Decision-support for Ecological Flow Alterations in the Great Lakes

and beyond…

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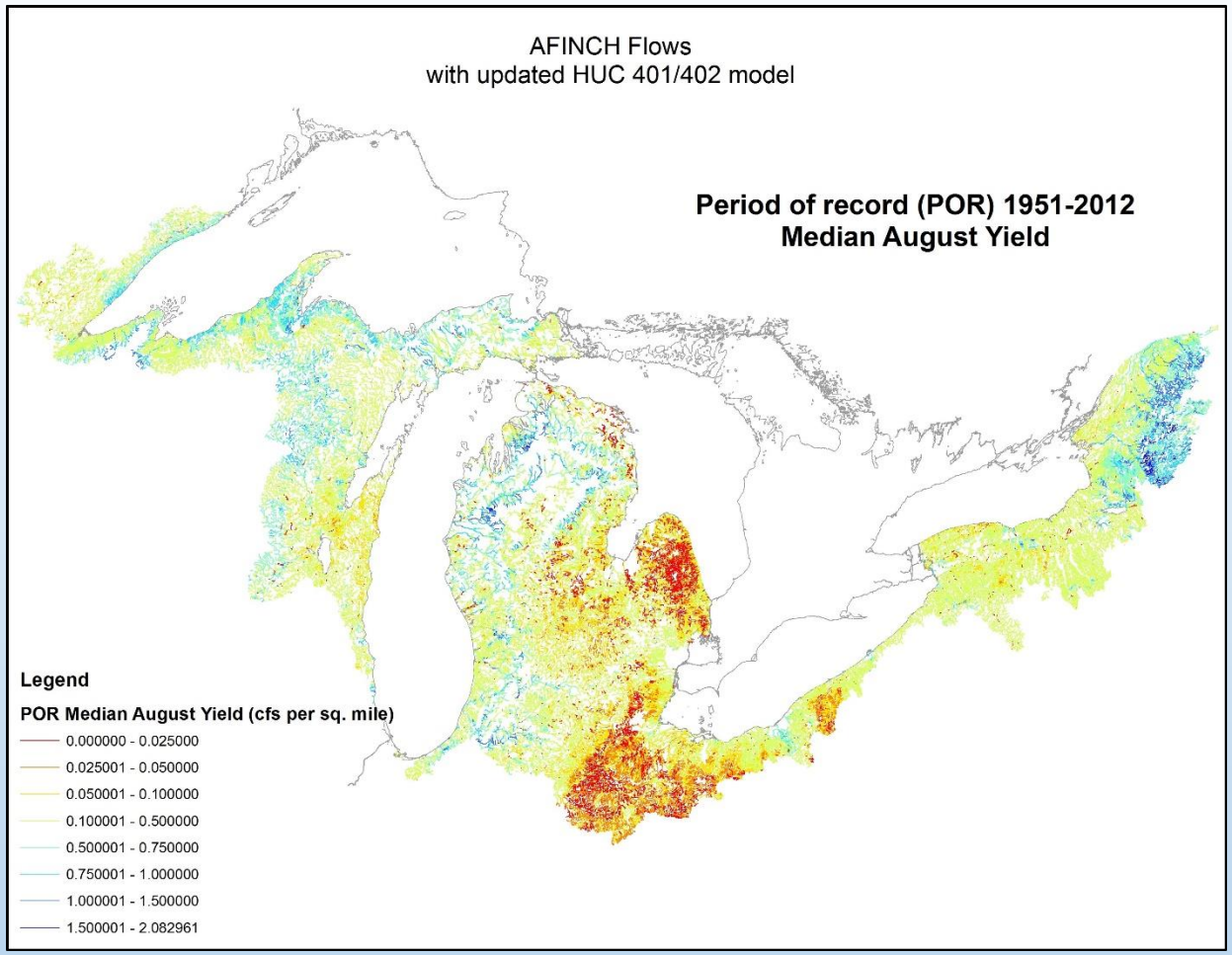
Assistance: M. Slattery, C. Luukkonen, and D. Holtschlag, and others helped with model development, data management, and mapping

