### Freshwater Mussels in Oklahoma Rivers From Endangered Species to Ecosystem Services



Caryn C. Vaughn George Lynn Cross Research Professor Presidential Professor Oklahoma Biological Survey & Biology Department <u>cvaughn@ou.edu</u> carynvaughn.com











What are the distribution and status of mussel species in Oklahoma rivers?

What are their habitat requirements and relationships with other species?



Atkinson & Vaughn, 2015, Freshwater Biology



What are the environmental flow needs of freshwater mussels?

#### How can we manage rivers to meet both wildlife and human needs?





#### SPECIAL REVIEW

#### Developing environmental flow recommendations for freshwater mussels using the biological traits of species guilds

KIZA K. GATES\*, CARYN C. VAUGHN\* AND JASON P. JULIAN $^{\dagger}$ 

### What do mussels do in ecosystems? What ecosystem services do mussels provide humans?



- Filter the water
- Recycle and store nutrients
- Provide and modify habitat
- Support food webs







## **Ecology and Evolution**

**Open Access** 

# Drought-induced changes in flow regimes lead to long-term losses in mussel-provided ecosystem services

Caryn C. Vaughn<sup>1</sup>, Carla L. Atkinson<sup>1,2</sup> & Jason P. Julian<sup>3</sup>

# POTENTIAL COLLABORATIONS



Caryn C. Vaughn <u>cvaughn@ou.edu</u> carynvaughn.com

Quantify biophysical ecosystem services provided by mussels and rivers

Determine economic and social value of ecosystem services

Establish environmental flow guidelines/policy for Oklahoma rivers