November 3, 2025

Colorado Water Conservation Board
1313 Sherman St., Room 718
Denver, CO 80203

Re: **"Youth Development, Water Education, and the Colorado Water Plan (Year Zero)" final report – WSRF grant POGG1 2025-617**

CWCB:

With gratitude for your support, we provide this final report for "Youth Development, Water Education, and the Colorado Water Plan (Year Zero)." Note we have branded this work the "Water Education Exemplars Project" (WEEP) publicly. All deliverables and tasks from our 2025 work plan have been successfully completed.

During our project's planning year, we have:

- Established a review system for Colorado water education resources, using best practices from youth development and environmental education (main project Objective);
- Completed 15 of 15 Water Education Exemplars reviews of water education materials and programs for Colorado K-16 students (Task 1);
- Recruited and trained 9 of 9 young people who now serve as reviewers, using *Guidelines for Excellence in Environmental Education* national standards' rubrics customized for Colorado (Task 2); and,
- Written a project continuation plan, including budget and fundraising needs, setting forth these 5-year project goals (Task 3):
    - 100 Water Education Exemplar reviews using the *Guidelines for Excellence in Environmental Education*;
    - 35 youth reviewers able to conduct the reviews, from nomination through to ground-truthing; and,
    - Amplification of designated Water Education Exemplars, through expansion, replication, and/or improvement.

Please find our main project deliverable, "Water Education Exemplars Project Reviews 2025," as the first attachment. This report adds to the documentation provided in our mid-year reports from April and July.

Additionally, we shared WEEP formally at four professional conferences, making five peer-reviewed presentations (copies attached):

- Colorado WaterWise 2025 Water Conservation Symposium (Sept. 18, Westminster);
- Colorado Alliance for Environmental Education 2025 Advancing Environmental Education Conference (Sept. 19, Estes Park);
- Sustaining Colorado Watersheds Conference (Oct. 8, Avon [concurrent session]);
- Sustaining Colorado Watersheds Conference (Oct. 8, Avon [poster session]); and,
- North American Association for Environmental Education 2025 Conference (Nov. 3-6, virtual [on-demand "Bright Spot"]).

Total attendance for these conferences exceeded 1,600 water and education professionals, and we reached more than 250 face-to-face during our presentations.

Since providing the first-ever evidence-based external evaluations of Colorado water education resources, we have begun to receive feedback about this system and its recognition of "Water Education Exemplars." These responses include:

- "We appreciate the thorough review, and we're excited to be addressing some of the areas we currently lack in our new exhibits, which will open by summer 2026…. We are also excited to print our new badge and display it at our exhibits in Hydro!" (Kathryn Venzor, Senior Director of Education & Visitor Engagement, and Stefan Karg, Water Education Coordinator, CSU Spur, Colorado State University);
- Review findings for the Denver Metro Water Quality Assessment Tool were presented to the South Platte River Urban Waters Partnership on Feb. 4. Based on recommendations from the review, the group is adding a student user's guide to their website and rewriting text to reduce complexity from an upper high school/undergraduate level to middle school. The Water Education Exemplar process, they concluded, was "helpful."
- The Greenway Foundation's South Platte River Environmental Education reports they have "already started including this credential in our grant applications" and they posted a notice to their social media accounts on Oct. 22 (LinkedIn, Facebook, and Instagram; see adjacent screenshot).
- The Center for Education, Engagement, and Evaluation of the Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder) posted a news release, "HEART Force Drought Unit Awarded Colorado Water Education Exemplar Badge" on Oct. 22, announcing the designation of their Hazard Education, Awareness, and Resilience Task Force (HEART Force) as an exemplar. They also are a current CWCB grantee working to improve HEART Force and other educational resources. More of their curricular resources, such as the We are Water Program, are expected to be reviewed in the future.

- Colorado Trout Unlimited posted a blog entry, "Colorado Trout in the Classroom Recognized as a Colorado Water Education Exemplar," on Oct. 22.
- Youth reviewers have expressed value in being involved. "The programs I have reviewed have me in awe that there is so much being done to promote the education of our youth…I love to see that the youth that will come after me have opportunities I may not have had!" (Alexia Lor, Metropolitan State University of Denver) Seven of the 9 youth reviewers wish to continue this work in 2026.

We are pleased with our planning year's accomplishments. Now that we have an operational system, we eagerly anticipate making steady progress through to project completion in 2030. Our project's work, both completed and planned, creates quality control for water education, builds an external evaluation system for water educators, and deepens water literacy for young Coloradans.

Donny Roush
Project Manager

Casey Davenhill
Executive Director

"Youth Development, Water Education, and the Colorado Water Plan"

WATER EDUCATION EXEMPLARS PROJECT REVIEWS 2025

Providing external evaluation and quality control for K-16 resources to deepen water literacy for young Coloradans

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November 2025

A project of COLORADO WATERSHED ASSEMBLY

Contents

Water Education Exemplars Project

A child born today will be an adult by 2050, the year the Colorado Water Plan will be fully implemented.

“How old will you be in 2050?”

Since the 2023 release of the Water Plan, we’ve been using this guiding question with students with positive, eye-opening responses. It also prodded water educators to contemplate how our work can better support the Plan’s vision.

As a result, we have established a quality control system for Colorado water education for the first time. We are now providing external evaluation to dozens of programs teaching K-16 students about water – with much of the work done by water-career-tracked young people. Thanks to Colorado Water Conservation Board funding (via local citizen-driven South Platte and Metro Basin Roundtable awards for a planning year during 2025), we have established a research-based system using national education standards to identify Colorado’s “Water Education Exemplars.” This year, we have established our review system and completed 15 program reviews and recruited and trained 9 young people.

This project is novel in its application of the *Guidelines for Excellence in Environmental Education* in support of State-level policy implementation, its tapping into this type of State funding for environmental education and external evaluation, and its employment of youth reviewers to identify Colorado’s Water Education Exemplars.

Starting in 2026, this 5-year project sets its pace to complete 100 reviews, engage and compensate 35 youth participants, and impact the majority of Colorado’s K-16 student population. It will also help inform State water decision-makers as to what materials and programs qualify as quality youth “education” and what resources do not (*e.g.*, agency outreach or advocacy group persuasive messaging).

Resources identified as “Colorado Water Education Exemplars” will be recognized and promoted. These best of the best education offerings will be amplified through expansion, replication, and improvement.

– Donny Roush, Project Manager/Certified Master Environmental Educator

Terms and Conditions

What is a program?

Any type of organized, topic-specific presentation or other delivery of information by educators to a defined audience of learners. Environmental education programs aim to develop environmental literacy by developing skills, knowledge, and inclinations to enable learners to arrive at their own well-reasoned judgments and take deliberate action as a member of their community.

The *Guidelines for Excellence in Environmental Education* defines "program" as "an integrated sequence of planned educational experiences and materials intended to reach a particular set of objectives." Note that programs can be nested into larger programs, much like watersheds.

What is a material?

Any type of structured information created and disseminated as an instructional resource. These include lesson plans, activity guides, websites, interpretive displays, and activity kits (also called traveling trunks). Environmental education materials typically separate the material creator from the instructor, while containing guidance for high-quality instructional delivery.

The *Guidelines for Excellence in Environmental Education* notes "material" as an instructional resource, such as activity guides and lesson plans, and that materials for environmental education come in a wide array of formats.

Criteria for programs and materials considered for this project

- Colorado-based and water-focused
- Intended for a K-16 audience
- Has duration and intensity beyond a brief episode
- Currently demonstrating success in reaching learners
- Predominantly educational in nature, rather than merely informational or persuasive
- Open to external evaluation

Colorado-ness

How does this educational program/material support the Colorado Water Plan?

While this response is open-ended, it provides evidence-based ways the resource may assist with attaining the vision of the Water Plan. It is not speculative, but rather based on how the current tool can be used with learners. This is a project-specific addition at the bottom of the summary sheet/rubric.

Recognition of exemplary programs and materials

Educational resources with accomplished reviews receive this badge to display, along with this explanatory tagline:

This program builds water literacy for young Coloradans. Its educational excellence has been corroborated by review against the *Guidelines for Excellence in Environmental Education* (national standards), and it is supportive of the Colorado Water Plan.

REVIEW PROCESS

Water Education Resource (Program or Material)

Nominated by staff and/or partners (Roundtables/ PEPO/CWCB/ env'l education networks)

Triage: Meets Criteria?

Preliminary assessment by staff: Is the resource…

- Colorado-based, water-focused
- K-16 audience
- More than a single episode
- Educational, rather than informational
- Open to evaluation

Yes: Likely Exemplar

Non-qualifying resources tend to be outreach and/or adult intended

Meet with "owner" of resource

Explain external evaluation process and documentation requested:

- Curricular/ instructional materials
- History of program/needs assessment
- Program evaluation
- Program budgets/plans

Full Review: *Guidelines for Excellence in Environmental Education*

Lead reviewer exams all documentation for evidence of:

- Indicators from *Guidelines for Excellence in Environmental Education* national standards manuals
- "Colorado-ness" factor (how the resource supports implementation of the Colorado Water Plan)

This step is the most time-consuming.

Second and Third Reviews

Ground-truthing by two additional reviewers to corroborate findings

Share with "owner" of resource

Findings shared, highlighting strengths and areas for improvement

Yes: Meets or exceeds standards

Designate as "Colorado Water Education Exemplar"

x100

Collection of water education resources best suited to support the Colorado Water Plan

Amplify: Expand, Replicate, Improve

REVIEW SUMMARIES

Caring for Our Watersheds

https://caringforourwatersheds.com/usa/colorado/

Poudre Learning Center

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment			💧	
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs			💧	

Notes:

Caring For Our Watersheds (CFOW) originated in 2007 in Alberta, came to Colorado in 2013, and has been hosted by Poudre Learning Center since 2019. Corporate sponsor Nutrien shows long-lasting commitment to the program, which is available in Canada, the United States, and Argentina, through a robust partnership model, with corporate support of more than $250,000 per year in collaboration with host organizations in 8 locations (Alberta, Saskatchewan, Manitoba, California, Colorado, Ohio, Chesapeake Bay region, and San Antonio de Areco watershed). For Colorado, Poudre Learning Center employs a full-time CFOW program specialist; the current coordinator won a CFOW award when she was in high school. Currently, participants are students from the Big Thompson and Cache la Poudre watersheds; in 2025, there were 294 project proposals submitted. The City of Greeley sponsors the Colorado program.

CFOW links strongly to the Poudre Learning Center mission of wonder and inspiration for young environmental stewards via outdoor learning and inquiry. Poudre Learning Center, a 65-acre outdoor classroom and nature center offering environmental education field experiences, is owned and operated by Greeley-Evans School District 6 – which in and of itself is exemplary.

For Nutrien, CFOW strongly supports their corporate sustainability strategy, environmental stewardship focus area, and community impact key area. Both the umbrella and regional scopes and scales of CFOW are testament to community needs and acceptance of a high-quality water education program.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

CFOW challenges students, working alone or in small teams, to answer a concise and powerful guiding question: What can you do to improve your watershed? The program uses project-based learning, with well-articulated materials, a range of instructional approaches, and a key distinguishing feature: project implementation funding for top-scoring projects. There are many, multiple project and background knowledge supports. Topical presentation of watersheds and watershed health is clear and concise without being overwhelming. Scoring rubrics are detailed and complete, with clear criteria and leveling. Nutrien bases the program on applicable Sustainable Development Goals and Poudre Learning Center has correlated all their learning activities to the Colorado Academic Standards. Successful projects must demonstrate contributions to environmental literacy, are impactful experientially and academically, and require synthesis, budgeting, and communications skills to prepare and present a winning proposal. Participants are driven to be action-oriented and creative in their approach to solving local issues they select to address.

In Colorado, the coordinator (who is a school district employee) provides resource-matching for individual projects, including from experts and for funding. She also ensures each submittal receives specific feedback "so students know a caring, knowledgeable adult actually read their work." A cadre of about 100 educational volunteers work to support and judge projects each year in the state. CFOW won the "Outstanding Service at the Global Level" award from the North American Association for Environmental Education in 2015.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

CFOW's model of an international sponsor-organizer with regional coordination by environmental education experts is dynamic and synergistic. Overall, the annual contest cycle of CFOW is designed to be easy-to-understand by teachers and students, with registration unlocking instructional resources, with a student workbook as a cornerstone. With guidance from their teachers and programmatic staff, students following the instructional cycle outlined in the workbook will complete a proposal for their idea to improve their watershed. Proposals are submitted for judging, with top proposals moving on to in-person presentations. At least 10 proposals are selected for implementation funding and support. Resulting projects include a creative, feasible solution (ideally one that is S.M.A.R.T. [Specific-Measurable-Achievable-Realistic-Timely]), with a budget, identified Sustainable Development Goals, and potentially original visuals, such as short persuasive videos. CFOW's three-phase format – with proposal, presentation, then implementation – mirrors the path of many real-world, professional watershed improvement projects. Authentic skills result.

Though most CFOW activities take place dispersed either at school, home or other spaces, some activities take place at Poudre Learning Center, most importantly in-person presentations and judging of the top 10 project proposals each spring. Other learning activities are available either on-site or in schools. Poudre Learning Center itself is a safe, accessible outdoor learning facility which complies with all applicable district, state, and federal policies. English language learners/Spanish speakers and special needs students are accommodated. Like CFOW-participating students, adult program volunteers are supported by an impressive array of materials, including sophisticated on-line reviewing and scoring platforms. CFOW is positioned within Poudre Learning Center's scaffolded offering of field experiences and student action programs.

CFOW's marketing communications are attractive, informative, and professional. The program is well-promoted. An additional

facet, noted as motivational by a Colorado awardee, is recognition of a top CFOW-wide international project each year chosen from among all the regional winners.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise				💧

Notes:

Annual reports tout impressive outputs: 44,400 student participants and 640 implemented projects since inception, more than $250,000 invested annually, and, in Colorado, an average of 307 proposals from 461 students over the last seven years. Evaluation is baked into program operations, with participant input sought before, during, and after annual contest windows (January to May in Colorado). Documentation of program outputs and outcomes is extensive and longitudinal, allowing trends of impact to be seen. The meshing of Nutrien's overall programmatic mission and that of CFOW within a Colorado school district-run outdoor learning center impresses as both collect and share data needed to document value. Evaluation instruments are user-friendly, resulting in valid data tied to program goals and objectives – measuring CFOW's contribution to environmental literacy fairly and accurately. Videos of "Legacy Stories" show powerful anecdotes of long-term influence of CFOW on some participants, including Colorado's program coordinator, who was a contest winner in high school. Overall, long-term evaluation data builds a convincing case of program effectiveness and impact.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate			💧	
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration			💧	
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

CFOW's participatory challenge is appropriate for high school ages and preparatory for post-secondary life. Students engage via a relevant, meaningful self-identified concern within their watershed. As they move toward advocating for an achievable solution, CFOW builds knowledge and skills, promotes civic action, and develops environmentally responsible behavior. The program is intellectually stimulating and elevates youth voice. Life-long skills such as teamwork and communication are practiced. Support is responsible and flexible. CFOW materials could, however, be more explicit in considerations of environmental justice, underserved audiences, and cultural responsiveness. Still, written guidance, on-line instructional videos and learning games, in-person experiential activities, and independent research are all encouraged, as much student work takes place dispersed across their schools, homes and other spaces. Collection of evaluation data is consistent, adequate, and aimed at assuring quality.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

Program results are well-documented and monitored closely to demonstrate success and drive improvement. Permissions from participants sought and traced. Strong promotion and recognition of overall program highlights.

Sharing of program accomplishments is celebratory and widely publicized, with many stories of how the guiding question (What can you do to improve your watershed?) has been answered elegantly and successfully in hundreds of ways. Plenty of evidence of program continuation, including sufficient funding.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- It is hard to imagine a better means of preparing the next generation of Colorado watershed managers than by managing a Colorado watershed – at small scale and with support from educators and experts.

- Caring For Our Watershed's integrative nature promotes and practices many process skills necessary for professional success, in the water sector and most others. It provides career-based inspiration.

- Depending on learner-decided direction, student projects can (and have) dealt in most any of the Water Plan's "Tools for Action." For instance, winning Colorado projects have focused on Stream/Watershed Restoration and Enhancement, Water Efficiency and Conservation Programs, and Endangered and Threatened Species Recovery Programs.

– reviewed January 2025

Colorado Water Fellows Program

https://watercenter.colostate.edu/water-education-and-workforce-development/colorado-water-fellows/

Colorado Water Center, Colorado State University

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

In response to a need for greater diversity in the water sector, the Colorado Water Center (CWC) at Colorado State University (CSU) started the Water Sustainability Fellowship program in 2017. Its initial goal was to connect undergraduate minority students with the water field. Through 2022, the program served 36 students of color who were mostly first-generation post-secondary students. In 2023, the program transformed into the Colorado Water Center Water Fellows Program. The Water Fellows Program, then opened to undergraduate and graduate students of all majors, "advances the next generation of water leaders by training and connecting undergraduate and graduate students to careers and opportunities in the water field." All CSU students may apply.

The program, with about 20 students per annual cohort, consists of an application and selection process, monthly cohort meetings with water experts, free attendance at three state-level water conferences, job and internship connections via a water career fair, an annual Water Fellows convening (with fellows from five other Colorado institutions with newer Water Fellows programs), and a $1,000 stipend. The 2024-25 cohort (n = 21) represented 19 different majors and students from undergraduate through PhD levels.

The Water Fellows Program resides within the CWC focus area of Water Education and Workforce Development and supports the CWC mission to facilitate outreach, education, and applied transdisciplinary research to address complex and evolving water-related challenges facing Colorado. As with other CWC programs, the Water Fellows encourages collaboration, synthesizes water knowledge, and inspires the next generation of water leaders. Water Fellows benefit from expert in-house program management and the wider CSU land-grant institutional infrastructure and knowledge base.

The program works as envisioned, filling a niche recognized, not only at CSU, but across the state generate new career-track water professionals. With more than 60 program alumni now, there is evaluative evidence of program excellence and anecdotal evidence

of success with multiple former Fellows landing entry-level water jobs in Colorado. In the past year, the program has evolved and grown, replicating first to Metropolitan State University of Denver, then to four other campuses: University of Colorado, Boulder; Colorado Mesa University; University of Denver (DU); and Fort Lewis College. (NB: With the exception of the DU program which is only for post-graduate law students, the other Water Fellow Programs will be reviewed separately.)

This Water Fellows Program addresses two pressing challenges in the water industry: an aging workforce and attracting and retaining new talent. It is serving as an effective and timely on-ramp to water careers.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

An academic-year-long program, the Colorado Water Fellows Program's design prepares students for careers in the water field through access to experts and field experiences; professional networking at the state's top water conferences; and polishing of professionalism through speaking to groups, having business cards, interacting at conferences, and professional head shots. For instance, at January 2025's Colorado Water Congress, Water Fellows served as panelists and introduced many of speakers during sessions.

Monthly meetings, though less formal, delve into topics such as water law, water equity and justice, water career navigation, Tribal perspectives, and one water approaches to integrated management of water resources. As already successful college students interested in the water sector, the Fellows arrive with much theoretical knowledge and predisposition to water conservation, so this program bridges between that education and real-world application. A fellowship is a practical experience. The emphasis is on a holistic understanding of water-related issues in Colorado and preparation to navigate the complexities of the field.

Program objectives are to:
- Build capacity supportive of increasing diversity in participation in water issues.
- Create a diverse, skilled, and collaborative water workforce.
- Build career pathways for higher education students desiring a role in the water sector.

The program's techniques – group meetings, conference participation, field experiences, discussions with visiting experts – are not ground-breaking. But the collective way the program brings these techniques together to accelerate career-readiness and networking is fresh and powerful. Although guided by highly qualified CWC staff, fellows play an active role in shaping the specifics of their year with the program, through input and suggestions on meeting topics, conference attendance, and skill-building activities. The most valuable aspects gained by fellows are access and introductions.

