



Economic Development Report

Colorado
State
University

Extension

Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172
<http://dare.colostate.edu/pubs>

PROFILE OF THE REPUBLICAN RIVER BASIN

Jenny Thorvaldson and James Pritchett¹

- *Agriculture comprises \$1.3 billion in sales in the Republican River Basin.*
- *Initial expectation is a 30,000 acre reduction in irrigated cropland.*

Overview

Colorado's population is growing rapidly, with the statewide population growth from 2000 to 2030 projected to be around 65 percent. The proportion of the state's population living in urban areas has been increasing, corresponding to national trends. As Colorado's population grows and urbanizes, water is likely to shift from agriculture to municipal and industrial (M&I) uses. Indeed, cities plan to dry up about 300,000 acres of irrigated farmland statewide to meet future needs. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights, which are then allocated to other uses.

The purpose of this fact sheet (and the three accompanying fact sheets) is to describe the economic base of four river basins, which will set the foundation for discussing the economic effects of shifting water from agriculture to other uses, including compost compliance. This fact sheet begins with a description of

the basic demographics of the Republican River Basin, followed by descriptions of the basin's economic base and agricultural sector. Next, it discusses the relative water supply and demand amounts in the basin, ending with a discussion of the future direction of our study.

Colorado is home to eight major river systems,² whose surface waters are divided among many uses. The Republican River Basin is comprised of all or parts of 7 counties (Kit Carson, Lincoln, Logan, Phillips, Sedgwick, Washington, and Yuma) located in the northeast corner of the state, as shown in Figures 1 and 2. Between 1990 and 2000, the population in the Republican Basin increased by 31 percent. Total population is 56,768 [1] and is expected to increase by another 65 percent by the year 2030 (Figure 3).

Economic Profile

The Republican River Basin accounts for just over one percent of the state's employment. Employment and earnings are concentrated in the agricultural and related industries. Annual value of sales and services of the Republican River Basin is \$3,061 million, with agriculture industries comprising \$1,339 million (44 percent) of this value (MIG, Inc., 2002). There are few economic alternatives to agriculture in the Republican River Basin and the counties in this area are heavily dependant on agriculture for their economic base.

¹ Authors are a graduate student and an associate professor, respectively, in the Department of Agricultural and Resource Economics at Colorado State University.

² The Republican River Basin is considered to be a sub-basin of the South Platte River Basin.

Extension programs are available to all without discrimination.

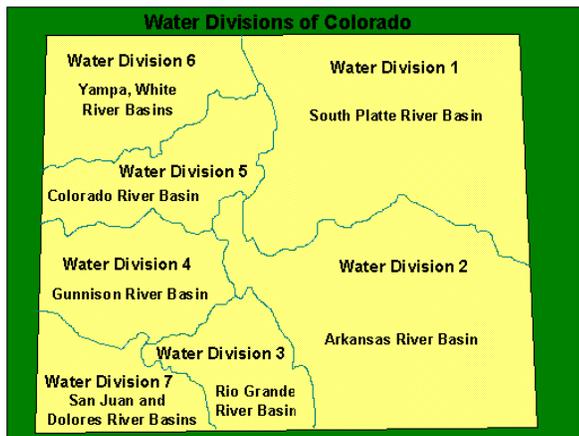


Figure 1: Colorado's Water Basins

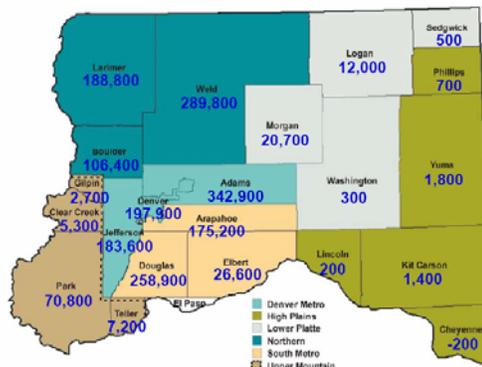


Figure 3: South Platte Subbasins and Changes in County Population 2000 to 2030
Note that Broomfield county (not in Figure 3) will have an increase in population of 32,500 people

