

FREQUENTLY ASKED QUESTIONS

about

WATER AND GROWTH IN COLORADO

In order to help readers access vital information more quickly, the authors have compiled a list of frequently asked questions, along with their answers. For further information: contact Doug Kenney; 303-492-1296; Douglas.Kenney@colorado.edu.

How much is Colorado expected to grow in the next two decades?

Projections from the State Demographer suggest approximately 1.7 million new residents by 2020. Most of these new citizens will locate along the Front Range, although growth rates in western Colorado will actually be higher in percentage terms.

Do Coloradans use much water?

According to the U.S. Geological Survey, Coloradans use about 208 gallons/day for “domestic uses,” compared to a national average of 179 gallons. Largely due to agricultural irrigation, total per capita offstream water use in Colorado is 3,690 gallons/day, a figure exceeded by only four other states (Idaho, Montana, Nebraska, and Wyoming), and nearly three times the national average of 1,280 gallons/day. (“Offstream use” includes water used for domestic purposes, commercial and industrial applications, thermoelectric power generation, irrigation, livestock, and mining. Figures are from 1995.)

Who uses the most water?

Over 90 percent of water consumed through human activities in Colorado occurs in agriculture. This is typical of arid and semi-arid western states. Agricultural water use in Colorado is not expected to increase, and is likely to decrease slightly in coming decades as a result of increased irrigation efficiencies and additional agricultural-to-urban water transfers.

How much water is used in lawn irrigation?

Roughly half of municipal water deliveries in the summer are for landscape irrigation, particularly Kentucky blue grass.

How does population growth in Colorado influence water demands?

Population growth and increasing economic wealth result in increased municipal demands for water. Recent research suggests that over the next two decades, municipal water demands in Colorado could grow by more than 250,000 acre-feet/year (roughly the amount of water used by a

million municipal residents). (An acre-foot is approximately 326,000 gallons, enough to flood an acre of land to a depth of one foot.) Over the next 100 years, this demand for new municipal water could exceed 1.2 million acre-feet. Political demands and legal requirements calling for water to be left instream for environmental and recreational purposes will also likely increase in coming decades.

Overall, are Colorado's water resources sufficient?

Despite its semi-arid climate and public perception, Colorado is a water rich state. Winter snowfall provides an abundance of water. The challenge for water providers is to adapt the timing and location of snowmelt to meet the timing and location of water demands. Generally, this means storing spring snowmelt in reservoirs for use in other seasons—especially the summer irrigation season. It also means moving water from resource-rich areas like the West Slope to demand-intense areas like the East Slope. This has been done extensively in Colorado.

How and why do cities get water from farms?

Colorado law allows water rights to be bought, sold and transferred. It is very common for cities to purchase water rights from farmers. For example in the Colorado-Big Thompson project along the northern Front Range, agricultural ownership of water shares dropped from 85 to 47 percent from 1957 to 1998 as growing Front Range cities bought agricultural water. For cities, this is often the cheapest and easiest way to acquire new water. For farmers, selling water is often more profitable than farming. Thus, it is a simple matter of supply and demand.

What are trans-basin diversions, and what role do they play in Colorado water management?

A trans-basin diversion is a water project or management scheme that moves water from one river basin into another. Most of the major trans-basin diversions in Colorado move water from the Upper Colorado River basin on the West Slope to the South Platte basin on the East Slope. These are sometimes known as trans-mountain diversions. The largest trans-mountain diversion in Colorado is the Colorado-Big Thompson Project, which moves over 200,000 acre-feet/year from the Granby area primarily to Weld and Larimer counties. Many municipalities plan future trans-basin diversions, although this may be unrealistic given environmental and area-of-origin concerns.

Why does the Front Range (particularly Denver, Aurora and Colorado Springs) turn to the West Slope and to agriculture for additional water?

In Colorado, most residents live on the Front Range, while most precipitation falls on the West Slope. Front Range rivers are typically unable to satisfy local demands. Consequently, water imports are a practical necessity. The two most abundant sources of water for urban demands are undeveloped West Slope water and water already used in agriculture.

What role does groundwater play in meeting new municipal demands?

