

# Lake Okeechobee System Operating Manual

## Iteration 3 - Phase 2 Batch Analysis

*Sanibel-Captiva Conservation Foundation*

*Conservancy of Southwest Florida*

**DRAFT** - October 22, 2021  
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# Iteration 3 Goals

- Goals presented by USACE focused on water supply (tribal, LOSA and LECSA), estuary and lake health, and moving more water to the southern Everglades (see USACE Technical Stakeholder Engagement - 16-17 Sept 2021 meeting presentation).
- For purposes of this analysis we focused on:
  - *Reduce stress to the Caloosahatchee River and Estuary*
  - *Help Lake ecology by addressing the duration and number of events above 17 feet*
- Initially CC was used as the foundation (Phase 1 of Iteration 3)
- After the initial alternative sensitivity runs (i.e. Iteration 3, Phase 1), alternative CCR1 was considered for the next phase of Iteration 3 to build "CCR2B"

# Iteration 3 - Run Screening

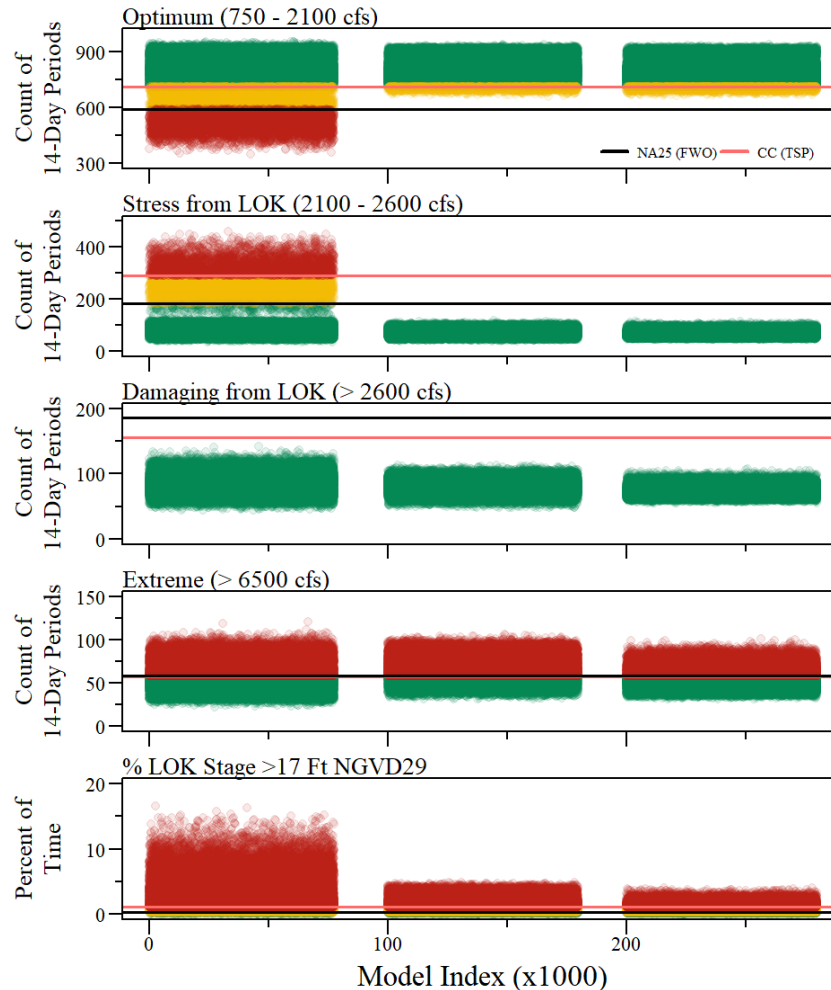
Using the RSM-BN Batch Runs spreadsheets (~240,000 runs)

- Runs were initially screened based on PM values relative to CC and NA25 (FWO)
  - Caloosahatchee optimal discharge (PM31)
  - Caloosahatchee stress discharge from LOK (PM37)
  - Caloosahatchee damaging discharge from LOK (PM38)
  - Caloosahatchee extreme discharge (PM36)
  - Percent LOK Stage >17 Ft NGVD29 (PM5)
- To narrow the data down, runs were subsetting based on PMs listed above relative to the CC value  $\pm 5\%$  (i.e. CC PM31 + 5%, CC PM37 - 5%, etc) then sorted and the 1st eight of each batch were retained