Quality of instructional staff, materials and educational settings is assured by taking place within the larger CSU collection of facilities, procedures, and support. The program is participatory, culturally responsive, developmentally appropriate, and enhances the environmental quality and economic prosperity of the fellows and those their careers will impact.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

Each academic year, the Water Fellows follows a cycle, beginning with the application process. For 2025-26, applications were due September 5. Following review by CWC selectors, a new cohort begins monthly meetings about a month later in the autumn and continue until the end of the academic year in late spring. Components of the program – monthly group meetings with expert guests and field experiences, participation at state-level water conferences, and career development support – build life-long skills for water professions and camaraderie amongst the participants. Participants are compensated, as professionals should be.

CWC managers create a welcoming and responsive learning environment, as evidenced by evaluation feedback and participant-

observation. With the scaling-up of the program in 2023 to a Metro area campus and again in 2024 to four additional campuses statewide, its support and networking now cover much of the higher education terrain across Colorado. Overall, this program uses tried-and-true formats and deliveries, but sets itself apart through the steady blending of quality ingredients. Program managers tap into the best of Colorado's water sector to propel the fellows into top gatherings and networks, making participation as advantageous as any means of career development.

A distinct new feature for 2025 was the Colorado Water Fellows Convening in February, which brought together fellows from all six institutions, program managers, faculty, funders, and a team of thematic experts for "celebrating the power of storytelling and science communication." Keynote speaker was now-CWCB chair Lorelei Cloud, from the Southern Ute tribe. First Nations' knowledge and skills was highlighted, through a storytelling workshop led by Colten Ashley, director of KSUT Public Radio's Tribal Media Center.

As part of CSU, the Colorado Water Fellows has a large university's overhead structure covering it, assuring the program complies with all environmental, health, safety, and occupational requirements. Meetings are held in university or equivalent facilities. Additionally, the program itself has official policies covering community agreements, attendance, alcohol, images and recordings, and attire. Fellows agree to abide by these policies. Likewise, program communications are frequent and clear, and include a logo for graphic identity.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise				💧

Notes:

CWC thoroughly documents programmatic participation and collects artifacts of internal meetings and external conventions, tracking inputs and outputs, as standard operating procedure. The program started small and has grown steadily. More meaningful evaluation, to monitor outcomes and impacts, comes from bi-annual progress reports detailing progress against the program work plan (which are Colorado Water Plan grant tasks, as this is currently a statewide Engagement and Innovation grantee) as well as year-end surveys. Surveys are open-ended, as suitable to a small-group sample, and ask:

- What aspects of the Water Fellows Program did you find most valuable/impactful?
- Please share your favorite moment in the Water Fellows Program.
- What networking and professional skills did you gain?
- What knowledge of the water industry and careers did you gain?
- What policy, collaboration, and equity perspectives did you gain?
- What exposure to the water community and culture did you gain?
- Please share how we can improve…
    - o community building and cohort connection?
    - o mentorship and support for diverse needs?
    - o career development and professional preparation?
    - o program communication and logistics?
    - o recognition and certification?
    - o event structure and relevance?

Use of evaluation data for program improvement shows in documentation and practice, tracking student progress during and after their program periods. For instance, last year's participants suggested a certificate would be of value and that feature has been added.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration				💧
5.5 Instructional methods				💧

5.6 Implement evaluation				💧

Notes:

The Colorado Water Fellows Program delivers outstanding educational engagement, through a focus on practical career experiences, to its participants as attested by their own self-reports and program documents. This program is highly responsive to societal needs, participant aspirations, and Colorado's environmental drivers. It is collaborative, intellectually stimulating, flexible, responsive, and integrative. Water careers have been shown to be launched via this program.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

As core to its land grant mission, CSU develops and applies knowledge to help Colorado communities thrive. CWC is a unit of CSU's Office of Engagement and Extension and its Water Fellows Program is but one example of how it brings the university's know-how to bear on societal needs and pressing environmental issues.

Program communications are clean, crisp, and frequent. Program leaders are present and knowledgeable, traveling the state to share their work. Together, they make the program well-known, visible, and – most importantly – understandable as a functioning part of the preparation for securing Colorado's water future.

Evaluation results and program accomplishments are readily shared to show effectiveness. The adoption of Water Fellows Programs at five additional institutions affirms the high quality of the program's concept and implementation. There is talk of more expansion, as well, with water fellow programs nationwide not beyond imagining. "I dream big," said then-Water Fellows Program director Jessica Thrasher in a podcast interview promoting the program. All indications are that the Colorado Water Fellows Program is a permanent component of the state's water sector, and an important piece of securing the state's water future.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- "The Program's emphasis on interdisciplinary education and career pathways aligns with the goal of advancing Colorado's water supply planning process by developing a well-equipped workforce. Furthermore, the initiative supports a statewide water innovation ecosystem by creating a network that encourages collaboration, innovation, and knowledge-sharing among water professionals, students, and the community" (per the approved Water Plan Grant proposal supplemental application, to address the calls for outreach, education, public engagement, and innovation in Colorado's Water Plan Chapter 9.5).

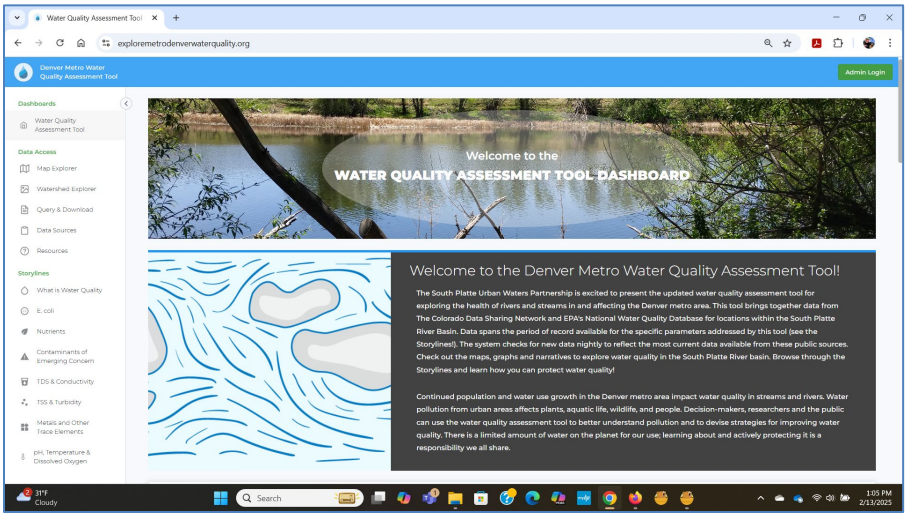
- "The Water Fellows Program and annual Water Fellows Education and Career Event directly align with Colorado's Water Plan's measurable objective to 'significantly improve the level of public awareness and engagement regarding water issues statewide…. In direct correlation with water value #4, the initiative contributes to cultivating an informed public with creative and resilient solutions, fostering strong, equitable communities capable of adapting and thriving amidst challenges (Water Plan Executive Summary, p. 2). Additionally, this project aligns with the following Water Equity Task Force recommendations including 'promoting diversity in career pathways in water-related fields through education and engagement; and promoting collaboration of new voices and greater community engagement in water discussions' (Colorado Water Plan 2023, p. 5)" (from the Water Project Justification section of the program's approved Water Plan Grant application summary).

– reviewed October 2025

Denver Metro Water Quality Assessment Tool

https://exploremetrodenverwaterquality.org/

South Platte River Urban Waters Partnership



Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	● Draws substantiated, recent, "real world" data from water quality agencies at federal, state and local levels, allowing learners to use primary sources directly ● All data providers are vetted and cited fully ○ As a data delivery tool only, this resource lacks elements of inclusivity, equity and alternate ways of knowing such as Traditional Ecological Knowledge	Not addressed Partially addressed Addressed
EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	● Provides opportunity to analyze, compare, contrast data, both spatially and temporally ● Suggests strategies for exploration of water quality and informs systems thinking, in particular via "storylines" (topic explainers) ● Feeds skills for decision-making, if learner is able to successfully operate the tool ○ Tool accessible only to upper-level students due to complexity and reading level of texts	Not addressed Partially addressed Addressed

	○ Light on civic skills-building	
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	● Storylines focus on important concepts of water quality, as well as complexity and interactions ● Maps, with multiple ways to change scales, are suitable context for developing understanding of South Platte River watershed's situation. They allow users to explore specific areas of interest and paints a data-driven picture of watershed health. ○ Could benefit from consideration of environmental justice and economic impacts of pollution, to broaden base of understanding	Not addressed Partially addressed Addressed
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and responsibility 4.2 Self-efficacy and personal agency	● All storylines end with a "What Can I Do?" section ● Cumulative effects of water quality issues are emphasized ● Personal behaviors impacting water quality are discussed, while learners may reach their own conclusions based on evidence they extract and display	Not addressed Partially addressed Addressed
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning 5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for specific learning settings 5.9 Assessment	● A broad objective that the tool "allows anyone to learn about pollutants and how they impact our ecosystem" is given ● Inquiry and familiarity with water quality issues is encouraged ● Localized tool is interdisciplinary and strong on everyday connections ● Storylines tie human activities to water quality impacts, allowing reflection on individual and collective actions ○ No lesson plans provided; a user's guide exists though it is not provided at the website ○ Single mode of delivery assumes computer	Not addressed Partially addressed Addressed

	access, no visual impairment, and some experience working with databases and displays of data ○ No standards correlation, instructional strategies, or assessments ○ No expanded learning environments, though water quality fieldwork would extend learning on this topic	
USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims 6.7 Support accepted recommendations and requirements	● Substantiated data is top strength ● Ample citations show accurate and reliable sources of information; has a copyright though no fair use statement ○ Not easy to use without background in using databases and on-line mapping, especially the query and download function ○ Making user's guide available on website would be helpful	Not addressed Partially addressed Addressed

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- This localized tool, which compiles near-real-time data, exists at the intersection of the Water Plan "Tools for Action" of "Public outreach and education" and "Data collection and storage"
- It enhances data literacy using Colorado-specific sources, during a key transitional time in student's academic life – the time between high school and post-secondary learning
- The Plan's "data-driven understanding of our current water supply and potential future scenarios" presumes data-literate people doing and supporting the necessary analyses; the Denver Metro Water Quality Assessment Tool builds data literacy

– reviewed November 2024

Excursions (Field Trips)

https://thegreenwayfoundation.org/spree/field-trips/

South Platte River Environmental Education (SPREE), The Greenway Foundation

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

This suite of grade-specific, content-packed learning experiences takes place outdoors in six Denver parks along the South Platte River and its tributaries. Preschool through 5th grade options (which can be customized per group needs), each with a sequence of 4-7 lessons taking 3-3.5 hours, are highly immersive – learners get in a stream in many cases. Excursions are offered March-May and September-November, reaching an average of about 5,000 students annually. All lessons are fully aligned with the Colorado Academic Standards, as well as correlated to the Next Generation Science Standards and the Guidelines for Excellence in Environmental Education.

Youth education is mission-integral to The Greenway Foundation (TGF) – a nonprofit provider of "equitable community engagement, education, and stewardship." TGF has operated for more than 50 years in metropolitan Denver. In 1976, TGF facilitated tree-planting along the river involving more than 2,000 school children. TGF's environmental education wing, South Platte River Environmental Education (SPREE) originated in 1982. Excursions are more than 20 years old, with readily available evaluation data back to 2010. Excursions curriculum is updated each off-season, based on participant feedback, the latest environmental education and teaching research, and organizational capacities. In a key partnership, SPREE receives financial support from the City and County of Denver, as it helps achieve municipal goals such as parks' activation and public works' education and outreach permit requirements.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

State of the educational art (and science) instructional design is a hallmark of SPREE's Excursions program, as is delivery by highly competent staff. SPREE regularly develops its own educators via high school and college student internships and paid seasonal positions; one testimonial – "I became a teacher because of SPREE" – shows the program's power. There are trainings specifically on Excursions' content and delivery twice per year.

The program's seven age-leveled lesson plans use a rather ingenious component structure, with some activities (adjusted slightly) at multiple grades, and lots of motor skills development for youngers. High-quality, if well-worn, materials are employed, as are multi-modal techniques. Goals are articulated and learner objectives are specific, measurable and achievable. Assessment is inserted throughout. Activities range from classic ("Oh Deer!") to innovative (gold panning) to inclusively experiential ("Sink or Float" rock toss). Colorado-specific facts and figures appear throughout, e.g., naming and greeting the river and other geographic features, site-specific histories, and acknowledgement of Arapaho and Cheyenne peoples (even for the youngest learners).

Learning activities within each Excursion build on each other, show increasing depth and sophistication as ages increase, and have environmentally responsible behaviors considered. Behavioral discussions focus on individual actions, and could have more of a systemic focus for older students. Lesson plans include shared facilitation notes, full of accumulated tips and tricks to assist educators, as many are seasonal and new to the field. To have such a written institutional memory is rare.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

Excursions are delivered with fidelity to lesson plans, which include explicit differentiation, cultural responsiveness, and accommodations. At least one bilingual educator is on-staff at all times. All controllable aspects of format, delivery, facilities, health, and safety show evidence of careful consideration and appropriate controls. Policies and practices for inclement weather, high river flows, late arrivals, medical issues, and behavior management are in-place and executed as necessitated by group needs. While on-site with groups all staff carry and use walkie-talkies. SPREE program headquarters, located in a City park building, complies with applicable health and safety rules and regulations for such facilities. A Denver park ranger supervisor reports, "Sites that are used by SPREE are noticeably cleaner than sites that SPREE does not use."

SPREE communicates robustly and successfully, as evidenced by their full calendar and exceptional ratings by teachers and families. Registration forms and FAQs on TGF's website are user-friendly and complete. Teachers report favorably on communications with SPREE. Marketing communications are released regularly, without excess.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise				💧

Notes:

Evaluation is integrated throughout the program (and all of SPREE). Instruments for students, teachers, and apprentice-level educators collect summative data, including individual feedback for educators guiding each trip. These instruments provide quality data without overwhelming participants. For instance, students have three core questions only. Teachers are incentivized with gift cards.

Outputs are tracked diligently with attendance and other evaluation data back to 2010 stored in one place. Extensive qualitative data about group behavior, reactions, weather conditions, and other situation factors (such as inevitable transportation issues), which usually go fugitive or are only discussed verbally by staff, are captured. Quantitative and qualitative evaluation data are incorporated into program refinements, as evidenced by pre-season planning observed by the reviewer. All staff receive professional development at least annually, in areas such as sheltered language instruction, cultural responsiveness, and

alternative delivery techniques for sight and mobility differences. When activities are modified or new activities considered, they are pilot-tested in-house and with select teachers and students. Overall, the program's contributions to environmental literacy are supported and documented.

TGF proudly reports outputs and outcomes, as they are worth sharing and publicizing. SPREE's work is closely monitored and program impacts are positive and substantial.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration				💧
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

Delivery of Excursions tightly matches goals, meets stated objectives, and is developmentally appropriate, without rigidity. Activities are highly participatory and often require cooperation and communication among learners. Experiences are often tailored to meet group preferences. Skilled facilitation provides a supportive, responsive, and welcoming learning experience, even for students not fully comfortable in an outdoor setting. Learners are challenged to explore across many environmental conditions, with weather-related cancellations being few. Content contributes to knowledge, skills, and dispositions, with a throughline of water's importance and the vigilance needed to protect this vital resource in the Colorado context. Spanish instruction is available, upon request, though staff limitations could be a potential barrier at times of high demand. Especially for older students, personal responsibilities and multiple perspectives toward water are emphasized. Collective impacts receive some attention, as well, but are not nearly as prominent. Still, an inclusive, engaging, and motivating learning climate pervades this program.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

SPREE excels at recordkeeping. Consequently, Excursions has a sizable archive dating back more than 15 years. This body of information allows TGF staff, board, and partners to analyze and adjust with confidence. On-going adjustments to Excursions result from ample evaluation data. Programmatic successes are publicized and celebrated. SPREE is a 5-time winner of Colorado Alliance for Environmental Education's Awards in Excellence. The recognitions afforded to SPREE, and its longevity, attests to recurrent planning, known outputs and outcomes, and positive returns on investment. Participant, teacher, and family testimonials and evaluation data are, by and large, glowing. External communications include annual reports, a large portfolio of photographs (most showing joyful expressions on students' faces), and occasional blog posts. A well-documented past bodes well for insightful sustainability for Excursions. This is a program in its prime, with a bright future.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- Excursions field trips, alongside SPREE's other educational programs (day camps, Leaders in Training for middle schoolers, River Rangers for high school and college students, Greenway Leadership Corps for teens, and family events), have stood the test of time. They call out and affirm the preciousness of water resources and the challenges of managing them. Built on an "awareness to action" educational model, Excursions always conclude with opportunity to consider responsible behaviors called for in the Colorado Water Plan.

- Embraced by their predominately urban audiences, SPREE is a trusted educational source with more than a quarter of century's worth of expertise in reaching, teaching, and positively impacting young people in metropolitan Denver. It offers a high-quality model for working with school districts and the continual tending of school-to-program relationships required for

year-in, year-out successes. Among Denver elementary schools, SPREE has partnered with McKinley-Thatcher for more than 20 years, four other elementaries for more than 15 years, and was essential to the 2015 founding of Joe Shoemaker School, which is named after the founder of The Greenway Foundation. Consider these powerful endorsements:

  - "This SPREE river field trip was a great extension for our water unit in Science." (5th grade teacher)
  - "Our 4th graders learned and retained more about Colorado history and geography through the SPREE field trip than through any other special guest speaker, hands-on project, or lesson throughout the school year." (Elementary school administrator)
  - "I've been bringing my kids to SPREE for over 25 years." (3rd grade teacher)

- Excursions weave the teaching of Colorado history with river science lessons, providing preschoolers through 5th graders with foundational understandings of watershed function and urban water systems. SPREE has set tens of thousands of students on paths toward being better environmental decision-makers and informed water stewards.

– reviewed March 2025

H_2O Outdoors

https://www.keystonescienceschool.org/outdoor-ed/h20-outdoors/

Aurora Water – Denver Water – Keystone Science School

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

A concentrated, big-picture program delivered over three intense days to up-to-30 high school students at a time, in a true headwaters setting (Summit County) by a team of highly respected water educators. H_2O Outdoors is immersive (more than 24 contact hours) and culminates in a role-playing town hall activity, where participating young people negotiate a complicated water problem based on an actual current Colorado issue. It is a short yet comprehensive dive into the roles of stakeholders and deliberative decision-making about water. Program activities build a variety of knowledge, skills, and aptitudes, including outdoor field experiences not usually available, especially to urban students.

Developed in 2009 based on a community request from a large water conservation district, H_2O Outdoors was an early response to the 2008 call for "new, impactful programs for secondary students" in the CWCB-commissioned "Water Education Task Force Report." Since inception, the program has been well-resourced and thoughtfully managed by long-term partners. This joint program is situated within educational portfolios of each partner, supportive of each entities' mission. Overall, the program is synergistic and impactful, if perhaps pricey (historical costs of ~$500 per student). It would be intriguing to see if this program could be downsized for organizations with less capacity. H_2O Outdoors is highly Colorado-specific, solution-oriented, and allows participants to practice

realistic water negotiations. Major Colorado water players (the partners, CWCB, utilities, environmental groups, agricultural and recreational interests) are introduced by name.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

With a learning cycle built on a "greatest hits" collection of water activities and clear goals addressing educational priorities, H_2O Outdoors aligns with partners' missions and reflects relevant water management issues in our state with unmatched authenticity. Learning activities elucidate key concepts (watershed, water rights, Colorado water history, water supply infrastructure, stream quality assessment, and the global water cycle), capped by role-playing where participants wrestle with a realistic scenario via collaboration and consensus-building. H_2O Outdoors gets a lot done in a short amount of time.

