

# A day in the life of the USGS

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**U.S. Department of the Interior**  
**U.S. Geological Survey**

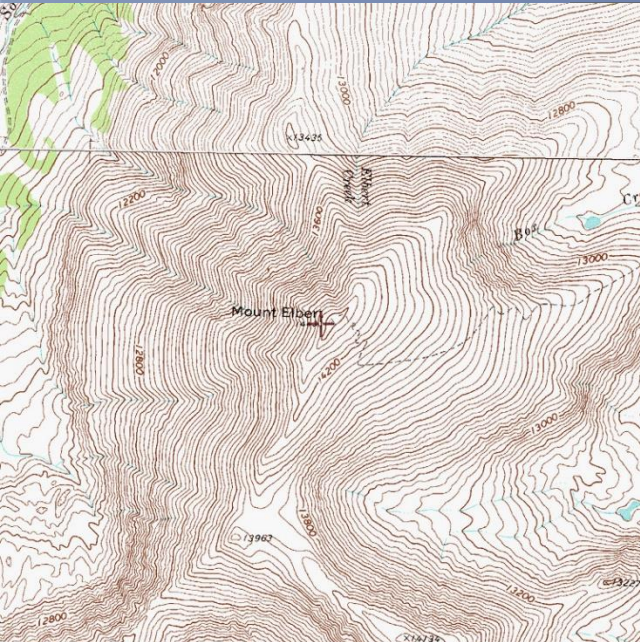
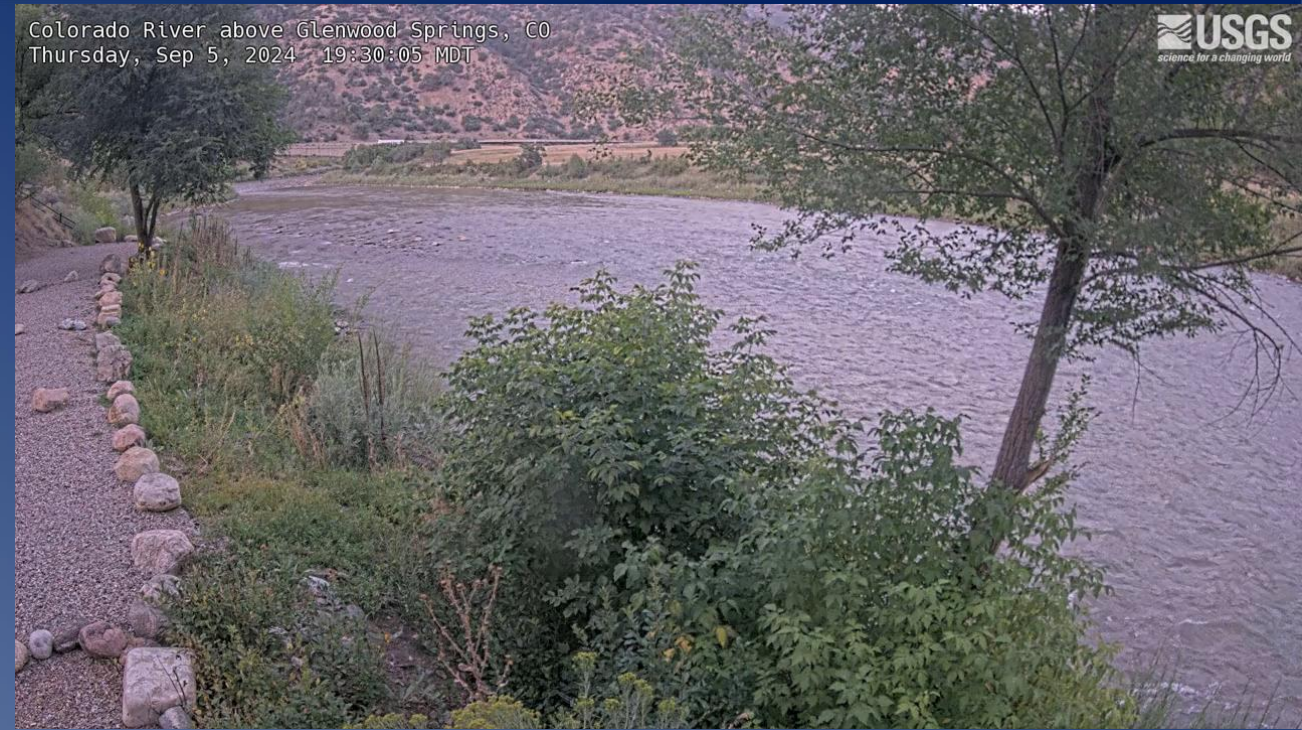


Source: <https://www.usgs.gov/media/images/usgs-personnel-embudo-station-new-mexico>

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# Tonight's agenda

1. Who is the USGS?
2. My path within the USGS.
3. How can you join the USGS?



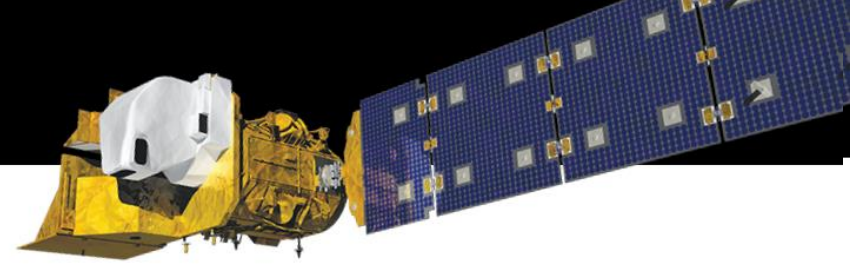
Source: <https://www.usgs.gov/products/multimedia-gallery/images>

# Who is the U.S. Geological Survey?

- Department of Interior, founded in 1879
- Conducts interdisciplinary scientific monitoring, assessment, and research
  - Mission: “The USGS monitors, analyzes, and predicts current and evolving Earth system interactions and delivers actionable information at scales and timeframes relevant to decision makers.”
  - Moto: “Science for a changing world”
- Five Science Themes
  - Core Science Systems
  - Ecosystems
  - Energy and Minerals
  - Natural Hazards
  - Water Resources
- Accomplish our mission through cooperation with local, state, and federal partnerships



