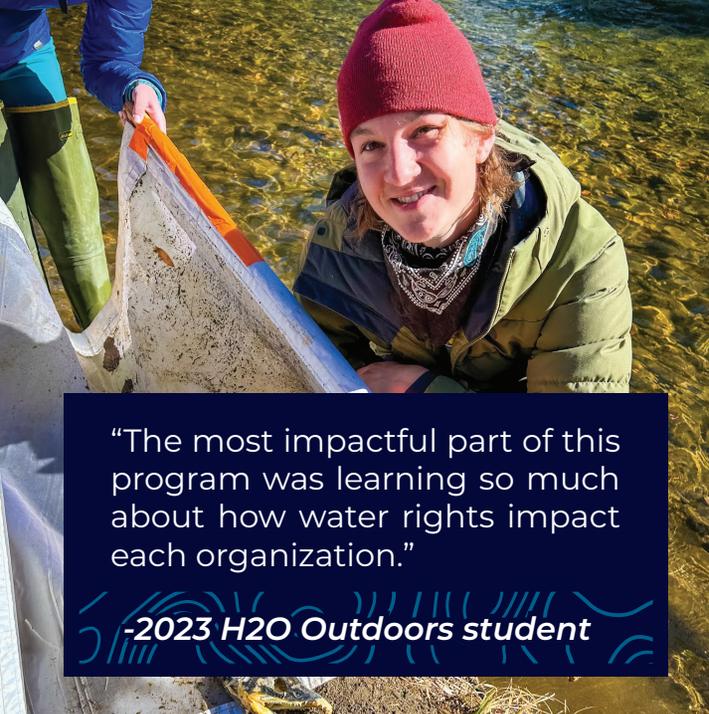




**KEYSTONE
SCIENCE SCHOOL**

2023 H2O Outdoors Impact Report





"The most impactful part of this program was learning so much about how water rights impact each organization."

-2023 H2O Outdoors student



THANK YOU TO OUR PROGRAM SPONSORS!

H2O Outdoors is made possible through generous funding provided by Denver Water and Aurora Water.



OVERVIEW



H2O Outdoors is a standards-based, educational program hosted at Keystone Science School and available to all Colorado high school students. Over the course of three days, students participate in a stream survey, expert panel, and town hall meeting to gain a broad understanding of the human and environmental complexities of water management in Colorado and, on a wider scale, the western United States.

During the program, students learned about Colorado's important role as the headwaters state for a large portion of the Colorado River Basin. They gained an understanding of water rights issues ranging from prior appropriation laws to the Colorado River Compact. The students conducted a stream survey, met experts from industries with stakeholder roles in the water management process, and participated in a town hall debate to address a scenario designed around realistic water management questions.

PROGRAM GOALS

1. Explain the concept of a watershed and identify major watersheds in the US, Colorado, and Summit County.
2. Understand water supply and demand issues in Colorado and the Colorado River Watershed.
3. Explain prior appropriation and the nature of a water right in Colorado.
4. Recognize the importance of limited freshwater resources.
5. Analyze and interpret the perspectives of real-life stakeholders in Colorado water management through the lens of sustainability.
6. Practice 'solutions-oriented' collaborative approaches to managing Colorado's water resources.
7. Collect field data relevant to water quantity and quality.



“The most impactful part of this program was getting to experience the differing views on such an important topic and educating myself on water issues in Colorado.”

-2023 H2O Outdoors student

PROGRAM SCHEDULE

Staff Training Days

Prior to the beginning of the program, Denver Water and Aurora Water education team staff spent time with the Keystone Science School instructors to get to know one another, ensure content unity, and learn from each other.

The instructors also connected with the Keystone Policy Center to do a training on how to coach the students on finding common ground and negotiate between stakeholders during the town hall.

Instructors also took time to review the curriculum topics and finish lesson planning.

