



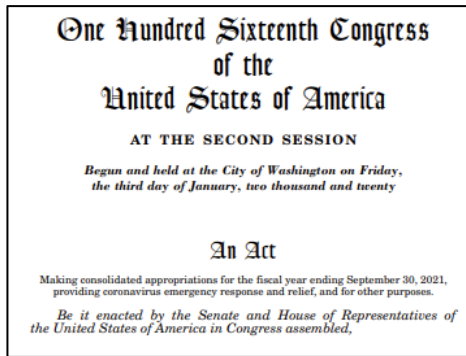
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# Research and Development Investments Supporting Water Management Resilience and Flexibility



# R&D Investments

## Snow Water Supply Forecasting Program



## Forecasting Prize Competitions

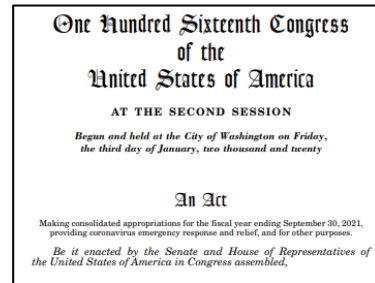
## Science and Technology Research Program



# Snow Water Supply Forecasting Program

*Establish interagency collaboration*

*External Funding Opportunities (SNOFO)*



2020

2021

2022

2023

2026



*Landing strips to onramp products into water supply forecasting*





# Inputs

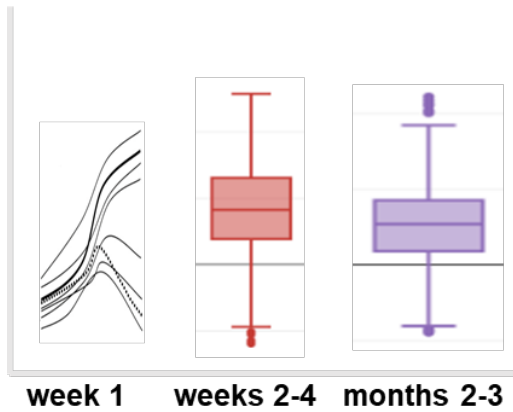
# Water Availability Forecasts

# Decision Support

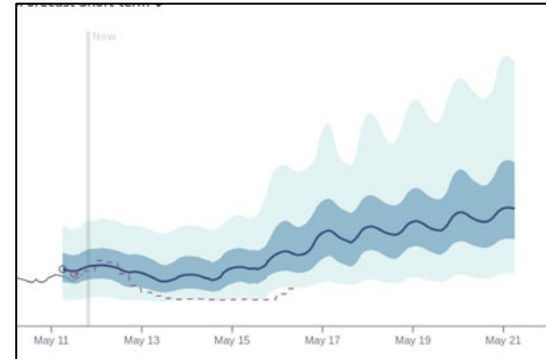
