

# Draft Resource Assessment by OSSS BEAM for Suwannee-Satilla Water Planning Region

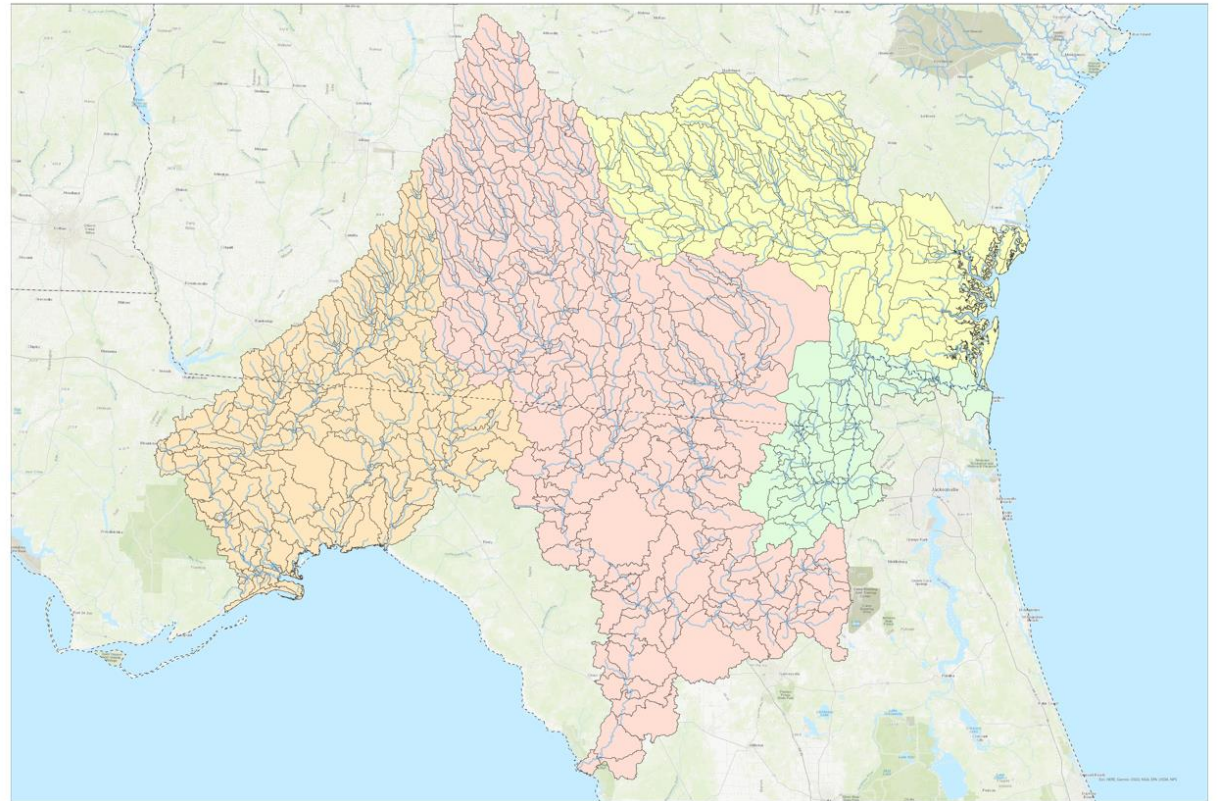
Georgia EPD

June 2022

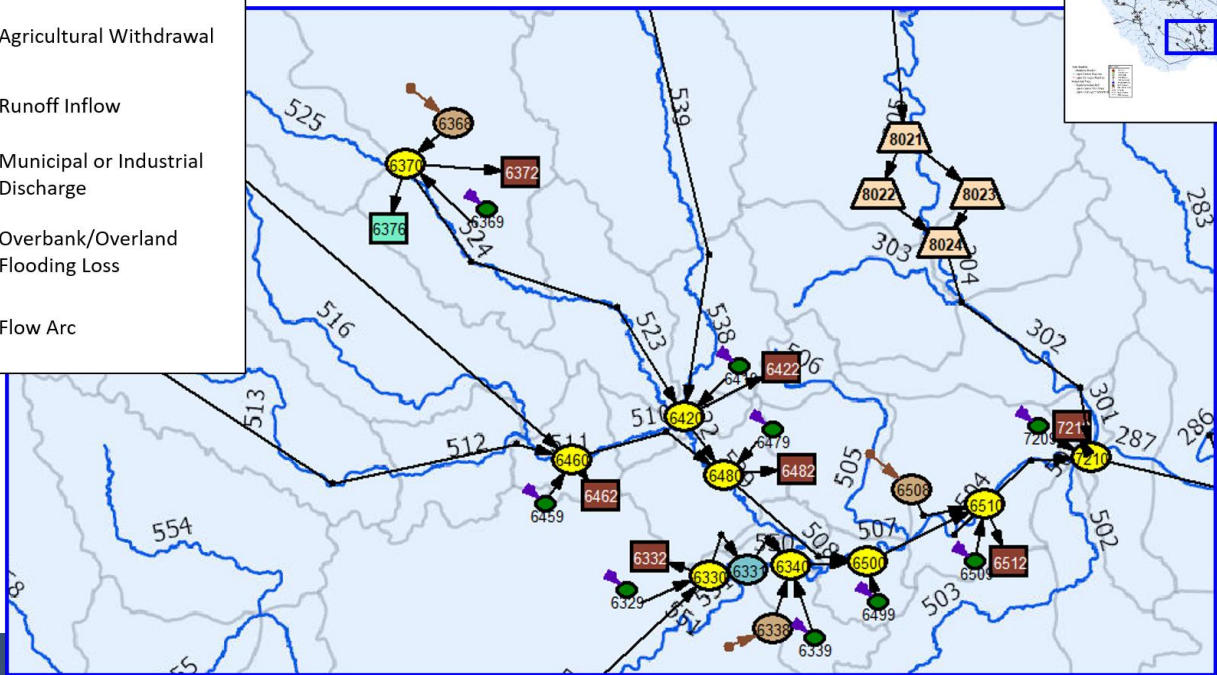
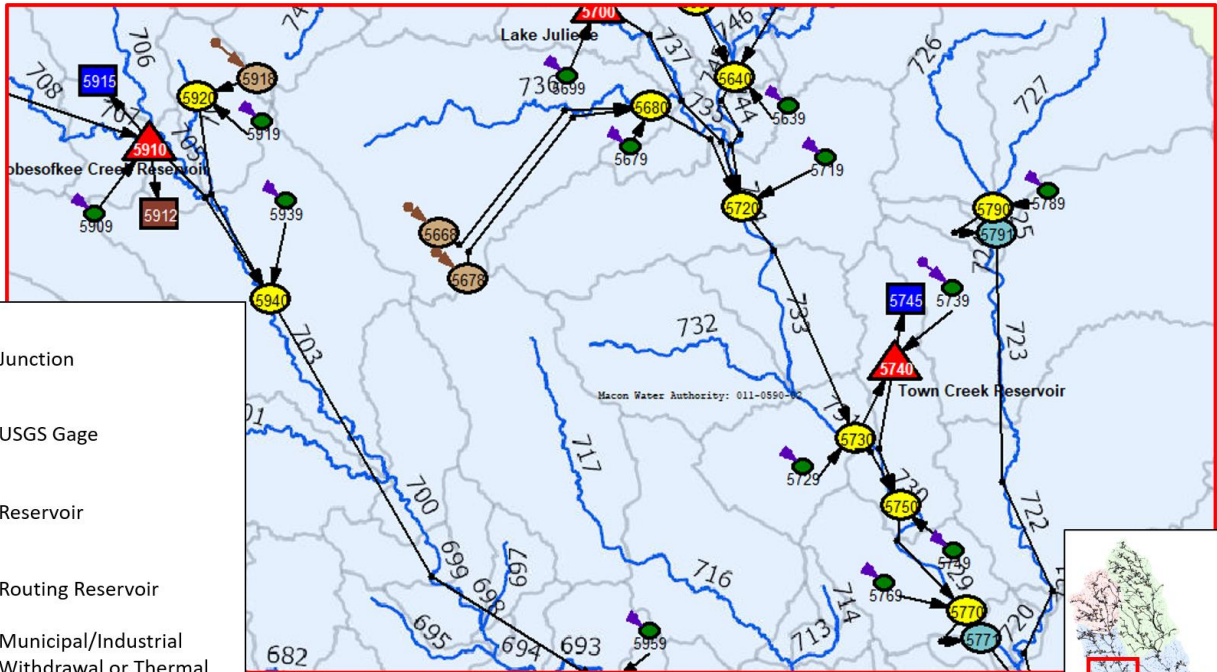
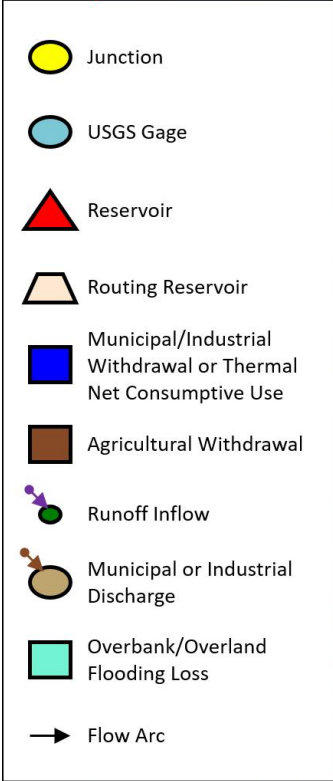
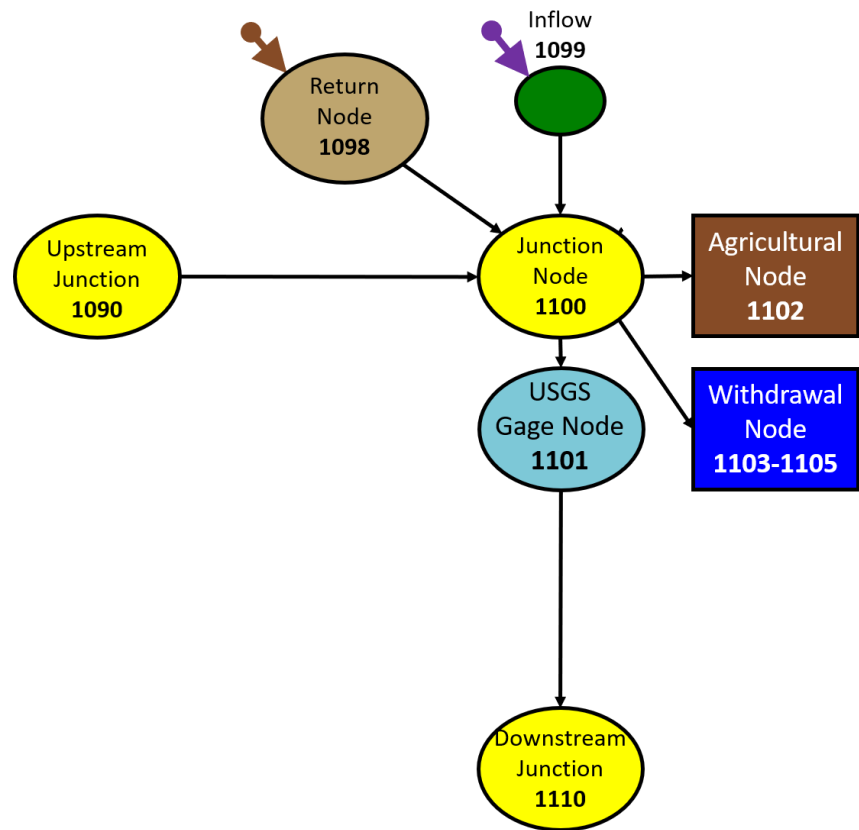
# Presentation Outline

- Introduction and Model Settings
- Model Results Baseline & Future Scenarios
  - Wastewater assimilation Challenges, Example (wastewater assimilation PMs)
  - Performance Metric at Macon for Boating (example of recreational PMs)
  - Performance Metrics for Fish Habitat (example of aquatic biology PMs)
- Additional Performance Measures to consider?