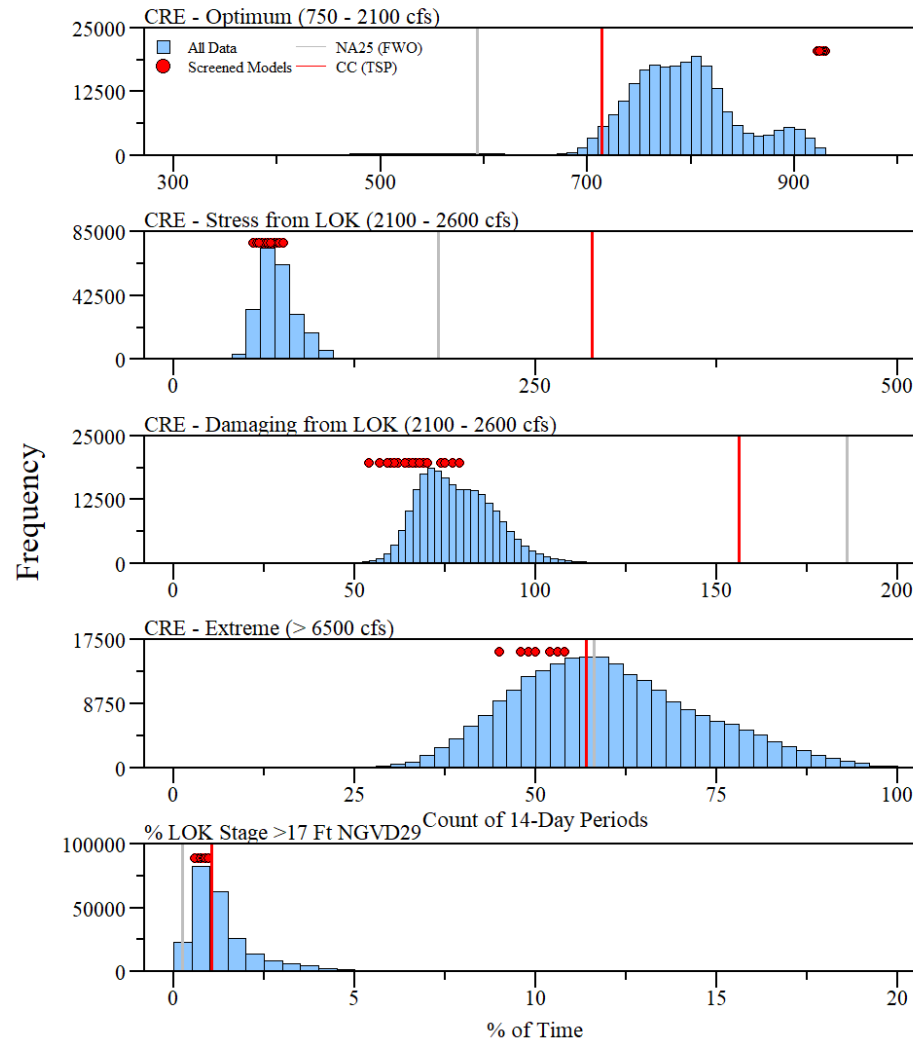
*Example R Code*

```
b1.screen<-subset(dat,  
  PM31>CC.val$PM31*1.05&  
  PM37<CC.val$PM37*0.95&  
  PM38<CC.val$PM38*0.95&  
  PM36<CC.val$PM36*0.95&  
  PM5<CC.val$PM5*0.95&  
  batch==1)  
b1.screen<-b1.screen[order(-b1.screen$PM31,b1.screen$PM37,  
  b1.screen$PM38,b1.screen$PM36,  
  b1.screen$PM5),]  
b1.screen<-b1.screen[1:8,]
```

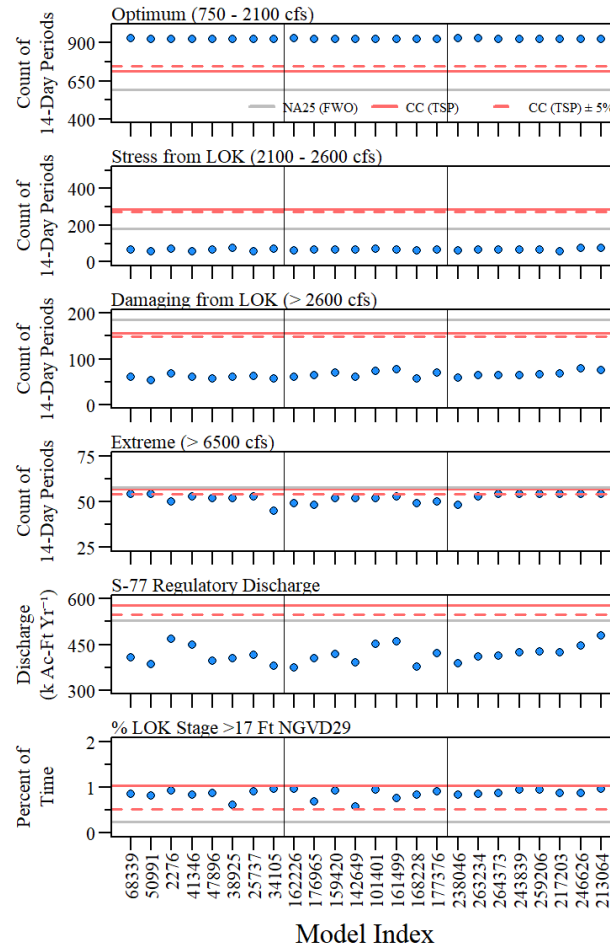
## Iteration 3 - Phase 2 (Initial Screening)



