

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

Georgia EPD
November 2022

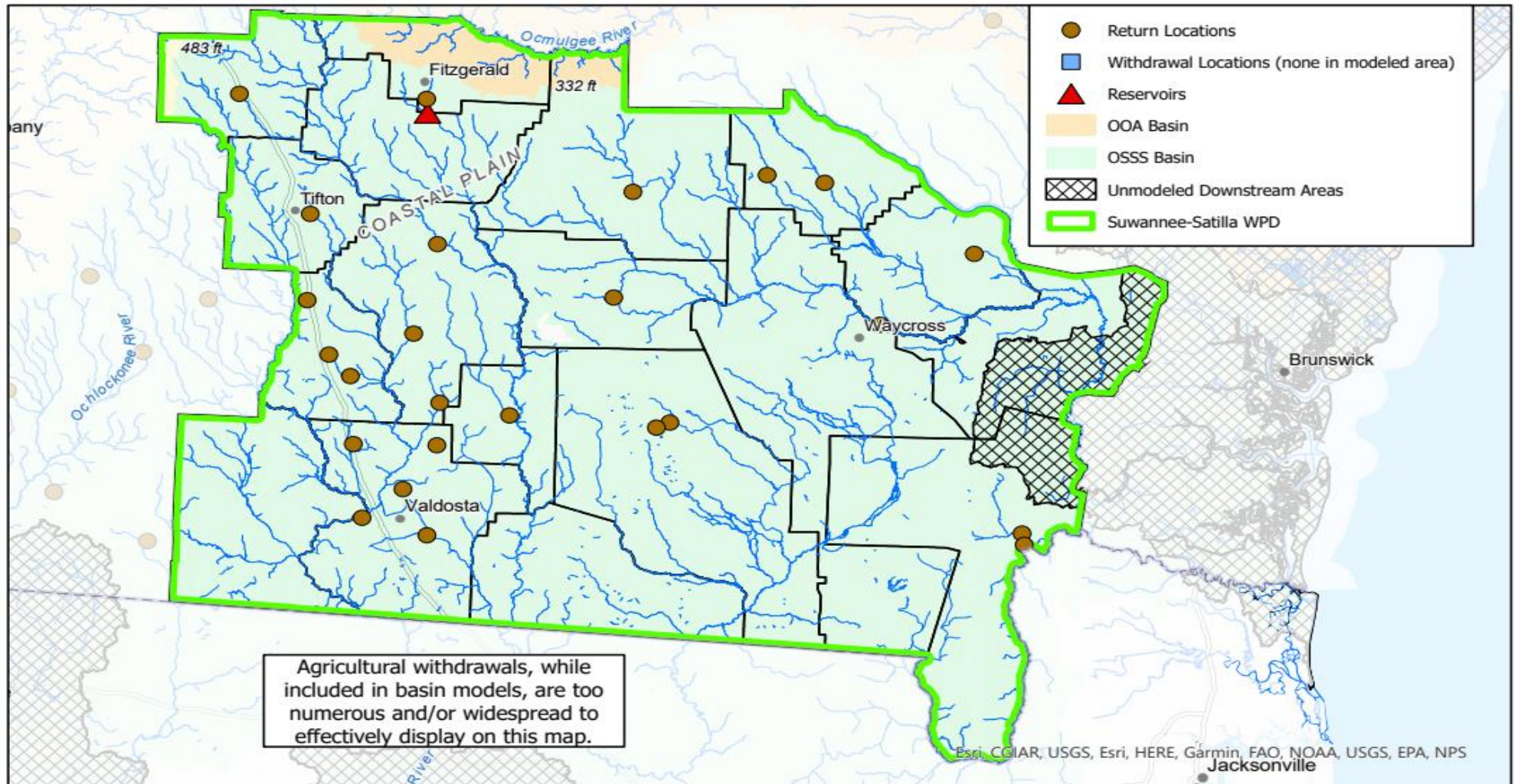
Presentation Outline

- 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?

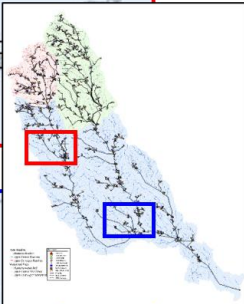
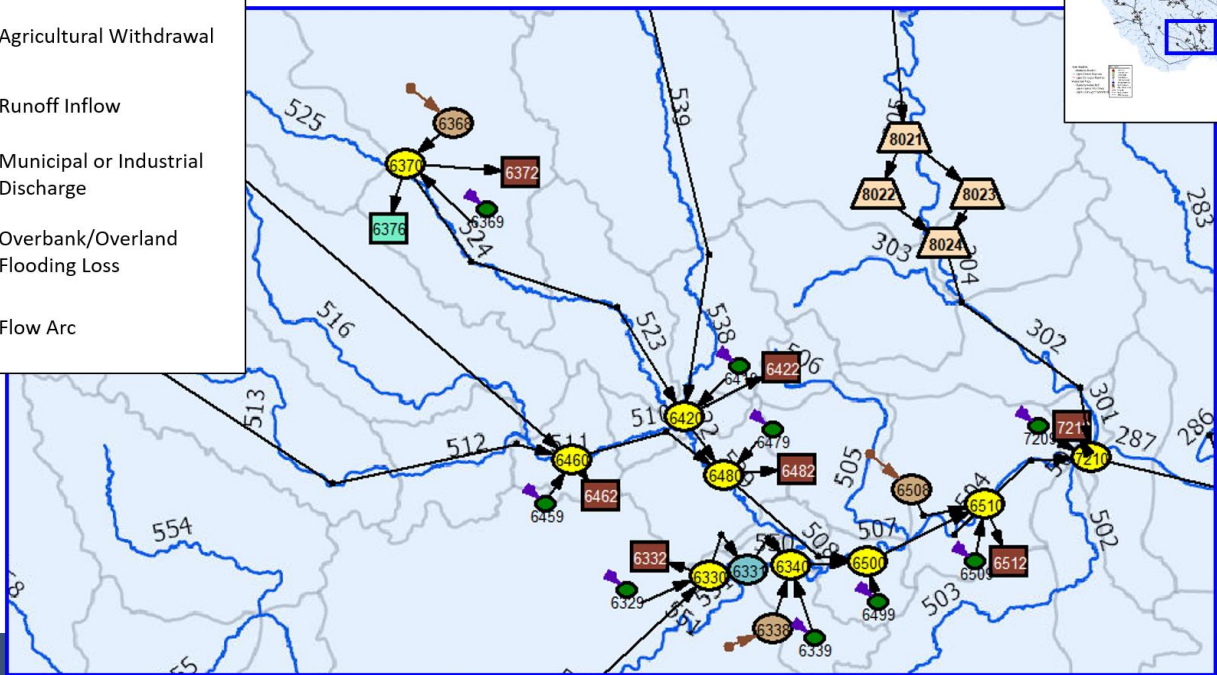
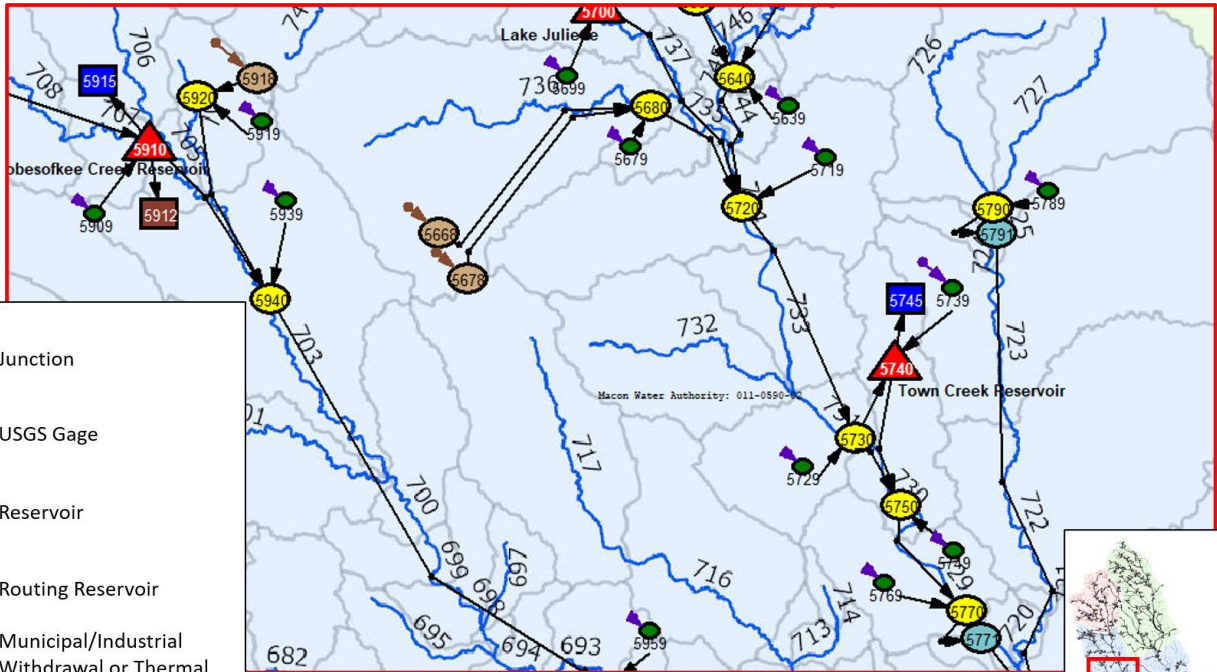
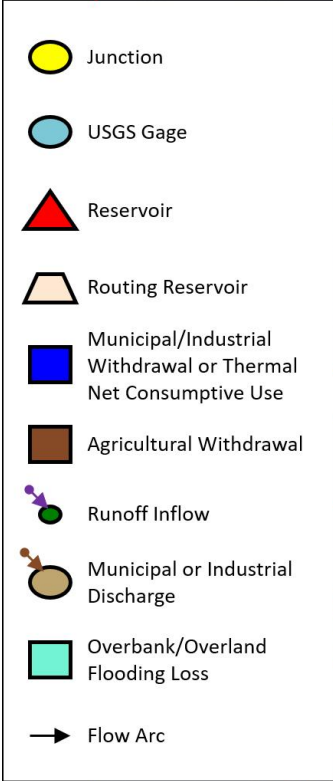
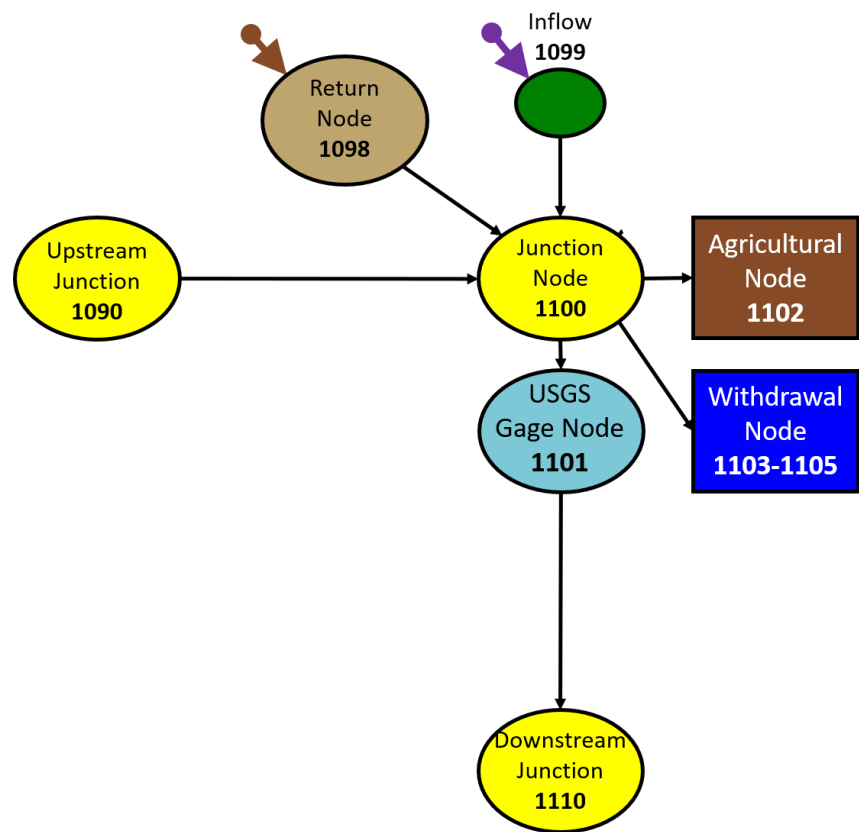
Summary of Council Metrics

