Publication: The Colorado Springs Gazette; Date:2007 Feb 18; Section:Section A; Page Number: 1

A GREAT THIRST FIRST IN AN OCCASIONAL SERIES

WHEN WILL OUR WATER RUN OUT?

As Colorado Springs, and the rest of the West, grows, scientists say demand will empty aquifers more quickly than expected.

By BILL McKEOWN and PAM ZUBECK THE GAZETTE

Water wars were a staple of the American West 150 years ago as settlers sought to reshape an empty, semiarid land.

That effort was successful — perhaps too successful. The rural, agrarian West built by that first wave of white settlers has been replaced by verdant golf courses, cookie-cutter suburbs and boulevards of big-box stores.

Some are predicting the 21st century in the West will be characterized by a new wave of water wars, fought by modern settlers trying to hold on to what they have.

Why?

Simply put: The demand for water in the West — including in Colorado — has or will soon outstrip the supply.

"Is there enough water to continue to meet all needs we currently have and have water for new population? I think everyone agrees the answer is no," said Doug Cain, the Lakewood-based associate hydrologic studies director for the U.S. Geological Survey.

That dire statement shouldn't be shocking to Coloradans. The signs of an impending water shortage have long been visible to experts, and the multiyear drought that struck the state in 2001 should have made even laymen aware of the West's water problems.

Consider:

c Front Range groundwater, both the shallow layers that can be replenished and the deeper aquifers that can't, are being tapped at a rate that will exhaust them. About 22,000 wells have been sunk into various aquifers in eastern and northern El Paso County, and some of those underground layers of water are showing signs of depletion.

The water supply for development in booming eastern El Paso County is at risk, said Kathy Hare, president of the Upper Black Squirrel Groundwater Management District. The district formed in 1973 to protect the water supply in the eastern El Paso County basin.

"They've been adding housing units left and right, and they're all relying on the same water supply," she said.

Despite warnings that groundwater will play out, there have been few signs that politicians, developers or home buyers are willing to face the facts. Between 2000 and 2006, for example, the portion of building permits issued in El Paso County for construction in unincorporated areas — those most apt to rely on wells — grew from 24 percent to 38 percent.

c Snowmelt, the main source of water for Front Range cities, has fluctuated wildly from year to year. Snowpack in the Arkansas River Basin has swung from 309 percent of normal in May 1968 to 10 percent of normal in 1981 and points between in the past 39 years, the Natural Resources Conservation Service reported.

A 2006 State of the Rockies Report Card issued by Colorado College predicted climate change in the next 80 years will threaten the ski industry and the urban water supply.

c Flows from most rivers in the state are over-allocated, not only to Colorado users but also to those in other states.

Although the Colorado River is a source of pride for Coloradans, it isn't called the mother of all rivers for nothing. Because of agreements reaching back to 1922, Colorado must share the river's waters with Arizona, California, Kansas, Nebraska, Nevada, New Mexico, Texas, Utah, Wyoming and Mexico.

c Many of those states depend on their allocation of Colorado River water to meet the demand of growing populations. And there doesn't appear to be any end in sight to new Westerners.

Colorado, for example, can expect 1.5 million new residents by 2030, and 300,000 of them will be in El Paso County, the U.S. Census Bureau predicts.

All those factors — depleting groundwater, unpredictable snowmelt, competition for water and population growth — set the stage for nasty conflicts. And the struggles, the U.S. Interior Department predicts, will only get more intense.

In fact, the department has identified the Front Range of Colorado, from Pueblo to Wyoming, as "highly likely" to see water supply crises by 2025.

THE SPRINGS' FUTURE

Those charged with providing water to Coloradans — sometimes called "water buffaloes" by their critics — are an

ingenious lot. They must be, because finding, buying, transporting and storing water is an expensive, politically fraught job.

Some of the best "buffaloes" historically worked for Colorado Springs, and they built a water system that is the envy of many Front Range cities.

Since the late 1800s, the city has built a water system to accommodate a population that's multiplied by 17 times in the past 100 years.

The projects include the Pikes Peak water collection system, which provides about 17 percent of Colorado Springs Utilities' supply. The remainder comes from four transmountain systems: Blue River, Homestake, Fryingpan-Arkansas and Twin Lakes.

Still, even this city is reaching the bottom of the pail.

Colorado Springs faces a demand for water in future years it can't guarantee, and the city must bring more water in by 2012, officials said.

To do that, city-owned Colorado Springs Utilities wants to build a pipeline that it calls its last big diversion project, the **Southern Delivery** System.

The system of pipes, pumps and local reservoirs would bring water from Pueblo Reservoir to exercise water rights the city owns in the Arkansas River's upper basin.

