

# [***SYMPOSIUM: THE ROLE OF CLIMATE IN SHAPING WESTERN WATER INSTITUTIONS***](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:4C46-DK00-00SW-5003-00000-00&context=1516831)

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**Reporter**

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**Highlight**

Ulysses' Tale, Dante, The Inferno

And turning our stern toward morning, our bow toward night,

we bore southwest out of the world of man;

we made wings of our oars for our fool's flight.

… .

Five times since we had dipped our bending oars

beyond the world, the light beneath the moon

had waxed and waned, when dead upon our course

we sighted, dark in space, a peak so tall

I doubted any man had seen the like. [[1]](#footnote-2)1

The Ascent From Hell, Dante, The Inferno

And it may be that moved by that same fear,

the one peak that still rises on this side

fled upward leaving this great cavern here.

Down there, beginning at the further bound

of Beelzebub's dim tomb, there is a space

not known by sight, but only by the sound.

of a little stream descending through the hollow

it has eroded from the massive stone

in its endlessly entwining lazy flow.

My Guide and I crossed over and began

to mount that little known and lightless road

to ascend into the shining world again. [[2]](#footnote-3)2

**Text**

**[\*3]**

A. EXPLORERS

Ulysses - traveling west - spotted a peak so tall no man had seen the like. The poet and his guide climbed out of hell through a hollow that a little stream - discovered only by its sound - had bored, into the lighted upper world.

As westerners, we recognize this immediately: Dante's tales are the story of the Great Western Journey. We feel the joy and awe of Zebulon Pike and Major Stephen H. Long (1806 and 1820) in sighting the Great Divide, rising out of a scorched and blasted desert plain and ascending up a freshet of mountain water. [[3]](#footnote-4)3 Traveling with Long, botanist Edwin James observed:

The images of pools of water, which we saw in the deserts of the Platte, appeared to us similar to those mentioned by Elphinstone, likewise to those observed by Nieburgh in Arabia, where inverted images were seen. [[4]](#footnote-5)4

… .

They ascended a primitive mountain which seemed to be of superior elevation, in order to overlook the western ranges, but they here found their horizon bounded by the succeeding mountain, towering majestically above them. To the east, over the tops of a few inferior elevations, lay expanded, like an ocean, the vast interminable prairie, over which we had so long held our monotonous march. [[5]](#footnote-6)5

Aridity. That's why the vistas shine so. And why the noses of our best western writers twitch so dryly.

B. WRITERS

Drouth - 1824

Hear how the wagons crack

In the copper drouth of the prairie,

The pitch that boils from the seams

Is not yet chilled by the moonrise,

The great wheels groan like slaves,

Under the loads they carry,

The wheels are shrunken and spiked

With wedges to keep them from breaking. [[6]](#footnote-7)6 **[\*4]**

Report on the Lands of the Arid Region of the United States

The Arid Region is … something more than four-tenths of the whole country, excluding Alaska.

… .

… During the fall and winter the streams are small; in late spring and early summer they are very large. A day's flow at flood time is greater than a month's flow at low water time. During the first part of the irrigating season less water is needed, but during that same time the supply is greatest. The chief increase will come from the storage of this excess of water in the early part of the irrigating season.

… .

… All the waters of all the arid lands will eventually be taken from their natural channels, and they can be utilized only to the extent to which they are thus removed, and water rights must of necessity be severed from the natural channels. [[7]](#footnote-8)7

Living Dry, Wallace Stegner's American West

Adaptation is the covenant that all successful organisms sign with the dry country… . Water is safety, home, life, place. All around those precious watered places, forbidding and unlivable, is only space, what one must travel through between places of safety. [[8]](#footnote-9)8

The Southwest

As a result of these three drying agents - sun, wind, and transpiration - all but the highest mountains suffer from what agronomists call "moisture deficiency." In many places this deficiency exceeds twenty inches. This means that no matter how excellent the soil or how free of frost the nights, unless irrigation water equal in amount to twenty or more inches of rain is spread at appropriate intervals on the fields, crops cannot be grown. [[9]](#footnote-10)9

**[\*5]**

***Colorado***, A History of the Centennial State

Periods of abundant rainfall and drought have occurred in regular cycles on the plains. The years from 1865 to 1872 were dry; those from 1873 to 1885 were wet. Droughts then came in cycles of twenty-one years, with the driest years occurring in 1892, 1912, 1934, and 1953. Total rainfall in the bad years dropped 15 to 25 percent below normal, with most of the reduction during the July and August growing seasons. [[10]](#footnote-11)10

The Land of Little Rain

Not the law, but the land sets the limit. Desert is the name it wears upon the maps… . Void of life it never is, however dry the air and villainous the soil. [[11]](#footnote-12)11

Water and the West, The ***Colorado*** ***River*** Compact and the Politics of Water in the American West

No area of the world is more aware of the current water crisis than western America, a vast arid and semiarid region embracing nearly half the continent of North America. Except for a strip along the north Pacific coast and isolated areas in the high mountains, the West is a region of sparse rainfall and few ***rivers***. The implications of these facts of geography have been enormous. From the time of the first settlers to the present, few westerners have failed to comprehend that control of the West's water means control of the West itself - its industry; agriculture; population distribution; and, withal, the direction of the future. [[12]](#footnote-13)12

We have learned from the relatively new science of paleohydrology not to be so arrogant or dismissive about the origins and reasons for mid-nineteenth century western water development. Native Americans, followed by Hispanic Americans, were working the waters of the Americas long before the Oregon Trail, from the ocean-like prairie to the waves of mountains blue to the western shores, opened for the Overlanders a way west.

**[\*6]**

C. NATIVE AMERICAN WATER USES

1. Puebloans of Mesa Verde

William H. Jackson, photographer and artist, accompanied the mapmakers. [[13]](#footnote-14)13 As a member of Ferdinand V. Hayden's Survey of ***Colorado*** in 1874-75, Jackson described the Pueblo ruins of the Puebloans (Anasazi) in the Mesa Verde region. [[14]](#footnote-15)14 High up on the side of a southeast-facing cliff, he spotted ruins of ancient homes up a series of weathered steps perched - almost impossibly - on sheer vertical space ledges. [[15]](#footnote-16)15 Opposite one of the rooms was "a large reservoir, or cistern, the upper walls of which came nearly to the top of the window." [[16]](#footnote-17)16

In 1893, the archaeologist G. Nordenskiold found what he called "conclusive evidence that the cliff-dwellers had to contend with the same dry climate and the same scarcity of water as now obtain in these regions." [[17]](#footnote-18)17 He described an ancient reservoir - enclosed by a circular wall, with a ditch running into it - that he found on Chapin Mesa. [[18]](#footnote-19)18 Nearby were the ruins of a considerable village. [[19]](#footnote-20)19 Referring to the ruins of ancient irrigation works found in northern Arizona, Nordenskiold conjectured, "It is not at all improbable that irrigation by artificial means was in use even among the prehistoric inhabitants of the Mesa Verde." [[20]](#footnote-21)20

In 1985, reporting on the University of ***Colorado***'s survey of Mesa Verde National Park, which took place between 1971 and 1977, archeologist Jack E. Smith reported the existence of two possible ancient reservoirs. The first is known as Mummy Lake (Far View Reservoir, probably the reservoir Nordenskiold had described) and is located on Chapin Mesa, the second is in Morefield Canyon. [[21]](#footnote-22)21

Recent survey, engineering, and archeological work by teams of the Wright Paleohydrological Institute - in cooperation with the National Park Service and the ***Colorado*** Historical Society - has confirmed the existence of four ancient Mesa Verde reservoirs. [[22]](#footnote-23)22 **[\*7]** Examination of sedimentation samples, soil and pollen testing, and broken pottery and other cultural artifacts, have produced estimates of the operational life of these reservoirs:

. Morefield Reservoir in Morefield Canyon (AD 750-1100)

. Far View Reservoir (also known as Mummy Lake) on Chapin Mesa (AD 950-1180)

. Sagebrush Reservoir on an unnamed mesa west of Chapin Mesa (AD 950-1100)

. Box Elder Reservoir in Prater Canyon (AD 800-950). [[23]](#footnote-24)23

Ken and Ruth Wright, with the help of Jack Smith and others from the Wright Paleohydrological Institute, conducted field investigations of the Morefield Reservoir in October 1995, May 1996, and May 1997, excavating an exploratory trench with a permit from the Park Service. [[24]](#footnote-25)24 The Morefield reservoir mound is 220 feet in diameter, rises 16 feet above the valley floor, is 21 feet deep, and has a long berm-looking structure extending north from the reservoir up the valley floor to intercept the intermittent stream channel. [[25]](#footnote-26)25

The entire structure looks like an inverted frying pan. [[26]](#footnote-27)26 Sediment samples showed that clay and sand were carried into the reservoir from the stream channel; the clay helped to seal the reservoir from leaking. [[27]](#footnote-28)27 The Puebloans mucked out the sediment as best they could, throwing the material onto a growing embankment. [[28]](#footnote-29)28 The mound rose over the centuries from sedimentation. What probably began as a hole dug into the channel to intercept shallow groundwater became an off-channel reservoir as the intermittent stream routed itself around a rising embankment. [[29]](#footnote-30)29

