

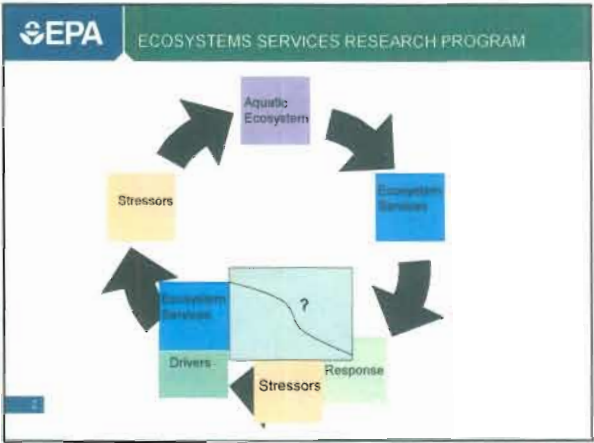
ECOSYSTEMS SERVICES RESEARCH PROGRAM
BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

Regional Modeling of Ecosystem Services Provided by Stream Fishes

Rashleigh, B., L. Prieto, S.T. Purucker, L. Suárez, M.C. Barber

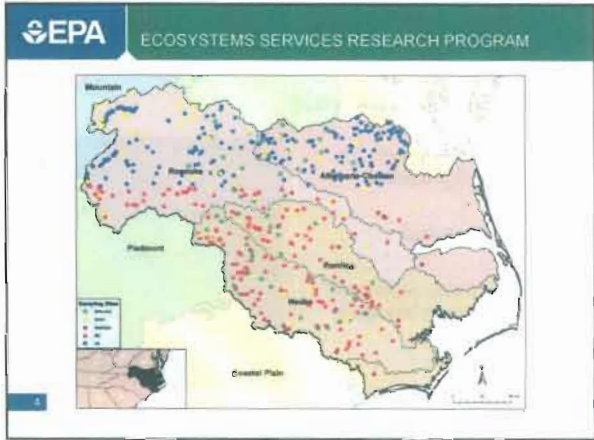
U.S. Environmental Protection Agency, Athens, GA

U.S. Environmental Protection Agency
Office of Research and Development



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SERVICE PROVIDERS	PRIAL ECOSYSTEM SERVICES (Wood and Research, 2002)
Bass, sunfish, trout, bullhead, pickere!	Sport fish
Biodiversity, darters, suckers	Aesthetic





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Hierarchical Multiple Regression

$r = \text{Intercept}$

$+ C_{\text{Forest}}$

$+ C_{\text{Flow}}$

$+ C_{\text{Temp}}$

$+ \dots$

Forest

Flow

Temp



NLCD

Roanoke River Watershed

Habitat Suitability Index (HSI)

$= 1/(1+e^x) \rightarrow 0 \text{ (Unsuitable)} \leq \text{HSI} \leq 1 \text{ (Most suitable)}$

5



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Model Example

Species	HSI	Correct Classification Rate (%)		
		Absence	Presence	Overall
<i>Percina roanoka</i> Roanoke darter	$1/(1 + \exp(-(-63.2 * 9.4 \text{ Flow} + 2.5 \text{ Velocity} + 8.2 \text{ Temp} - 0.3 \text{ Temp}^2 + 0.03 \text{ Agr} - 0.5 (\text{Flow Temp})))$ * Mean intercept	86	76	81



6



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Services Analysis

- Combine models for service providers
- Map services
- Calculate response of services to change in stressors

SERVICE PROVIDERS	FINAL ECOSYSTEM SERVICES
Bass, sunfish, trout, bullhead, pickerel	Sport fish
Biodiversity, darters, suckers	Aesthetic

7



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Services Provisioning

Sport fish

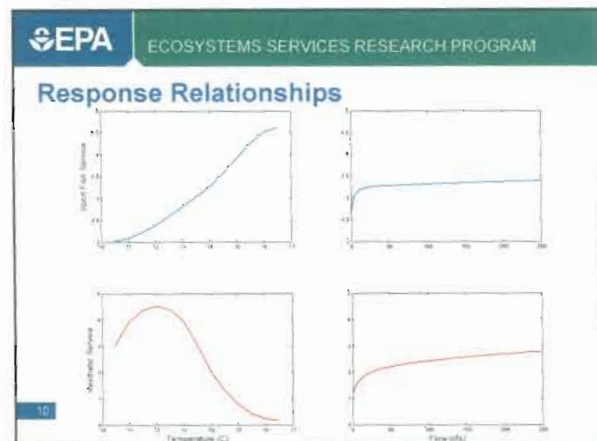
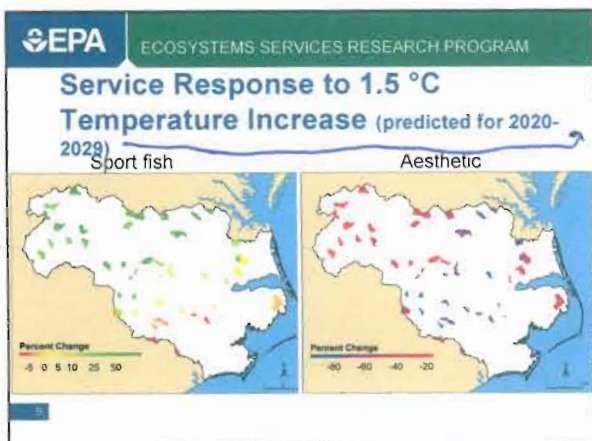
Aesthetic



8

2

can this
be moved
up one line?

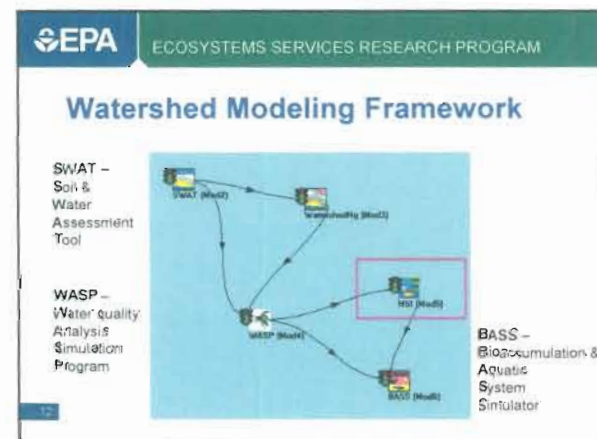


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Conclusions

- Service response depends on location
- Two services have distinct responses to stressors
- Some fish species are more important service providers than others

11



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