# Suwannee-Satilla Region and OSSS Model Domain



# BEAM Node Types



# OSSS BEAM Model Baseline Settings

- Simulation Period (various hydrologic conditions): 1939-2018
- Withdrawal and Discharge amount: (1) baseline: average of period 2010-2018 (i.e. marginally dry conditions); (2) Future: 2060 projection
- Instream Flow Protection Thresholds: per permit conditions
- Reservoir physical and operational data: from reservoir owner or EPD

# Water Supply Settings: Facilities Analyzed in BEAM Model for Suwannee-Satilla Region

Facility	Total number
Municipal Withdrawal	0
Municipal Discharge	23
Industrial Withdrawal	0
Industrial Discharge	2
Energy Withdrawal	0

# Municipal Discharge Facilities

Node No.	Permit No.	Permit Holder
2168	GA0025852	City of Ashburn
2188	GA0033596	Town of Alapaha
2198	GA0047236	City of Fitzgerald
2248	GA0021296	City of Lakeland
2298	GA0020222	CITY OF VALDOSTA
2348	GA0031828	City of Homerville
2368	GA0037460	City of Homerville
2568	GA0039365	City of Nashville
2578	GA0048470	City of Tifton
2598	GA0021563	City of Sparks
2608	GA0024911	City of Adel
2628	GA0033553	Ray City (Ray City WPCP)
2668	GA0030104	Stoker Utilities
2788	GA0031950	City of Lenox
2838	GA0037974	City of Hahira
2868	GA0033235	City of Valdosta
3158	GA0032328	City of Alma
3258	GA0024431	City of Douglas
3298	GA0038334	City of Pearson
3418	GA0020966	City of Waycross
3528	GA0037206	City of Patterson
4238	GA0027189	City of Folkston
4248	GA0037613	City of Folkston

# Industrial Discharge Facilities

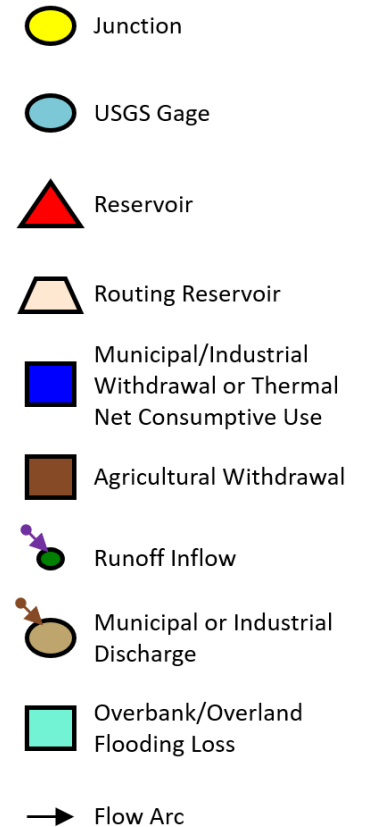
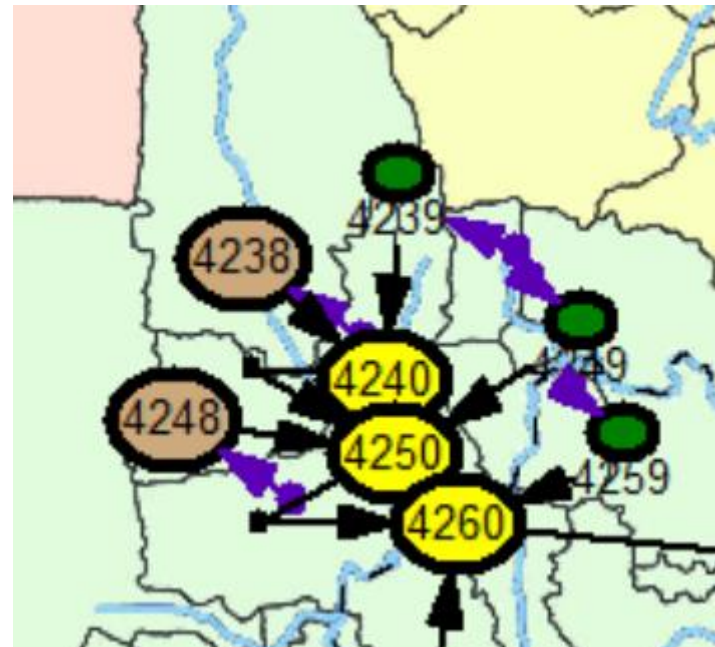
Node No.	Permit No.	Permit Holder
2638	GA0020001	US Dept of Air Force
3188	GA0024619	Milliken & Company

# Wastewater Assimilation Challenge

- Wastewater increases with population growth, which may also bring challenge to water resource management.
- Effluent limitation is determined by two factors:
  - Available technology – technology based effluent limitations
  - Water quality standards – upholding water quality standards in the receiving water body - 7Q10 flow is usually used as low flow threshold for determining wastewater assimilation and NPDES permit limitations

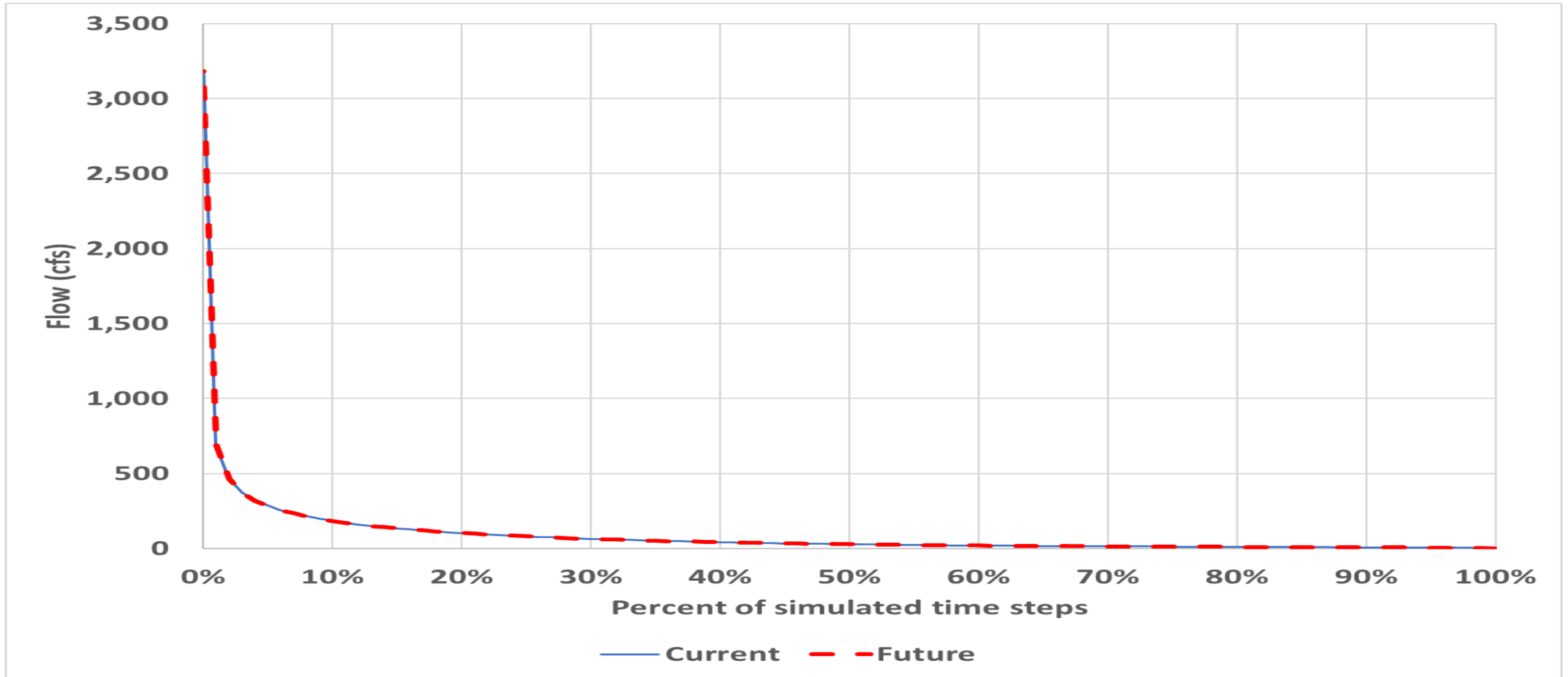
# Wastewater Assimilation Challenge Example 1: Permit GA 0037613 (BEAM Node 4248)

- Permit holder: City of Folkston (Folkston WPCP Wetlands)
- Permitted monthly discharge flow: 0.5 mgd
- 7Q10 Flow at discharge location: 1.83 cfs



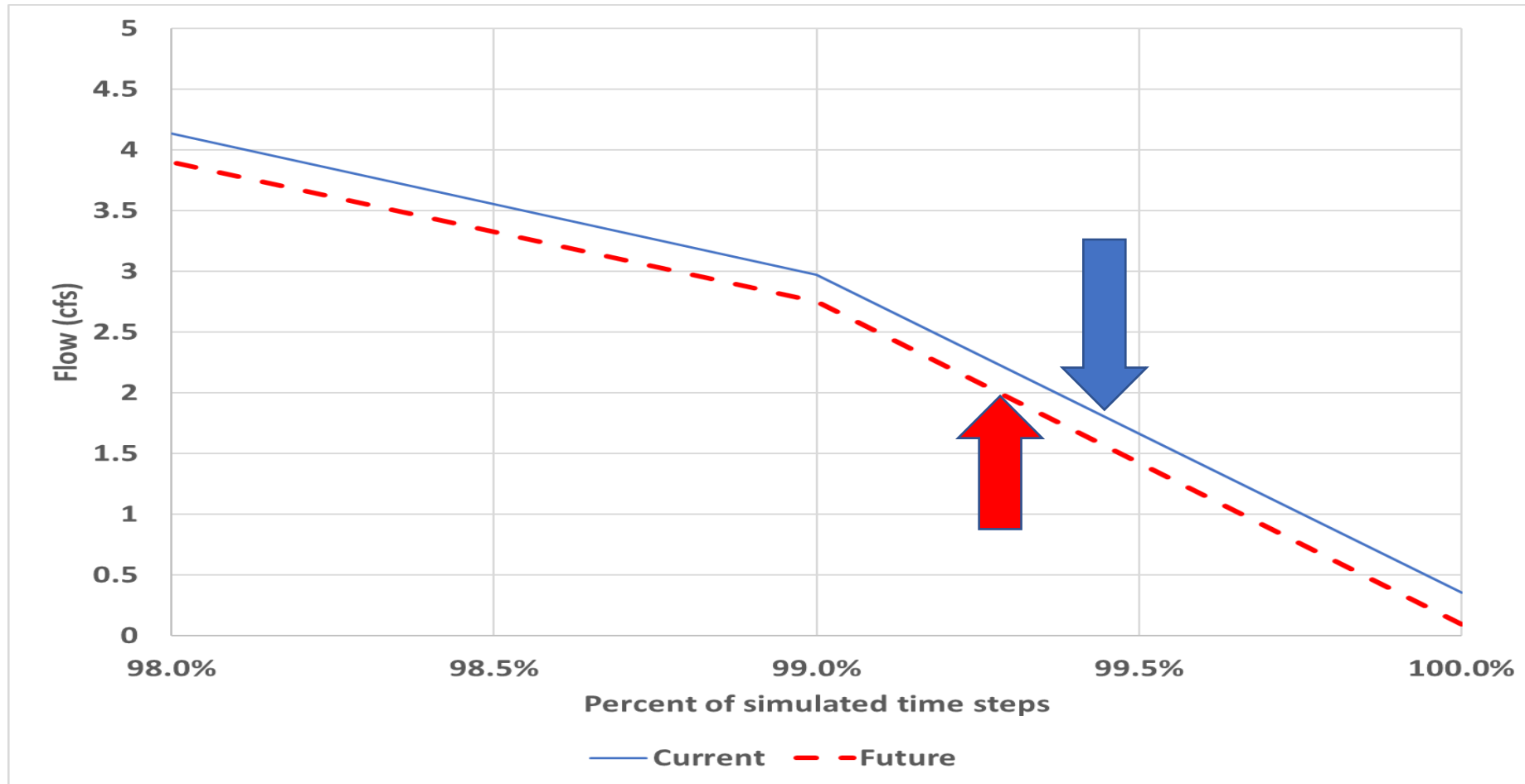
# Simulation Results at GA 0037613 Location