Region	Coosa-North Georgia
Water Supply Metrics	Challenge days
	Total volume of shortage
	Shortage vol in2007-2008
	Shortage vol in2011-2012
Wastewater Discharge Metrics	Challenge days
	Total volume of shortage
Lake Elevation Metrics	?
Local Flow Metrics	?

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)baseline 2011:2011 demand (drought year); (3) Projected 2060 M&I and 2060 AG demand.
- 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

Facilities having Wastewater Assimilation Challenge (unit: acre-ft) (OSSS Basin)(part 1)

BEAM Node		2188	2198	2248	2568	2578	2598	2608	2628
Permit No.		GA0033596	GA0047236	GA0021296	GA0039365	GA0048470	GA0021563	GA0024911	GA0033553
Permit Holder		Town of Alapaha (Alapaha WPCP)	City of Fitzgerald (C.A. Newcomer)	City of Lakeland (Lakeland WPCP)	City of Nashville (Nashville WPCP)	City of Tifton (New River WPCP)	City of Sparks (Sparks WPCP)	City of Adel (Adel WPCP)	Ray City (Ray City WPCP)
7Q10 Flow (cfs)		1.4	0.25	2	0.01	0.06	0.02	0.15	0.26
Challenge days (percentage)	Baseline	4498(15.39%)	308(1.05%)	149(0.51%)	1459(4.99%)	4552(15.58%)	7718(26.41%)	3949(13.51%)	2136(7.31%)
	Baseline_2011	6017(20.59%)	322(1.10%)	153(0.52%)	1947(6.66%)	4682(16.02%)	9056(30.99%)	4658(15.94%)	2411(8.25%)
	Future_2060M&I_2060AG	5227(17.89%)	828(2.83%)	175(0.60%)	6036(20.66%)	2803(9.59%)	726(2.48%)	0(0.00%)	2288(7.83%)
Total volume of shortage (acre-ft)	Baseline	11336.05	88.79	213.60	1508.26	1485.06	5167.94	1026.23	1057.81
	Baseline_2011	14503.57	94.38	235.88	38.49	1937.80	7168.94	1278.89	1198.68
	Future_2060M&I_2060AG	13941.46	528.34	258.26	10918.35	1503.01	44.79	0.00	1257.43

Facilities having Wastewater Assimilation Challenge (unit: million gallon) (part 1)

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Total volume of shortage (million gallon)	Baseline	3693.86	28.93	69.60	491.47	483.91	1683.98	334.40	344.69
	Baseline_2011	4726.00	30.75	76.86	12.54	631.43	2336.00	416.73	390.59
	Future_2060M&I_2060AG	4542.83	172.16	84.16	3557.75	489.76	14.59	0.00	409.73

Facilities having Wastewater Assimilation Challenge (unit: acre-ft) (part 2)

BEAM Node		2868	3158	3188	3258	3298	3418	3528	4238	4248
Permit No.		GA0033235	GA0032328	GA0024619	GA0024431	GA0038334	GA0020966	GA0037206	GA0027189	GA0037613
Permit Holder		City of Valdosta (Withlacoochee WPCP)	City of Alma (Alma WPCP)	Milliken & Company (Alma Plant)	City of Douglas (Southeast WPCP)	City of Pearson (Pearson WPCP)	City of Waycross (Waycross WPCP)	City of Patterson (Patterson WPCP)	City of Folkston (Folkston WPCP (Pond))	City of Folkston (Folkston WPCP Wetlands)
7Q10 Flow (cfs)		4.31	1.77	0.55	0.04	0.29	14.2	0.21	0.15	1.83
Challenge days (percentage)	Baseline	48(0.16%)	3450(11.81%)	472(1.62%)	3474(11.89%)	131(0.45%)	3424(11.72%)	176(0.60%)	217(0.74%)	168(0.57%)
	Baseline_2011	294(1.01%)	3571(12.22%)	598(2.05%)	4358(14.91%)	130(0.44%)	4476(15.32%)	181(0.62%)	217(0.74%)	179(0.61%)
	Future_2060M&I_2060AG	804(2.75%)	3363(11.51%)	718(2.46%)	3760(12.87%)	116(0.40%)	4170(14.27%)	177(0.61%)	217(0.74%)	186(0.64%)
Total volume of shortage (acre-ft)	Baseline	130.92	5546.58	397.46	22313.84	24.47	74149.40	39.52	37.88	334.81
	Baseline_2011	905.52	5776.66	552.82	27449.03	25.02	108013.69	41.23	37.88	379.78
	Future_2060M&I_2060AG	3301.19	5409.96	680.82	33858.80	23.81	105057.71	41.63	37.88	417.31

Facilities having Wastewater Assimilation Challenge (unit: million gallon) (part 2)

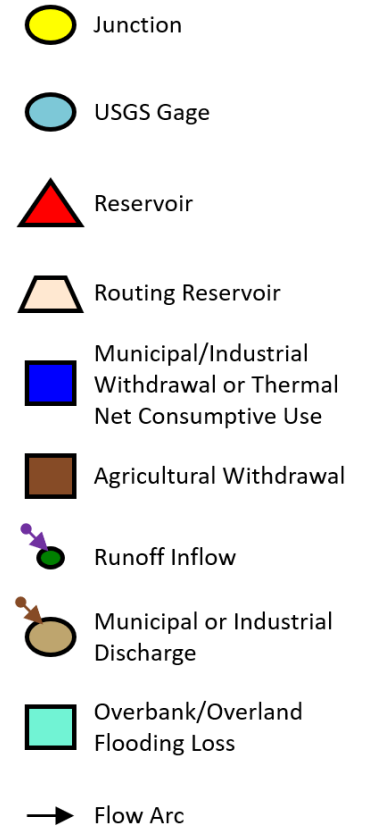
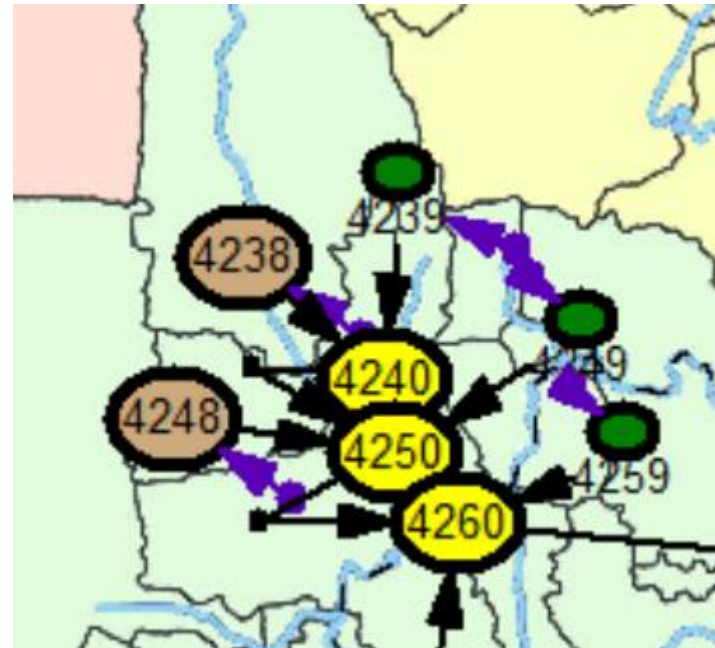
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Total volume of shortage (million gallon)	Baseline	42.66	1807.36	129.51	7270.98	7.97	24161.63	12.88	12.34	109.10
	Baseline_2011	295.07	1882.33	180.14	8944.29	8.15	35196.34	13.44	12.34	123.75
	Future_2060M&I_2060AG	1075.70	1762.84	221.84	11032.91	7.76	34233.13	13.56	12.34	135.98

