

# DROUGHT IMPACTS ON FOREST AND WATER RESOURCES OF NORTHERN CALIFORNIA

A McIntire-Stennis supported project  
(2022-2025)

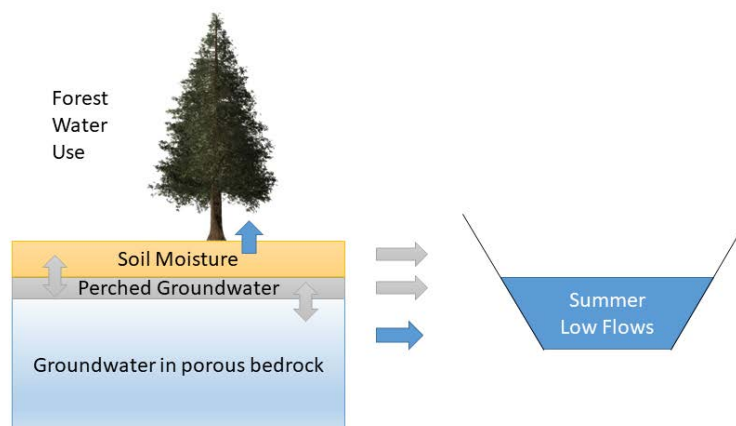


The objective of this research is to assess threats posed by drought to coniferous forest health and productivity and water resources in the northern California region.

**Specific results will be generated for redwood and mixed-conifer forests:** Quantification of water storage in groundwater of representative forested watersheds using flow recession analysis of existing river flow records.

Quantification of water storage in soil moisture of representative forested watersheds using satellite-derived soil moisture measurements and field-based soil moisture measurements. Quantification of temporal persistence of water stored in groundwater and soil moisture into seasonal drought and multi-year drought periods, by analysis of river flow recession curves, and soil moisture recession curves assembled from satellite-derived soil moisture measurements. Quantification of trends in temperature, relative humidity and solar radiation, and rainfall amounts, duration, intensity and seasonality for the period of instrumental record.

Assessment of mechanisms by which precipitation, evaporation, soil and hydrologic factors affect tree growth and limit coniferous forest cover using range and climate maps and review of scientific literature.



## About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.



## COLLABORATION



### Declining Streamflows

Study worked with the Usal Redwood Forest Foundation, City of Arcata Community Forest, and Schatz Demonstration Tree Farm.

Recent research has shown declining summer stream flows throughout the region, punctuated by wet years with some of the largest precipitation totals since 1888.

## IMPACT

A synthesis predicting how coniferous forest cover and water resources in northern California could be affected by future drought.



100,000,000

The drought of 2011-2015 killed over 100 million trees in California.



4

Two graduate and two undergraduate students received training.



2

Master's Theses will use data from this project.