Potsherds in the Morefield Reservoir trench were evidence that the people dipped water out of the reservoir and carried it away in water jars. [[30]](#footnote-31)30 They used deer antlers, sticks, and baskets to muck out the **[\*8]** reservoir. [[31]](#footnote-32)31

The Puebloans used a feeder ditch or canal to divert water into the reservoir. [[32]](#footnote-33)32 There are numerous large stones - the size of a large cowboy hat, and larger - lying at the surface of the dike that extends from the reservoir north. [[33]](#footnote-34)33 The rocks are aligned and clearly appear to have been placed there, not washed in. This is evidence of the ditch or canal structure cutting northward to intercept the stream channel, 1400 feet of it! [[34]](#footnote-35)34

Apparently, the Puebloans used the four reservoirs for a drinking water supply. At Mesa Verde, they were dry land farmers, growing corn and storing it in nearby granaries they built of rock. [[35]](#footnote-36)35 They knew of droughts; in fact, they tried to keep up to two years of corn in storage. [[36]](#footnote-37)36

There's a great kiva near the Morefield Reservoir. [[37]](#footnote-38)37 House ruins in the vicinity show a population of nearly 500 people. [[38]](#footnote-39)38 They must have been proud of their reservoir, and very worried that it took so much work to muck out the reservoir and lengthen the canal. As the berm grew, they had to shift their diversion point again and again to intercept the shifting stream channel. [[39]](#footnote-40)39 They must have prayed for the rain to come and the water to enter the canal without washing it out.

The Wright Final Report on the Morefield Reservoir Investigation has a chart of tree ring data that show an annual average precipitation of eighteen inches per year from AD 800 to AD 1100 - not much different from today in the Mesa Verde region, but there were good wet years and recurring droughts. [[40]](#footnote-41)40 The Anasazi farmers, like today's, remained perched between a sudden flood and enduring scarcity.

PUEBLO PEOPLE OF MESA VERDE

You want to know where water's precious,

Where every scoop of dirt's a prayer of life;

And tomorrow's blessing - carried in a pot

**[\*9]** Of clay is a source of wonder up a slope

A thousand years away - perch upon

A buried kiva's rim and take within the

Arcing southeast sun this light they saw -

You see - and may you keep this light

Within and speak it openly;

They worked and loved, like we, this

Land, this calling, this Mesa Verde. [[41]](#footnote-42)41 The Wrights credit the ancestral Puebloans with having good organizational capabilities and considerable skill in building and maintaining large public works with rudimentary tools in a harsh climate:

Long before Columbus sailed for America, the ancestral Puebloans, people that we refer to as the Anasazi, were thriving at Mesa Verde, even though the winters were harsh and water supplies were limited. They had no written language; they did not have bronze, iron, or steel; and they did not use the wheel. As a result, our American history books tend to underrate them in terms of technical capabilities and social organization. However, the Anasazi had rudimentary knowledge of hydrological phenomena, water transport, and storage. To build reservoirs, they also had good organizational capabilities; otherwise, their large public works efforts requiring major and continuous operation and maintenance work would not have been possible. They were able to plan, build, and operate reservoir projects in southwestern ***Colorado*** more than one thousand years ago. The evidence that they left behind has provided ample proof of their civil engineering achievements that spanned hundreds of years. [[42]](#footnote-43)42

The four Mesa Verde reservoirs captured water only during storm events from runoff in the canyons and on top of the mesas. [[43]](#footnote-44)43 The two mesa-top reservoirs lacked natural drainage basins. [[44]](#footnote-45)44 Nevertheless, well-traveled paths, the environs of pueblos, and upslope agricultural fields created runoffs from even small rainfalls. [[45]](#footnote-46)45

**[\*10]** Extended droughts periodically occurred. [[46]](#footnote-47)46 One of these in the 800s, resulted in depopulation for a time, [[47]](#footnote-48)47 although the so called "Great Drought of 1276-1299" in the region may have been the reason why the Pueblo people abandoned Mesa Verde by 1300. [[48]](#footnote-49)48 Why they left is still a mystery the archeologists have not solved. Perhaps, the combined factors of a shortage of wood for construction and fuel, depletion of soil nutrients, and the rise of the Pueblo culture in New Mexico and Arizona attracted them to move to the "big city" to join others already there! [[49]](#footnote-50)49 For example, groups may have moved to the Hopi villages on their mesas and the Rio Grande Pueblos. [[50]](#footnote-51)50

2. The Hopi

Lieutenant Joseph C. Ives of the United States Corps of Topographical Engineers encountered the Hopi (called Moqui then) in 1857 during the expedition when he wrecked the steamboat - emblazoned "Explorer" on its wheel house - at Black Rocks, where Boulder Canyon Dam now stands. [[51]](#footnote-52)51 Proceeding on foot and mule overland, he arrived at the South Rim of the Grand Canyon. [[52]](#footnote-53)52 Acrophobic at seeing that astounding chasm, Ives uttered one of history's most ironic false prophecies:

The region last explored is, of course, altogether valueless. It can be approached only from the south, and after entering it there is nothing to do but to leave. Ours has been the first, and will doubtless **[\*11]** be the last, party of whites to visit this profitless locality. It seems intended by nature that the ***Colorado*** ***River***, along the greater portion of its lonely and majestic way, shall be forever unvisited and undisturbed. [[53]](#footnote-54)53

Following the drainage of the Little ***Colorado*** ***River***, Ives found the Hopis on their mesas. [[54]](#footnote-55)54 He described how at several of the villages - by a system of upper and lower reservoirs, intake ditches, and irrigation ditches - the Hopi stored, conveyed, and used drinking, irrigation, and stock water:

The face of the bluff, upon the summit of which the town was perched, was cut up and irregular. We were led through a passage that wound along some low hillocks of sand and rock that extended half-way to the top. Large flocks of sheep were passed; all but one or two were jet black, presenting, when together, a singular appearance. It did not seem possible, while ascending through the sand-hills, that a spring could be found in such a dry looking place, but presently a crowd was seen collected upon a mound before a small plateau, in the centre of which was a circular reservoir, fifty feet in diameter, lined with masonry, and filled with pure cold water. The basin was fed from a pipe connecting with some source of supply upon the summit of the mesa. The Moquis looked amiably on while the mules were quenching their thirst, and then my guide informed me that he would conduct us to a grazing camp. Continuing to ascend we came to another reservoir, smaller but of more elaborate construction and finish. From this, the guide said, they got their drinking water, the other reservoir being intended for animals. Between the two the face of the bluff had been ingeniously converted into terraces. These were faced with neat masonry, and contained gardens, each surrounded with a raised edge so as to retain water upon the surface. Pipes from the reservoirs permitted them at any time to be irrigated.

Peach trees were growing upon the terraces and in the hollows below. A long flight of stone steps, with sharp turns that could easily be defended, was built into the face of the precipice, and led from the upper reservoir to the foot of the town. [[55]](#footnote-56)55

Ives, an engineer, admired the engineering skill of the Hopi:

The whole reflected great credit upon the Moquis' ingenuity and skill in the department of engineering. The walls of the terraces and reservoirs were of partially dressed stone, well and strongly built, and the irrigating pipes conveniently arranged. The little gardens were neatly laid out. [[56]](#footnote-57)56

**[\*12]** Ives depended on Native American guides to lead him to other water holes as he trekked back out of what appeared to him as an appalling, exotic, bone-dry, except-for-a-few human-created-garden-spots landscape. [[57]](#footnote-58)57

3. Early Spanish Explorer Reports

The Spanish explorer Francisco Vasquez de Coronado - looking for mineral treasure his culture coveted - reported that the Native Americans of the Southwest worshipped water: "So far as I can find out, the water is what these Indians worship, because they say that it makes the corn grow and sustains their life, and that the only reason they know is because their ancestors did so." [[58]](#footnote-59)58 The Maya practiced water religion by means of the "most elaborate New World water cult," and like many Native Americans, particularly in the desert southwest, "because of its cardinal role in the daily struggle for survival [water] was also afforded a telling reverence in southwestern religion, mythology, and lore." [[59]](#footnote-60)59

In 1697, Padre Kino and ***co***-explorer, Captain Juan Mateo Manje, reported seeing ruins of waterworks built by the Hohokam in the Arizona Salt and Gila ***River*** drainages. [[60]](#footnote-61)60 Archaeological investigations in the nineteenth and twentieth centuries revealed an estimated total of 135 to 150 miles of canals in the Salt ***River*** Valley alone by A.D. 800. [[61]](#footnote-62)61 Some of the irrigation works may have existed as early as 300 B.C. [[62]](#footnote-63)62

Complicated water systems flourished among Mexico's high aboriginal cultures:

In Yucatan, Oaxaca, and the Central Valley of Mexico complicated water systems flourished. Sophisticated irrigation agriculture allowed the food surplus which, in turn, made the development of urban civilization possible. Throughout the constellation of civilizations in central and southern Mexico one could find diversion and check dams, dikes, canals, sluices, aqueducts, deep wells, reservoirs, tanks, and irrigation ditches with technologically advanced headgates and lateral channels. [[63]](#footnote-64)63