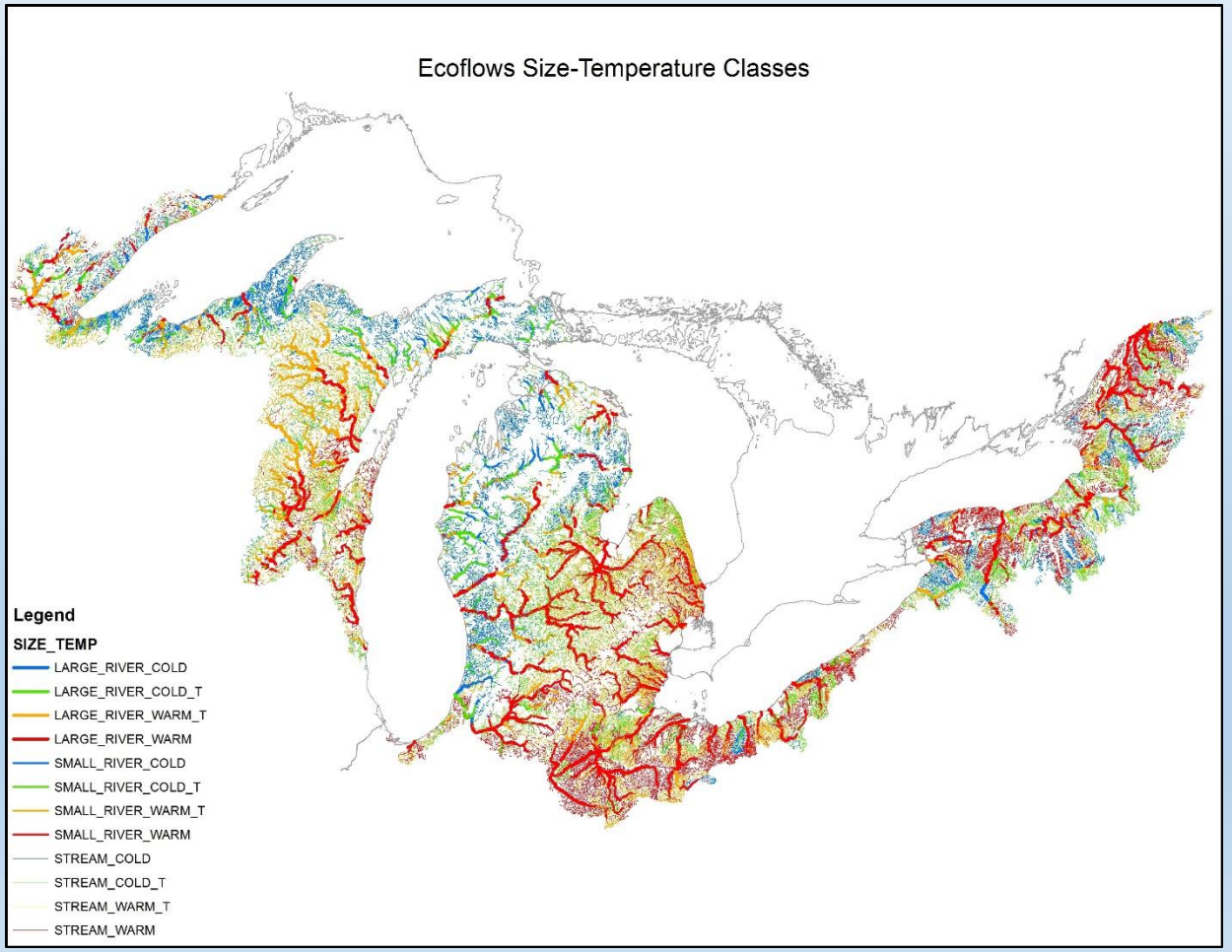
Data Providers: fishery management and conservation agencies and geology groups.

The Question: How to get the biggest bang for the buck in resource restoration or protection?

