Colorado River Mainstem Basin Facts

Colorado Water Conservation Board

March 2002

Dillon Reservoir (Photo courtesy of Linda Strand)

Bill Owens
Governor

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Colorado River Basin

Overview

The Colorado River accounts for 25 percent of the stream flow leaving the state. Development of the basin yield is limited by interstate compacts with other Colorado River Basin States. Between 450,000 and 600,000 acre-feet is diverted to Eastern Colorado annually. Future development is limited to 120,000 acre-feet by the 15-Mile Reach Programmatic Biological Opinion at the present time.

Major tributaries include the Fraser, Blue, Eagle and Roaring Fork Rivers. Large amounts of U.S. Bureau of Land Management and Forest Service lands are in this basin. Agriculture is the dominant water use, with diversions of approximately 2.2 million acre-feet for the irrigation of 300,000 acres.

Major Water Organizations

Water Conservation District
Colorado River

Water Conservancy Districts

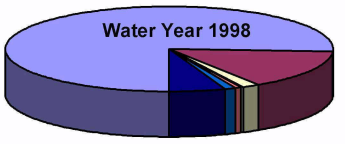
Collbran	Battlement Mesa
Ute	Basalt
West Divide	Bluestone
Silt	Middle Park

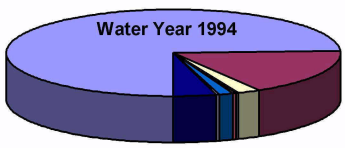
Other Organizations
Grand Valley Water Users Association
Grand Valley Irrigation Company

Growth

The basin is comprised of portions or all of ten counties in the western part of the state including small portions of Rio Blanco and Lake Counties; however, the majority of the population is in the eight counties listed in the bar graph below. Between 1990 and 2000, the population in this region increased by 42 percent, and now accounts for 5.5 percent of the state's population. The graph below outlines populations for the portions of the counties that are in this basin.

Surface Water Diversions in Acre-feet by Use

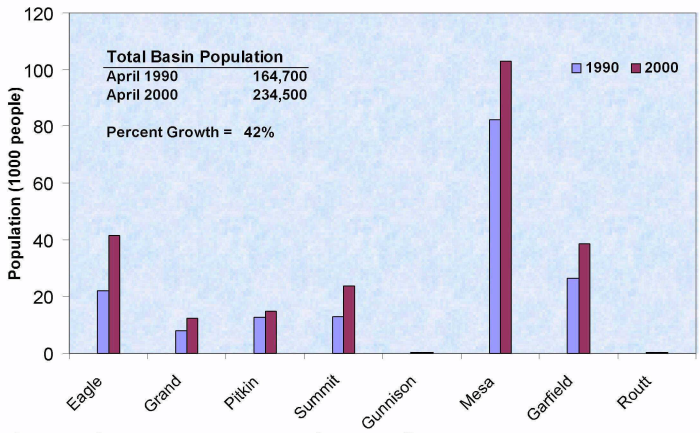




	1998 (AF)	1994 (AF)
Irrigation	2,185,350	1,921,676
Storage	434,194	450,330
Municipal	50,289	56,267
Industrial	5,321	3,749
Commercial	2,293	131
Domestic	15,315	9,050
Stock	28,438	36,856
Recreation	3,398	6,131
Fish	160,827	108,693
Augmentation	0	280
Recharge	0	1
Total	2,885,425	2,593,164

Source: Colorado Division of Water Resources, Division 5 Annual Reports

Colorado River Basin Population by County



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)
Granby Reservoir	539,800
Dillon Reservoir	254,036
Green Mountain Reservoir	154,600
Ruedi Reservoir	102,369
Williams Fork Reservoir	90,640
Wolford Mountain Reservoir	66,000
Homestake Reservoir	43,600
Vega Reservoir	33,800
Shadow Mountain Reservoir	18,400
Rifle Gap Reservoir	13,602
Willow Creek Reservoir	10,600
Jenny Creek Reservoir	9,591
Grass Valley Reservoir	5,058
Clinton Reservoir	4,372
Eagle Park Reservoir	3,148

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

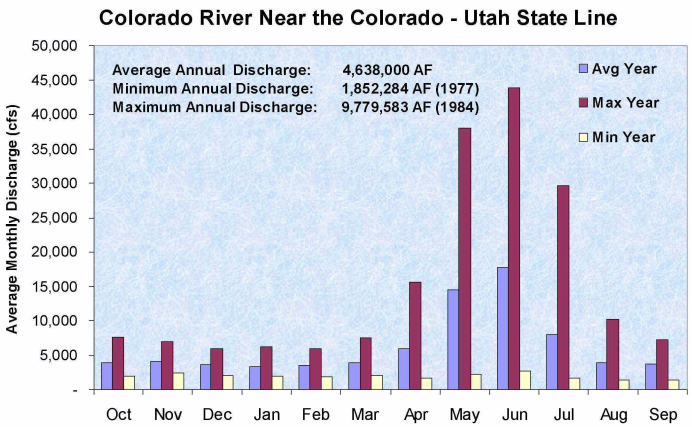
Hydrological Variations

Examples of annual Colorado River flow variation are shown in the following table, and seasonal variations are shown in the annual discharge graph.