**[\*13]**

D. HISPANIC WATER USES

For nine years, from 1831-1840, Josiah Gregg crossed and re-crossed the plains by means of the Santa Fe Trail. [[64]](#footnote-65)64 In Commerce of the Prairies he describes the acequia system by which the Hispanic settlers irrigated long, narrow parcels abutting the stream from a mother ditch feeding smaller laterals to five or six-acre fields. [[65]](#footnote-66)65 Operation and maintenance of the acequias was a common enterprise for the benefit of the community. Three hundred or more acequias were operating in New Mexico by the 1800s. [[66]](#footnote-67)66

The Siete partidas (1265), Politica indiana (1647), Recopilacion (1681), and Novisima recopilacion (1805), and specific ordinances and royal decrees were a basic source of Spanish and Colonial law, including the law of water use. [[67]](#footnote-68)67 The Plan de Pitic (1783) set forth a mechanism for the assignment of land and irrigation water rights. [[68]](#footnote-69)68 A special commissioner in the locality was to divide the water "in such a way that all the land subject to irrigation (that portion previously designated as subject to irrigation) would receive its benefits, especially during the spring and summer, the season most crucial to a successful harvest." [[69]](#footnote-70)69

The construction of an irrigation system for the new communities began even before the houses, public buildings, and churches were finished. [[70]](#footnote-71)70 "It was crucial to have the ditches in place before the first sowing." [[71]](#footnote-72)71 The water official (alcalde) assigned and supervised the irrigation schedule of each farmer. [[72]](#footnote-73)72

Beneficial use and priority of use, along with cooperation in community, were important principles in the New Mexico water system, which derived from Moorish and Spanish laws and customs. Settlers were to respect the amount of water the Native Americans had long used for drinking water and irrigation. [[73]](#footnote-74)73 However, conflicts between neighboring landowners, and between Native Americans and the Hispanic settlers, inevitably occurred because land with a reliable and permanent water source was scarce. [[74]](#footnote-75)74

The New Mexico acequia tradition influenced ***Colorado*** in two direct ways. First, the oldest continuous water right in existence today is for the 1852 San Luis People's Ditch diverting from Culebra Creek. [[75]](#footnote-76)75 **[\*14]** It was built to irrigate the fields of Hispanic settlers on the Sangre de Cristo Grant, an 1844 Mexican land grant. [[76]](#footnote-77)76

[*Second*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T352-D6RV-H379-00000-00&context=1516831), when Benjamin Eaton - later, a ***Colorado*** governor - became disillusioned with gold mining as one of the ***Colorado*** 1859ers, he learned to work acequia water on the Maxwell Land Grant outside of Cimarron, New Mexico. [[77]](#footnote-78)77 Returning to homestead in ***Colorado*** Territory in 1864, he dug his own irrigation ditch and helped to construct the Union Colony No. 2 Canal in the early 1870s and, later, both the Larimer and Weld Canal in northern ***Colorado*** and the High Line Canal in the Denver basin. [[78]](#footnote-79)78 As a member of the territorial legislature, constitutional convention, and state legislature, he worked to shape the prior appropriation provisions of the ***Colorado*** Constitution and early statehood water statutes, including the Adjudication Acts of 1879 and 1881. [[79]](#footnote-80)79

E. CLIMATE AND THE WATER LAWS

1. The Western Movement

The western movement was more than seeking the material goal of working lush farmlands in Oregon, like Ulysses venturing west: "It was Manifest Destiny made visible in wheel tracks. It was, as Thoreau recognized, a culmination of Occidental man's age-old instinct to follow the setting sun to the blessed isles, to the gardens of the Hesperides." [[80]](#footnote-81)80 But the emigrants into the West had to go through the arid lands to get there. U.S. Army Captain Randolph Marcy's 1859 guide to the Overland Trail warns of "long stretches where grass and water are scarce." [[81]](#footnote-82)81

Walter Prescott Webb observed that settlers coming into contact with strange and new conditions can become innovators. Sometimes, their way of coping is a radical break from the past:

In the development of institutions there is always a conflict between custom and necessity. Through custom people cling to old traditions and try to perpetuate them by adapting them to new conditions, but necessity argues the case on its merit without much regard for precedent. Out of the conflict comes a compromise in which the old is modified and adapted. Since the frontier was ever in contact with strange and new conditions, the frontiersman became an innovator **[\*15]** and therefore sometimes a radical. [[82]](#footnote-83)82

Sharp departure from prior customs may result in new laws that institutionalize the change. This happened in the American West, because of climate. ***Colorado***'s experience is an excellent example.

2. Droughts Give Rise to Prior Appropriation Law

The years from 1865 to 1872 were dry. [[83]](#footnote-84)83 In 1872, the ***Colorado*** Territorial Supreme Court issued its first water decision, Yunker v. Nichols. [[84]](#footnote-85)84 The reality of settling into the arid lands, long known to the Native and Hispanic Americans by hard experience - that water is a scarce and precious community resource needed to grow crops - produced a radical break from the pre-existing English and American common law, which the Territorial Supreme Court encapsulated as the ruling principle of ***Colorado*** water law:

Rules respecting the tenure of property must yield to the physical laws of nature, whenever such laws exert a controlling influence. In a dry and thirsty land it is necessary to divert the waters of streams from their natural channels, in order to obtain the fruits of the soil, and this necessity is so universal and imperious that it claims recognition of the law. [[85]](#footnote-86)85

The law of water scarcity and need - so the court declared - imposed a servitude across private and public lands for the building of ditches to divert and carry water to its place of beneficial use for irrigation, wherever that might be. [[86]](#footnote-87)86 The pre-existing English and American common law assigned the right to use the waters of the stream only to those who held land adjoining the stream, limited the amount to de minimus consumption, and required the landowner's consent for any crossing of property or the construction of facilities on the lands of another. [[87]](#footnote-88)87 Yunker v. Nichols abrogated all three of these pre-existing property right formulations in favor of public water ownership and the establishment of use rights therein by private individuals and public agencies. [[88]](#footnote-89)88

Although the court based its decision in part on a statute of the **[\*16]** first territorial legislature in 1861, [[89]](#footnote-90)89 it baldly proclaimed that the necessity of water use in the arid climes prevented the legislature from repealing the fundamental right of the people to access and use the scarce public water supply:

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831) conceive that, with us, the right of every proprietor to have a way over the lands intervening between his possessions and the neighboring stream for the passage of water for the irrigation of so much of his land as may be actually cultivated, is well sustained by force of the necessity arising from local peculiarities of climate … .

It seems to me, therefore, that the right springs out of the necessity, and existed before the statute was enacted, and would still survive though the statute were repealed.

If we say that the statute confers the right, then the statute may take it away, which cannot be admitted. [[90]](#footnote-91)90

The 1876 ***Colorado*** Constitution ratified the principles of Yunker v. Nichols, establishing prior appropriation for beneficial use as the governing precept for the waters of the natural stream, and providing for a right of private condemnation across the lands of another to build the necessary water works for beneficial use. [[91]](#footnote-92)91 In 2002, the ***Colorado*** Supreme Court, citing the court's 1872 decision, reiterated the ***Colorado*** Doctrine as follows:

Advancing the national agenda of settling the public domain required abandonment of the pre-existing common-law rules of property ownership in regard to water and water use rights. Reducing the public land and water to possession and ownership was a preoccupation of territorial and state law from the outset. A new law of custom and usage in regard to water use rights and land ownership rights, the "***Colorado*** Doctrine," arose from "imperative necessity" in the western region. This new doctrine established that: (1) water is a public resource, dedicated to the beneficial use of public agencies and private persons wherever they might make beneficial use of the water under use rights established as prescribed by law; (2) the right of water use includes the right to cross the lands of others to place water into, occupy and convey water through, and withdraw water from the natural water bearing formations within the state in the exercise of a water use right; and (3) the natural water bearing formations may be used for the transport and retention of appropriated water. This new common law established a property-rights-based allocation and administration system which promotes multiple use of a finite resource for beneficial purposes. [[92]](#footnote-93)92

**[\*17]** The water provisions of ***Colorado***'s 1876 constitution and Adjudication Act of 1879 directly resulted from upstream/downstream junior/senior disputes over water scarcity. [[93]](#footnote-94)93 The 1870 Union Colony - downstream, near the confluence of the Cache la Poudre and South Platte ***Rivers*** - built and began to operate their irrigation canals, only to find in 1874 that diversions by a new, upstream ditch near old Fort Collins had reduced the Cache la Poudre's flow to a trickle. [[94]](#footnote-95)94 Clearly, the priority system and its enforcement - prior reliance on turning the water to beneficial use and protecting that use - had to be institutionalized within the three branches of ***Colorado*** government for the benefit of the citizens. Therefore, the ***Colorado*** General Assembly assigned the state's judiciary to decree water rights priorities, and the state and division engineers and water commissioners to enforce them. [[95]](#footnote-96)95

The pitch of water scarcity resounds repeatedly along the channel of the water law.

1882, Coffin v. Left Hand Ditch:

The climate is dry, and the soil, when moistened only by the usual rainfall, is arid and unproductive; except in a few favored sections, artificial irrigation for agriculture is an absolute necessity… .

