Surface Water Modeling Discussion
During the August Meeting, we…
1. Reviewed the surface water modeling results for all scenarios
2. Reviewed the results of the flow-biological health study at key locations

Today, we want to…
1. Review the scenario results and an additional model simulation requested by an RBC member (Full Allocation minus recent registrations)
2. Consider whether to identify **Reaches of Interest** and/or **Surface Water Conditions**
3. Determine what we want to address with possible management strategies or recommendations
4. Decide if more data, data analysis, or modeling is needed to consider these items.
Requests for Additional Data, Analysis, or Modeling

1. The RBC would like to see 20/30/40 monthly flows at select strategic nodes, for each scenario.
Reaches of Interest are defined as specific stream reaches that may have no identified Surface Water Shortage but experience undesired impacts, environmental or otherwise, determined from current or future water-demand scenarios or proposed water management strategies.

The designation of a Reach of Interest must be agreed upon by the RBC and may be related to recreational flows or in-stream flow considerations.
Definitions

A **Surface Water Condition** is a limitation, defined by the RBC, on the amount of water that can be withdrawn from a surface water source, and which can be applied to evaluate **Surface Water Supply** for planning purposes.

**Surface Water Supply** is the maximum amount of water available for withdrawal 100% of the time at a location on a surface water body without violating any applied **Surface Water Conditions** on the surface water source and considering upstream demands.
Current Surface Water-Demand Scenario

Period of Record Low Flow

Physically Available Surface Water Supply

116 cfs
Surface Water Condition (80 cfs)

Conditions are for planning purposes only - not legally binding
Surface Water Condition (80 cfs)

Surface Water Supply (36 cfs)

Conditions are for planning purposes only - not legally binding
Review of Surface Water Shortages and 2002 Low Flows at Key Locations
Surface Water Shortages

Current Conditions

Water Use Scenario

Frequency of Shortage

< 10% □
10-50% ▼
> 50% □

Summary of Supply Shortages

- Total basin annual mean shortage: 1.5 MGD
- Maximum water user shortage: 4.1 MGD
- Total basin annual mean shortage: 1.7%
- Water users experiencing shortage: 17.6%
- Average frequency of shortage: 16.7%

Period of record:
8/31 to 12/18
(1,049 months)
Surface Water Shortages

2070 Business as Usual Scenario

Summary of Supply Shortages

- Total basin annual mean shortage: 1.5 MGD
- Maximum water user shortage: 4.1 MGD
- Total basin annual mean shortage: 1.0%
- Water users experiencing shortage: 15.8%
- Average frequency of shortage: 16.7%

Period of record: 8/31 to 12/18 (1,049 months)
Surface Water Shortages

2070 High Demand Scenario

Summary of Supply Shortages
- Total basin annual mean shortage: 1.55 MGD
- Maximum water user shortage: 5.1 MGD
- Total basin annual mean shortage: 0.7%
- Water users experiencing shortage: 19.7%
- Average frequency of shortage: 13.4%

There was no shortage here for the 2070 BAU Scenario

Period of record: 8/31 to 12/18 (1,049 months)
Surface Water Shortages
Permitted and Registered Water Use (Full Allocation) Scenario

Summary of Supply Shortages
Total basin annual mean shortage: 34.8 MGD
Maximum water user shortage: 231.5 MGD
Total basin annual mean shortage: 4.5%
Water users experiencing shortage: 46.4%
Average frequency of shortage: 45.0%

Period of record: 8/31 to 12/18
(1,049 months)
Surface Water Shortages

Full Allocation Scenario not including Guinyards Landing and Lois Ann Farms Allocations

Summary of Supply Shortages
- Total basin annual mean shortage: 23.9 MGD
- Maximum water user shortage: 178.7 MGD
- Total basin annual mean shortage: 3.7%
- Water users experiencing shortage: 43.5%
- Average frequency of shortage: 47.5%

Period of record: 8/31 to 12/18 (1,049 months)
## Comparison of Surface Water Shortages on Mainstem, below Location of Guinyards Landing Registration

### Full Allocation Simulation

<table>
<thead>
<tr>
<th>Water User Name</th>
<th>User Type</th>
<th>Source Water</th>
<th>Location (mi)</th>
<th>Average Annual Demand (MGD)</th>
<th>Minimum Physically Available Flow (MGD)</th>
<th>Average Shortage (MGD)</th>
<th>Maximum Shortage (MGD)</th>
<th>Frequency of Shortage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR: Lois Ann</td>
<td>Ag water user</td>
<td>Mainstem</td>
<td>69</td>
<td>105</td>
<td>31</td>
<td>1.2</td>
<td>0.9</td>
<td>5.1%</td>
</tr>
<tr>
<td>IR: Williams &amp; Sons</td>
<td>Ag water user</td>
<td>Mainstem</td>
<td>69</td>
<td>2</td>
<td>0</td>
<td>0.1</td>
<td>73.9</td>
<td>5.3%</td>
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<tr>
<td>WS: Charleston</td>
<td>M&amp;l water user</td>
<td>Mainstem</td>
<td>159</td>
<td>287</td>
<td>59</td>
<td>13.1</td>
<td>231.5</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

