

# Water Flow and Temperature Considerations for Multi-Species/Run Management on the Sacramento River

Miles E. Daniels\*, Eric Danner, Liam Zarri, Eric Palkovacs,  
Flora Cordoleani, Cyril Michel

UCSC Project Scientist and NOAA affiliate

[miles.daniels@ucsc.edu](mailto:miles.daniels@ucsc.edu) & [miles.daniels@noaa.gov](mailto:miles.daniels@noaa.gov)

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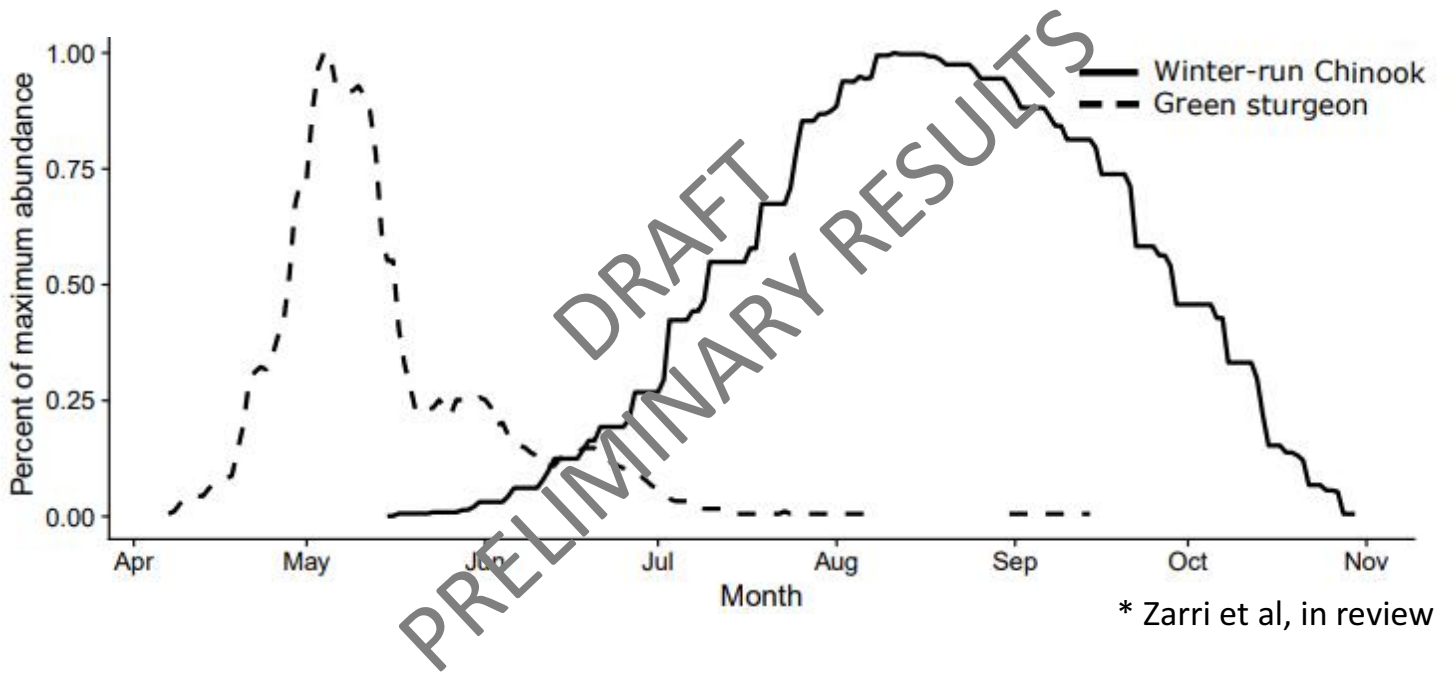