… .

We conclude, then, that the common law doctrine giving the riparian owner a right to the flow of water in its natural channel upon and over his lands, even though he makes no beneficial use thereof, is inapplicable to ***Colorado***. Imperative necessity, unknown to the countries which gave it birth, compels the recognition of another doctrine in conflict therewith. [[96]](#footnote-97)96

1938, People v. Letford:

It is a matter of common knowledge that, due to climatic conditions, except in a few limited areas, agricultural crops cannot be produced in ***Colorado*** except by irrigation of the land. Also it was early evident, and still is obvious, that the economic and industrial development of an arid state is directly dependent on its water supply. [[97]](#footnote-98)97

**[\*18]**

1986, County Commissioners v. Denver Water:

The effects of drought on water supply in ***Colorado*** are well known. The impact of drought on municipalities has resulted in lawn watering restrictions, moratoriums on service, and other restrictions on use to conserve water. A drought in the 1950s was so severe that the Board restricted use by temporarily creating a "Blue Line" beyond which water service would not be extended, and within which service was not assured.

As a result of the drought crisis of 1976 and 1977, the Board adopted water restrictions and a Tap Allocation Program which established procedures and criteria to allocate new taps among the various entities under contract outside Denver which are served by the Board's water system. [[98]](#footnote-99)98

3. The Role of Adjudication and Administration

Prior appropriation is a doctrine of scarcity that curtails undecreed water uses and decreed surface and tributary groundwater junior water uses, in accordance with decreed priority, when there is insufficient water available to supply all uses. [[99]](#footnote-100)99 Adjudication of water rights priorities, and engineering studies of diversions and uses in wet, average, and dry times, allow water planners and suppliers to determine whether present and future water demands can be met, and what water rights have a supply dependable enough to support new uses by acquisition and change of those senior water rights to the new uses through water market transactions. [[100]](#footnote-101)100 Augmentation and substitute supply plans may operate to allow out-of-priority uses to continue if adequate replacement water is made available to the otherwise injured water rights. [[101]](#footnote-102)101

F. A WATER LAW AND INSTITUTIONAL BRIDGE - JOHN WESLEY POWELL

In his 1879 Arid Lands Report to Congress, John Wesley Powell identified principles of climate, necessity, law, and use remarkably similar to those the ***Colorado*** Supreme Court had announced in 1872:

The ancient principles of common law applying to the use of natural streams, so wise and equitable in a humid region, would, if applied to the Arid Region, practically prohibit the growth of its most important industries.

**[\*19]**

… .

If there be any doubt of the ultimate legality of the practices of the people in the arid country relating to water and land rights, all such doubts should be speedily quieted through the enactment of appropriate laws by the national legislature. Perhaps an amplification by the courts of what has been designated as the natural right to the use of water may be made to cover the practices now obtaining; but it hardly seems wise to imperil interests so great by intrusting them to the possibility of some future court made law. [[102]](#footnote-103)102

1. Visions of Agrarian Democracy

Powell emphasized that priority of utilization, based on seniority of rights, should apply in times of short supply based on the "necessities of the country." [[103]](#footnote-104)103 He would limit the water anyone could appropriate to water actually used; his caveat was that water ought to be tied to the land permanently, a position he reasserted when serving as a member of the Public Lands Commission. [[104]](#footnote-105)104 Like Jefferson before him, he foresaw the West's future in terms of an enduring agrarian democracy. Instead, today's West is a rapidly urbanizing, multi-faceted democracy, but Powell had a major hand in the rise of western irrigated agriculture and the institutions that grew up around it. Western agriculture - beyond Powell's vision - has supported the rise of western urbanization and a water law that provides stability, reliability, and flexibility in the identification, protection, and change of water use rights. [[105]](#footnote-106)105

Like the Native Americans, who animated his ethnology work, [[106]](#footnote-107)106 Powell saw the hand of the Great Spirit in the blessing and the working of water. He revered both the desert and the garden that is the American West. Son of a Methodist minister, his scientifically poetical writing invokes the redeeming power of the water drop: "It may be anticipated that all the lands redeemed by irrigation in the Arid Region will be highly cultivated and abundantly productive, and agriculture will be but slightly subject to the vicissitudes of scant and excessive rainfall." [[107]](#footnote-108)107 Climate, flood and drought, the power of divinely-inspired human labor teamed with natural cosmic forces to **[\*20]** make a settling place through science, engineering, law, individual and community enterprise, and enlightened public policy - Powell harnessed Stephen Long's desert view and William Gilpin's garden view [[108]](#footnote-109)108 into a vision of government in service to the cause of western settlement.

2. The Public Interest

Powell saw the necessity of invoking the power of the national government to aid the farmer; otherwise, corporate monopolies - not animated by the public interest - would control the scarce water resource. His vision started with cooperative efforts, like those of the Mormons in Utah and the Union Colony in ***Colorado***, to construct ditches from the streams to the land. [[109]](#footnote-110)109 Inevitably, however, the settlers could not - within the limits of their own labor and finances - construct the reservoirs that would be needed to compensate for nature's yearly watershed rhythm of a flood of water off the mountains from spring snowmelt, then a drought when the heat of mid-summer requires crop water but the streams ebb low. [[110]](#footnote-111)110

Powell became a law and institution builder, serving as director of the U.S. Geological Survey after the short tenure of fellow western surveyor Clarence King. [[111]](#footnote-112)111 He advocated the organization of irrigation and land use districts, and supported laws that would institutionalize the ability of western settlers to survive and enjoy living on the land. [[112]](#footnote-113)112

A series of alternate droughts and flash floods during the late 1880s and early 1890s brought [western farmers to] the belated realization that they could not maintain their farms unless they stabilized their water supplies by building larger reservoirs and stronger dams and canals than those they had attained so far through private effort. [[113]](#footnote-114)113

With congressional funding, the U.S. Geological Survey produced a survey of potential reservoir sites and a short-lived piece of Powell-proposed legislation to withdraw reservoir sites from settlement under the Homestead laws, [[114]](#footnote-115)114 so they would be available for use as needed in **[\*21]** the future. [[115]](#footnote-116)115

Powell envisioned segmenting major ***rivers*** into a series of "natural districts" or "hydrographic basins" for the resolution of land and water problems; each district would own the water within its boundaries, and each landowner in the district would share in the water and water decision making. [[116]](#footnote-117)116 Although his land reservation proposals caused a congressional furor and repeal of the reservoir site reservations, his vision of local water districts in charge of water rights and decision making - aided by national legislative and administrative policy - has been followed throughout the West, at least in part, through local district sponsorship and operation of reclamation projects.

G. CLIMATE AND WATER INSTITUTIONS

Water scarcity sparked Powell's proposals, as they mark the current western institutional landscape. Drought events of four years or more occurred in large regions of ***Colorado*** and the West during the years 1899-1902, 1933-1937, and 1952-1956. [[117]](#footnote-118)117 Each of these climatologically-caused episodes corresponded to the enactment of major laws creating significant water institutions.

In 1902, Congress enacted the Reclamation Act, creating the U.S. Bureau of Reclamation. [[118]](#footnote-119)118 Also in 1902, Kansas sued ***Colorado***, commencing the era of interstate water allocation through United States Supreme Court equitable apportionment decrees and interstate water compacts. [[119]](#footnote-120)119

In 1937, the ***Colorado*** General Assembly created the ***Colorado*** Water Conservation Board, [[120]](#footnote-121)120 the ***Colorado*** ***River*** Water Conservation District, [[121]](#footnote-122)121 and the Water Conservancy Act, [[122]](#footnote-123)122 under which the Northern ***Colorado*** Water Conservancy District became the first of the fifty-one water conservancy districts existing in ***Colorado*** today. [[123]](#footnote-124)123

In 1956, Congress enacted the ***Colorado*** ***River*** Storage Project Act, [[124]](#footnote-125)124 putting into place a network of ***Colorado*** ***River*** reservoirs structured to support the operation of the 1922 ***Colorado*** ***River*** Compact. [[125]](#footnote-126)125 The 1956 Act was inevitable - the years 1905 to 1929 were the longest recorded wet cycle [[126]](#footnote-127)126 - and resulted in a significant overestimation of ***Colorado*** ***River*** water available for allocation to the **[\*22]** Upper and Lower Basin ***Colorado*** ***River*** states. [[127]](#footnote-128)127 The guarantee of a 75 million acre-foot per ten-year period running average to the Lower Basin left the Upper Basin states in dire need of a large storage system that could withstand at least a severe four-year drought. [[128]](#footnote-129)128

In turn, reaction to the implementation of the 1956 Act - through the construction of Glen Canyon, Flaming Gorge, Blue Mesa, and Navajo dams - helped to counter-produce the 1964 Wilderness Act, [[129]](#footnote-130)129 as proposed dams at Echo Park and Marble Canyon dramatized the environmental call for creation of a national wilderness preservation system.

H. RECLAMATION

Harking to Powell's view of water scarcity and the need for redistribution of the natural hydrograph through reservoirs, the progressive era produced a marriage of the national forest preservation system with the reclamation program of irrigation development.

