

South Platte/Republican River Basin Facts

Colorado Water Conservation Board

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Cherry Creek Reservoir

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South Platte River Basin

Overview

The South Platte and Republican Rivers drain 20 percent of the state's land area. Major tributaries to the South Platte include Tarryall, Plum, Bear, Cherry, Clear, Boulder, Big Dry, and St. Vrain Creeks; and the Big Thompson and Cache La Poudre Rivers. The Republican River is a tributary to the Kansas River.

Agriculture is the predominant water use, with approximately 2.0 million acre-feet per year used for irrigation of 1.1 million acres. An additional 880,000 acre-feet per year of groundwater is applied for irrigation; and 100,000 acre-feet per year of groundwater is used to meet municipal, domestic, livestock, industrial and commercial purposes. These values do not include water in the High Plains area from Ogallala Formation wells.

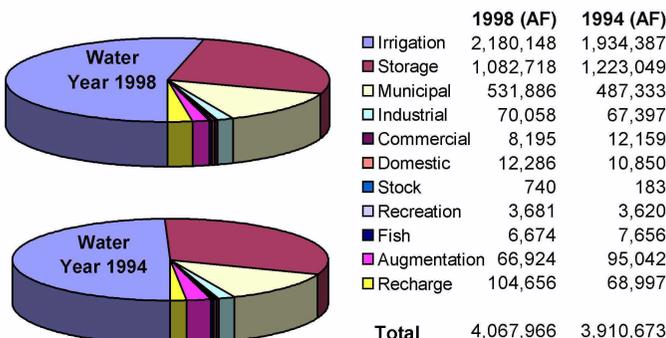
Water Conservancy Districts

- Central Colorado
- Lower South Platte
- Northern Colorado
- St. Vrain and Lefthand
- Upper South Platte

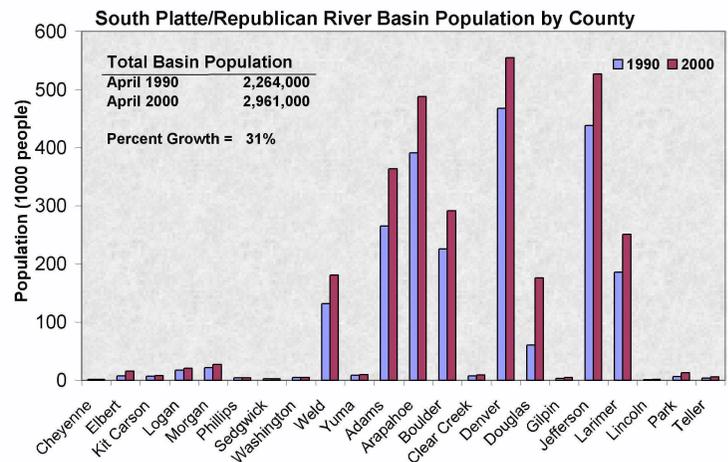
Growth

The basin is comprised of portions of 22 counties in the northeast corner of the state. Between 1990 and 2000, the population in this basin increased by 31 percent and now accounts for 68.9 percent of the state's total population. The graph below lists populations for the portions of the counties that are in this basin.

Surface Water Diversions in Acre-feet by Use



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



Source: Colorado Department of Local Affairs

Additional information about this river basin is available at <http://cwcb.state.co.us>

Major Storage Projects

Reservoir	Normal Storage (acre-feet)
Horsetooth Reservoir	152,000
Carter Lake	112,200
Eleven Mile Canyon Reservoir	97,800
North Sterling	74,590
Cheesman Reservoir	79,064
Point of Rocks	74,590
Empire Reservoir	37,700
Prewitt Reservoir	28,840
Riverside Reservoir	65,000
Spinney Mountain Reservoir	53,873
Standley Lake	43,344
Jackson Reservoir	35,629
Barr Lake	32,100
Aurora Reservoir	32,400
Gross Reservoir	41,811
Julesburg Reservoir	31,800
Chatfield Reservoir	26,600
Milton Reservoir	29,732
Antero Reservoir	25,618
Marston Reservoir	19,795
Button Rock Reservoir	16,080
Horse Creek Reservoir	18,747
Cherry Creek Reservoir	13,226

