

# Lake Okeechobee System Operating Manual

## Iteration 3 - Phase 2 Batch Analysis

*Sanibel-Captiva Conservation Foundation*

*Conservancy of Southwest Florida*

**DRAFT** - October 22, 2021

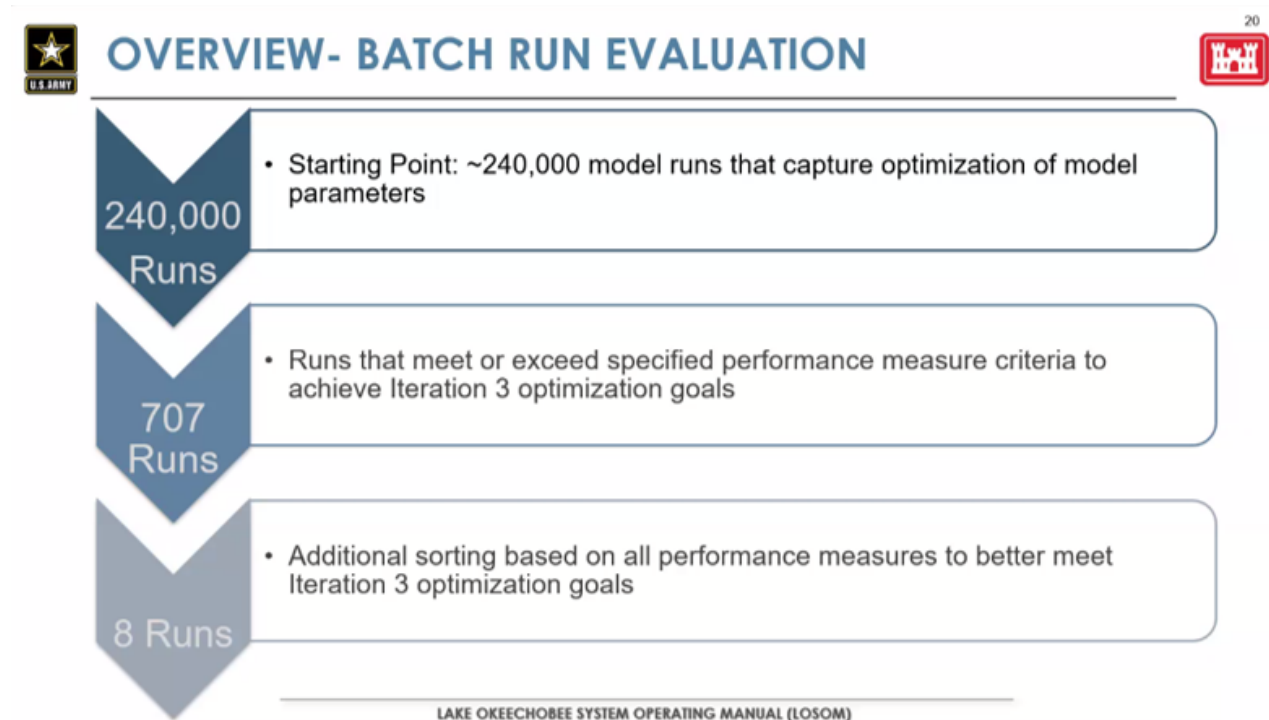
(Updated: November 02, 2021 )



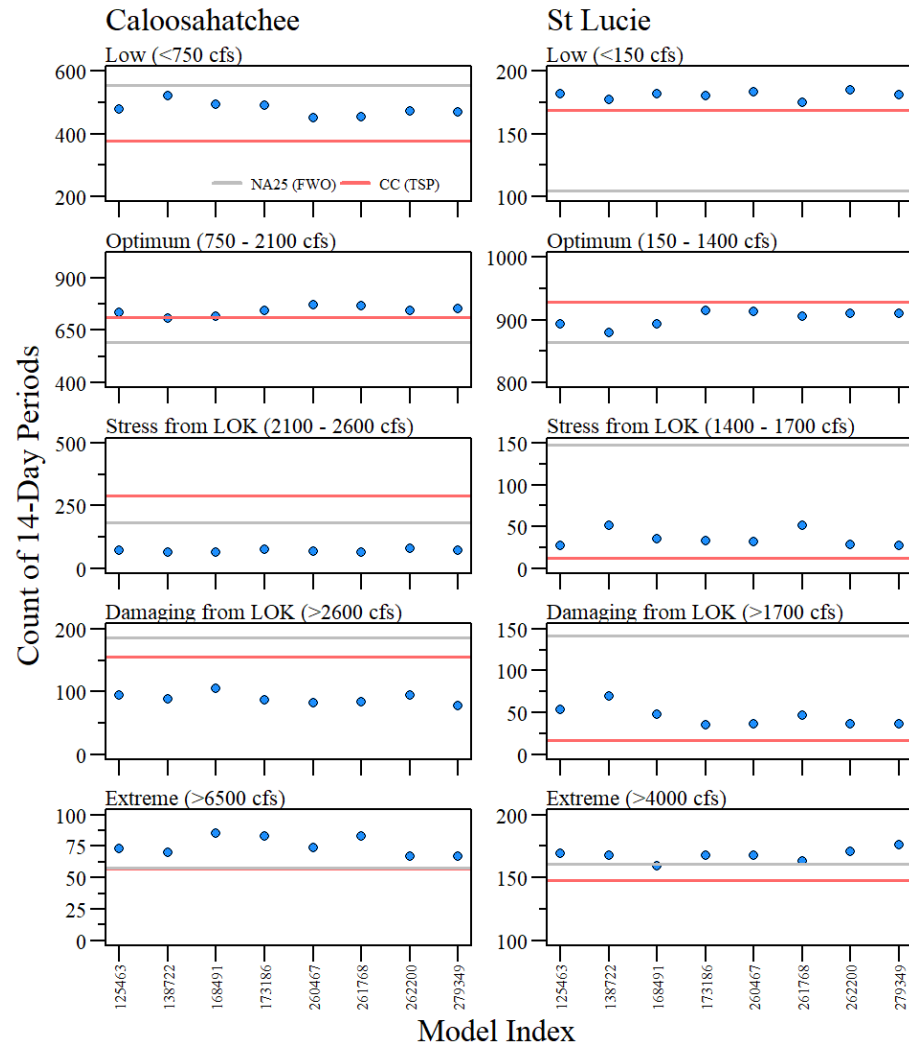
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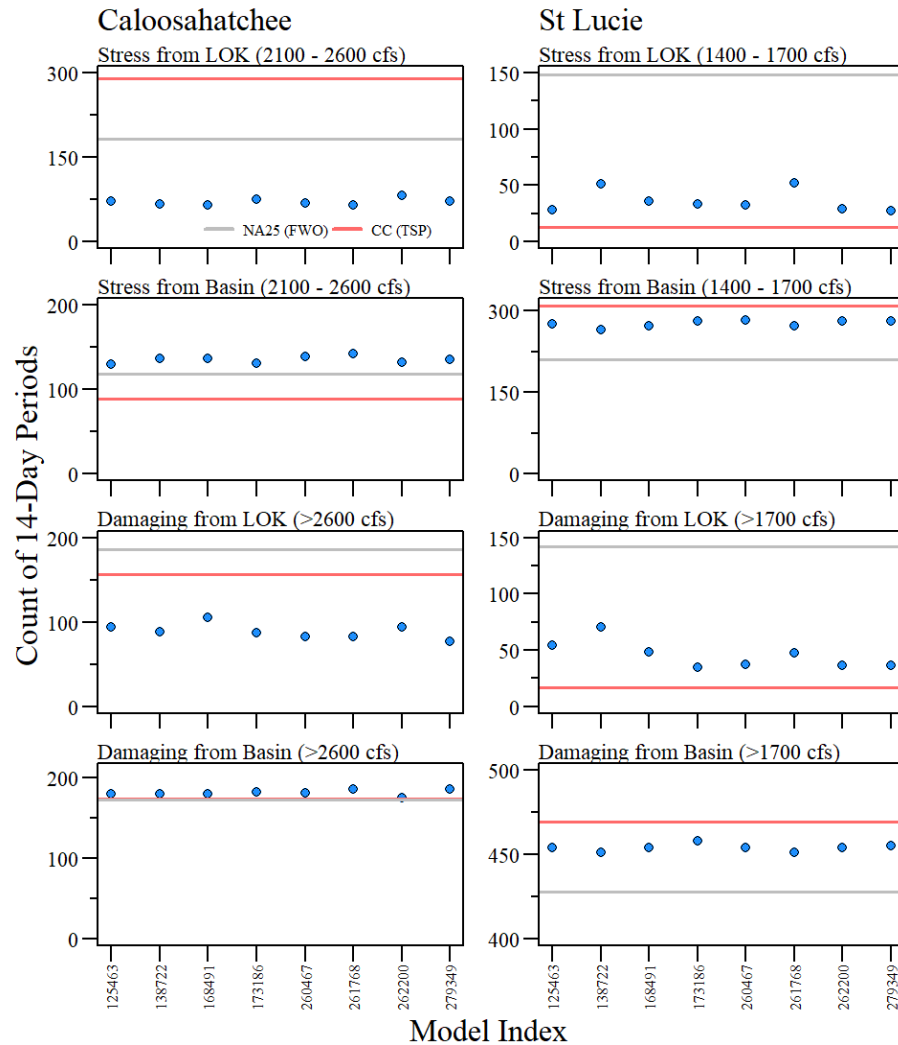
## Evaluation of model runs presented to PDT by USACE 2021-10-26