1. Hearings on the Reclamation Act

The 1901 congressional hearings on the Newlands and Shafroth bills [[130]](#footnote-131)130 sounded loudly with the principle that forest watersheds must be protected in aid of western water development and use. Congressman Newlands of Nevada emphasized that the capacity of locally built direct flow ditches, to provide a stable irrigation supply, had reached its limit, and the existing settlers were in need of water storage they could not finance on their own:

On all those streams lands have been taken up and reclaimed, but the limit of reclamation under the present system has been reached. These ***rivers*** discharge immense quantities of water during the early spring and summer months, but become attenuated threads during July, August, and September. The only method of further development of irrigation is by water storage. [[131]](#footnote-132)131

… .

**[\*23]**

The snows on the mountains are in a certain sense storage reservoirs for the water. The snows fall in immense quantities and great banks form in the ravines and the valleys, and as long as they are protected by the trees, the melting is not as rapid in the spring and summer months as it otherwise would be. When these trees are cut down the snow is exposed to the fierce rays of the sun, it melts rapidly, and the water rushes down in the early spring months. The destruction of the forests has limited and cramped many of the existing irrigation systems of the arid regions. Settlements which in former years never suffered from drought are now suffering, not because there is not the same quantity of water in the streams, but because it comes at a time when it is not needed, on account of the melting of the snow hastened by the cutting down of the forests. [[132]](#footnote-133)132

Congressman Newlands invoked Powell's earlier admonition that private corporations could not be trusted to act in the public interest:

Private capital will not undertake to build storage works unless there is a speculative profit. Investors wish to get a large area of land out of which they may make this profit by leading irrigation ditches over it, and the general tendency of such a course is to create land monopolies. The object of the people of the United States is to prevent land monopolies and promote settlement. [[133]](#footnote-134)133

Pointing to the over-appropriation of the South Platte by the direct flow ditches, Congressman Shafroth of ***Colorado*** urged federal funding of reservoirs to allow irrigation of newly developed lands and to stabilize the water supply of existing farmers:

Now, the Platte ***River*** in ***Colorado*** has been appropriated eight times over, and on account of the increase of the population the claims on the waters of the Platte ***River*** have increased to eight times beyond what it is possible for the ***river*** with its ordinary flow to supply, and there is not a drop of water for any new lands… . If you construct reservoirs and put them in direct connection with the reclamation of Government lands and designate that the water is to be utilized in that connection, the water turned into the stream from the reservoir can be taken out at a lower point and taken to the land the Government owns. [[134]](#footnote-135)134

Shafroth emphasized that the "laws of the irrigation States" recognized conservation of water for the improvement of lands. [[135]](#footnote-136)135

2. Forest and Water Conservation

The great American forester Gifford Pinchot also testified at these hearings that the forest reserves would support, not impede, present and future water uses: "The successful development of those lands, the **[\*24]** continuance of their prosperity, and the extension of this irrigation system over the West depends absolutely on the preservation of these forests." [[136]](#footnote-137)136

***Colorado*** was central to the public debate surrounding the creation of the national forests. ***Colorado*** Senator Henry Teller, who also served for a time as United States secretary of interior, contended for the conveyance of the public lands to state and local interests and fought against federal forest reserves. [[137]](#footnote-138)137 President Teddy Roosevelt campaigned on the ground in ***Colorado*** for the forest reservations, arguing that withdrawal from homesteading and conservation of the forested watersheds was necessary for the development and use of water for farms and cities. [[138]](#footnote-139)138 Fourteen million acres of forest reserve exist in ***Colorado*** today. [[139]](#footnote-140)139 Roosevelt convinced many Coloradans, despite Teller's adamant states' rights advocacy. [[140]](#footnote-141)140 Key to the compromise [[141]](#footnote-142)141 were provisions in the 1897 Forest Organic Act [[142]](#footnote-143)142 adhering to state water law and allowing rights-of-way for irrigation canals, ditches, flumes, and reservoirs. [[143]](#footnote-144)143

The 1902 Reclamation Act [[144]](#footnote-145)144 wedded the national government's role in water conservation to forest conservation. As a result of this progressive conservation marriage, the Bureau of Reclamation ("Bureau") has celebrated its one-hundred year anniversary. It has created more than six hundred dams and reservoirs, and it distributes water to more than 31 million urban and rural residents in the West, including one-fifth of the region's irrigation farmers on land that produces 60 percent of the nation's vegetables. [[145]](#footnote-146)145 The Bureau's early, almost exclusive, irrigation focus inevitably shifted as the western United States proceeded into the World War I, Great Depression, World War II, and environmental eras.

**[\*25]**

3. From the Early Projects to Complex Controversies

In the late 1920s, Southern Californians were as much interested in the power production and flood control benefits of the Boulder Canyon Project as they were in a water supply. [[146]](#footnote-147)146 Dams, as energy producers and cash registers, helped the effort of the United States to emerge from the Great Depression and produce the power needed to win World War II and supply the growing cities after the war. [[147]](#footnote-148)147 Today, Bureau dams have a total capability of producing 14.7 million kilowatts of electricity. [[148]](#footnote-149)148

The creation of jobs, power, and water for cities often worked at cross-purposes to the homestead ideal upon which the Bureau began, and, despite charges that it has tried to dominate and compete, cooperation with local interests and institutions has been a major tread of its step. [[149]](#footnote-150)149 Congress interjected the Bureau into a web of pre-existing land and water laws that recognized the values and rights of private entrepreneurs, and expected the Bureau to operate as a business, recapturing investments, while producing economic and democratic miracles for the disenfranchised urban poor and soldiers returning to civilian life. [[150]](#footnote-151)150

***Colorado*** benefited from early reclamation projects and suffered detriment to its interests from others, dramatizing the point that the Bureau was responsive to a national constituency that included competing regional and state interests. Among the first five authorized projects were the Gunnison (Uncompahgre) Project in western ***Colorado*** and the Sweetwater (North Platte) Project in Wyoming and Nebraska. [[151]](#footnote-152)151

The Uncompahgre Project resulted from the late 1890-early 1900s drought, rescuing and completing a project that local residents had started. [[152]](#footnote-153)152 The Gunnison Tunnel, diverting Gunnison ***River*** water into the Uncompahgre Valley, six miles long with a carriage canal another twelve miles long, came on line in 1909. [[153]](#footnote-154)153 In the ensuing decades, the Bureau "built additional diversion dams and either purchased private canals or constructed new ones, totaling approximately 470 miles." [[154]](#footnote-155)154 By 1913, "the Uncompahgre Project canals delivered water to 37,000 **[\*26]** acres while the private irrigation structures transmitted water to 13,600 acres… . Within the next decade, the acreage increased to 64,180 acres irrigated within the project." [[155]](#footnote-156)155

John C. Fremont's 1842 surveying expedition produced a seven-part strip map of an overland, watered route by way of the North Platte through South Pass. [[156]](#footnote-157)156 The North Platte ***River*** from Chimney Rock through Scott's Bluff and Ft. Laramie was a critical portion of the Oregon Trail's opening into the mountain West. [[157]](#footnote-158)157

The Bureau's Sweetwater Project benefited these portions of the North Platte valley in Wyoming and Nebraska. [[158]](#footnote-159)158 It included the construction of Pathfinder Dam, named for Fremont, and the Fort Laramie and Interstate canals. Water deliveries started in 1908. [[159]](#footnote-160)159 By the mid-1920s, the Bureau constructed over two thousand miles of canals and laterals, bringing water to about two hundred and twenty thousand acres in Wyoming and Nebraska. [[160]](#footnote-161)160 The Bureau added Guernsey Dam at Goshen Hole, Wyoming, and created Lake Alice and Lake Minatare in Nebraska. [[161]](#footnote-162)161 Under the Warren Act, [[162]](#footnote-163)162 allowing contracting of water with private water users for supplemental water on their lands, irrigated acreage increased another one hundred thousand acres. [[163]](#footnote-164)163

Early reclamation projects resulted in an embargo on ***Colorado***'s development of the waters of the Rio Grande and North Platte ***Rivers*** and contributed palpably to (1) interstate water litigation in the U.S. Supreme Court; (2) successful negotiation of numerous water compacts; (3) construction of ever-larger waterworks by the Bureau and others; and (4) the essential and enduring role of the states, local water districts, and municipalities. All of these embedded arrangements resulted from adaptation of a changing West to the reality of western aridity.

