



# Proposal

- Incorporate 5 flow-ecology metrics as performance measures of Broad River water use scenarios. They are:
  - Mean Daily Flow
  - Base Flow
  - Duration of Low Flow
  - Frequency of Low Flow
  - Timing of Low Flow
- These were chosen based on:
  - Relevance to water withdrawal and drought management
  - Strength of relationship
  - Distribution: All stream classes and basin area represented
  - Readily calculable in SWAM



# Proposal



- ▶ **Why?** This enables you to evaluate the actual impact on the basin's health *and* compare multiple scenarios quickly
- ▶ **How** to use them? We recommend:
  - ▶ Evaluate the performance of water use scenarios on stream and river health
    - ▶ Strategic nodes, stream reaches of interest, and selected tributaries.
  - ▶ Use them in a risk management context: high, medium, low risk (we have an example)

# Proposal: Low-Med-High Risk Ranges

	Instream Flow Performance Recommendations and Risk Ranges								
Stream Type:	Southeastern Plains 1 (SE1)			Southeastern Plains 3 (SE3)			Mid-Atlantic 1 (M-A-1)		
	<i>Risk Ranges</i>								
	Low	Med	High	Low	Med	High	Low	Med	High
Flow Metric									
Mean Daily Flow (FR)	>0.66	0.42-0.66	<0.42	>0.75	0.52-0.75	<0.52			
Base Flow (MR)							>0.68	0.25-0.68	<0.25
Duration of Low Flow (FR)				<0.13	0.13-0.40	>0.40			
Frequency of Low Flow (FT)							<0.23	0.23-.053	>0.53
Calendar Day of Lowest Flow (MO)				<261					
Calendar Day of Lowest Flow (FT)							>251		
<p><i>FR</i>=Fish Species Richness: The number of fish species found in a stream or river reach</p> <p><i>MR</i>=Macroinvertebrate Richness: The number of aquatic insect, worm, crayfish, etc. species found in a stream or river reach ("bait")</p> <p><i>FT</i>=Tolerant Fish: Fish like mosquitofish, carp, and green sunfish which can survive stagnant, low oxygen, and / or polluted water</p> <p><i>MO</i>=Megaloptera/Odonata Index: The percentage of invertebrates present as "hellgrammites" and long-lived dragonflies in a stream or river reach</p>									

# EDO10

HUC 10  
Outlet



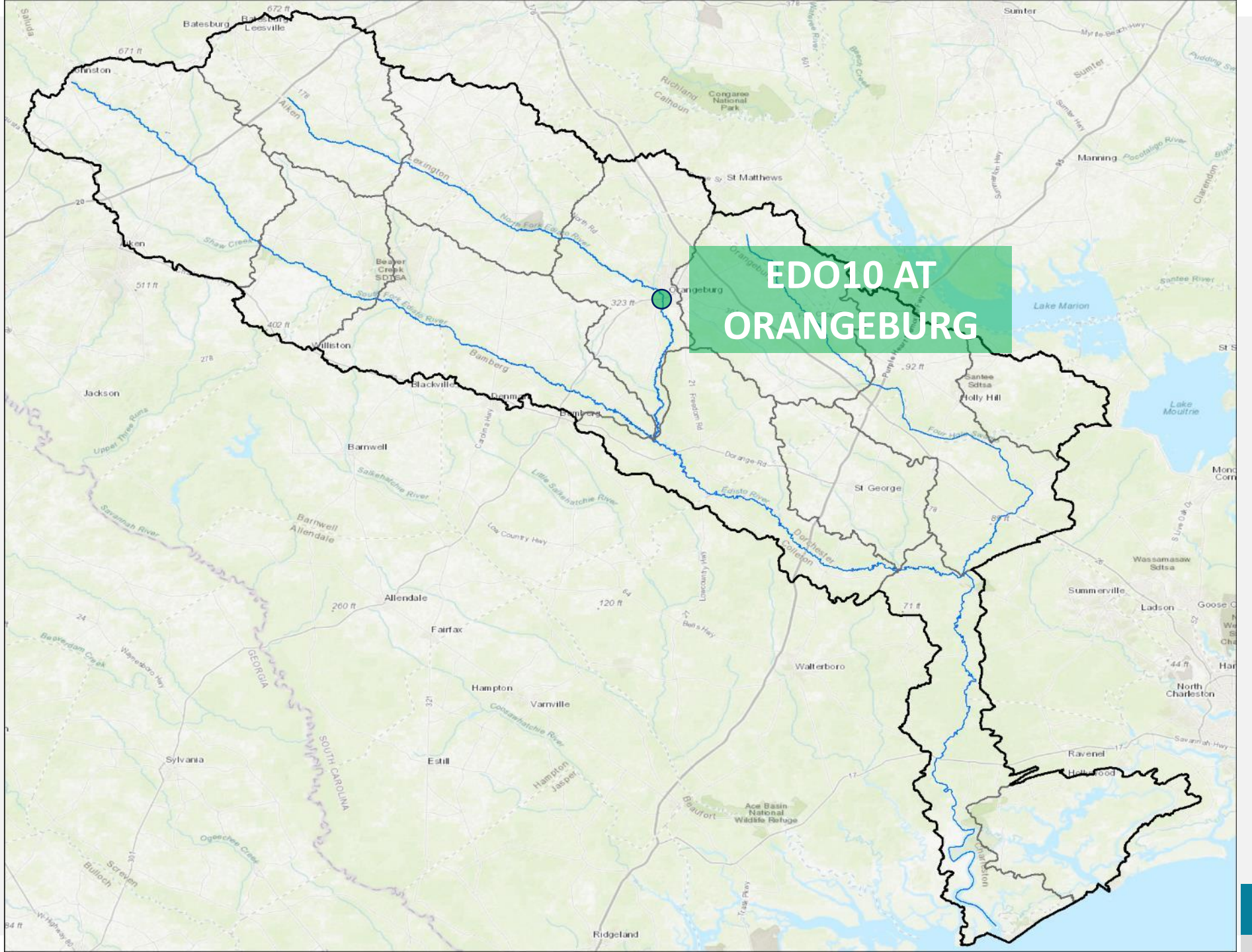
USGS Gage



Other  
Strategic  
Nodes



Flow  
Performance  
Measures



# Mean daily flow: EDO10 NORTH FORK

Scenario	Current	Predicted	% change	Bio Metric	Change in Bio	SE
UIF	723.21	741.43	2.5%	Richness	1.9%	15
HD 2070	723.21	709.94	-1.8%	Richness	-1.4%	15
Full	723.21	622.04	-14.0%	Richness	-10.4%	15
BAU	723.21	721.48	-0.2%	Richness	-0.2%	15

SE Plains: Stable baseflow