Gage	Maximum Recorded Flow (cfs)	Minimum Recorded Flow (cfs)
At State Line	68,300 (1984)	960 (1956)
At Cameo	38,000 (1984)	700 (1940)
At Dotsero	22,200 (1984)	350 (1944)

Source: U.S. Geological Survey Water Data Reports

Annual Discharges



Source: U.S. Geological Survey Water Data Reports

Major Water Rights Calls

What it is: **Cameo Irrigation Call** (Totaling 2,260 cfs with most priorities from 1912-1934. Grand Valley Irrigation Co. priorities of 1882 and 1914.)

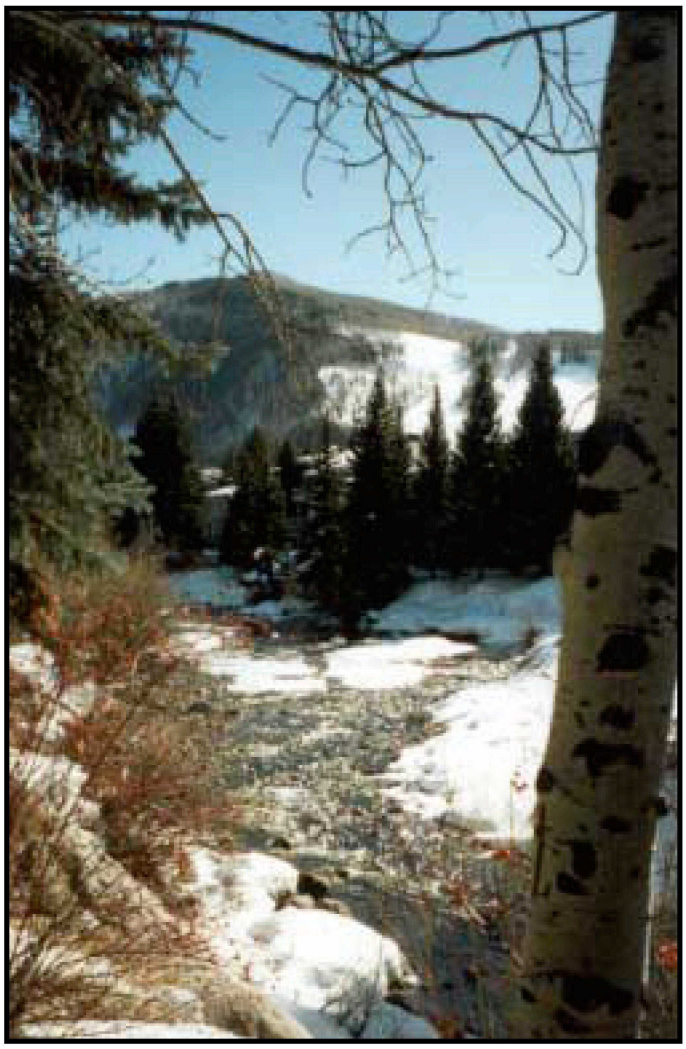
What it does: Provides water mostly for irrigation and power in the Grand Valley near Grand Junction.

When: From as early as April to as late as October in dry years.

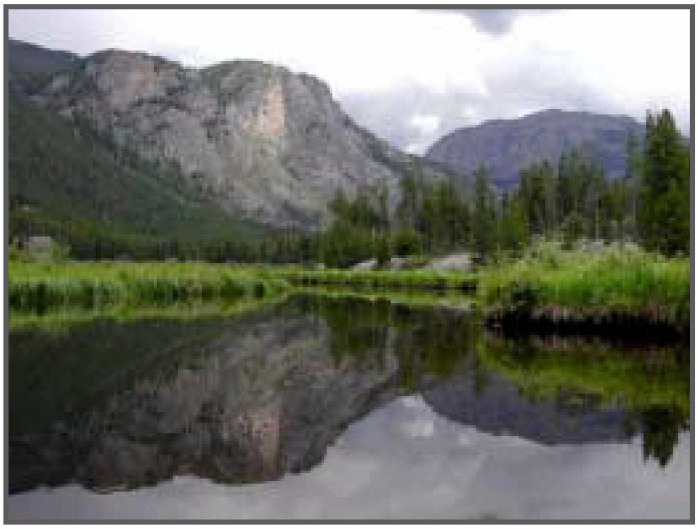
What it is: **Public Service Company's Shoshone Hydropower Call** (1905, 1,250 cfs and 1940, 158 cfs)

What it does: Provides water to the Shoshone Power Plant near Glenwood Springs.

