



# Watershed Function

## *Functional Traits and Watershed Resilience Science Focus Area*



### What Is the Watershed Function SFA?

The Watershed Function SFA is an integrated, multilaboratory project focused on interacting impacts of warming and drought on the hydro-biogeochemical functioning of mountainous watersheds and their retention or release of water, carbon, nitrogen, and other elements. The SFA aims to understand mechanisms underlying the resistance and resilience of watersheds to disturbance to predict pathways of watershed adaptation to future climate conditions.

### Research Questions



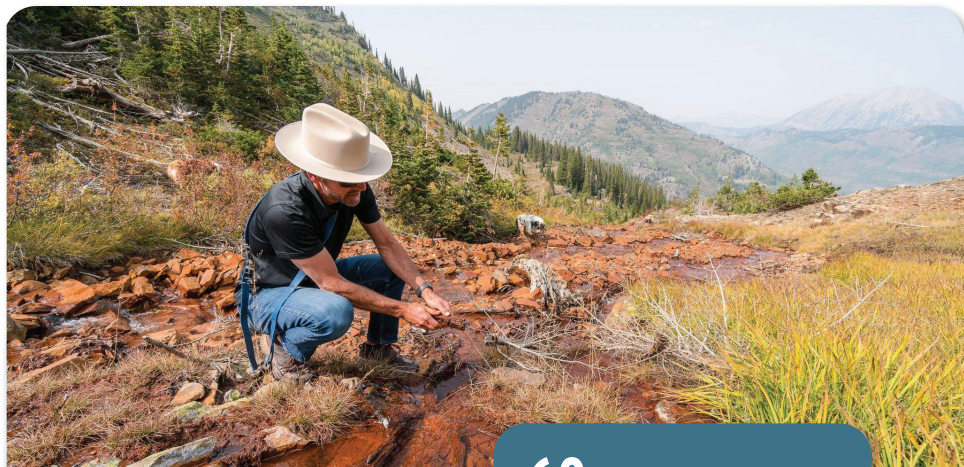
How do mountainous watershed functions respond and adapt in the face of increasing press and pulse disturbances?



As climate changes in mountainous watersheds, what are the threats to water quantity and quality provided to downstream environments? How might adaptive management of forests and floodplains mitigate these threats?

### Why Study Mountainous Watersheds?

Watersheds provide key resources for human populations, with pressing demands for clean water, food, and energy. In parallel, interacting disturbances are significantly reshaping interactions within watersheds throughout the world. A deeper understanding of mountainous watershed functions is needed as changing mountainous hydroclimate is estimated to cause trillion dollar impacts across the Western United States in coming decades.



## Research Design

The SFA's three Research Focus Areas explore how hydrological, ecological, and biogeochemical processes evolve and interact mechanistically by using watershed functional traits (i.e., how climate, topography, and geology evolve together with living organisms to regulate hydro-biogeochemical function across watershed compartments). The SFA has also developed a ModEx Integration Core as a central hub to facilitate integrated modeling, observation, and experimentation to enhance prediction of watershed function.

60+ RESEARCHERS

>120 PUBLIC  
DATASETS  
AVAILABLE IN ESS-DIVE

## Research Location

The SFA focuses on the Upper Colorado River Basin (UCRB) and builds upon research at the East River while expanding into the Taylor River watershed. Both are representative and vulnerable headwater systems within the UCRB. The Colorado River and its headwater tributaries supply water for municipal use to more than one in 10 Americans, irrigation for more than 5.5 million acres, and more than 4,200 megawatts of electrical-generating capacity for millions of people.



## More Information

**Watershed  
Function**  
[watershed.lbl.gov](http://watershed.lbl.gov)



**ESS Program**  
[ess.science.energy.gov](http://ess.science.energy.gov)



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