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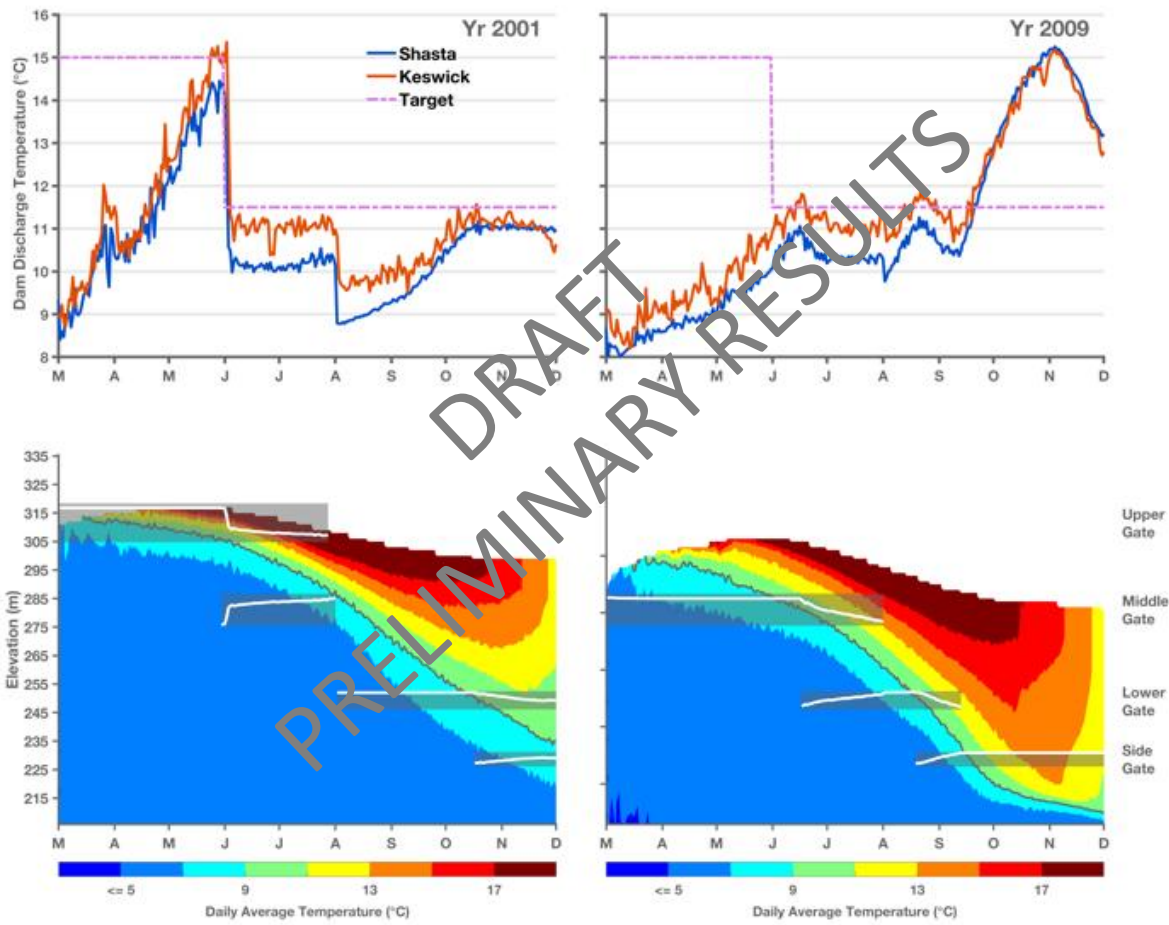
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# Can Shasta be managed to for sturgeon and winter-run?



Low/Warm release for sturgeon and high/cold for winter-run

# Green Sturgeon and Winter-Run Chinook



# Spring-Run and Winter-Run Chinook



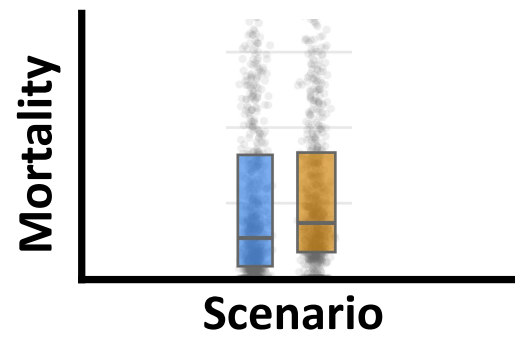
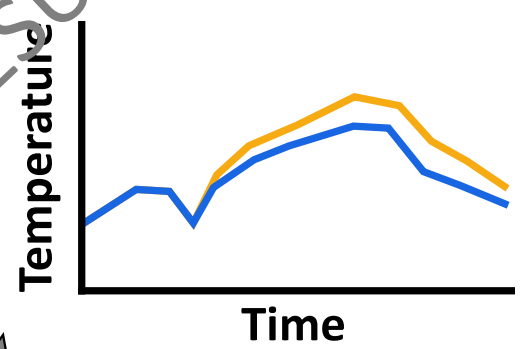
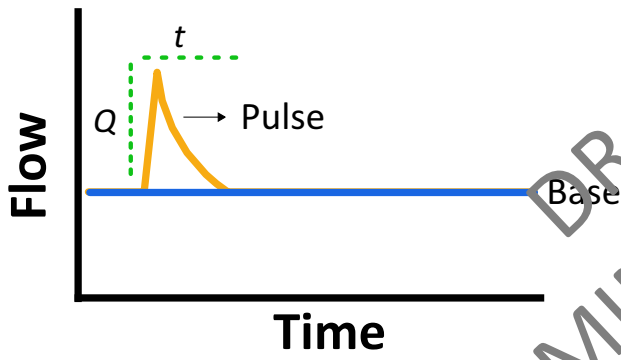
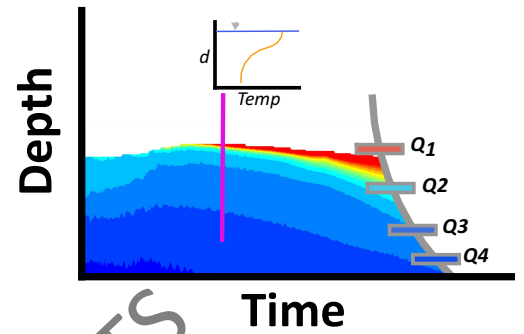
How would a managed pulse to stimulate spring-run migration impact winter-run?