Figure 3: Estimated Population Growth by 2030 of the South Platte River Basin, of which the Republican River Basin is a part

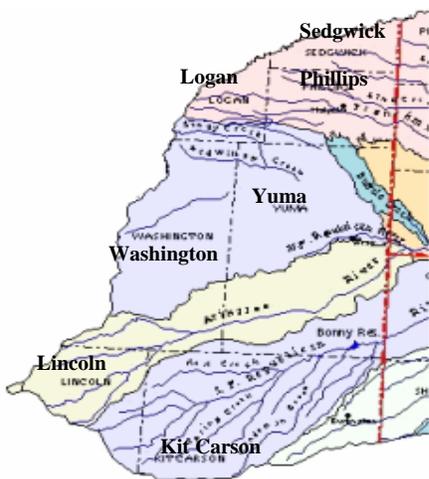


Figure 2: Colorado Counties within the Republican Basin

The reduction in irrigated cropland has implications not only for the agricultural sector, but also for the larger economy of the counties in the basin as well. If a substantial number of irrigated acres are removed from the Republican River Basin's economic activity, impacts will ripple through the local economy, due to indirect and imputed effects. Areas relying more exclusively on irrigated agriculture for economic activity, such as the Republican Basin, are likely to suffer greater impacts versus regions with a broader, more diverse economic base. Table 1 lists the major industrial sectors of the Rio Grande River Basin.

Table 1: Economic demographics for the 7 Republican River Basin counties (2002)

Industry	Value of Sales (million \$)	Percent of Total
Total	\$3,061	100.00%
Notable Contributors (Sectors)		
Government and non-NAICs	\$390	12.74%
Cattle ranching and farming	\$375	12.25%
Grain farming	\$277	9.05%
Retail trade	\$164	5.36%
Manufacturing	\$156	5.10%
Construction	\$155	5.06%
Health and social services	\$133	4.35%
All other crop farming	\$120	3.92%
Finance and insurance	\$112	3.66%
Wholesale trade	\$110	3.59%

Agriculture

Agriculture has been a major influence on both past trends and present conditions in almost every area of socioeconomic concern because the basin is located in one of the most agriculturally productive regions of the U.S. The basin's agricultural output has both regional and national significance [5]. The total land area of the Republican River Basin is 12,709 square miles (8,133,888 acres), with the highest proportion of this land area in farm and ranch (a whopping 90 percent) relative to the other 3 basins studied. Of the area in farm and ranch, 61 percent is cropland. Of the cropland, 15 percent is irrigated cropland and 85 percent is

dryland (Figure 4). Dryland farming is still common with wheat as the primary dryland crop. The introduction of irrigation from both surface and ground water sources has diversified crops and increased livestock production. It has also stabilized the population by reducing the effect of droughts and floods. Corn, alfalfa hay, and dry edible beans are the main irrigated crops grown today. Grazing lands are utilized for beef cattle. Hay production also plays an important role in the economy. Agriculture continues to be the dominant economic sector in the basin. Table 2 lists the value of sales by crop.