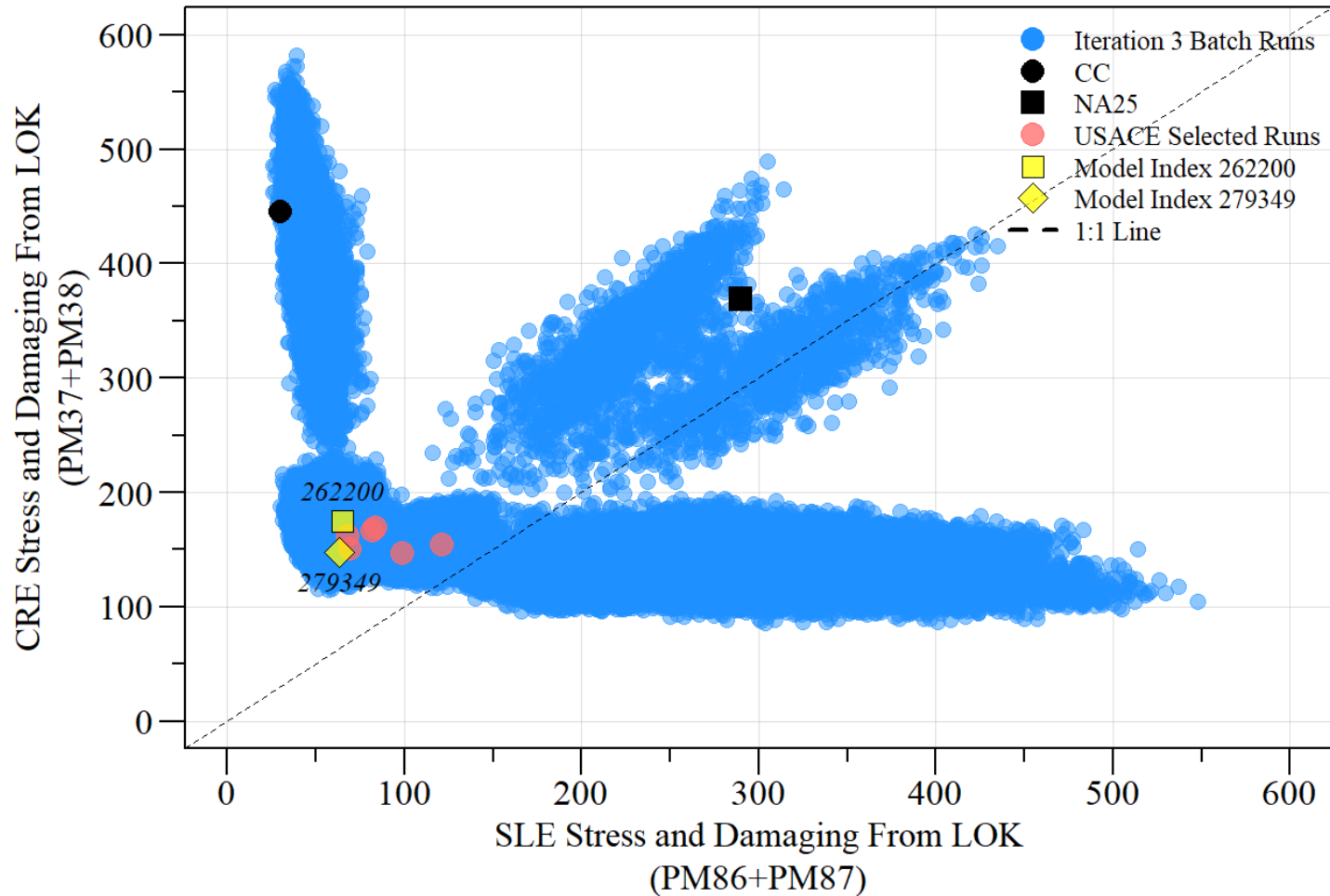
# Iteration 3 - Phase 2



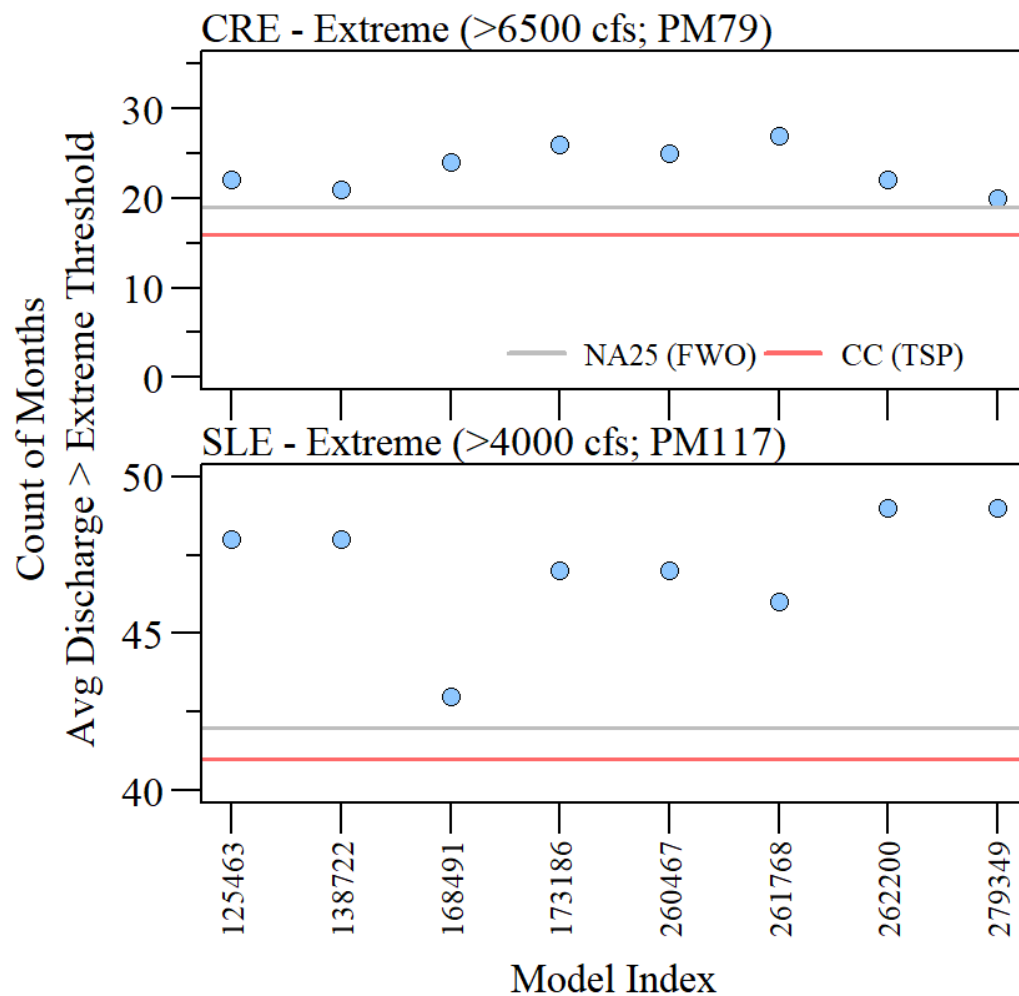
# Iteration 3 - Phase 2



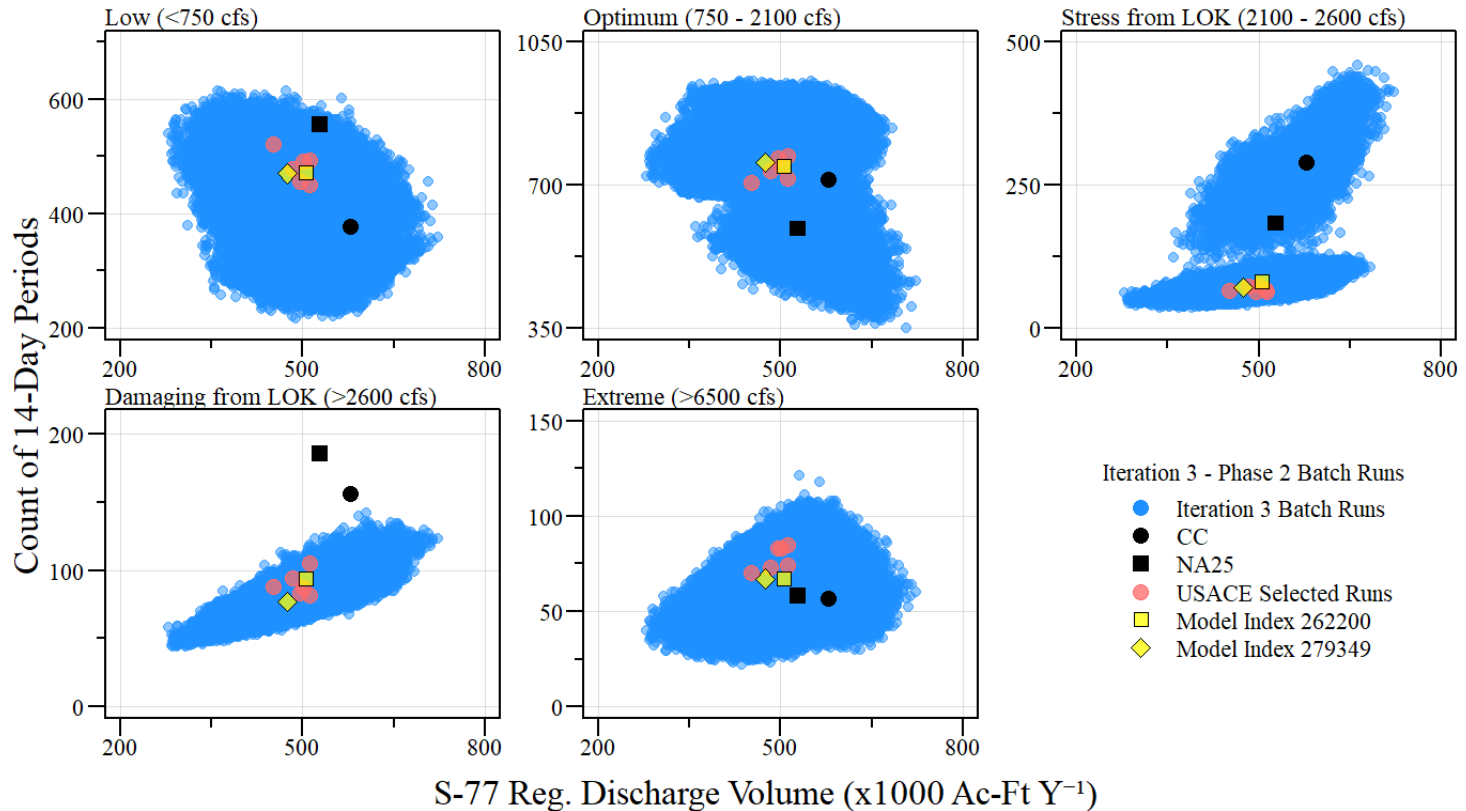
