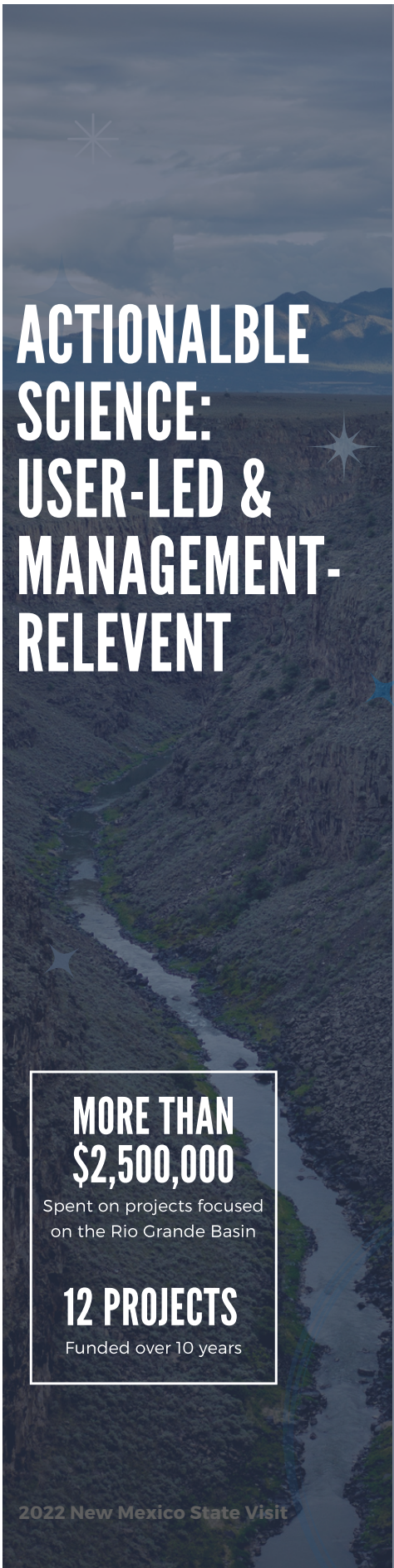
SOUTH CENTRAL
CLIMATE ADAPTATION SCIENCE CENTER

THE SOUTH CENTRAL CASC

The South Central Climate Adaptation Science Center (SC CASC) was established in 2012 and is one of ten CASC Centers across the country. Each regional CASC is housed at a host university which serves as a hub for a consortium of member organizations in the region. The CASC network generates actionable science, trainings, and products that address identified science needs which are useful in supporting resource management decisions, actions, and plans. The SC CASC accomplishes this through multi-disciplinary and stakeholder-driven approaches to funding projects that assess the impact of climate change on natural and cultural resources within our region of Oklahoma, New Mexico, Texas, and Louisiana.

STAKEHOLDER INFOMED SCIENCE

Since its establishment, the SC CASC has funded twelve projects ($2,573,215) with a focus on New Mexico, particularly in the Rio Grande River Basin. The South Central CASC uses funding priorities that are closely tied to the needs of cultural and natural resource managers. Since 2017, a SC-CASC-led stakeholder committee known as Climate Change Committee Friends of the Rio (C3FRio) has provided guidance to the CASC regarding the climate science needs in the Rio Grande Basin. This collaboration has resulted in both actionable and informative science. Continue reading the highlights below to learn about some of the CASC-funded projects in New Mexico.



WILDFIRE & SOIL

Wildfire Probability Mapping Based on Regional Soil Moisture Models

Funded Fiscal Year 2017 (Complete)

Soil moisture is a significant indicator of wildfire risk, though it has not been used for wildfire assessments previously. Dr. Tyson Ochsner (Oklahoma State University) developed the rNewhall model, a promising soil moisture model that can estimate the likelihood of wildfires and predict the yield of burnable plant material in grasslands more accurately than weather data alone. His research team filled critical knowledge gaps by quantifying the relationship between modeled soil moisture and wildfire within the Rio Grande and Red River Basins using soil maps and climate data.