The **Southern Delivery** System is needed to service the Banning-Lewis Ranch development, 24,000 acres on the city's northeast side that is expected to be home to 175,000 people in the next 40 years.

The project is steeped in controversy. Its latter phases require federal approval and may need the nod from Pueblo County, which has raised the issue of water quality in Fountain Creek, which takes Colorado Springs' wastewater effluent to Pueblo.

Even if that billion-dollar project is built, Utilities concedes its supply of fresh mountain water won't meet the city's needs by 2040.

And that really gets Dave Gardner's goat.

The 51-year-old Springs native thinks current water users are being asked, through higher utility rates, to fund a foolhardy growth-for-growth's-sake philosophy.

Gardner, who's making a documentary film about growth and sustainability, has attended countless public meetings learning about water and the city's plan.

He thinks pumping in more river water might delay the crisis for 30 years, but eventually the free-wheeling growth that has characterized this city for years will have to end.

"Then what do we do, go after agriculture?" he asked. "That buys us another 40 years. It's completely unsustainable. Do we want our grandchildren to live in a state where you can still fish? Where you can go to a city park that's not concrete?"

Gardner wants the city to stop building "growth-inducing" water projects.

"There is no law that says a community has to continue to connect new water customers if you're gambling with the future and you don't know for sure the water will be there," he said.

MORE OPTIONS

Several other ideas being considered statewide to provide water to future generations. Some are easily doable; others will take time and money.

Many cities have begun pricing water to reflect its true cost, or adopting a tiered system with heavy users paying more per gallon after certain thresholds. That has, in part, eased the escalation of demand for irrigation water. Colorado Springs Utilities adopted a tiered system in 2006, and residents now use less water than they did in 2001, the last year before the drought that led to several years of watering restrictions.

But simply saving water won't stop what some have called a "hell-bound train."

Utilities officials don't particularly like to talk about it, but someday the city may have to treat its wastewater back to drinking standards to supply enough water to faucets. That, they say, will be an expensive task, fraught with public relations problems in a city accustomed to having some of the finest tap water in the country.

Utilities, like others farther north, has been sinking deep wells into the Denver Basin, a massive aquifer that stretches from Highway 94 in El Paso County to Fort Collins. Some experts say the nonrenewable Denver Basin is being depleted far more quickly than expected.

One scientist from the Denver Museum of Nature predicted Denver Basin groundwater will be gone this century.

Other scientists think that is alarmist, because not enough is known about the hydrology of the Denver Basin.

The USGS is expected to complete the most comprehensive study of the basin this summer.

Colorado Springs Utilities and others in the state are considering or have begun experimenting with injecting water into aquifers in wet years, to be withdrawn in lean ones.

The technology is promising, but there are technical and legal problems, such as assuring that other well users don't suck out the water before it is needed.

None of those ideas would help individual well owners who live far from established water districts and who

have tapped into the shallowest aquifers above the Denver Basin. If their wells run dry, they have undesirable options: drill a new, deeper well in hopes of prolonging their water supplies or have water trucked in and stored in cisterns.

City dwellers could perhaps take hope in the idea of Fort Collins resident Aaron Million.

He has come up with a plan to pipe water across Wyoming along Interstate 80 and south to the Front Range from the Flaming Gorge Reservoir on the Green River.

The $4 billion to $5 billion project is called "intriguing" by Colorado water gurus, but it's unclear whether it can clear regulatory hurdles.

AGRICULTURAL IMPACT

In the end, such ideas are stopgap measures. Thesolution to the Front Range's water woes — and many see it as a poor one — is robbing Peter to pay Paul.

Cain, of the USGS, said, "If the question is, 'Is there water in Colorado for new municipal growth?' There is enough water for that, but it has to come from some existing use, so that has to be interrupted or changed to make way for that."

He's referring to agriculture, still a potent force in the state's economy. Farms and ranches use 88 percent of the state's supply of water to irrigate 5 percent of Colorado's land.

Already, the three big Front Range water providers — the Denver Water Board, Aurora and Colorado Springs — have begun buying agricultural water rights.

The deals might be good for farmers wanting to get out of the business, but they have profound implications for the schools, businesses and towns that dot the eastern plains.

At the height of the drought, state lawmakers made it easier to do a more kind and gentle water grab: Water providers can now lease agricultural water rights in lean years, when farmers might struggle to produce a crop, and give up the water in wetter years.

Still, there isn't any doubt among those in agriculture that big-city water boys are coming with wads of cash and slick lawyers.

That's when Coloradans must decide what kind of state they want.

"I'm not saying the kinds of choices that would need to be made are easy," Cain said. "They involve moving water from some traditional uses to others, and it will affect the way our state looks and the economy of the state."

