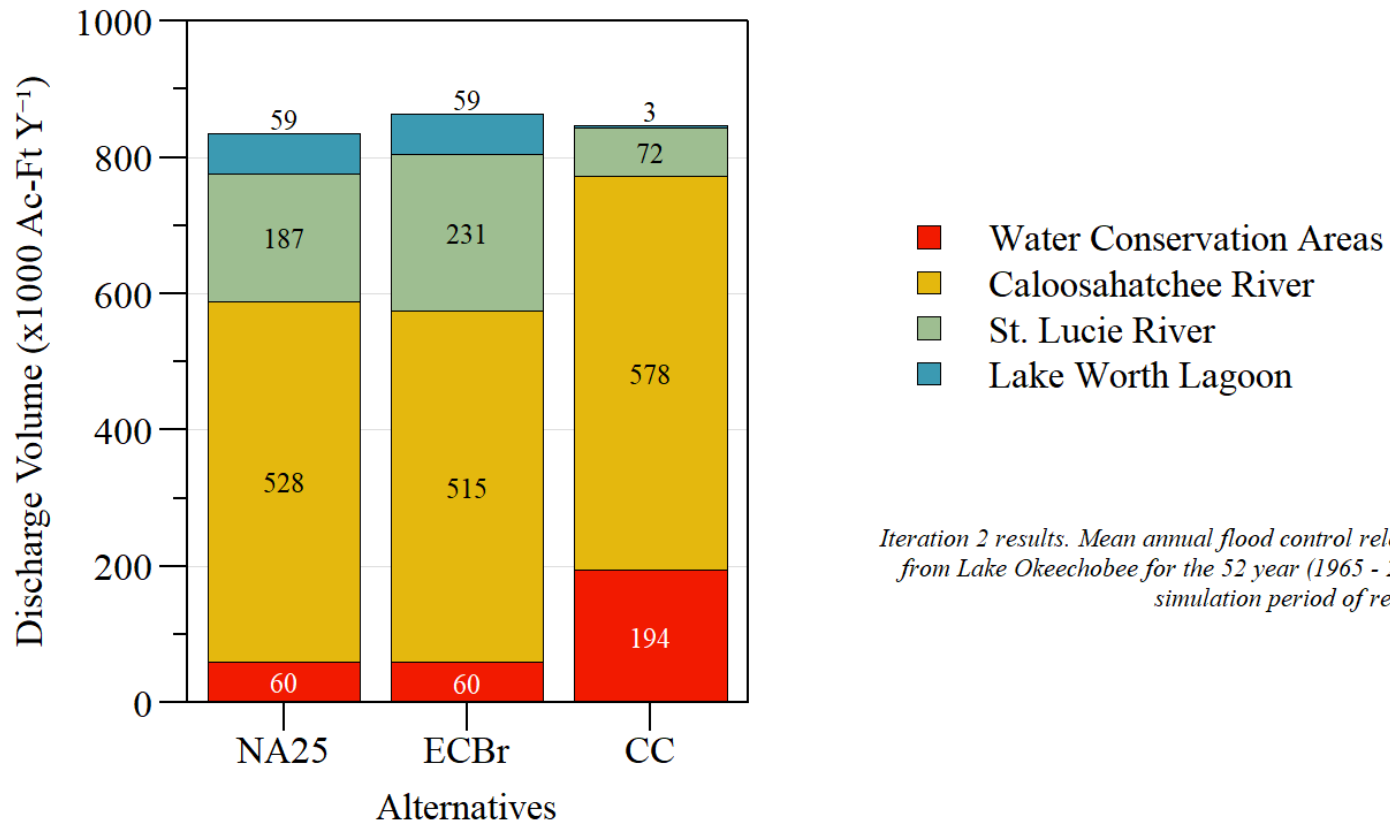
Average annual lake discharge volume over the simulation period of record when stress and damaging discharge at S79 and S80, respectively.

