Savannah-Upper Ogeechee Regional Water Planning Meeting

July 12, 2022



waterplanning.georgia.gov

Council Business

Council Chair, Bruce Azevedo



Council Business and Updates

 Vote and approve March 8, 2022 meeting summary (provided to Council for review on Friday, July 8, 2022)

Resource Assessments – Surface Water Results

Wei Zeng, Georgia EPD



Draft Resource Assessment by SO BEAM for Savannah-Upper Ogeechee Water Planning Region

> Georgia EPD July 2022

Presentation Outline

- Introduction and Model Settings
- Model Results Baseline & Future Scenarios
 - Water Supply Challenges, Examples (water supply PMs)
 - Banks County Board of Commissioners
 - City of Crawford
 - City of Toccoa
 - Thomson-McDuffie County Water & Sewer Commission
 - Wastewater assimilation Challenges, Example (wastewater assimilation PMs)
- Additional Performance Measures to consider?
 - Performance Metric at Macon for Boating (example of recreational PMs)
 - Performance Metrics for Fish Habitat (example of aquatic biology PMs)

SO-Upper Ogeechee Region and SO Model Domain







Hazen

OOA BEAM Model Baseline Settings

- Simulation Period (various hydrologic conditions): 1939-2013
- 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 Savannah-Upper Ogeechee Region

Facility	Total number
Municipal Withdrawal	13
Municipal Discharge	25
Industrial Withdrawal	4
Industrial Discharge	4
Energy Withdrawal	0

Example 1:Permit 006-0106-05 (BEAM Node 1825)

- Permit holder: Banks County Board of Commissioners
- Withdrawal limit: 1.0 mgd (daily/monthly)
- Min flow requirement: 1.63 cfs below Mountain Creek Reservoir Dam





Permit 006-0106-05 Withdrawal Amount Settingaverage of 2010-2018 and 2060 projection

2010 - 2018

Baseline vs Future





Water Supply Challenge in 2007-2008

Shortage at node 1825 -- 006-0106-05: Banks County Board Of Commissioner



Simulated Useable Storage in 2007-2008



Water Supply Challenge in 2011-2012

Shortage at node 1825 --- 006-0106-05: Banks County Board Of Commissioner



Simulated Useable Storage in 2011-2012



Water Supply Shortage Frequency in 1939-2013

Shortage at node 1825 -- 006-0106-05: Banks County Board Of Commissioner



Simulated Useable Storage Frequency



Water Supply Challenge Summary

Total days of Challenge		Total volume o	f shortage (acft)
Baseline	Future	Baseline	Future
0	2,867	0.00	18,161

Example 2:Permit 109-0105-01 (BEAM Node 2005)

- Permit Holder: City of Crawford
- Permit limits: 0.43 mgd (daily)/0.25 mgd (monthly)





Permit 109-0105-01 Withdrawal Amount Settingaverage of 2010-2018 and 2060 projection

2010 - 2018



Baseline vs Future



Simulated Shortage in 2007-2008



Shortage at node 2005 -- 109-0105-01: City of Crawfor

Simulated Shortage in 2011-2012



Water Supply Shortage Frequency in 1939-2013

Shortage at node 2005 --- 109-0105-01: City of Crawford



Simulated Useable Storage Frequency



Note

- EPD and Hazen and Sawyer (EPD contractor) reached out to water supply providers asking for their water supply reservoirs' physical and operational data.
- Many water supply providers responded with available information, enabling BEAM to utilize this information in simulating potential scenarios.
- Some either do not have such information or simply did not respond to this inquiry. As a result, EPD modeling team has to make assumptions
 - In this case, an assumption of no storage in the water supply reservoir is made.