Basin Conditions



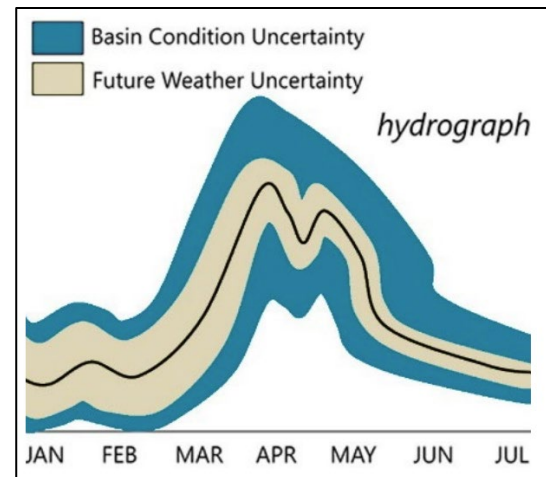
Future weather and climate



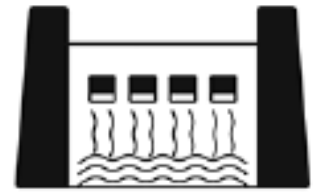
Short-term Streamflow



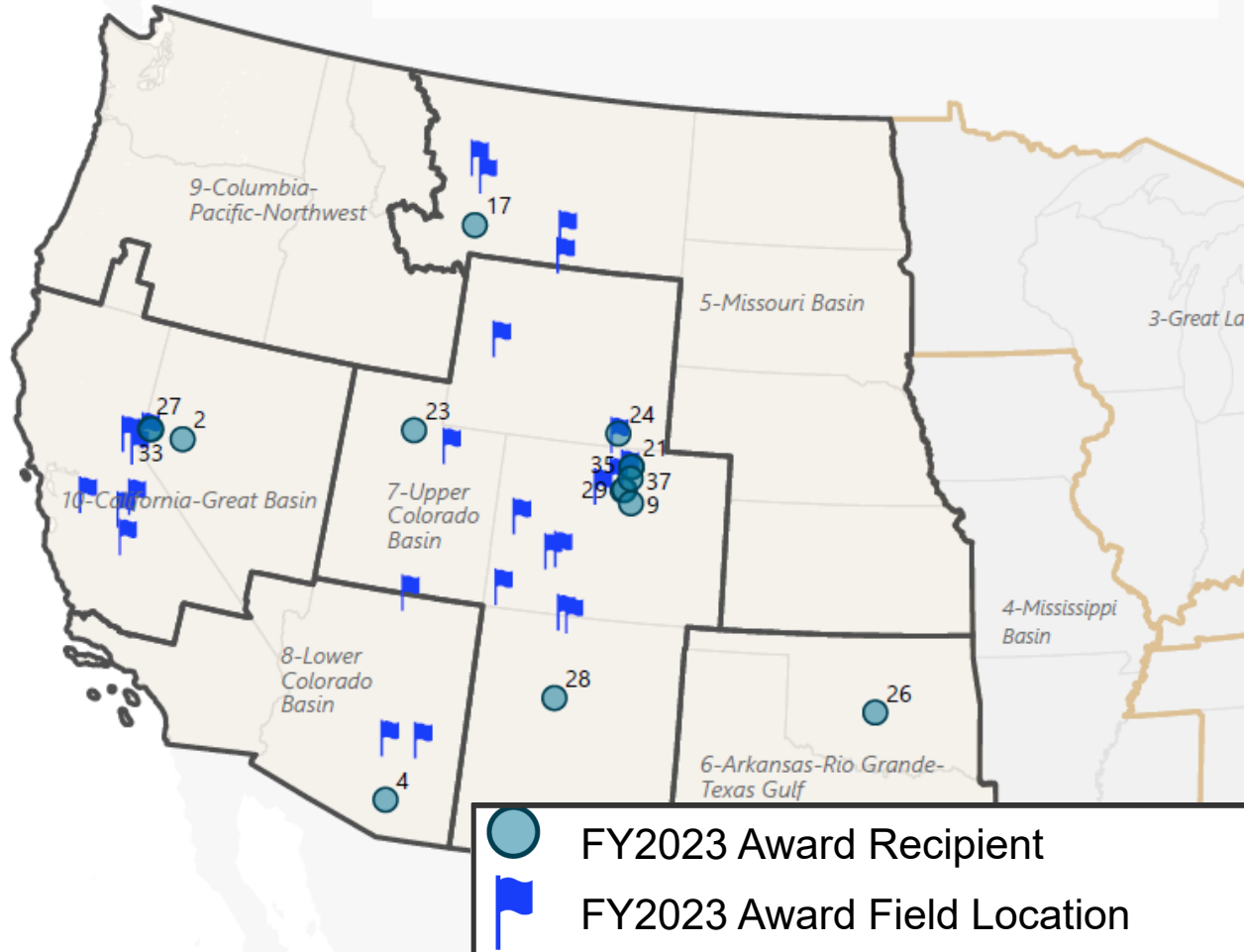
Seasonal Streamflow Volume



Water Management



Snow Water Forecast Program  
Fiscal Year 2023 SNOFO Research Field Locations



**\$11M awarded to 15 projects to private, state, local, and academic institutions**

**Technologies represented:**

- SWE Data Fusion
- UAV and Plane-based LiDAR surveys
- Satellite based observation
- Machine learning forecasting technique
- In-situ cosmic ray instrumentation
- Snow temperature measurement
- Post-wildfire WSF forecasting
- Statistical modeling with emerging SWE monitoring data sources