# USGS by the Numbers



## People

**8,190** Employees

**1,356** Contractors

**564** Emeriti

**257** Volunteers

## Science and Monitoring

**165,000+** Publications (since 1879)

**54,000** 7.5-minute Quadrangles (Topographic Maps)

**200** Threatened/Endangered Species Studied

**25** Active Patents (85 since 1996)

**1** Research Reactor

**~20,000** USGS-operated Groundwater Wells in U.S. to Deliver and Monitor Water Levels and Water-quality Data

**11,500+** USGS-operated Streamgages

**3,800+** USGS-operated Earthquake Sensors in U.S.

**~70** U.S. Volcanoes Directly Monitored of 161 Considered Active

**14** Geomagnetic Observatories

**3** Satellites

**150M** Remotely-sensed Data Products Distributed (including Landsat)

**100%** Interferometric Synthetic Aperture Radar (IfSAR) Data Collected in Alaska

**94.7%** National Coverage of 3DEP High-resolution Elevation Data

**55%+** U.S. Coverage of Geologic Maps (Detailed to Intermediate Scale)

**171** Geologic Provinces USGS Assesses for Undiscovered Oil and Gas Resources

**~100** Mineral Commodities for which USGS Collects National Data for 180 Countries

## Locations

**487**

Laboratories

**405** Facilities

In all 50 states and 2 territories (Guam and Puerto Rico)

**68**

Science Centers (7 Regions)

**22**

Programs (5 Mission Areas)

**10**

Climate Adaptation Science Centers  
1 National - 9 Regional

## Partnerships

**4,300** Partners/Cooperators

**4,675** Contracts (FY21)

**43**

Cooperative Research Units

**54**

Water Resources Research Institutes

## Funding

**\$1,578M** FY25 President's Budget Request

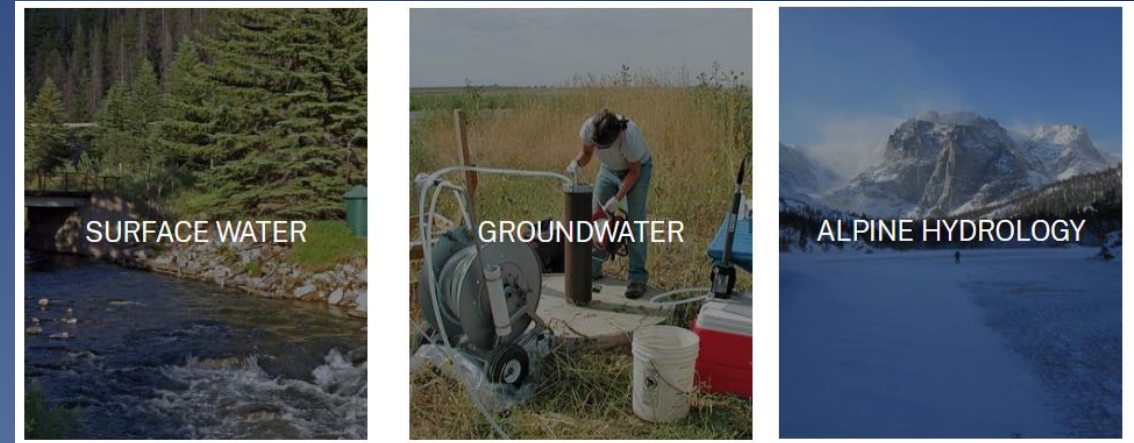
**\$646M** FY23 Reimbursables

**\$69.0M** FY25 Bipartisan Infrastructure Law



# Colorado Water Science Center

- Four offices (Lakewood, Pueblo, Grand Junction, Durango)
  - ~130 employees
- Organization of the Colorado WSC:
  - Hydrologic data collection
  - Hydrologic interpretative studies
  - Science support staff
- Types of scientists in Colorado WSC:
  - Hydrologist, Hydrologic Technician, Geologist, Hydrogeologist, Geophysicist, Physical Scientist, Soil Scientist, Chemist, Ecologist, Biologist, and more...
- Type of science: Everything related to the hydrologic cycle



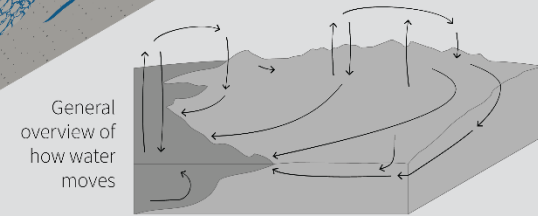
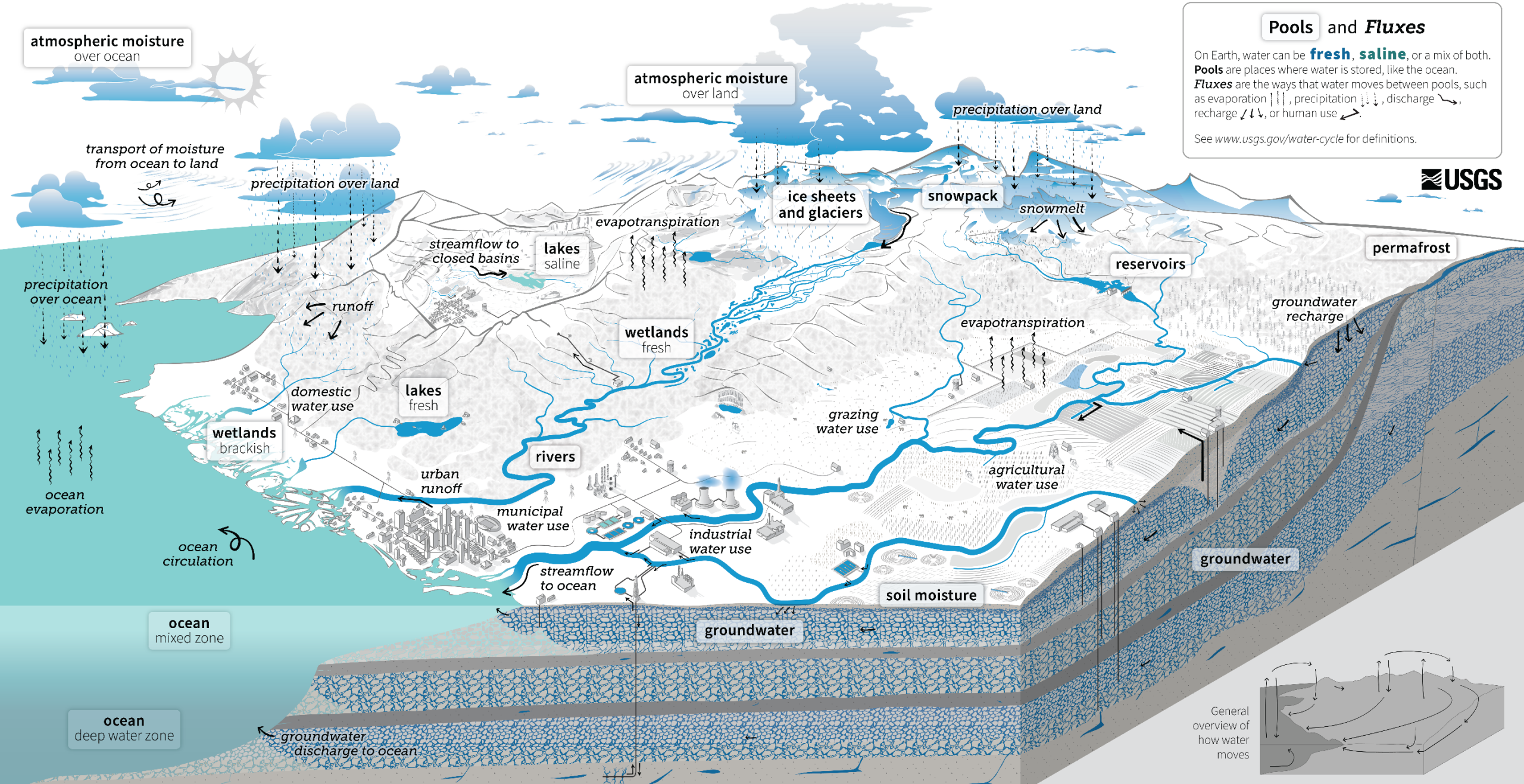
atmospheric moisture  
over ocean