Where our water comes from

Reservoirs, date completed and
capacity in millions of gallons:

SOUTH SLOPE SYSTEM

Lake Moraine 1891 431 Boehmer 1894 176.3 Big Horn 1896 62.3 Wilson 1896 218 Mason 1905 640.3 McReynolds 1905 667.9 Big Tooth 1929 210.1

NORTH SLOPE SYSTEM

Crystal 1935 1,100 South Catamount 1937 848.4 North Catamount 1960 3,900

NORTHFIELD SYSTEM

Northfield 1890 90 Nichols 1913 191 Rampart 1970 13,300

BLUE RIVER SYSTEM

Montgomery 1957 1,660 Upper Blue 1966 690.6

HOMESTAKE SYSTEM

Homestake 1967 13,970 Turquoise-Homestake 1968 4,900

TWIN LAKES SYSTEM

Twin Lakes 1972 9,700

FRYINGPAN-ARKANSAS PROJECT

Pueblo Reservoir 1975 18,100

COLORADO CANAL

Lake Henry Account 1986 2,200 Lake Meredith Account 1986 6,700

LOCAL SYSTEMS

Rosemont 1932/enlarged in '62 826.8 South Suburban 1928 75.5 Gold Camp 1889 120 Pikeview 1894 295

GROUNDWATER

Wells scattered south and north of
Colorado Springs account for less
than 1 percent of the city's supply.

GLOSSARY OF WATER TERMS MORE DEFINITIONS AT GAZETTE.COM

ACRE-FOOT

— The volume of water required to cover 1 acre to a depth of 1 foot. Equal to 43,560 cubic feet or 325,851 gallons, or 1,233 cubic meters.

AQUIFER

— A saturated water-bearing formation, or group of formations, that yield water in sufficient quantity to be of consequence as a source of supply.

BENEFICIAL USE

— Use of water — such as domestic, municipal, agricultural, mining, industrial, stock watering, recreation, wildlife, artificial recharge, power generation or contamination remediation — that provides a benefit. Water rights not put to beneficial use are subject to forfeiture. Historically, very few uses of water have been declared nonbeneficial by courts.

COMPACT

— An agreement between states apportioning the water of a river basin to each of the signatory states. Approval by Congress is required.

DENVER BASIN GROUNDWATER

— Groundwater of the Dawson, Denver, Arapahoe and Laramie-Fox Hills aquifers underlying the Front Range area from Colorado Springs to Greeley. This water is allocated to the overlying landowner by statute, administered by rules of the State Engineer, that allows pumping at a rate of 1 percent per year, assuming a hundred-year life of the aquifer and requiring some of the pumped water to be put back into the system.

DEVELOPED OR IMPORTED WATER

— Water brought into a stream system from another, unconnected source, such as transmountain diversion water or nontributary well water. This type of water can be reused and successively used to extinction and is

often used in augmentation or exchange plans. In contrast, native basin water is subject to one use, and the return flow belongs to the stream system to fill other appropriations unless a decree was obtained for the right to reuse and successively use return flows.

INJECTION WELL

— Well used for injecting water or other fluid into a groundwater aquifer.

NONTRIBUTARY GROUNDWATER

— Groundwater outside the boundaries of any designated groundwater basin, the withdrawal of which will not, within 100 years, deplete the flow of a natural stream at an annual rate greater than one-tenth of 1 percent of the annual rate of withdrawal.

SENIOR APPROPRIATOR

— Owner of a surface-water right whose right was acquired prior to other rights holders on the same stream.

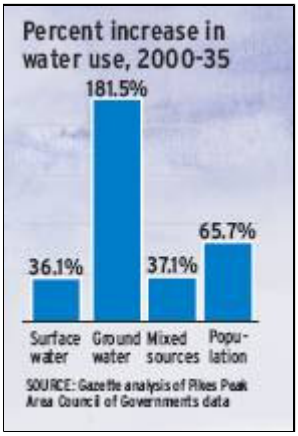
WATER RIGHT

— A property right to the use of a portion of the public's surface or tributary groundwater resource obtained under applicable legal procedures. Water rights can be passed with a conveyance of land by deed, lease, mortgage, will, or inheritance.