This program expertly meshes partners' programs, leveraging decade-plus involvement by key educators and honed resources from all partners. It is Colorado through-and-through – setting up stakeholder scenarios that are simple enough to understand, but realistic enough to depict conflicting views which require deliberative interactions for reaching solutions. Global-to-state-to-local scaling expose learners to multiple perspectives in culturally responsive and developmentally appropriate ways.

Ample pre-program planning and professional development occurs during annual cycle. Program leaders have decades of water education experience. All field instructors are highly qualified educators and at least Wilderness First Aid-certified. Materials and lesson plans are vetted, instructionally sound, and highly suitable for this program.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

Program structure, content, and multi-partner delivery supports stated goals, as well as each partner's mission. Learning environment established is rich, supportive, and aligned with current Colorado water events. Authentic and engaging per participant reports, the target audience is reached, though limited (with no more than 30 participants in a program session). This does allow for a low student-to-facilitator ratio, all but guaranteeing plenty of attention to all learners. It is built on the research-based BEETLES (Better Environmental Education, Teaching, Learning & Expertise Sharing) learning cycle: invitation → exploration → concept invention → application → reflection. The slate of activities includes various methods and modalities, sequenced thoughtfully. Health and safety standards are met, as are all applicable facility requirements (backed by policies of three high-profile, respected, and long-lived agencies and non-profit). The program takes place on the grounds and surrounding area of a residential environmental education center, founded in 1976. Assessment and evaluation are built-in and occur at many stages.

Programmatic communications are attractive and adequate for marketing to a targeted audience of teachers encouraging them to invite their students' participation. In-depth program and facility packets provide ample information on all aspects of the facilities and program to students, teachers, and families.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise			💧	

Notes:

Evaluation has been embedded systematically within the program since its first year. Monitoring has been steady, with only minor adjustments in the data collection and reporting. Evaluation reports are publicly available as annual impact reports found on partner websites. These summarize outputs, outcomes, anecdotes and qualitative data such as their classic group photo at the Continental

Divide sign year after year. There's evidence that evaluation findings are also folded back into program revisions aimed at continual improvement and demonstrating value to larger partner organizations. H_2O Outdoors won the 2012 Secondary Education Award for Excellence from the Colorado Alliance for Environmental Education.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration				💧
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

The program's cycle of instruction moves rapidly toward a powerful role-playing town hall activity, a method known to consolidate knowledge and skills while providing practice with civic actions and perspective-taking. Participants grapple with compromise and effective fact-based argumentation in support of their assigned point of view. They are pushed to synthesize and defend informed decisions in the context of a Colorado water conundrum. The program generates understanding of the "how" and "why" of water issues.

Using the same basic structure for more than 15 years, H_2O Outdoors covers environmental history and water realities, exploring impacts on a variety of socio-economic groups. The experience profoundly affects many students. Participant testimonials state this particular educational experience revealed the complexity of water in Colorado to them, and has spurred at least one to pursue a water sector career.

H_2O Outdoors has a fascinating track record of responding to current water realities through intellectually stimulating exploration and high-quality learning for its teenaged audiences. The flow of program agendas and evaluation data evidence careful scope and sequence into rapid-fire and packed days of a tremendously impactful experience.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

Abundant program documentation highlights learning, impact, and celebration of success. Annual debriefings by the facilitation team loops feedback into continual improvements and show use of evaluation data in planning of successive programs. H_2O Outdoors also has featured an unusual wrap-around offering: a simultaneous teacher professional development workshop on teaching watershed investigations.

This long-running program is poised for continuation and has a well-earned spot in the partners' line-ups. Pride and a sense of ownership by partners and participants alike shows in publicity. H_2O Outdoors's annual impact report could serve as a model for other water education programs of how to share learnings with the wider environmental education and water communities.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- A program report for H_2O Outdoors notes: "As citizens of Colorado, these experiences provide background knowledge that students need to be active community members and informed citizens regarding water in our State." This review strongly corroborates that claim.

– reviewed February 2025

HEART Force (Hazard Education, Awareness, and Resilience Task Force)

https://ceee.colorado.edu/programs/heart-force

Center for Education, Engagement and Evaluation, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder

HAZARD EDUCATION AWARENESS & RESILIENCE TASK FORCE

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

HEART Force, a place-based education program, stands for Hazard Education, Awareness, and Resilience Task Force. HEART Force engages rural Colorado middle and high school students and teachers in understanding, preparing for, and responding to wildfire, flood, and drought. HEART Force's curricular module contains 17 lessons with teaching pathways through for each hazard at both levels, along with a myriad of supporting resources such as instructional calendars and sequencing maps, primary resources, expert contacts, videos, related lessons, and programmatic research. The unit uses data-focused lessons, leading to a scenario-based role-playing game, then culminating with a student-led action project. It is as complete an educational package as any reviewed.

For purposes of this review, we followed the drought pathway through the resources, as the materials emphasize water conservation and denote drought as a chronic hazard unfolding over years, as opposed to acute hazards of floods and wildfires. As such, it's support of the Colorado Water Plan is outstanding.

Not only was an in-depth needs assessment conducted, it was published in a peer-reviewed journal (Kathryn J. Boyd, Anne U. Gold & Megan K. Littrell [2021]: Teaching practices around natural hazards and community resilience in Colorado, Journal of Geoscience Education, DOI: 10.1080/10899995.2021.1964319). This front-end evaluation examines a community need of education about and resiliency to natural hazards. From a survey of 279 mostly rural teachers, the HEART Force development team thoroughly incorporated the educational, community, and environmental needs of their target audience into program development from the onset.

HEART Force was produced by the Center for Education, Engagement, and Evaluation, within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado Boulder. HEART Force, and other outstanding

educational work created by CIRES, has been funded by the National Oceanic and Atmospheric Administration (NOAA). HEART Forces helps fulfill the CIRES education and outreach mission of inspiring curiosity and community action.

HEART Force is both efficacious and attractive. Adequately resourced and expertly developed, tested and distributed, the program connected to 88 rural teachers and more than 2,000 students in its first three years. An exemplary model of intentional lessons, comprehensive materials, and highly qualified support delivered to under-resourced communities, HEART Force makes considerable contributions to environmental literacy. Its localization makes for more impact on students. In addition to teaching to standards about natural hazards, the student-driven unit further enhances community ability to prepare for and bounce back from disasters. It does so synergistically, weaving cultural, environmental, and economic dimensions in sensitive and responsible ways. Audience needs are always primary. A trauma-informed practices guide and mental health strategies are included and notes many Colorado students will have direct experience with floods, wildfires, and drought. Social-emotional learning content is considerate to these conditions, and acknowledges dangers and damages being discussed may have hit close to home for many.

Further, HEART Force acknowledges and leverages existing community entities, especially county-level emergency management agents, building on strengths of rural social capital. A suggestion for culminating action projects to enter the RISE (Resilience Innovation Sustainability Environment) Challenge contest shows a bias toward cooperation with similar educational offerings, rather than competition. (The RISE Challenge is another reviewed program for the Water Education Exemplars Project.)

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

With appealing graphics and layout along with approachable content, the lessons in HEART Force all scaffold toward inspiring and empowering Colorado students to be knowledgeable about wildfire, floods, and drought, and to possess skills for building community resilience to these hazards. Lessons are aligned with Next Generation Science Standards and the Colorado Academic Standards. In addition to standards alignment, each lesson plan's "Instructional Overview" lists either "Learning Objectives," "Learning Goals," or "Building Toward" as targets; the varying terms might be a source of confusion, though the look and feel of the lesson plan layouts is consistent. Teacher supports are many and take into account learning differences and are appropriate for a range of learners. One bilingual role-playing game set-up is available, while any other Spanish translation would need to be done by end-user educators.

The educators who created and manage HEART Force are highly qualified, as befitting of professional staff within a large research institute at the University of Colorado Boulder. The program team includes curriculum developers and evaluators, all of whom have advanced degrees, teaching certifications, or both.

HEART Force clearly is designed to reach its main instructional goal "to increase rural youth's understanding of natural hazards, their community's risks and vulnerabilities and to strengthen youth's agency to increase community resilience" (Schloesser K, Davis R, Ruffin T, Gold AU, Christensen A, Littrell MK and Boyd KJ [2024] Centering and uplifting youth voice in planning for a more resilient climate future in rural Colorado: a case study of a student resilience team asking for change. Front. Clim. 6:1408872. doi: 10.3389/fclim.2024.1408872).

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

HEART Force's lesson plans and additional resources are available for free and can be used, with attribution, without further permissions. They are easy to access and use. The collection is housed in a searchable database with other education and outreach programs from CIRES (specifically, its education and outreach unit called the Center for Education, Engagement and Evaluation). Within individual lessons one finds all sorts of links to additional resources – videos, data tools, agency websites, documents, etc. HEART Force stands out in having peer-reviewed journal articles about the program's development and performance. The program's three-plus-year initiation and implementation is also documented with a 34-page summative evaluation report. HEART Force won a 2022 Innovative Environmental Education Program Award from the Colorado Alliance for Environmental Education.

As the program's needs assessment showed teachers tend to focus on the science of natural hazards over community and environmental impacts, the design team selected to extend the unit into "community resilience," defined as "the capacity of community members and organizations such as schools, businesses, or hospitals to maintain essential functions before, during, and after hazard strikes" (Boyd et al. 2021). Community resilience became a context to construct a transdisciplinary unit that is distinctly place-based and action-oriented, while still addressing standards in science, social studies, and civics. To support teachers in this significant extension, the team also held professional development workshops around the state. Over the course of a 3-year pilot, 88 teachers participated in seven workshops. Following the professional development, more than half of these teachers used the curriculum in their classroom. Peak implementation, including successful community action projects, was documented in Estes Park and Hotchkiss. At least a dozen "Community Resilience Expos" were held.

Suggested sequences through the HEART Force curriculum (of which there are six, one for each hazard at both middle school and high school levels) run seven lessons with a 1-4-week duration. Initial lessons introduce key concepts ("resilience" most importantly) via a 5 E technique (engage-explore-explain-elaborate-evaluate). Creative responses are prompted in imagining responses of strong communities to made-up disturbance (e.g., an invasion from outer space). They also grapple with potentially difficult terminology and real-world technical information and data, necessitating a teacher's skill to play a significant role in generating student attention and comprehension. If the background-building lessons are successful, the role-playing games and culminating student-led action projects can be learning highlights – as borne out by evaluation data. "The scenario-based role-playing game and community engagement experiences were most often reported as having high impacts on students," states the HEART Force summative evaluation report (2023).

Through a seven-lesson sequence, a range of strategies and techniques will be employed and incorporate social-emotional learning and environmental justice considerations. Students can demonstrate their learning through generation of products in various forms. Inclusion of official local and state Hazard Mitigation Plans and recommended guest speaking by emergency planning experts introduces students to civic functions that are often not conspicuous. Targeted to often less-resourced rural schools, HEART Force presents a highly experiential, situationally sensitive, and engaging unit for learning about a potentially charged topic. HEART Force strengthens civic capabilities.

HEART Force materials also include advice for safety, accessibility, and publicity. As documented in program publications, participant quotations, case studies, and photographs have been adequately collected. Interested teachers can join a CIRES education and outreach mailing list and also communicate directly with program managers and local officials.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise				💧

Notes:

Evaluation of HEART Force's launch was planned and integral, taking place in each phase of program development and implementation. In monitoring and documenting outputs, outcomes, and impacts, HEART Force has amassed plenty of evidence to demonstrate program excellence.

Evaluation started up front with a large needs assessment, surveying 279 Colorado teachers, mostly in non-urban schools. While 70% of those sampled taught about natural hazards, only 30% included civic skills and development of resiliency in their instruction. The needs assessment (Boyd et al. 2021) concluded, "Results imply teachers' need for effective and place-conscious

educational resources in order to build more resilience in students and thus help communities prepare for natural hazards."

As HEART Force was then developed, student empowerment and skills-building for preparedness and recovery were made prominent. Audience needs, not programmatic ones, took precedent. Simultaneously, tracking and measuring program outputs and outcomes was orchestrated as well. CIRES has full-time evaluators, who worked on the HEART Force team alongside curriculum developers and program managers. They use a mixed-methods approach with pre-/post- workshop and implementation surveys of teachers, pre-/post- unit student surveys, and web analytics of on-line curriculum access, plus photos, participant statements, and student work samples. Instruments and methods were approved by the University's institutional review board.

Program evaluation data were collected early and often to answer guiding questions on increasing youth understanding of natural hazards and community risk, then strengthening youth agency to contribute to community resilience. School year 2019-20 served as a pilot year for the entire program, though was interrupted by the COVID pandemic. Feedback from the pilot was incorporated for updates to details in the lessons and instruments, while showing overall program design was leading to desired outcomes.

Evaluation found HEART Force achieved targeted learner outcomes and impacts. From 2019-22, HEART Force was known to be used by 35 teachers of nearly 2,000 students, with the module accessed 5,196 times. Teachers reported role-playing games and culminating expos as most impactful; 83% said this curriculum had positive impacts. Students, through 295 matched pre-/post-questionnaires, showed significant gains in understanding the science of hazards and how to improve community resiliency. They reported liking hands-on activities most. Coding of open-ended responses showed impressive inter-coder reliability of 94-98%. Revisions are currently being made to HEART Force materials based on evaluation recommendations.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration				💧
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

Delivery of HEART Force satisfies not only stated program goals, but also institutional missions, national and state educational standards, and raising of environmental literacy. Content is local, relevant, and inclusive. It activates wise water decision-making and civic responsibility. Data and primary documents used are substantiated and reputably sourced. Professional development and direct support from CIRES educators ensure fidelity of in-school implementation, so learning climates engage, motivate, and validate across a range of educational settings and learning styles. Collaborations, most notably with the RISE Challenge, boost student achievement and community connection. The techniques in the lessons are participatory, accommodating, and investigatory.

In a 2025 peer-reviewed journal article (M.K. Littrell, K.J. Boyd, K. Schloesser, A. Christensen, A.U. Gold & I. Alam [24 Apr 2025]: Place and community engagement in a youth natural hazards and community resilience education program, Journal of Geoscience Education, DOI: 10.1080/10899995.2025.2489709), CIRES educators and researchers report that HEART Force improved students:

- Understanding of community resilience;
- Knowledge about things their communities can do to prepare and respond to natural hazards; and
- Confidence to engage with their community.

Teacher feedback emphasized the importance of place and community engagement in education about natural hazards. The team found that teachers could use the scenario-based role-play games to spark more student engagement with little program support. Local community resilience projects, however, required a higher level of support from teachers and the HEART Force program team. Students desired to take civic action, though they needed adult support to do so successfully.

#6 Analyze, Adapt, and Share	N	S	M	A

6.1 Evaluation results				💧
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

HEART Force comprehensively and openly reports evaluation results, documenting progress, celebrating accomplishments, and driving program improvement. The program's project-based learning allows students to express creativity and garner a deeper understanding for the physical and cultural impacts of wildfires, floods, and droughts. Evidence indicates a program of the highest educational quality.

Long-term sustainability of CIRES education and outreach, at present, is being undermined by threats of slashing federal funding to NOAA. Viability of thousands of high-quality resources like HEART Force is uncertain. As a tool for enhancing water literacy in Colorado, HEART Force is positive and exceptional.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- The Colorado Water Plan states "collective actions we take today across every corner of the state will increase water resilience for Colorado." HEART Force focuses directly on developing such a sense of agency in young people, so they can work together to make their communities more resilient. Resilience is a teachable concept.

- HEART Force respects youth as stakeholders in the present. The curriculum was built on a conceptual framework of "future-scaffolding," so as to better understand environmental challenges while also building skill and intentions to solve them. It advocates for "intentional inclusion of youth in resilience planning."

- HEART Force's drought pathway asks "How can we mitigate the impacts of drought?" The Colorado Water Plan asks the same question. "Resilient Planning" to build water security features in Water Plan Partner Actions (pp. 216-220). HEART Force uses the Water Plan's "Natural Hazard Planning" to allow young people to flex their civic muscles, building community strength to tackle water challenges.

– reviewed July 2025

Hydro Exhibits

https://csuspur.org/hydro-exhibits/

Colorado State University Spur Campus – Hydro Building

Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	● Exhibits are located on three levels of the Hydro building at Colorado State University's Spur campus. An architecturally stunning space with shapes and forms reflective of water and waterways, the building is welcoming, accessible, and compelling – especially due to entry being free. Visitors may choose to interact almost immediately upon entry. Conceptually, the generally clean and well-functioning exhibits build with content on water properties and uses on Level 1, to Colorado-specific geography, history, and ecology on Level 2, up to more advanced water science and engineering on Level 3 and near research labs. All are beautifully and consistently executed, with vetted content. An intuitive numbering system – 101 - 303 – classifies the material, helps families and groups navigate. As you climb, content gets more sophisticated and nuanced. Manipulable elements invite tactile engagement. There is an intentional combination of eye-pleasing displays, technology-driven exhibits, and hands-on interactive activities.	Not addressed Partially addressed Addressed