## Flow Frequency



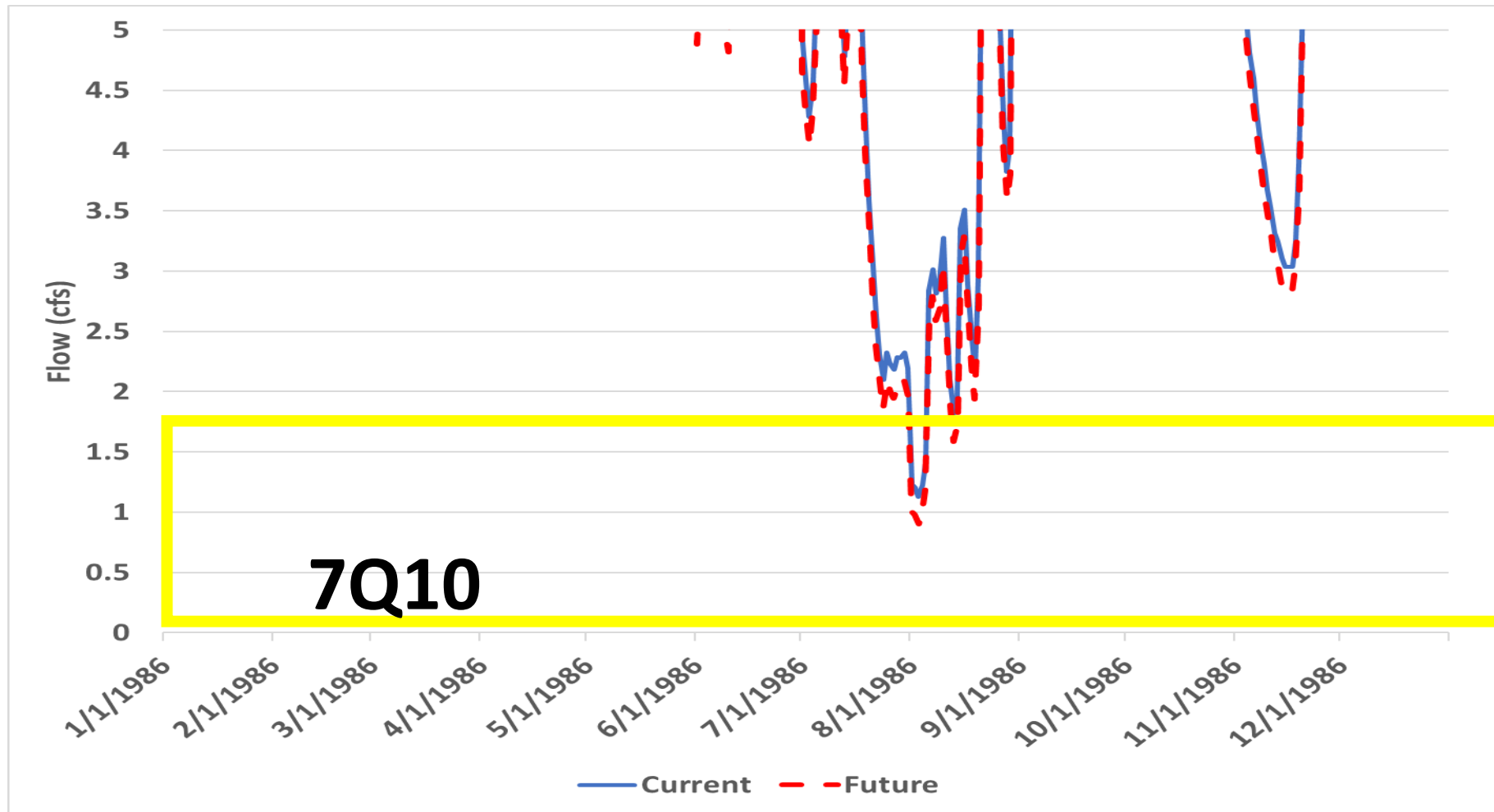
# Simulation Results at GA 0037613 Location

## Flow Frequency (low end) (7Q10 = 1.83 cfs)



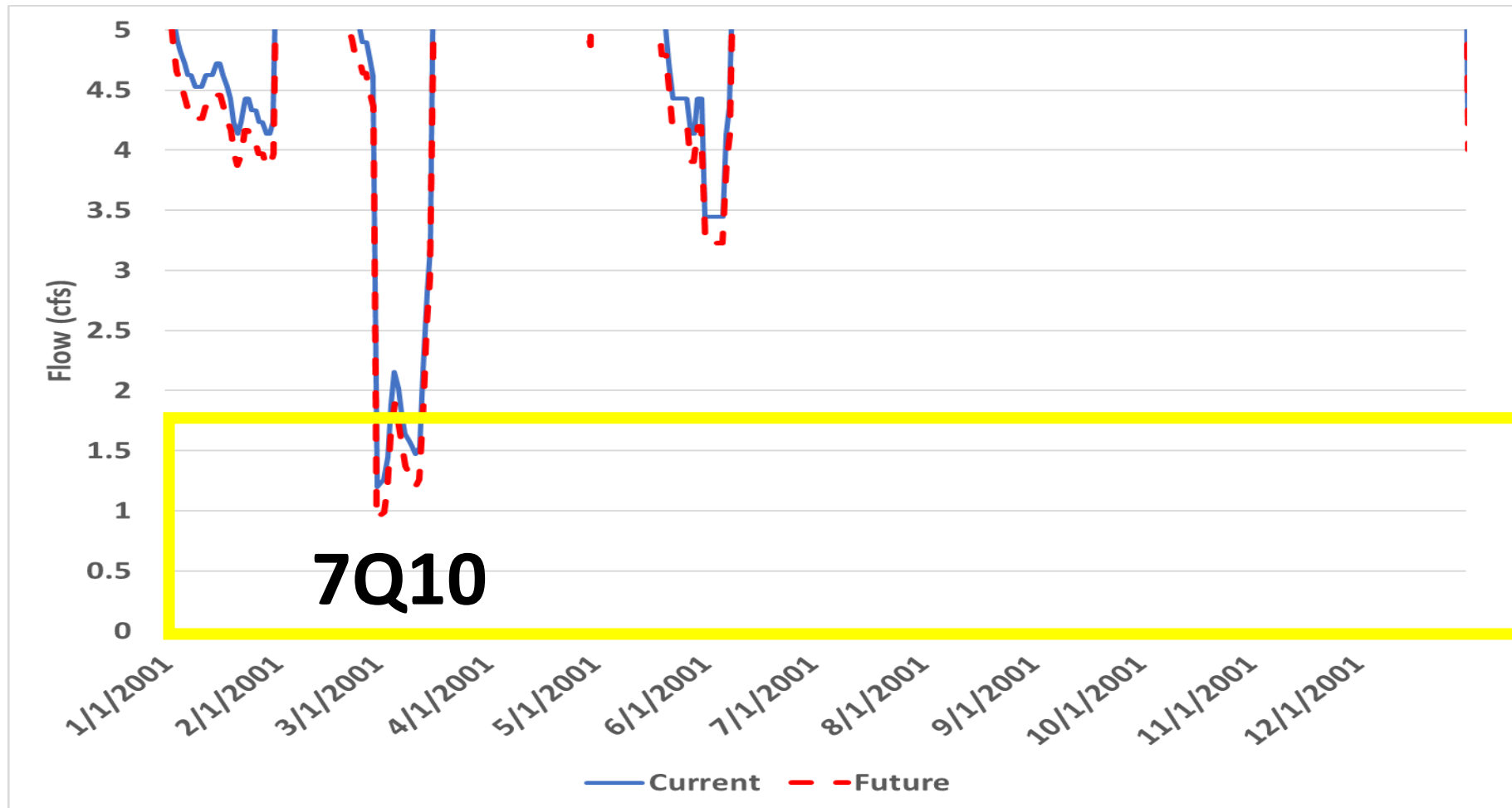
# Simulation Results at GA 0037613 Location

## Flow in 1986



# Simulation Results at GA 0037613 Location

## Flow in 2001



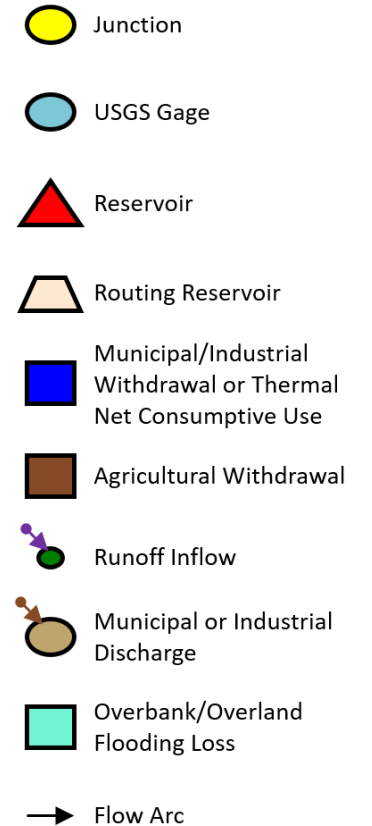
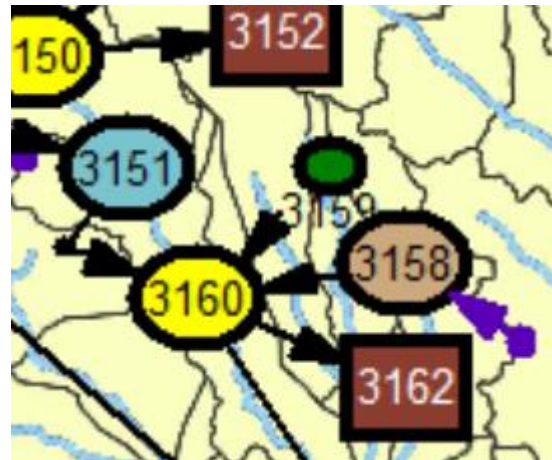
# Wastewater Assimilation Challenge Summary

Scenario	Total days of Challenge	Total volume of shortage (acre-ft)
Current	168	335
Future	186	417