atmospheric moisture  
over land

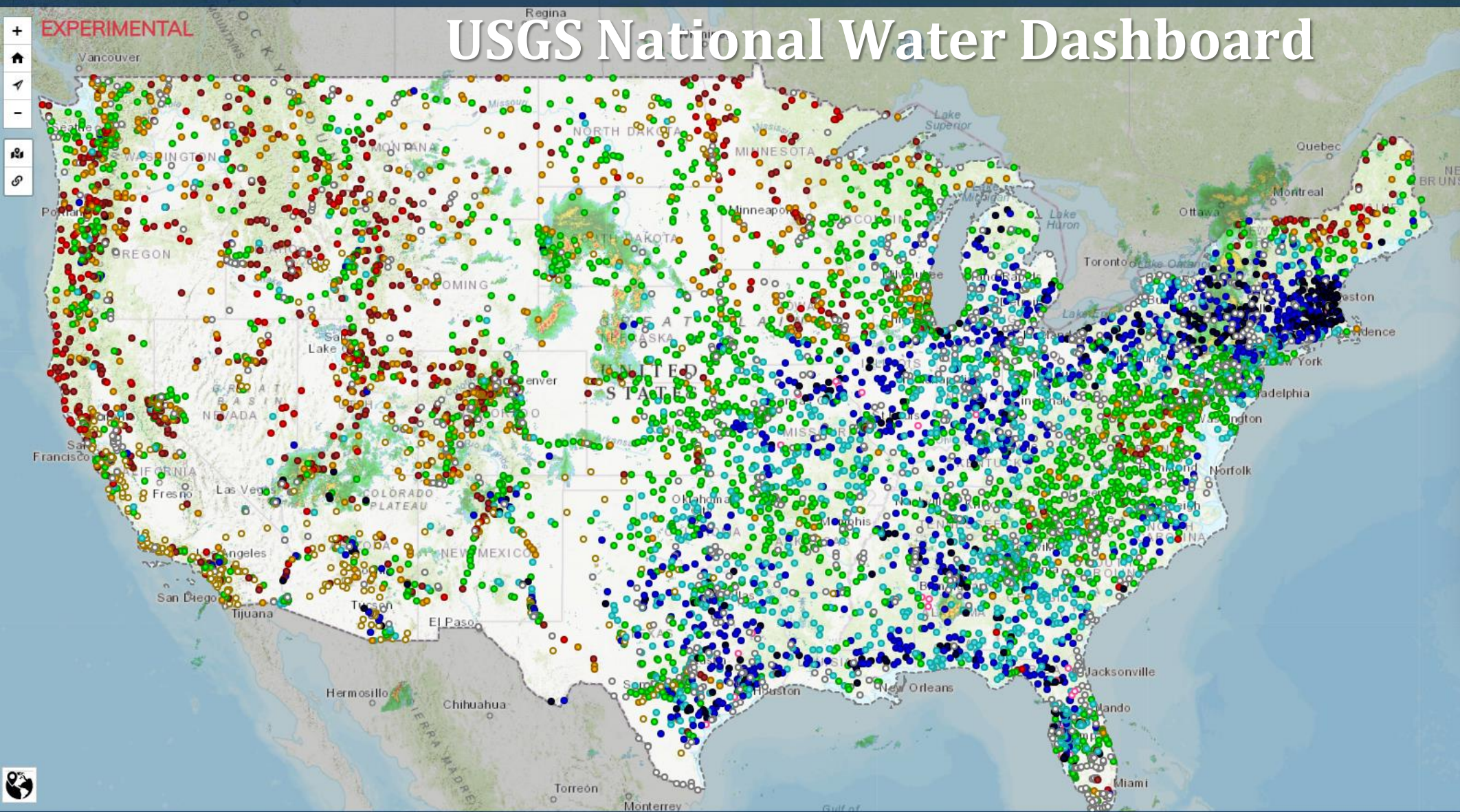
### Pools and Fluxes

On Earth, water can be **fresh, saline**, or a mix of both. **Pools** are places where water is stored, like the ocean. **Fluxes** are the ways that water moves between pools, such as evaporation ↓↑, precipitation ↓↓, discharge ↘, recharge ↙↘, or human use ↘.

See [www.usgs.gov/water-cycle](http://www.usgs.gov/water-cycle) for definitions.