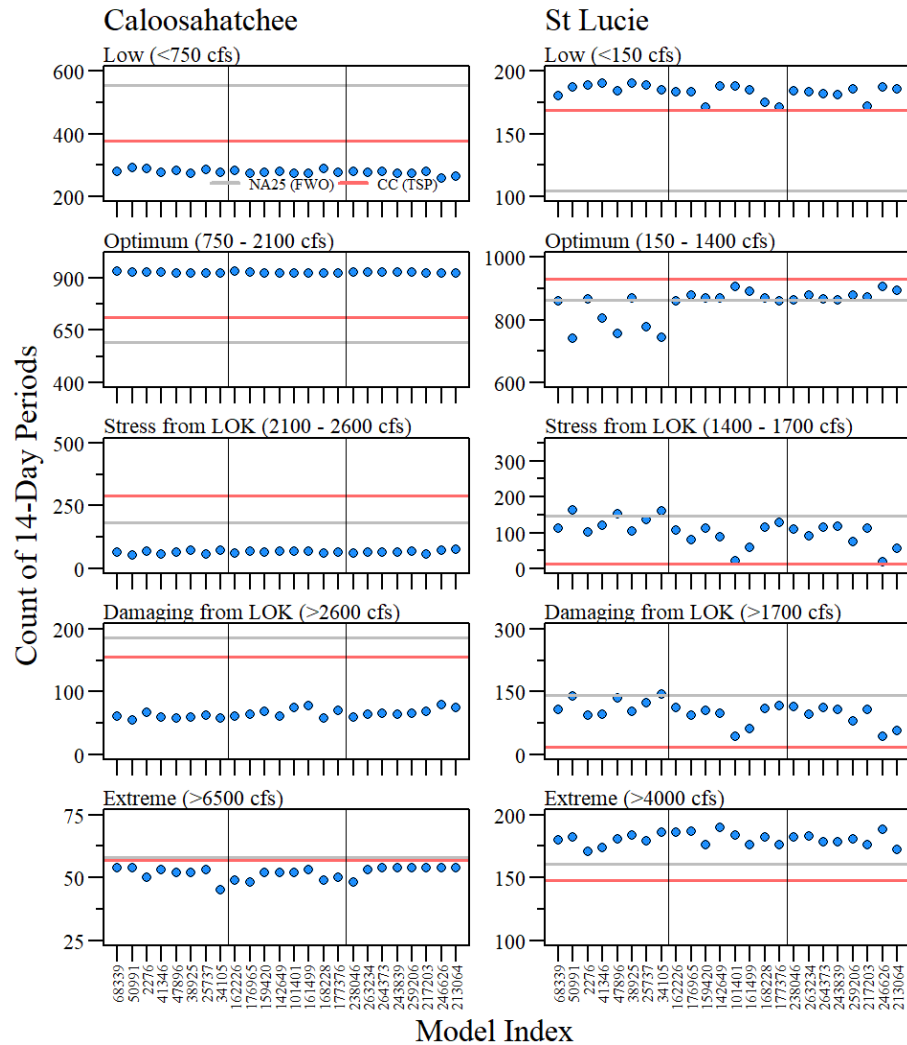
# Iteration 3 - Phase 2 (Initial Screening)