# FY24 SNOFO: Coming soon!

- Expected to be open on [grants.gov](https://grants.gov) in February
- Review of applications through the Spring 2024
- Project selections Summer 2024, awards Fall 2024
- Individual projects awarded \$300,000-\$999,999
- Eligible applicants:
  - State, county, city or township, and special district governments
  - Native American Tribal Governments and other organizations
  - School districts and institutions of higher education (public and private)
  - For-profit organizations
  - Nonprofits
  - Individuals





# Prize Competitions: Crowd-sourcing innovation in forecasting

## RODEO II: SUB-SEASONAL CLIMATE FORECASTING

CLOSING THE GAP ON SUB-SEASONAL CLIMATE FORECASTING

★ OVER ★  
**\$800,000**  
IN PRIZES!

## SNOWCAST SHOWDOWN



DRIVEN DATA



NCAR | NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

USDA | NRCS  
U.S. Department of Agriculture  
Natural Resources Conservation Service



## STREAMFLOW FORECAST RODEO

UP TO \$500K PRIZES

Short-Term Streamflow Forecasting

JOIN TOPCODER



1.99 ft  
Gauge Height

23.5 cfs  
Discharge

# Water Supply Forecast Rodeo Competition

Spurring innovation and advancement in seasonal water supply forecasting by engaging a broad solver community that spans relevant areas of expertise, including hydrology and water resources, hydrologic modeling, statistical modeling, data science, and artificial intelligence / machine learning

Seeking innovation in:

Forecast Skill

Uncertainty estimation

Explainability and Forecast Communication

Performance under changing conditions (e.g., climate, land cover disturbance)

**\$500,000 in prizes**

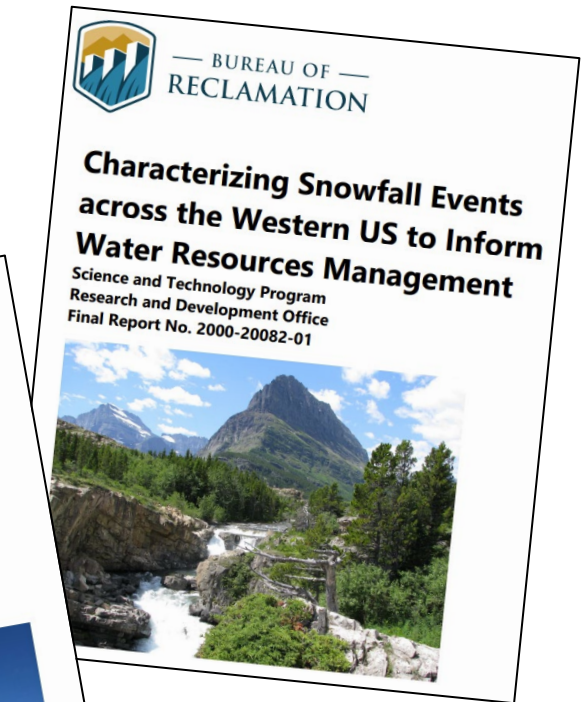


<https://www.drivendata.org/competitions/group/reclamation-water-supply-forecast/>