# Wastewater Assimilation Challenge Example

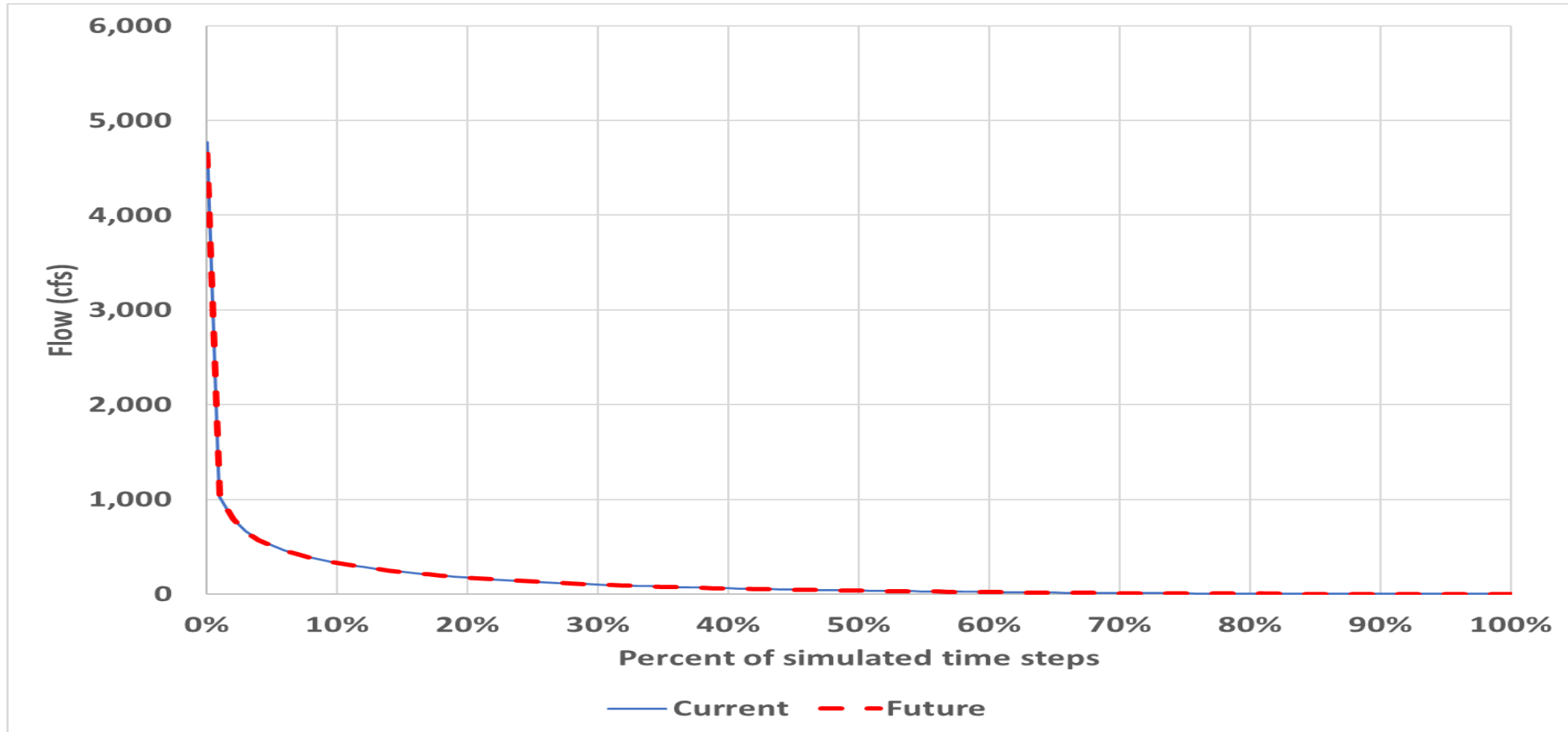
## 1: Permit GA 0032328 (BEAM Node 3158)

- Permit holder: City of Alma (Alma WPCP)
- Permitted monthly discharge flow: 0.75 mgd
- 7Q10 Flow at discharge location: 1.77 cfs



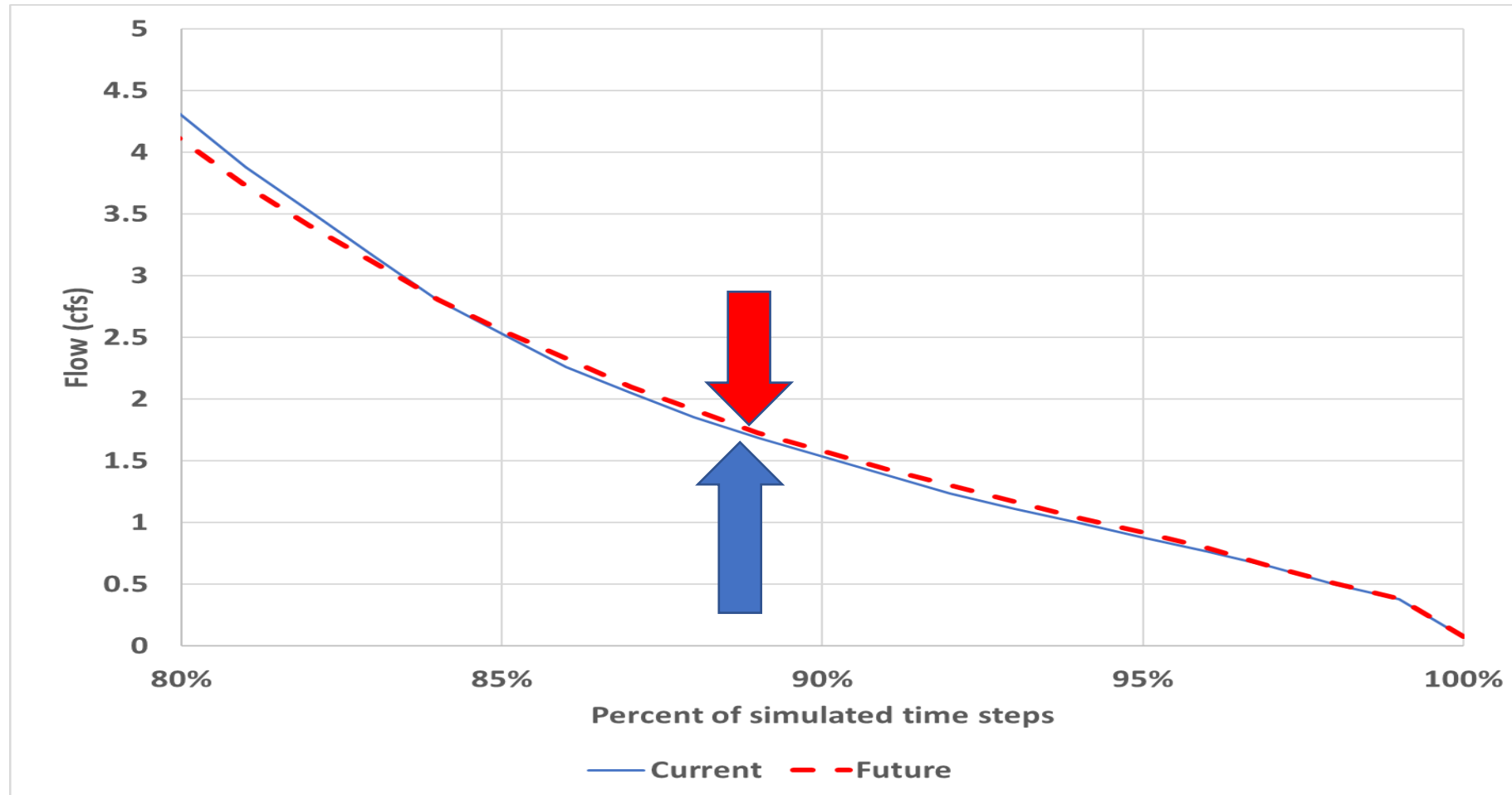
# Simulation Results at GA 0032328 Location

## Flow Frequency



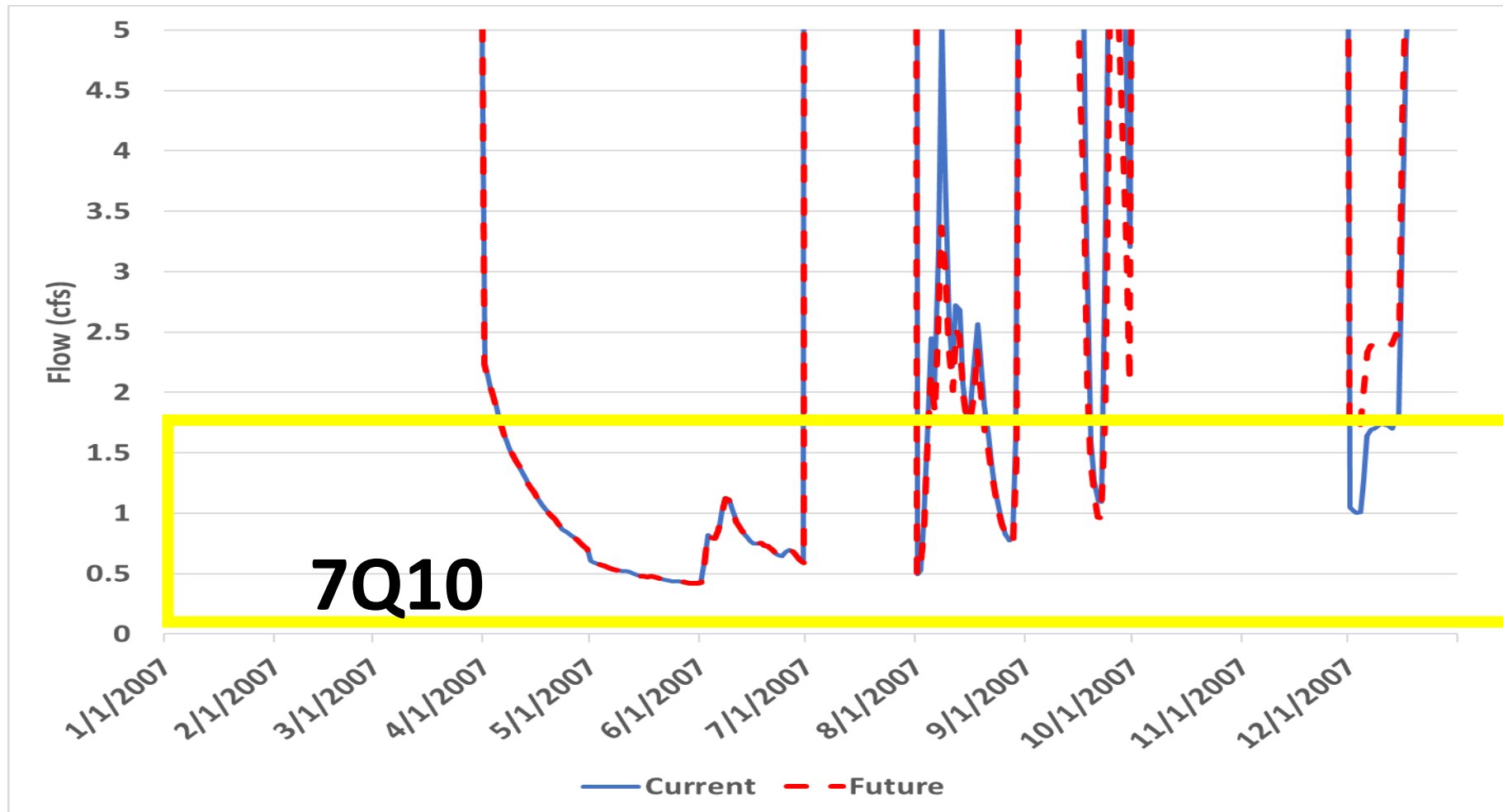
# Simulation Results at GA 0032328 Location