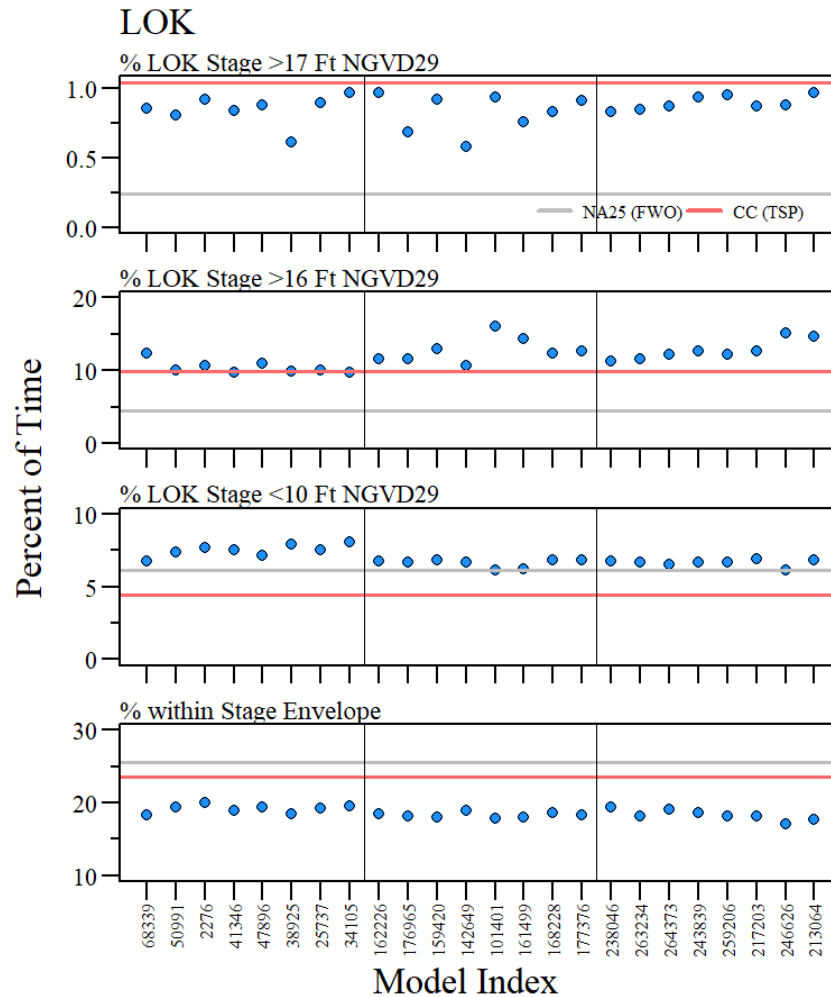
# Iteration 3 - Phase 2



# Iteration 3 - Phase 2

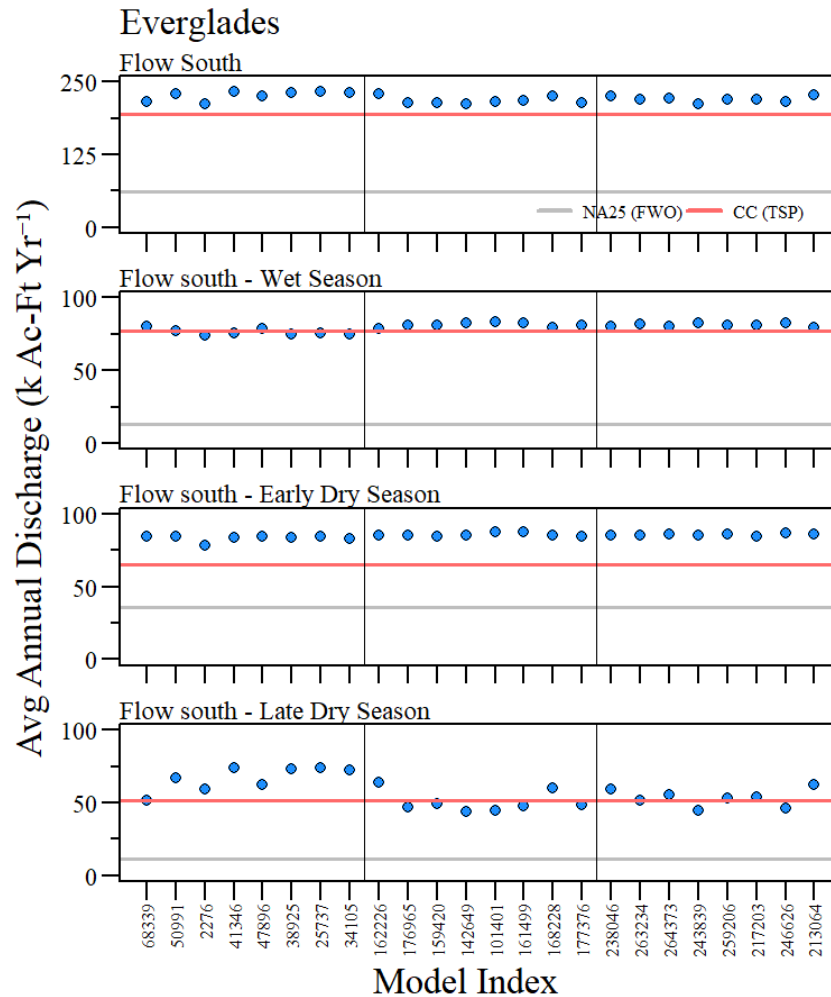


# Iteration 3 - Phase 2

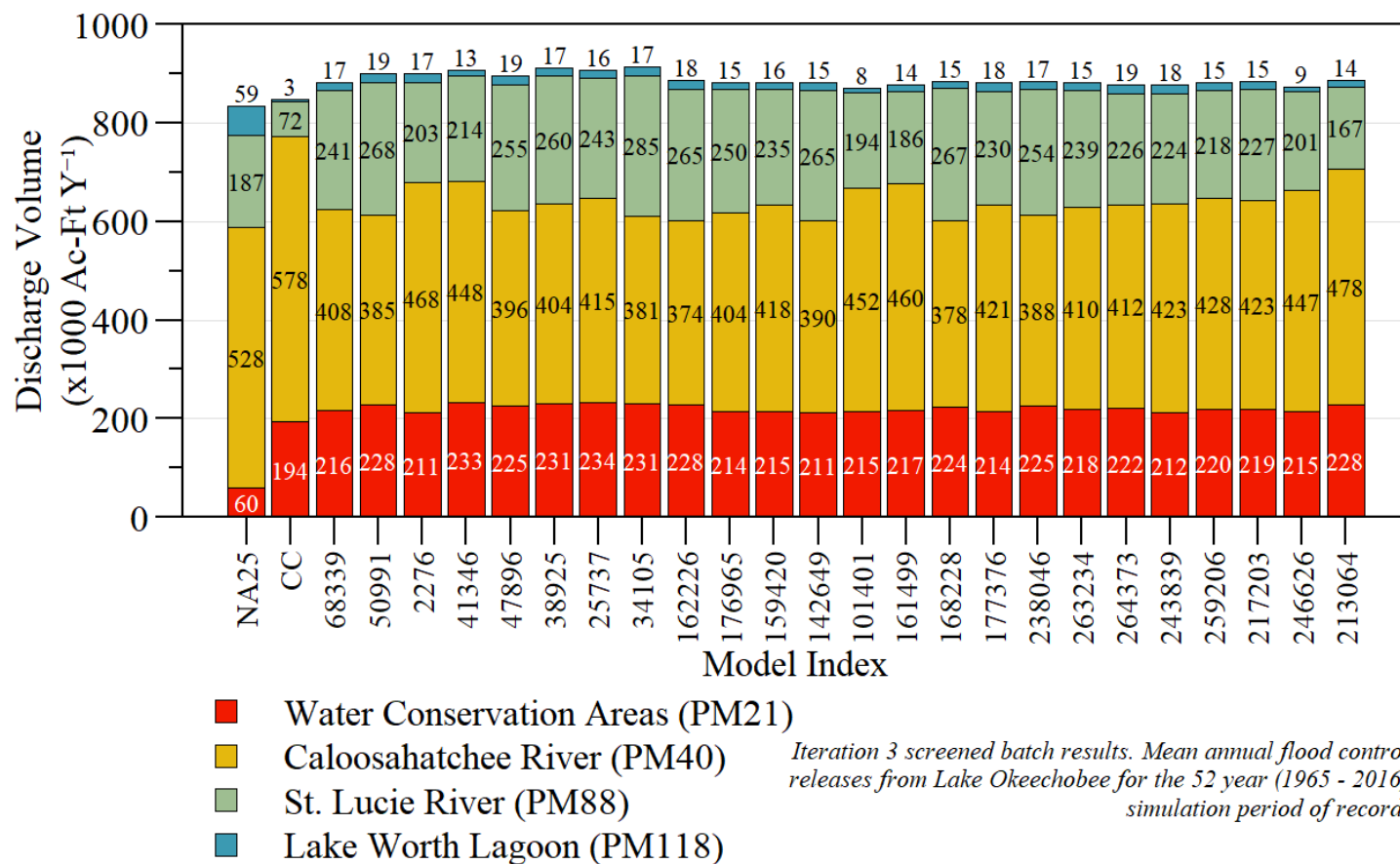




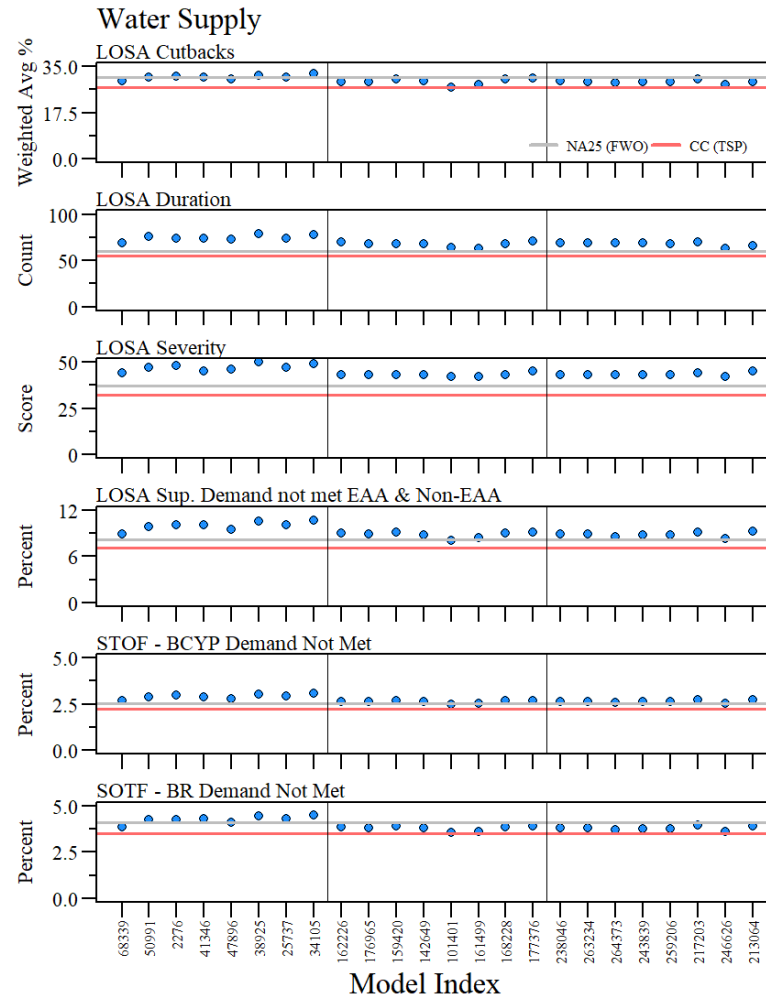
# Iteration 3 - Phase 2



## Iteration 3 - Phase 2



# Iteration 3 - Phase 2




# Iteration 3 - Run Screening Part II

Using the RSM-BN Batch Runs spreadsheets (~240,000 runs)

