

# Water Availability

Deliberative Forum Guide

IN COLORADO

---

**How should we meet the challenges of increasing water demands with decreasing water availability in Colorado?**

---

ENVIRONMENT &  
SOCIETY SERIES



## Big challenges face Colorado water management

- Growing water supply gap: As cities grow, they may not have enough water to supply people and businesses. Conserving water and storing additional water will help. Today, an acre-foot of water provides water for five people for one year. By 2050 it is expected that the state will be short more than 500,000 acre-feet of water.
- Agricultural dry-up: The sale of agricultural water rights to cities is causing irrigated agriculture to disappear. At the current rate of transfer, there will be a major reduction in Colorado's agricultural lands. Our agricultural lands provide us with food, open spaces and wildlife habitat. Losing these agricultural lands could affect Colorado's economy and food security. In addition, rural communities will suffer as agricultural businesses go away.
- Increase funding for water projects: Colorado should investigate options to raise the money necessary to address the above challenges.
- Critical environmental concerns: Coloradans are proud of our natural environment. We enjoy nature and the recreation our streams and lakes provide. As the climate changes and the demand for water increases, we need to protect water quality, watershed health, and ecosystems. Environmental challenges will arise as the demand for water increases.
- Changing climate conditions: Climate change could make it more difficult to meet Colorado's future water needs. Variability in the amounts of precipitation makes it hard to know how much water we will have in the future.
- Inefficient regulatory process: Colorado needs a better regulatory process if we are to respond to our water challenges. By working together and setting priorities, Colorado can do its part to move water projects forward more quickly. For example, it often takes 15 to 20 years to get all the approvals necessary to build a reservoir.
- Water law limitations: Colorado water law is historically complex and governed by a system of *prior appropriation*. Environmental, recreational, and urban water rights are often secondary to private interests, particularly in times of water shortage.

## Option 1: support our livelihood

Water is a public resource, and it is important for everyone to help ensure a sustainable future that includes clean water. It should be used and provided fairly to protect the well-being of people and communities. Water availability is a concern for personal, public, and business use in Colorado and is something that requires attention on an individual as well as community level.

### Examples of What Could Be Done

Strict policies and regulations (local and regional level) are needed to protect health and safety ensuring sufficient water supply for the current, and growing, population of Colorado.

Ensure people have adequate access to healthy water at a fair cost throughout Colorado. Maintain and plan for a future with a sufficient water supply for human consumption, agricultural use to ensure food security, and recreational uses to ensure job security.

Create and enforce more environmentally strict laws to ensure water conservation practices on farms and ranches. Also create and enforce more environmentally strict laws to ensure mining and natural gas extraction does not use excessive water depleting local rivers, streams, and municipal water supplies.

Use public education and outreach to ensure individuals are able to make informed decisions about water quantity issues in Colorado and encourage people to become engaged in the issues.

### Some Trade-Offs to Consider

This could impact the population and economic growth in Colorado if limitations are imposed on allowing areas to grow on the same trajectory they are currently on. Adjusting current lifestyles can seem daunting or unfair to some, yet the long term benefits often outweigh short term impacts.

Focusing water availability on human needs could limit or decrease water quantity in rivers and impact opportunities for the recreation economy of Colorado (fishing, boating, hunting, snowmaking at ski areas, etc.).

Strict laws or policies may impact water available for the agriculture industry in Colorado impacting local jobs, economy, and food availability. Limiting water use could also impact the oil and natural gas industry by decreasing water use and access.

Additional education programs are difficult to implement due to lack of time in the classroom, available resources, and technical expertise. Short term campaigns and resources are good starts, but more support is necessary to ensure long term behavior change.

## Option 2: work with nature to create sustainable systems

Many of our systems to supply water for agricultural, towns and cities, natural resource extraction, and industry work against rivers rather than with them, and despite some efforts, rivers and the natural world often gets short-changed. Human communities are intertwined with a healthy environment, so we must focus on creating systems for supplying water that are sustainable for people and river ecosystems.

### Examples of What Could Be Done

### Some Trade-Offs to Consider

Create and enforce adequate laws to ensure that water in rivers and streams is protected to provide adequate habitat for aquatic species including fish among others. Also, ensure that groundwater and springs are not excessively pumped ultimately lowering the water table and decreasing river flows in local streams.

Water users will have to strictly limit their water consumption which may lead to economic hardship or inconveniences within their current way of living and doing business.

Protect riparian riverfront property and wetlands that both absorb and store water with local zoning laws. Also invest in stormwater infrastructure that incorporates and utilizes nature (i.e. rain gardens, bioswales, constructed wetlands, permeable pavement) by allowing water to soak back into the ground instead of flowing directly into the river.

Landowners may lose available land for development with riparian set-back laws on river front property. Municipalities will have to create a budget to invest in converting available common space to stormwater retention/infiltration features.