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

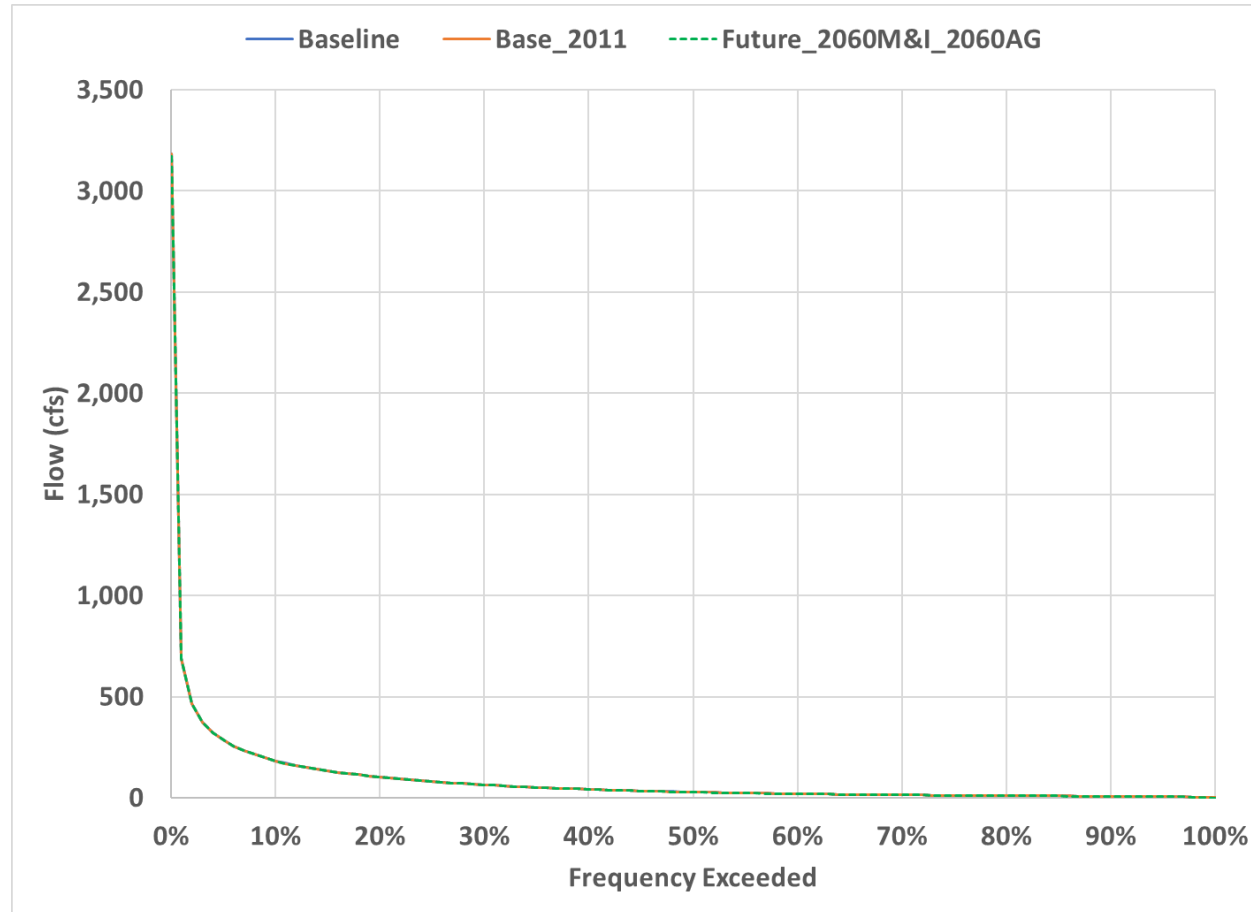
Wastewater Assimilation Challenge Example 1: Permit GA 0037613 (BEAM Node 4248)

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



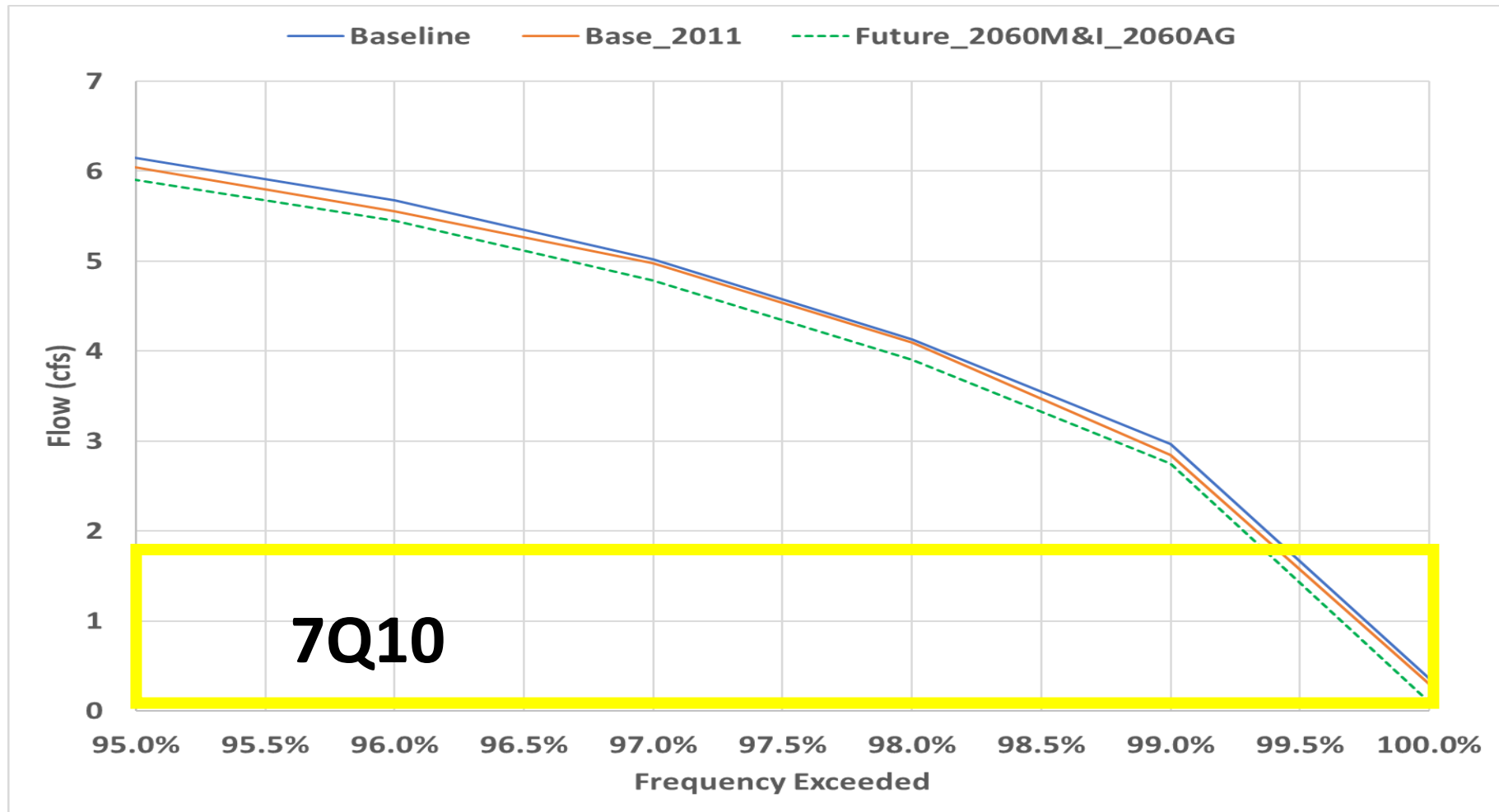
Simulation Results at GA 0037613 Location