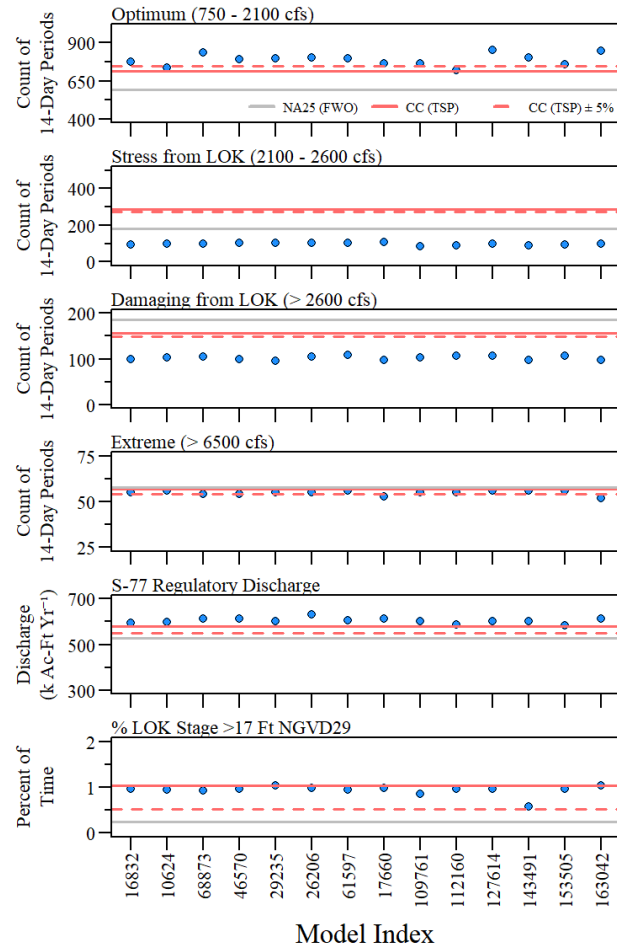
- Runs were initially screened based on PM values relative to CC and NA25 (FWO)
  - Caloosahatchee stress discharge from LOK (PM37)
  - Caloosahatchee damaging discharge from LOK (PM38)
  - Caloosahatchee extreme discharge (PM36)
  - St Lucie extreme discharges (PM85)
  - Percent LOK Stage >17 Ft NGVD29 (PM5)