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831). INTERSTATE DISPUTES AND THEIR RESOLUTION

In the same year Congress passed the Reclamation Act, Kansas sued ***Colorado*** for impeding the flow of the Arkansas ***River*** into Kansas. Kansas was a riparian state; ***Colorado***, a prior appropriation **[\*27]** state; the United States, the owner of huge federal lands from and through which the vast percentage of western water flowed. [[164]](#footnote-165)164 In the course of the litigation, which resulted in two opinions, [[165]](#footnote-166)165 Kansas claimed its law required ***Colorado*** to by-pass all water to it; ***Colorado*** claimed its law could keep any water from flowing into Kansas; and the United States claimed that all unappropriated western water had been reserved for development and distribution through the 1902 Reclamation Act. [[166]](#footnote-167)166

The United States Supreme Court rejected all three theories in favor of case-by-case original jurisdiction for the equitable apportionment of waters between states that share an interstate stream system. [[167]](#footnote-168)167 The Court held that each state could choose its own water law, could not impose its choice on another state, and the national government's interest in reclamation of arid lands could not supplant state water law selection. [[168]](#footnote-169)168

Having failed to establish a reservation of western water for the reclamation program, the United States used its property power over federal lands to embargo permits for crossing of federal lands necessary to build non-federal water projects upstream of Pathfinder Dam in Wyoming and Elephant Butte Reservoir in New Mexico. [[169]](#footnote-170)169 This embargo, and the looming loss to Wyoming in an equitable apportionment case, [[170]](#footnote-171)170 spurred Delph Carpenter of ***Colorado*** to formulate the "compact idea" resulting in the era of interstate water compact negotiation and ratification. [[171]](#footnote-172)171

Professor Daniel Tyler explains in his biography of Delph Carpenter that this water compact brainstorm derived from Carpenter's understanding of drought and "***river*** culture":

The culture of ***rivers*** and streams is dictated by geographical location. Upstream residents tend to manifest an attitude of superiority. Their connection to reliable water is guaranteed, especially during periods of drought. Their major concern comes from the fact that most western states accept the principle of first in time, first in right. Economic development downstream, where warmer temperatures encourage agriculture and population growth, results in a prior use of water and therefore a potential legal claim to that water in times of scarcity. Downstream residents worry **[\*28]** excessively about upstream transfers of water out of the ***river*** basin and upstream consumption that diminishes downstream flows at critical times. [[172]](#footnote-173)172

Experience with interstate water litigation taught Carpenter three great lessons. When the United States Supreme Court exercises its original jurisdiction to resolve an interstate water dispute, (1) the doctrine of equitable apportionment governs; (2) what is an equitable apportionment in one decade may not be so in another; and (3) the upstream state can lose to a downstream state whose development occurs first, if not now then later.

Carpenter had two primary fears: California would preempt ***Colorado*** by its capacity for early development, and the federal government - through the Bureau - would command all western ***rivers*** to the detriment of individual states. [[173]](#footnote-174)173 However, by the time the Supreme Court recognized Wyoming's interstate Laramie ***River*** priority, leaving only 15,500 acre-feet per year for additional ***Colorado*** use, [[174]](#footnote-175)174 Carpenter had convinced the powerful League of the Southwest to endorse the compact idea for the ***Colorado*** ***River***, and Congress had enacted legislation for a seven-state ***Colorado*** ***River*** Compact Commission, [[175]](#footnote-176)175 whose chair became Commerce Secretary Herbert Hoover.

The ***Colorado*** ***River*** Compact of 1922 institutionalized, as a matter of state and federal law, the allocation of ***Colorado*** ***River*** water. [[176]](#footnote-177)176 Because of reliance on the longest wet cycle in recorded ***Colorado*** history (1905 to 1929), [[177]](#footnote-178)177 the Upper Basin states of ***Colorado***, New Mexico, Wyoming, and Utah are shorted in dry times by the guarantee of a 75 million ten-year running average of water delivery at Lee Ferry for the Lower Basin States of Arizona, California, and Nevada. [[178]](#footnote-179)178 This realization led to the alliance ***Colorado*** Congressmen Ed Taylor and Wayne Aspinall forged with western state congressional colleagues to build reclamation projects in the Upper Basin and throughout the West - projects to assist in the operation of the compacts and assure local water supply for agricultural, municipal, commercial, power production, and recreation. [[179]](#footnote-180)179

**[\*29]**

J. STATE AND LOCAL WATER BOARDS, DISTRICTS, MUNICIPALITIES, DITCH AND RESERVOIR COMPANIES - THEIR ENDURING ROLE

The Great Depression drought of the 1930s propelled water development as a major means for rehabilitating America. ***Colorado***'s successful effort to forge a permanent water arrangement with the United States through the Great Divide flushed up construction and operation of the ***Colorado***-Big Thompson Project, with water features tapping the headwaters of the ***Colorado*** ***River*** to benefit water uses on the western and eastern slopes of ***Colorado***. [[180]](#footnote-181)180

In 1937, the ***Colorado*** General Assembly gave birth to the ***Colorado*** Water Conservation Board, [[181]](#footnote-182)181 the ***Colorado*** ***River*** Water Conservation District ("***Colorado*** ***River*** District"), [[182]](#footnote-183)182 and the Water Conservancy Act. [[183]](#footnote-184)183 The Northern ***Colorado*** Water Conservancy District became the first of the now-current fifty-one conservancy districts in ***Colorado***. [[184]](#footnote-185)184 The ***Colorado*** ***River*** District was the first of three conservation districts established by the ***Colorado*** legislature, the other two being Rio Grande Water Conservation District [[185]](#footnote-186)185 and Southwestern Water Conservation District. [[186]](#footnote-187)186

A primary motivator for the establishment of state and local boards and districts was that the Reclamation Act required the Bureau to contract with local entities to obtain repayment for part of federal water project construction and operation costs. [[187]](#footnote-188)187 The conservancy districts - empowered by the legislature to receive public funds from a property tax mill levy, make assessments, and charge fees for water use [[188]](#footnote-189)188 - undertook the water project sponsorship and repayment role. Along with the conservancy districts, the conservation districts - assigned with a regional responsibility for water development and basin protection in separate major watersheds within the state [[189]](#footnote-190)189 - became fixtures for state and national assertion of local water interests.

The ***Colorado*** Water Conservation Board - whose representatives are from all regions of the state, and are appointed by the governor and confirmed by the senate [[190]](#footnote-191)190 - became the coordination and **[\*30]** planning reservoir for marshalling ***Colorado***'s interest in the development and use of its scarce water resource. [[191]](#footnote-192)191 The state and division engineers continued their historic role of administering the decrees of ***Colorado*** courts confirming the priorities of water use rights. [[192]](#footnote-193)192 The ***Colorado*** Groundwater Commission oversaw the permitting of ground water withdrawals from designated deep groundwater basins. [[193]](#footnote-194)193

Across the state, towns and cities, water and sanitation districts, irrigation districts, mutual ditch and reservoir companies, homeowner associations, and individual businesses each have a local constituency and responsibility for water planning and delivery. Although criticized at times for acting undemocratically and for a narrow interest, each of these organizations - with the governor, the legislature, and the courts also performing their assigned roles - focuses on conserving water for community uses, a very important public interest also pursued by the Native American and Hispanic peoples - and western visionaries like John Wesley Powell. These institutions - and the result of pressure and counter-pressure among constituent groups - shape and reshape the water customs and values of the people. [[194]](#footnote-195)194

K. THE 1956 ***COLORADO*** ***RIVER*** STORAGE PROJECT ACT AND WILDERNESS PRESERVATION, COUNTER-TWINS

The annual native flow of the ***Colorado*** ***River*** can vary between 4.4 million acre-feet in drought times to 21.9 million acre-feet in wet years. [[195]](#footnote-196)195 The ***Colorado*** ***River*** Compact guarantees a delivery of 75 million acre-feet measured at Lee Ferry to the Lower Basin over any ten-year period. [[196]](#footnote-197)196 Only by storing water can the Upper ***Colorado*** ***River*** Basin states "even come close to meeting their allotted annual uses and discharging their Lee Ferry obligations." [[197]](#footnote-198)197

In 1956, Congress enacted the ***Colorado*** ***River*** Storage Project ("CRSP") Act [[198]](#footnote-199)198 to assist the Upper Basin states in developing their allocation of water, producing hydropower, and ensuring Compact deliveries, among other uses that, as a result of the 1968 ***Colorado*** ***River*** Basin Act, include fish, wildlife, and recreation. [[199]](#footnote-200)199 Particularly in times of drought, the Aspinall Unit on the Gunnison ***River*** in ***Colorado*** - together with Navajo Dam in New Mexico, Glen Canyon Dam in Utah, Fontenelle Dam in Wyoming, and Flaming Gorge Dam **[\*31]** in Utah - operate as a "savings account," so that the citizens of ***Colorado*** and the other Upper Basin states can develop and use the water allotted to them by the Compact "without fear of being "called out' at some time by the demands of the Compact." [[200]](#footnote-201)200

The proposal to build a dam on the Green ***River*** at Echo Park near the ***Colorado***-Utah border - and another at Marble Canyon just east of the main gorge of the Grand Canyon below Lee Ferry - gave birth to the compromise of constructing Glen Canyon Dam and also helped Congress pass the1964 Wilderness Act to flow forth from Congress. [[201]](#footnote-202)201

In late 1955 and early 1956, Howard Zahniser of The Wilderness Society worked unceasingly at trying to insert a proviso into the CRSP that would protect the sanctity of the park system from future reclamation projects. Conservationists also insisted upon a second provision protecting Rainbow Bridge National Monument from the huge reservoir that would be created by the proposed Glen Canyon Dam. After another round of negotiations on Capital Hill, Zahniser gained assurance from Upper Basin leaders like Aspinall and William Dawson of Utah that they would support the provisos in return for the cessation of conservation-organization opposition to the CRSP. At long last, the way seemed clear to passage. [[202]](#footnote-203)202

Water storage to assist state use of water compact allocations, park protection, and wilderness preservation - these are the three essentials of the CRSP compromise that forged beneficial use and preservation, not just beneficial use, to the maturing western experience. Just as the reclamation movement tapped Native and Hispanic American water use roots, so the wilderness movement tapped a resonant core of awe and respect in Americans. Wilderness has fundamentally shaped our American character. Preservation of its remaining vestige is a great national achievement, the argument for which included the water quality and quantity benefits of preserving natural watersheds.