	Text complexity is appropriate for family audiences, and graphics vary from simple images of land, water, and people, to family-appropriate displays of data. Sources and citations are available, if inconspicuous. Some exhibit text is available on-line for language translation. Exhibits wrap-around other learning spaces, including a well-equipped learning laboratory and an educator-staffed stream table. People and places depicted show diversity, and include Traditional Ecological Knowledge along with a considered land acknowledgement. Multiple perspectives, ways of knowing, and media are presented. As an array, the exhibits are inclusive, balanced, and equitable. Most text is bilingual (English and Spanish); videos have subtitles. Water science and engineering content appears alongside artful pieces, including a masterfully integrated "River Music" presentation, which takes hydrographic data and time-lapse video as a basis for symphonic compositions delivered via headphones. Overall, the exhibits constitute a true STEAM experience – science, technology, engineering, art, math all woven together. ○ As with all exhibits in busy museum-like settings, maintenance needs are constant. Videos could use ending indicators. Magnified images of organisms, such as *Fragilaria*, could use size indicators. Eastern Plains tributaries' depiction could be confusing, suggesting more and permanent flows in these ephemeral streams; a distinct shading and "intermittent" label might help. Severe implications for Colorado's water future are absent, though the setting may not be appropriate for any such gloom and doom.	
EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	● If learners wish to go beyond skimming and looking at initial photos and graphics, these exhibits offer interactive elements which may build knowledge and skills. Various exhibits invite touch, manipulation, listening, classifying, sorting, open responses, role-playing, and data-recording. Art is presented as integral to our relationships to water. Interpretive text encourages inquiry and curiosity. Water is presented wholistically and systematically, aligning with the Critical Water Concepts (from "Statewide Water Education Action Plan 2020-2025") from "101" exhibits about water properties to upper-level panels on a public resource involving extensive, human-built infrastructure. Young learners see a variety of role models depicted and	Not addressed Partially addressed Addressed

	are encouraged to learn through play, especially in the “Mock Lab” station. Exhibits excel at presenting foundational concepts within Colorado’s water context, especially the South Platte River basin, providing opportunities to consider water’s importance, beauty, and conservation. Skills elicited include recording of observations and simple reasoning using basic data about quality and quantity. ○ While visitors can explore and deepen appreciation for Colorado’s water, real impacts seem to be the domain of experts: “scientists,” “researchers,” “technicians,” and “liaisons.” Exhibit content does not delve deeply into collective behaviors and public policies impacting water supply and health. Civic challenges of securing Colorado’s water future are not addressed directly, beyond notice of finiteness and allusions to quality impairment and clean-up technologies. Overall, the exhibits present a well-rounded systematic overview, where experts have direct impacts while other people are somewhat more detached.	
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	● Exhibit content covers water basics and Colorado’s water situation. Critical Water Concepts 1 - 4 are addressed well, beginning with properties and uses through to water careers. Thematic organization, by both levels of the building and grouping in areas, aids in conceptual understanding. A wide variety of flora and fauna are presented, from well-known and conspicuous (mallards and beaver) to miniscule and obscure (riffle beetles and planaria). Cultivation of awareness and focusing on building blocks of water knowledge are strengths. Learners will notice ample environmental science and engineering, plus art, Traditional Ecological Knowledge, and occasional social science and humanities. Rich in Colorado context, the exhibits collectively offer a STEAM experience (science-technology-engineering-art-math). Relevancy is underscored with the South Platte River just outside within view and suggestions to extend ones’ visit from exhibit to streambank. Content touches on interrelationships: historical, cultural, and geographic. Exercises to extend thinking toward complexity, challenge, and	Not addressed Partially addressed Addressed

	solutions could be boosted. Scaling goes from the universal (via water chemistry) to the local (the South Platte as the lifeline of northeast Colorado).	
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and responsibility 4.2 Self-efficacy and personal agency	● People of many different groups are shown, such as in portraits of water sector professionals. While calls to action are minimal and muted, some opportunities for reflection and further involvement can be found: "What does water mean to you?" open-ended response forms, an invitation to join South Platte BioBlitz citizen science efforts, a mention of "It's important we make wise choices" about water's uses, and "Can you think of ways we can protect the quality of our water?" at the bottom of water quality data sheets. Some light encouragement to apply knowledge and skills to environmental decisions and behaviors appears. ○ Promotion of personal and civic responsibility is limited. Few consequences beyond mention of historical conditions of river impairment are found. Habitat repair is stated to have been done by "organizations," not people, while "agencies" manage flows. Water rights, laws, and policies are not mentioned, though it is labeled as a shared resource. Technology is presented as the domain of "experts" who may help "lawmakers" make policy. Water quality is determined by "scientists." More connections could be made to narrow the distance from non-experts to these actors. Long-term sustainability of water resources would benefit from obvious and direct acknowledgement of individual actions having cumulative effects and the seriousness of Colorado's water future.	Not addressed Partially addressed Addressed
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning 5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for	● Exhibits deliver abundant factual information contextualized to Colorado's water situation. Beautiful displays are fully integrated into a beautiful building. Text, video, and experiential formats allow for multi-sensory engagement and attracts learners of different abilities and backgrounds. Many entry points and a variety of hands-on discovery is nested into the interior design. Learners can efficiently expand their experience, choosing to move through quickly or to linger. So, the exhibits are effective in ways the best museum installations are. Self-directed technological features are a plus: touch globes, audio-video presentations for small groups or one person at a time, and learning games on tablets. The building is ADA-compliant, has LEED	Not addressed Partially addressed Addressed

specific learning settings 5.9 Assessment	Platinum status, and was designed for efficient wayfinding. Exhibits are near other learning features such as Stream Table and The Backyard (models of watersheds and stream processes). Many prompts to further engage to other learning spaces on this campus and, especially, to visit the South Platte River, just outside the buildings, expands the learning environment. Scaffolding starts with global water properties, distribution, and uses, builds to Colorado-specific and interdisciplinary displays, with art integrated throughout. Plenty of references tie to common everyday life occurrences. Partnerships are noted with Denver Water and Trout Unlimited. Self-assessment questions are sprinkled throughout, e.g., “Can you follow the chart (known as a hydrograph) that shows the flow of water forming the music?” Relevancy and importance of water supplies is reinforced without scare tactics. Multi-age groups were observed enthusiastically engaged with exhibits on multiple occasions; staff and docents are visibly available for questions. ○ Hydro’s exhibits might benefit from giving learners even more inquiry, reflection, and opportunities to apply learning. Mentions of water’s finiteness would be bolstered by some forward-looking/future-oriented facts about supply-demand trends, factors impacting quality, and Colorado’s west-east reality of distribution and use. Inclusion of basics on Colorado’s water policy framework, water rights, and the Colorado Water Plan would add value.	
USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims 6.7 Support accepted recommendations and requirements	● Situated within an elegant facility, the exhibits are cohesive and approachable. Graphics catch eyes, engage visitors and entice them to become learners. Materials are durable, museum-quality, and appear fresh after two years of almost daily use. Note the Hydro exhibits are one set of components in a large public-facing, three-building campus. Interpretive writing is concise and appropriately leveled. Maintenance of displays is evident as all were complete and functional. Even a “coming soon” placard about water supply delivers cursory content and previews the look of a new component. Dozens of visitors were observed with no signs of frustration or misuse.	Not addressed Partially addressed Addressed

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- These exhibits deliver many concepts, such as clearly defining “watershed,” which represent foundational understandings for water literacy. They start with water properties, which – although often glossed over or skipped – are necessary for comprehension of basic water chemistry, which in turn affects all aspects of quality and quantity issues. That this is done with eye-opening demonstrations makes them more memorable. From the “101” introduction, which fits squarely with the first Critical Water Concept (CWC) from the “Statewide Water Education Action Plan 2020-2025,” displays progress through content covering all CWCs, except for governance by water law. The CWCs form a basis for well-informed discourse and decision-making contributing to sustainable water by 2050.

– reviewed May 2025

RISE Challenge Colorado (Resilience, Innovation, Sustainability, Environment)

https://earthforce.org/challenges/rise-challenge/riseco/

Earth Force

Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

The RISE Challenge arose from a sincere need for young people to be involved in elevating community resilience as "natural" hazards become more intense and frequent as the climate changes this century. Part classroom learning, part contest, and part youth summit (a gathering where authentic student projects are shared publicly), the RISE Challenge started collaboratively during the 2018-19 school year by partners Earth Force (a national education non-profit specializing in environmental action civics), the Federal Emergency Management Agency (FEMA), and the Association of State Floodplain Managers Foundation (ASFPM Foundation; the funding arm of a professional association). This program guides students to explore their communities to assess vulnerabilities to natural hazards; develop and test their own ideas about ways to prepare, mitigate, and respond to disasters; and, carry out their action plan to increase local resilience. Students focus on what matters to them and their communities. Built on a framework called the Earth Force Process, a learning approach culminating in youth asking for improvements in community policies and practices, the RISE Challenge turns small groups of young people into civic actors affecting change where they live. Such "civic laboratory" programs that combine place-based learning and community engagement have substantial research-based evidence of building environmental literacy and stronger civic engagement.

Started in northern Colorado, the RISE Challenge steadily expanded, going statewide in 2020 – the same year as the largest pandemic in a century and Colorado's two largest wildfires ever. RISE also then partnered with the HEART (Hazard Education, Awareness, and Resilience Task) Force curriculum (from the Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder; also, a Colorado Water Education Exemplar), choosing to collaborate, instead of compete for educational bandwidth of teachers and students. Such synergy is striking.

Since 2020, the RISE Challenge replicated into Montana, Illinois, and Utah. During the 2024-25 school year, more than 600

students created more than 50 projects. Despite such ample and visible educational value, the RISE Challenge is currently on hold due to federal funding freezes.

A quality program such as the RISE Challenge helps young people gain knowledge and skills to address natural hazards and the social systems necessary for managing emergencies. This program was resource-rich and well-articulated, and the hiatus creates a gap. Essentially, this program can function to prepare young Coloradans for storms, fires, and water scarcity.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

The RISE Challenge was designed "to create a generation of citizens with the knowledge, skills, and motivation to improve community resilience to natural disasters." The program's broad goals are to:
• Improve community engagement in building resilience
• Improve student learning
From these succinct learning targets, the program has been clearly delineated and uses a thoughtful blend of content, process, and product guidance.

RISE Challenge-specific instructional materials are attractive, appropriate, and suitable. They include a handy teacher's guide ("Quickstart") with 30 links to resources; a 22-page, well-scaffolded "Student Workbook," which includes rubrics for the performance tasks; and checklists for project pitches and action stories, along with a video archive of prior student work. Another key feature of excellence is the on-call support offered by the state program manager; this person is available to all participants throughout the entire learning cycle.

Natural hazards, as mentioned in the Colorado Academic Standards, are addressed by RISE, especially for secondary science. As students research differing viewpoints, hazards and their impacts on underserved communities often comes to the fore.

The RISE Challenge's instructional blend of academic learning and life skills has been shown to produce ownership, long-term engagement, and real improvements in community resilience. The program's instructional design excels in guiding student exploration of environmental conditions faced by their own communities and application of learning through collective action for positive change.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

Content-wise, the RISE Challenge incorporates the HEART Force curriculum, a Colorado-grown resource focused on wildfire, flood, and drought (and also a designated Colorado Water Education Exemplar), along with student-discovered primary resources such as county emergency management plans and interviews with local disaster experts. For process, Earth Force's time-tested and research-backed cycle of student empowerment addresses nearby environmental issues and enacts civic improvements. A full Earth Force Process covers these essential experiences:

- Youth select a local, relevant environmental issue that is rooted in their lived experience
- Youth learn about the issue and co-create, with adult partners, a feasible solution
- Youth advocate for systemic policy or practice changes, based on their selected solution

Within the RISE Challenge's "Quickstart: Adult Mentors," 20 Earth Force activities are suggested to guide students on their investigative journey. As for student products, there are three performance tasks for the RISE Challenge: a face-to-face project pitch, which includes a project budget, to the program manager; a 5-minute action story video, reviewed by staff educators and

subject-matter experts; and, a 30-minute presentation and question-and-answer session with a community panel for 10 finalist groups. Finalists are ranked and receive cash awards for project implementation.

Students are granted meaningful roles with project budgets, facilities, materials, and health and safety considerations. They learn to prepare, mitigate, and respond to natural hazards, including aspects they may not have been familiar with before. As groups self-define and study their own community, cultural responsiveness is assured. Assessment occurs primarily via performance task revision and presentation. For each RISE Challenge project, students construct their own work plan and budget, while overall program delivery at each site takes place within parameters outlined in "Quickstart: Adult Mentors" and "Student Handbook," which contain developmentally appropriate checklists and rubrics. Regular program communications include social media posts, press releases, and flyers for recruitment, and virtual and in-person support sessions from the program manager and subject-matter experts.

Educators taking part in the RISE Challenge report it takes an average of about 20 instructional sessions to guide students through to a completed project, though with a wide variety in experiences. Ideally, adult educators become allies with the youth, making the project happen together. In Colorado, annual participation reached about 600 students generating about 25 projects. An exceptional middle school group in Estes Park, dubbed the Environmental Resilience Team (ERT), has been a RISE Challenge finalist each year since 2019, winning in 2022 and 2023. Consisting of a pair of dedicated teachers and 8-13 students, this group completed projects such as gathering and distributing "go bags" for evacuees and traveling to the State Capitol to advocate for Wildland Urban Interface Building Codes, clearly civic activities more advanced than those usually expected of adolescents.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise		💧		

Notes:

RISE Challenge program-specific evaluation involves collection of participation statistics and student and teacher reflections. These are compiled and published annually in reports listing "Impact & Deliverables."

As the RISE Challenge is built atop an Earth Force chassis, that organization's longer and deeper evaluative history contains ample evidence of planning, collection, analysis, and documentation about program performance and improvement. For instance, Melchior (2019) in "Earth Force 2003-2019 Program Evaluation" concluded youth feel motivated and develop civic skills if they have the following experiences:

- find an issue that they care about
- debate the issue and multiple solutions
- advocate to power about the issue

Earth Force and its RISE Challenge demonstrate this youth development through a record of evaluation which is longitudinal and detailed.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration			💧	
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

The RISE Challenge had a steadily rising trajectory through spring 2025, being delivered as designed and showing growth – both in size and locations. Student artifacts and annual reports display accomplishments toward program goals, environmental literacy, and community resilience. Process activities nudge students to consider perspectives of others, including Traditional Ecological Knowledge in a few instances, building inclusivity. Reliance on substantiated curriculum, primary resources, and local expertise,

plus varied methods of inquiry and discovery, calls on learners to tap and test a broad array of knowledge, skills, and actions. More group-to-group collaboration could enhance inclusivity and provide broader perspective-taking. Nevertheless, RISE cultivates wise environmental decision-making and civic responsibility. Guidance on "Youth-Adult Partnerships," where responsibilities and power are shared throughout the process, promotes a fertile learning environment where contributions are valued and learning is reciprocal. Their student-centered, flexible approach embodies sensitivity to environmental justice and equity. Participant reflections attest to educational outcomes of empowerment, engagement, and agency.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability			💧	
6.3 Share learnings				💧

Notes:

Through annual reports, social media, and videos, program accomplishments are captured and shared with a wider audience. Visibility and accountability result. Using an uncommon, though impactful, channel, the RISE Challenge has also been the subject of a publication in a peer-reviewed journal. "Centering and uplifting youth voice in planning for a more resilient climate future in rural Colorado: a case study of a student resilience team asking for change" (by K. Schloesser of HEART Force, T. Ruffin of Earth Force, and five additional co-authors in *Frontiers in Climate* [October 2024]) explains the case of multi-challenge winner ERT from Estes Park Middle School and adds to the scholarly literature on environmental education and civic action by youth. It concludes, "Through this work, ERT students gained invaluable exposure to the democratic process, increasing the likelihood of their participation in political processes as they get older." Thus, what is perhaps the program's greatest success story is documented and celebrated.

Given the current unstable funding environment, a renewed plan for long-term stability will need to be implemented. As their website now states, "Earth Force is exploring new ways to sustain the RISE Challenge."

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- The RISE Challenge offers a transformative programmatic model that integrates science education and civics. Through project-based learning on local, relevant issues, it successfully teaches resilience planning and policy advocacy. Students develop personal and civic responsibility. More students could benefit from such a community-based approach.

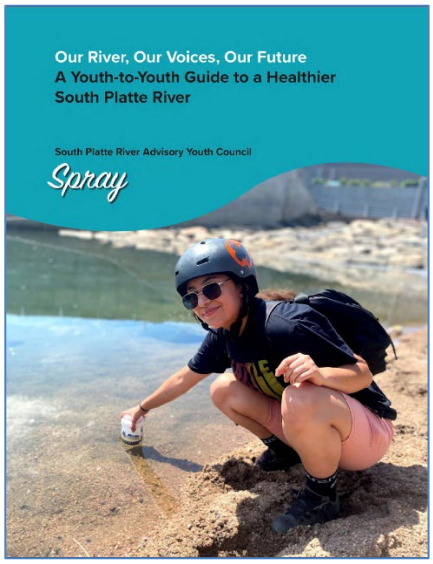
- RISE projects focus on Colorado environmental issues and allow students to flex their civic skills, perhaps for the first time. Such community engagement matches calls in the Colorado Water Plan for wider and deeper participation. Colorado Water Plan Partner Actions reflected in RISE fit squarely within the Effective Engagement category, but also – depending on topics selected by students – have included Meeting Future Water Need, Wise Water Use, and Thriving Watersheds. Of note, the 2020 Colorado Resilience Framework, which informed the design and implementation of the RISE Challenge and is listed as a student resource, is cross-referenced in the Colorado Water Plan (p. 218).

– reviewed September 2025

South Platte River Advisory Youth Council

https://sites.google.com/view/spray-projects/home

Confluence Colorado



Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources			💧	
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

As part of a summer 2019 Upward Bound program for 14 Denver high school students, educators and youth development specialists from nonprofit organizations Lincoln Hills Cares and El Laboratorio partnered with Colorado State University staff and the participating youth on a series of hands-on, project-based learning activities to examine Denver's river. At summer's end, the team put forth their final product, "Sourcebook: South Platte River Youth Advisory Council," a detailed plan to "empower our community to heal past generations, provide for present generations, and ensure the livelihood of future generations by protecting the health of the South Platte River."

The group soon inverted two words, "youth" and "advisory," to become the SPRAY Council, consisting of around 10 high school and college students at any given time. It has been operational since, though with changes in its administrative and fiscal home, at lower capacity than envisioned, and through a self-described "patchwork" of funding. The SPRAY Council's foundational concept – a robust and action-oriented team of young people, "particularly those typically not well-represented in environmental decision making," directly contributing to improving urban river health – remains timely and relevant.

As a culturally-responsive, youth-centered group, SPRAY Council addresses environmental and educational needs, harnesses power from many partners, and aligns with missions and organizational resources. It also is tied to regulatory needs for impaired stream segments and existing Total Maximum Daily Load directives. From the onset, SPRAY Council focused STEM learning via study of the urban river and development of civic action skills, elevating environmental literacy and water conservation policies and practices. SPRAY Council's plans, most notably "Our River, Our Voices, Our Future: A Youth-to-Youth Guide to a Healthier South

Platte River" (released at the end of 2021), chart a course toward a flourishing program. Potential for impacts – both in developing diverse water leaders and demonstrable contributions toward a fishable and swimmable river – remains high. SPRAY Council's aspirations are an example of a needed and powerful programmatic concept held back mostly due to funding realities.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

SPRAY Council's mission states, "We must learn to change the things we do that degrade the river. We are committed to acting on behalf of the river." Partners providing material support for this mission are many. SPRAY Council activity at various times has been coordinated by Lincoln Hills Cares, El Laboratorio, Metro Denver Nature Alliance, Colorado State University/Colorado Water Center, Wright Water Engineers, and Confluence Colorado. Work has been fueled by grants from the Catalyst Fund (Network for Landscape Conservation and The Nature Conservancy), Colorado Water Conservation Board, Colorado Department of Public Health and Environment, U.S. Environmental Protection Agency, and Denver Foundation. More than a dozen other partners have provided learning activities and expertise.

Environmental education lessons for SPRAY Council are delivered by educators, sometimes coordinating staff, sometimes other agency partners. Scientists and engineers from Metro Water Recovery, Adams County, Mile High Flood District, Colorado State University, and Wright Water Engineers have worked side-by-side with Council members. Alongside STEM learning, youth develop life-long soft skills – setting agendas, planning strategically, punctuality, contacting decision-makers for assistance, growing collaborations, selecting collective actions, etc.

SPRAY Council is administered by qualified and suitable staff. Young BIPOC adults, who are products of educational opportunities similar to SPRAY Council, serve as primary contacts with council members. Elder administrators and advisors, younger coordinators reflective of the Council's target audience, and a broad selection of visiting experts make for an exceptional team in support of youth on the Council. And, a series of engaged, dedicated young people have been drawn to serve on SPRAY Council.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery			💧	
3.2 Facilities				💧
3.3 Health and safety				💧
3.4 Communication				💧

Notes:

SPRAY Council meetings occur regularly, monthly or slightly less frequently, adjusted to meet group needs and changing access to venues. Field sessions have typically been half- to full-day excursions, often on Saturdays. Meetings take place primarily on-line, while learning episodes are mostly in-person. The Council also internally uses an app for group communications. Format and delivery match that of standard and usual boards, committees, and councils. Notes are recorded, though not formally as minutes. Learning activities are usually facilitated by a partner representative.

Administering organizations provide facilities and transportation following established polices, though many of the activities take place outside in or near the river. Council activities comply to applicable health, safety, and environmental guidance.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				💧
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise			💧	

Notes:

As evidenced by several funding proposals and published program plans, SPRAY Council operations incorporate evaluation, tracking inputs, outputs, outcomes, and impacts. "Our River, Our Voices, Our Future: A Youth-to-Youth Guide to a Healthier South

Platte River" (2021) contains a listing of 17 lessons learned, such as "Acknowledge that youth have important contributions to make, and are not simply persons to be 'educated' over to someone else's viewpoint," "Youth – and people in general – have trouble caring about a river they have never experienced," and "Everyone – youth, professional, or community member – investing substantial time in a program deserves to be compensated for their involvement." A formal evaluation report on 2021 activities used focus group interviews and pre-/post- surveys of participating youth. Results showed only passing familiarity with the South Platte River, moderate desires to care for the river, and a perception of pollution as the biggest threat to environmental and human health. Practical recommendations incorporated in response were more experiential interactions for the team as well as with other youth groups, streamlined team communications, and having food be part of team sessions. More recent evaluation information is less detailed. Pilot testing of components, while not specifically noted, can be inferred from modifications in program plans and funding proposals over time.