## Flow Frequency (low end) (7Q10 = 1.77 cfs)



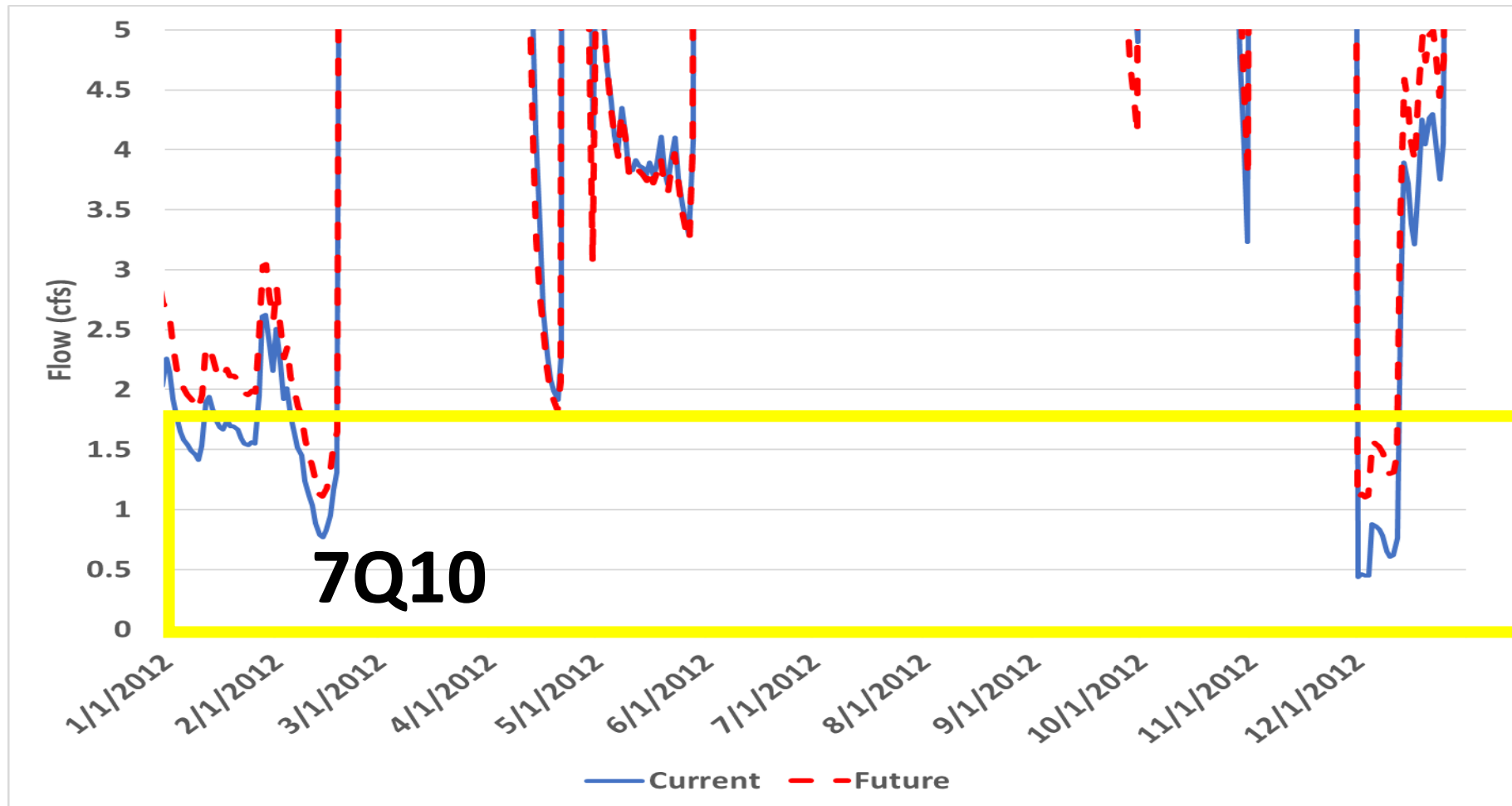
# Simulation Results at GA 0032328 Location