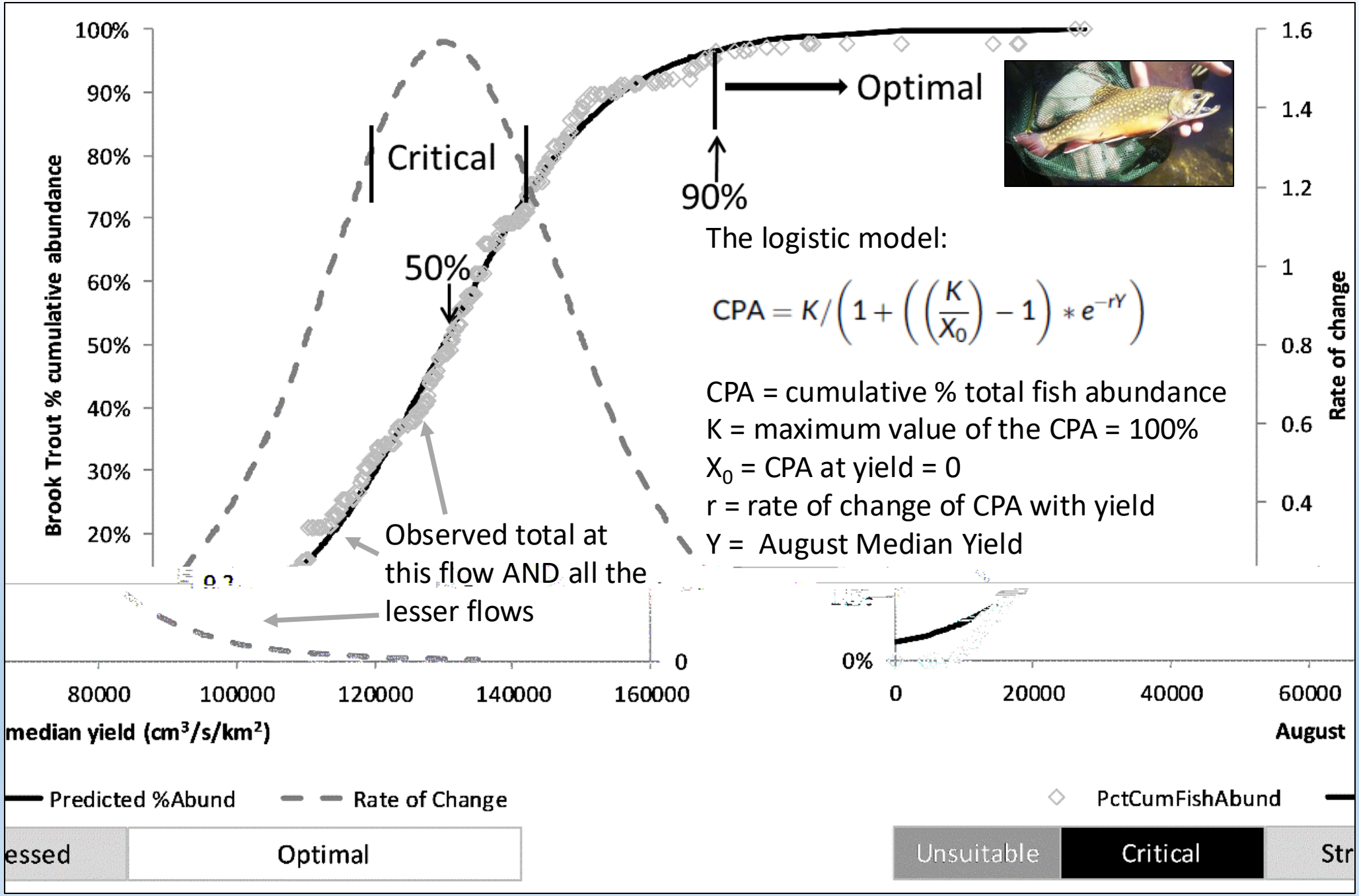
- Fish population health depends on Lotic flow: No water, No fish – but what is the best flow for fish?