ONLINE Interactive A closer look at the region's water system:

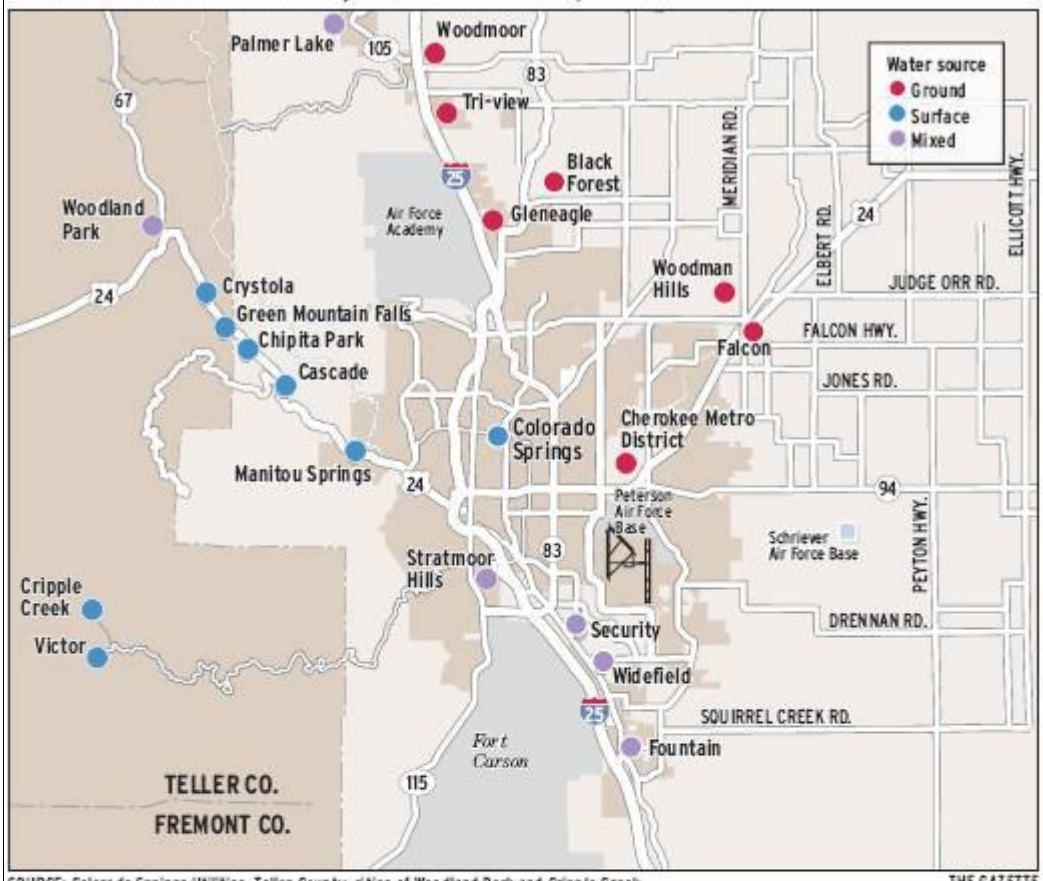
gazette.com/ interactives/ watersystem

ILLUSTRATION BY NICHOLE MONTAÑEZ, THE GAZETTE


Percent increase in water use, 2000-35
181.5%
65.7%
36.1%
37.1%
Surface water
Ground water
Mixed sources
Population
SOURCE: Gazette analysis of Pikes Peak Area Council of Governments data

The wellspring of water

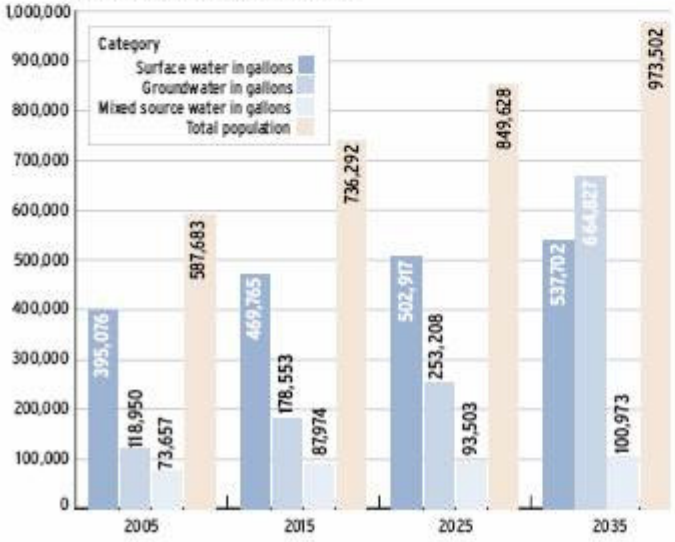
Residents of El Paso and Teller counties get their water from a variety of sources.



SOURCE: Colorado Springs Utilities, Teller County, cities of Woodland Park and Cripple Creek THE GAZETTE

Population's impact on water demand

As the Pikes Peak region gets more populous, most of that growth will be in areas that depend on groundwater supplies.



SOURCES: Gazette analysis of Pikes Peak Area Council of Governments Small Area Forecast data THE GAZETTE

Denver Basin aquifers

The basin extends from Weld County to Fountain in El Paso County.

SOURCE: Citizen's Guide to Colorado Water Law THE GAZETTE