When: Often exercised during the winter, thereby limiting upstream supplies for municipalities, transbasin diversions and snowmaking.



Eagle River (Photo courtesy of Brian Blair)



West Inlet to Grand Lake, Rocky Mountain National Park (Photo courtesy of Fred Wilson)

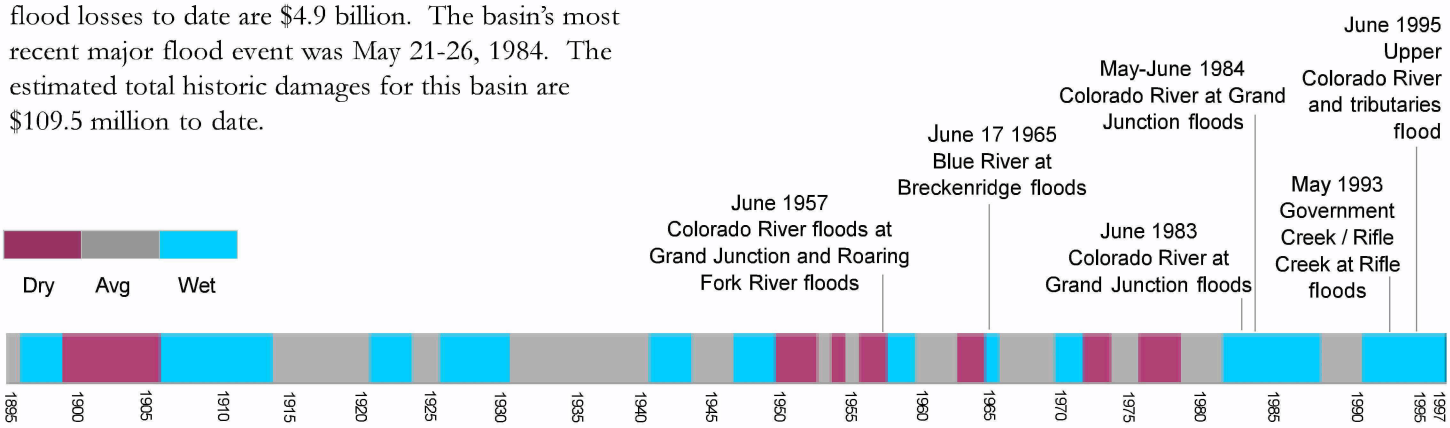
Stream and Lake Protection

There are 374 instream flow segments totaling approximately 1,992 stream miles in the basin. There are also 142 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 is based on the flow or lake level required to maintain the water-dependent natural environment.

Source: Colorado Water Conservation Board

Wet and Dry Periods

Every year, Colorado experiences at least one 100-year flood somewhere in the state. Colorado's total estimated flood losses to date are $4.9 billion. The basin's most recent major flood event was May 21-26, 1984. The estimated total historic damages for this basin are $109.5 million to date.



Source: Colorado Water Conservation Board

Major Imports into the Basin

None

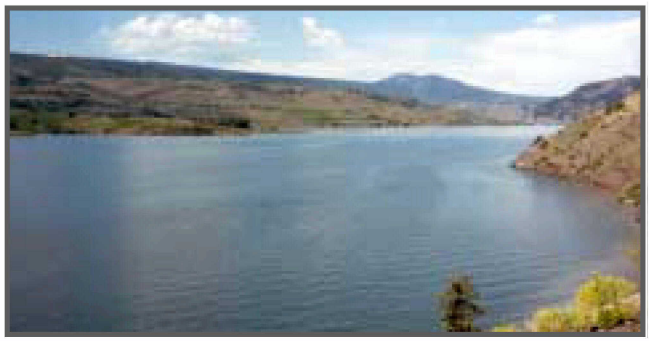
Major Exports from the Basin

	Name	Diversions (acre-feet)
1*	Adams Tunnel	207,488
2	Roberts Tunnel	64,330
3	Boustead Tunnel	60,931
4	Moffat Tunnel	48,994
5	Twin Lakes Tunnel	42,070
6	Homestake Tunnel	26,652
7	Grand River Ditch	18,122
8	Continental Hoosier Tunnel†	9,551
9	Busk-Ivanhoe Tunnel	4,598
10	Wurtz Ditch	2,834