Example 3:Permit 127-0102-02 (BEAM Node 1225)

- Permit Holder: City of Toccoa
- Permit limits: 9.0 mgd (daily)/9.0 mgd (monthly)





Permit 127-0102-02 Withdrawal Amount Settingaverage of 2010-2018 and 2060 projection

2010 - 2018







Simulated Shortage in 2007-2008

SO Base 20220708

Shortage at node 1225 -- 127-0102-02: City of Toccoa,

Simulated Useable Storage in 2007-2008



Storage at node 1220 -- Toccoa Reservoir & Lake Lawsor

Simulated Shortage in 2011-2012



Shortage at node 1225 -- 127-0102-02: City of Toccoa,

Simulated Useable Storage in 2011-2012



Storage at node 1220 -- Toccoa Reservoir & Lake Lawson

Water Supply Shortage Frequency in 1939-2013

Shortage at node 1225 -- 127-0102-02: City of Toccoa



Simulated Useable Storage Frequency

Storage at node 1220 -- Toccoa Reservoir & Lake Lawson

Percent of simulated time steps

- SO Base 20220708

SO Future 20220708

Water Supply Challenge Summary

Total days of Challenge		Total volume o	f shortage (acft)
Baseline	Future	Baseline	Future
54	432	392.78	4,794.00

Example 4:Permit 097-0111-03 (BEAM Node 4085)

- Permit Holder: Thomson-McDuffie County Water
- & Sewer Commission
- Permit limits: 2.0 mgd (daily)/1.5 mgd (monthly)





Permit 097-0111-03 Withdrawal Amount Settingaverage of 2010-2018 and 2060 projection

2010 - 2018



Baseline vs Future



Simulated Shortage in 2010

Shortage at node 4085 -- 097-0111-03: Thomson/ McDuffie Water & Sawer



Simulated Useable Storage in 2010



Water Supply Shortage Frequency in 1939-2013

Shortage at node 4085 -- 097-0111-03: Thomson/ McDuffie Water & Sawer



Parcent of simulated time steps

- SO Base 20220708

Simulated Useable Storage Frequency



Water Supply Challenge Summary

Total days of Challenge		Total volume o	f shortage (acft)
Baseline	Future	Baseline	Future
100	74	148.06	96.14

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: Permit GA 0050215 (BEAM Node 1858)

- Permit holder: Banks County Board of Commissioners (Hudson River WPCP)
- Permitted monthly discharge flow: 1 mgd
- 7Q10 Flow at discharge location: 17 cfs





Simulation Results at GA 0050215 Location Flow Frequency



Simulation Results at GA 0050215 Location Flow Frequency (low end) (7Q10 = 17 cfs)



Simulation Results at GA 0050215 Location Flow in 2007



Simulation Results at GA 0050215 Location Flow in 2012



Additional Performance Measures Considered by Other Regional Planning Councils

- Recreational availability
 - Boating
 - Kayaking
- Ecological functions
 - Habitat availability

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 \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



Number of Days with River Stage above 6 ft at Macon

Reach Habitat

- Shallow/Fast
 - Species: Spottail Shiner and Bluehead Chub

• Deep/Fast

https://www.inaturalist.org/guide_taxa/4906

• Species: Largemouth Bass



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)



Performance Metric-Deep/Fast Habitat Frequency



Performance Metric-Deep/Fast Habitat (Monthly Average)



Summary

- Moderate water supply challenges under baseline & future water use conditions
- Moderate wastewater assimilation challenges under baseline & future water use conditions
- Example of baseline & future performance measures for recreational (boating) activities in the Ocmulgee River near Macon
- Examples of baseline & future performance measures for assessing habitat availability for certain types of fish

Questions?

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Incorporation of New Performance Metrics

Ashley Reid, CDM Smith Laura Hartt, Jacobs



Incorporating new performance metrics into resource assessments

- Surface Water Availability Resource Assessment
 - Water supply challenges
- Water Quality Resource Assessment
 - Wastewater assimilation challenges
- Recreation Uses
 - Boating
 - Fishing
 - Swimming



Recreational Metrics and Potential Indicators

Boating

- Water elevation at boat ramps
- Stage or discharge at USGS gages
- Fishing and Swimming
 - Dissolved Oxygen (DO)
 - Bacteria



Next steps to incorporate new metrics

- 1. Understand model capacity and the information needed to incorporate metrics into resource assessments.
- 2. Identify available data and how it can be best used:
 - GA EPD Assessments
 - Know Your River
 - American Whitewater



Public Comment/Questions

Thank You

Need More Information? reidan@cdmsmith.com haydn.blaize@dnr.ga.gov