## Iteration 3 - Phase 2



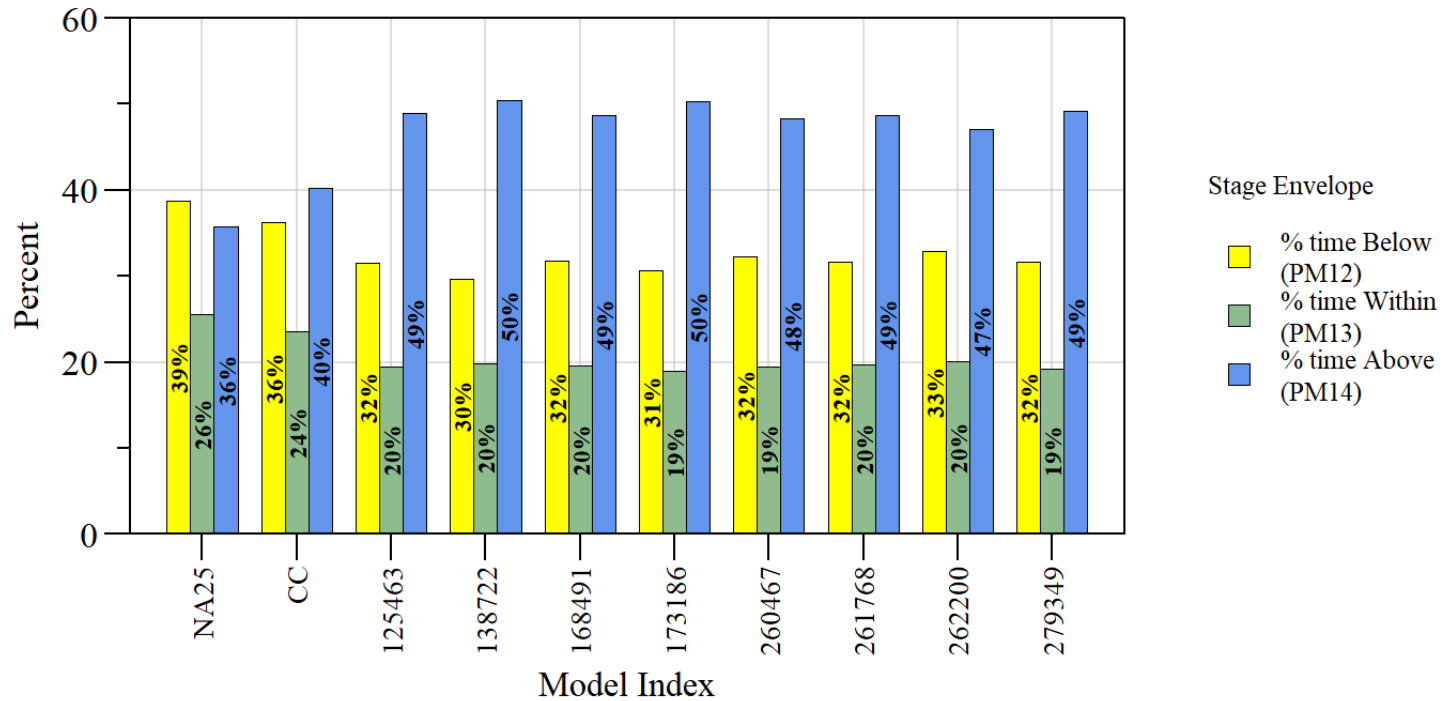
## Iteration 3 - Phase 2



## Iteration 3 - Phase 2

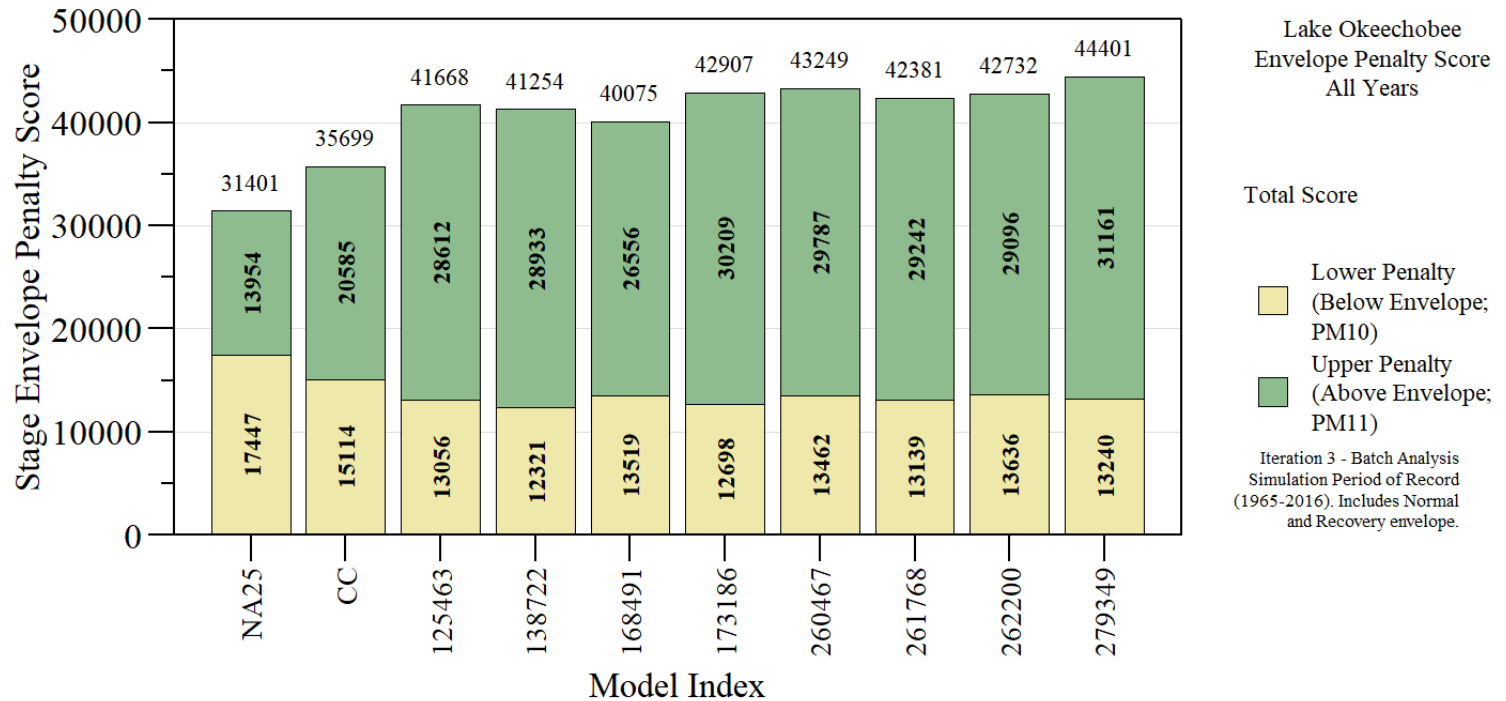


## Iteration 3 - Phase 2