Create a campaign to shift cultural attitudes and acceptable behaviors for landscaping and outdoor water use. Create 'energy smart' program for indoor and outdoor water conservation to incentivize conservation practices; one option is to increase the price of tap water.

People may be inconvenienced by new cultural norms and lifestyle requirements. A government agency or non-profit will have to provide funding to incentivize water conservation practices. The less advantaged may not be able to afford the price of tap water.

Price water to reflect its real costs, including ecological costs (natural capital).

The price for a unit of water could be much more than it is currently being sold for by municipalities and water providers. This could lead to water being a privilege versus a human right.

Utilize Smart Growth principles. If there is not enough water, then do not build. Create an equation developers' can use to determine if there is in fact enough available water supply for the future tenants/owners of their development.

There may not be enough new, affordable housing available for those who move into Colorado. Lower income and minority families become more vulnerable to increased living costs and risk losing the historical and cultural significance of their community.

## Option 3: rely on innovation and advanced management

Colorado's water is provided through complex, interconnected engineered systems; but water management is often behind the times and disjointed. Faced with pressures from competing water demands, drought, and legal obligations, Colorado water users, scientists, and policy makers should develop innovative strategies, new policies, and agreements designed to improve water conservation and efficiency and introduce flexibility into water law. We can do better if we use up-to-date management tools, think in and manage whole systems, and invest in innovation that can meet the growing water demands.

### Examples of What Could Be Done

### Some Trade-Offs to Consider

Revise current water laws, policies, and agreements to expand the role of federal agencies in managing Colorado's water resources.

A centralized government authority could limit Colorado's home-rule status of local control and the efficacy of State-local-community partnerships.

Invest in and subsidize innovative technologies to monitor water consumption and current conditions to optimize agricultural, industrial, and municipal water use.

New technologies require considerable capital investments not everyone can afford and may have unanticipated consequences for human and ecological health.

Increase transmountain diversions to deliver more water from high mountain western slope streams to front range cities and agriculture, requiring new or expanded infrastructure, reservoirs, and storage aquifers.

Infrastructure is costly and take a long time to implement. Diverting water for consumption could impact the economy of western slope communities by reducing available water for agriculture, reduce river flows and impact river ecosystems, and increasing reliance on non-renewable groundwater.

Incentivize water-saving practices, programs, and partnerships between water utilities and businesses, schools, organizations, towns, and cities.

Some businesses, schools, and organizations may not have the human or financial capacity to implement comprehensive, sustainable programs.

Allow water to be traded on open markets where supply and demand determine the cost of water and its best uses ("water banks").

Varied environmental conditions from climate change increase risk of market disequilibrium.

## Glossary

Agriculture: The occupation of cultivating land, raising crops, and feeding, breeding, and raising livestock; farming or ranching.

Bioswale: Landscape elements designed to remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides (less than six percent) and filled with vegetation, compost and/or riprap rocks.

Energy Smart: Using electrical power in an efficient or economical way.

Groundwater: Water found in spaces between soil particles underground (located in the zone of saturation).

Infrastructure: The basic physical and organizational structures and facilities (e.g., buildings, roads, and power supplies) needed for the operation of a society or enterprise.

Irrigation: The controlled application of water to cropland, hay fields, and/or pastures to supplement that supplied by nature.

Natural Capital: The world's stocks of natural assets which include geology, soil, air, water and all living things. It is from this Natural Capital that humans derive a wide range of services, often called ecosystem services, which make human life possible.

Permeable Pavement: Permeable paving is a range of sustainable materials and techniques for permeable pavements with a base and subbase that allow the movement of stormwater through the surface. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water.

Prior appropriation: This system is commonly summed up as "first in time, first in right." This means that those with senior (older) rights can begin to use water before junior (newer) rights holders in times of water shortages.

Retention/infiltration features: Engineered stormwater treatment features which are designed to effectively remove pollutants from runoff events.

Riparian: Land areas directly influenced by a body of water; usually have visible vegetation or other physical characteristics showing this water influence. Stream banks, lake borders, and marshes are typical riparian areas.

Smart Growth: Planned economic and community development that attempts to curb urban sprawl and worsening environmental conditions.

Stormwater: Rainfall or snowmelt that runs off over the land surface, potentially carrying pollutants to streams, lakes or reservoirs.

Transmountain Diversions: Man-made conveyance schemes (tunnels or canals) which move water from one river basin where it is available, to another basin where water is less available or could be utilized better for human development.

Water bank: The practice of forgoing water deliveries during certain periods, and “banking” either the right to use the forgone water in the future, or saving it for someone else to use in exchange for a fee or delivery in kind.

Xeriscaping: A form of landscaping that utilizes a variety of indigenous and drought-tolerant plants, shrubs, and ground cover.



For more information about Environmental Issues Forums, visit <http://naaee.org/our-work/programs/environmental-issues-forums>, or contact the partners listed above.