Flow Frequency

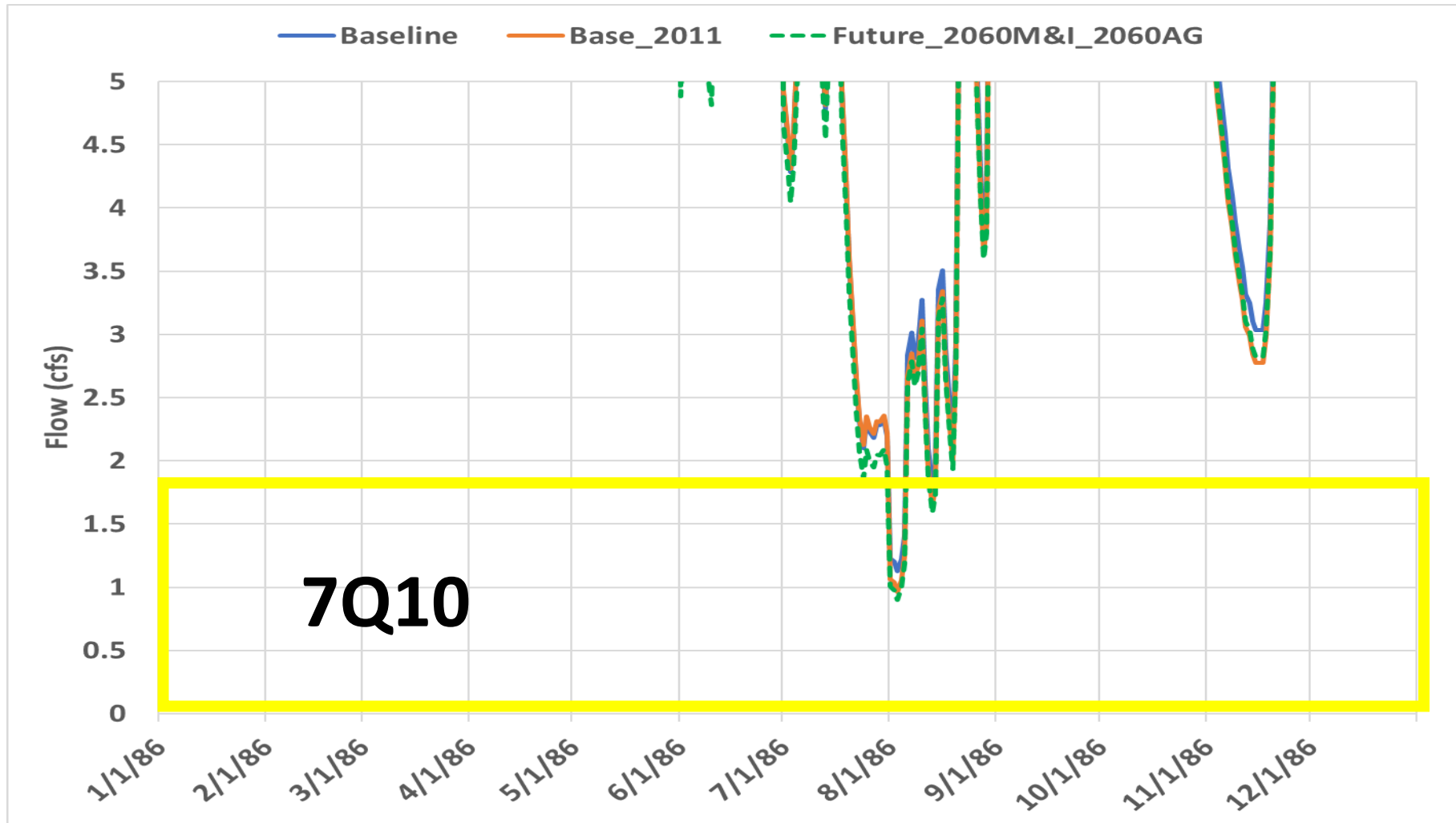


Simulation Results at GA 0037613 Location

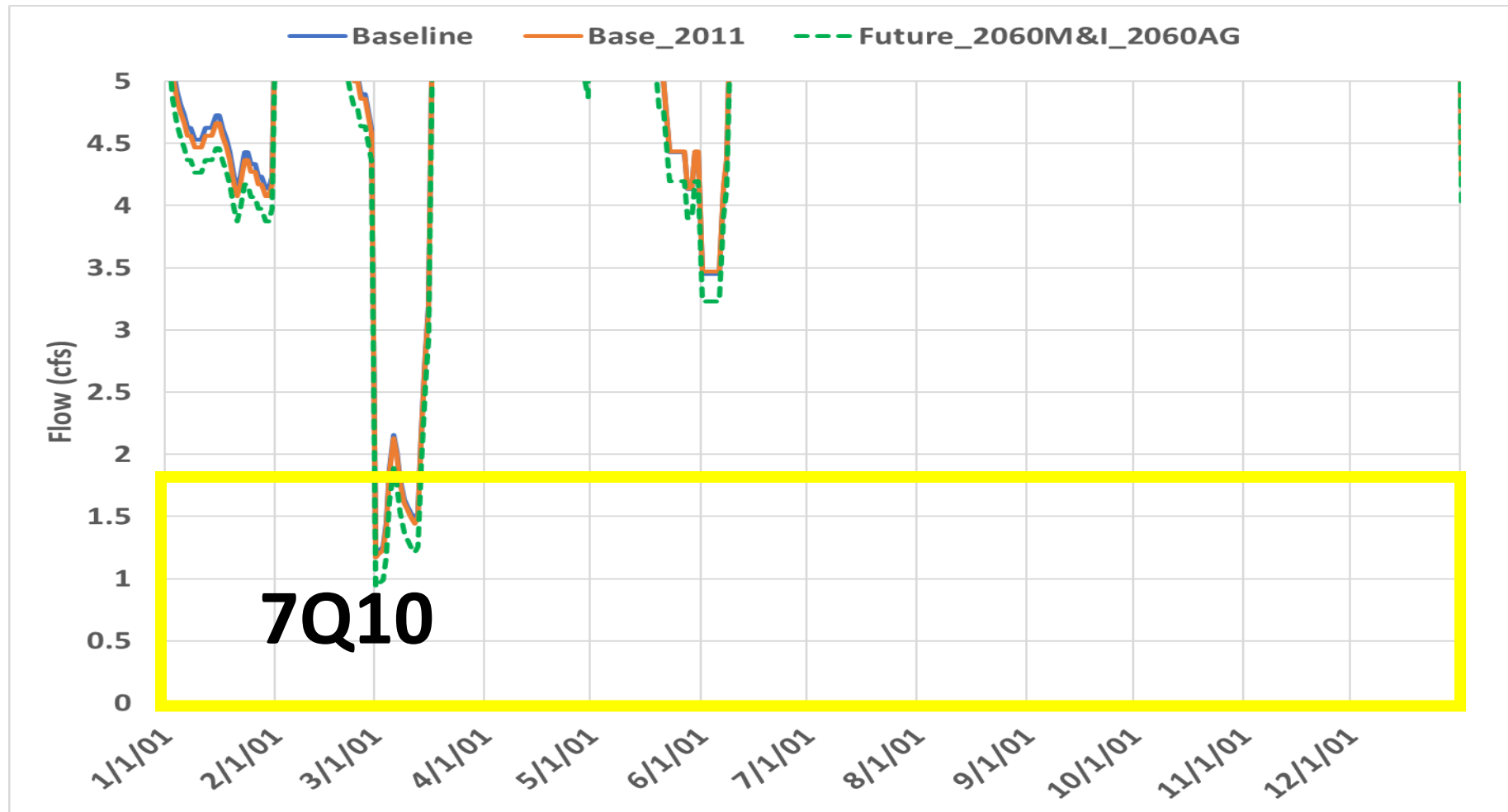
Flow Frequency (low end) (7Q10 = 1.83 cfs)



Simulation Results at GA 0037613 Location Flow in 1986

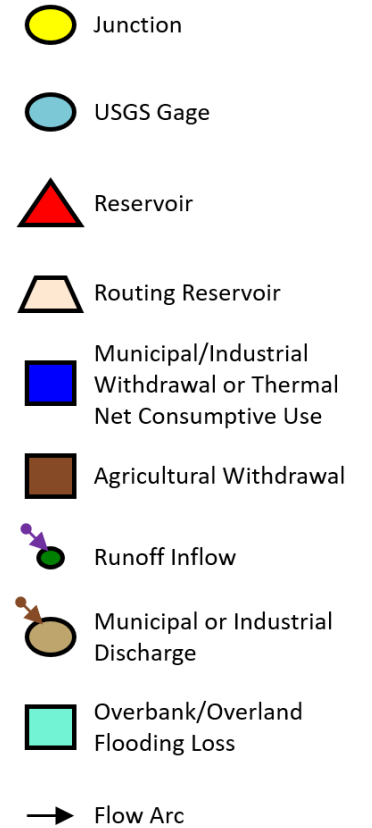
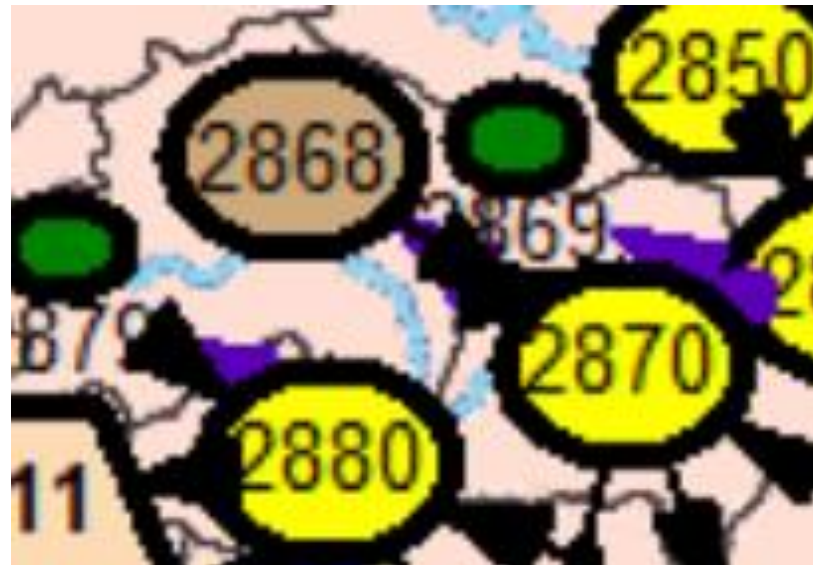


Simulation Results at GA 0037613 Location Flow in 2001



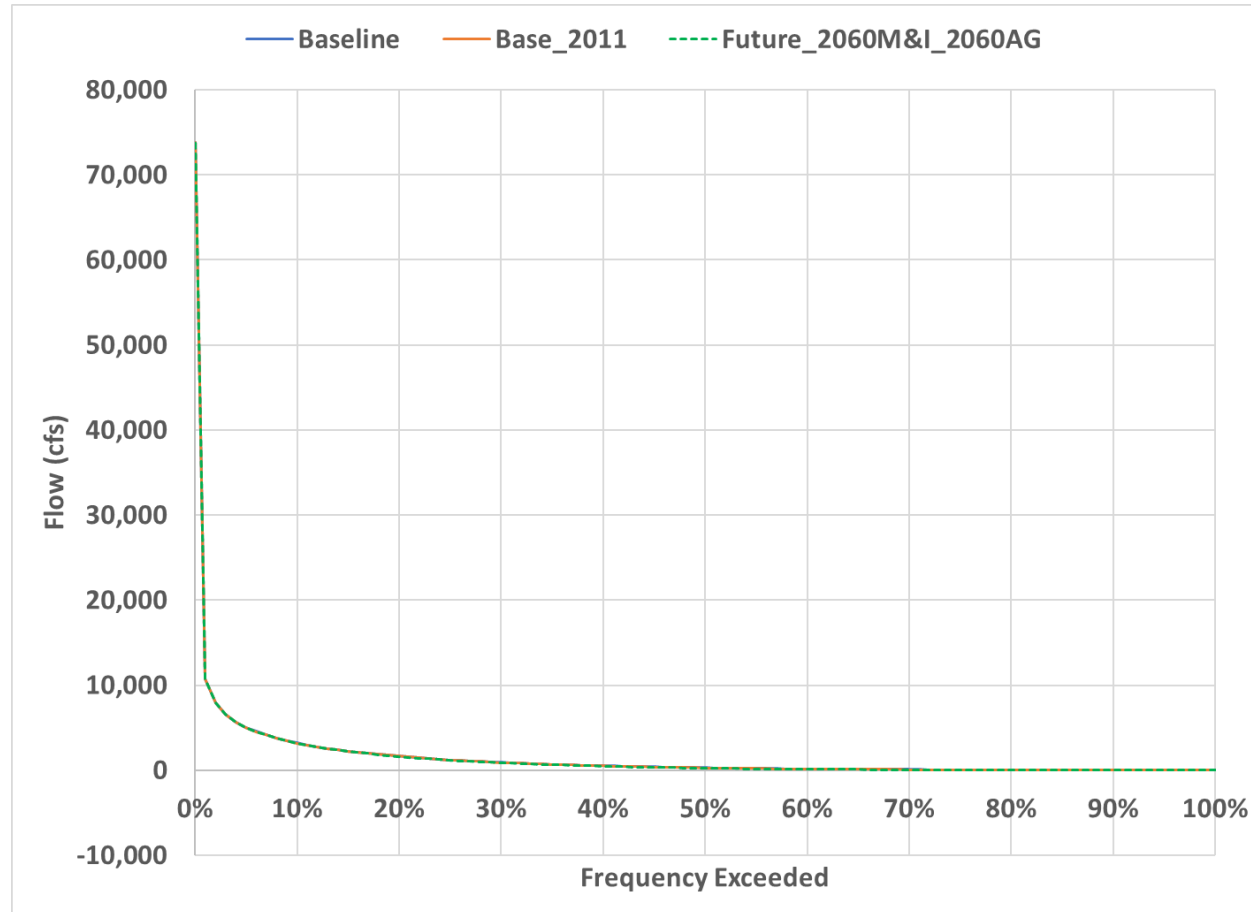
Wastewater Assimilation Challenge Example 2: Permit GA 0033235 (BEAM Node 2868)