# Lake Discharges



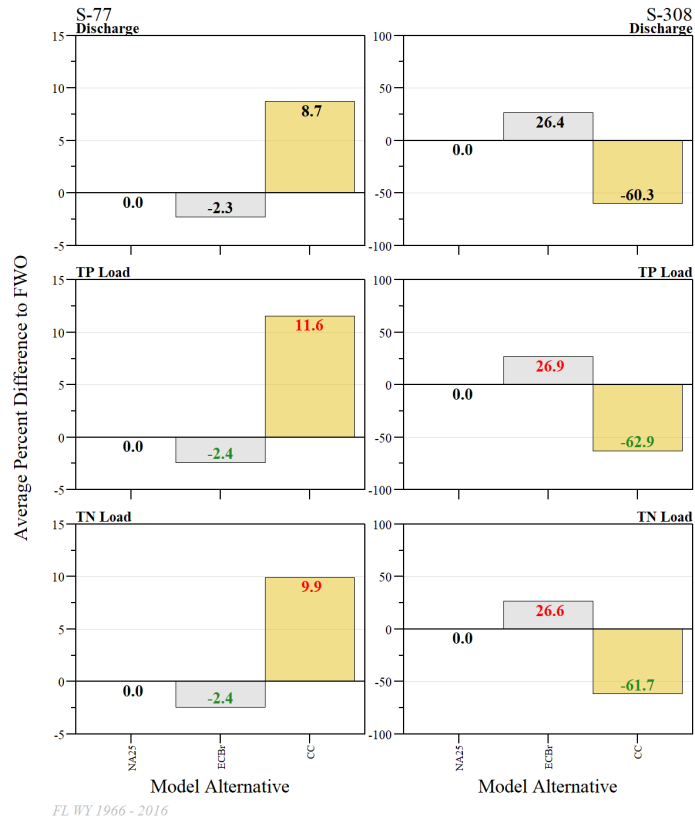
Average annual lake discharge volume over the simulation period of record when low and optimum discharge at S79 and S80, respectively.

# Flood control discharges



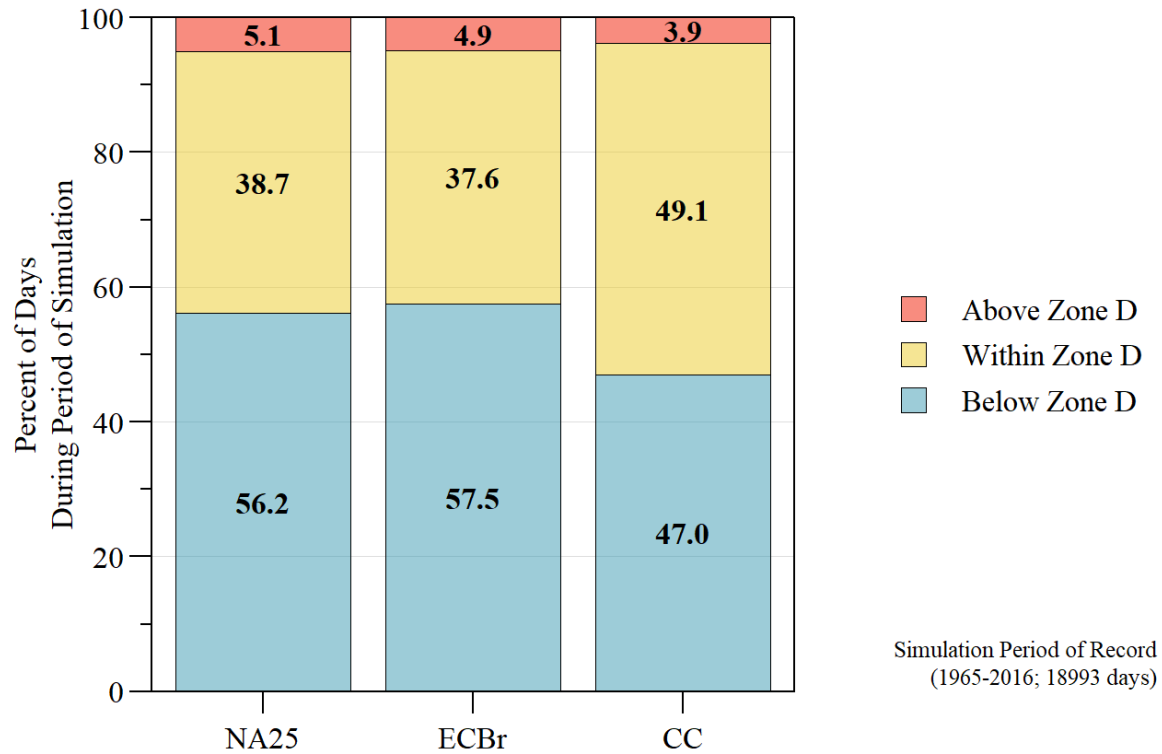
Average annual flood control discharges from Lake Okeechobee to Water Conservation Areas and Northern Estuaries over the simulation period of record.

# 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.