# USGS National Water Dashboard



**Layers**

- USGS Stations 1
- STREAMS 8299
  - Flow status: ON
  - Streamflow Summary
- LAKES
- WELLS
- WATER QUALITY
- RAIN
- ATMOSPHERIC
- TIDAL
- Weather Conditions 1
- Hydrology
- Base Map
- Clear Layers

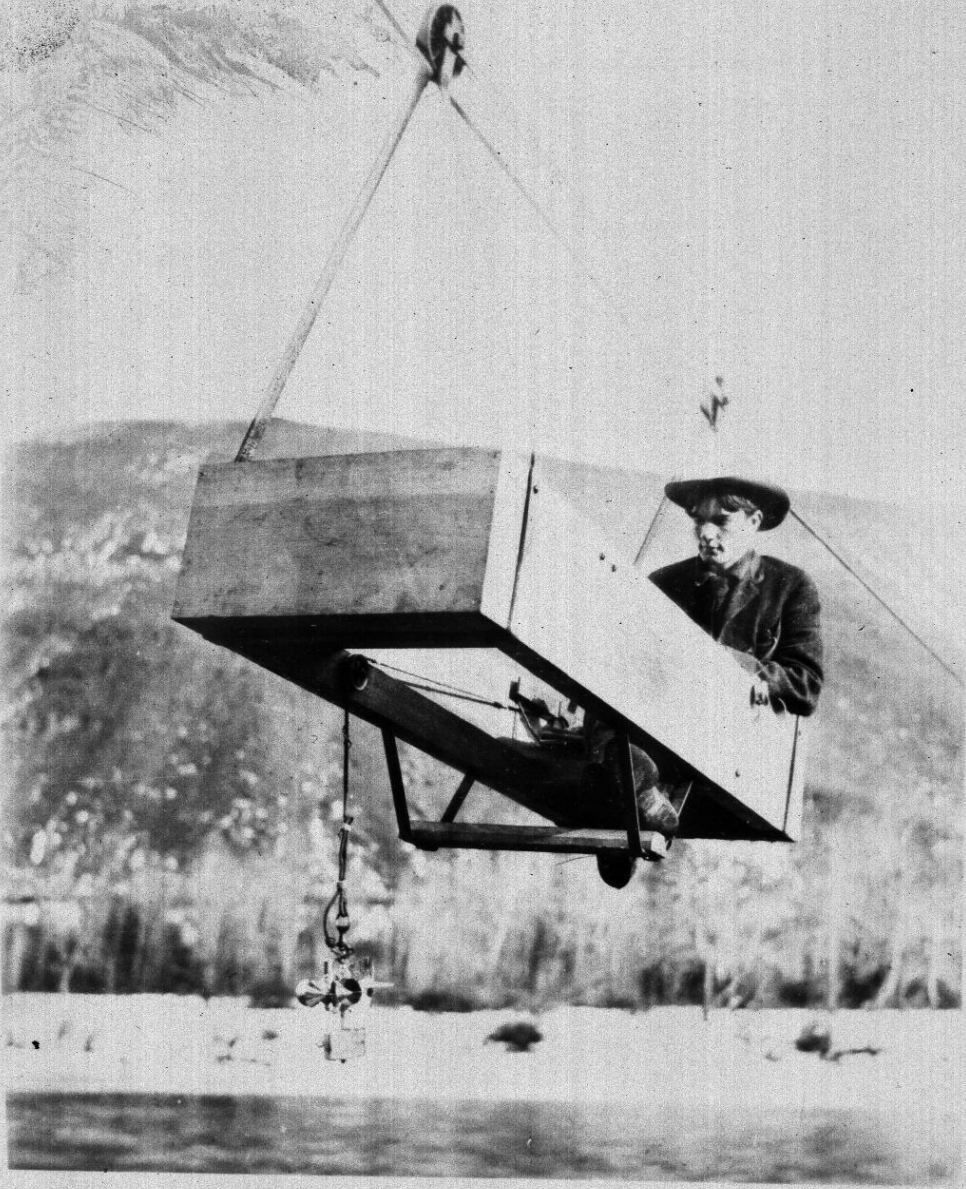
Scale 16,640,368 Lat 42.3177 Lon -100.5410  
 500 km  
 300 mi