Wednesday, October 26th

- Students arrive and program introduction
- Read the Lorax all together and introduce the student's stakeholders
- Cooperation based teambuilder
- Build a watershed - basic introduction to the Continental Divide, which way water flows
- Write questions for expert panel in journal
- Expert panel
- Evening program: Stakeholder development and poster making
- Astronomy and Campfire

Thursday, October 27th

- Prior appropriation at breakfast
- FIELD GROUPS - Off campus for data collection**
- Drop in a bucket - Water uses in Colorado
- 80/20 - Where are the people?/where is the water?
- Discuss point/nonpoint source pollution → chemical survey
- Stream survey - chemical, physical, biological
- Loveland Pass—revisit watersheds, connect watersheds
- Back on campus, hot chocolate and snack
- Prepare & present aquatic survey results
- Plumbing the Colorado activity - understanding the Colorado River flow
- Watch a video about the Pulse Flow on the Colorado River

Evening Program:

- Stakeholder poster presentations
- Dutch Auction and dance party

Friday, October 28th

Town Hall Meeting

- Each stakeholder states who they are, why they value water, and their position on the prompt
- Open debate/discussion
- Mingling time - stakeholders can meet and discuss specific solutions
- Open debate/discussion - solution focused
- Solution voting
- Discussion and clarification
- Debrief



DAY 1

EXPERT PANEL & WATERSHEDS

EXPERT PANEL

The expert panel is an opportunity for students to learn about issues within water quality and quantity directly from professionals working in the field of water management. The panel provides students with a baseline of water management knowledge while exposing them to careers within the world of water.

TOUR OF CONTINENTAL DIVIDE & WATERSHED EXPLORATION

To gain a sense of scale surrounding western water issues, students visited the Continental Divide to discuss human impact on watersheds, including pollution and trans-mountain diversions, and the distribution of water in Colorado relative to its population.

PANELISTS

Colorado Farm Bureau

Brandon Bainer

Associate Director of County & Member Development

Tarin Kemp

Director of Public Policy State Affairs

Outdoor Recreation and Tourism

Troy Wineland

Summit County Water Commissioner

Climax Molybdenum

Alex Ungers

Senior Environmental scientist

Front Range Water

Matt Bond

Denver Water - Youth Education Manager

CWCB

Jackie Daoust

Regional Water Plan Grant Manager for the Metro, South & North Platte

Oil and Gas

Mary Dawson

Aurora Water, Sr. Environmental Education & Outreach Specialist

Western Resource Advocates (WRA)

Anna Graf

Keystone Science School, School Year Programs Manager

Trout Unlimited/Fishing

Mark Heminghaus

Former Trout Unlimited Summit County chapter president

Colorado River District

Ellie Muncy

Town of Breckenridge Community Development Planner



"I liked going outside and getting a hands-on experience."

-2023 H2O Outdoors student



DAY 2 STREAM SURVEY

On day 2 students went into the field to conduct stream surveys and tested the health of local rivers. Two groups of students traveled to different locations across the Summit County watershed to collect data before sharing their results with each other. Following an analysis of the data, students made their own inferences of the general health of the watershed.

What tests were completed?

Physical Water Test

1. Stream discharge (CFS calculations)
2. Stream Area
3. Resistance Constant
4. Surface Velocity

Aquatic Biology Survey

1. Monitoring Aquatic Macro-invertebrates

Chemical Water Quality Test

1. Temperature
2. pH
3. Dissolved Oxygen
4. Heavy Metals
5. Phosphates
6. Iron
7. Nitrates & Nitrites

Where did groups go for the testing?

Upper Blue River, Lower Blue River and compared information gathered about the Snake River.

DAY 3

TOWN HALL

The town hall is the culminating activity with students focused on collaboration and consensus building. Through the lens of their assigned stakeholder roles, students worked to generate policy recommendations within the given prompt.

PROMPT

The population of the Front Range is predicted to increase from 5.8 million in 2021 to 7.8 million by 2040. In preparation for this population boom, there has been a proposal to expand an existing reservoir in the mountains of the front range. The project will raise the height of the dam by about 100 feet and increase the capacity of the dam from 40,000 acre-feet to about 120,000 acre-feet. The water to increase the capacity is coming from the Western Slope through an already established transbasin diversion tunnel.

Guided questions for you to think about as your stakeholder:

- Will your stakeholder benefit more from the water being moved to the Front Range or would it benefit you more to have it stay on the Western Slope?
- Do you agree with the proposal as it stands? What conditions would you add or modify to this proposal to see it passed?
- What alternative solution to raising the dam height do you propose?

AND/OR

- What compromises are you willing to work with if this proposal does happen?
- What do you want?
- What do you need?
- What are you going to bargain with or for?

