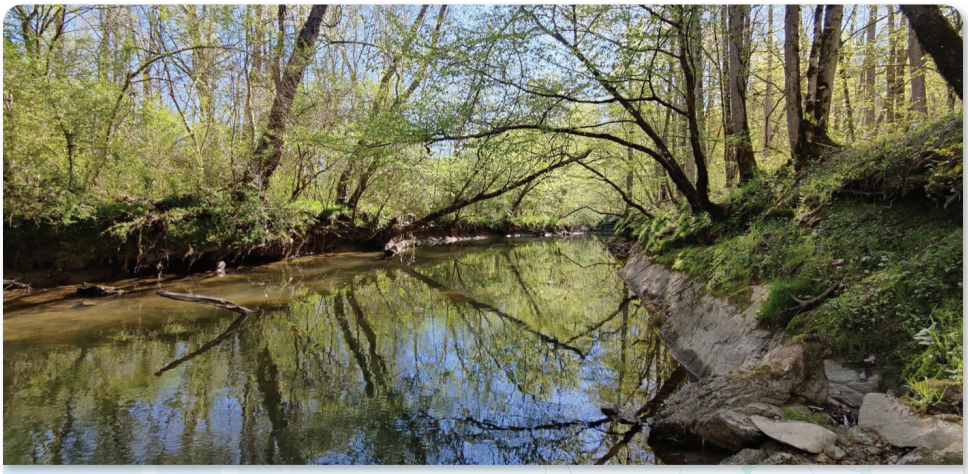


WaDE

Watershed Dynamics and Evolution Science Focus Area

What Is the WaDE SFA?

The WaDE SFA aims to advance predictive understanding of how dominant processes controlling watershed hydro-biogeochemical function operate under a range of hydrologic regimes and vary along stream networks that drain heterogeneous land covers.

Why Study Watersheds?

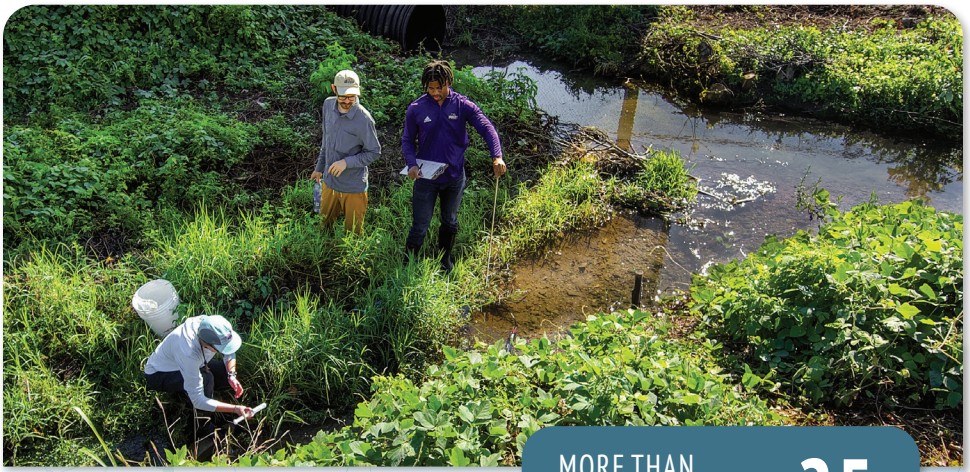
Water resources in the southeastern United States are important for energy production, irrigated agriculture, industry, and human consumption, but they are vulnerable to accelerating changes in land use and land cover and a range of climate-induced disturbances, from higher temperatures to an intensifying hydrologic cycle. Improving transferable understanding of how watersheds function under different environmental conditions is critical to preserving the important societal and ecosystem services these systems provide.

Key Knowledge Gaps

- Land cover effects on watershed function
- Mechanisms controlling upland-stream interactions
- Spatial-temporal controls on integrated measures of watershed function
- Skewed stream observational networks
- Integrated mechanistic and configurable virtual watershed capabilities

U.S. Department of ENERGY | Office of Science
Biological and Environmental Research Program

The Environmental System Science (ESS) program within the U.S. Department of Energy's (DOE) Biological and Environmental Research (BER) program supports research to provide a robust and scale-aware predictive understanding of terrestrial ecosystems, watersheds, and coastal systems.



MORE THAN **37** PUBLICATIONS

25 STUDY SITES

YEARS ACTIVE: **2023** TO **PRESENT**

Research Design

During WaDE's nine-year, phased plan, researchers focus successively on three mid-order watersheds to support systematically translating, applying, and refining the process understanding and virtual watershed modeling capabilities gained from one watershed to increasingly disparate systems. The WaDE SFA is organized around three integrated research themes and a crosscutting modeling activity. Mid-order streams are a vital link between low-order headwaters and larger rivers but are underrepresented among existing observational networks. WaDE researchers seek to address knowledge gaps like how land cover gradients and hillslope-catchment interactions affect watershed function.

Research Locations

The Tennessee River Basin is the most intensively used freshwater resource region in the contiguous United States, supporting approximately 4.5 million people. Research watersheds were selected to be broadly representative of mid-order watersheds across the Basin to support transferability of process understanding and modeling capabilities.

More Information

WaDE
wade.ornl.gov

ESS Program
ess.science.energy.gov

All images courtesy WaDE

Contacts

Principal Investigator
Eric Pierce
pierceem@ornl.gov

BER ESS Program Managers
Paul Bayer
paul.bayer@science.doe.gov

Brian Benscoter,
Dan Stover,
Daniel Winkler

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