*Example R Code*

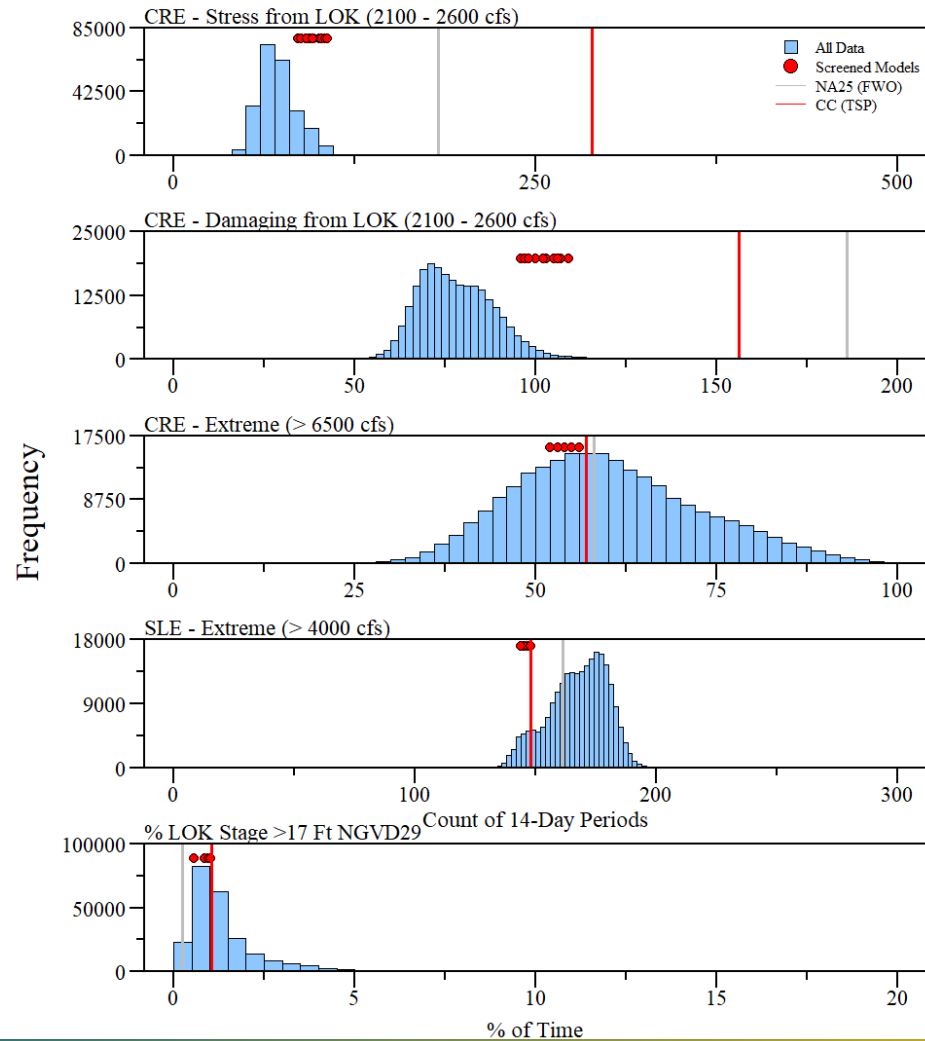
```
b1.screen2=subset(dat,  
                  PM37<CC.val$PM37&  
                  PM38<CC.val$PM38&  
                  PM36<CC.val$PM36&  
                  PM85<=CC.val$PM85&  
                  PM5<CC.val$PM5&  
                  batch==1)  
b1.screen2=b1.screen2[order(b1.screen2$PM37,  
                             b1.screen2$PM38,  
                             b1.screen2$PM36,  
                             b1.screen2$PM85,  
                             b1.screen2$PM5),]  
b1.screen2=b1.screen2[1:8,]
```