# Streamflow measurements

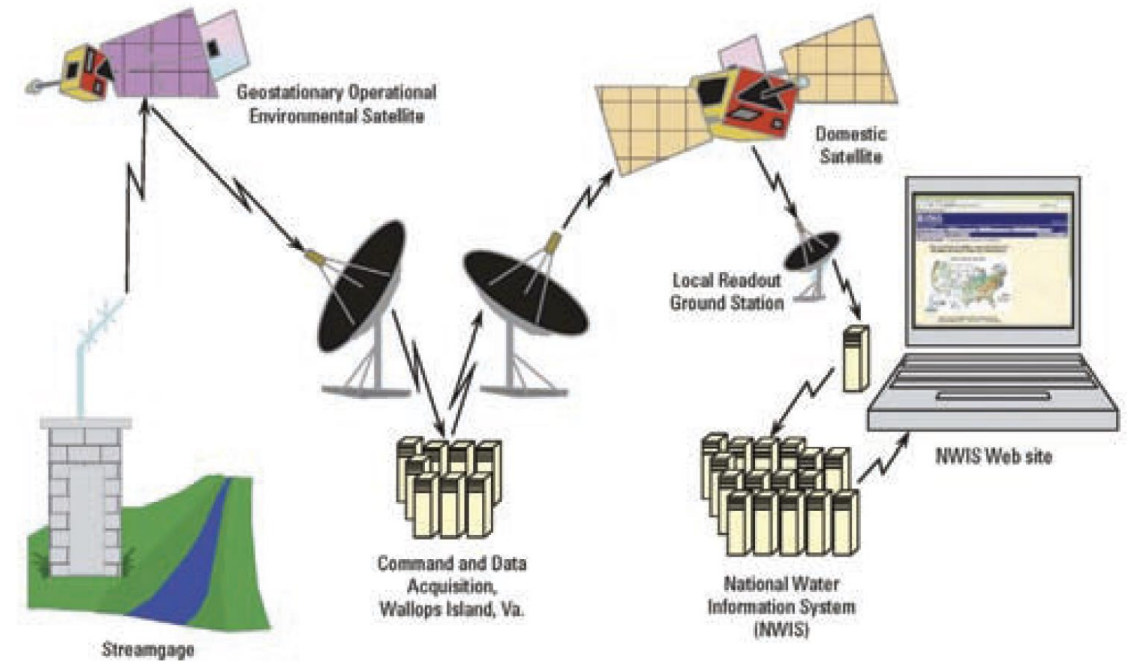
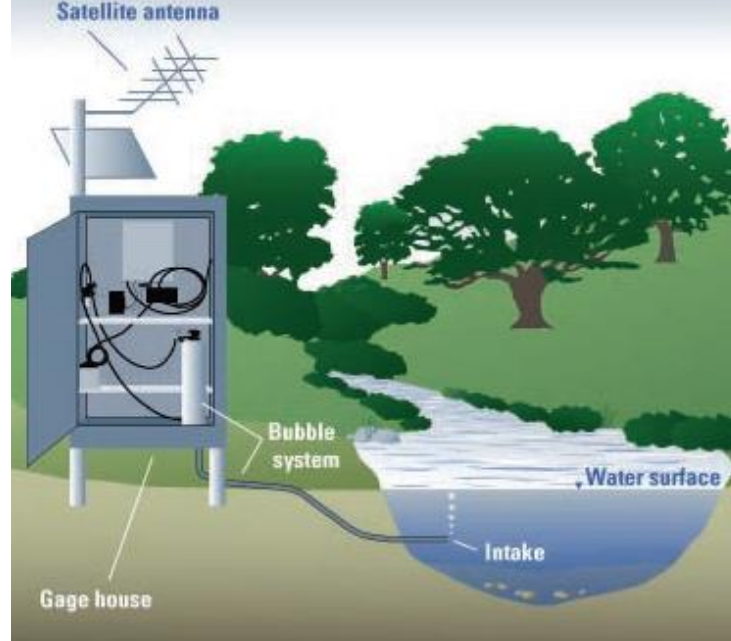
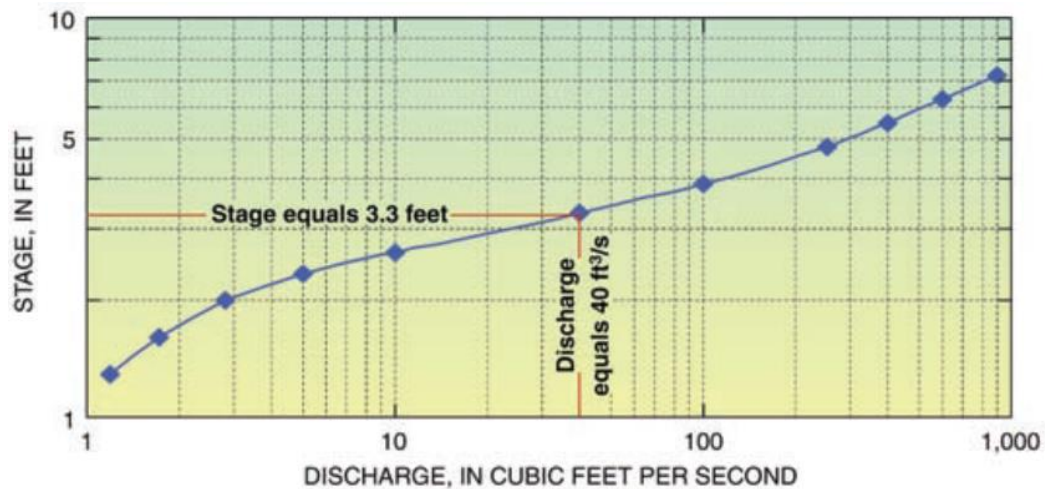
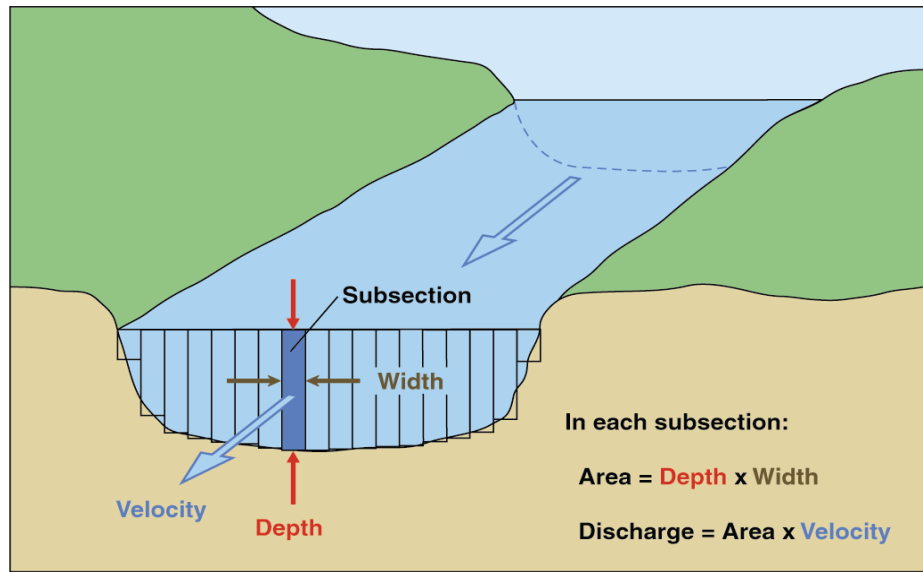


# Streamflow measurements



Source: <https://www.usgs.gov/faqs/where-can-i-get-real-time-and-historical-streamflow-information>

# Streamflow-gaging station



More than just streamflow



# Next Generation Water Observing System (NGWOS)

ACTIVE

By [Water Resources Mission Area](#) April 27, 2021

## NGWOS Illinois River Basin briefing sheet now available

IRB efforts will focus on nutrients, sediment, harmful algal blooms, water availability, urban flooding, and emerging contaminants

[Read more](#)

**Overview**

[Science](#)

[Data](#)

[Multimedia](#)

[Publications](#)

[Web Tools](#)

Substantial advances in water science, together with emerging breakthroughs in technical and computational capabilities, have led the USGS to develop a Next Generation Water Observing System (NGWOS). The USGS NGWOS will provide real-time data on water quantity and quality in more affordable and rapid ways than previously possible, and in more locations.