- Permit holder: City of Valdosta (Withlacoochee WPCP)
- Permitted monthly discharge flow: 8-12 mgd
- 7Q10 Flow at discharge location: 4.31 cfs



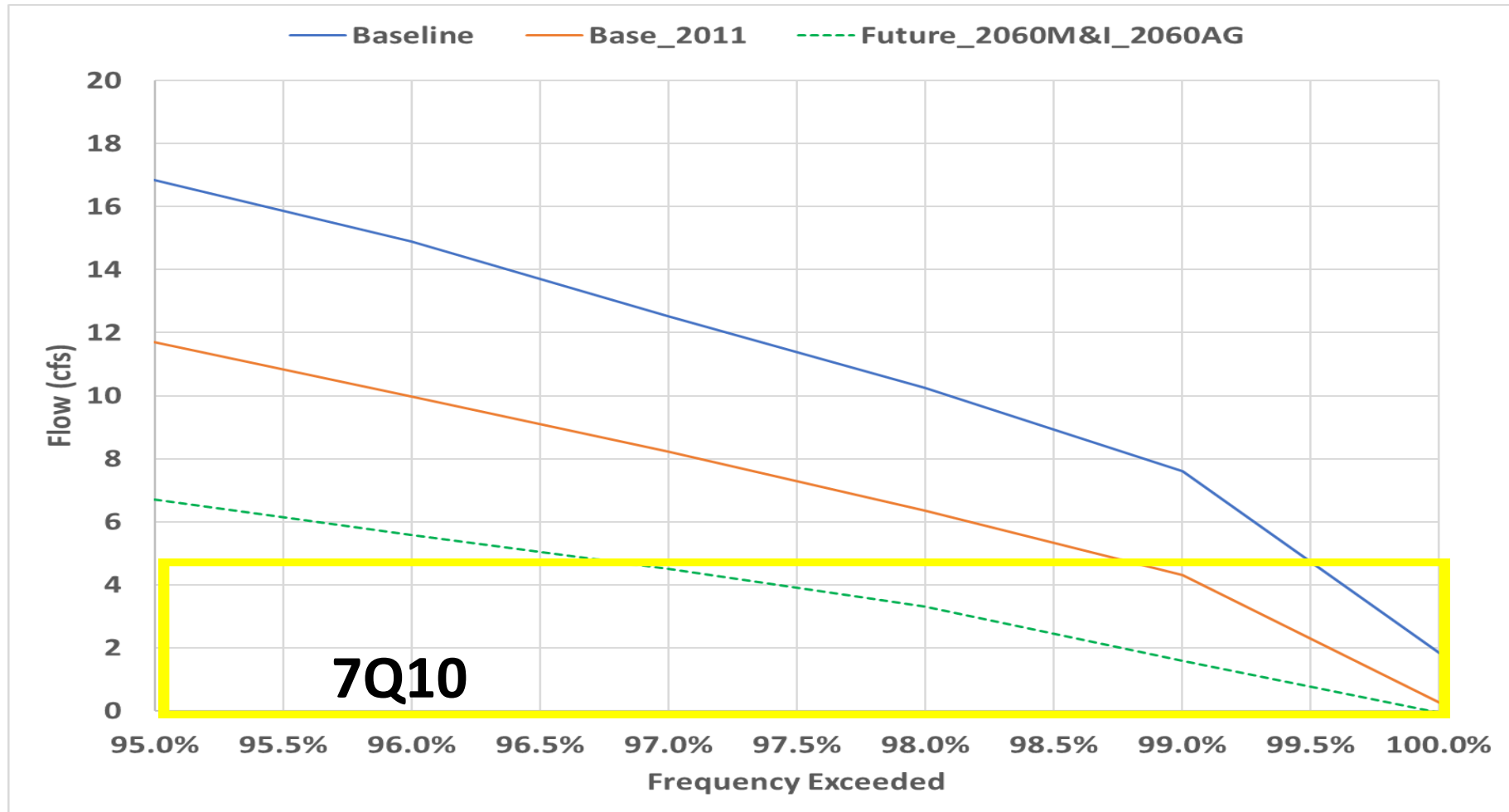
Simulation Results at GA 0033235 Location

Flow Frequency



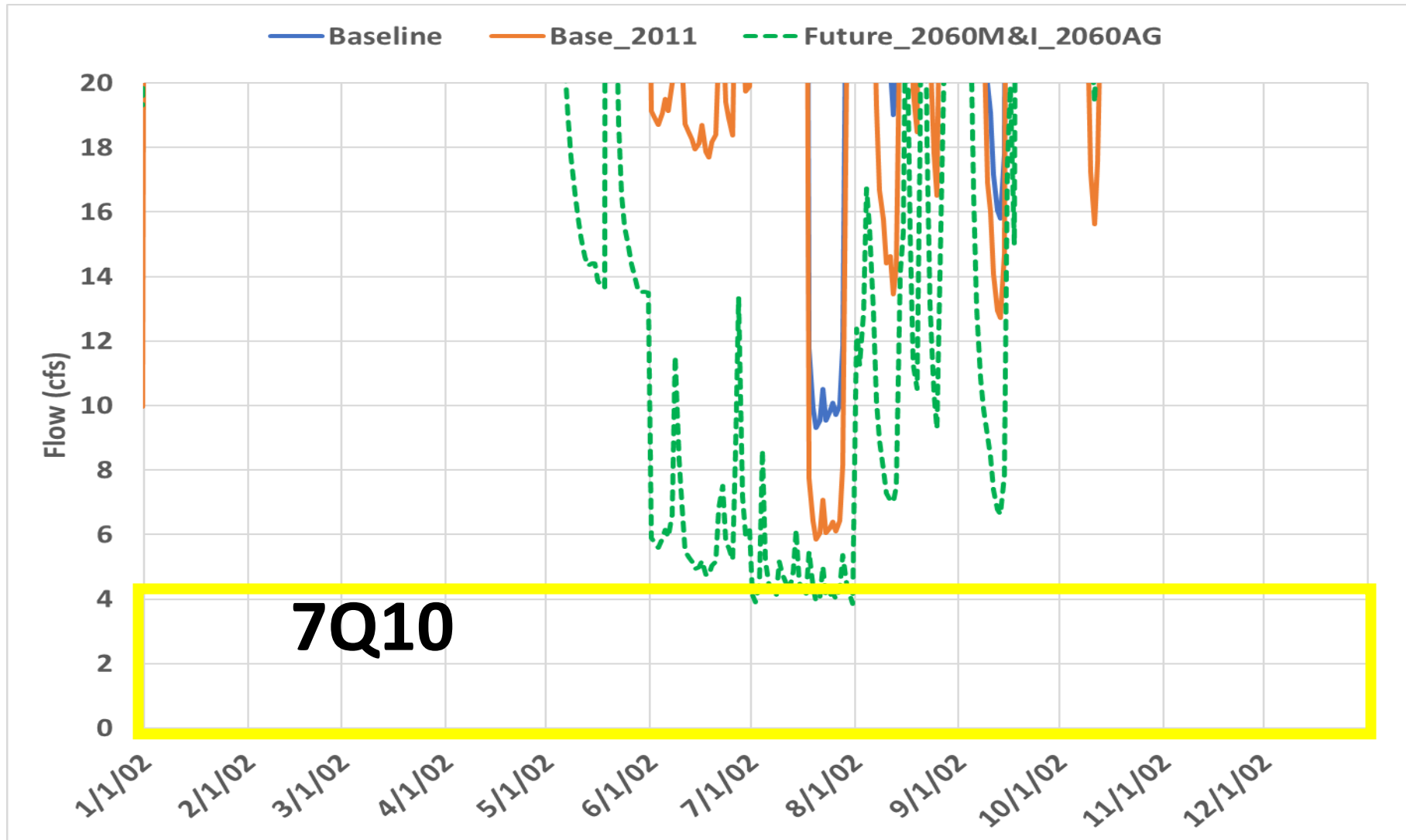
Simulation Results at GA 0033235 Location

Flow Frequency (low end) (7Q10 = 4.31 cfs)