SPRAY Council's short history is one of adapting to shifting partners and approaches in seeking a secure fiscal footing and administrative home. A youth-driven council working on behalf of a river basin, a sophisticated and meaningful educational idea, has so far operated at a lower capacity than envisioned and has not been fully continuous. More revision and modification appear to be coming, as the program moves under the auspices of Confluence Colorado, seeking deeper impact and lasting effectiveness.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration				💧
5.5 Instructional methods			💧	
5.6 Implement evaluation				💧

Notes:

The overall instructional arc of SPRAY Council is one of empowerment, skills-practice, and amplification of youth voice. This is learning-by-doing following youth development and environmental education best practices. SPRAY Council members and coordinators explore the river deeply through a range of experiences. Hallmarks include exposure to multiple perspectives (those of community activists, university researchers, traditional knowledge-keepers, water quality professionals from regulated agencies, and professional engineers), building collaborative partnerships, and applying personal and civic responsibility dispositions to a regional issue. A shining example of program implementation is the 2021 "Our River, Our Voices, Our Future" plan, the compilation of which was youth-led and highly valuable for galvanizing future environmental and civic involvement.

Council members gain confidence as they get to work alongside professional engineers, water agency personnel, and community organizers and indigenous elders. They try on a range of skills, building multi-disciplinary understanding of the intertwined webs of socio-political and riverine systems. Content is delivered mostly through primary sources and direct collection and analysis of data. Learning climate is one of action-orientation and validation of identity and agency. Young people are granted equitable power for creation of learning climate, what exactly to learn about, and focus of efforts. Such instructional methods are age-appropriate (for ages 16-20), existing in a temporal and developmental space between pedagogy and andragogy; this space is sometimes termed "heutagogy," the management of self-directed teams through non-linear and authentic terrain. SPRAY Council fits this description, as its curriculum is interdependent and adaptive, reliant on lots of formative assessment and barrier removal.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				💧
6.2 Plan for long-term sustainability			💧	
6.3 Share learnings				💧

Notes:

Through attractive reports, an extant website, and publicly available grant proposals, SPRAY Council documents programmatic activity. Documentation includes evaluation results and consequent program modifications. Culminating youth summits have been celebratory and inspirational.

Long-term program sustainability is desired, but has proved fleeting to date. Council organizers, to their credit, keep trying, as a

long-term financial and administrative plan is in the works. As an intermediary phase of learning between academic learning and real-world applicability, SPRAY Council has a laudable rationale for continuation.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- This youth group concept could be argued as an apprenticeship-like learning experience and preparatory for service on Basin Roundtables and similar boards and commissions. SPRAY Council emulates the function and skill set necessary for such service. Council membership comes with equitable, inquiry-based, and autonomous power-sharing similar to that granted Basin Roundtable members.

– reviewed August 2025

Trout in the Classroom

https://coloradotu.org/trout-in-the-classroom

Colorado Trout Unlimited

Key Characteristics and Indicators of Environmental Education Program Excellence Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always				
#1 Gather Information & Assess Priorities & Resources	**N**	**S**	**M**	**A**
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

Trout in the Classroom (TIC) is more than 30 years old. As Trout Unlimited (TU) is an organization dedicated to wild trout, it is unsurprising that they'd desire to create a school-based program about these fish. As a mature program, TIC has direct ties to the mission of Trout Unlimited (TU): care and recovery of streams, so children enjoy wild fish. TIC reaches more than 100,000 students annually in 34 states, plus the United Kingdom (as well as highly similar Salmon in the Classroom programs in Alaska and Canada). In Colorado, there are currently 59 sites with 67 tanks and 20,138 students involved, with more than 80 sites anticipated next year and a long-range goal of 100 sites. Program expansion in Colorado over the last few years has been guided by honest self-assessments of need, capacity, and funding. TIC taps backing from national to local levels, generating tremendous synergy with dozens and dozens of interrelationships. Colorado TIC lists 50 vetted volunteers, 28 TU staff, about a dozen Colorado Parks and Wildlife (CPW) staff, and more than 80 partner organization. In Colorado, each participating site (usually a school classroom, but also museums and nature centers) signs a memorandum of understanding with Colorado TU and state agency CPW. This preserves TIC as a State licensed aquacultural program, legally allowed to release raised fish into Colorado waterways.

With each site needing about $2,800 in equipment, financial resources may strain capacities. And, being equipment-heavy also means continuous maintenance. TU chapters and state office works with each site to meet these budget needs and provide constant support. Curriculum-wise, TU national collection has more than 90 lesson plans available online, while the state-level program has excellent standards crosswalks and detailed resource lists with linked lesson plans, readings, and procedures. Instructional and operational supports keep the focus on each site's aquarium, which becomes a distinct model of a managed system that through nurture over time shows environmental health through the vitality of the apex organisms in it. All of these

components combine to attract scores of teachers and thousands of students into this highly popular educational offering.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				💧
2.2 Instructional materials and techniques				💧
2.3 Instructional staff				💧

Notes:

Thanks to the maturity of the program, with plentiful curricular and technical resources, staff and expert volunteer support, and detailed instructional design, clear evidence of environmental literacy development is strongly indicated. Applicable to Colorado water issues, TIC provides an exceptional model for building skills for and deep understanding of water quality and supply management. The pace and duration of TIC shines, as students experience how establishing a healthy aquatic ecosystem and rearing fish from eggs to fingerlings is a multi-month, slow-moving process, with regular waypoints, a lot of monitoring, and, most likely, many tweaks, to achieve desired results. Success is not guaranteed, and – though a hard lesson, especially for youngers – failure happens, may be inexplicable, and some organisms die even when conditions appear adequate.

TIC's multi-layered objectives align with TU's mission of uniting people with rivers through education and experiences; match wider civic and environmental needs; and, reflect environmental quality, social equity, and economic prosperity. Cultural relevancy is bolstered by a variety of add-on resources and lesson plans focused on non-dominant, non-Western subjects. For Colorado, TIC might benefit from some acknowledgment of Traditional Ecological Knowledge (indigenous thinking on and use of fish resources). That water is both a universal necessity for living things and has cultural value around the globe comes through, nonetheless.

Academically, TIC documents strong alignment to the Colorado Academic Standards, with clear and detailed crosswalks for grades PK-2, 3-5, middle school and high school provided. A rich, though not overwhelming, array of resources wrap-around the core activity of raising and releasing trout, and can easily be expressed to become interdisciplinary and integrated project-based learning. That said, accommodations for special needs, disabled, and English-language learners could be improved. Teachers, with TU assistance, tailor the program to local needs. Most articulations elegantly merge science, math, social studies, language arts, art, and/or physical education.

Staff and expert volunteers are highly experienced and trained, with Colorado leadership from a semi-retired PhD scientist and an environmental educator with more than 20 years in the field. Lead teachers for each site must undergo entry training before eggs will be delivered at the start of the school year. Such extensive support helps overcome the significant, year-round commitment required, especially for lead teachers. There is no shortage of supports for success.

Educational goals and objectives are stated for the program and its components. For Colorado, sets of "Curriculum Guides" and "Curriculum Resources," leveled at PK-2, 3-5, middle school, and high school, map strong alignment to the Colorado Academic Standards. Reading lists could benefit from inclusion of lexiles, however. Lesson plan lists at the national and state level allow ease of search and find for specific classroom needs. Special needs accommodations could be added for diverse learners and better differentiation. As TIC relies heavily on properly functioning aquaria, much material and support focus on equipment operations, monitoring, and care and feeding of fish. Such practical, technical skills are practiced repetitively, and the educational value of this should not be overlooked. A conceptual expansion from managing an aquarium to managing, say, a stream segment, to more complex landscape ecosystem management could result from a school-year-long TIC experience. Again, the duration and gradual progress toward a goal of releasing trout into the wild in the spring establishes and reinforces the very patterns of knowledge, skills, and aptitudes necessary for water conservation.

TIC is well-resourced, rich in all sorts of educational, technical, and human resources, using a well-tested model of national umbrella, state hubs, and local sites. Individual sites have flexibility within base parameters, allowing teachers to set-up their version of the program within their own setting and circumstances.

The abundance of data generated on-site heightens relevancy. The popularity of TIC at both elementary and secondary levels shows it adjusts to be age appropriate. When employed skillfully, materials are developmentally appropriate and responsive to students of varying cultural backgrounds while providing meaningful stewardship opportunities.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				💧
3.2 Facilities				💧

3.3 Health and safety				💧
3.4 Communication				💧

Notes:

The basic format of raising fish in a classroom aquarium has been articulated with massive supporting resources. Being a full-year commitment with not insignificant financial investment (about $2,800 entry-level), format and delivery have responsibility built-in, with lots of tasks and reporting. Though accountability falls heavily on participating teachers, TU, CPW, and the partner nongovernmental organizations offer dozens of experts to assist, including dedicated TIC staff in Colorado. Moreover, students can be granted (or grow into) many routinized tasks required to take organisms from egg to release. Expectations are made abundantly clear via the memorandum of understanding, checklists, timelines, and reporting rationale. TIC may be a substantial commitment, but the extent should be clear from the onset and the reward can be great. TIC's participation numbers demonstrate willingness, if not enthusiasm, for taking it on.

Individual site facilities, when created to specifications, meet aquacultural regulatory requirements. TIC's technology can be rather complex, but there's lots of guidance. That said, access for all TIC participants to real-time data from nearly all sites across the state is impressive and a rich source for viewing and interpretation by students. TIC's discussion group evinces that teachers and students pay attention to how other sites are doing and that there is a sense of shared process and purpose. There are multiple touchpoints for help, with monthly team calls as a primary opportunity for assistance. In other instances, water quality issues were observed to be addressed by "problem ticket" forms, protocol documents, staff (both in-person and virtual assistance), and through a peer-to-peer platform. Such multi-channel means of communication of program content is a hallmark of TIC.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan			💧	
4.2 Evaluation strategies, techniques, and tools				💧
4.3 Pilot test the program and revise			💧	

Notes:

TIC has used end-of-year evaluation questionnaires since inception. Their student instrument is simple, with only 3 questions, but does provide monitoring of self-reported outcomes. In the past year, Colorado TIC has enhanced evaluation to include a more sophisticated pre-/post- methodology. Data (shared by TIC staff for this review) on student knowledge and attitude change, as well as teacher satisfaction, are now incorporated and used for program improvements. Teacher trainings include post-training quizzes and multiple opportunities for feedback. Staff and volunteers are also polled concerning progress. This school year, newly created part-time, seasonal coordinator positions were piloted and found to be valuable; they will become permanent program features in 2025-26.

Lots of data from trout tanks gets generated through state-of-the-art automated collectors and is uploaded to the CitSci, a Colorado State University-hosted global support platform (https://citsci.org/). By and large, these data on water quality and trout health are more functional than evaluative.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				💧
5.2 Learning climate				💧
5.3 Flexible and responsive instruction				💧
5.4 Inclusion and collaboration			💧	
5.5 Instructional methods				💧
5.6 Implement evaluation				💧

Notes:

TIC delivers a rich and deep educational experience over the length of a school year. Learners tap a broad range of skills, as they tend to their fish. Although TIC follows a classic raise-and-release cycle for animals dependent on almost daily chores (in the manner of 4-H livestock or having pets to teach responsibility), the program is different in that trout are neither pets nor livestock. They are, rather, indicators of environmental quality. Students are confronted with many variables that may impact the viability of

their fish. Though their classroom aquarium being a microcosm of a larger environment may not be expressed explicitly, it will be comprehended on some level. With the aquarium ecosystem, learners grapple with environmental conditions, concepts, processes, and challenges. The program features more chemistry than most other environmental education offerings. Based on chemical data, decisions must be made to affect water quality and fish survivability. Site-specific data are generated constantly and can be analyzed to better inform tweaks to these fickle fishes' surroundings. Conceptual bridges to the larger environment emerge progressively.

Learning climate is fostered by daily presence of a classroom's fish, which require care and tending to survive. The situation stimulates inquiry ("Is it normal for them to bury in the rocks?" as a recent example), presents on-going data to analyze and adapt to, and builds efficacy as procedures are followed and modified. Flexibility and responsiveness are utmost, both for instructors and learners. Feedback is constant; collaboration is crucial. Though not a program deficiency, TIC could benefit from acknowledgment of Traditional Ecological Knowledge, such as recognition of fisheries work being done by the Southern Ute Tribe.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results			💧	
6.2 Plan for long-term sustainability				💧
6.3 Share learnings				💧

Notes:

A document "TIC Changes for 2024-25 Year" explains modifications, which were mostly administrative and deal with data collection and reporting. TIC has backing from national, state, and local TU chapters, plus lots of schools lining up to participate year-in and year-out. Such signs of success show that TIC is poised to continue and has long-term stability.

Trout releases as a culminating event have proven to be both memorable for students and attractive for news media attention, as many get covered and publicized each spring. As noted in the CTU "Currents" newsletter, "Our release events are a celebration of learning and conservation."

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- TIC teaches big ideas about natural resource management, developing students into knowledgeable and skillful stewards. As stated upfront in the TIC teacher training module, "Caring for the fish fosters a conservation ethic in the students, and the act of walking to a streambank and directly releasing the fingerlings into the water makes a concrete connection between caring for the fish and caring for the water." TIC offers a powerful, immersive educational tool to address the Colorado Water Plan's calls for informed and engaged citizens. This is especially true at the high school level, as evidenced by the alignment to the Environmental Science/Natural Resources Systems Career Pathway and its "Colorado Watershed Management" and "Wildlife & Fish Management" courses as defined in the Colorado Department of Education's Career and Technical Education (CTE) career cluster for agriculture, natural resources, and energy. TIC meets the CTE Scope and Sequence target for this pathway (specifically academic standard alignment NRS.01): "Plan and conduct natural resource activities that apply logical, reasoned, and scientifically-based solutions to natural resource issues and goals."

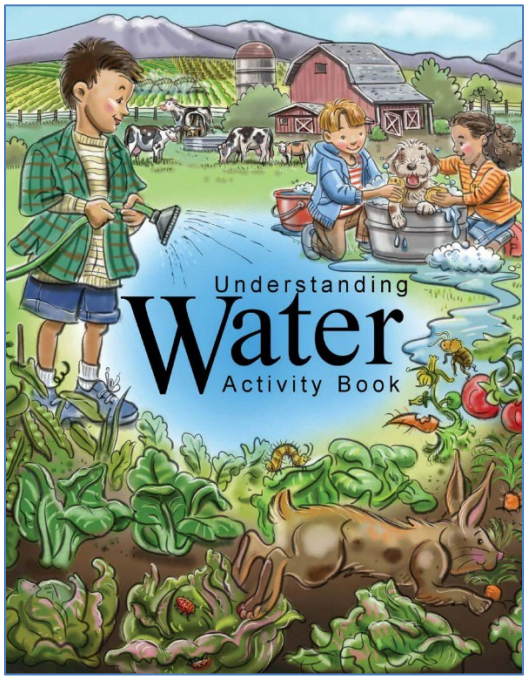
- A valuable aspect of TIC, which may not be obvious at first glance, is how participation in the program makes visible water and wildlife management agencies and non-governmental organization, as well as regulations, data, and consequences of adaptive management. The dynamics of rearing fish, including negative factors such as mortalities, builds understanding and tolerance for the vagaries of complex, nature-based, and human-influenced systems. TIC's blend of wildlife, natural resources, and technology is second to none in water education, and mirrors Colorado's water infrastructure system. Knowing the actors and the rules is requisite for informed, reasoned public engagement and participation.

– reviewed June 2025

Understanding Water Activity Book

https://colorado.agclassroom.org/teaching-resources/activitybooks/

Colorado Foundation for Agriculture



Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	● Presents basic water concepts at a 3rd grade level in a cute, if dated, workbook format; covers water's chemical and physical properties, cycle, supply, uses, treatment, pollution, and conservation with occasional Colorado-specific mentions ● Primary sources cited are reputable, from natural resource and agricultural agencies and large nongovernmental organizations ○ Would benefit from more diverse and inclusive depictions of people and differing knowledge systems ○ Many topics only discussed on a surface level and without skills-building aspects ○ Though the resource has been revised three times since original publication in 1998, specialist reviews and teacher "test drives" do not appear to have been repeated	Not addressed Partially addressed Addressed

EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	● Asks students to set-up and observe foundational water properties such as states of matter and freeze-thaw transformation ● Introduces components of the water system ● Math and vocabulary-heavy skills practice, with a few instances for reflection ("What would you do to save water?") ○ Not much creative exploration or critical thinking, as nearly all activities focus on right-vs.-wrong answers ○ Lacks group cooperation, deliberation, and problem-solving/independent reasoning ○ Too much recall and reproduction, not much beyond lower-order thinking skills ○ Little encouragement for deeper inquiry and perspective-taking ○ Challenges to water security only appear in passing, with no mention of Colorado's future scenarios and pressures from population growth and climate change ○ Little to no application, action-orientation, or unstructured explorations with water	Not addressed Partially addressed Addressed
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	● As stated on the title page, "this activity book is intended to stimulate interest and awareness." This resource succeeds here. ● Presents age-appropriate information about the interrelationships between water and humans, that is, the natural and the built ● Attends to geographic scales of water systems from global to local ○ Depth of knowledge does not go deeper than basic level of defining, recognizing, and identifying ○ Presents a series of facts more so than concepts and systemic functions ○ Only slight contextualizing of water's role across natural, socio-cultural, economic, and political systems ○ As stated on p. 2, "the intent of this activity book is to help you prepare knowledgeable decision-makers." This resource mostly falls short here.	Not addressed Partially addressed Addressed
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and	● Lists plenty of water conservation behaviors and asks reflective questions (e.g., "What would you do to save water?")	Not addressed Partially addressed

responsibility 4.2 Self-efficacy and personal agency	○ Heavy reliance on right-or-wrong answers throughout what is basically a packet of worksheets misses opportunities for examining water impacts within an appropriate sphere of influence for elementary students, introducing water laws and policies (especially water rights), and strengthening decision-making skills based on reaching one's own conclusions ○ Rather than building personal agency and authentic application of knowledge and skills, the resource has a smattering of unnecessarily rigid expectations, some describing behaviors beyond the control of a young child. For example, pp. 58-59 list 28 water conservation activities and concludes "If you are a water conservationist" all answers must match those in the provided key. So, instead of encouraging waterwise behavior, a literal reading could trigger anxiety about not always doing the right things.	Addressed
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning 5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for specific learning settings 5.9 Assessment	● A few Colorado-specific informational texts passages offer connections to everyday water use ● Offers alignments to Colorado Academic Standards, Next Generation Science Standards, and Common Core State Standards ● Mildly interdisciplinary, with math skills practice and vocabulary development ○ Built on rote answers filled into lots of blanks and uses lower-order thinking tools such as one-dimensional puzzles and word searches; there are only a couple of relevant performance-tasks. ○ Too basic and linear to be considered learner-centered ○ Does not have a range of instructional strategies or adaptations to accommodate varied learning styles ○ Content, especially some of the illustrations, do not depict a diversity of people; cultural sensitivity could be heightened ○ Does not extend learning beyond completion of worksheets, with exception of short activities on phases of water and density/flotation ○ Has no overt learning objectives, as filling in the blanks seems the only requisite task for completion ○ No extensions to real-world water, learner assessments, or questioning strategies	Not addressed Partially addressed Addressed

USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims 6.7 Support accepted recommendations and requirements	● Structure follows a logical sequence of concepts from introductory (Water is required for life.) to more complex (Water treatment is an industrial function.) ● Resource is available free to download and to order printed copies from Colorado Foundation for Agriculture (which reports about 2,000-3,000 copies per year are distributed) ○ Text-heavy with dated typography and dense layouts; could benefit from a redesign to more up-to-date appearance and more open-ended responses, plus experiences beyond the pages of the workbook so as to be more effective for today's classrooms ○ Needs more flexibility to needs of diverse learners and settings ○ Some passages are confusing; e.g., on p. 6, statements of "99 drops or 100%," "Two percent or 2/3" – The Project WET activity "A Drop in the Bucket" teaches the tiny percentage of Earth's water which is fresh and accessible with more clarity. ○ Though the activity booklet contains an evaluation questionnaire, there is no reported data on use or effectiveness	Not addressed Partially addressed Addressed

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- Addresses the first Critical Water Concept ("The physical and chemical properties of water are unique and constant.") from the Statewide Water Education Action Plan (2020), which many resources – especially those for elementary students – overlook.