 Download Screened Data #2

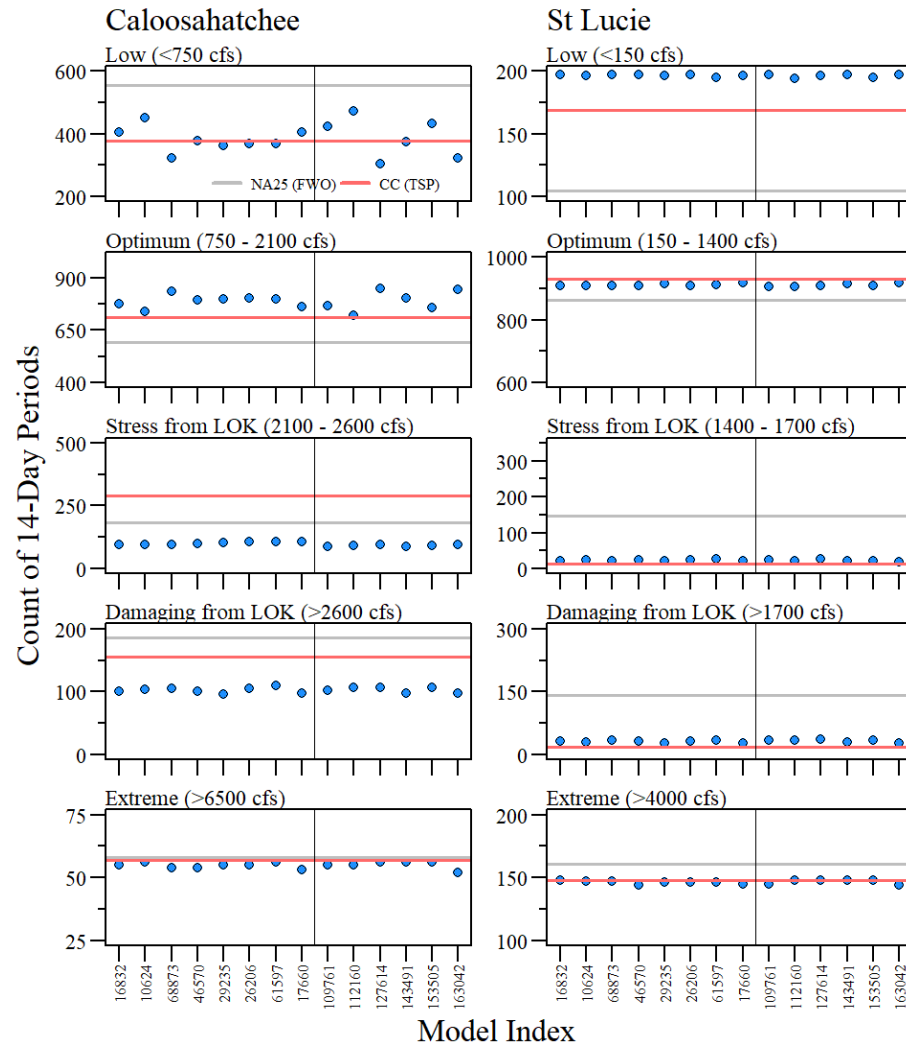
# Iteration 3 - Phase 2



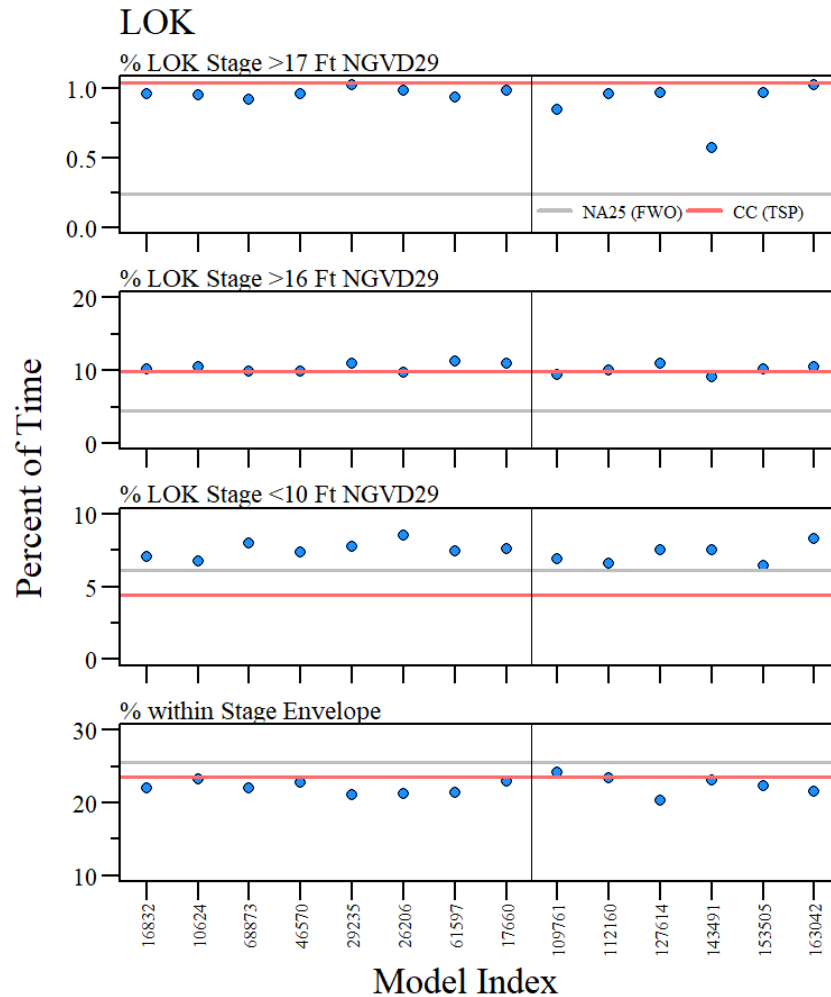
# Iteration 3 - Phase 2 (Initial Screening)