The movement for preservation started with the great nineteenth century western surveyors themselves - and the artists, photographers, botanists, and geologists who accompanied them - but most importantly the citizens of the United States. Congress intended the surveys of George Wheeler, Clarence King, Ferdinand Hayden, and John Wesley Powell to provide the location and resource nexus for settlement of the West. [[203]](#footnote-204)203 But, the people of the United States through the work of artists, journalists, and popular magazines, such as **[\*32]** Harper's Weekly, [[204]](#footnote-205)204 also saw how vast, beautiful, varied, and stupendous this land is, carved of sporadic, surging ***rivers*** and trickling drops; sun; wind; and plenty of parching days.

The paintings of Thomas Moran, the sketches of William Henry Holmes, and the photographs of W.H. Jackson were direct products of the Powell and Hayden surveys. These works led the way for the establishment of those jewels of the park system, including Yellowstone, Grand Canyon, and Mesa Verde National Parks - and with the tremendous added value of John Muir's hiking, writing, wandering, and advocacy, Yosemite. [[205]](#footnote-206)205

San Francisco tapped Muir's beloved Hetch Hetchy Valley for municipal storage. Muir's reaction to what he viewed as a moral outrage sounds a high and clear tone of the liberty bell that Americans can hear - and appreciate - among all the tones we hear from the lyric and rhythm of Nature and its influence on our national character.

That any one would try to destroy such a place seems incredible; but sad experience shows that there are people good enough and bad enough for anything. The proponents of the dam scheme bring forward a lot of bad arguments to prove that the only righteous thing to do with the people's parks is to destroy them bit by bit as they are able. Their arguments are curiously like those of the devil, devised **[\*33]** for the destruction of the first garden - so much of the very best Eden fruit going to waste; so much of the best Tuolumne water and Tuolumne scenery going to waste. Few of their statements are even partly true, and all are misleading.

Thus, Hetch Hetchy, they say, is a "low-lying meadow'. On the contrary, it is a high-lying natural landscape garden. [[206]](#footnote-207)206

Twenty-four wilderness areas, over three million acres, exist in ***Colorado*** today because Coloradans joined with other citizens of the United States to pass the wilderness acts, starting with the 1964 Act. [[207]](#footnote-208)207 Congressman Wayne Aspinall, as chairman of the House Interior Committee - a procurer of water projects for ***Colorado*** - played a key if reluctant role. [[208]](#footnote-209)208 Echo Park Dam had been a part of plans for the ***Colorado*** ***River*** Storage Project, but Congress removed it from the CRSP because of wilderness advocate opposition in favor of preserving Dinosaur National Monument. [[209]](#footnote-210)209

Wallace Stegner's Wilderness Letter of December 3, 1960 speaks to the preservation chamber of America's heart, just as John Wesley Powell's water writings address the beneficial use chamber of the same heart:

We need wilderness preserved - as much of it as is still left, and as many kinds - because it was the challenge against which our character as a people was formed. The reminder and the reassurance that it is still there is good for our spiritual health even if we never once in ten years set foot in it. It is good for us when we are young, because of the incomparable sanity it can bring briefly, as vacation and rest, into our insane lives. It is important to us when we are old simply because it is there - important, that is, simply as idea. [[210]](#footnote-211)210

***Colorado***, the state of the Great Divide - mother of ***rivers*** - headwaters of the Platte, Arkansas, Rio Grande, and ***Colorado*** ***Rivers*** has an enduring legacy of water preservation, conservation, and beneficial use.

L. 2000-2003 DROUGHT, TESTING THE LIMITS

1. The Interstate Water Caps

In the South Platte, Arkansas, and ***Colorado*** ***River*** watersheds, ***Colorado*** has approached the limits of its interstate water allocations. [[211]](#footnote-212)211 The ***Colorado*** Water Conservation Board uses an estimated four **[\*34]** hundred thousand acre-feet of water available for development under its ***Colorado*** ***River*** Compact and Upper ***Colorado*** ***River*** Compact apportionment. [[212]](#footnote-213)212

Normally, ***Colorado*** ***rivers*** generate an annual average of sixteen million acre-feet of water. [[213]](#footnote-214)213 In the drought year 2002, they produced approximately four million acre-feet. [[214]](#footnote-215)214 ***Colorado*** lived in 2002 on six million acre-feet of storage water released from reservoirs. [[215]](#footnote-216)215 About 2000 reservoirs exist in ***Colorado***. [[216]](#footnote-217)216

***Colorado***'s current population is over 4.25 million persons. [[217]](#footnote-218)217 In 1971, agriculture accounted for 92 percent of the state's water deliveries for consumptive use; today, that figure is 85 percent. [[218]](#footnote-219)218 The difference represents market transfers, primarily to domestic and municipal use, which accounts for 10 percent of ***Colorado***'s deliveries for beneficial use. [[219]](#footnote-220)219

2. Conservation and New Uses

Together with demand-reducing measures, such as water restrictions and surcharge pricing, reservoirs with adequate storage rights are crucial to the state's ability to endure drought, such as the one ***Colorado*** has just experienced. A water right is a right to share in the public's water resource. [[220]](#footnote-221)220 Conservation is indispensable - in all its forms - in stretching a scarce resource. The measure, scope, and limit of a water right is beneficial use. [[221]](#footnote-222)221 Beneficial use without waste or speculation is the core of our western water law doctrine. In times of scarcity, juniors defer to seniors, and the water market operates to transfer senior priorities to those who want to make a new use or firm up a junior use. [[222]](#footnote-223)222 Augmentation plans allow out-of-priority diversions to operate if adequate replacement water is supplied to senior water rights that would be injured otherwise. [[223]](#footnote-224)223

The ***Colorado*** General Assembly has adopted an instream flow law for fish and wildlife protection, [[224]](#footnote-225)224 and has enacted a recreational in- **[\*35]** channel diversion law for rafting and boating. [[225]](#footnote-226)225 Surely, these laws are reflections of our maturation as westerners. They take their place in the priority system, with the opportunity to firm their use, through water market transfer of senior rights and water storage and release. These legal mechanisms have their institutional counterparts: the Water Conservation Board for the instream flow program; cities, conservancy districts, and other local governments, with consultation by the Water Conservation Board, for recreational in-channel diversions. [[226]](#footnote-227)226

3. Water Planning and the Public Interest

A true mark of western water being a scarce public resource is how long and how often we have institutionalized its conservation and use. This is apparent in legal assignments made to national, state, and local public agencies - from the U.S. Geologic Survey to the Bureau of Reclamation, from the Water Conservation Board to the Upper Gunnison Water Conservancy District, from the City and County of Denver to the Town of San Luis.

The public institutions, created by legislative bodies at all levels, have the duty, in the public interest, to plan for and secure a firm water supply, responsive to environmental laws as well as all other applicable laws, to the best of their ability. Environmental institutions and citizen groups help shape how, when, if, and why additional water works will be built, but they do not have the public's water supply responsibility and will not be answerable for a lack of planning and failure to undertake needed actions. Public officials, on the other hand, will be held accountable.

As a result of severe drought at the outset of the twenty-first century, public officials at all levels are engaged in drought planning and response. As a result of the 1976-1977 drought and a dry year in 1981, ***Colorado***'s governor initiated the development of a comprehensive drought management plan. [[227]](#footnote-228)227 "The ***Colorado*** plan is effective because it incorporates three primary components: a monitoring system, an impact assessment system, and a response system. The State is currently attempting to give greater emphasis to mitigation in its plan." [[228]](#footnote-229)228 This effort has redoubled as a result of the most recent drought.

**[\*36]**

4. Adjusting the Water Laws

In its 2003 session, the ***Colorado*** General Assembly added additional flexibility to ***Colorado*** water law, extending administrative authority in the state engineer for water banking, changes of water rights, substitute supply plans, emergency water plans, loans of water including for instream flow purposes, prohibition of new covenants that restrict the use of drought-tolerant vegetative landscapes, state technical assistance for water usage and billing systems, and water rights for conservation easements, consistent with the laws for water court adjudication of water rights and state engineer enforcement of them. [[229]](#footnote-230)229 The legislature also provided for financial mitigation to counties that suffer tax revenue loss from the removal of agricultural water from their jurisdiction. [[230]](#footnote-231)230 The assembly has directed the Water Conservation Board to undertake a statewide assessment of water supply, water demand, and water development strategies; project alternatives are to include social, economic, and environmental impacts and a consensus-building approach. [[231]](#footnote-232)231 These short-and long-term measures have their bud in the most recent drought but their root in the long, ongoing process of adapting to the arid lands. Surely, the arena of reducing water demand and increasing the efficiency of water application and use deserves additional action.