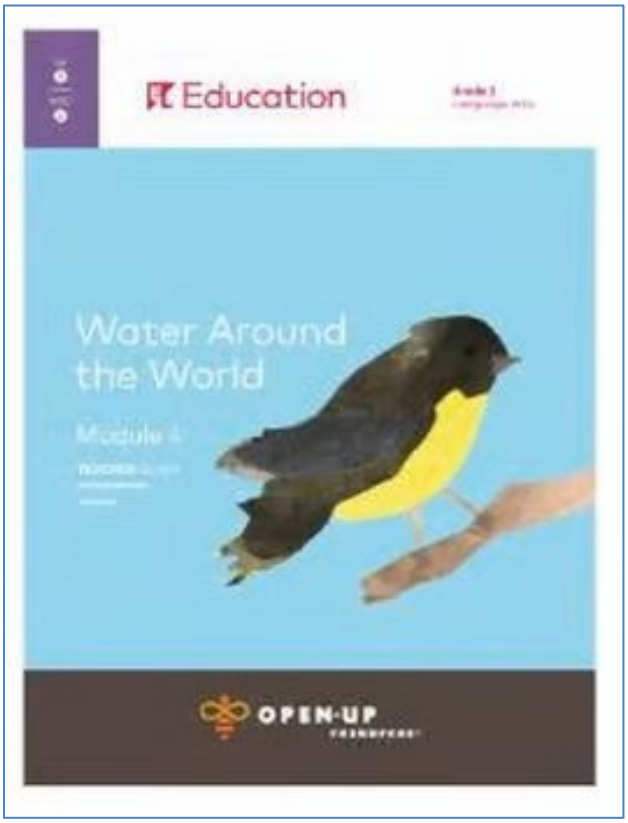
- With a comprehensive revision focused on upgrading instructional soundness, the resource could better deliver foundational concepts to young students, setting them up for success as adult stewards of Colorado water.

– reviewed August 2025

Water Around the World Module

https://curriculum.eleducation.org/curriculum/ela/grade-3/module-4

EL Education (as localized by Joe Shoemaker School, Centennial: A School for Expeditionary Learning, Tollgate Elementary School of Expeditionary Learning, Odyssey School of Denver, and City & County of Denver's Stormwater Education & Outreach Program [Colorado materials here])



Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	● With 700+ pages across 2 volumes, 39 full-blown lesson plans, and abundant supporting materials, this module is the epitome of inclusivity and accuracy. (This module has been downloaded freely more than 8 million times) ● Unit allows flexibility and versatility, and has been made Colorado-specific over the last decade by several Front Range "expeditionary learning" teachers and an educator from a water utility; the regional version was built based on the *Guidelines for Excellence: Environmental Education Programs* ● A literacy unit of about 8 weeks' duration, this	Not addressed Partially addressed Addressed

	resource ties substantive reading and writing skills while simultaneously delivering STEM content about water – access, demand, and pollution ● Wide range of sources, all of which are cited/vetted, and include variety in representation (people of color, traditional ecological knowledge, and those from less developed countries). The result is a balance of voices from around the world, with only a few mentions suggesting victimization ● Highly inclusive for English language learners, those needing differentiation (through multiple means of representation, diverse range of assignments, expression and engagement), and learners of various styles, plus social-emotional learning ● Opinion items are labeled as such	
EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	● Exhaustive in structure, content, performance tasks, and supporting materials, this resource is as detailed as any set of lesson plans for teaching elementary students about water ● Relying on repeated, careful analytical reading of small portions of text, the unit builds skill and stamina, from figuring out parts of speech and gist, into issue analysis and weighing of solutions, before culminating with composition of an evidence-based essay advocating for a particular water conservation action ● Consistent patterns of learning make it easier for students to grapple with the content ● Strong linkage between lessons, the unit incrementally builds skills for making informed decisions about a crucial environmental issue – safe drinking water ● Most commonly localized with in-stream water quality fieldwork (including aquatic benthic macroinvertebrates) or a tour of nearby water utility facilities. (Such fieldwork is suggested on p. 8 of the teacher's guide)	Not addressed Partially addressed Addressed
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	● The unit's primary source is the age-appropriate book *One Well: The Story of Water on Earth* by Rochelle Strauss. This nonfiction anchor text is dissected in 2-4-page chunks to build understanding gradually. The book explores water access and quality around the world. For Colorado,	Not addressed Partially addressed Addressed

	the anchor text was updated in 2022 ● Big ideas (e.g., Water is a finite resource.) tie thematically to each lesson's learning targets, with conceptual understanding built through progressive consideration of details ● By deconstructing text, students can understand the water cycle and its importance bit by bit ● Conceptual understanding is presented in context of daily water needs and usage, most often through the experience of young people, in a variety of geographic, cultural, and historical settings ● Deep understanding of the water cycle and drinking water systems develops – beginning with a global perspective (completely aligned with the One Water concept) and then made more relevant with reflection on water within each students' daily life ● Interconnectivity of water resources and human dependency on them emerges. Deepened understanding of a basic need and human right leads to informed application of action skills	
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and responsibility 4.2 Self-efficacy and personal agency	● "Working to contribute to a better world" is an overarching goal of EL Education (formerly Expeditionary Learning), publisher of this module. The module achieves the goal as it relates to safe drinking water for all ● The unit builds empathy for global peers who may have to spend hours each day fetching water ● The unit focuses on responsibility to conserve water, both through individual behavior and systemic improvements ● The unit powerfully builds ideas of cumulative effects and shared well-being, at local to global scales ● Culminating projects (a persuasive essay and a student-produced public service announcement) authentically apply learning, requiring demonstration of literacy and creation of an original work, effectively introducing students to self-efficacy through practice of literacy and communication skils ● Diverse perspectives are consulted and celebrated, while agency is uncovered as students stake positions on a water-saving behaviors	Not addressed Partially addressed Addressed
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning	● Comprehensive care for learners across a range of abilities is exhibited through the detailed layout	Not addressed

5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for specific learning settings 5.9 Assessment	and design, with goals, objectives, standards correlations, assessments, tools, and techniques – up to and including many opportunities for self-consideration of one's learning – for all lessons ● Use of drawings early in the module helps humanize the issue and eases students into the topic ● Wide assortment of accommodations, multiple modes of expression, and guidance for technology and supplemental resources included for teachers ● Ably blends literacy skills-building via STEM content ● Pre-, formative, and post-assessments are plentiful. Specific performance-based tasks close each section of the full module ● Colorado localization with hands-on fieldwork expands the learning environment to nearby streams and infrastructure	Partially addressed Addressed
USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims 6.7 Support accepted recommendations and requirements	● While voluminous, this module has clear, logical flow and pacing; common layout makes for smooth, consistent lesson preparation and delivery ● Lesson organization and specifications are complete and easy-to-understand ● Aligned to Common Core State Standards ● Entire module can be downloaded, including the volume of supplemental materials, making use and adaptation more feasible than hard-copy alone ● Anchor text was updated in 2022 for Colorado teachers and students ● Makes substantiated claims about watershed health and conservation ○ Given the volumes' size, it can be difficult to find a single item when referred to only by the title of the sheet; an index or numbering system could help	Not addressed Partially addressed Addressed

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- The module's "Big Ideas" (Water is a finite resource. The demands on water and water pollution threaten our freshwater sources. Due to rainfall, freshwater is not distributed equally around the world.) align strongly with the Colorado-specific Critical Water Concepts, from the Statewide Water Education Action Plan (2020). Such foundational understandings are necessary for the success of the Colorado Water Plan.

- As localized by Front Range educators, most commonly with nearby in-stream fieldwork and tours of utility facilities, this long-term, standards-based unit accomplishes dual purposes of driving academic achievement and developing a life-long water ethic.

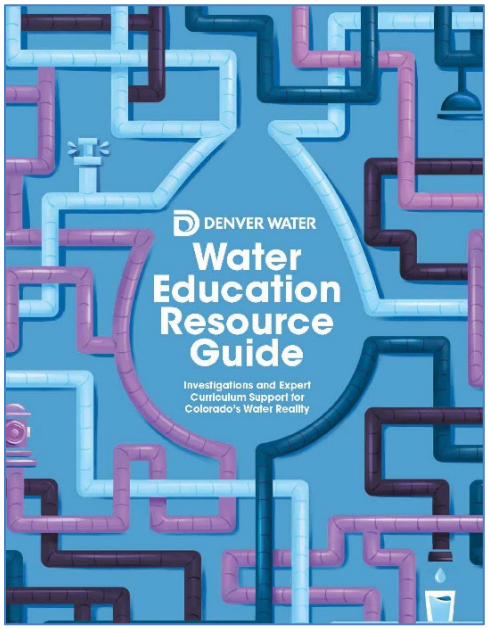
- Educational resources about Colorado water designed for younger learners are less common than ones for high school and higher. Exemplary ones, like Water Around the World, are even rarer. This resource deserves wider use in Colorado schools.

– reviewed December 2024

Water Education Resource Guide

https://www.denverwater.org/education/youth-education-program/werg

Denver Water Youth Education Program



Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	● Presents ample amounts of background, systemic information, plus water source and use data from and about Denver's drinking water supply system, with thoughtful sequencing and scaffolding toward overarching goal of understanding a clean water supply system ● Presented squarely from an agency position, as a primary source of information about their area of expertise ● From within the agency, a variety of sources and voices are represented; from outside, however, more diverse viewpoints are less evident ○ More detailed citations would be beneficial	Not addressed Partially addressed Addressed

EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	● Excels at providing building block knowledge and skills for understanding of water systems and conservation behaviors, with learners encouraged to arrive at their own conclusions through thorough investigations ● Has an unusual completeness of educator supports, with curricular priorities (objectives plus big ideas), background, inquiry guidance, and procedures following an engage-explore-explain sequence for each investigation ● Confronts water scarcity without being scary ● Focuses more on individual behaviors than collective actions or policies ○ Could have included a design challenge, to build engineering skills, along with other project-based culminating activities	Not addressed Partially addressed Addressed
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	● Localization and relevancy of investigations is outstanding; for instance, “Incredible Journey” from Project WET is given Colorado specificity ● Plentiful concepts about the urban water system addressed, zooming-in from a global to local scale as investigations progress ● Ample mapping and graphing skills addressed ● Colorado’s complex system of water supply comes into focus, with emphasis on large-scale engineering projects and the prior appropriation legal framework ○ History presented is in-depth, but may come across as self-serving and overly positive, especially to non-Metro region readers	Not addressed Partially addressed Addressed
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and responsibility	● Strong focus on concepts with encouragement to transfer those concepts into action-oriented individual skills for conserving water ● Thematic progression feeds systems thinking,	Not addressed Partially addressed Addressed

4.2 Self-efficacy and personal agency	with some discussion of climate change, regulatory environment, and technological impacts ○ Emphasis on the distinction between conservation and efficiency may seem like splitting hairs to younger learners, especially with individual behavioral focus on conserving water, leaving open an interpretation that others control the technologies of efficiency	
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning 5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for specific learning settings 5.9 Assessment	● Superbly learner-centered with activation of background knowledge, exploration/inquiry, big ideas, assessments, reflection, everyday relevancy, and widely accepted instructional strategies blended throughout ● Focuses in an interdisciplinary way on foundational concepts first – water cycling, global distribution of resources, Colorado's hydrologic and climactic situation – before building skills ● Student readings and worksheets are plentiful, attractive, and supportive of lesson content ● Detailed alignment document for Colorado Academic Standards included ● Strong assessment, with many pre-, formative, and post- prompts ○ Few accommodations and extensions offered, which limits differentiation; English-only materials ○ A few instances where language and images could be more inclusive (e.g., "inefficient students" instead of inefficient water practices and photos of career connections)	Not addressed Partially addressed Addressed
USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims	● Gestalt of the guide is inviting, attractive and engaging ● All components (hard copy and on-line) necessary for educators to deliver with success are included in a clear and logical progression ● Content expertise of agency highly evident	Not addressed Partially addressed Addressed

6.7 Support accepted recommendations and requirements	● Materials are mostly provided or low-cost ● Student handouts #5, 9, 11 are stand-outs ○ Needs publication date/copyright (appears to be 2020) and fair use statement ○ Some navigation challenges were noted with on-line Google Drive files ○ Additional citations would help substantiate claims	

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

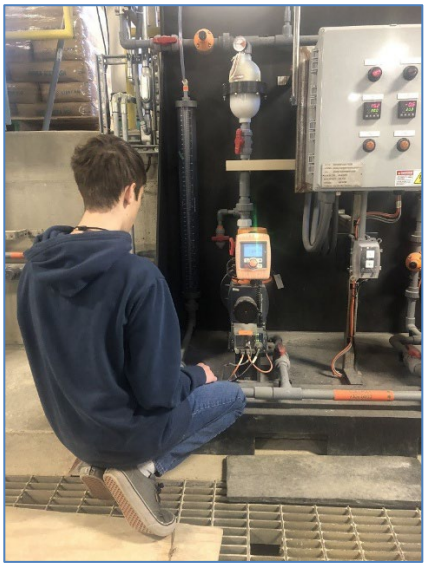
- This localized curriculum guide combines the Water Plan's "Public Outreach and Education" and "Water Efficiency and Conservation Programs" tools.
- For about 1 in 4 Colorado K-16 students, this educational resource from their drinking water provider contains highly relevant information and teaches concepts which – if delivered by a skilled educator – could go a long way in building water literacy and encouraging water-saving behaviors.
- A learner exiting these investigations successfully would have big ideas and action-oriented skills from which to make wise water use decisions, assisting their communities in stretching water supplies.

– reviewed December 2024

Water Quality Management Program

https://arvadawest.jeffcopublicschools.org/learning/career-pathways/water-quality-management-pathway

Arvada West High School



Key Characteristics and Indicators of Environmental Education Program Excellence

Key: **N**...Never **S**...Sometimes **M**...Most of the time **A**.... Always

#1 Gather Information & Assess Priorities & Resources	N	S	M	A
1.1 Self-assessment				💧
1.2 Organizational priorities, capacity, and resources				💧
1.3 Environmental, educational, and community needs				💧
1.4 Audience needs				💧

Notes:

The Water Quality Management Pathway (WQM) at Arvada West High School is a Colorado Career and Technical Education (CTE) program, where students are readied for water professional careers. WQM started at Arvada West 8 years ago and is the brainchild of veteran teacher Chris Madsen. WQM enrolls about 100 students per year, with about 90% taking both years' worth of courses during their junior and senior years. Through this program, students can earn up to 12 college credits without paying tuition fees and gain immediately transferable job skills (including a Class D Operators Certificate for Water and/or Wastewater Treatment), while exploring an in-demand and meaningful career in environmental science, water/wastewater treatment, and laboratory technology. WQM supports a statewide need for the next generation of water utility workers, to counter the imminent retirements of about one-third of current professionals in the next decade.

A 92-criteria internal evaluation study completed annually evidences honest, thorough self-assessment. It is scored into 12 elements – standards-aligned and integrated curriculum; sequencing and articulation; student assessment; prepared and effective program staff; engaging instruction; access and equity; facilities, equipment, technology and materials; business and community partnerships; student career development; "career and technical student organizations;" work-based learning; and data and program improvement. These elements correlate closely to the Guidelines' key characteristics and indicators. Evidence for all 5 key characteristics and their indicators was found in abundance. The program's latest self-evaluation showed that WQM excels in engaging instruction, prepared and effective program staff, business and community partnerships, and its sequencing and articulation. This review agrees with that self-assessment. Open acknowledgment of opportunities for enhancement, a sign of program excellence in itself, calls for improvements in the career and technical student organization, recruitment and outreach to

underrepresented groups, and data collection and reporting. By the end of the 2028-29 academic year, WQM will establish a fully functioning chapter of the Rocky Mountain Water Works Association (RMWWA) as its official career technical student organization.

#2 Design Instruction	N	S	M	A
2.1 Goals and objectives				●
2.2 Instructional materials and techniques				●
2.3 Instructional staff				●

Notes:

Though there are 1,367 CTE programs enrolling more than 125,000 students in Colorado and Arvada West has 10 CTE pathways, WQM stands out as it is the only water-specific high school program in the state (There are a total of 4 water quality management CTE programs: Denver Public School's Emily Griffith Technical College and Red Rocks Community College for post-secondary and Arvada West and water quality as a component of the Natural Resources Pathway at Littleton Public School's EPIC [Explorative Pathways for Innovative Careers] Campus for secondary students.). As the largest such program in the state and a Water Education Exemplar, WQM is ripe for replication elsewhere, especially to build a pipeline for workforce-ready, next-generation water system operators. WQM graduates are capable of starting water careers immediately.

The mission of the WQM is "to prepare students for successful employment in the diverse water industry by providing a hands-on, active and applied curriculum created with industry partners." This is consistent with and buttressed by the mission of both Arvada West High School (to develop students' skills and critical thinking so they positively contribute to society) and CTE (to provide knowledge and skills for entry into high-wage, high-demand industries). WQM's competency-based coursework aligns with industry standards, correlates with the Colorado Academic Standards, and contributes to environmental quality and economic prosperity. The program bridges academic knowledge and technical expertise.

WQM's instructional materials and techniques blend some initial textbook-lecture learning with ample laboratory procedures, fieldwork, and versatile work-based learning at facilities of industry partners. During the first academic year in WQM, students work through 2 textbooks: *Basic Environmental Technology: Water Supply, Waste Management and Pollution Control* (6th Ed.; 2014) by Jerry Nathanson and Richard Schneider and *Controlling Environmental Pollution: An Introduction to the Technologies, History, and Ethics* (2006) by Aarne Vesilind and Thomas D. DiStefano. As students progress through the program, learning becomes more hands-on and experiential.

Laboratory competencies are taught in appropriate and dedicated spaces. At Arvada West, WQM has its own classroom, complete with more than $50,000 in laboratory and field equipment. At Red Rocks Community College, the Water Quality Management Technology program has its own building with laboratory and classrooms. Overall, the program of study starts with broad foundational knowledge and skills, progressing in specificity as students learning technical skills in the lab, in the field, and on job sites. Curriculum, instruction, materials, and assessments are diverse, inclusive, and harmonized to ensure each student has opportunity to succeed.

The WQM program director is a 22-year secondary science teaching veteran, who is also adjunct faculty for Red Rocks Community College. The program's advisory panel of business and community partners meets twice annually to review, celebrate, and provide feedback; advisors represent small, medium, and large utilities, including the state's largest drinking water provider (Denver Water) and wastewater treater (Metro Water Recovery). These partners also provide more than 800 hours of job-shadowing/work-based learning annually, as well as several internships and apprenticeships.

Learning opportunities are extended by WQM's participation in Trout in the Classroom, Colorado River Watch, and Trout Unlimited's Bull Moose Committee (which follows clean water policy-making). Each year, students raise trout, take environmental samples monthly, and have the chance to advocate for conservation legislation, if they choose.

WQM's articulation of content and instructional strategies is both broad and deep. The program is impactful, purposely co-designed with stakeholders and responsive to community needs. The program's remarkable contributions to environmental literacy and the water workforce are highly evident.