Source: Colorado Division of Water Resources Office of Dam Safety Database

Major Water Rights Calls

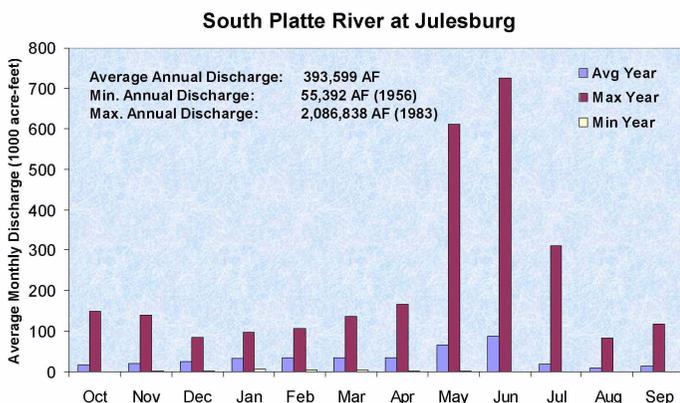
The South Platte River is overappropriated. During most days and most years, there is a call somewhere on the South Platte River. In the summer, the entire river is generally controlled by direct flow calls that have priorities in the 1870s and 1880s. At times there may be as many as six ditches taking the entire river flow at their headgates. The major tributaries also have internal calls during the majority of the year which result in junior water rights being curtailed from diverting water in those drainages. In the summer the calling ditches on the Cache la Poudre, Big Thompson and Saint Vrain Rivers and Boulder, Clear and Bear Creeks have priorities that are generally in the 1860s and are senior to the call on the South Platte River. Therefore, the calls on the South Platte generally do not affect the tributaries.

Stream and Lake Protection

There are 212 instream flow segments totaling approximately 1,339 stream miles in this basin. There are also 35 lakes with decreed natural lake levels. These decreed water rights are held by the CWCB to “protect the natural environment to a reasonable degree.” The decreed flow or lake level for each of these instream flow segments and natural lakes is based on the flow or lake level required to maintain the water-dependent natural environment.

Source: Colorado Water Conservation Board

Annual Discharges



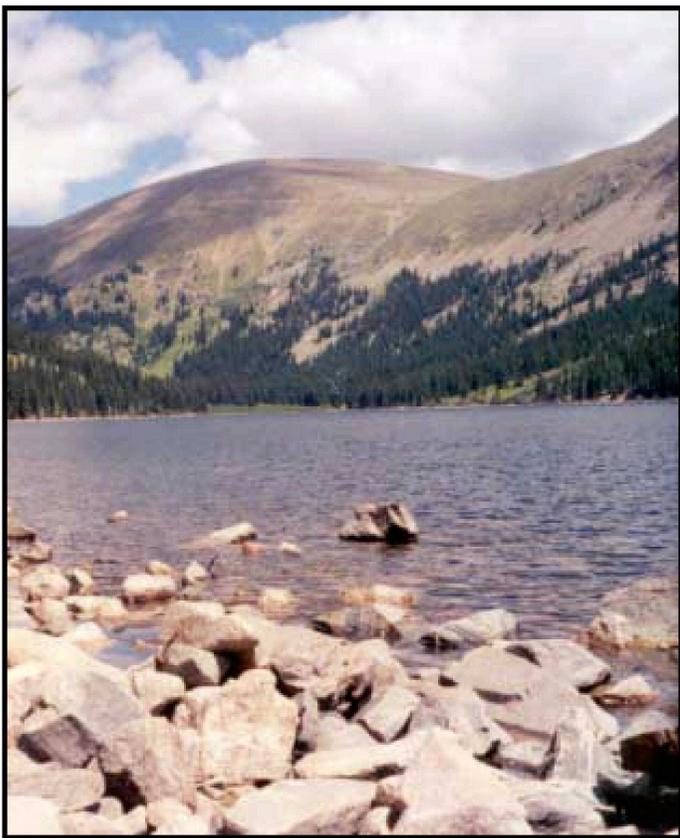
Source: U.S. Geological Survey Water Data Reports

Hydrological Variations

Annual and seasonal variations are shown below for the South Platte River at Denver and Julesburg.