“The town hall argument was very impactful. Working to understand different opinions and viewpoints is vital to our future and I feel we definitely got to work on that here.”

- 2023 H2O Outdoors student



Stakeholders

*Colorado River District
Climax Molybdenum Mine
Colorado Water Conservation Board (CWCB)
Trout Unlimited
Colorado Farm Bureau
Oil and Gas Exploration Company
Front Range Water
Outdoor Recreation & Tourism
Western Resource Advocates (WRA)*

PROCEDURE FOR TOWN HALL MEETING

The students all met in Rives (our KSS Dining Hall) and represented their stakeholders, facilitated by instructors. Some of the partners were there to help answer questions as they came up. The teachers from the Beyond the Classroom program attended as well as some of the Keystone Science School administrative staff.

Town Hall Meeting

- Each stakeholder states who they are, why they value water, and their position on the prompt
- Open debate/discussion
- Mingling Time - stakeholders can meet and discuss specific solutions
- Open debate/discussion - solution focused
- Solution Voting
- Discussion and Clarification
- Debrief

TOWN HALL RESULTS & POLICY RECOMMENDATIONS

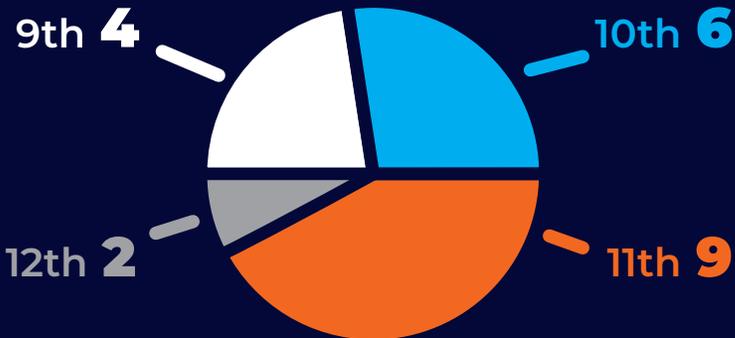
- Expanding the reservoir capacity up to 80,000 acre-feet instead of the 120,000 acre-feet as was originally proposed. It will be initially filled to 60,000 acre-feet but has the capacity for 80,000 when needed.
- Front Range water is willing to support recreation efforts on the reservoir.
- Climax can invest money into the recreation projects in exchange for affirmation of their water rights and funding of water treatment resources.
- Oil and Gas exploration could fund the recreation projects in exchange for an increased amount of recycled water.
- Oil and Gas exploration provide financial support to Trout Unlimited for education purposes in exchange for Trout Unlimited support of this project.
- Front Range Water will suppliers the Western Resource Advocates in funding monitoring systems for efficient water use.
- Outdoor Recreation and Tourism will help fund fish ladders for Trout Unlimited in exchange for Trout Unlimited helping to maintain the trails and recreation areas around the reservoir.
- Trout Unlimited and Colorado Water Conservation Board provide financial support to the Colorado River District to help fund water conservation research.