#3 Design Program Structure & Delivery	N	S	M	A
3.1 Format and delivery				●
3.2 Facilities				●
3.3 Health and safety				●

3.4 Communication				

Notes:

WQM is structured around 2 academic-year-long, competency-based courses, namely "Environmental Systems: Water" and "Advanced Studies in Water Quality." As dual enrollment courses with Red Rocks Community College, students can earn up to 12 college credits (for "Introduction to Water Quality," "Basic Water Quality Analyses," "Bio/Bacteriological Quality Analyses," "Water Certification Review for C & D," "Wastewater Certification Review for C & D," and "Water Quality Special Topics"). WQM combines rigorous academic coursework with hands-on professional experience, meeting the vision of a high-quality CTE program. Instructional format and delivery blends durable skill integration, lab-centered instruction, "know-and-show" modeling (*i.e.*, clear performance expectations and demonstrated mastery through guided labs, claim-evidence-reasoning reflections, exit tickets, and performance assessments), and project-based-learning capstone projects.

These courses are aligned with relevant industry standards and needs. While coursework follows a single track, work-based learning opportunities are more flexible. An advisory board consisting mostly of utility professionals meets twice annually to review and advise, ensuring the program aligns with current trends in the water industry. A visible outcome of this strong business and community partnering is the "Downstream Development Program," providing hundreds of job-shadowing experiences totaling more than 800 hours of work-based learning per year. As a result of WQM, students have interned and apprenticed with Metro Water Recovery, Denver Water, City of Westminster, North Table Mountain Water, Consolidated Mutual Water. At least 20 students have matriculated to RRCC to pursue a Water Quality Management degree; about 15 previous students now work for municipalities and utilities, including Metro Water Recovery, Westminster, and Arvada. WQM exemplifies how strong business and community partnerships can enhance educational outcomes by aligning instruction with real-world needs, fostering extended learning, and sustaining program success through active industry collaboration.

WQM facilities and job sites, at the high school, community college, field sites, and utility partner plants, are compliant with health, access, and safety rules and regulations. As indicated by syllabi, course websites, family communications, and professional presentations, WQM communicates extensively about the program's availability, content, outputs, and outcomes.

By the end of the pathway, students have the academic foundation, lab competencies, and field experience necessary to pursue entry-level water careers or continue their education in environmental science or water resource management. Students may earn their Class D certifications (water or wastewater) and enter the workforce directly after graduation.

#4 Develop an Evaluation Plan	N	S	M	A
4.1 Evaluation plan				
4.2 Evaluation strategies, techniques, and tools				
4.3 Pilot test the program and revise				

Notes:

Thanks to the State CTE system, planned and repeated evaluation drives program implementation and is used to better the program. The key component is "Colorado Secondary Program Self-Evaluation," an instrument completed by WQM at the start of the school year. Ninety-two statements covering 12 program elements are marked on agreement, frequency, and likelihood Likert scales. These elements are scored on a 100-point range. In 2024, WQM scored highest for accomplished staff (97.2), engaging instruction (100), and effective partnerships (94.4). Opportunity for more generation and incorporation of student demographic and performance data (57.5) is noted. From this instrument's data and findings, a "Program of Work" (defined as "a systematic review of the program's goals, curriculum, activities, funding, and resources with the overall goal of assessing the program's effectiveness and sustainability") is written and presented to the WQM Advisory group of industry and community representatives. Their reactions and advice lead to program modifications, and can loosely be considered a form of pilot-testing.

#5 Deliver Program & Implement Evaluation Plan	N	S	M	A
5.1 Instructional content				
5.2 Learning climate				
5.3 Flexible and responsive instruction				
5.4 Inclusion and collaboration				
5.5 Instructional methods				

5.6 Implement evaluation				

Notes:

Educational experiences delivered by WQM develop water literacy, in particular water quality knowledge, skills, and qualifications. Programmatic learning climate is responsive, supportive, and accessible. Instructional content, while being grounded in lab analytics, branches out to show cultural relevancy, consideration of environmental ethics, and multiple social and cultural perspectives. Places of learning are expanded to allow repeated forays to spaces well beyond the home-base classroom. As a result, WQM learners were repeatedly observed to be enthusiastic, engaged, and intellectually challenged.

Instruction isn't rigid, allowing for current events and conditions to be incorporated. Dual enrollment can sometimes leave less room for individualization within core coursework, but workplace and field opportunities are more flexible. Evidence shows individualization occurs regularly. Instructional methods become more interactive and participatory as students' progress through the 2-year cycle. WQM successfully incorporates engaging instruction by adhering to content standards, integrating project-based learning, providing contextualized experiences, and fostering a supportive and respectful learning environment.

WQM packs a lasting educational punch, and a WQM graduate can punch their ticket to much-needed and lucrative careers, helping to ensure operations and maintenance of safe, clean municipal drinking water and sanitary sewage systems. For those choosing other careers, WQM develops well-informed Coloradans capable of environmentally responsible behavior and water-smart conservation. WQM, with abundant resources and educator expertise, represents a workforce pipeline directly addressing a huge civic need – fresh, new water system operators.

#6 Analyze, Adapt, and Share	N	S	M	A
6.1 Evaluation results				
6.2 Plan for long-term sustainability				
6.3 Share learnings				

Notes:

WQM operates within two large education institutions, the Jefferson County Schools and the Colorado Community College System. Both have strong accountability systems. First, WQM is housed within a large comprehensive public high school, with about 1,800 students and one of 17 high schools in JeffCo Schools. As such, there are robust assessment and accountability systems in place: grading, standardized testing, teacher performance reviews, a School Accountability Committee, etc. For CTE, administered by the State's community college central offices, the aforementioned self-evaluation and advisory group are components of approved and credentialed CTE programs.

Data collected and reported documents steady growth in size, sophistication, and success of WQM. Outstanding student success stories include those like Kaylee Stone, a 2025 program graduate, who landed a paid internship while a student and then a full-time job as a program graduate at Metro Water Recovery. She also testified about water quality issues before the Colorado legislature in 2023.

Long-term sustainability of WQM, as with other well-administered CTE programs, is fueled mostly by State and supplemented by federal funding sources – the Career and Technical Act and the Carl D. Perkins Act/Strengthening Career and Technical Education for the Twenty-First Century Act, respectively. The accomplishments and quality of WQM make it a prime example of water education programs positioned for replication.

For a program at a single high school, WQM has a high profile, with its success celebrated and shared often. Program director Chris Madsen presents to many groups and at professional conferences several times per year. Students often post WQM activities on social media. WQM, deservedly so, has many fans and many advocates.

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- As stated in the WQM parent/guardian introduction letter: "Together, we are preparing the next generation of water professionals and environmental leaders." This program squarely does that. Colorado could use more CTE programs modeled on Arvada West's.

- Colorado's drinking water and sanitary sewage systems face workforce challenges, namely aging of current staff and attracting new talent. WQM shows a way to entice and equip the next generation of water system operators.

- Vibrant Communities and Thriving Watersheds, overarching action areas in the Colorado Water Plan, subsume water infrastructure tended by a vibrant and thriving workforce. WQM is a shining example of how water education produces those necessary personnel.

--reviewed July 2025

Where Water Flows Uphill

https://www.mylibrary.us/wwfu/

Library and Innovation Center, High Plains Library District

(Immersive art installation by Wes Bruce)

Key Characteristic and Description	Notes	Rating
ACCURATE AND INCLUSIVE 1.1 Accurate 1.2 Centers on equity and inclusion 1.3 Balanced presentation of differing viewpoints and theories	A multi-level immersive art installation located within Greeley's main library, "Where Water Flows Uphill" is a whimsical, inspirational space created by artist Wes Bruce, a one-time Weld County resident. As a culturally-meaningful experience, it successfully sparks curiosity and consideration of the beauty and ubiquity of water. Surrounding visitors with artwork, poetry, film, and music, "Where Water Flows Uphill" celebrates Indigenous perspectives and the nearby nature of the Cache la Poudre River. Throughout the space, one encounters a repeated metaphor: "we are rivers." Guidance and direction are light, noting this "sort of fictional world" is inhabited by a cast of "character archetypes" (e.g., Cottonwood, Snake, Moon). Inspired by authentic personal experiences of the artist with the river, the multi-level design includes entire art-covered walls and floors, a "multi-curvilinear, three-screen non-narrative art and dance film," and interactive elements that engage families, especially ages 4-11 as observed during our review. The space, unified by a soothing color palette and an attractive, if difficult to decipher, typeface called Aqua Lingua, has ample nooks and crannies, small rooms and	Not addressed Partially addressed Addressed

	opportunities for climbing and crawling. It effectively balances multiple art forms (with paintings and poetry the most prominent), while honoring Traditional Ecological Knowledge. Accessibility could be improved, however. Physical spaces could exclude wheelchair users, people with visual impairments, non-English readers, and those prone to sensory overwhelm. Still, the content beautifully offers profound themes about our connection to nature. So, with an intended purpose as a "curiosity-primer," the space succeeds in reminding about the beauty of nature, the nature of water, and the need to conserve it.	
EMPHASIS ON SKILLS BUILDING 2.1 Thinking and process skills 2.2 Skills for asking questions and exploring different perspectives 2.3 Skills for decision-making 2.4 Skills for addressing environmental challenges and opportunities	As a rather abstract learning environment, "Where Water Flows Uphill" encourages self-reflection and personal interpretation rather than more traditional instruction. Instead of imparting facts and figures, it imparts wonder, movement, and appreciation. Visitors encounter philosophical questions painted on walls, thought-provoking poems, and coded messages that may encourage deeper thinking about connections between Colorado flora, fauna (including humans), and water. The space successfully promotes social-emotional learning and motor skills through puzzles, hidden climbing areas, and opportunities for personal perspective-taking. Imagination flourishes in cozy spaces designed for introspection. There are limitations, however. The custom typography challenges comprehension, repeating word patterns may confuse some readers, and embedded puzzles prove time-consuming and may frustrate. Significantly, the space does not address concrete environmental challenges or build decision-making skills. While fostering thinking about the concept of interconnectedness, it does not contain opportunities for more actionable understanding of ecological systems and their real-world problems.	Not addressed Partially addressed Addressed
DEPTH OF UNDERSTANDING 3.1 Awareness 3.2 Focus on concepts 3.3 Concepts in context 3.4 Attention to different scales	This metaphorically rich space dives deeply into water's spiritual and ecological connections, exploring themes from personal relationships to universal scales. "Where Water Flows Uphill" successfully integrates some basic watershed education with poetic interpretations of natural systems, offering multiple sections that address humanity's place within nature's interconnected web. Interactive elements encourage visitors to	Not addressed Partially addressed Addressed

	discover personal connections to rivers and ecosystems through artistic concepts rather than direct instruction. The space's esoteric approach may create comprehension barriers, however. Complex concepts remain hidden behind abstract presentations that require more time than most were observed willing to give. Perhaps, with repeated visits, one might decode some of the obscure messages. Such meaningful engagement is probably challenging for younger audiences who engage more through play than contemplation. Flow between sections might be seen to lack obvious connections and clear structure, forcing a studious learner to need to invest a lot of time and brain-power to teasing out messages and meaning beneath the beautiful surfaces. While the text and graphics demonstrate real-world environmental awareness, an absence of overt guidance means many visitors miss the profound watershed and ecosystem concepts within.	
PERSONAL AND CIVIC RESPONSIBILITY 4.1 Sense of personal stake and responsibility 4.2 Self-efficacy and personal agency	This water-focused experience creates a spiritual connection between visitors and aquatic systems, encouraging exploration without demanding specific action. While the metaphors and fantasy elements may challenge younger children's comprehension, the installation successfully fosters emotional bonds through the powerful metaphor of "yourself as a river." The experience prioritizes independent discovery and motor skill development, connecting Colorado's geography to broader themes of finding beauty and meaning in nature, though it remains intentionally indirect rather than explicitly calling for environmental stewardship.	Not addressed Partially addressed Addressed
INSTRUCTIONAL EFFECTIVENESS 5.1 Learner-centered instruction 5.2 Different ways of learning 5.3 Connection to learners' everyday lives 5.4 Expanded learning environment 5.5 Equitable and inclusive learning environments 5.6 Interdisciplinary 5.7 Goals and objectives 5.8 Appropriateness for specific learning	The river-themed learning environment offers both active and contemplative spaces for Greeley-area children, featuring interactive elements, poetry, and place-based connections to local geography and culture. While artistically engaging across age groups, the installation struggles with educational coherence—creating an "either-or" dynamic where younger children focus primarily on physical play and miss deeper textual meanings, while older visitors can grasp concepts but may find the tight spaces physically limiting. Clear goals and objectives, assessment tools, and full accessibility (for mobility and non-English readers) are not evident. Overall, the installation was observed to function more as playground or provocative art than integrated	Not addressed Partially addressed Addressed

settings 5.9 Assessment	educational experience. That's OK, and seems to be its main intention.	
USABILITY 6.1 Clarity and logic 6.2 Easy to use 6.3 Long-lived 6.4 Adaptable 6.5 Accompanied by instruction and support 6.6 Make substantiated claims 6.7 Support accepted recommendations and requirements	"Where Water Flows Uphills" offers a self-guided experience where visitors can engage at their own pace and path, and could discover new elements each time they visit. While the space provides safe, free exploration that's suitable for families with children, it has some usability challenges. Complex text and graphics and no single through-line may confuse. Some visitors were observed displaying an uncertainty about "where to begin?" After two years of heavy use, maintenance issues are becoming evident—from wear-and-tear to cleanliness and trash. Though popular and durable as a play space, the installation's deeper educational potential could benefit from well-articulated goals, clearer wayfinding, and more substantiated information. As a visual-stunning and thought-provoking experience, it succeeds.	Not addressed Partially addressed Addressed

COLORADO-NESS – How does this educational material support the Colorado Water Plan?

- The Colorado Water Plan calls for "all Coloradans to embrace a new water ethic." Appreciation of water as a vital natural resource and source of beauty underpins such an ethic. "Where Water Flows Uphill" works well as appreciative inquiry, and so assists with such social-emotional development. A visitor interviewed during our review answered the question of what they learned, saying, "The beauty of nature and the need to conserve it."

--reviewed June 2025

Reviewers

The National Project for Excellence in Environmental Education, initiated by the North American Association for Environmental Education (NAAEE) in 1994, developed a series of guidelines that set the standards for high-quality environmental education. Each of these publications was developed by a diverse team of professionals, and each has gone through a substantive review by thousands of professionals prior to its publication.

The Water Education Exemplars Project (WEEP) uses the latest editions of two sets of Guidelines:

- *Environmental Education Programs: Guidelines for Excellence*
- *Environmental Education Materials: Guidelines for Excellence*

Both of these sets of guidelines feature rubrics for scoring individual evaluations. For WEEP, these rubrics were modified with an additional factor we call "Colorado-ness," which shows evidence of the resource's support of Colorado's Water Plan.

Each reviewer took part in a 2-day workshop to become qualified to apply the *Guidelines for Excellence in Environmental Education*. Such trainings are facilitated by a member of the Guidelines Trainers' Bureau, consisting of environmental educators who are credentialed by NAAEE to train others on use of the *Guidelines* to evaluate educational resources.

For WEEP, project manager Donny Roush has been involved in Guidelines development and deployment since 1996, has been a member of the Trainers' Bureau since 2006, and was a member of the national writing team for the most recent revision of *Environmental Education Programs: Guidelines for Excellence* (2022). In turn, Roush facilitated the June 2025 "Youth and Water Convening," where the first cohort of youth WEEP reviewers learned to conduct reviews using these tools.

WEEP Reviewers, 2025 cohort

WEEP's 2025 youth reviewers are:

- Isabel Thornton, Colorado State University
- Elsa Vossler, Denver School of the Arts/University of Portland
- Tianna Kell, The Greenway Foundation
- Nadia Brooks, Environmental Learning for Kids/University of Denver
- Alexia Lor, Metropolitan State University of Denver
- Saria Mowrer, Poudre Learning Center/City of Greeley
- Maya Hanner, Arvada West High School/Colorado State University
- Kaiden Angel, Arvada West High School
- Emily Buchanan, Colorado State University


COLORADO
WATER
EDUCATION
EXEMPLAR

A project of

Colorado Watershed Assembly

COLORADO HEALTHY RIVERS FUND
WATER IS LIFE. KEEP IT CLEAN!

Youth Development, Water Education, and the Colorado Water Plan

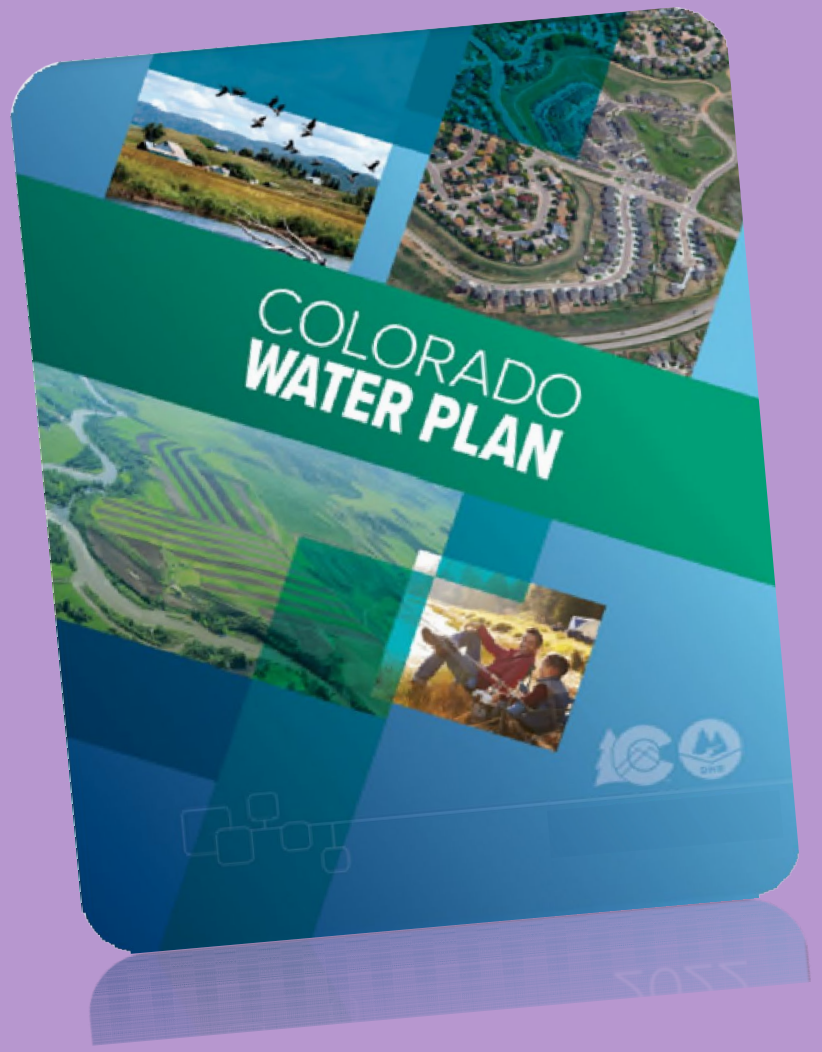
Donny Roush, Certified Master Environmental Educator

Colorado Watershed Assembly

A project of

COLORADO HEALTHY RIVERS FUND
WATER IS LIFE. KEEP IT CLEAN!

How old will you be in 2050?