These Advancements in modeling wildfire danger may increase wildfire preparedness and decrease the loss of life, property, and habitat. The team developed a simple model that can produce high-resolution simulations and predict soil moisture conditions at multiple depths. The rNewhall model will be made accessible as part of an R modeling package once it is refined and finalized. The team will continue to improve the model by refining sensitivity testing and incorporating modeled daily precipitation and temperature data to create connectivity of landscape-scale lateral water flow.

FIRE, SNOW, & WATER FLOWS

The Effects of Wildfire on Snow Water Resources under Multiple Climate Conditions

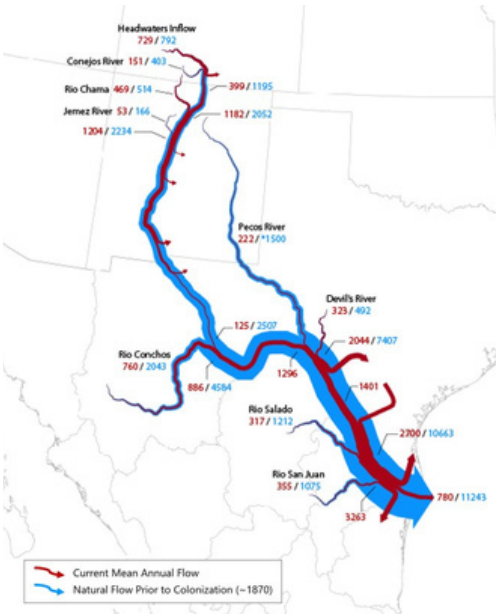
Funded Fiscal Year 2017 (Complete)

Through this project, Dr. David Moeser (NM Water Science Center, USGS) determined that the direction a canopy edge faces, as well as the structure of that canopy, are important factors for predicting post-disturbance changes in snow water resources. His team quantified how local snow-water resources were affected by the 2011 Las Conchas Fire in the Jemez Mountains under current and future climate conditions. Understanding the correlations between canopy structure and snow storage can help predict the change in snow water in the area watersheds. This knowledge can be used to guide silviculture practices to mitigate future fire disturbances and maximize snow storage and retention time.

Analyzing the Response of Waterflow to Projected Climate Conditions in the Upper Rio Grande Basin

Funded Fiscal Year 2018 (Complete)

A team led by Dr. David Moeser (NM Water Science Center, USGS) projected that natural peak flows in the Rio Grande will occur on average one month earlier each year in the future. This team helped develop a watershed model for the Upper Rio Grande Basin (URGB) using the Precipitation Runoff Modeling System to simulate naturalized streamflow conditions. The model indicates that all sites in the URGB will experience significant changes in streamflow timing, but will be most prevalent in snow-dominated sites due to early snow melt from increasing temperatures. These results can help resource managers improve "now-water" forecasting and water resource planning. The National Weather Service plans to use the results to improve forecasting capabilities in snowmelt-driven basins impacted by wildfire.



Assessing Climate Variability and Adaptation Strategies for the Rio Grande Basin

Funded Fiscal Year 2019 In Progress

Dr. Samuel Sandoval-Solis's research aims to estimate the climate variability of the southern branch of the Rio Grande basin and to identify periods of historical drought and water abundance between 1900 and 2010. Understanding the extreme climatic events of the past will inform predictions of future droughts and floods and will support adaptive strategies and solutions for improving water resource management in the basin.
Through this novel research, the team has developed a naturalized flow estimate for every year from 1900-2010 and subsequently demonstrated that the highly-regulated Rio Grande is currently in a sustained, anthropogenic drought.

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For more information this project and more, follow the QR code and sign up for our newsletter!

https://southcentralclimate.org/resources/resources-for-researchers/resources-for-resource-managers/