### Study Area



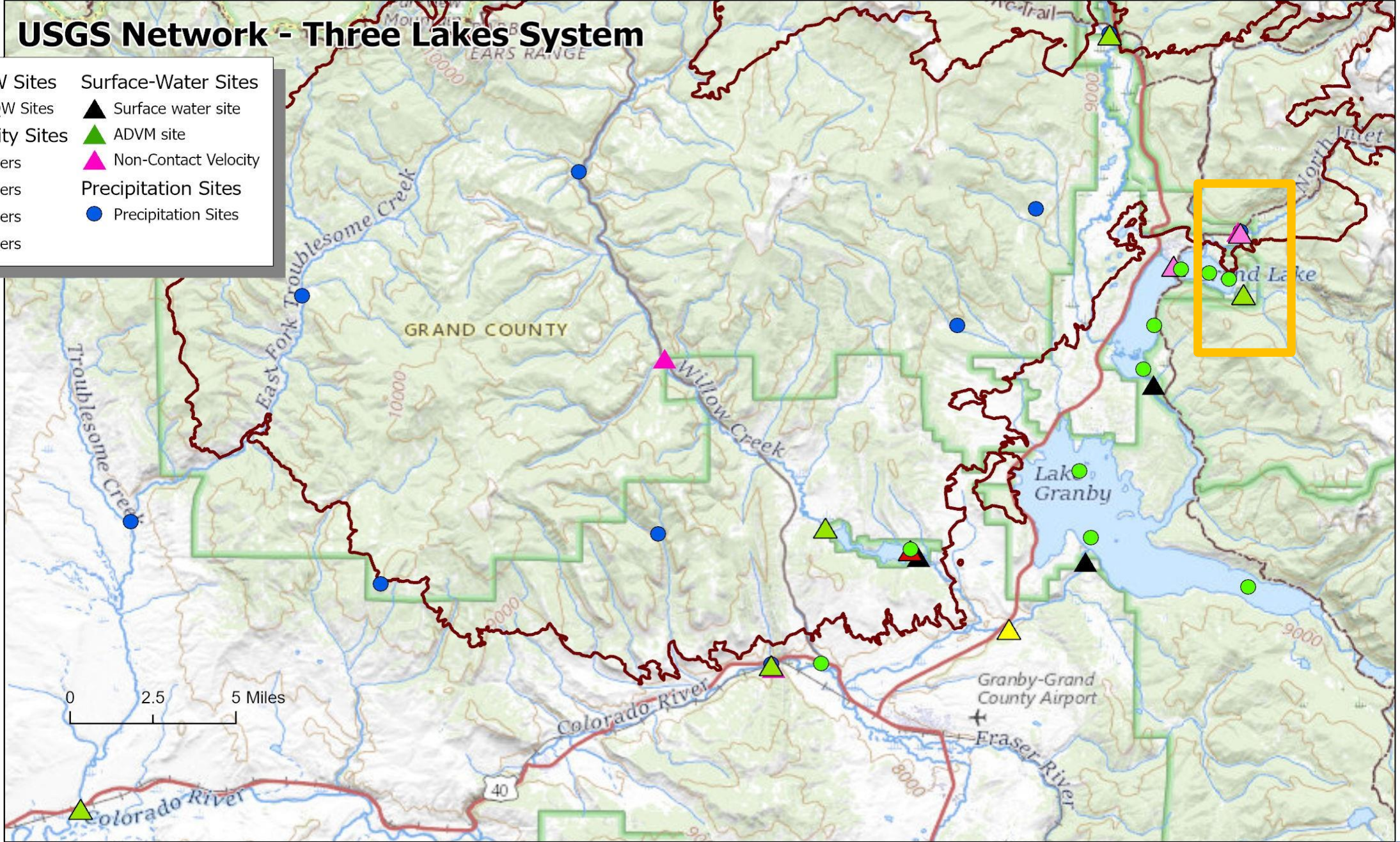
# East Troublesome Fire



- 198,812 acres burned in 2020
- Jumped the Continental Divide (snow storm eventually put it out)
- Three Lake System is a significant source of water to the Front Range

# USGS Network - Three Lakes System

- |                     |                        |
|---------------------|------------------------|
| Discrete QW Sites   | Surface-Water Sites    |
| ● Discrete QW Sites | ▲ Surface water site   |
| Water-Quality Sites | ▲ ADVM site            |
| ▲ 2 parameters      | ▲ Non-Contact Velocity |
| ▲ 5 parameters      | Precipitation Sites    |
| ▲ 6 parameters      | ● Precipitation Sites  |
| ▲ 7 parameters      |                        |



# North Inlet and East Inlet

- Unique burned/unburned paired watersheds
- Unique pre-fire continuous datasets
- Re-instrumented continuous stage, temperature, specific conductance, turbidity, fluorescence of dissolved organic matter (fDOM), nitrate
- Discrete sampling, including refrigerated autosampler



# Willow Creek Reservoir Profiler Water Temperature

## 2023 Willow Creek Reservoir Water-Quality Profiler

Station Name: Willow Creek Reservoir near dam near Granby, Colorado  
Station ID: 400853105563701

Hover over color map to view individual data points and approval status:  
P = provisional A = approved.  
If a data point is selected, select it again to toggle back to full view.



Scale is automatically adjusted based on current year data range. Color scheme is for visualization purposes only.