## Flow in 2007



# Simulation Results at GA 0032328 Location

## Flow in 2012

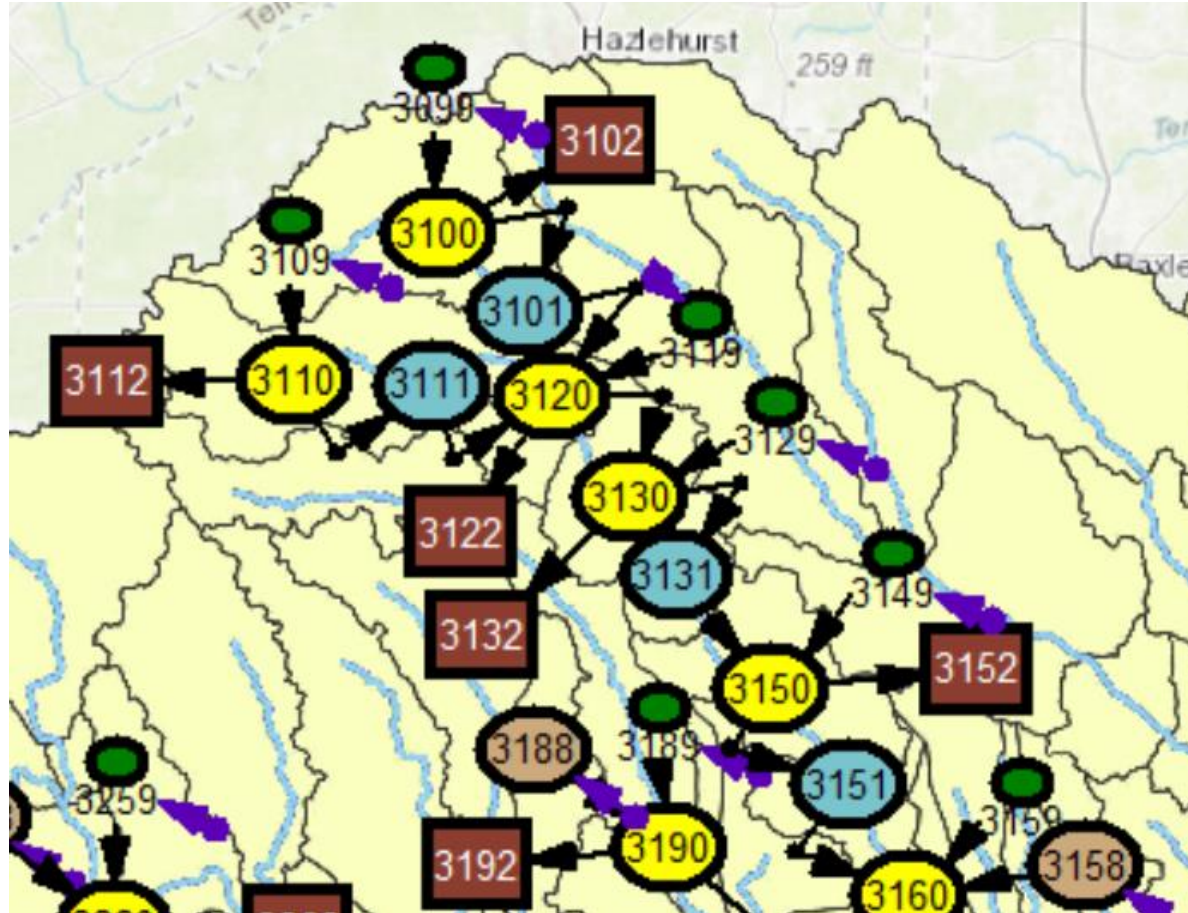


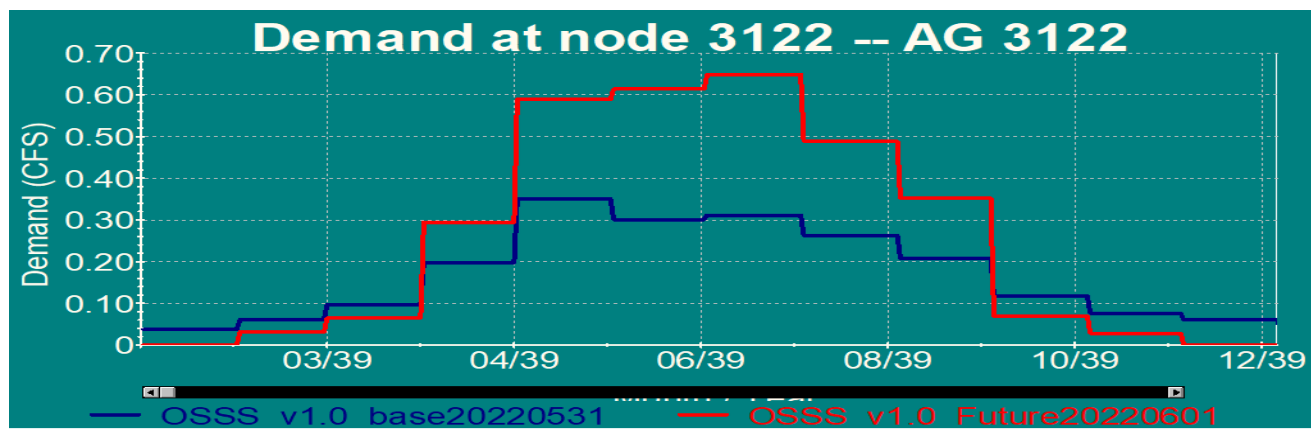
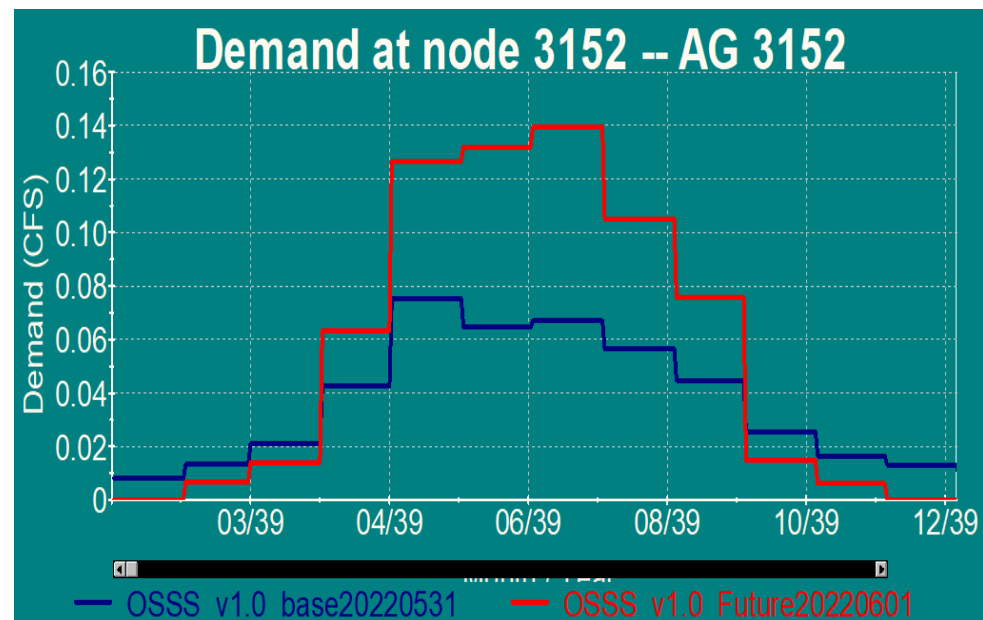
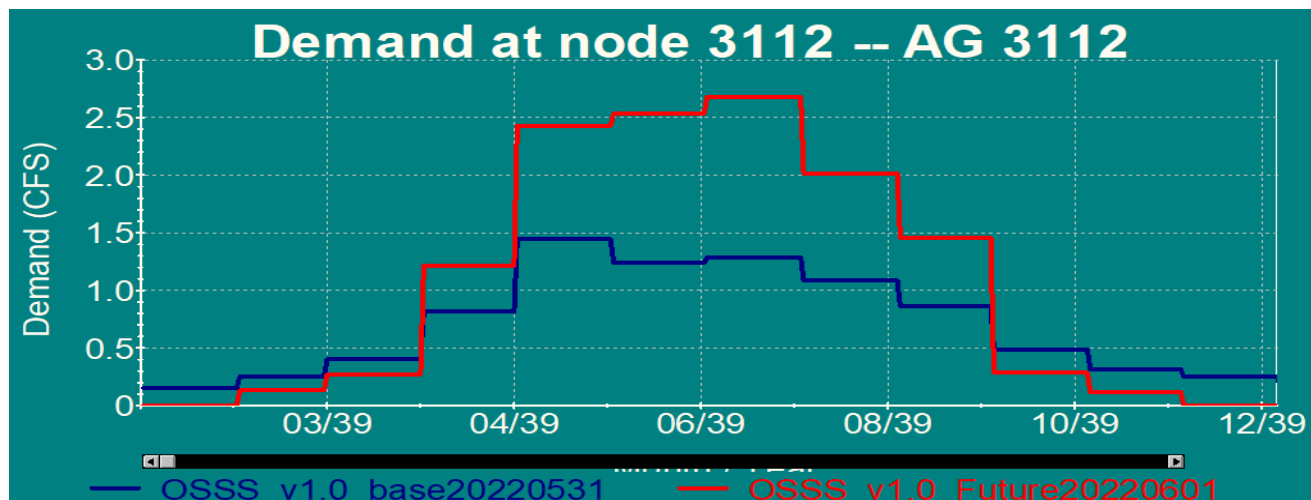
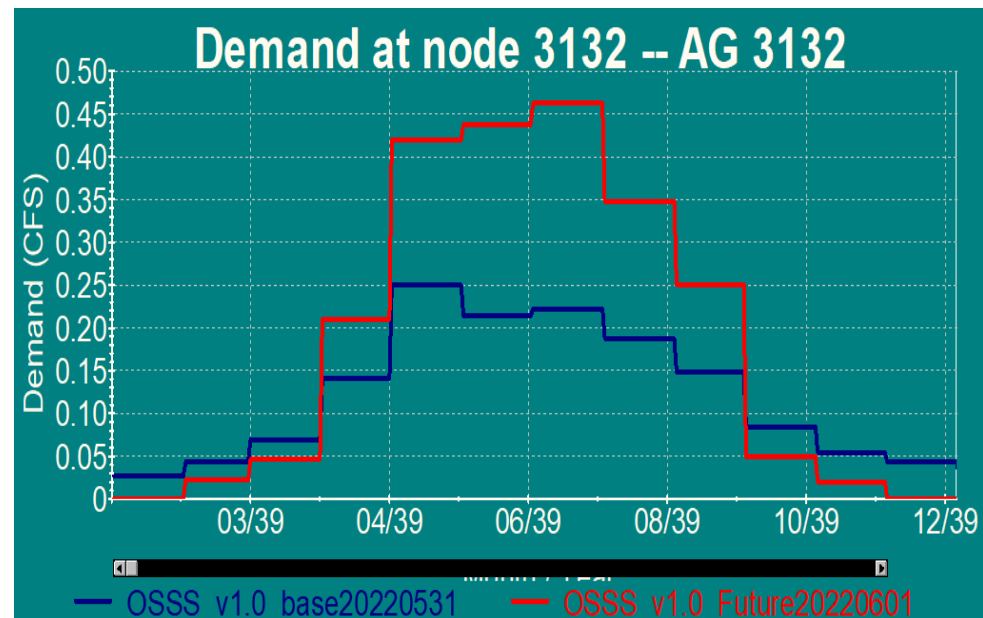
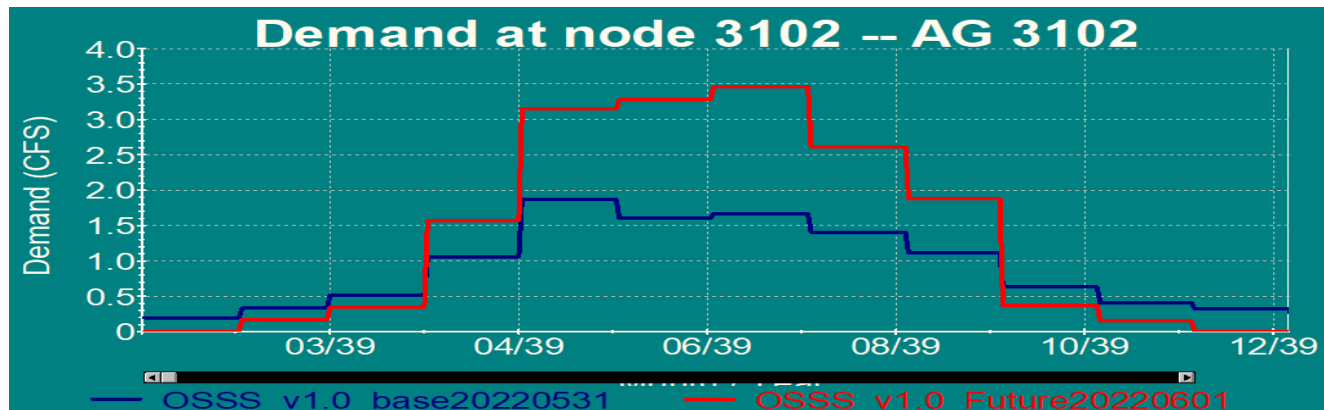
# Wastewater Assimilation Challenge Summary

Scenario	Total days of Challenge	Total volume of shortage (acre-ft)
Current	3377	5309
Future	3283	5089

# Why the challenge became smaller?

Because the pattern of predicted upstream AG uses





# Summary

- Moderate wastewater assimilation challenges under baseline & future water use conditions
- Performance measures for recreational activities and habitat availability can be added with stakeholders' input.

# Questions?

## Contact Information:

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# Using Flow to Create Boating/Paddling Performance Metric

For Informational Purposes Only

- Convert stream flow to stage

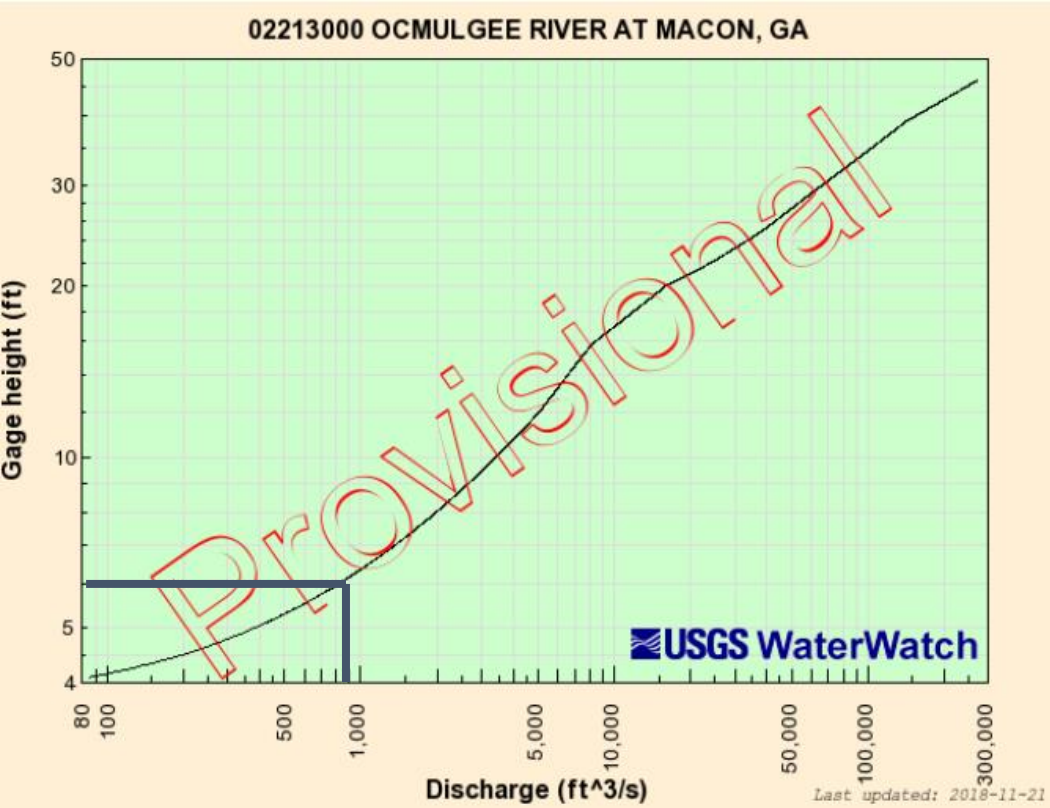
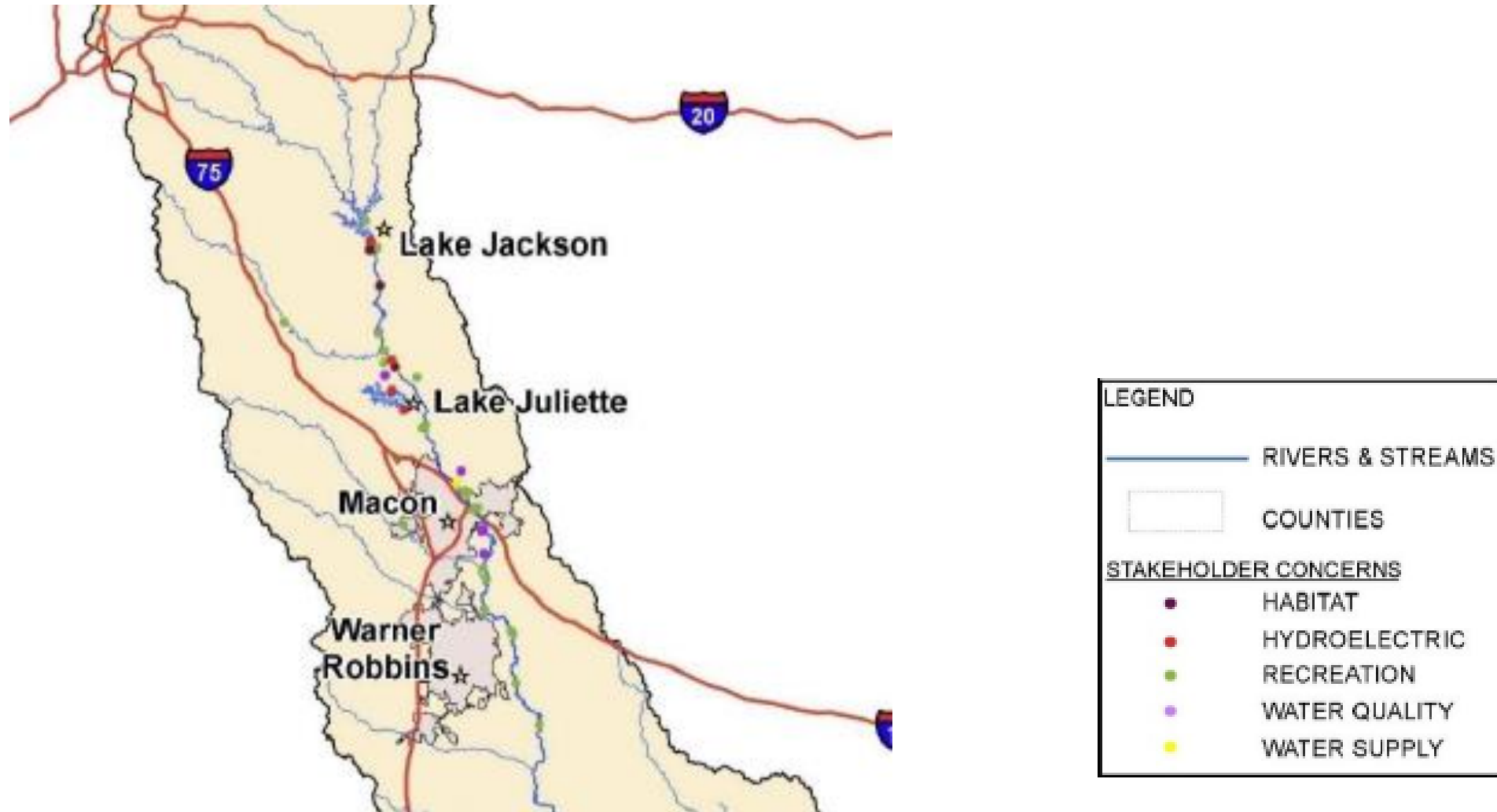


