

South Carolina State Water Plan

Metrics for Plan Effectiveness

September 6th, 2018

For Today:

State Water Plan Metrics

- Present options on metric approaches
 - Examples; not a prescription
 - Different aspects of the plan will require different metrics
- Proposal to the PPAC addressing instream use metrics
 - Feasibility level: Do we have the data we need to create them?
 - Decisions on whether to do that and how to use them comes later

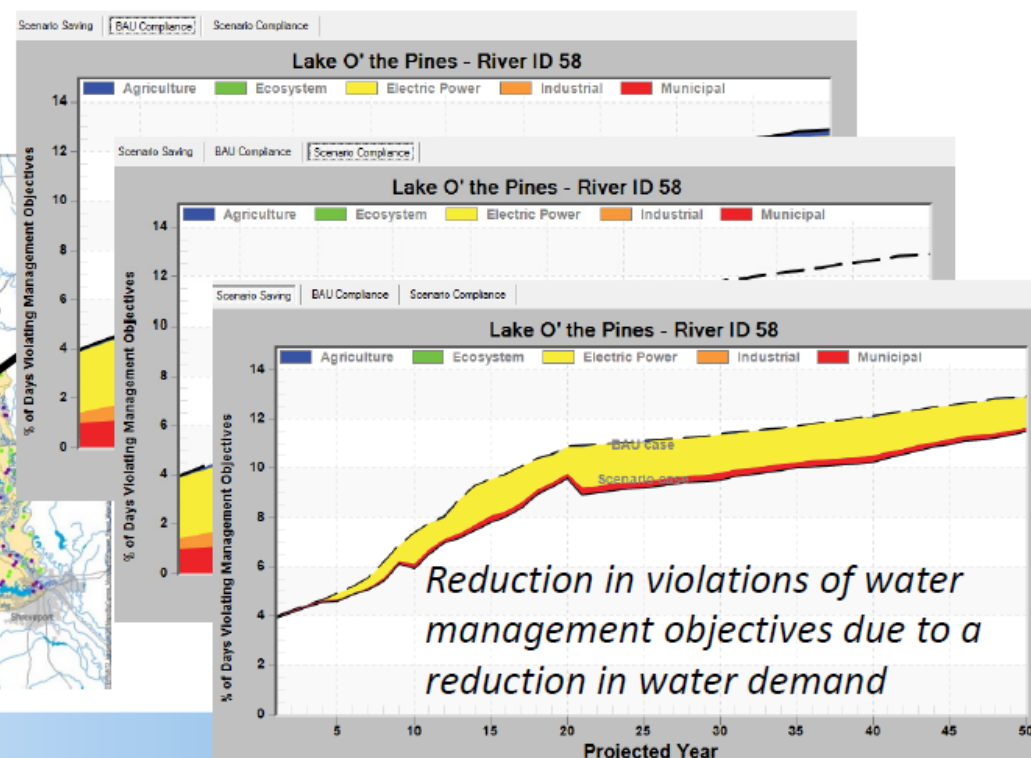
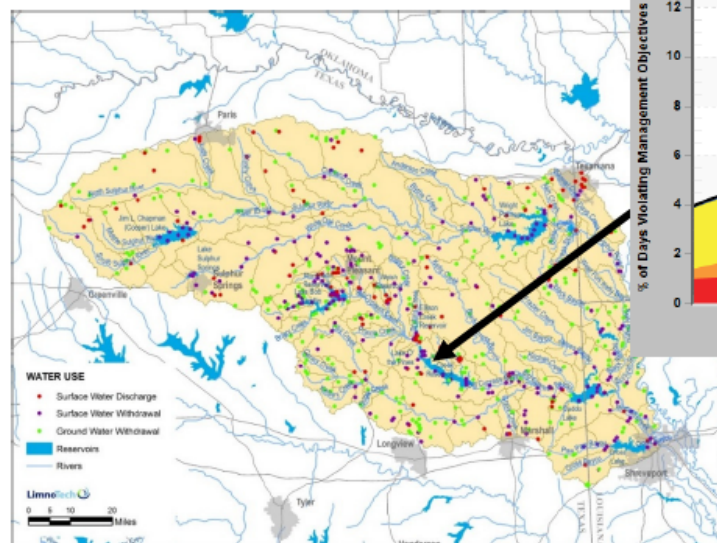
Metrics: Our Charge as PPAC