Opportunity to provide decision-support



How do fish populations relate to different flow rates? The Cumulative Abundance Curve

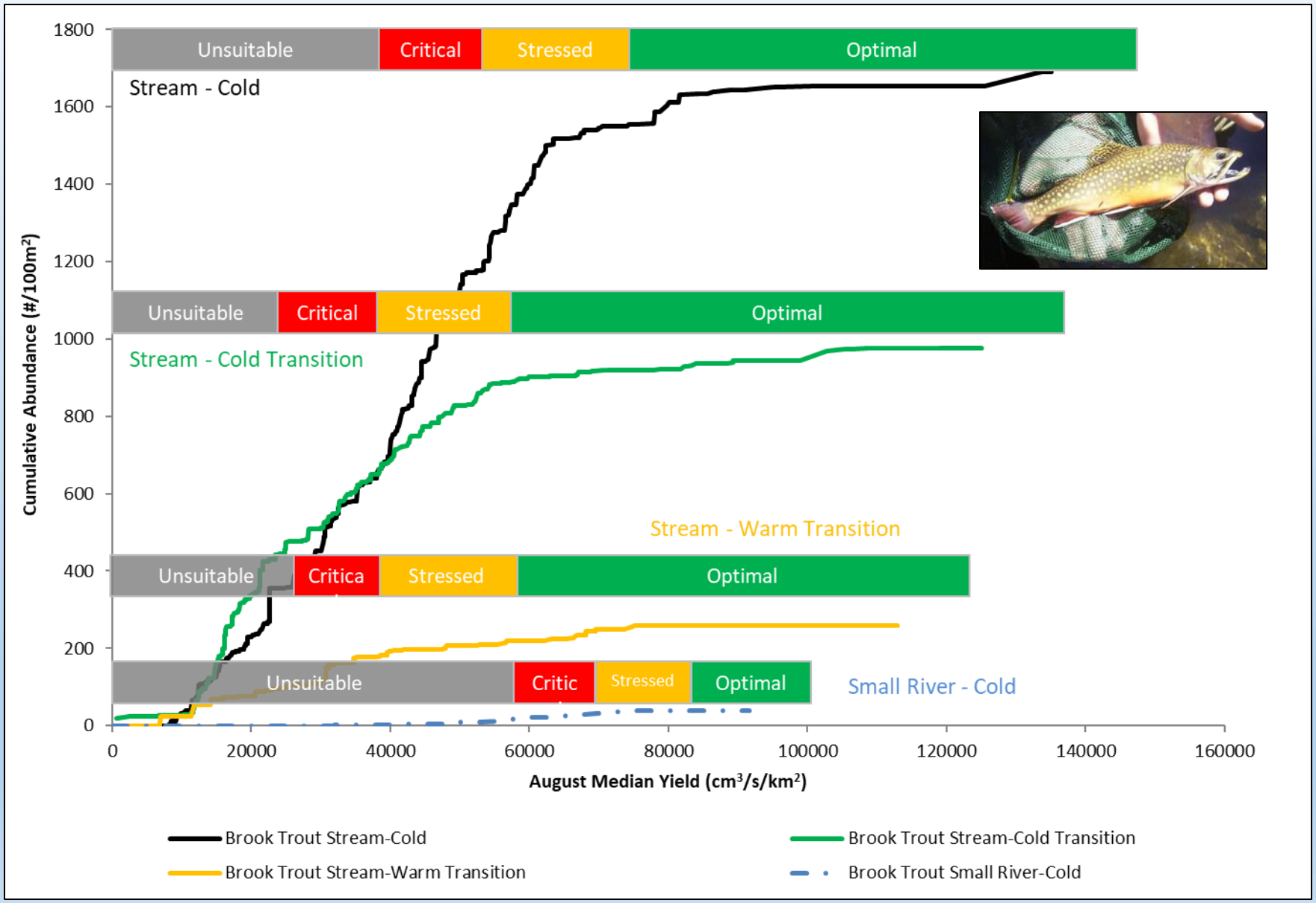


The logistic model:

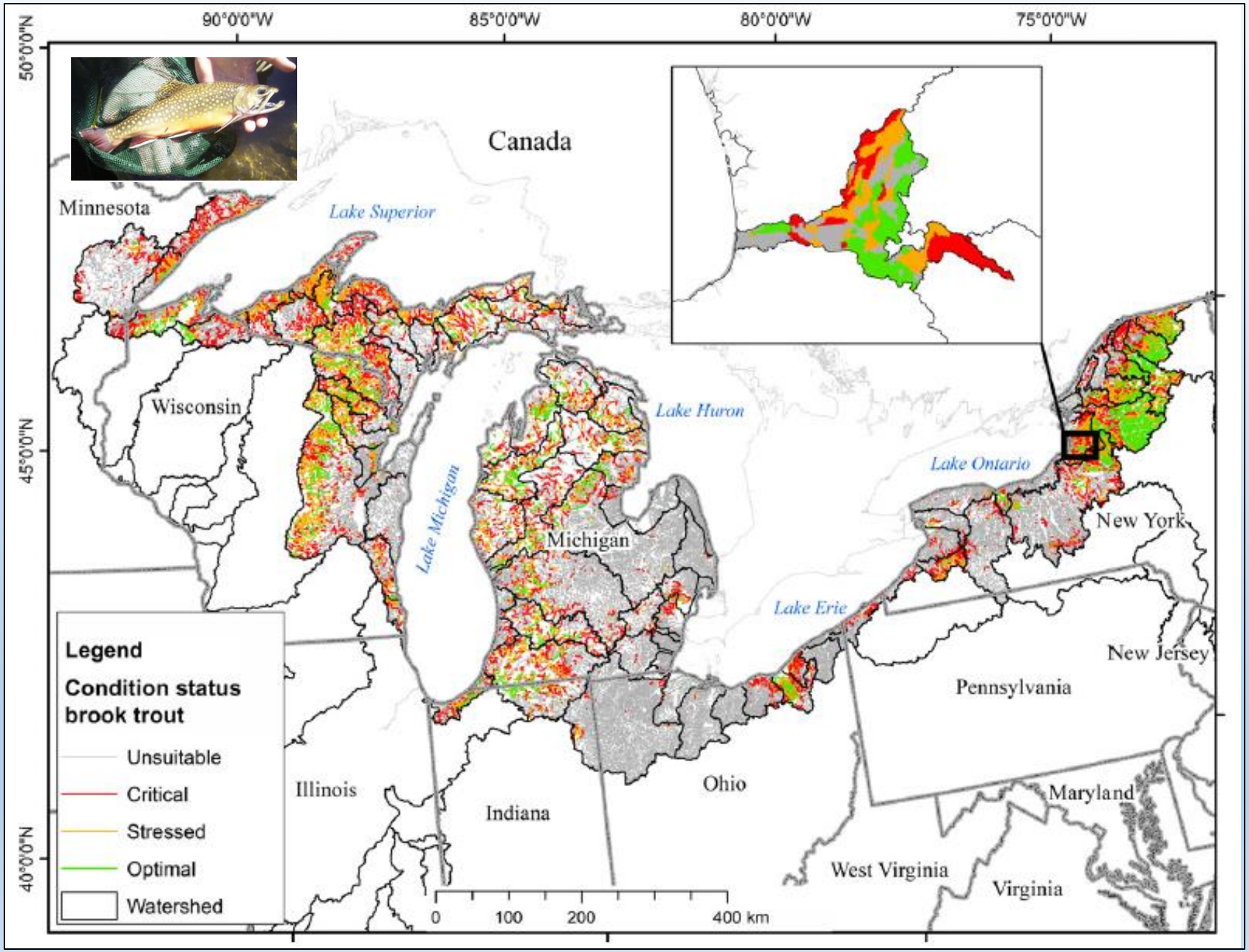
$$CPA = K/\left(1+\left(\left(\frac{K}{X_0}\right)-1\right)*e^{-rY}\right)$$

CPA = cumulative % total fish abundance
K = maximum value of the CPA = 100%
X_0 = CPA at yield = 0
r = rate of change of CPA with yield
Y = August Median Yield