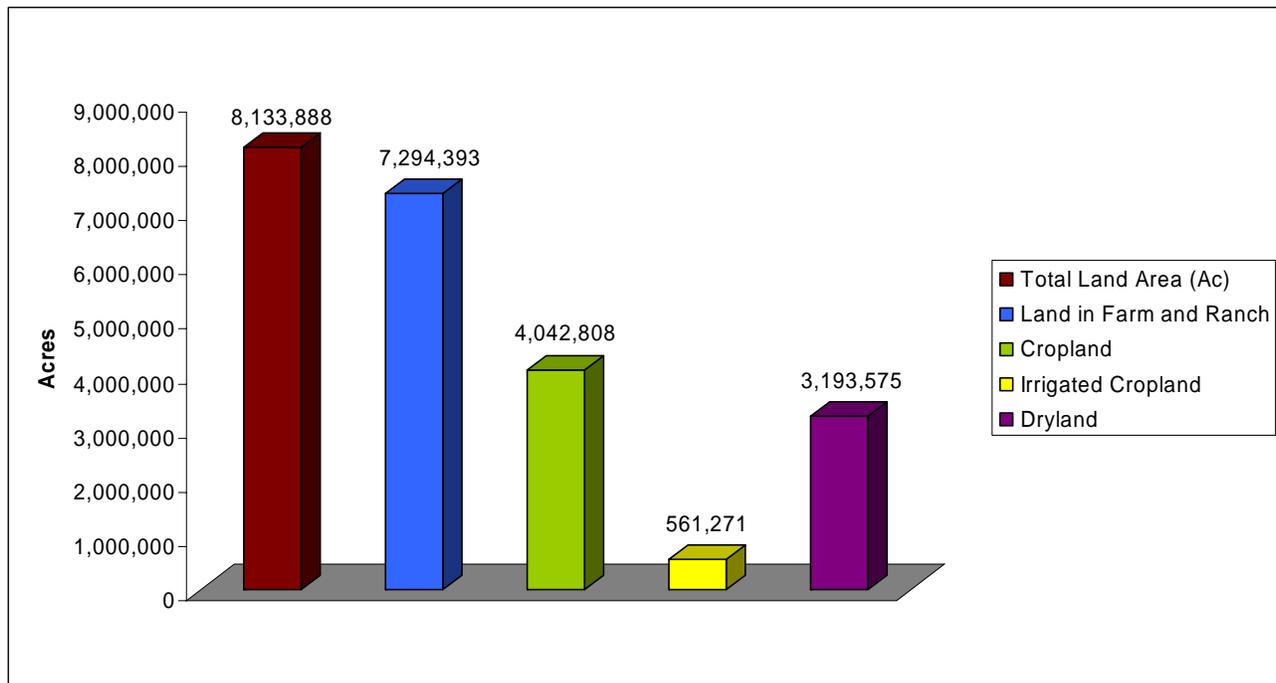


Figure 4: Republican Basin Land Disposition

Table 2: Value of Sales by Irrigated Crop for Republican River Basin Counties (2001)

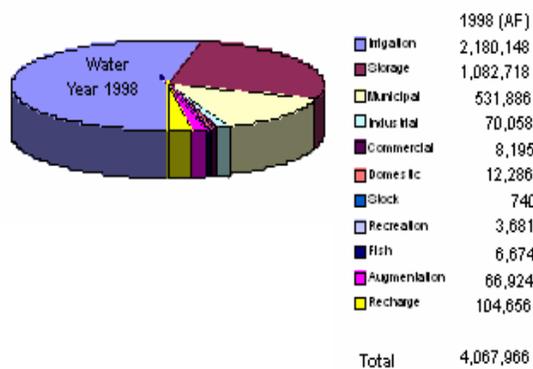
Crops	Total Production of Irrigated Crops	Value of Irrigated Crop Sales (million \$)	Percent of Total
Total		\$367.06	100.00%
Notable Contributors			
Corn Grain (BU)	99,125,600	\$206.18	56.17%
Hay (TON)	838,715	\$75.48	20.56%
Sugarbeets (TON)	44,825,000	\$15.24	4.15%
All Wheat (BU)	5,106,250	\$13.79	3.76%
Sunflower (LBS)	120,104,600	\$12.61	3.44%
Dry, Edible Beans	74,898,000	\$11.98	3.26%
Corn Silage (TON)	552,500	\$11.33	3.09%
Potatoes	731,000	\$6.80	1.85%

Historically, the productivity of irrigated lands in the Republican River Basin has contributed to the economic and social well-being of the area. Communities throughout the basin depend on the agricultural sector for their economic base and stability. The productivity of these lands contributes to individual operators' standard of living, as well as supporting employment opportunities on and off the farm.