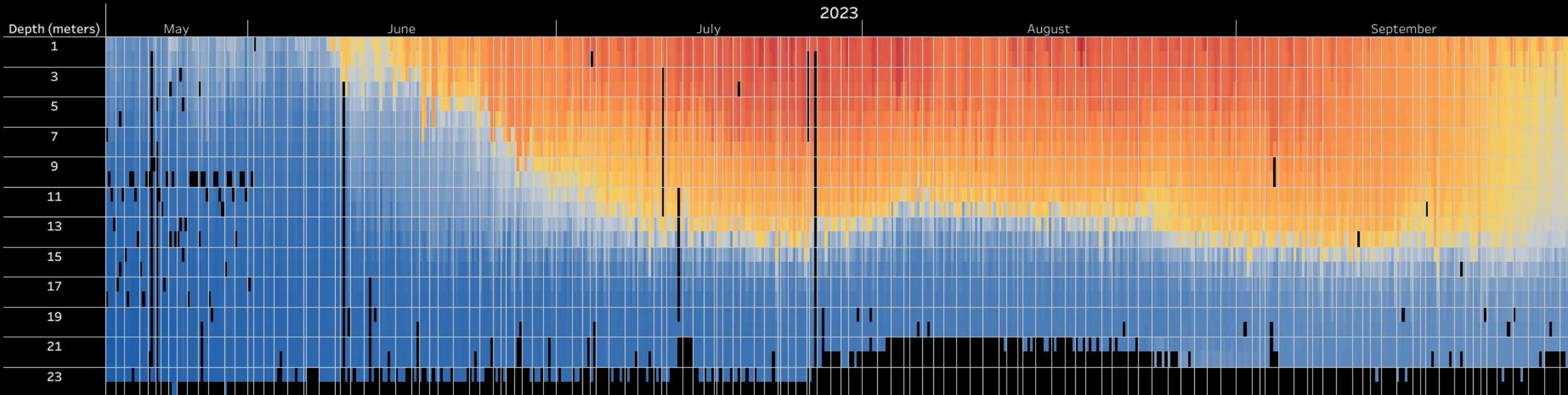
Degrees Celsius



Slide to select time range



Temperature, water



# Willow Creek Reservoir Profiler Dissolved Oxygen

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Station ID: 400853105563701

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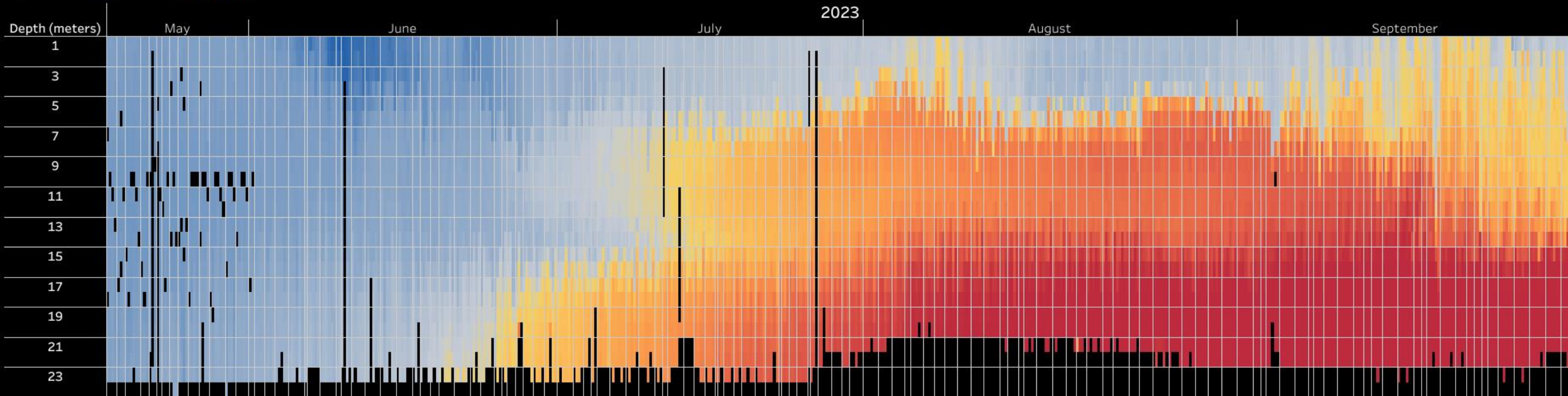
Milligrams per liter



Slide to select time range



Dissolved oxygen, water, unfiltered





# USGS Colorado River Basin Science & Technology

An Integrated Approach to Improve Efficiency and Delivery of Actionable  
USGS Drought Science Using Advanced Information Technology

[Visit a Narrative Description of this Innovative Science Initiative](#)



HOME

SCIENCE

DATA

MAPS

PUBLICATIONS

WEB TOOLS

## Colorado River Basin: Actionable and Strategic Integrated Science and Technology

The USGS Colorado River Basin Actionable and Strategic Integrated Science and Technology (ASIST) initiative is a landscape scale project to accelerate interdisciplinary science and application of advanced technology for stakeholder-driven challenges in the Colorado River Basin. The ASIST initiative supports science co-development with partners for integrated drought science and technology projects

# My path to the USGS

- UC Davis
  - B.S. in Soil and Water Science, minor in Environmental Toxicology
- Christchurch, New Zealand
- Napa Valley Winery – Chemist
- Entrix – Env. Consultant
- UNR/Desert Research Institute
  - M.S. and Ph.D. in Hydrology
- USGS
  - Oklahoma-Texas WSC
  - Colorado WSC
  - California WSC (detail)

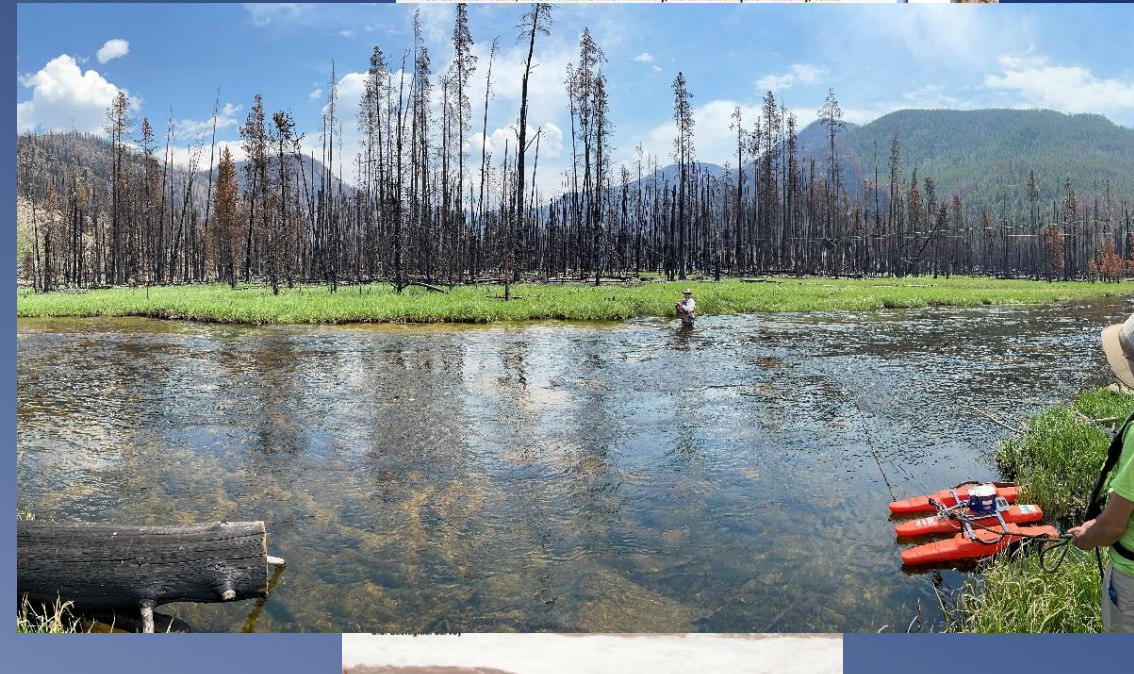
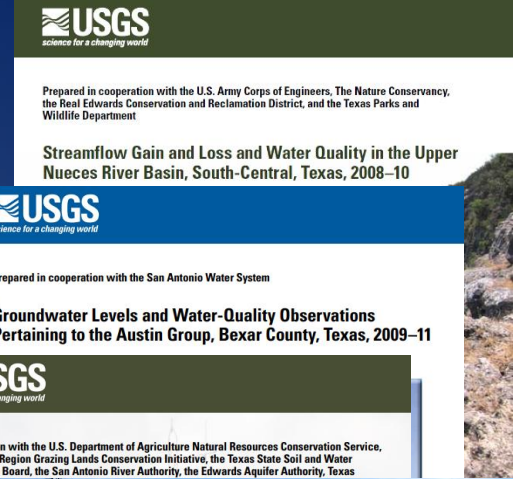