In recent decades, groundwater has emerged as a major water supply source for new growth, especially in Douglas and Arapahoe Counties. Over 90 percent of Castle Rock's water supply, for example, comes from deep groundwater. Groundwater reserves in the Denver Basin aquifers are vast, but are largely nonrenewable. If future growth follows its recent pattern, there could be 500,000 people dependent on Denver Basin groundwater in the next few years.

What are the impacts of growth on the aquatic environment?

Impacts vary widely. Construction of dams can have a devastating ecological impact on stream ecosystems. Similarly, human uses can dramatically deplete streamflows, and can introduce pollutants into water bodies. Not all impacts are negative, however, as alterations to streamflow regimes often provide unexpected benefits to some species and locations. For example, the South Platte River is a perennial stream only due to human activity and, particularly, to trans-basin diversions that feed the river with flows from the Upper Colorado system. In general, the protection of instream flows and the environmental restoration of systems impacted by dams, diversions, and related activities, have traditionally not been high priorities in western water law, policy, and management. That is slowly changing.

If growth continues, will Coloradans run out of water?

The vast majority of Coloradans live in cities served by water systems with the economic, political, and technical resources to ensure a continuing water supply. The ability of engineers, politicians, lawyers, and business leaders to keep water in the taps of homes and businesses should not be underestimated. For most Coloradans, the real issue is not one of impending shortages, but rather is the increasing environmental, economic, and social costs that must be paid to keep the water flowing to growing regions.

Will water become more expensive?

The cost of water will likely go up as competition increases for limited supplies. However, there is no reason to expect dramatic price increases for most users. Colorado water bills are well below the national average, and relatively insignificant for most consumers.

Will neighboring and/or downstream states try to claim Colorado's water?

Colorado shares several rivers with other states. Major interstate rivers include the Colorado, Arkansas, Rio Grande, and Platte. Colorado is a party to nine interstate compacts that specify the rights of each state to shared interstate rivers. As long as these compacts are not modified by congressional action or a Supreme Court judgment, Colorado's rights to interstate rivers are quite secure.

Will rapidly growing Front Range cities be able to meet future demands?

Some municipal water providers face greater challenges than others in responding to the water demands of growth. Established cities, such as Denver, with well-developed water systems, abundant and old water rights, and limited room for new population growth are best positioned. Many newer communities, such as those on the southern edge of the Denver-Metro area, must scramble to overcome their lack of developed water resources or water rights, and their explosive rates of growth. In these situations, however, the challenge is primarily one of finding water of low cost and high quality, rather than finding a sufficient amount of water.

Will rapidly growing mountain resort communities be able to find adequate water supplies?

Although water is physically plentiful on the West Slope, unclaimed water is often in short supply during the snow-making season. Several mountain resort communities, particularly those in Summit County, are finding water difficult to secure, as local water resources are already claimed by Front Range cities and by environmental protection programs.

What comes first: water development or growth?

The relationship between water and growth in the modern West is often misunderstood. Historically, it has been assumed that water development was a necessary precursor to growth and, similarly, that a lack of water development could act as a deterrent to growth. While these premises may have been true at one time, recent experience in Colorado and other western states shows both ideas are now unsupportable. To the contrary, many of the regions showing the highest rates of growth in the West—from Douglas County, Colorado to Las Vegas, Nevada—show the opposite trend; growth is actually highest in some of the driest regions. Similarly, the veto of the proposed Two Forks dam on the Front Range by the Environmental Protection Agency in 1990 certainly did not deter growth in the Denver-Metro area. Examples also suggest that an abundance of water is often insufficient to stimulate growth. The experience of Pueblo is illustrative.

What are Colorado's options for developing new water supplies?

Developing additional water through new dams and reservoirs has become increasingly difficult, largely due to concerns over environmental protection and the fact that the most obvious water projects have already been built. Moving already developed water from one location to another is often a more practical option, but can bring negative consequences for rural agricultural areas steadily losing water to cities. Development of deep (mostly non-renewable) groundwater is also an attractive option in some situations, but is not a permanent solution to the water demands of growth.

What are the most practical ways of increasing municipal water supplies?