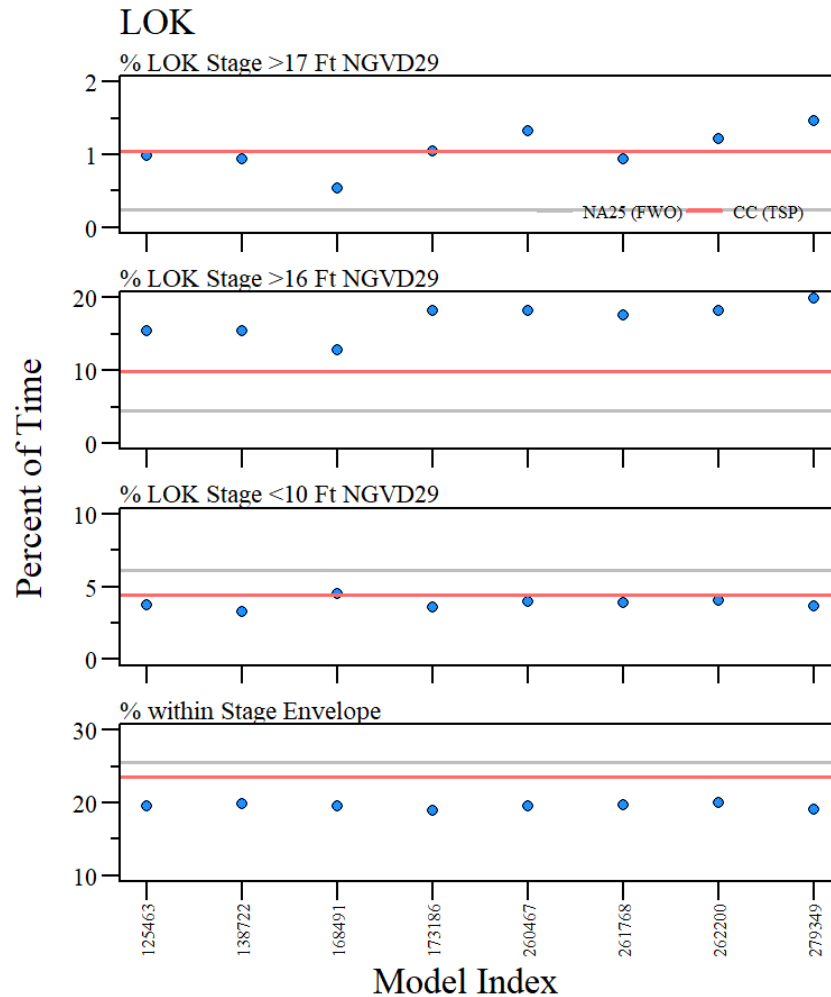




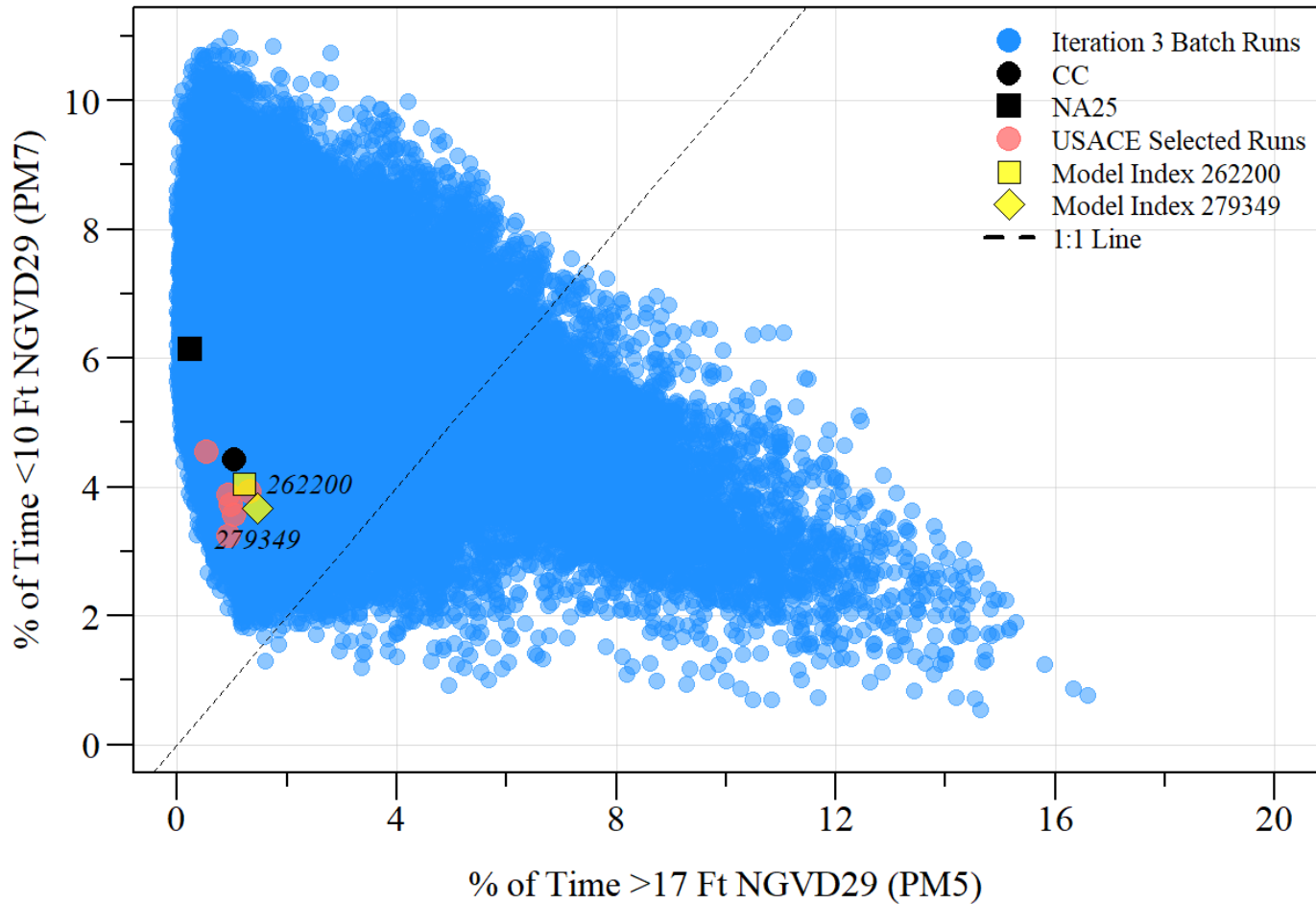
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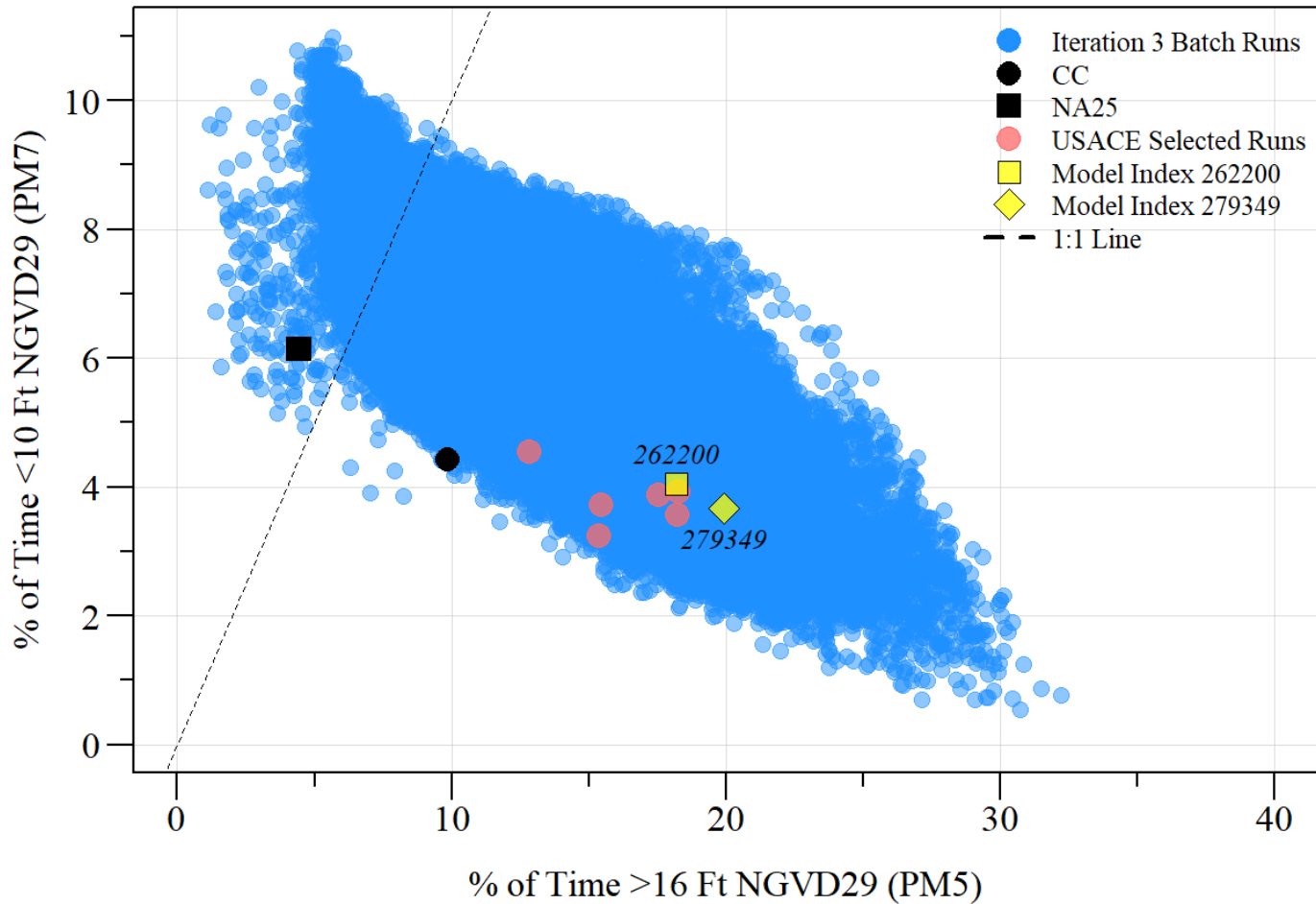
## Iteration 3 - Phase 2