# Examining icecore glaciochemical records to understand paleoclimatology



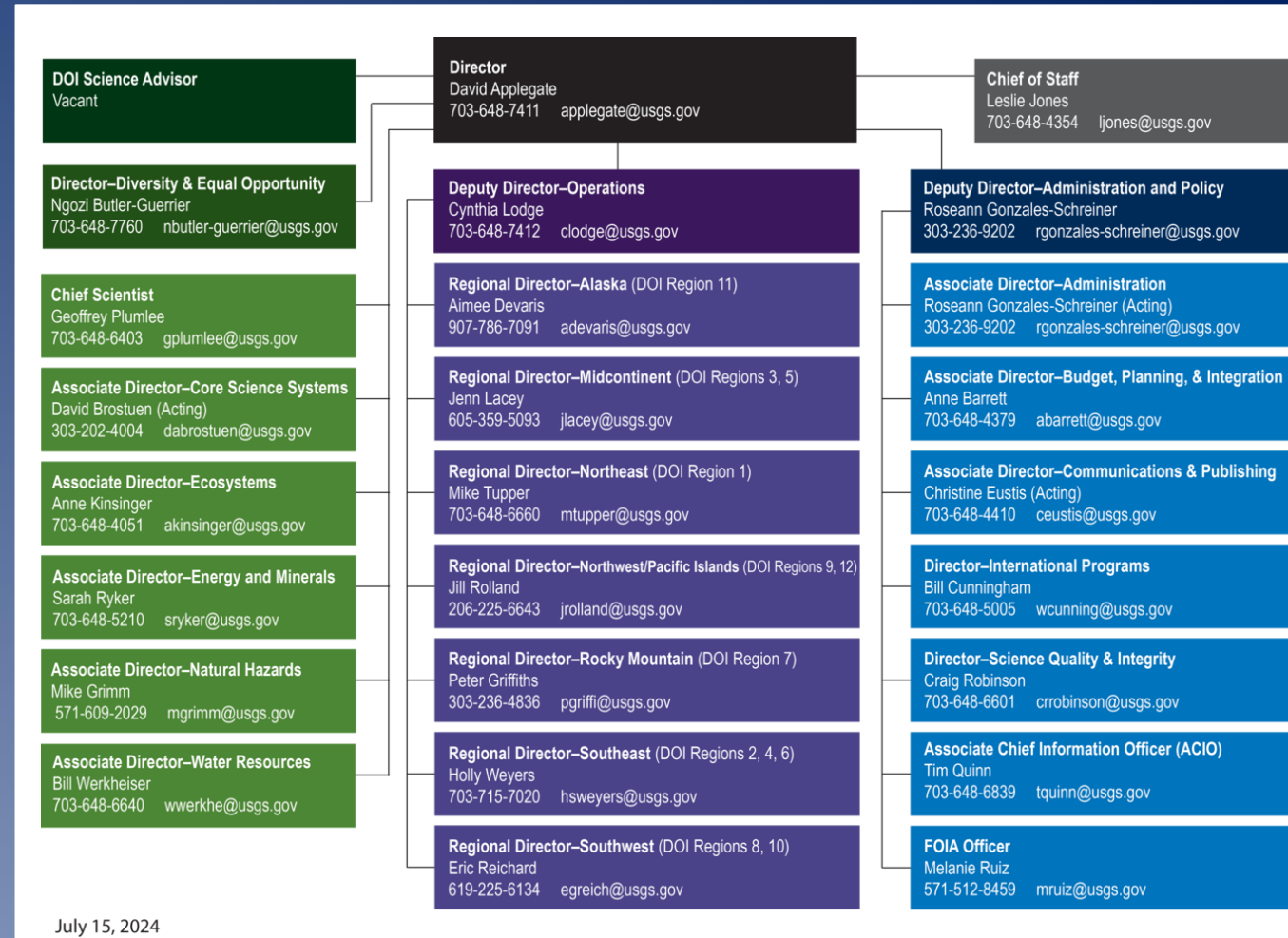
# My role with USGS: Jack of all trades

- Several aspects of the hydrologic cycle:
  - Surface water gain/loss with geochemical analyses
  - Groundwater characterization in minor aquifers
  - Springflow separation
  - Evapotranspiration – brush management
  - Suspended-sediment and HSPF modeling
  - Anthropogenic water quality analyses
- Recent focal points
  - Snow monitoring, climate change effects
  - Post-wildfire water quality
  - Harmful algal blooms
  - Holistic networks – water quality, geomorphology, sediment, ecology



# Many different seats on the USGS bus

- Scientists
  - Project Chief
  - Specialist
    - surface water
    - groundwater
    - water quality
  - Research Grade Evaluation (RGE)
- Management
  - Water Science Center
    - several supervisory roles
  - Regional Office
  - Water Mission Area



# Why join the USGS?

- USGS focuses on the science, not policy, not recommendations, not enforcement... just unbiased science.
- Do some *AMAZING* science
  - Develop specialized skills of many different data types
- You get to do everything from soup to nuts
  - Proposal ideas, field collection, data interpretation, publications, outreach





# Join the Team at the U.S. Geological Survey

Explore careers at the USGS, experience a day in the life of employees, navigate USAJobs, and see frequent questions on Federal hiring

[Find Your Career](#)

[A Day in the Life](#)

[Hiring Paths](#)

[Navigating Federal Hiring](#)

[Frequently Asked Questions](#)



<https://geonarrative.usgs.gov/join-the-team-at-usgs/>

# USGS Resources

- Water Data for the Nation:  
*<https://dashboard.waterdata.usgs.gov>*
- Publications warehouse:  
*<https://pubs.usgs.gov/>*
- Colorado Water Science Center:  
*<https://www.usgs.gov/centers/colorado-water-science-center>*
- Local Colorado hydrologic conditions  
*<https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=wsc-co>*
- Join the USGS Team  
*<https://geonarrative.usgs.gov/join-the-team-at-usgs/>*



# Questions?

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