State Water Plan Metrics

- Charter: “.... provide water for human needs while *ecologically protecting* the resource.”
- Roles and Responsibilities of the BAC's:
 - “...identify future conflicts, particularly in times of drought, and propose policies and/or physical improvements that could mitigate those conflicts”.
 - “Propose policies or management strategies to mitigate or eliminate water shortages, stresses, and conflicts”

Water Prism Big Cypress-Sulphur Basin, TX

***Scenario: retire coal-fired unit,
increase muni/industrial/ag efficiency
(per 2012 Texas Water Plan)***

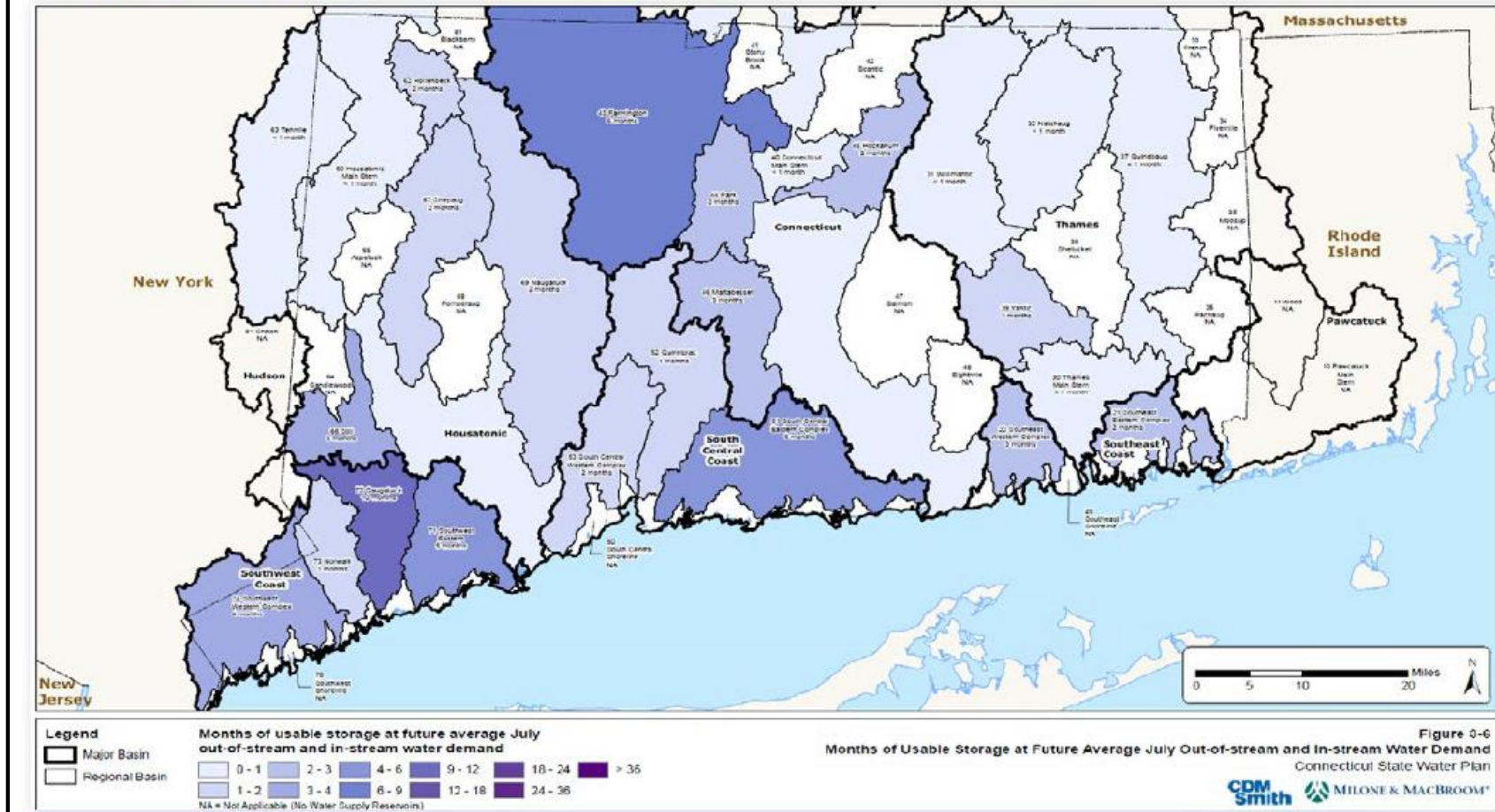


Demand vs Index Condition

State Water Plan Metrics

Figure ES-4*: Example Storage Map for July Demand Levels

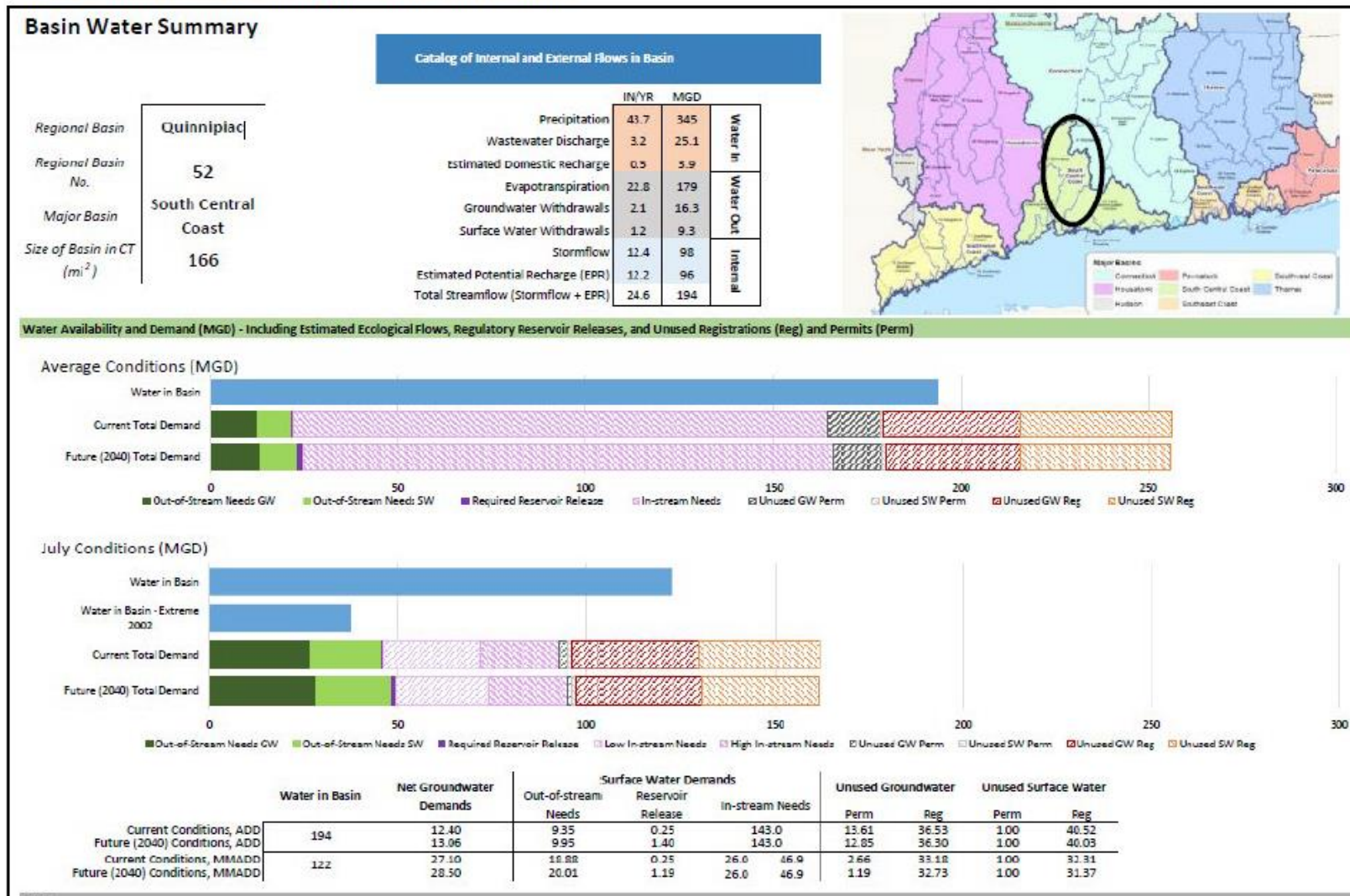
*This also appears in Section 3 as Figure 3-6.