Gage	Maximum Recorded Flow (cfs)	Minimum Recorded Flow (cfs)
At Denver	40,300 (1965)	8.8 (1951)
At Julesburg	37,600 (1965)	0.0 (1902)

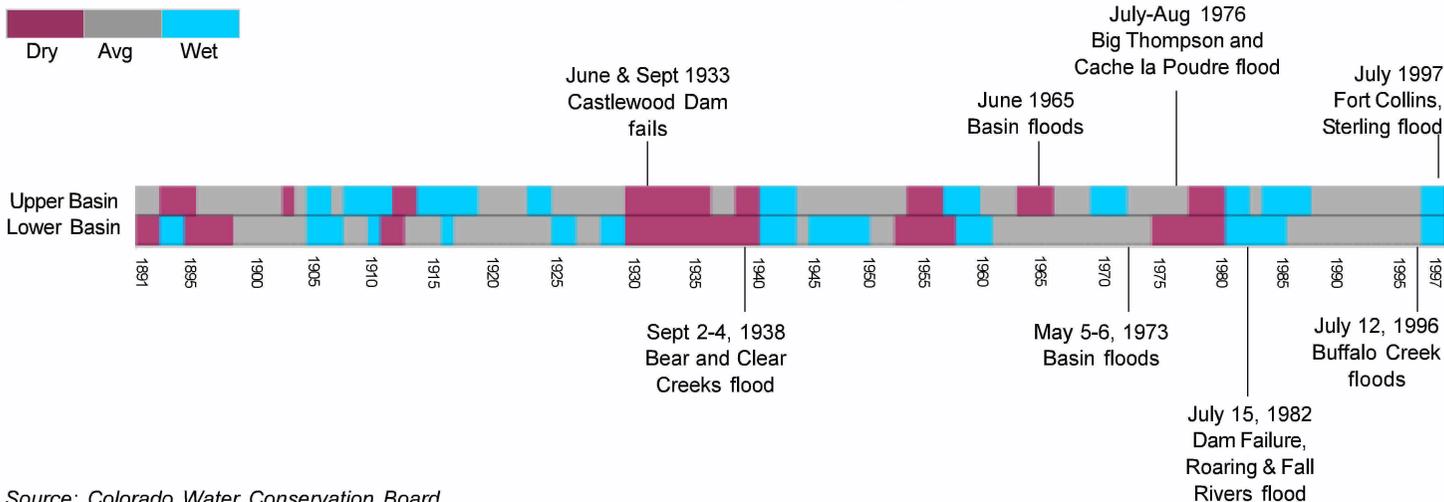
Source: U.S. Geological Survey Water Data Reports



Jefferson Lake (Photo courtesy of Theresa Stone)

Wet and Dry Periods

Every year, Colorado experiences at least one 100-year flood somewhere in the state. Colorado's total flood losses have been documented to be \$4.9 billion to date. The South Platte Basin's most recent major flood event was July 28-29, 1997. The estimated total historic flood damages for this basin are \$3.4 billion to date.



Source: Colorado Water Conservation Board

Major Imports into the Basin

Name	Recipient Stream	Diversions (acre-feet)
1*Adams Tunnel	Big Thompson R.	231,060
2 Moffat Tunnel	South Platte R.	52,912
3 Roberts Tunnel	South Platte R.	68,767
4 Grand River Ditch	Cache La Poudre R.	20,256
5 Laramie-Poudre Canal	Cache La Poudre R.	16,104
6 Aurora Homestake	South Platte R.	16,544
7 Michigan Ditch	Cache La Poudre R.	4,410
8 Berthoud Pass Ditch	Clear Creek	1,090
9 Wilson Supply Ditch	Cache La Poudre R.	1,673

Major Exports from the Basin

None

* Numbers in the above table correspond to numbers that accompany arrows on the basin map (p. 5).

† Continental Hoosier Tunnel exports from the Colorado Basin to the Arkansas Basin through a portion of the South Platte Basin.

Source: Division 1 1998 Annual Report, 10-year averages

Unique Characteristics

- Average imports into the South Platte Basin exceed those in all other basins.
- Reliance on Denver Basin non-tributary groundwater, which has a limited life, for municipal and industrial needs.
- Presence of threatened and endangered species significantly affects water resources management and development.