Evolving Water Uses

The Republican River drains approximately 7 percent of the state's land area, with agriculture being the predominant water use in this area (Figure 5). The Republican River Compact of 1942 allocates the Republican River's surface waters between Colorado, Nebraska and Kansas, and is one of only three of Colorado's nine interstate water compacts that explicitly apportion water on the basis of consumptive use (CU).³ A U.S. Supreme Court Master ruled in 2001 that the Republican River compact should include ground water use "to the extent it depletes the Republican River streamflows." In effect, the Special Master ruling altered the compact's accounting stance so that groundwater depletions are now included. In 2003, Colorado exceeded its Republican River compact allocation by several thousand acre-feet; consequently, agriculture's consumptive use of the Republican River water must be reduced, and initial plans are to retire wells on 30,000 irrigated acres.

Surface Water Diversions in Acre-feet by Use



Source: Colorado Division of Water Resources, Division 1 Annual Reports and Division 7 Annual Reports

Figure 5: Republican Basin Surface Water Uses

The plans for nearly all Republican River water providers include some component of agricultural transfers and the optimization of existing supplies through new storage and/or reuse and exchanges. As urban growth continues, there will be some natural retirement of agricultural lands as these properties are converted to urban use. This will occur primarily in the Northern area, as very little agricultural use remains in the South metro and Denver metro areas. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights to some extent. The presence of threatened and endangered species significantly affects water resources management and development in the Republican River Basin.⁴ Water resources management and development is also affected by Compact obligations, interstate litigation, and over-appropriated surface and groundwater sources.

Future Direction

Agriculture represents approximately 91 percent of water used in Colorado and SWSI⁵ projections indicate that it will make up 86 percent of the water use in 2030. Seventy-five percent of the total value of Colorado crops is derived from the irrigated sector, highlighting the importance of, and dependence on, a secure water supply. The greatest changes in agricultural water use are expected to occur in the Front Range as M&I growth moves into agricultural lands and/or as water is transferred from agriculture to support growth. Understanding the impact of these changes on rural Colorado economies, and the effect on the open space provided by farms and ranches, is a key challenge for all Coloradans.

As the next step in our study we will use the number of lost irrigated acres predicted by SWSI to examine how such a loss in irrigated acres will alter economic activity in this region. We will use the IMPLAN input-output model to predict the direct, indirect and induced economic impacts stemming from this loss of irrigated agriculture in each of these four river basins. Our next fact sheet will discuss economic impact analysis and the use of input-output models. This will be followed a final fact sheet discussing the results and conclusions of our study.

³ Consumptive use is that portion of the water demand for a specific category that is consumed and does not return to the stream system through return flow.

⁴ Endangered species within the basin include the peregrine falcon, whooping crane, Eskimo curlew, bald eagle, and black-footed ferret. The Plains orange-throat darter is listed as threatened.

⁵ The Statewide Water Supply Initiative (SWSI) is an 18-month study by the Colorado Water Conservation Board (CWCB) to take a comprehensive look at how Colorado will meet its future water needs. SWSI has identified how much water Colorado will need to help meet the needs of its growing population. The state's eight major water basins will need an additional 630,000 AF of new water by the year 2030 to meet projected demands, 53 percent more water than is being used today.

Sources

“Table 1: Annual Estimates of the Population for Counties of Colorado: April 1, 2000 to July 1, 2003 (CO-EST2003-01-08).” *U.S. Census Bureau, Population Division*, April 9, 2004.

“South Platte/Republican River Basin Facts.” *Colorado Water Conservation Board*, March 2002.

“Update on Statewide Water Supply Initiative-South Platte Basin.” *Statewide Water Supply Initiative*, October 2004.

Minnesota IMPLAN Group, Inc. 2002. Colorado State University, Fort Collins, CO.

“Republican River Basin Water Management Study.” *Department of the Interior, Bureau of Reclamation*, February 1985.