### Full Allocation Simulation, not including Guinyards Landing and Lois Ann Farms

<table>
<thead>
<tr>
<th>Water User Name</th>
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<th>Average Annual Demand (MGD)</th>
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<th>Maximum Shortage (MGD)</th>
<th>Frequency of Shortage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR: Lois Ann</td>
<td>Ag water user</td>
<td>Mainstem</td>
<td>69</td>
<td>105</td>
<td>49</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>IR: Williams &amp; Sons</td>
<td>Ag water user</td>
<td>Mainstem</td>
<td>69</td>
<td>2</td>
<td>48</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>WS: Charleston</td>
<td>M&amp;l water user</td>
<td>Mainstem</td>
<td>159</td>
<td>287</td>
<td>112</td>
<td>3.5</td>
<td>178.7</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

Note: Guinyards Landing has an 18 MGD average annual demand under the Full Allocation Scenario
**EDO6**

**HUC 10 Outlet**

**USGS Gage**

**Other Strategic Nodes**

**Flow Performance Measures**

<table>
<thead>
<tr>
<th>EDO06 SOUTH FORK EDISTO RIVER NEAR COPE, SC</th>
<th>Current Use</th>
<th>UIF</th>
<th>BAU 2070</th>
<th>HD 2070</th>
<th>Full Allocation</th>
<th>Full Allocation Minus*</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean flow (cfs)</td>
<td>774</td>
<td>792</td>
<td>764</td>
<td>752</td>
<td>486</td>
<td>675</td>
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<tr>
<td>median flow (cfs)</td>
<td>654</td>
<td>669</td>
<td>644</td>
<td>635</td>
<td>364</td>
<td>554</td>
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<tr>
<td>25th percentile flow (cfs)</td>
<td>435</td>
<td>456</td>
<td>422</td>
<td>412</td>
<td>159</td>
<td>351</td>
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<tr>
<td>10th percentile flow (cfs)</td>
<td>322</td>
<td>345</td>
<td>309</td>
<td>293</td>
<td>58</td>
<td>248</td>
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<tr>
<td>5th percentile flow (cfs)</td>
<td>256</td>
<td>285</td>
<td>240</td>
<td>223</td>
<td>6</td>
<td>193</td>
</tr>
</tbody>
</table>

* Full Allocation minus Guinyards Landing and Lois Ann Farms
EDO06 SOUTH FORK EDISTO RIVER NEAR COPE, SC
Flow (CFS) for 2002

- Unimpaired
- Current Use
- Full Allocation
- 2070 Business as Usual
- 2070 High Demand
- Full Allocation Minus*

* Full Allocation minus Guinyards Landing and Lois Ann Farms
<table>
<thead>
<tr>
<th>EDO13 EDISTO RIVER NR GIVHANS, SC</th>
<th>Current Use</th>
<th>UIF</th>
<th>BAU 2070</th>
<th>HD 2070</th>
<th>Full Allocation</th>
<th>Full Allocation Minus*</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean flow (cfs)</td>
<td>2593</td>
<td>2667</td>
<td>2475</td>
<td>2396</td>
<td>1821</td>
<td>1987</td>
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<tr>
<td>median flow (cfs)</td>
<td>1751</td>
<td>1826</td>
<td>1633</td>
<td>1570</td>
<td>939</td>
<td>1126</td>
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<tr>
<td>25th percentile flow (cfs)</td>
<td>994</td>
<td>1095</td>
<td>863</td>
<td>780</td>
<td>253</td>
<td>411</td>
</tr>
<tr>
<td>10th percentile flow (cfs)</td>
<td>658</td>
<td>755</td>
<td>539</td>
<td>451</td>
<td>0</td>
<td>89</td>
</tr>
<tr>
<td>5th percentile flow (cfs)</td>
<td>520</td>
<td>618</td>
<td>393</td>
<td>299</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Full Allocation minus Guinyards Landing and Lois Ann Farms
EDO13 EDISTO RIVER NR GIVHANS, SC Flow (CFS) for 2002

Flow

Month

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Unimpaired
Current Use
Full Allocation
2070 Business as Usual
2070 High Demand
Full Allocation Minus*

* Full Allocation minus Guinyards Landing and Lois Ann Farms