Endangered Species

In the Platte River Basin in Central Nebraska, the whooping crane, piping plover, interior least tern, and pallid sturgeon are listed as threatened or endangered under the federal Endangered Species Act. The U.S. Fish and Wildlife Service has concluded that the habitat for these species has been reduced by water diversions and land use changes. The CWCB has worked as a member of a three-state partnership to (1) improve habitat for these species so water use and future development do not jeopardize these species, (2) help water users to comply with federal laws, and (3) prevent new species from being listed.

An Action Plan is being developed to provide an average of 130,000 to 150,000 acre-feet per year for restoring habitat along the Platte in Central Nebraska. This water will be provided in part by (1) restoring the storage capacity of Pathfinder Reservoir in Wyoming, (2) establishing an

Compact Facts

South Platte River Compact of 1923

Establishes Colorado’s and Nebraska’s rights to use water in Lodgepole Creek and the South Platte River. Nebraska has the right to fully use water in Lodgepole Creek before Lodgepole enters Colorado. Colorado has the right to fully use water in the South Platte River between October 15 and April 1. Between April 1 and October 15, if the mean daily flow of the South Platte River at Julesburg drops below 120 cfs and water is needed for beneficial use in Nebraska, water rights in Colorado between the western boundary of Washington County and the state line (the “Lower Section”) with priority dates junior to June 14, 1897 are curtailed. In addition to prior perfected rights in Colorado in use at the time of the Compact in the Lower Section, Colorado reserves the right to develop 35,000 acre-feet of storage in the Lower Section.

Republican River Compact of 1942

Establishes the rights of Colorado, Nebraska and Kansas to water in the Republican River Basin and makes specific allocations of the right to make beneficial consumptive use of water from identified streams.

environmental water account in Nebraska’s Lake McConaughy, and (3) developing a groundwater recharge and river re-regulation project near Tamarack State Wildlife Area in Colorado. These actions are expected to provide an additional approximately 70,000 acre-feet per year of water for the threatened and endangered species in Central Nebraska. The plan will identify other water conservation or

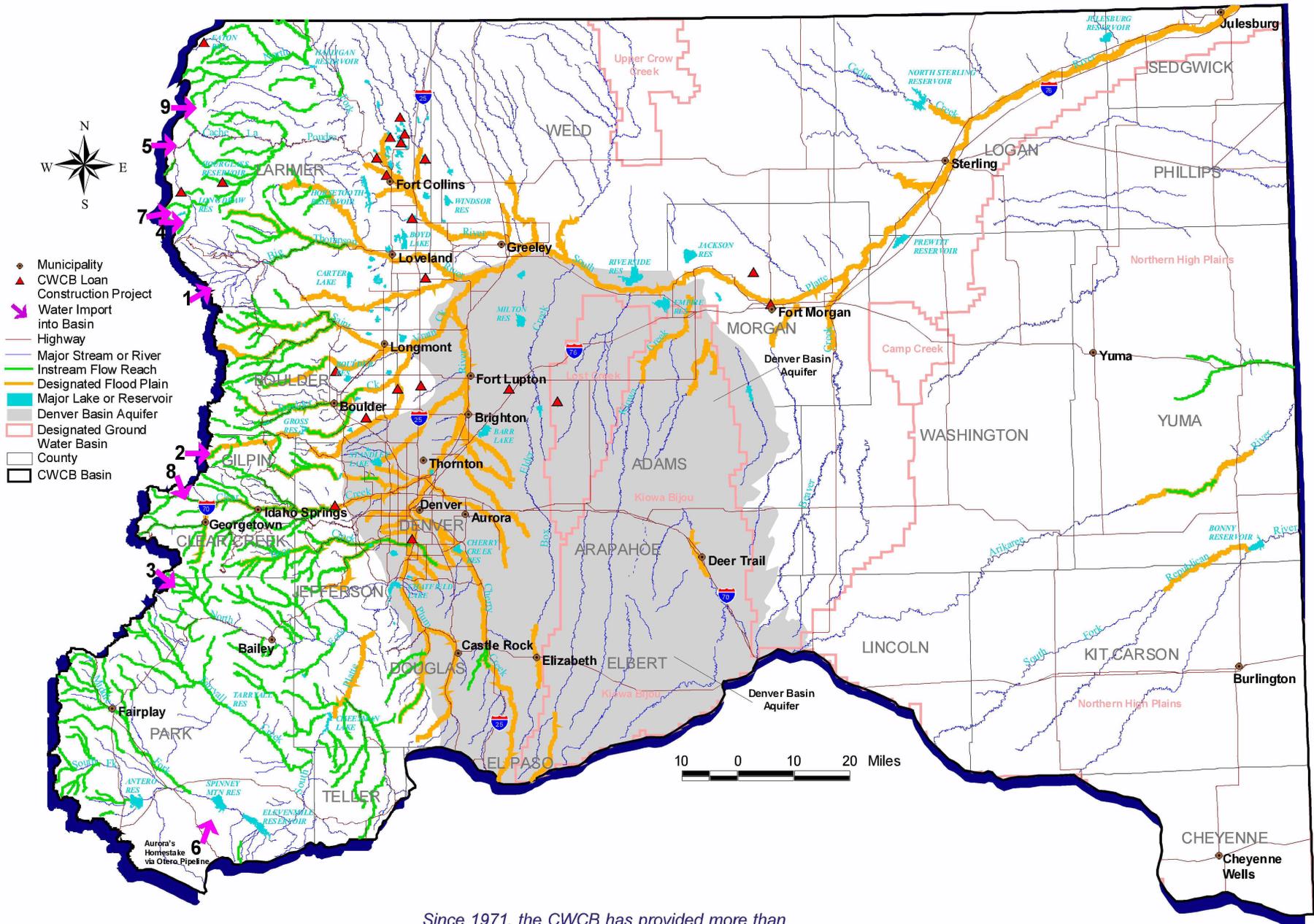
water supply means for further enhancing flow conditions by an additional 60,000 to 80,000 acre-feet per year from water conservation or new water supply sources within the three states. An Environmental Impact Statement is being prepared that analyzes these actions. Following completion of the EIS, the federal government and states may agree to participate in a 15-year implementation program.