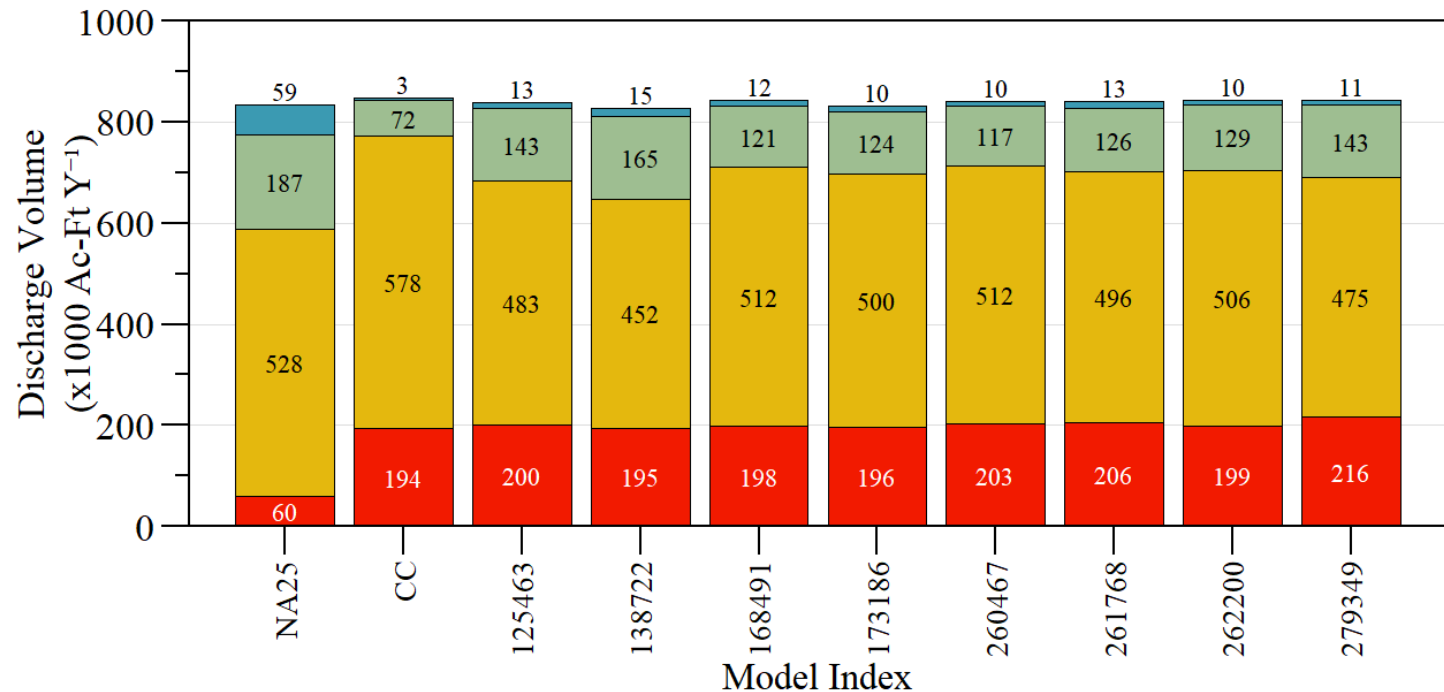
## Iteration 3 - Phase 2



## Iteration 3 - Phase 2



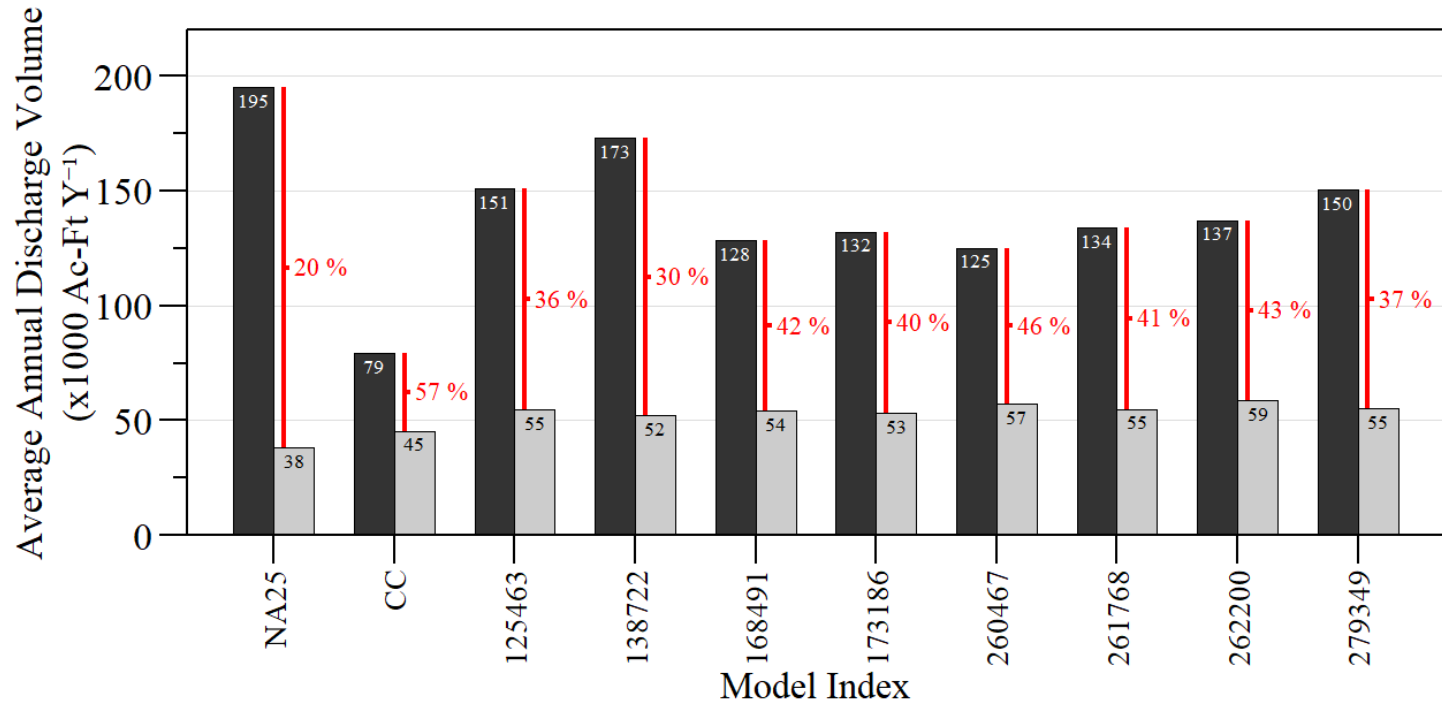
## Iteration 3 - Phase 2



- Water Conservation Areas (PM21)
- Caloosahatchee River (PM40)
- St. Lucie River (PM88)
- Lake Worth Lagoon (PM118)

*Iteration 3 screened batch results. Mean annual flood control releases from Lake Okeechobee for the 52 year (1965 - 2016) simulation period of record.*

## Iteration 3 - Phase 2



- S308 (Total Flow)
- S308 (Back Flow)

*Iteration 3 screened batch results. Mean annual discharge and backflow volume at S308 for the 52 year (1965 - 2016) simulation period of record with % backflow volume identified.*

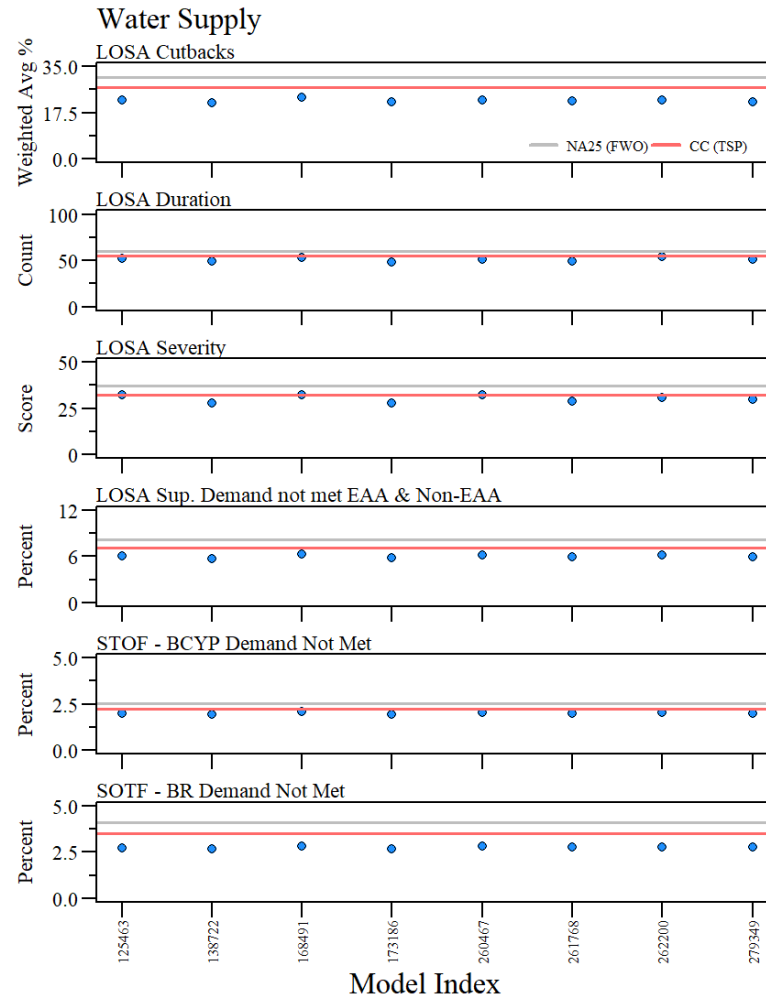
# Iteration 3 - Phase 2

Performance Measure	Model Index								
	CC	125463	138722	168491	173186	260467	261768	262200	279349
CRE - Low (PM30)	-32.2	-14.0	-6.1	-11.2	-11.7	-19.1	-18.2	-15.3	-15.5
CRE - Optimum (PM31)	20.4	23.9	18.9	20.9	25.6	30.0	29.2	25.6	27.3
CRE - Stress from LOK (PM37)	57.9	-60.7	-63.9	-65.0	-59.0	-62.8	-65.0	-55.7	-61.2
CRE - Damaging from LOK (PM38)	-16.1	-49.5	-52.7	-43.5	-53.2	-55.9	-55.4	-49.5	-58.6
CRE - Extreme (PM36)	-1.7	25.9	20.7	46.6	43.1	27.6	43.1	15.5	15.5
SLE - Low (PM80)	61.0	73.3	68.6	73.3	71.4	74.3	66.7	76.2	72.4
SLE - Optimum (PM81)	7.5	3.5	1.7	3.5	5.8	5.7	4.9	5.3	5.3
SLE - Stress from LOK (PM86)	-91.2	-81.1	-65.5	-75.7	-77.7	-78.4	-64.9	-80.4	-81.8
SLE - Damaging from LOK (PM87)	-88.0	-62.0	-50.7	-66.2	-75.4	-73.9	-66.9	-74.6	-74.6
SLE - Extreme (PM85)	-8.1	5.0	4.3	-1.2	4.3	4.3	1.2	6.2	9.3
S308 Regulatory Flow (PM88)	-61.7	-23.6	-12.0	-35.6	-33.6	-37.4	-32.8	-31.0	-23.9
S77 Regulatory Flow (PM40)	9.5	-8.4	-14.3	-2.9	-5.2	-3.1	-6.1	-4.2	-10.1
CRE MFL (PM39)	0.0	-10.0	0.0	-10.0	0.0	-10.0	-10.0	-20.0	-10.0
LOK MFL (PM20)	-22.2	-22.2	-22.2	-11.1	-22.2	-11.1	-11.1	-11.1	-11.1
LOK - Total Stage Envelope Penalty (PM10+PM11)	13.7	32.7	31.4	27.6	36.6	37.7	35.0	36.1	41.4