In order to maintain adequate water supplies in the face of continued growth, it is generally recognized that the reallocation of water from the agricultural to the municipal sector will

continue. Ultimately, the physical limits of natural water supplies must be recognized, and management strategies must be refocused on controlling demands, as well as conservation and efficiency.

Can we meet future water demands through water conservation alone?

Water conservation practices cannot satisfy future water supply needs alone, but are an important piece of the puzzle. Conservation strategies allow water providers to avoid the economic, environmental and political costs associated with new development and with reallocations.

Will the East Slope and West Slope ever stop fighting over trans-basin diversions?

Several recent efforts suggest that a new era of cooperation may be emerging between the East and West Slopes. The most promising examples include the Wolford Mountain Reservoir, the Eagle River MOU, and Clinton Gulch project. Increasingly, it is easier to cooperate on trans-basin water development than to fight.

What is conjunctive use?

Conjunctive use describes a water management strategy that uses both groundwater and surface water in a coordinated fashion. In a conjunctive use scheme, an aquifer can be a water source during dry periods, and a storage reservoir during wet periods. Colorado has relatively little experience with conjunctive use, but this is likely to change in future decades. The strategy is used extensively in California, which is both drier and more populous.

Can water policy be used as a growth management tool?

Water policy does not appear to be a useful tool for growth management. Decisions about where or how to grow are rarely influenced by the availability of water. It does appear possible, however, to influence water development and management through growth management policies. If growth management policies suggest lower rates of growth, or rates of growth that can be predicted with greater certainty, then the need to pursue new water supplies can be reduced.

What are the most exciting areas of innovation in Colorado water law, policy and management?

For the most part, the positive innovations deal with emerging water management strategies, more so than formal legal or policy reforms. At the heart of these strategies are increased cooperation, an attempt to minimize adverse impacts of water development and use, and a commitment to stretch existing supplies further. Specific tools include cooperative/joint water developments, small-scale and off-stream water storage, market-based water reallocations, temporary water transfers, groundwater development and conjunctive use, integration and coordinated operation of water systems, wastewater reuse, conservation and demand management, and cooperative solutions to environmental problems.

Will the possibility of future water shortages hurt economic growth in Colorado?

In the short term, there is no reason to believe that water concerns will hurt economic growth in Colorado, except perhaps in a few isolated communities. In the long term, maintaining the economic vitality of the state will require finding better ways to meet growing municipal and industrial demands while simultaneously protecting agricultural activity and the environmental and recreational amenities of the state.

Does Colorado need to build more dams?

Additional dams would undoubtedly be useful in serving some new demands and in taking full advantage of the state's entitlements to interstate rivers, such as the Colorado and South Platte Rivers. Additional dam building, however, generally runs counter to the goal of protecting and restoring aquatic ecosystems. Most parties agree that the era of big dams is over, or at least has entered a dormant period of indeterminate length. Nonetheless, several opportunities still exist for smaller projects and for modifying the operation of existing projects to increase storage.

Is Colorado vulnerable to drought?

Most water users in Colorado are protected from droughts by water storage reservoirs and the availability of groundwater. Another source of protection, ironically, is wasteful water-using practices that provide plenty of opportunities for conservation in tough times. As water conservation becomes more of an everyday management practice, our vulnerability to drought may actually be increased. Additionally, climatic research suggests that recent decades have been unusually wet in many parts of Colorado, including the South Platte basin. Consequently, most Front Range residents have little or no experience with drought, and some water users may be unprepared.

What is the role of the federal government in Colorado water management?

The federal government is a major player in Colorado water management for several reasons. Much of the land in Colorado is federal public land, including most mountainous regions where major rivers originate and where many water projects, both federal and non-federal, are located. Additionally, federal law is particularly important in the areas of water quality management and endangered species protection.

Who paid for this study?

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Who/what is the Natural Resources Law Center?

The Natural Resources Law Center is a non-profit research and educational organization housed with the University of Colorado School of Law. The mission of the Natural Resources Law Center is to promote sustainability in the rapidly changing American West by informing and influencing natural resource laws, policies, and decisions. The Natural Resources Law Center was established in 1982.