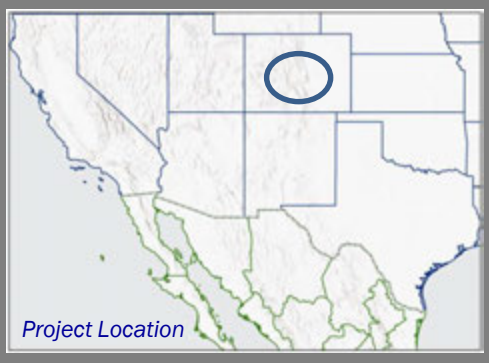
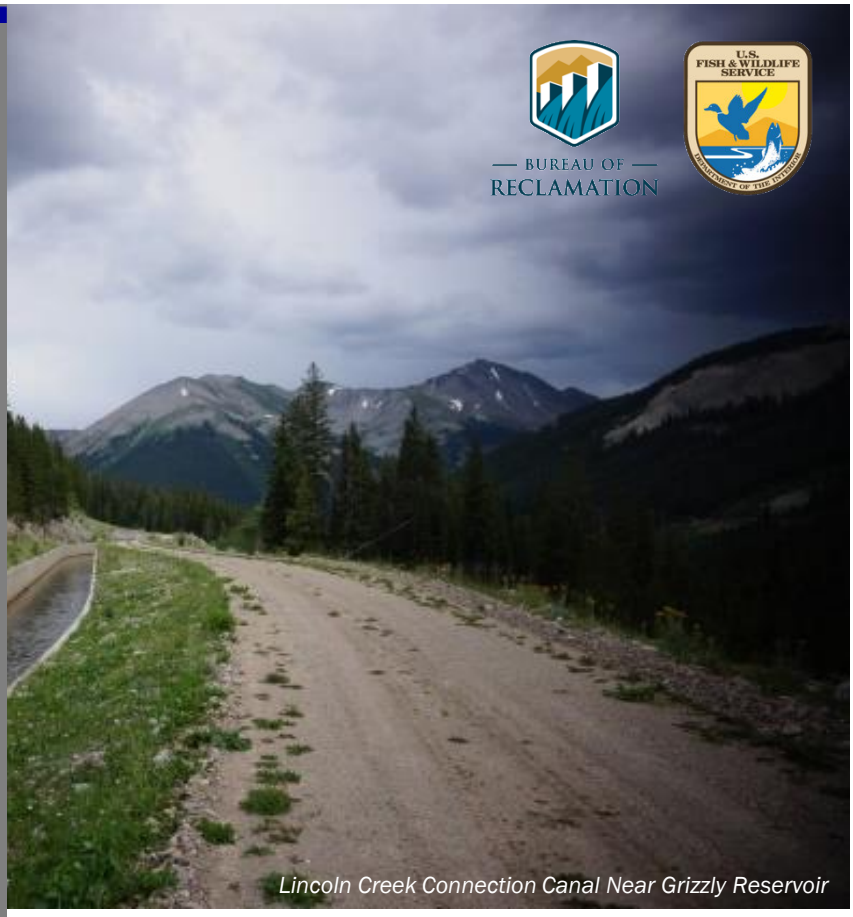
ACTIONABLE SCIENCE

Analyzing Social Learning to Improve Drought Response Along the Arkansas River in Colorado

NCAR NASA WWA CIRES

The way decision-makers choose to manage drought can have unintended impacts on people and communities. These impacts can reduce the ability of communities to respond to and recover from drought. However, they can also introduce opportunities for change. The Cooperative Institute for Research in the Environmental Sciences (CIRES) and the National Center for Atmospheric Research (NCAR) examined examples of unintentional impacts from drought decisions in the Arkansas River Basin of Colorado. By tracing the historical origins and impacts of decisions and their impacts, they show how decision-makers learned together (social learning) to manage as a team.





Lincoln Creek Connection Canal Near Grizzly Reservoir

KEY ISSUES ADDRESSED

Decisions made to manage drought at individual or community scales can create unexpected impacts on others. For example, legacies of water transfer from agricultural to municipal communities--called buy-and-dry--economically devastated Crowley County in southeast Colorado, which is still struggling to recover today. Stressed by chronic drought, farmers sold the majority of water rights, transferring much of the power to municipalities. In another example, a multi-year drought in the early 2000s resulted in flow alterations that benefited trout on the Arkansas River. While trout thrived, the recreation and agricultural sectors struggled.

PROJECT GOALS

- Track unintended consequences from drought decisions as they move throughout the area and impact others
- Identify features of social learning that can mitigate future unintended consequences of drought decisions ahead of time
- Share these lessons learned with others to help groups build social learning before drought and other hazards occur

COMPASSION OVER CONFLICT

Social learning requires people, often with different resource management goals, to learn with one another. Though potential for conflict was possible, long-term collaboration proved beneficial.

Tour Map from the Roaring Fork Conservancy

PROJECT HIGHLIGHTS

Place-based Approach: The team studied areas in a river basin in Colorado where local decision makers had recent experience with drought. This approach allowed participants to reflect on decisions they made, to note individual and community impacts they witnessed, and to identify others who might have been unexpectedly affected.

Impacted Voices: To understand the multiple motivations, decision contexts, and resource needs that are at play, and across different scales, the research team conducted interviews with participants across different sectors (e.g. agricultural producers, water managers, state engineers, extension agents, energy company officials) in the Arkansas River Basin.

Historical Context: The research team performed a historical analysis of each example of unintended impacts of drought decisions by exploring local newspaper articles, trade journals, and online content created for the Arkansas River Basin. This approach allowed the research team to place decisions and their impacts into historical context to provide a richer understanding of why and how decisions might cascade through a system.

Collaborators

- Collaborative Institute for Research in Environmental Sciences
- Western Water Assessment, University of Colorado, Boulder
- See online for full list of collaborators

LESSONS LEARNED

A community can "shortcut" social learning that might otherwise have had to happen through learning "the hard way." The research team identified four avenues for short-cutting social learning: 1) holistic governance; 2) taking a historical view of outcomes, drawing a more expansive boundary around who counts as part of a resource system; 3) shifting to collaborative frameworks that generate new connections across sectors to learn from others' previous experiences; and 4) experimenting with pilot or temporary programs or structures that can serve as a proxy for direct experiences, creating knowledge that can be quickly incorporated into new policies and practices.

As an example of using holistic governance and collaborative frameworks, several recreation and trout conservation groups came together under the auspices of a Voluntary Flows Management program to manage the Arkansas River for both trout and recreation. This multi-stakeholder program allowed them to create water flow agreements for non-drought times that could accommodate both recreation and trout.

As an example of experimenting with pilot programs, in the case of buy-and-dry, different groups experimented with pilot programs to explore alternative water transfer practices that prioritize the needs of growing communities and the legacies of farming in Colorado.

NEXT STEPS

- Complete a similar study in Weber Basin, Utah
- Explore the feasibility of additional studies in the western U.S, including Wyoming and Texas

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Society for Range Management Conference, Colorado

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Photos courtesy of Jen Henderson.
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