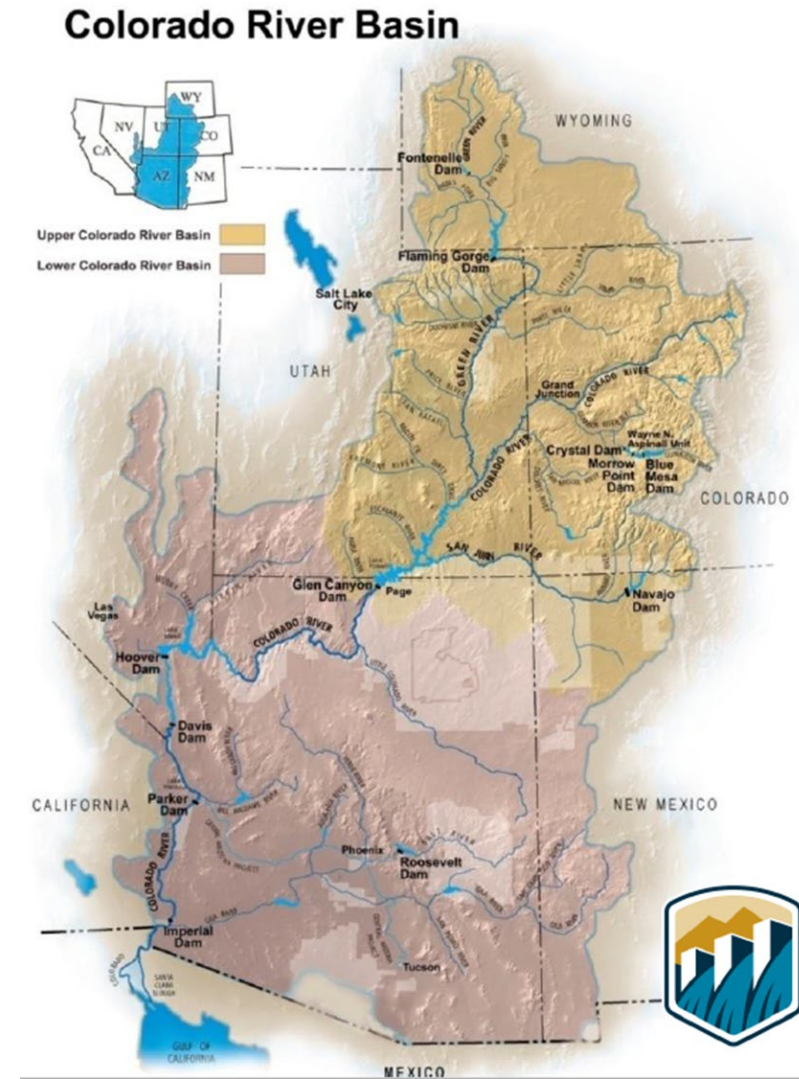
# Science and Technology Research Program

- Reclamation-wide, competitive, merit-based applied research and development program
- Project partners can receive funding through contracts/financial assistance/cooperative agreements



# Other Reclamation Investments Supporting Water Management Resilience and Flexibility

- WaterSMART Program
  - Basin Studies
  - Water Management Options Pilots
- Climate Change Activities
  - SECURE Water Act Report
  - West Wide Climate Risk Assessment (WWCRA) Team
  - Climate Change Community of Practice





[Idennis@usbr.gov](mailto:Idennis@usbr.gov)

[www.usbr.gov/research/snow.html](http://www.usbr.gov/research/snow.html)

<https://www.usbr.gov/research/challenges/>

[www.usbr.gov/research/st](http://www.usbr.gov/research/st)

[www.usbr.gov/waterSMART](http://www.usbr.gov/waterSMART)



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EXTRA



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# Basin Studies Program

## Basin Studies

Reclamation works with non-Federal partners to evaluate current and future water supply and demand and develop strategies to ensure reliable water supplies in river basins in the 17 western states

### Funding

- 50% non-Federal cost share required
- Basin Studies are not grants and Reclamation funding must be used for Reclamation staff time or contractors

## Water Management Options Pilots

Reclamation and stakeholders build on completed Basin Studies through efforts to advance strategies and apply tools and information to address water management challenges and supply and demand imbalances

### Funding

- 50% non-Federal cost share required
- These Pilots are not grants and Reclamation funding must be used for Reclamation staff time or contractors

## Colorado River Basin