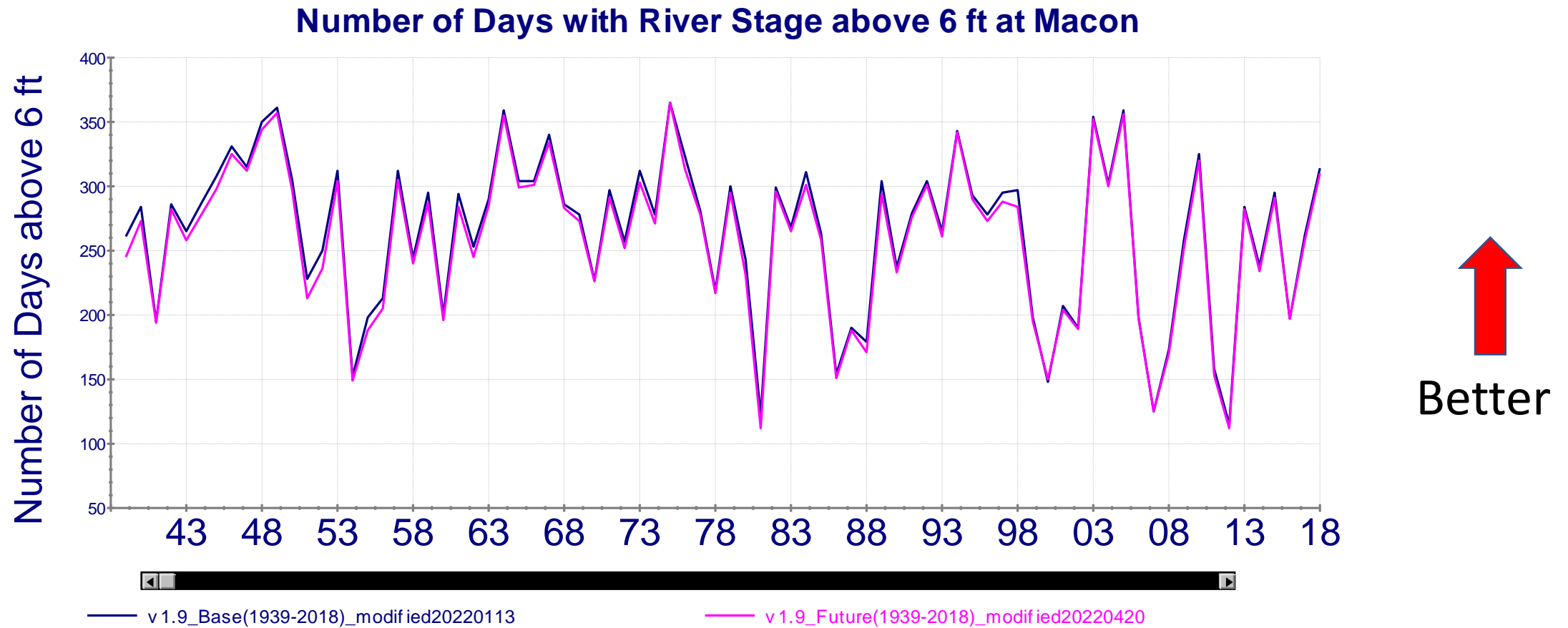
Table 11. Low-flow metrics for Ocmulgee River recreational boating

River Service	Metric	Source
Kayaking/canoeing	Amount of time that kayaking or canoeing is not ideal (i.e., gage height $\leq 6.0$ feet) due to low water conditions	Personal communication with Kathleen O' Neal (Ocmulgee Outdoor Expeditions)
Boating	Amount of time that boating is not ideal (i.e., gage height $\leq 7.5$ feet) due to low water conditions	Viable stage for kayaking/canoeing + 1.5 feet (average shaft length of short- and long-shaft small engines); (Iboats, 2009)

# Locations of Recreational Interests – Stakeholder Input



# Performance Metric at Macon, GA for Boating



# Reach Habitat

- Shallow/Fast

- Species: Spottail Shiner and Bluehead Chub



[https://www.inaturalist.org/guide\\_taxa/490641](https://www.inaturalist.org/guide_taxa/490641)

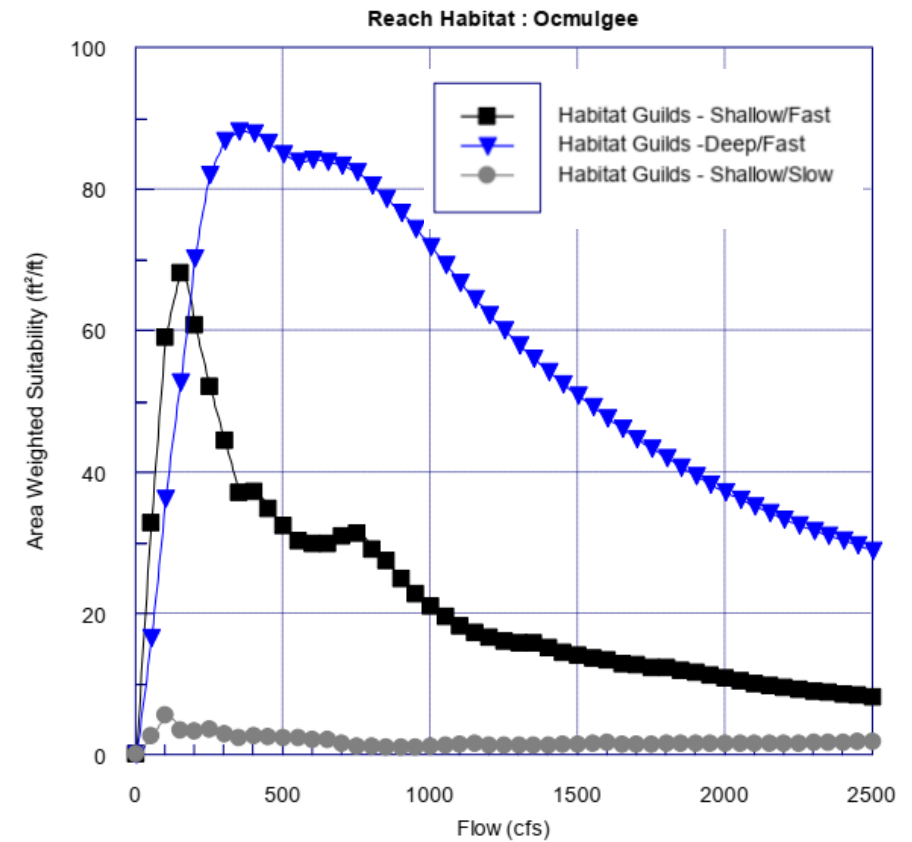
[https://en.wikipedia.org/wiki/Spottail\\_shiner](https://en.wikipedia.org/wiki/Spottail_shiner)