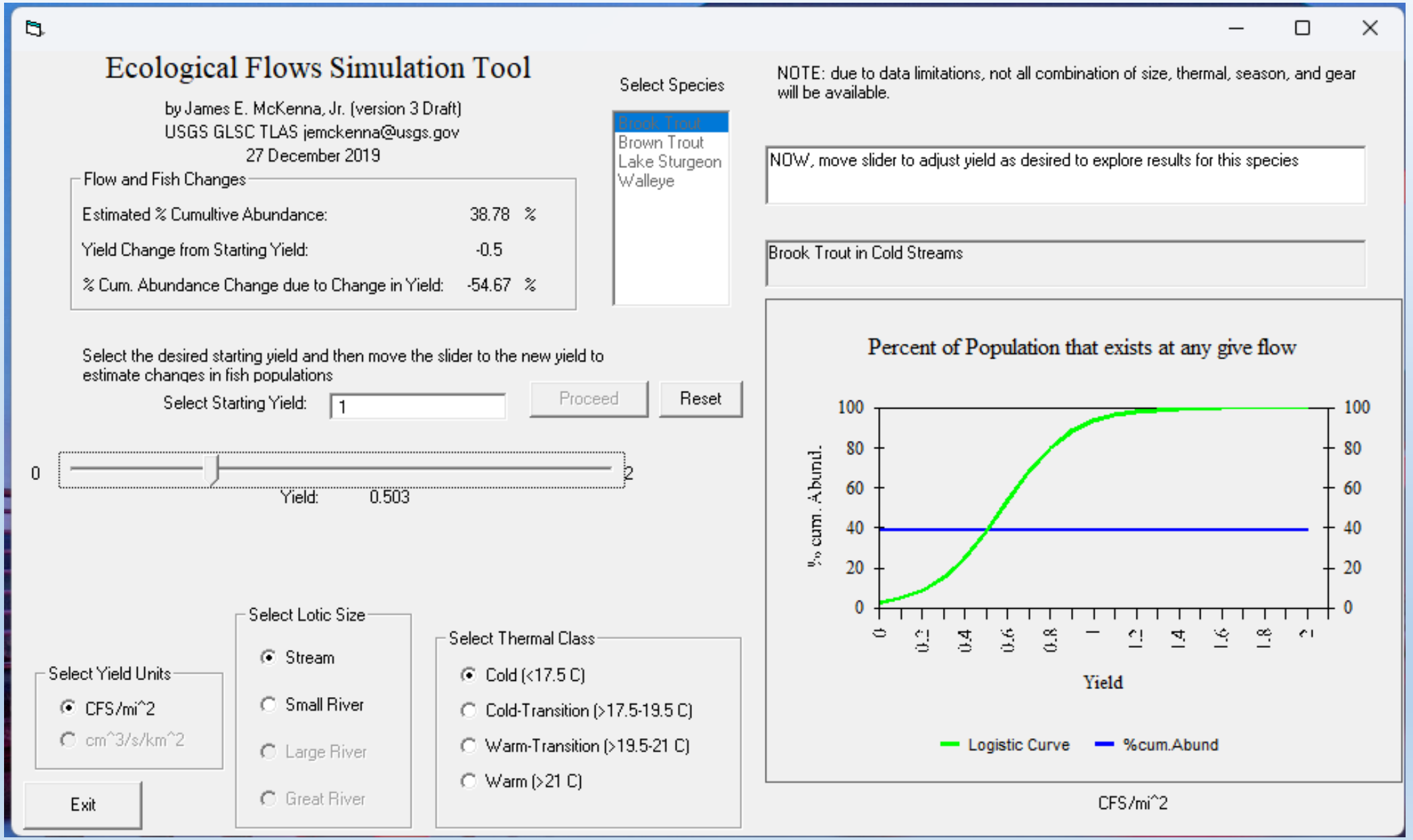
Brook Trout Abundance and Flow by Lotic System Type