Percent Difference relative to FWO (NA25)

*“Balance is not a passive resting place—it takes work, balancing the giving and the taking...”*

# Iteration 3 - Phase 2

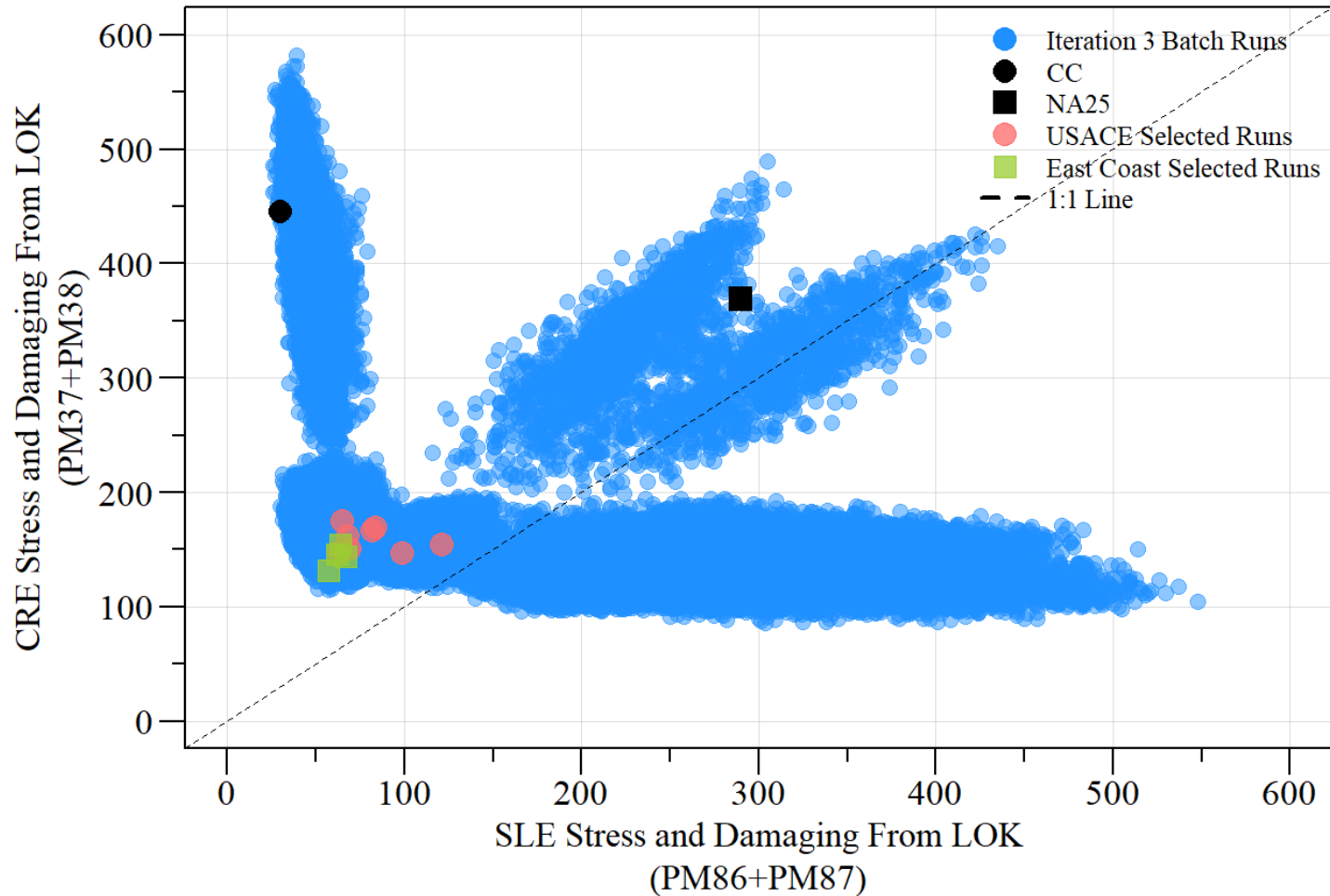




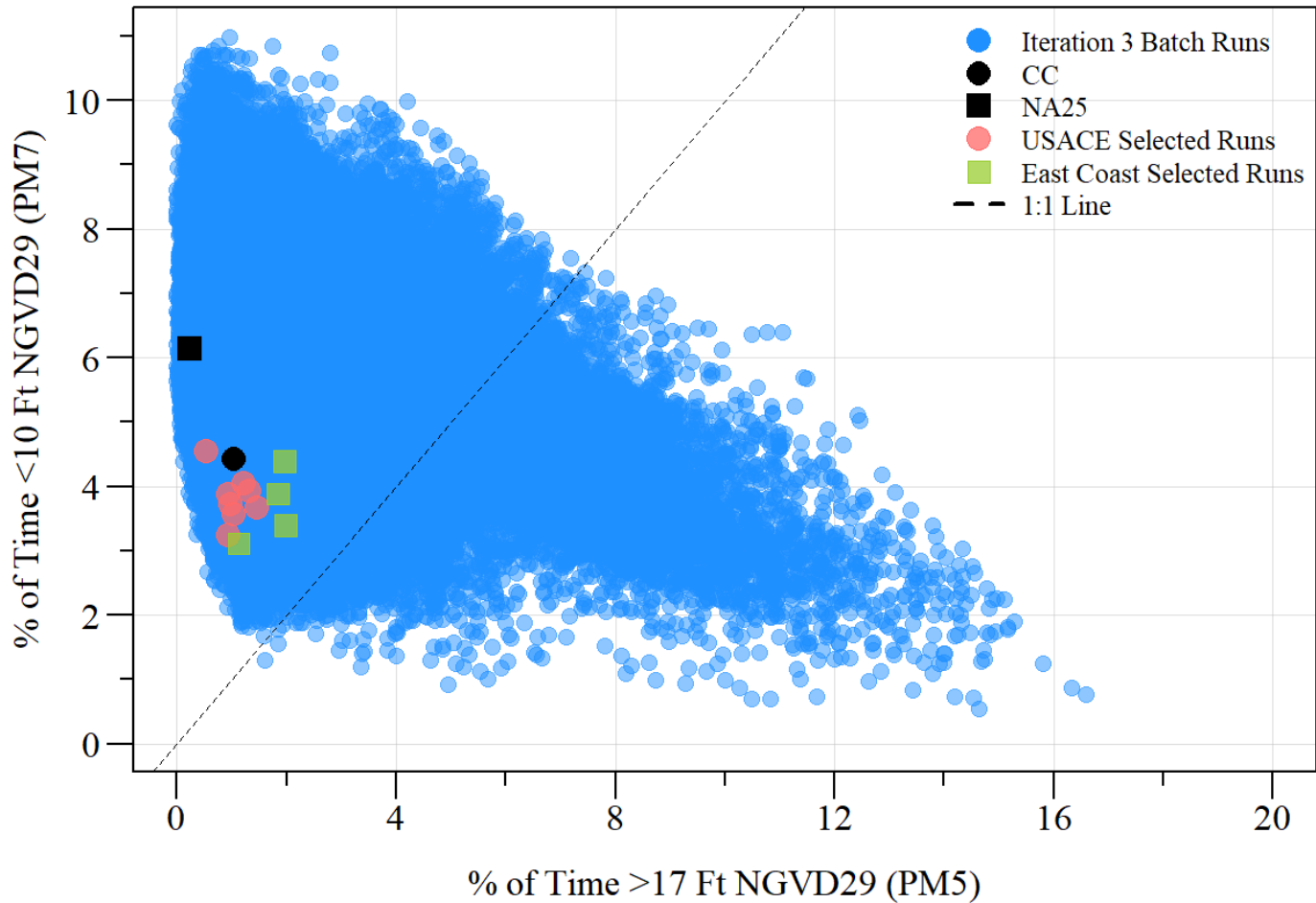
# East Coast Stakeholder Selected Plans

Model Index: 273238, 121211, 142495, 128556

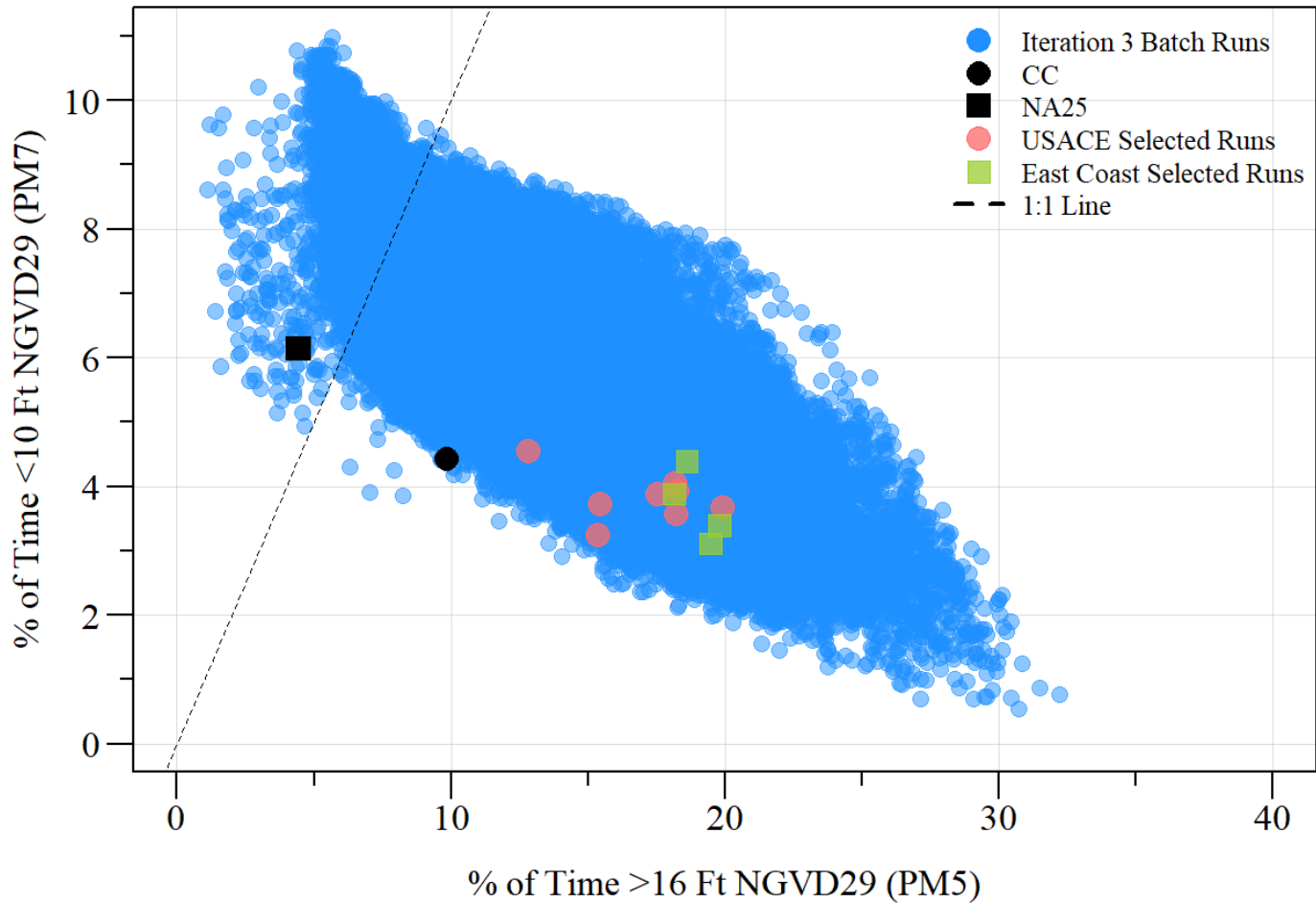
## Iteration 3 - Phase 2



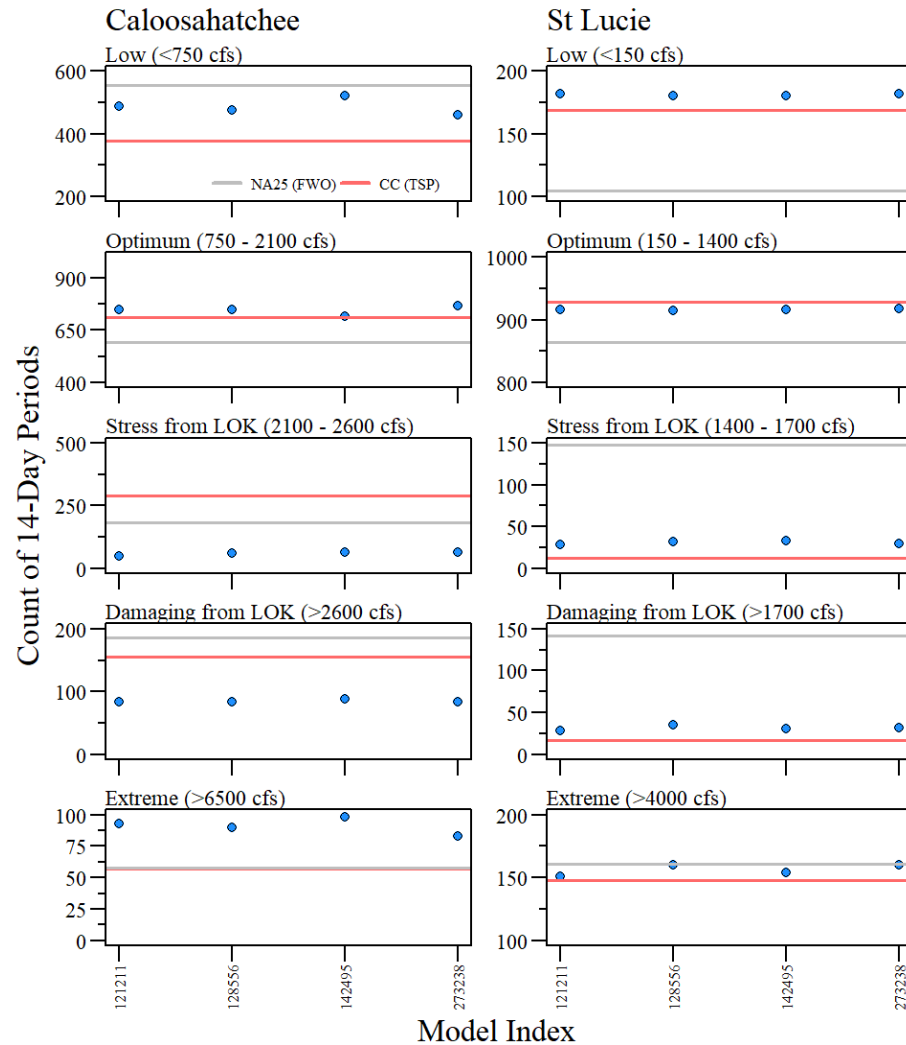
## Iteration 3 - Phase 2



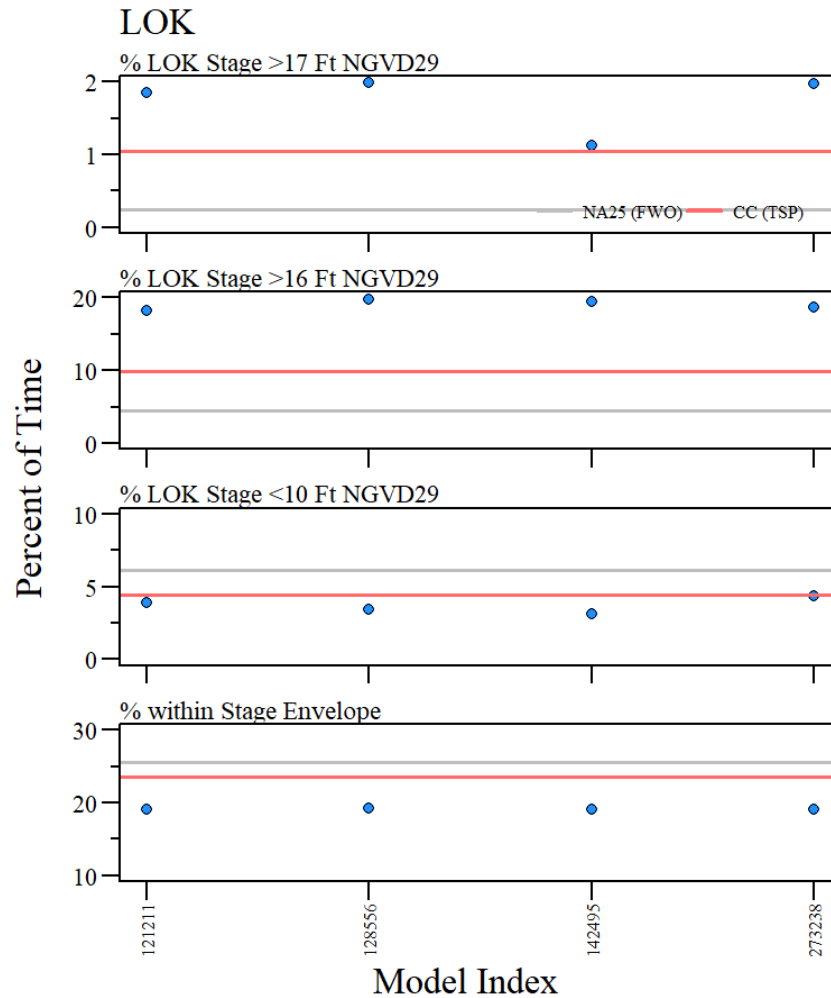
## Iteration 3 - Phase 2



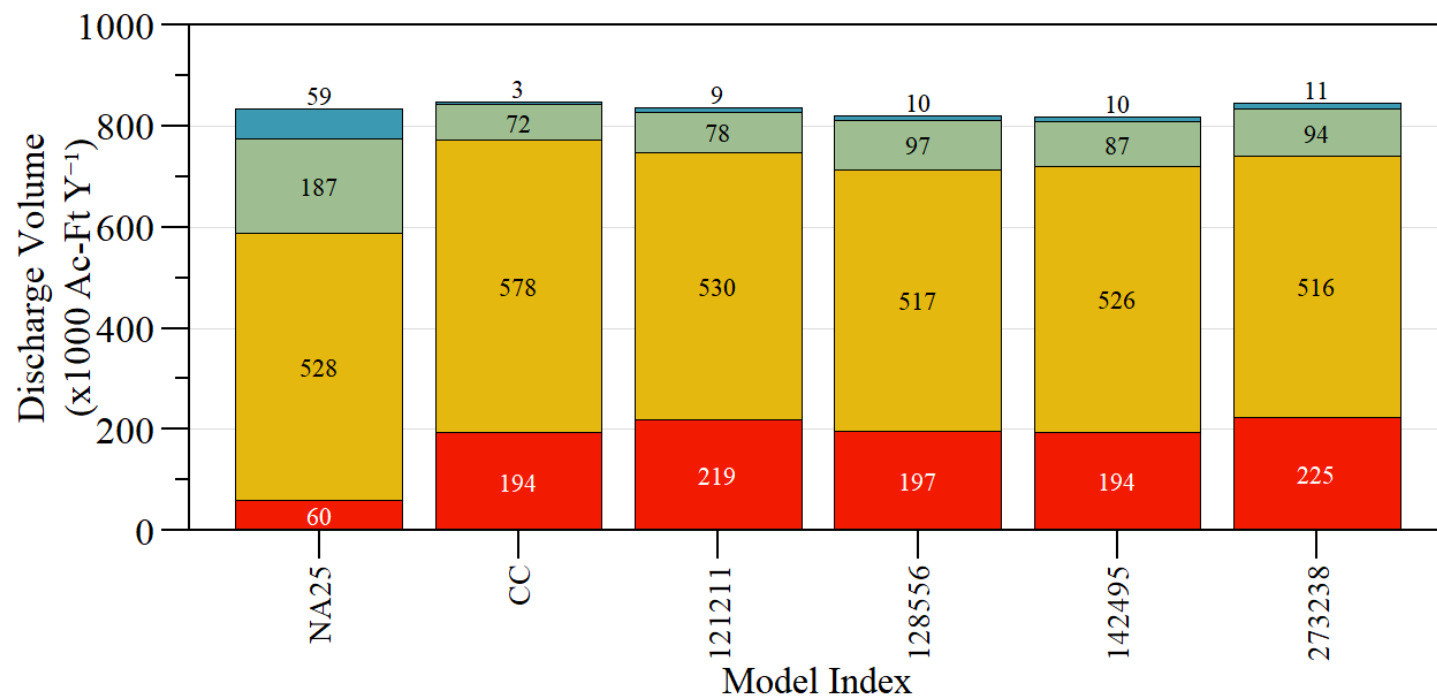
# Iteration 3 - Phase 2



## Iteration 3 - Phase 2



## Iteration 3 - Phase 2



- Water Conservation Areas (PM21)
- Caloosahatchee River (PM40)
- St. Lucie River (PM88)
- Lake Worth Lagoon (PM118)

*Iteration 3 screened batch results. Mean annual flood control releases from Lake Okeechobee for the 52 year (1965 - 2016) simulation period of record.*

# Iteration 3 - Phase 2

Performance Measure	Model Index				
	CC	121211	128556	142495	273238
CRE - Low (PM30)	-32.2	-12.2	-14.7	-6.5	-17.3
CRE - Optimum (PM31)	20.4	26.3	26.1	20.6	29.3
CRE - Stress from LOK (PM37)	57.9	-73.2	-67.2	-64.5	-65.6
CRE - Damaging from LOK (PM38)	-16.1	-55.4	-54.8	-52.2	-55.4
CRE - Extreme (PM36)	-1.7	60.3	55.2	69.0	43.1
SLE - Low (PM80)	61.0	73.3	71.4	71.4	73.3
SLE - Optimum (PM81)	7.5	6.0	5.8	6.0	6.1
SLE - Stress from LOK (PM86)	-91.2	-80.4	-78.4	-77.7	-79.7
SLE - Damaging from LOK (PM87)	-88.0	-80.3	-75.4	-78.2	-77.5
SLE - Extreme (PM85)	-8.1	-6.2	-0.6	-4.3	-0.6
S308 Regulatory Flow (PM88)	-61.7	-58.3	-48.1	-53.4	-49.9
S77 Regulatory Flow (PM40)	9.5	0.4	-2.0	-0.3	-2.3
CRE MFL (PM39)	0.0	10.0	-10.0	0.0	0.0
LOK MFL (PM20)	-22.2	-11.1	-11.1	-22.2	-11.1
LOK - Total Stage Envelope Penalty (PM10+PM11)	13.7	40.7	42.9	40.0	42.8