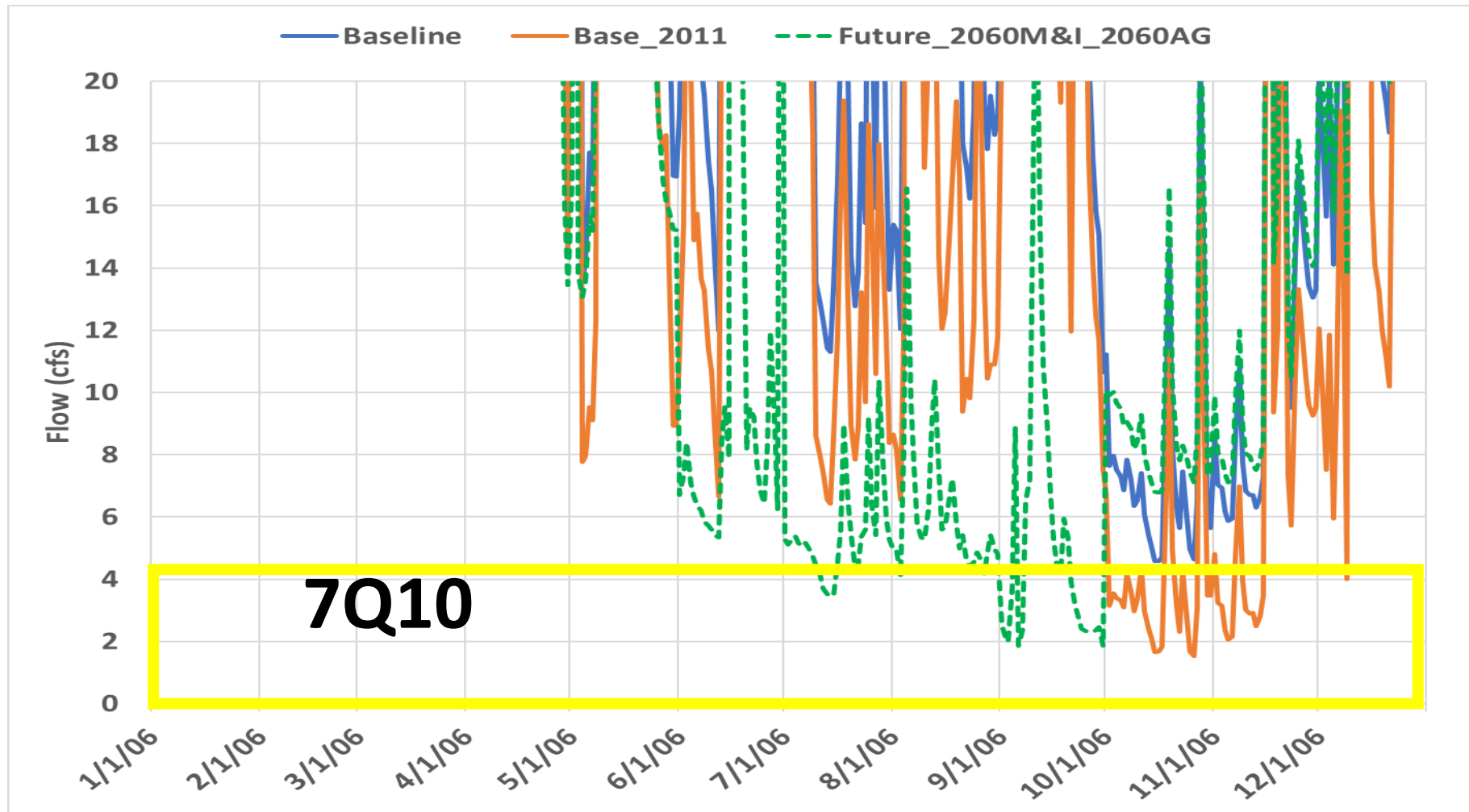


Simulation Results at GA 0033235 Location

Flow in 2002



Simulation Results at GA 0033235 Location Flow in 2006



Using Flow to Create Boating/Paddling Performance Metric

For Informational Purposes Only

- Convert stream flow to stage

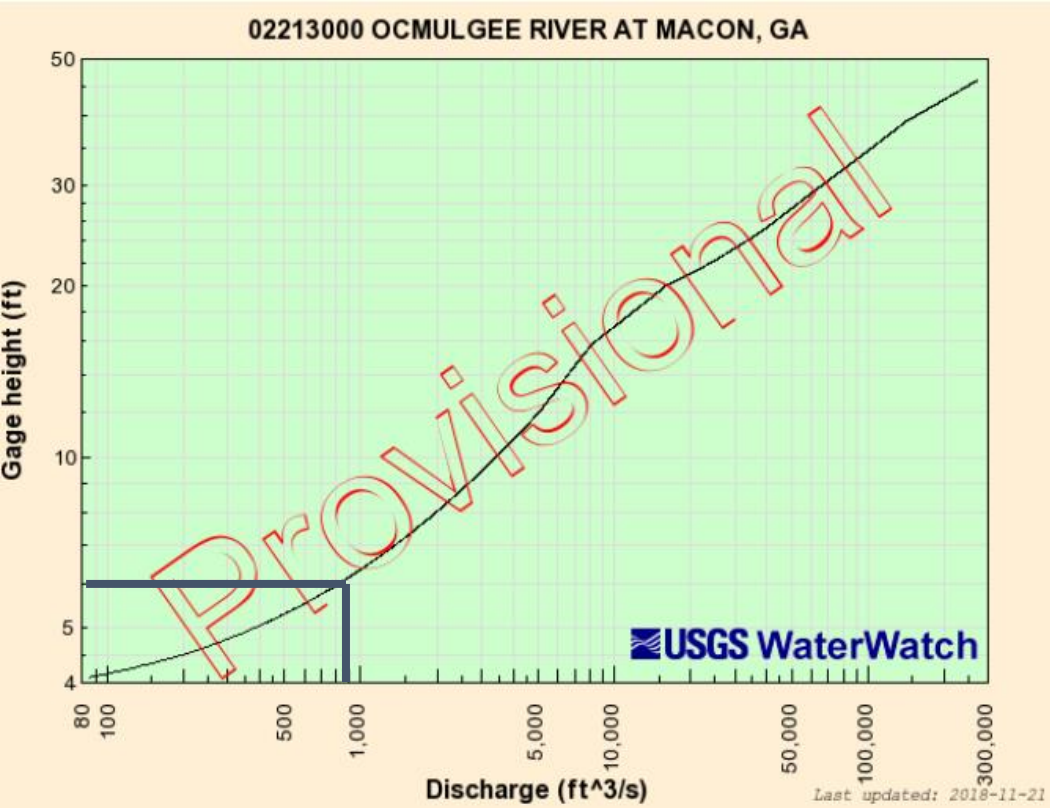
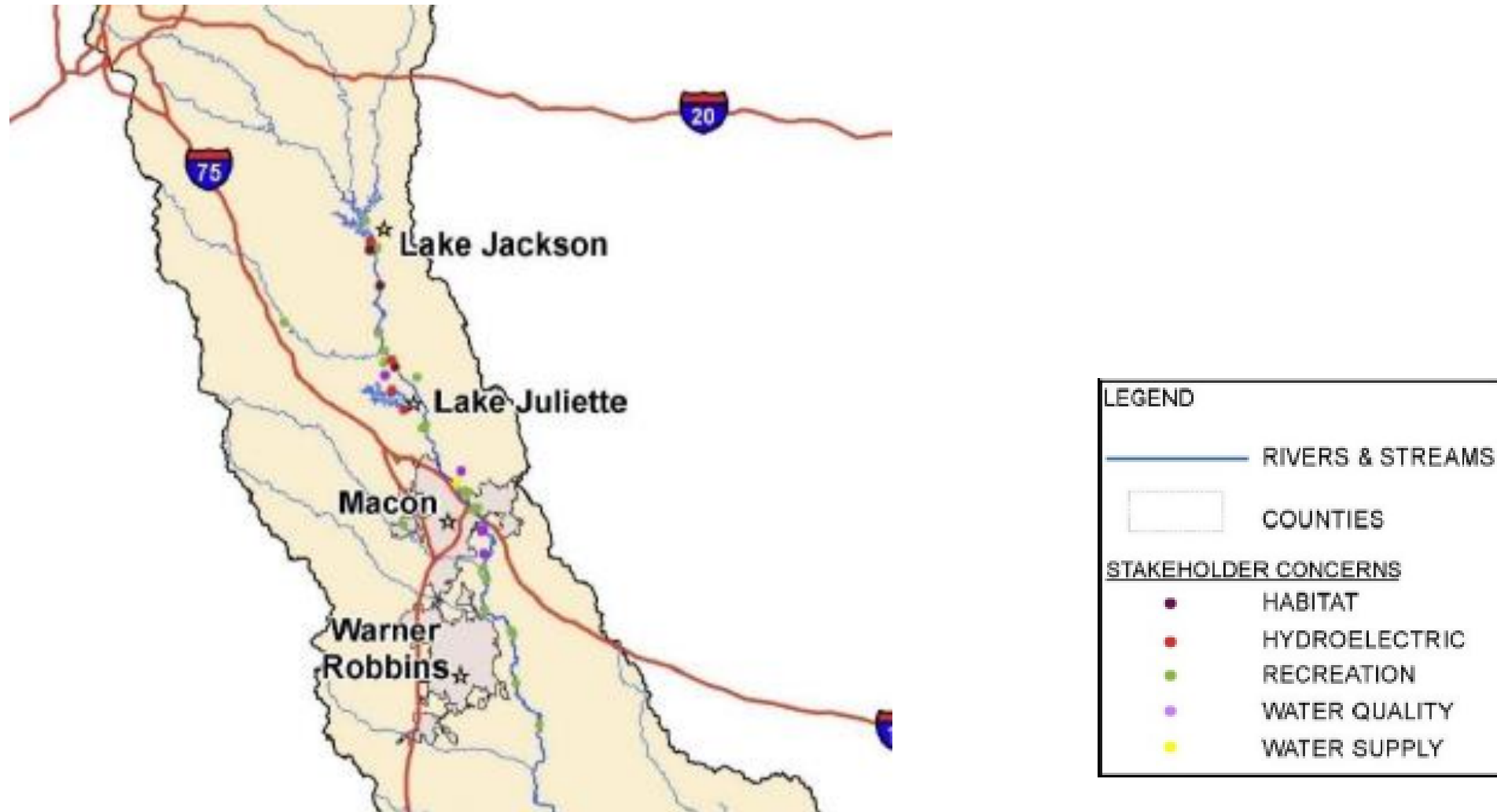


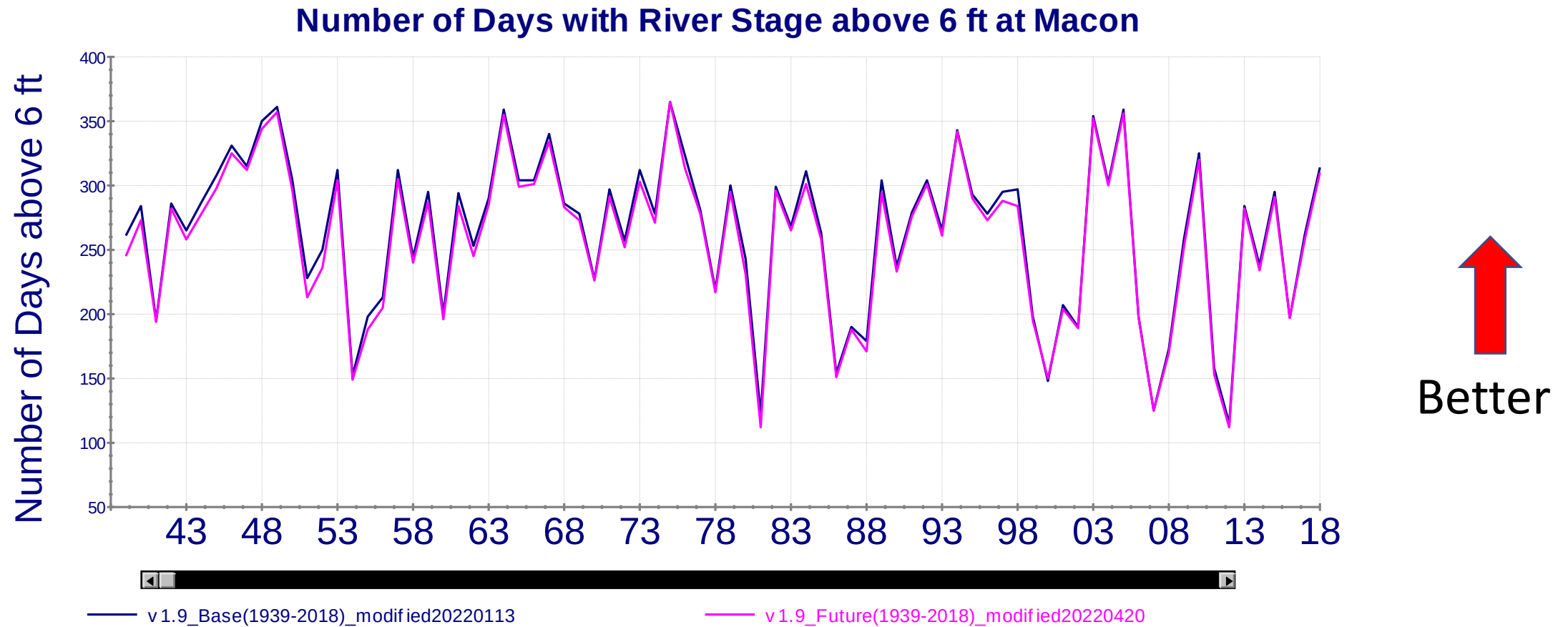
Table 11. Low-flow metrics for Ocmulgee River recreational boating