Groundwater

	Alluvial Aquifer Along the South Platte and its Tributaries	Denver Basin Bedrock Aquifers	Designated Groundwater Basins Including the High Plains Aquifer
Aquifer Characteristics	Width: 1 to 10 miles Thickness: < 5 to 200 feet	Consist of Dawson, Denver, Arapahoe, and Laramie-Fox Hills sedimentary rocks	Designated groundwater basins include Lost Creek, Kiowa Bijou, Northern High Plains and Upper Crow Creek.
Primary Uses	Agriculture, municipal and domestic	Municipal, industrial and domestic	Agricultural and domestic
Yield	Wells can yield up to 2,000-3,000 gpm where the sands and gravels are thick and contain only a small percentage of fine materials. Approximately 8 million acre-feet of water is contained in the South Platte alluvium.	Water contained in these aquifers within the five-county area in and adjacent to Denver Metropolitan area is approximately 467 million acre-feet, of which 150 million acre-feet is recoverable. 1998 level of use for the Denver Basin is estimated at 57,000 acre-feet/year, or 4% of the maximum recoverable annual appropriation.	Water in transient storage in the alluvial aquifers varies from 150,000 acre-feet (Upper Crow Creek) to 2.4 million acre-feet (Kiowa Bijou).
Recharge Source	Precipitation, irrigation return flows, canal seepage, and seasonally from the South Platte River and its tributaries	Recharge minimal, with the majority coming from outcrop areas	Precipitation, imported water, and seasonally from streams
Water Rights Administration	Prior appropriation system with well pumping covered by plans for augmentation or temporary supply plans	Senate Bill 5, administered under a 100-year aquifer life	Colorado Ground Water Commission and local management districts

Source: Colorado Department of Natural Resources

South Platte and Republican River Basin



- Municipality
- ▲ CWCB Loan Construction Project
- ↘ Water Import into Basin
- Highway
- Major Stream or River
- Instream Flow Reach
- Designated Flood Plain
- Major Lake or Reservoir
- Denver Basin Aquifer
- Designated Ground Water Basin
- County
- CWCB Basin

Since 1971, the CWCB has provided more than \$53.9 million in loan financing for 80 water projects in this basin. Projects receiving over \$500,000 are shown on the basin map as a red triangle ▲.