Percent Difference relative to FWO (NA25)



# Iteration 3 - Phase 2 (USACE & East Coast)

Performance Measure	Model Index												
	CC	125463	138722	168491	173186	260467	261768	262200	279349	121211	128556	142495	273238
CRE - Low (PM30)	-32.2	-14.0	-6.1	-11.2	-11.7	-19.1	-18.2	-15.3	-15.5	-12.2	-14.7	-6.5	-17.3
CRE - Optimum (PM31)	20.4	23.9	18.9	20.9	25.6	30.0	29.2	25.6	27.3	26.3	26.1	20.6	29.3
CRE - Stress from LOK (PM37)	57.9	-60.7	-63.9	-65.0	-59.0	-62.8	-65.0	-55.7	-61.2	-73.2	-67.2	-64.5	-65.6
CRE - Damaging from LOK (PM38)	-16.1	-49.5	-52.7	-43.5	-53.2	-55.9	-55.4	-49.5	-58.6	-55.4	-54.8	-52.2	-55.4
CRE - Extreme (PM36)	-1.7	25.9	20.7	46.6	43.1	27.6	43.1	15.5	15.5	60.3	55.2	69.0	43.1
SLE - Low (PM80)	61.0	73.3	68.6	73.3	71.4	74.3	66.7	76.2	72.4	73.3	71.4	71.4	73.3
SLE - Optimum (PM81)	7.5	3.5	1.7	3.5	5.8	5.7	4.9	5.3	5.3	6.0	5.8	6.0	6.1
SLE - Stress from LOK (PM86)	-91.2	-81.1	-65.5	-75.7	-77.7	-78.4	-64.9	-80.4	-81.8	-80.4	-78.4	-77.7	-79.7
SLE - Damaging from LOK (PM87)	-88.0	-62.0	-50.7	-66.2	-75.4	-73.9	-66.9	-74.6	-74.6	-80.3	-75.4	-78.2	-77.5
SLE - Extreme (PM85)	-8.1	5.0	4.3	-1.2	4.3	4.3	1.2	6.2	9.3	-6.2	-0.6	-4.3	-0.6
S308 Regulatory Flow (PM88)	-61.7	-23.6	-12.0	-35.6	-33.6	-37.4	-32.8	-31.0	-23.9	-58.3	-48.1	-53.4	-49.9
S77 Regulatory Flow (PM40)	9.5	-8.4	-14.3	-2.9	-5.2	-3.1	-6.1	-4.2	-10.1	0.4	-2.0	-0.3	-2.3
CRE MFL (PM39)	0.0	-10.0	0.0	-10.0	0.0	-10.0	-10.0	-20.0	-10.0	10.0	-10.0	0.0	0.0
LOK MFL (PM20)	-22.2	-22.2	-22.2	-11.1	-22.2	-11.1	-11.1	-11.1	-11.1	-11.1	-11.1	-22.2	-11.1
LOK - Total Stage Envelope Penalty (PM10+PM11)	13.7	32.7	31.4	27.6	36.6	37.7	35.0	36.1	41.4	40.7	42.9	40.0	42.8

Percent Difference relative to FWO (NA25)

## Model Index

Performance Measure	NA25	CC	125463	138722	168491	173186	260467	261768	262200	279349	121211	128556	142495	273238