Basin Summary Statistics

State Water Plan Metrics

Figure ES-5: Example Basin Summary Sheet for the Quinnipiac Basin



Instream Use Metrics: The Basics

State Water Plan Metrics

- What: Biologically derived statements of stream / river health as determined by flow
- Where: Statewide; though construction of flow-health relationship varies by stream type and geography
- How: Relate biological community to degree of flow alteration
- Who: Team of agency / university biologists and water stakeholders

Instream Use Metrics: The Biological Basis

State Water Plan Metrics



Cold headwater – brook trout, brown trout, sculpins



Riffle-obligates – Margined madtom, longnose dace, central stoneroller, fantail darter



Riffle-associates – White sucker, northern hog sucker, shorthead redhorse



Nest-builders – Fallfish, creek chub, river chub, redbreast sunfish, smallmouth bass



Diadromous – American shad, alewife, American eel

Instream Use Metrics: How does it work?

State Water Plan Metrics

Eighty (80) FLOW-ECOLOGY HYPOTHESES describe *who* (species or guild) is affected by *what* (flow component), *when* (month or season), *where* (habitat), and *how* (hypothesized ecological response).

Hypotheses are consolidated into **FLOW NEEDS (20)** ● ●

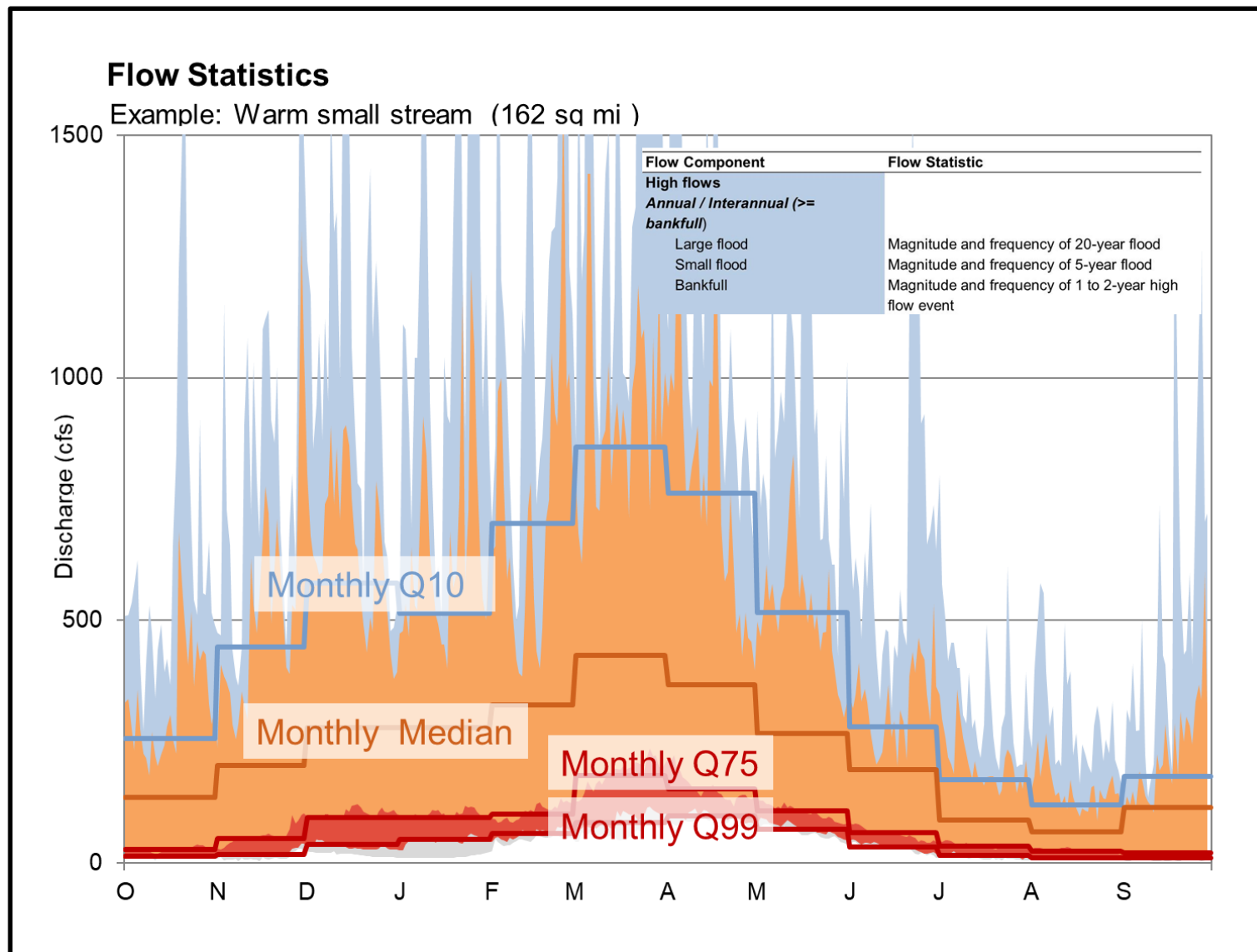
FLOW RECOMMENDATIONS to support FLOW NEEDS defined by:

- Qualitative and quantitative support assessed with Weight-of-Evidence.
- Hydrologic characterization
- Expert review and confirmation

Seasonal flows	<ul style="list-style-type: none">• Less than X% change to seasonal flow range (monthly Q10 to Q50)• Y% change to monthly median;• Z% change to seasonal flow range (monthly Q50-Q75)
Low flows	<ul style="list-style-type: none">• X% change to monthly Q75; and• Y% change to low flow range (monthly Q75 to Q99)