** 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 5 1998 Annual Report, 10-year average



Green Mountain Reservoir (Photo courtesy of Theresa Stone)

Endangered Species

Under the Endangered Species Act, four Colorado River native fish species are listed as endangered: Colorado pikeminnow, humpback chub, bonytail, and razorback sucker. Causes for the decline of these species may include alteration of stream flows by water projects, introduction of non-native species and past efforts to remove the native fish from the Colorado River.

In 1988, the States of Colorado, Utah and Wyoming; water users; hydropower customers; environmental organizations; and federal agencies developed a program to recover these species while allowing water use and development to continue. The Recovery Program for Endangered Fish of the Upper Colorado River Basin is designed to achieve recovery by (1) improving flow conditions by adding water to the river when needed by the fish, (2) improving and developing habitat, (3) reducing non-native fish populations, and (4) developing native fish stocking programs. Implementation of the Recovery Program should allow Colorado to fully develop its entitlement to water under the Compacts.

Compact Facts

Colorado River Compact of 1922

Allocates 7.5 million acre-feet (maf) of consumptive use annually to (1) the Upper Colorado River Basin (those parts of Arizona, Colorado, New Mexico, Utah, and Wyoming above Lee Ferry, Arizona) and (2) the Lower Colorado River Basin (those parts of Arizona, California, Nevada, New Mexico and Utah below Lee Ferry, Arizona). This Compact requires the Upper Colorado River Basin to deliver an average of 75 maf to the Lower Basin during any consecutive 10-year period.

Rio Grande, Colorado and Tijuana Treaty of 1944 between the United States and Mexico

Guarantees delivery of 1.5 maf of Colorado River water per year to Mexico. If there is not adequate surplus water to satisfy the obligation, the Upper and Lower Basins are to equally share the burden of reducing uses to make up any deficiencies.

Upper Colorado River Basin Compact of 1948

Allocates the Upper Basin consumptive use of water as follows:

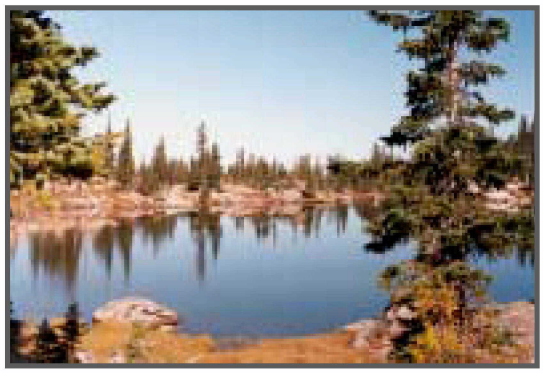
Arizona	50,000 acre-feet/year
Colorado	51.75%
Utah	23%
Wyoming	14%
New Mexico	11.25%

Additionally, the State of Colorado may not deplete the flow in the Yampa River below an aggregate of 5 maf over any 10-year period.

Depending upon the interpretation of the Compacts, other laws, and the amount of water in the river, Colorado's right to the consumptive use of water under the Compacts may range from 3.079 maf to 3.855 maf per year. Colorado currently consumes an average of 2.3 maf per year with facilities in place capable of using up to 2.6 maf. Colorado's apportionment has not been divided among the various sub-basins within the state. The Yampa and La Plata River Basins have specific delivery obligations under the Compacts. The allocation and administration of any surpluses and shortages under the Compacts within Colorado remains open to discussion but ultimately will be subject to determination and administration by the State Engineer.

Unique Characteristics

- Approximately 480,000 acre-feet of transmountain diversions is made to the South Platte and Arkansas River Basins from the Colorado Mainstem on average each year. This far exceeds transmountain diversions from any other area in the state.
- There is less reliance on groundwater in the basin for irrigation, municipal and industrial water supply purposes than in the Rio Grande, Arkansas and South Platte River Basins.
- The presence of four species of endangered fish and the resulting U.S. Fish and Wildlife Service's Recovery Program have significant effects on water resources management and development.
- Salinity issues could affect future development in the basin.



Columbine Lake (Photo courtesy of Sarah Reeves)

Colorado River Mainstem Basin

Since 1971, the CWCB has provided more than $48.4 million in financing for 34 water projects in the basin. Projects receiving over $500,000 are shown on the map as a red triangle ▲.