**Asses impacts of spring pulse**

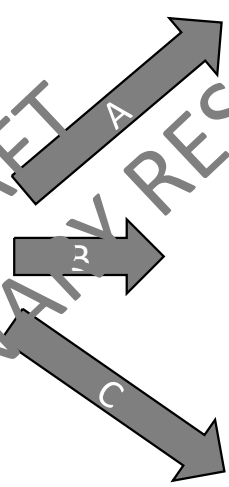
A = Reservoir storage (total and cold pool)

B = Temperature (reservoir discharge and in-river)

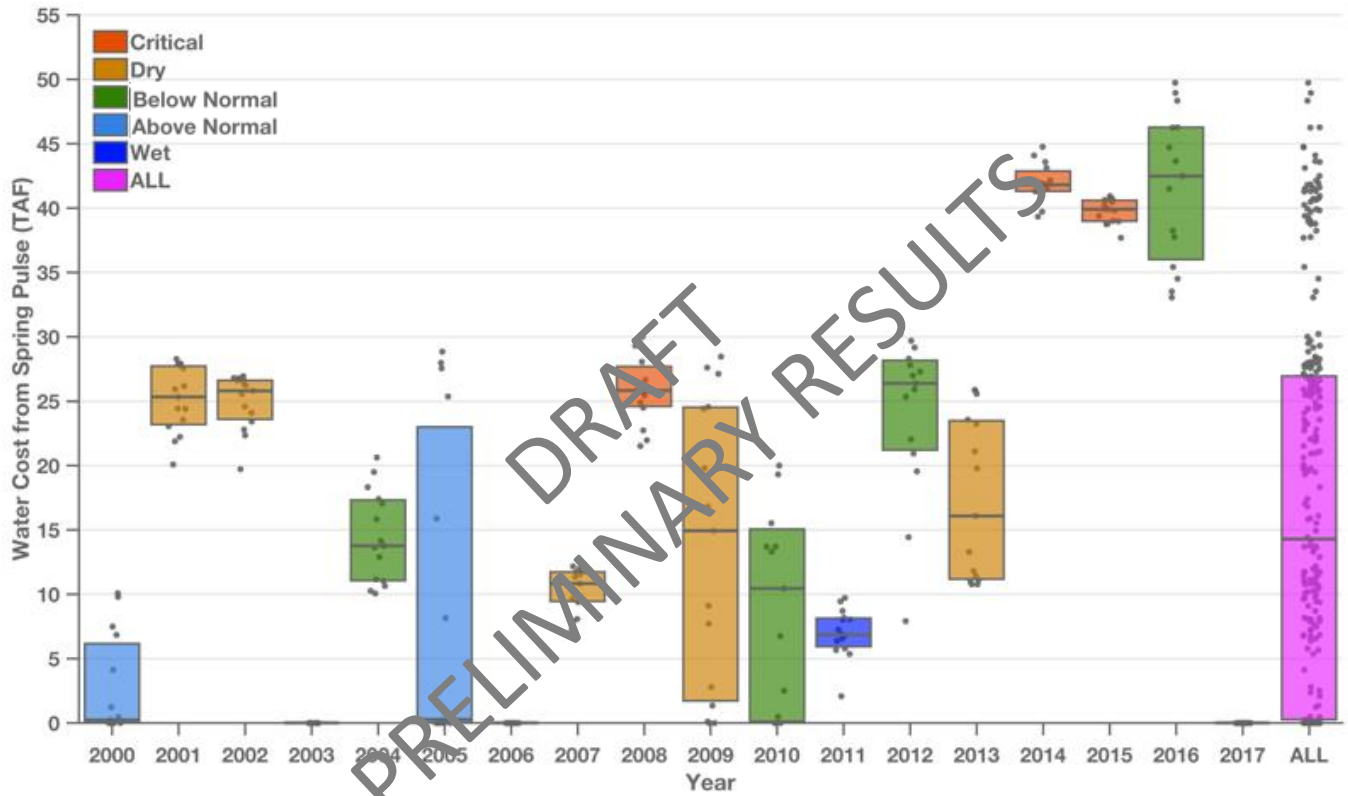
C = Winter-run temperature-dependent egg mortality



DRAFT PRELIMINARY RESULTS



# (1) Pulse water cost



**NOTE: Box encompasses 25<sup>th</sup> and 75<sup>th</sup> percentile of water cost associated with sensitivity to pulse start date, Results hereafter use date associated with highest water cost**

## (4) Winter-run egg survival



**Distribution of temperature-dependent egg mortality increase associated with simulated pulse, boxes encompasses 25<sup>th</sup> and 75<sup>th</sup> percentile associated parameter uncertainty from 50 ensembles**

# Conclusion/Thoughts

- Understanding constraints is important
- Multi-species/run management success likely year dependent
- Modeling and is useful to help understand management options and constraints