Colorado Water Plan (2023)

—“youth,” “children,” “K-12” not mentioned, but…

- **Partner action:** ENGAGEMENT & INNOVATION
- **Tools for action:** Public outreach and education
- **“Partner Actions Rely on Effective Engagement and Education at Different Levels”** “Education is the key to bridging perceived divides across the western and eastern slopes, rural and urban populations, and diverse people. Public education around water must be increased.” (p. 219)

Education…

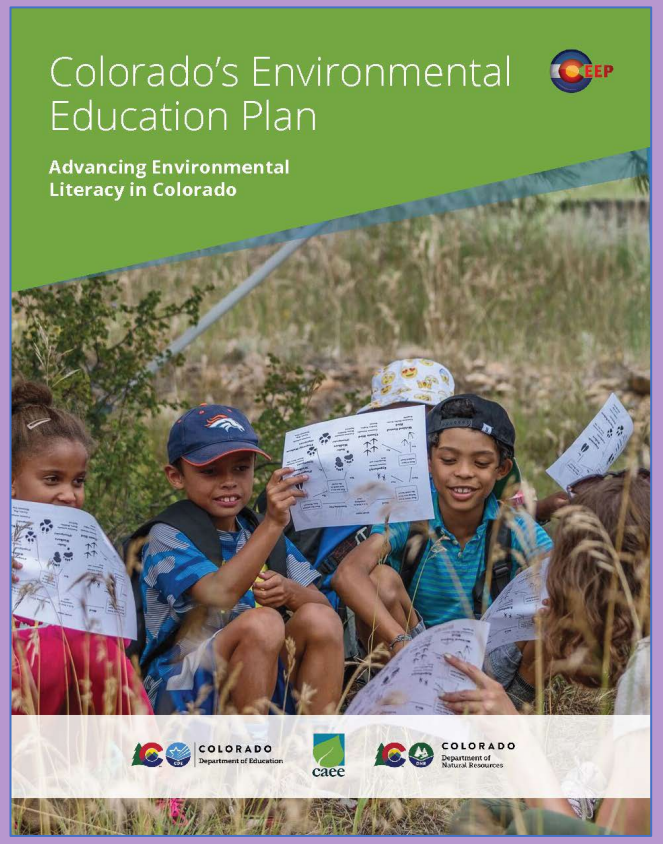
- **…is the facilitation of learning**
- **…is more than outreach and information dissemination**
- **…is not persuasion**

- **Environmental education:** a lifelong, interdisciplinary process concerned with the interrelationships and interconnectedness of human and natural systems (UNESCO, 1977)
- **Outcome:** environmentally responsible behavior (application of knowledge, skills, and commitments)

Environmental education in Colorado

naaee
North American Association for Environmental Education

caee



SWEAP
STATEWIDE WATER EDUCATION ACTION PLAN | 2020-2025

Statewide Water Education Action Plan (SWEAP) Task Force

Critical Water Concepts and Colorado Academic Standards

Toolkit for Colorado Educators and Organizations

Updated November 5, 2021

Response

Create **quality control** for water education by…

Building an **external evaluation** system for water education resources, so water educators have **evidence of the best programs** and materials for…

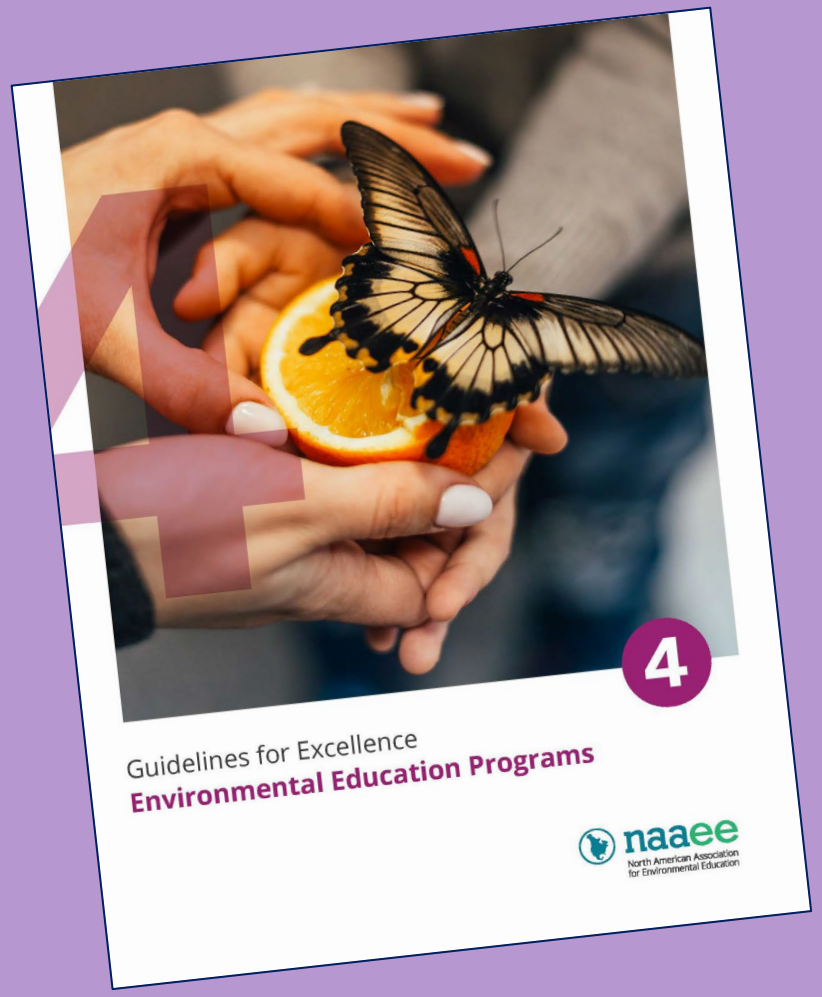
Deepening **water literacy** for young Coloradans.

Characteristics of programs and materials considered for this project

- Colorado-based and water-focused
- Intended for a K-16 audience
- Has duration and intensity beyond a brief episode
- Currently demonstrating success in reaching learners
- Predominantly educational in nature, rather than merely informational or persuasive
- Open to external evaluation

Colorado-ness: How does this educational program/material support the Colorado Water Plan?

Excellence in environmental education



- National standards, alongside Next Generation Science Standards and Common Core State Standards
- 7 sets of Guidelines
  - Programs
  - Materials
  - Climate Action and Justice
  - K-12 Learning
  - Community Engagement
  - Early Childhood Education
  - Professional Development
- This project focuses on programs (2022) and materials (2021)

REVIEW PROCESS

Water Education Resource (Program or Material)

Nominated by staff and/or partners (Roundtables/ PEPO/CWCB/ env'l education networks)

Triage: Meets Criteria?

Preliminary assessment by staff: Is the resource…

- Colorado-based, water-focused
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- More than a single episode
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Yes: Likely Exemplar

Non-qualifying resources tend to be outreach and/or adult intended

Meet with "owner" of resource

Explain external evaluation process and documentation requested:

- Curricular/ instructional materials
- History of program/needs assessment
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Full Review: *Guidelines for Excellence in Environmental Education*

Lead reviewer exams all documentation for evidence of:

- Indicators from *Guidelines for Excellence in Environmental Education* national standards manuals
- "Colorado-ness" factor (how the resource supports implementation of the Colorado Water Plan)

This step is the most time-consuming.

Second and Third Reviews

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Share with "owner" of resource

Findings shared, highlighting strengths and areas for improvement

Yes: Meets or exceeds standards

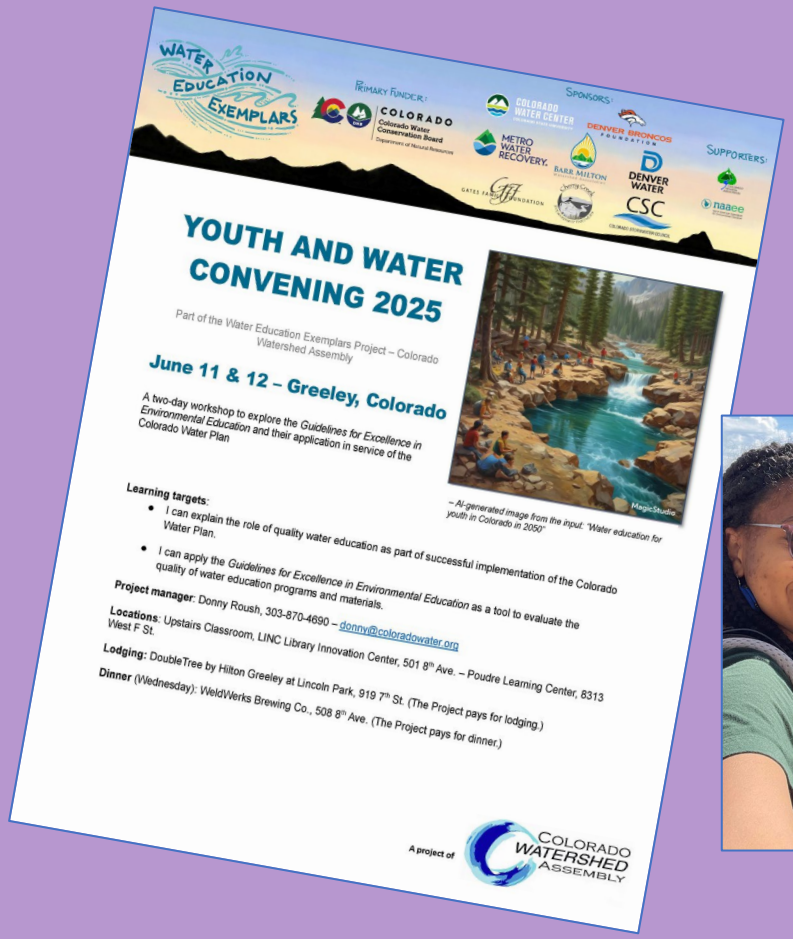
Designate as "Colorado Water Education Exemplar"

x100

Collection of water education resources best suited to support the Colorado Water Plan

Amplify: Expand, Replicate, Improve

Youth Development



WATER EDUCATION EXEMPLARS

PRIMARY FUNDER: COLORADO Colorado Water Conservation Board Department of Natural Resources

SPONSORS: COLORADO WATER CENTER · DENVER BRONCOS FOUNDATION · METRO WATER RECOVERY · BARR MILTON · DENVER WATER · CSC · GATES FAMILY FOUNDATION

SUPPORTERS: naaee

YOUTH AND WATER CONVENING 2025

Part of the Water Education Exemplars Project – Colorado Watershed Assembly

June 11 & 12 – Greeley, Colorado

A two-day workshop to explore the *Guidelines for Excellence in Environmental Education* and their application in service of the Colorado Water Plan

– AI-generated image from the input: "Water education for youth in Colorado in 2050"

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A project of COLORADO WATERSHED ASSEMBLY

Planned 5-year outputs and outcomes

Year 0 (2025) **– set up system, 15 reviews, 9 youth reviewers**

Years 1-4 **– 100 reviews, 35 youth reviewers**

Years 5 **– amplification, expansion, replication, improvement of Water Education Exemplars**

All for <$1 million – project budgets of no more than $150,000 per year

Exemplars (to date)

- **Caring for Our Watersheds**
- **H2O Outdoors, Keystone Science School**
- **Excursions, SPREE**
- **Denver Metro Water Quality Assessment Tool**
- **Water Education Resource Guide, Denver Water**
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Colorado Water Conservation Board
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Metro Water Recovery

CSC
Colorado Stormwater Council

Barr Milton
Watershed Association

Denver Broncos Foundation

Denver Water

Gates Family Foundation

Cherry Creek Stewardship Partners

Supporters:

Colorado Riparian Association

naaee
North American Association for Environmental Education

Youth Development, Water Education, and the Colorado Water Plan

Donny Roush, Project Manager

Casey Davenhill, Executive Director

Colorado Watershed Assembly

A project of

COLORADO HEALTHY RIVERS FUND
WATER IS LIFE. KEEP IT CLEAN!

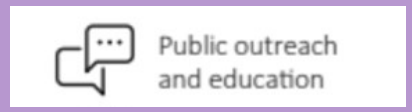
How old will you be in 2050?

Colorado Water Plan (2023)

—“youth,” “children,” “K-12” not mentioned, but…

- **Partner action:**

- **Tools for action:**



- **Agency action 4.1** “Create a capacity-building hub to provide accessible educational opportunities”
- **“Partner Actions Rely on Effective Engagement and Education at Different Levels”** “Education is the key to bridging perceived divides across the western and eastern slopes, rural and urban populations, and diverse people. Public education around water must be increased.”

Education…

- **…is the facilitation of learning**
- **…is more than outreach and information dissemination**
- **…is not persuasion**

- **Environmental education:** a lifelong, interdisciplinary process concerned with the interrelationships and interconnectedness of human and natural systems (UNESCO, 1977)
- **Outcome:** environmentally responsible behavior (application of knowledge, skills, and commitments)

Environmental education in Colorado

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North American Association for Environmental Education

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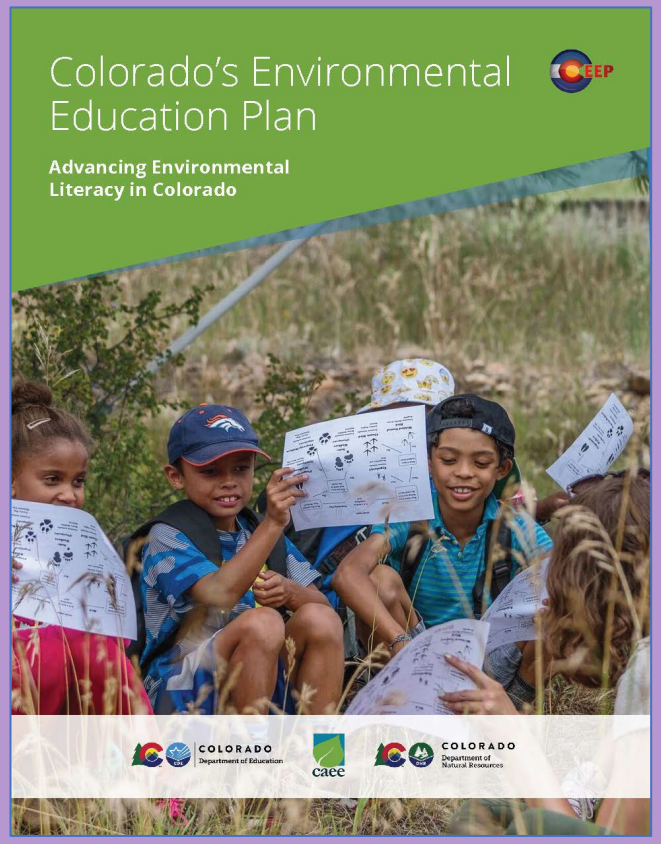


SWEAP
STATEWIDE WATER EDUCATION ACTION PLAN | 2020-2025

Statewide Water Education Action Plan (SWEAP) Task Force

Critical Water Concepts and Colorado Academic Standards

Toolkit for Colorado Educators and Organizations

Updated November 5, 2021

Response

Create **quality control** for water education by…

Building an **external evaluation** system for water education resources, so water educators have **evidence of the best programs** and materials for…

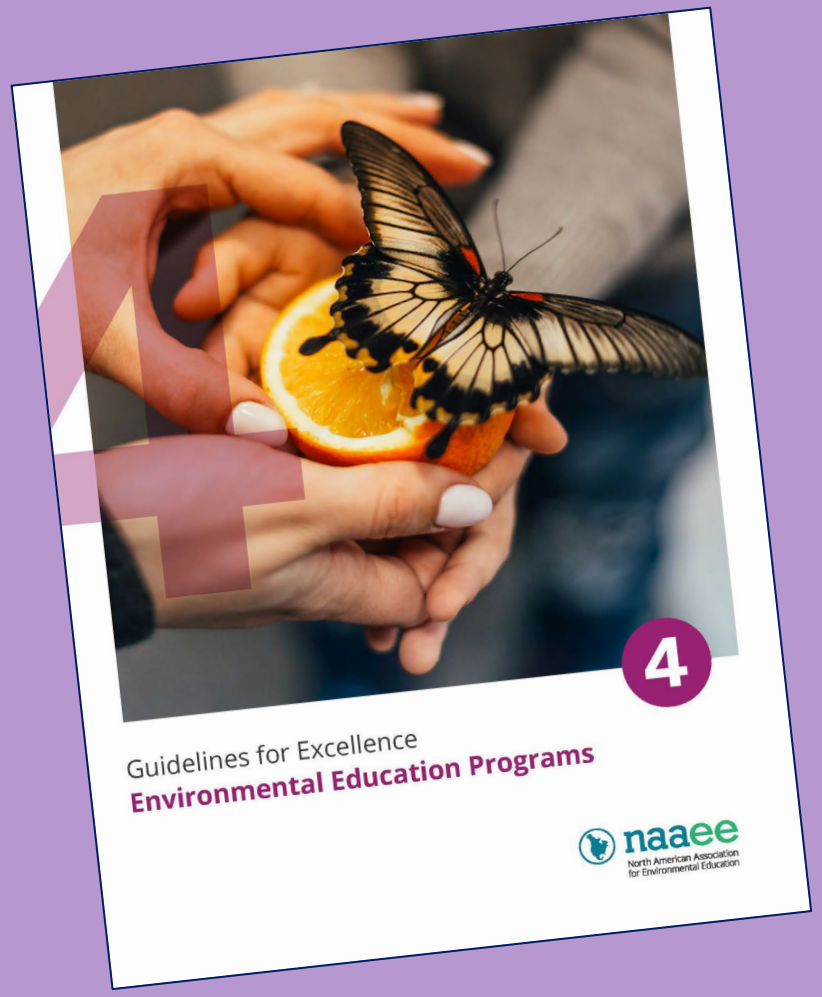
Deepening **water literacy** for young Coloradans.

Characteristics of programs and materials considered for this project

- Colorado-based and water-focused
- Intended for a K-16 audience
- Has duration and intensity beyond a brief episode
- Currently demonstrating success in reaching learners
- Predominantly educational in nature, rather than merely informational or persuasive
- Open to external evaluation

Colorado-ness: How does this educational program/material support the Colorado Water Plan?

Excellence in environmental education



- National standards, alongside Next Generation Science Standards and Common Core State Standards
- 7 sets of Guidelines
  - Programs
  - Materials
  - Climate Action and Justice
  - K-12 Learning
  - Community Engagement
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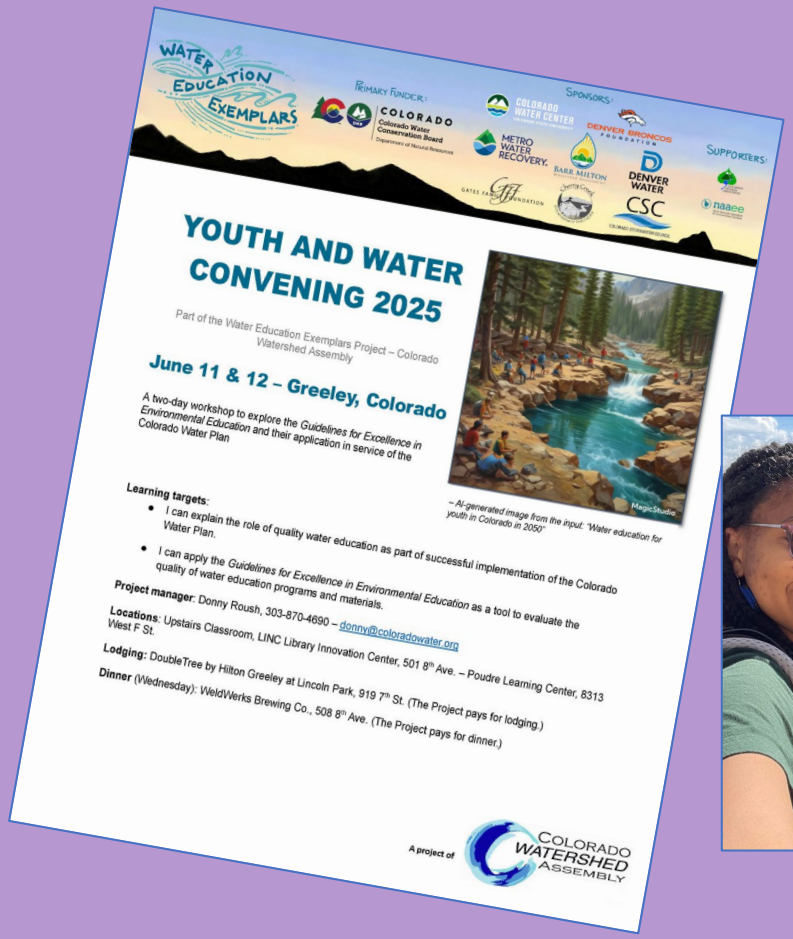

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