River Service	Metric	Source
Kayaking/canoeing	Amount of time that kayaking or canoeing is not ideal (i.e., gage height ≤ 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 ≤ 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://en.wikipedia.org/wiki/Spottail_shiner

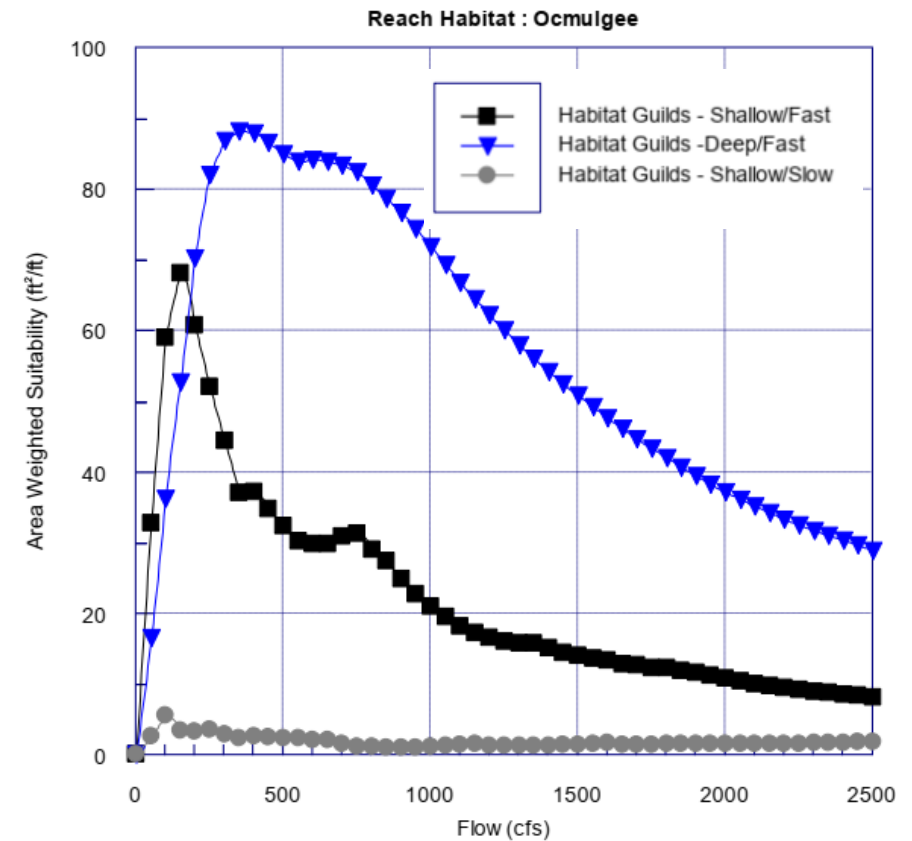
- Deep/Fast

- Species: Largemouth Bass

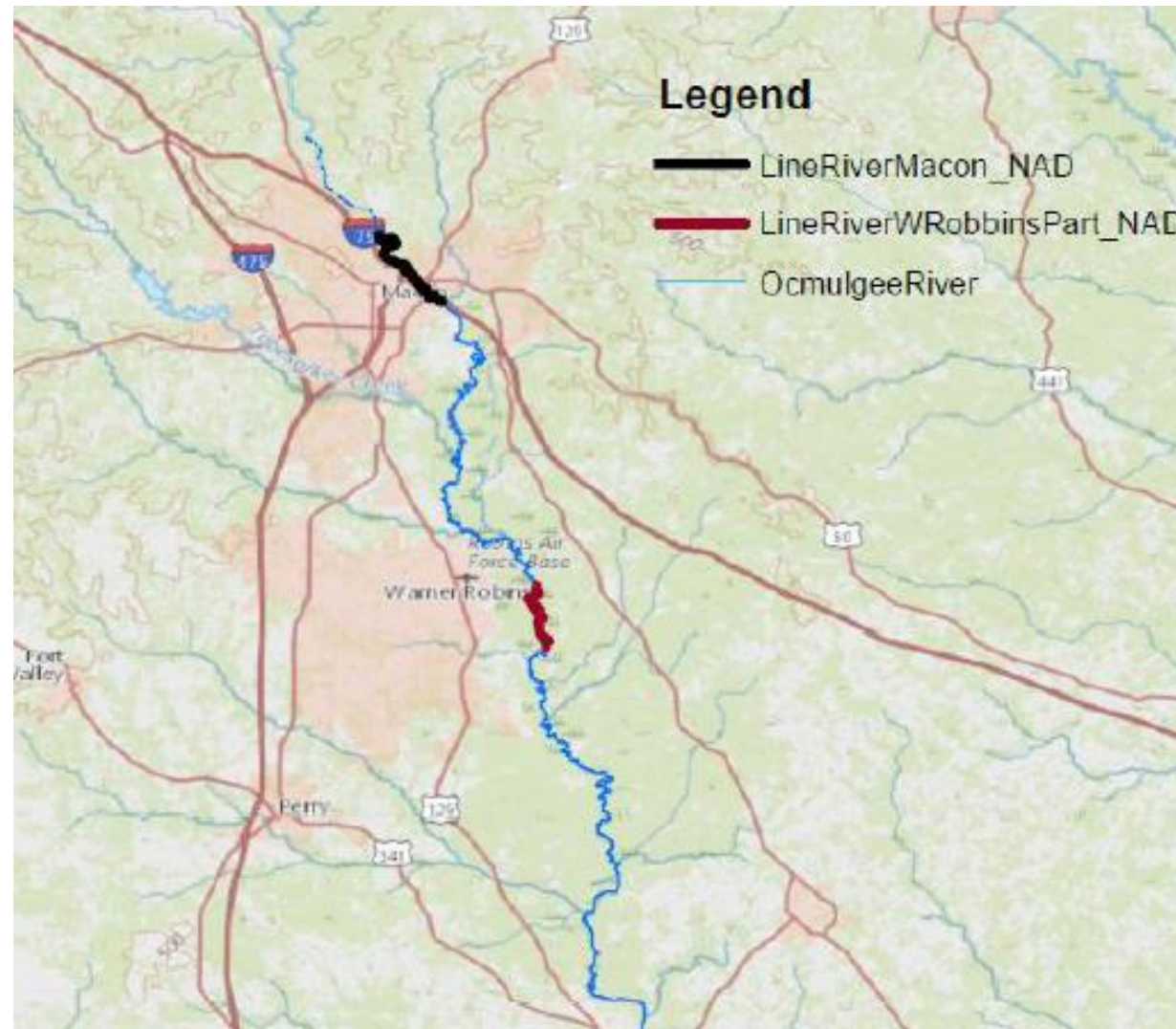


© Duane Kaver

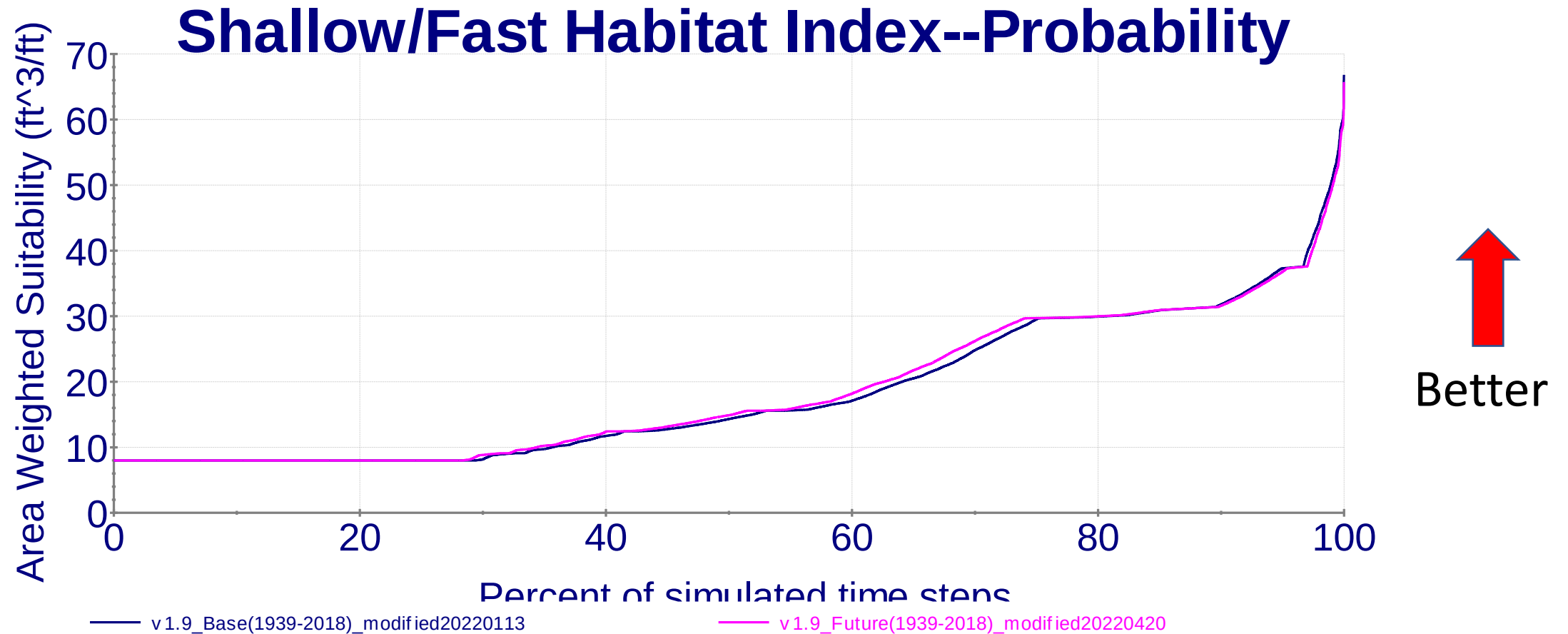
https://www.fws.gov/fisheries/freshwater-fish-of-america/largemouth_bass.html