# Iteration 3 - Phase 2

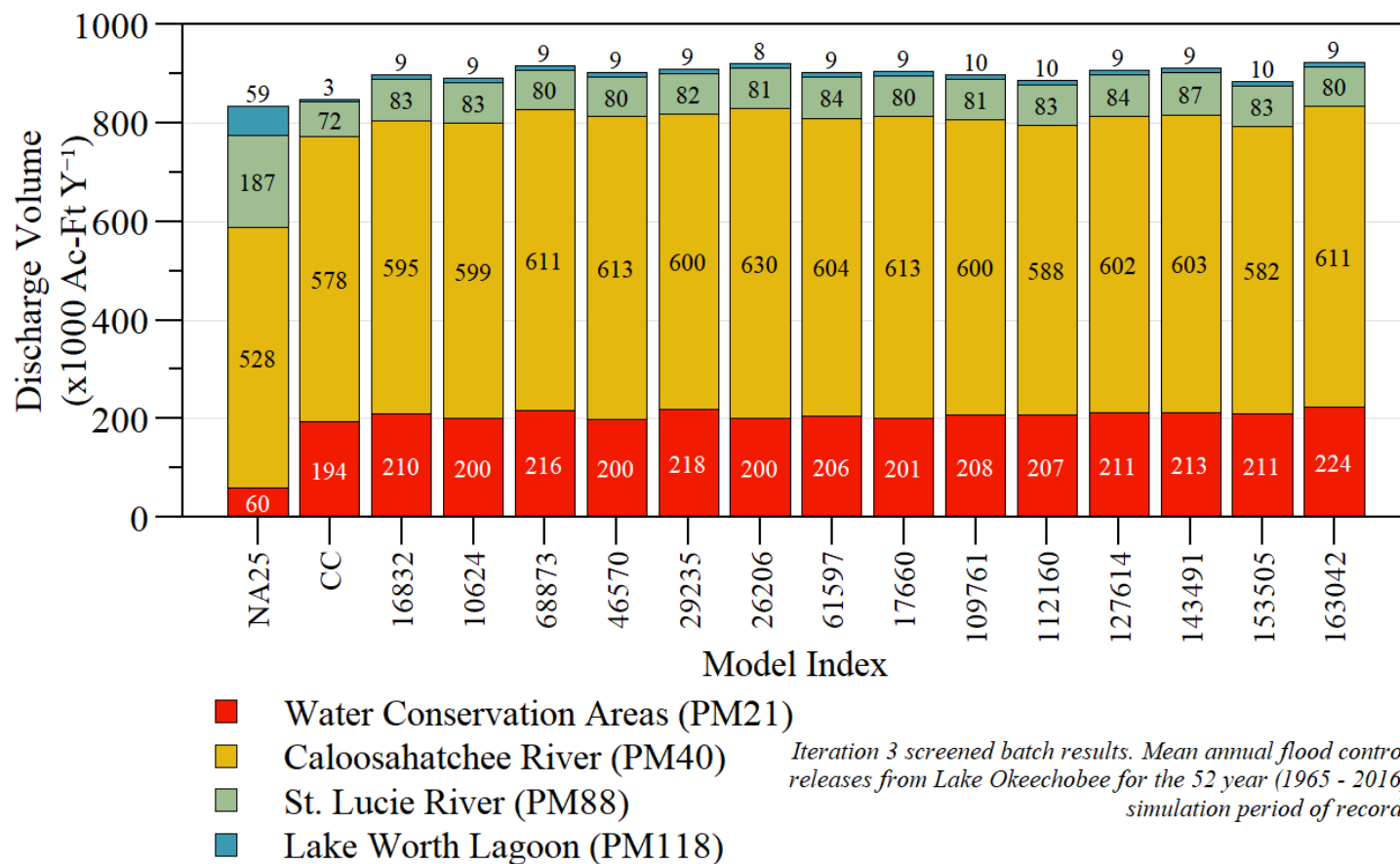


## Iteration 3 - Phase 2

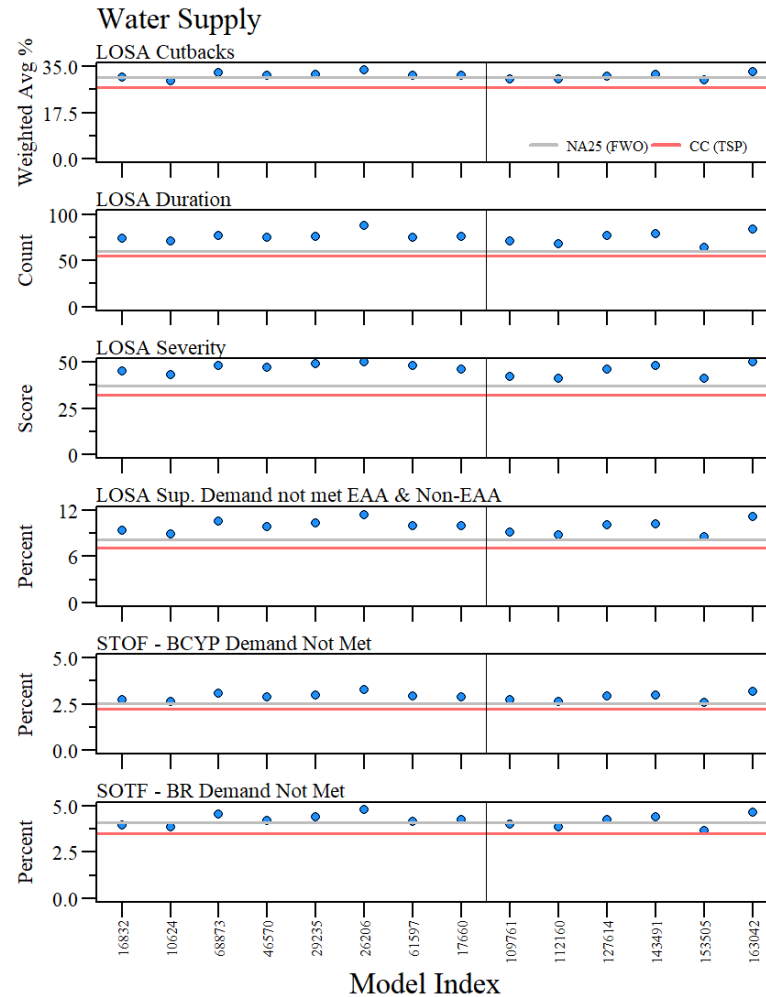




## Iteration 3 - Phase 2



# Iteration 3 - Phase 2



## Iteration 3 - Phase 2

- This is an initial look at the batch results and expect our evaluation to evolve with greater understanding.
  - Screening is sensitive to the criteria in-which you focus on as exemplified by the two screening attempts presented here.
- 1<sup>st</sup> screening focuses on CRE and Lake resulting in a completely different set of models when including SLE extreme flows (i.e. 2<sup>nd</sup> screening exercise).
- 2<sup>nd</sup> screening, when focused on reducing CRE Stress, Damaging and Extreme, SLE extreme and Lake high stages results in a model that looks very similar to the original CC model with slight changes to PM values.