CRE - Low (PM30)	556.0	377.0	478.0	522.0	494.0	491.0	450.0	455.0	471.0	470.0	488.0	474.0	520.0	460.0
CRE - Optimum (PM31)	593.0	714.0	735.0	705.0	717.0	745.0	771.0	766.0	745.0	755.0	749.0	748.0	715.0	767.0
CRE - Stress from LOK (PM37)	183.0	289.0	72.0	66.0	64.0	75.0	68.0	64.0	81.0	71.0	49.0	60.0	65.0	63.0
CRE - Damaging from LOK (PM38)	186.0	156.0	94.0	88.0	105.0	87.0	82.0	83.0	94.0	77.0	83.0	84.0	89.0	83.0
CRE - Extreme (PM36)	58.0	57.0	73.0	70.0	85.0	83.0	74.0	83.0	67.0	67.0	93.0	90.0	98.0	83.0
SLE - Low (PM80)	105.0	169.0	182.0	177.0	182.0	180.0	183.0	175.0	185.0	181.0	182.0	180.0	180.0	182.0
SLE - Optimum (PM81)	864.0	929.0	894.0	879.0	894.0	914.0	913.0	906.0	910.0	910.0	916.0	914.0	916.0	917.0
SLE - Stress from LOK (PM86)	148.0	13.0	28.0	51.0	36.0	33.0	32.0	52.0	29.0	27.0	29.0	32.0	33.0	30.0
SLE - Damaging from LOK (PM87)	142.0	17.0	54.0	70.0	48.0	35.0	37.0	47.0	36.0	36.0	28.0	35.0	31.0	32.0
SLE - Extreme (PM85)	161.0	148.0	169.0	168.0	159.0	168.0	168.0	163.0	171.0	176.0	151.0	160.0	154.0	160.0
S308 Regulatory Flow (PM88)	187.4	71.7	143.1	165.0	120.7	124.4	117.4	126.0	129.4	142.6	78.1	97.3	87.3	93.9
S77 Regulatory Flow (PM40)	527.8	577.8	483.5	452.5	512.3	500.4	511.6	495.6	505.6	474.6	530.0	517.4	526.4	515.9
CRE MFL (PM39)	10.0	10.0	9.0	10.0	9.0	10.0	9.0	9.0	8.0	9.0	11.0	9.0	10.0	10.0
LOK MFL (PM20)	9.0	7.0	7.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
LOK - Total Stage Envelope Penalty (PM10+PM11)	31401.0	35699.0	41668.0	41254.0	40075.0	42907.0	43249.0	42381.0	42732.0	44401.0	44188.0	44887.0	43977.0	44839.0

Percent Difference relative to FWO (NA25)

Units: Salinity metric, 14-day period count; Regulatory Discharge, x1000 Ac-Ft Yr<sup>-1</sup>; MFL, number of exceedances; Stage Envelope Penalty, Score.