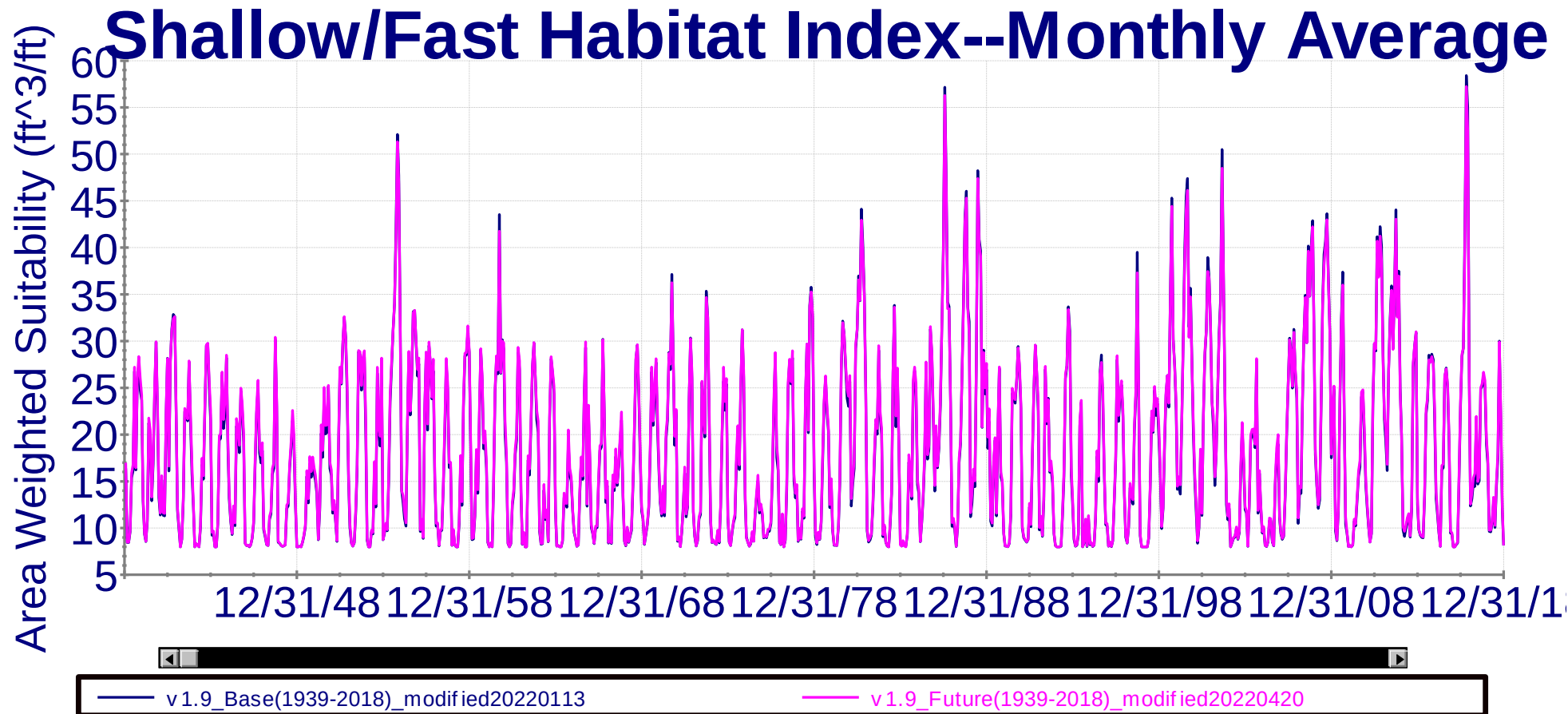
Reaches of the Ocmulgee River Where Bathymetric Data Allow for Habitat Assessment



Performance Metric-Shallow/Fast Habitat Frequency

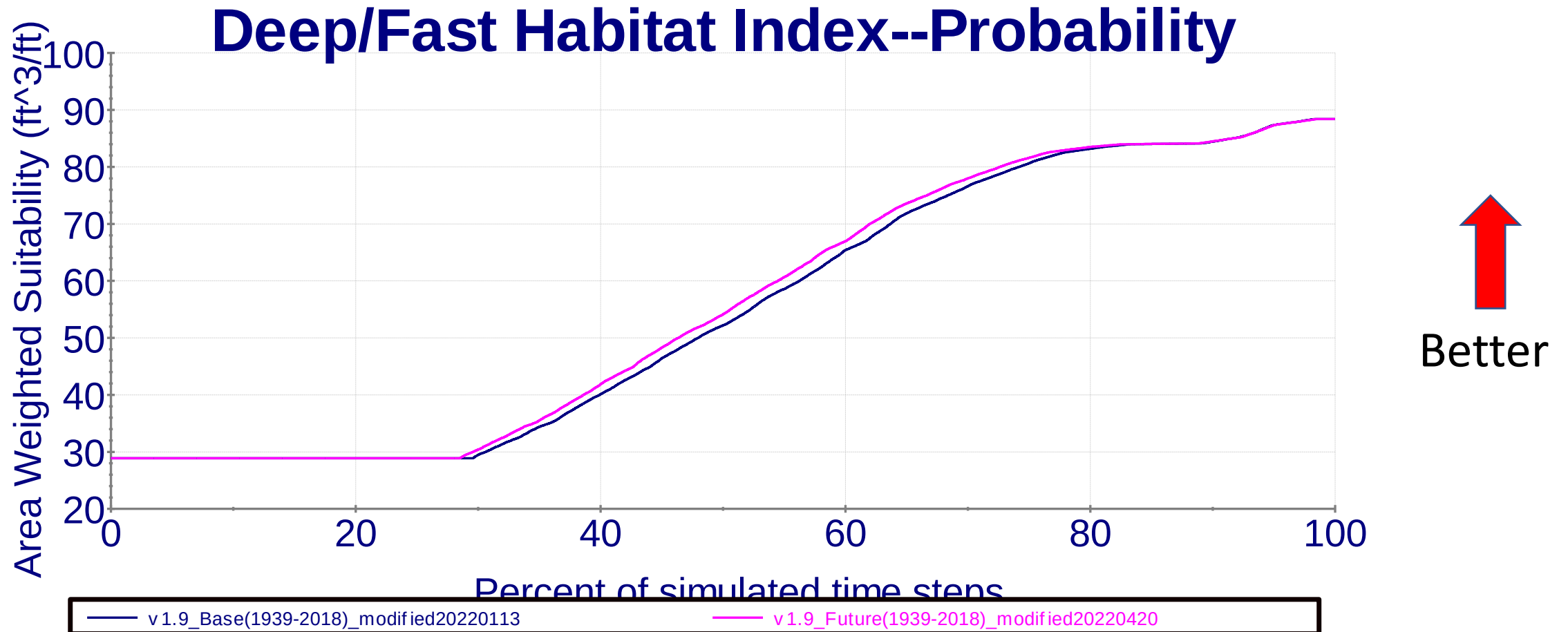


Performance Metric-Shallow/Fast Habitat (Monthly Average)

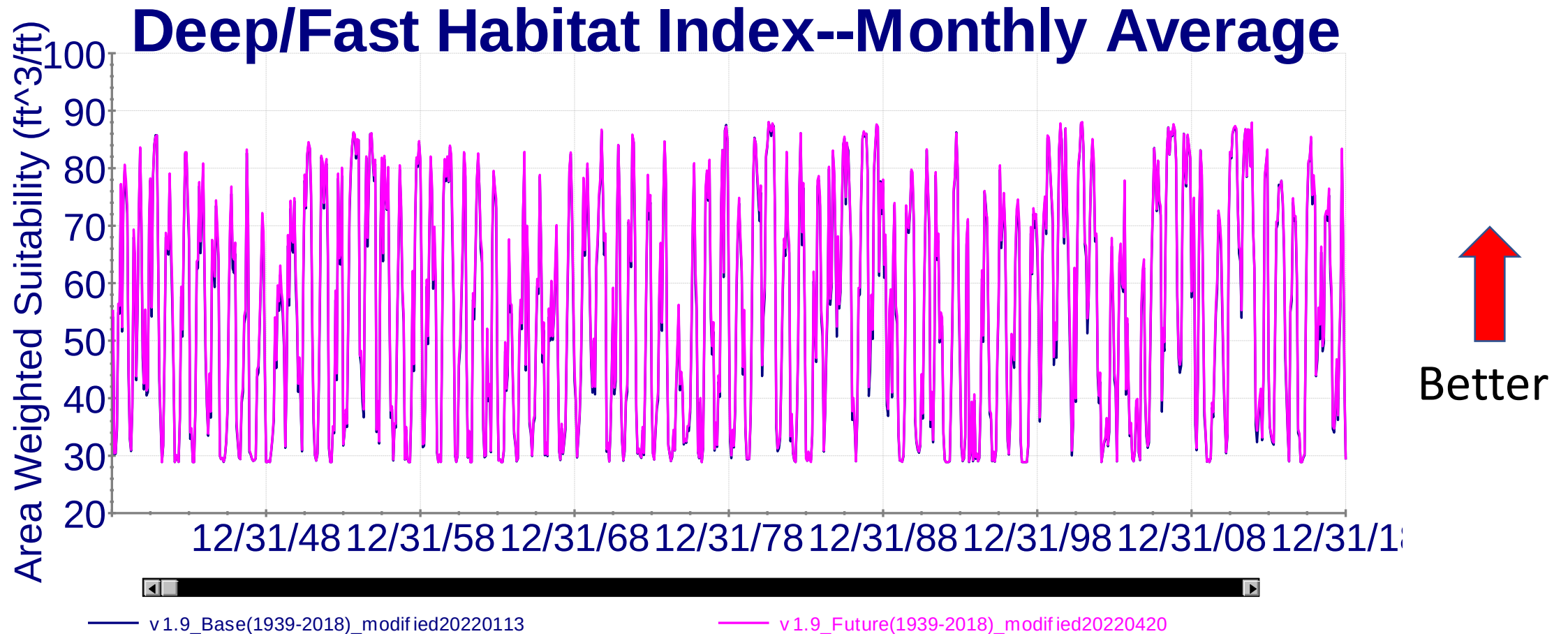



Better

Performance Metric-Deep/Fast Habitat Frequency



Performance Metric-Deep/Fast Habitat (Monthly Average)



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?

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