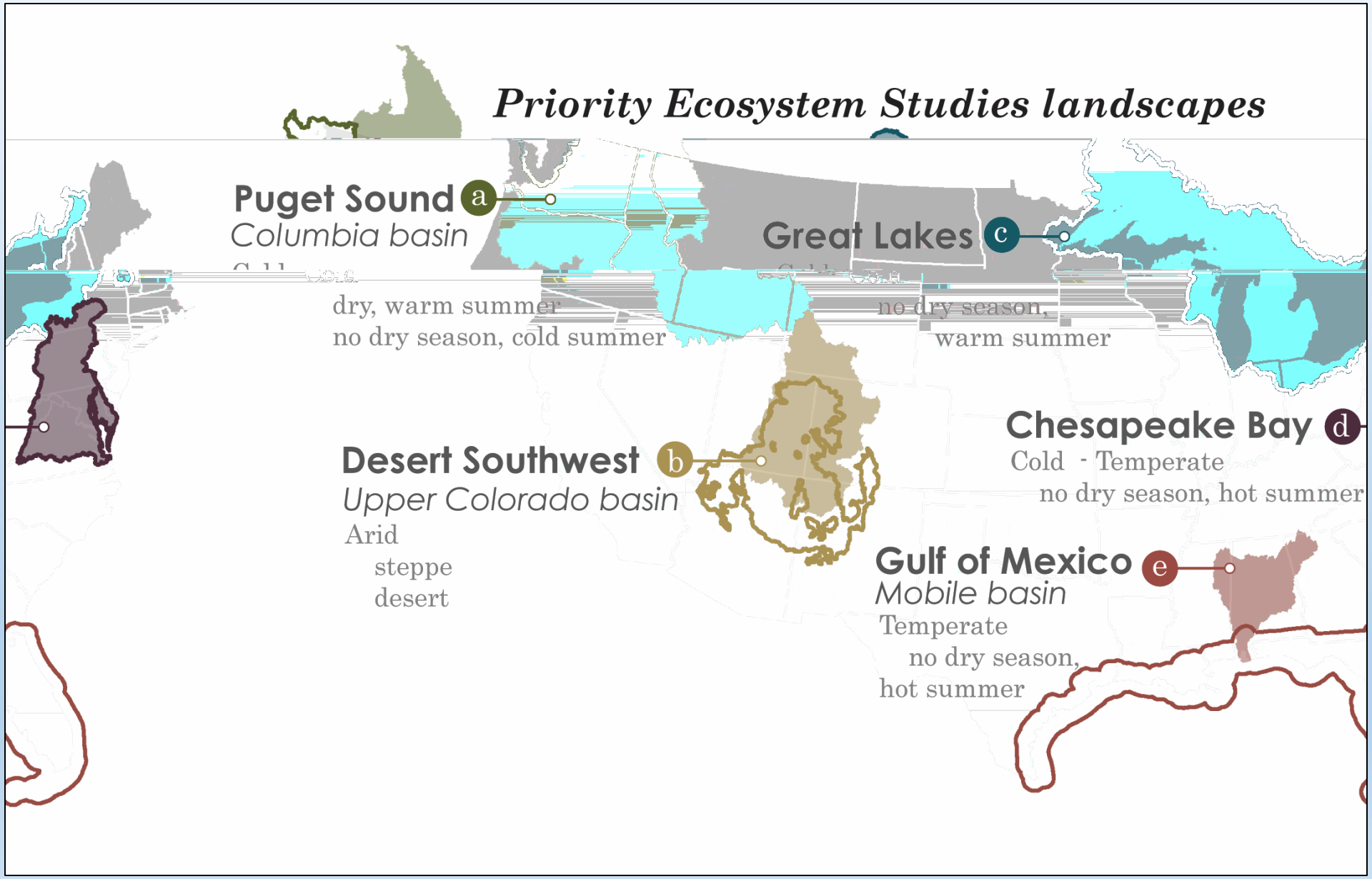
Regionwide Flow Status: Brook Trout



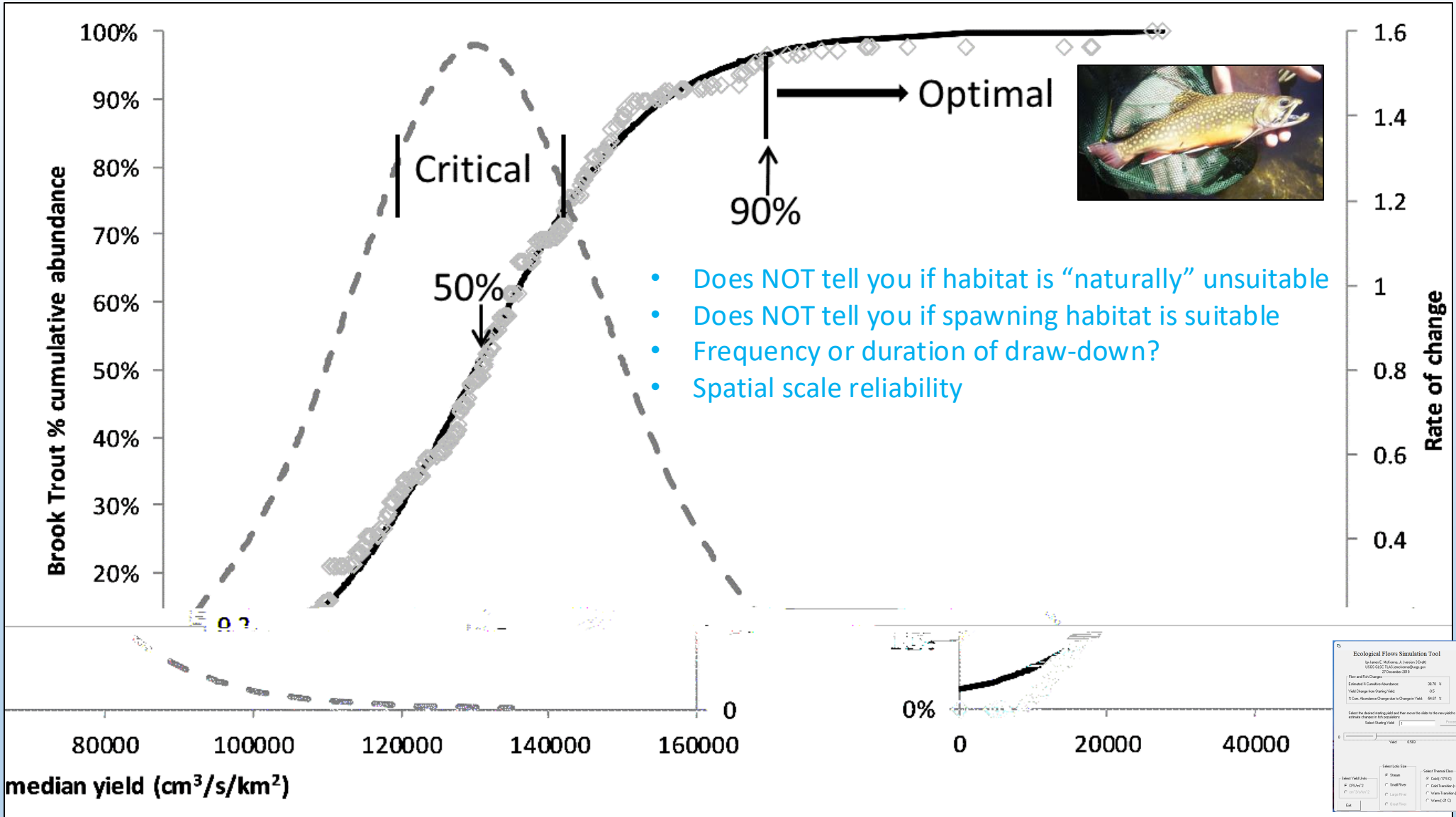
Decision Support Program: the App



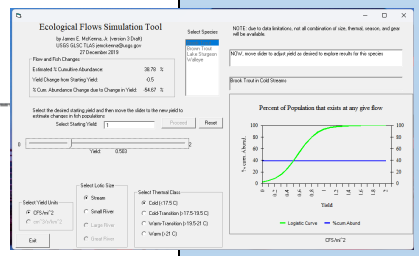
Expanding Nationally



Decision Support



- Does NOT tell you if habitat is “naturally” unsuitable
- Does NOT tell you if spawning habitat is suitable
- Frequency or duration of draw-down?
- Spatial scale reliability



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