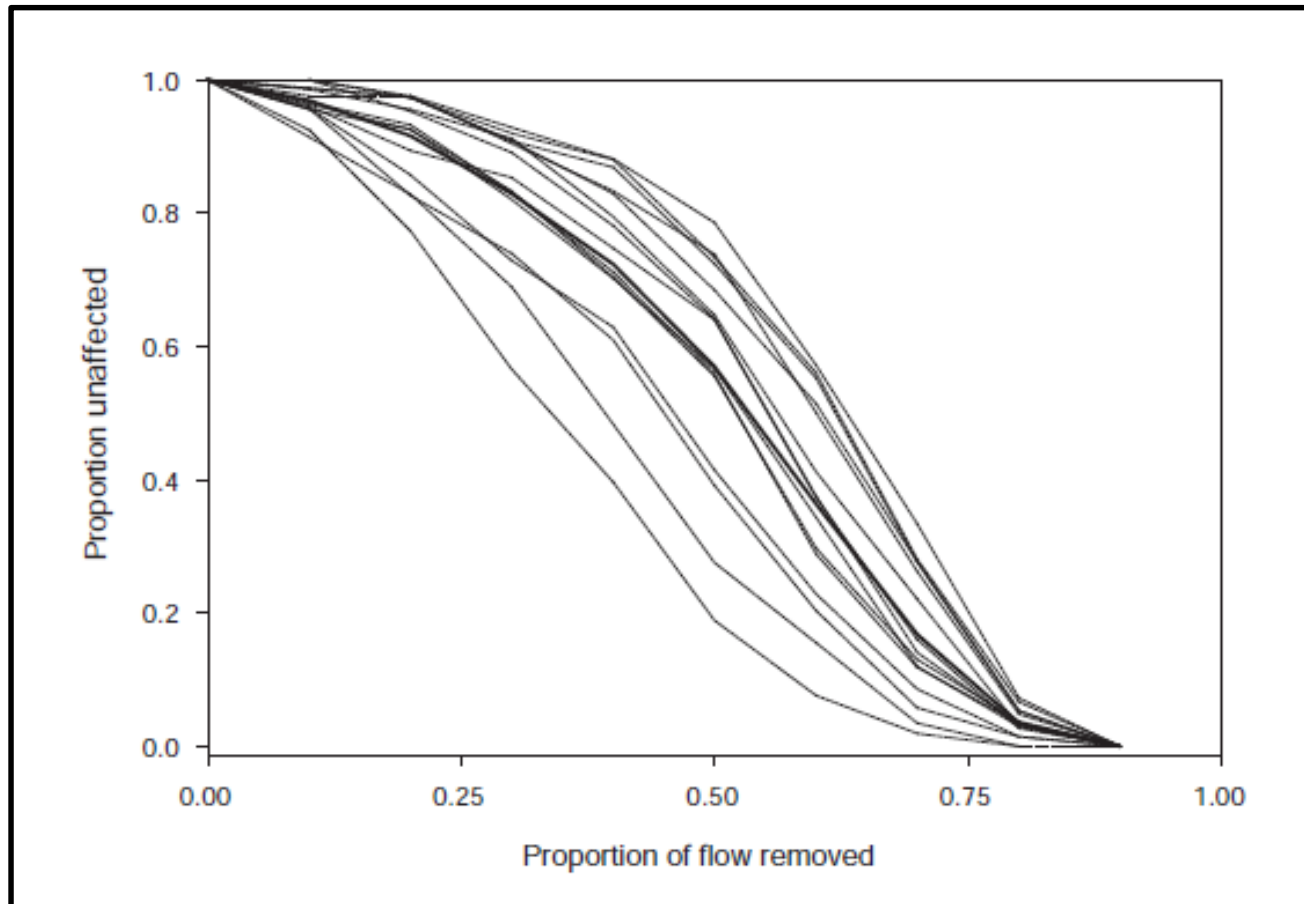
Instream Use Metrics: How does it work?

State Water Plan Metrics



Instream Use Metrics: What is Needed? Who does it?

State Water Plan Metrics



Instream Use Metrics: Proposal

State Water Plan Metrics

- An exploration of current SC data to develop standards
 - Do we have the right data in the right places to develop them?
 - If not, what is the time-cost-scope needed to close the data gap?
- Why Now?
 - Feasibility analysis requires time – actual metric development will require another phase of work
- Preliminary scope
 - Complete feasibility analysis by September 2019
 - Will require participation of relevant agency biologists
 - PPAC participation highly desired
 - Anticipated cost: \$50-100,000.00

Flow Science in the Act

State Water Plan Metrics

- Based in methods published by the South Carolina Water Resources Commission in 1988-89
- Based on 1987 flow regime in 9 “priority stream segments”
- Based in physical measurements at segments; applied fish passage requirements of 2 species along with navigation needs
- “Conclusions or recommendations presented are subjected to revision as new information becomes available”