THE STUDENTS



STUDENT GRADE



22 STUDENTS

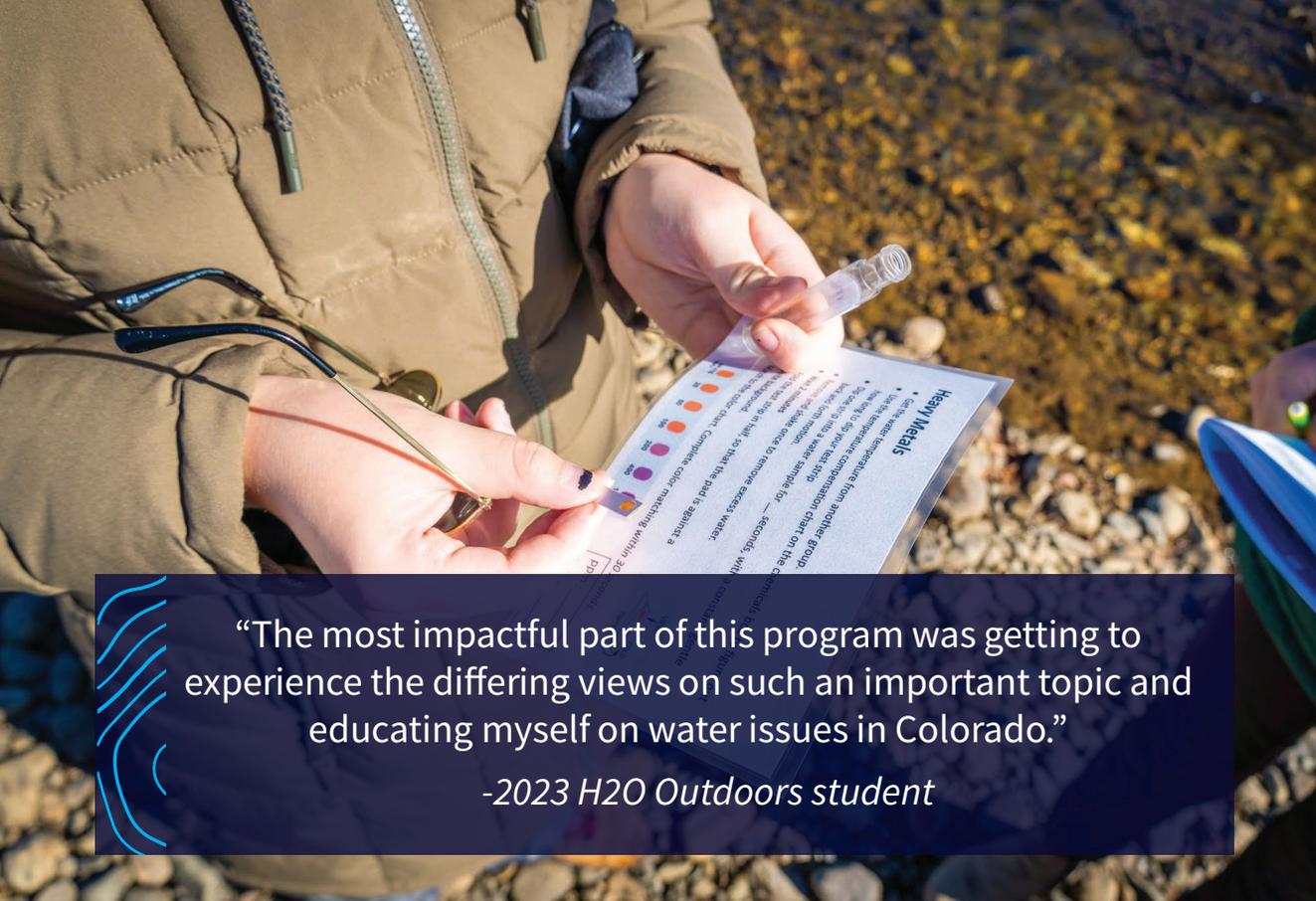
576 CONTACT HOURS

PARTICIPANT CITIES IN COLORADO

Aurora
Arvada
Castle Rock

Denver
Evergreen
Littleton

Monte Vista
**Steamboat
Springs**



“The most impactful part of this program was getting to experience the differing views on such an important topic and educating myself on water issues in Colorado.”

-2023 H2O Outdoors student





POST-PROGRAM EVALUATION **RESULTS**

After the conclusion of the program:

100% of our participants felt they were knowledgeable about water.

100% of participants believed that collaboration can occur when opinions differ.

95% of participants felt it was important to understand the issues surrounding water policy and management.

100% of participants understood where their water comes from.

100% of participants agreed that Collaboration is important in determining water policy and management.

100% of our participants agreed that water is a limited resource.





What is one new thing you learned while you were at H2O Outdoors?



“One new thing I learned during this program was that communities are working together to refill the Colorado river.”

“I learned how to collaborate with people I didn’t know.”

“I learned about Western Resource Advocates which I didn’t previously know about.”

“One new thing I learned during this program was what role farmers and ranchers play when it comes to Colorado’s water. I also learned about how important it is that multiple people contribute to a conversation.”

“One thing I learned during this program is how the Colorado river impacts so many people.”



**KEYSTONE
SCIENCE SCHOOL**

THANK YOU!

See you at the next
H2O Outdoors

COMING FALL 2024

SUPPORT KSS PROGRAMS

Help us continue our mission and deliver quality outdoor education by donating today at

[KEYSTONESCIENCESCHOOL.ORG](https://www.keystonescienceschool.org)

or scan the QR code below!



DONATE HERE