- Deep/Fast

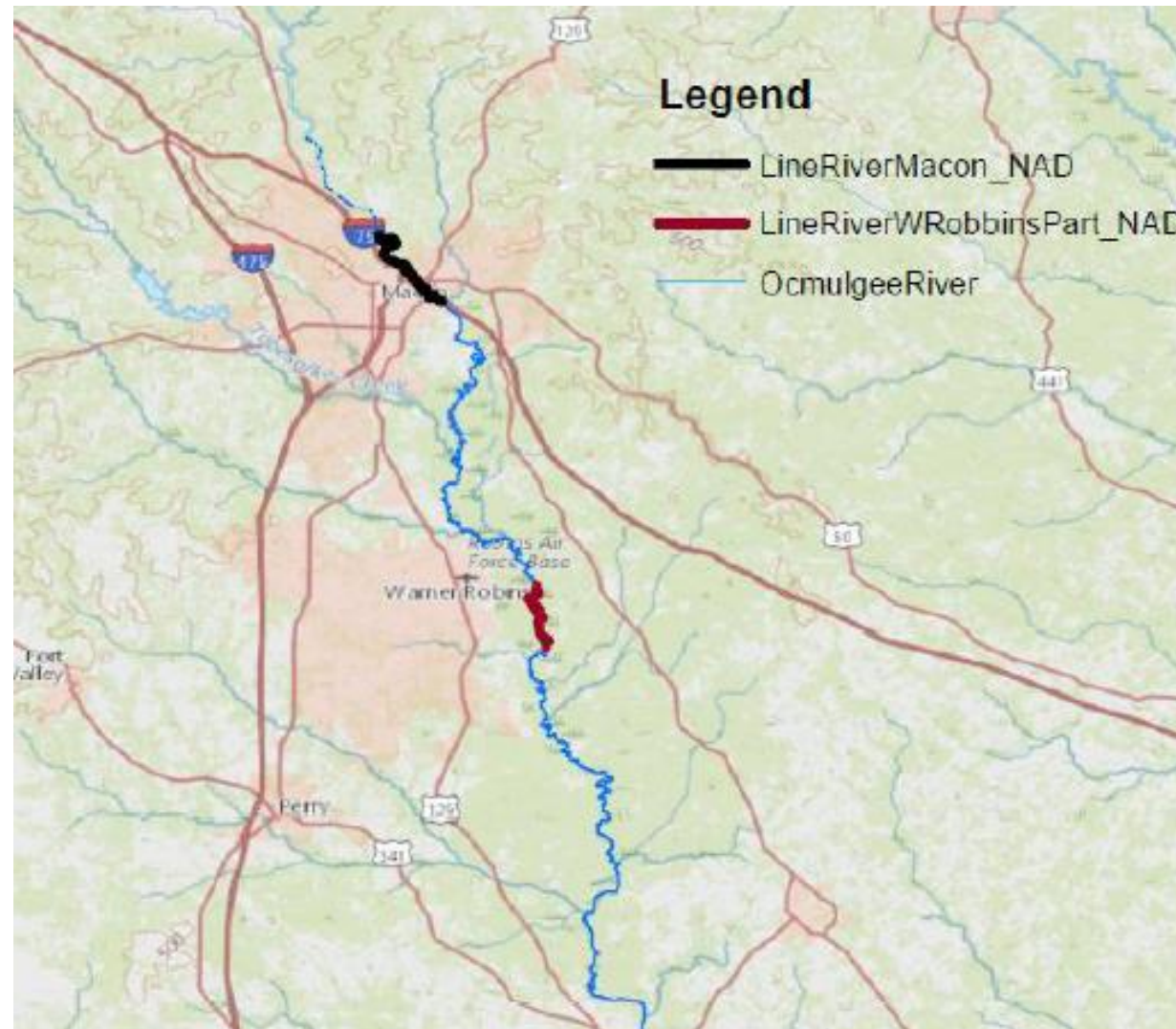
- Species: Largemouth Bass



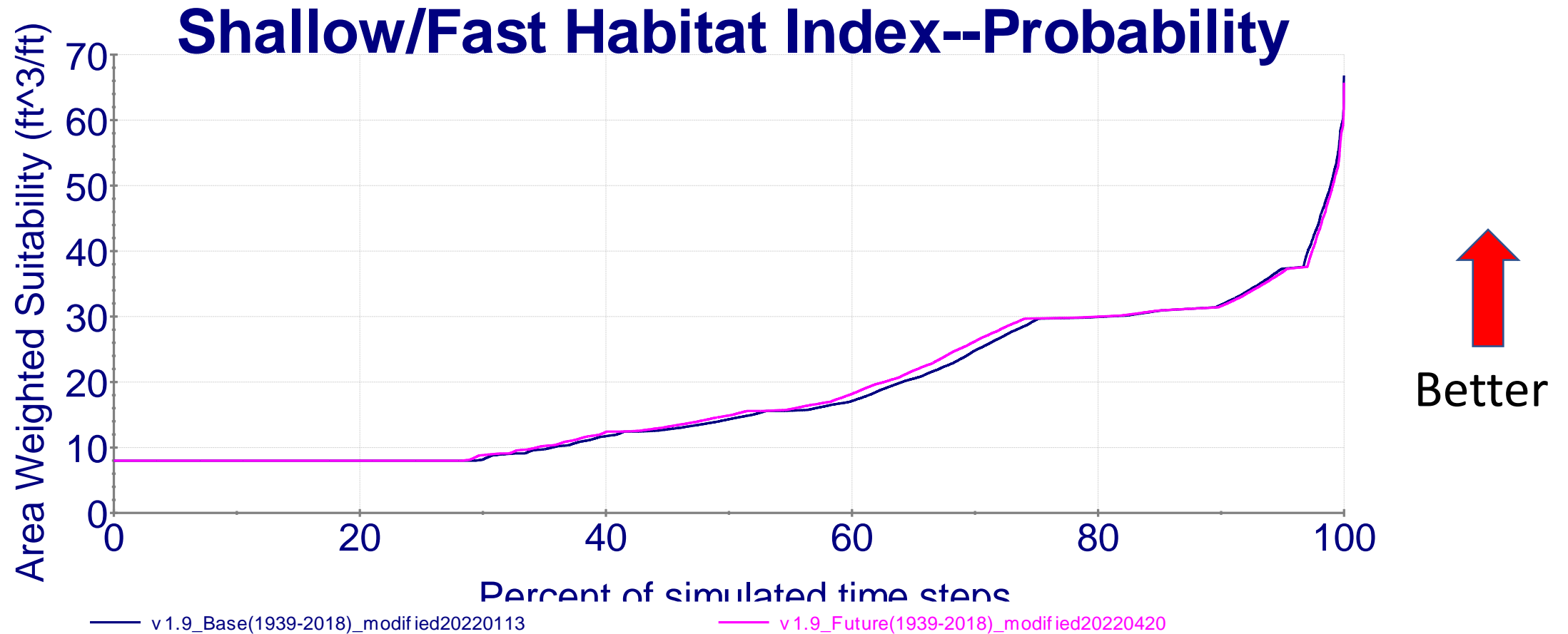
[https://www.fws.gov/fisheries/freshwater-fish-of-america/largemouth\\_bass.html](https://www.fws.gov/fisheries/freshwater-fish-of-america/largemouth_bass.html)



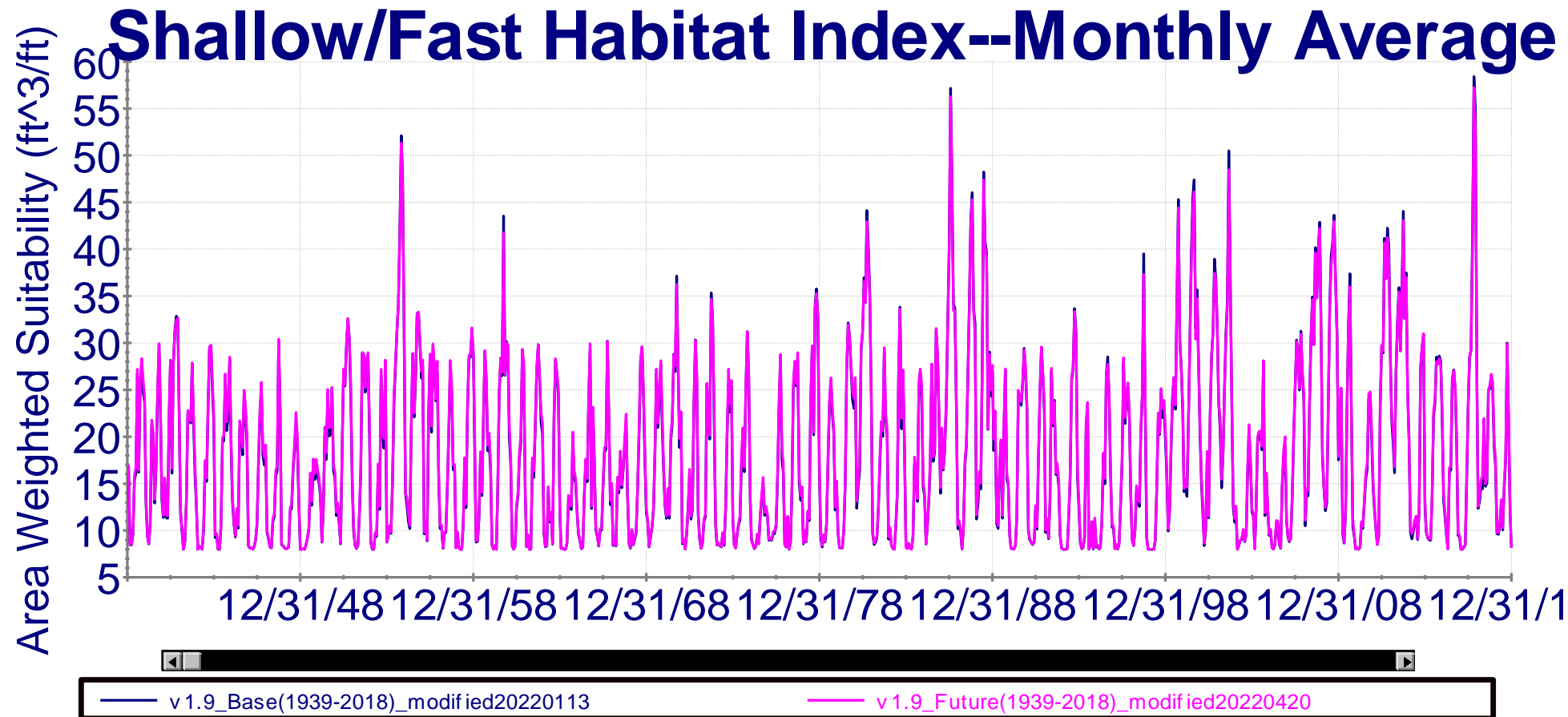
# Reaches of the Ocmulgee River Where Bathymetric Data Allow for Habitat Assessment




# Performance Metric-Shallow/Fast Habitat Frequency

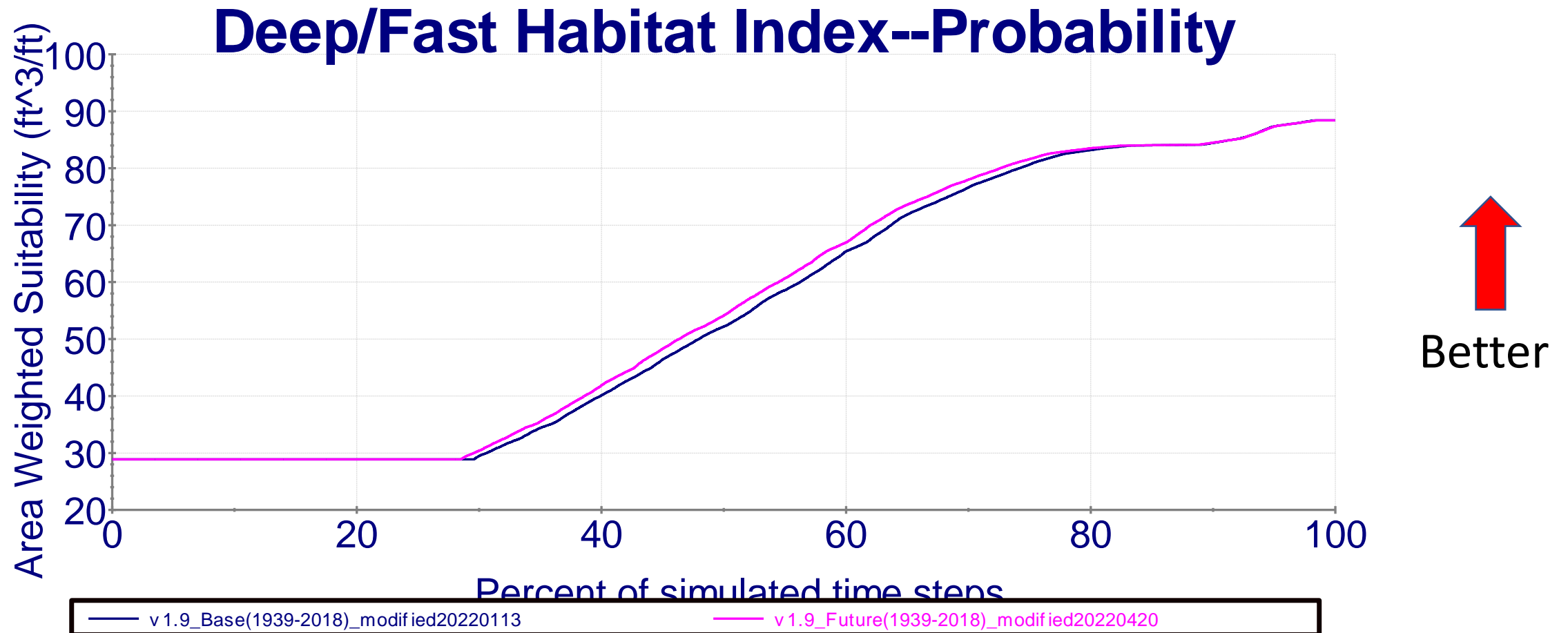


# Performance Metric-Shallow/Fast Habitat (Monthly Average)



  
Better

# Performance Metric-Deep/Fast Habitat Frequency



# Performance Metric-Deep/Fast Habitat (Monthly Average)

