



# COLORADO STATE UNIVERSITY

## ADVANCING WATER SECURITY AND RESILIENCE

Colorado State University researchers work across the hydrological cycle with a focus on modeling and interdisciplinary partnerships that study water systems from the sky to the water table beneath the Earth's surface. CSU is internationally recognized in atmospheric sciences, hydrology, and water management, and works in communities to increase the public's understanding of water resources.

### BY THE NUMBERS

**200+**

CSU water experts across disciplines

**NO. 6**

Hydrology and Water Resource education in the U.S. (EduRank)

**100+**

Teaching faculty

**22**

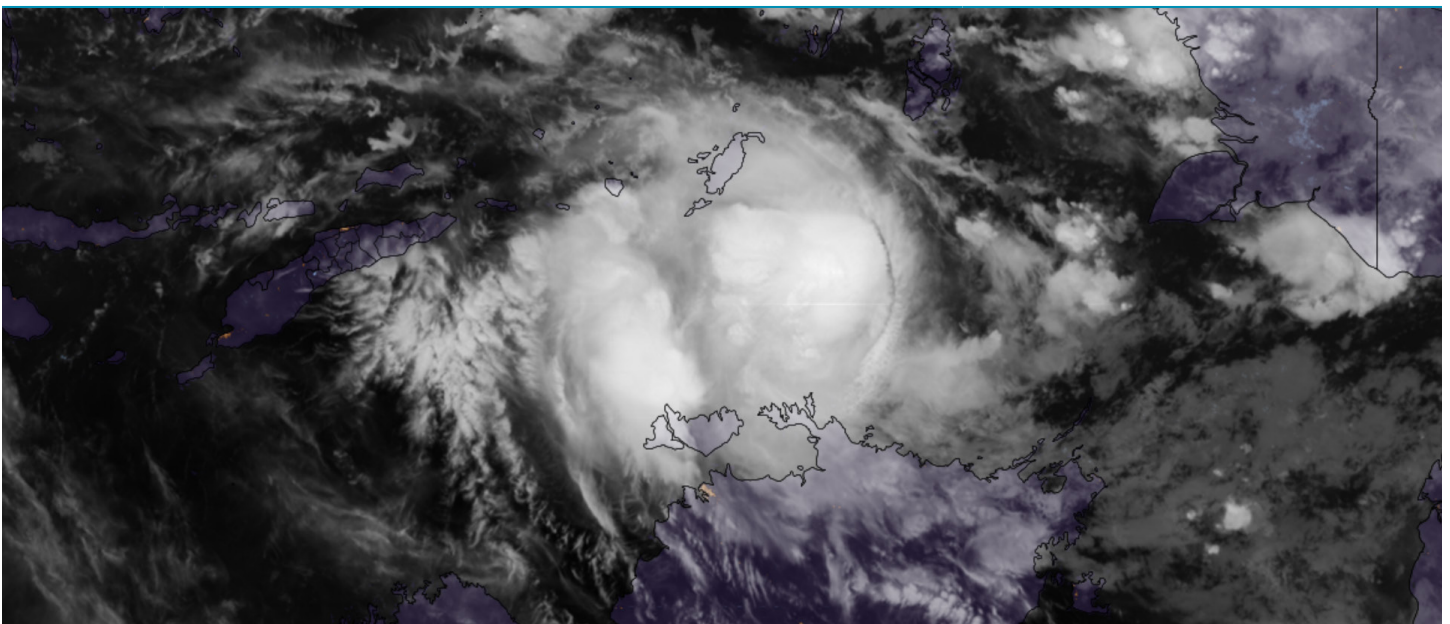
Academic departments

**19**

Academic programs

**150**

Advanced courses



### CLIMATE AND STORM DYNAMICS

#### Research connecting atmosphere to water management

CSU's top-tier atmospheric science program studies storm behavior and seasonal climate signals and translates it into actionable water intelligence for communities. Their work advances forecasting to improve early warning capabilities for extreme precipitation, snowpack timing, drought, and rapid onset flooding to directly inform utilities, reservoir operators, and emergency managers. These tools help communities anticipate supply constraints, plan for high-impact storm events, and protect people and infrastructure before hazards emerge.



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## WATERSHED AND INFRASTRUCTURE MODELING

### Tools supporting resilient planning and communities

Civil and environmental engineers turn climate information into hydrologic and infrastructure models that cities, basins, and utilities can use for risk reduction and long-term planning.

**Urban systems:** CSU's [Integrated Urban Water Model \(IUWM\)](#) allows utilities to test conservation, reuse, and land-use scenarios under changing conditions. By simulating demand, wastewater generation, and integration of alternative water sources, IUWM helps cities reduce supply vulnerabilities and right-size future investments.

**Basin resilience:** CSU researchers analyze how conservation strategies influence water security and governance across the Colorado River Basin. Through a [multi-university, NSF-supported initiative](#), teams also develop watershed resilience strategies for regions facing wildfire impacts, diminishing supplies, and rapid population growth to help communities prioritize interventions that protect lives, ecosystems, and infrastructure.

## AGRICULTURAL AND WATER QUALITY INNOVATION

### Applied solutions for working lands and communities

CSU pairs climate and hydrologic science with agricultural, ecological, and public health expertise to deliver field-tested tools that strengthen rural water resilience.

**Targeted irrigation:** Through innovative irrigation technologies, crop consumptive use evaluation, and alternative cropping systems, [CSU empowers agricultural producers](#) to adjust to changes in climate. The [USDA-supported TAPS program](#) gamifies strategies on replicated plots, regularly achieving **15-25% water savings without yield penalties.**

**Water quality:** At CSU Spur Hydro, co-located with utility partner Denver Water, researchers conduct **~200,000 water quality tests per year**, advancing treatment innovation and supporting community monitoring. Work at Spur also examines water reuse, stormwater capture, and nature-based solutions such as green roofs.

**Groundwater and soil moisture:** Additional CSU research evaluates how [flood irrigation influences aquifers and river levels](#) and [applies largescale soilmoisture data](#) to improve drought prediction and wildfire risk assessment, providing agricultural producers and land managers with earlier, more accurate signals for decision making.