We must not forget the contributions of the professional community, including climate scientists - meteorologists, hydrologists, climatologists, among them - who help us gauge, analyze, and forecast based on past and current data, so we can prepare for what we must do to conserve supply and reduce demand. Our heritage is the same as all of those who have preceded us here. We must work the water well, and we must also leave it alone to do its shaping.

**[\*37]**

M. CONCLUSION

In one ironic sentence, Bernard DeVoto summed up the problem and experience of the way west - such as Lewis and Clark realized after they had bushwhacked their way with a lot of supreme effort, and luckily, to the mouth of the Columbia with the help of Native Americans, Sacagawea, the Shoshone, and the Nez Perce: "The point it indicated was clear and precise: the route they had taken west was certainly not the shortest and probably not the best one." [[232]](#footnote-233)232

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831) would add, how else goes the course of western civilization? Weather and water politics, in the wild cycle of their beneficial seasons, will always be with us.

GOOD ***COLORADO*** HEADWATERS EDUCATION

Good we don't have to buy the weather,

Good isn't for sale and just happens whenever.

Predictions, though good and getting better,

Are wildly inaccurate when the best worst weather

Hits so suddenly you can't tell where the pitch

Comes from. I prefer weather to politics,

I mean, at least, when you sear your lips

Or an will wind spanks your bottom, you can

Rightly say, "Wait just a minute, it'll change" -

***Colorado*** axiom - any politics charging straight

Off the Divide is worth standing to for. Sure you have to hunker down when thunder

Booms and lightning catches between a vortex

Pit-of-gut instinct and a gearing rain that may never

Touch ground. "Norm" is only a mathematical

Possibility. Yell, Hail! and run. Your average-

Staked tent blows down any minute. Greg Hobbs

6/7/2003

**[\*38]**

N. APPENDIX: GREG HOBBS, MESA VERDE JOURNAL

Prater Canyon Box Elder Reservoir Survey

By Wright Paleohydrological Institute

In Cooperation with the ***Colorado*** Historical Society

And the National Park Service, May 2-4, 2003

May 1, 2003

Bobbie picks Greg up at the new Idaho Springs High School where the ***Colorado*** Supreme Court has heard oral argument on two criminal cases in front of students from a number of area high schools.

Greg and Bobbie drive through four major watershed headwaters on their way to Cortez: the Platte, the Arkansas, the Rio Grande, and the ***Colorado***. The route is I-70 to Eisenhower Tunnel (Platte watershed), Eisenhower Tunnel to Leadville (***Colorado*** ***River*** watershed into Arkansas ***River*** watershed), Leadville to Wolf Creek Pass (Arkansas ***River*** and Rio Grande watersheds), and Wolf Creek Pass to Cortez (***Colorado*** ***River*** watershed - San Juan, Pine, Piedra, La Plata, and Mancos ***Rivers*** sub-watersheds).

Arrival and check into Comfort Inn at 10:00 p.m. We are met by Terri Ohlson.

May 2, 2003

Some engineer has set the clock radio in Greg and Bobbie's room to go off at 5:00 a.m. Promptly at 5:00 a.m. the radio comes on!

Breakfast is at six. The survey team early arrivals arrive for breakfast.

7:00 a.m. the team assembles in the Comfort Inn parking lot. Ken and Ruth Wright welcome all of us. Jack Smith, former Chief Archeologist at Mesa Verde National Park, briefs us on Park etiquette. In short, the etiquette is you may find and pick up artifacts but put them back where you found them. No collecting!!

Ken explains that this is the "intellectual day." The "heavy lifters" come tomorrow.

Doug Ramsey, a soil scientist, and Dick Wiltshire, U.S. Bureau of Reclamation civil/geotechnical engineer, load up a mobile core-drilling rig loaned by the Bureau of Reclamation.

We are off to Mesa Verde - sky high canyon home of the Anasazi. Ruth explains on the way:

The Pueblo I occupation was 750-900; the Pueblo II, 900-1100; and Pueblo III, 1100-1300. The Box Elder Reservoir in Prater Canyon was likely in operation from 750 to 950 A.D., during the Pueblo I period primarily. Its location and existence became known after the year 2000 Bircher fire burned off the pi<tild>non, juniper, and sagebrush. A fast and furious wind burned fiercely 27,000 acres.

**[\*39]** The Box Elder Reservoir is named for the unusual box elder trees that are in the stream channel near the reservoir. Box Elder is the fourth Mesa Verde reservoir the Wright Paleohydrological Institute has surveyed. Two are mesa top reservoirs: Far View Reservoir (also known as Mummy Lake) on Chapin Mesa (A.D. 950-1180), and Sagebrush Reservoir on an unnamed mesa west of Chapin Mesa (A.D. 950-1100). The third is a canyon-bottom reservoir, Morefield Reservoir in Morefield Canyon (A.D. 750-1100).

We pass through Morefield Canyon and wind over tricky switchbacks into Prater Canyon.

Our first view of Box Elder Reservoir, site 5MV4505, is from high on the Prater Canyon ridge. No doubt about it. There's a big berm on the channel side of a circular-shaped landform. We see burned/ghostly white box elder trees in the channel at the upper end of the reservoir site.

This may be an "intellectual day" for some of us, but Doug Ramsey and Dick Wiltshire get right to work on setting up the drill rig and start drilling and extruding cores - they're at it all day with the help of Ernie Pemberton, formerly head of the Bureau of Reclamation's Sedimentation Branch; John Rold, former ***Colorado*** State Geologist; and David Breternitz, retired archeologist.

Bobbie has sharp eyes. She spots a sheer-white small and elegantly shaped arrowhead lying on the south slope of the berm.

We set out with archeologist Jim Kleidon to find P-I and P-II sites in the vicinity of the reservoir. We walk up the west slope of the canyon to the north end of the reservoir site. We find a P-II site (900-1100). Jim explains that the potsherds we see all over the ground are pottery pieces of P-II black and white and corrugated pottery. This is site 5MV3159.

Bobbie finds what we call a "hammer stone." It's made out of igneous rock and has a chipped out portion in the center for tying on a handle. It is broken, split right down the middle from top to bottom. We examine with awe this tool of 1,100 years ago, and put it back in place.

We return to the surface of the reservoir body - now just a large mound because of sedimentation over the centuries. The soil experts are excited. They point to cored material that is clearly the result of sediment transport and compression within the reservoir body. The cores taken so far are down to 11 feet.

Ken signals we are going back over the ridge to Morefield Canyon. Terri Ohlson and Jack Smith have hiked over the ridge between Prater Canyon and Morefield Canyon - to the east - to see how long it takes to walk between the two reservoirs.

Driving up the bottom of Morefield Canyon, we see Terri and Jack walking up the road towards us. They've proved the point. Even though they found, then lost, the ancient Anasazi trail near the top of the ridge, it took only an hour and a quarter to cross over. Forty-five minutes probably would do it for those familiar with the trail - and **[\*40]** strong from constantly walking where they needed or wanted to go - a thousand years ago.

We see the Morefield Reservoir mound, site 5MV1931. Ken and Ruth, with the help of Jack Smith, conducted field investigations here in October 1995, May 1996, and May 1997, excavating an exploratory trench with a permit from the Park Service.

The mound is 200 feet in diameter, rises 16 feet above the valley floor, is 21 feet deep, and has a long berm-looking structure extending from it north up the valley floor. The whole thing looks like an inverted frying pan. Soil samples and potsherds showed that clay and sand were carried into the reservoir from the stream channel.

The Anasazi mucked out the sediment as best they could, throwing the material onto a growing embankment. The clay sealed the bottom of the reservoir from leakage. The mound rose over the centuries, so what probably began as a hole dug into the channel to intercept shallow groundwater became on off-channel reservoir as the intermittent streambed routed itself around a rising embankment.

To get water into the reservoir required a feeder ditch/canal. Bobbie and I walk up the elevated berm-like structure from the reservoir north. The stream channel is to our west. We clearly see large numerous stones lying at the surface - the size of a large cowboy hat, and larger. They are aligned and clearly appear to have been placed, not washed in. Here is evidence of the ditch/canal structure cutting northward to intercept the stream channel!

Bobbie and Ken (who has joined us) walk back and forth among the stones, showing me the canal's alignment. 1,400 feet of it!

Ken says there was no irrigation used here. This was a drinking water supply. The Anasazi at Mesa Verde were dry land farmers, using valley bottom alluvial land and terraces to grow their corn, storing it in nearby granaries they built of rock. They knew of droughts. They tried to keep up to two years of corn in storage.

The potsherds in the reservoir trench showed the Anasazi dipped the water out and carried it away in water jars, which sometimes broke in the effort to bring water back to their families. Deer antlers, sticks, and baskets were used to muck out the reservoir.

There's a great kiva near the Morefield Reservoir. House ruins in the vicinity show a population of nearly 500 people. They must have been proud of their reservoir, and very worried that it took so much work to keep it scooped out and to lengthen the canal. As the berm grew, they had to shift their diversion point again and again to intercept the shifting stream channel. They must have prayed for the rain to come and the water to enter the canal without washing it out.

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831) have with me a copy of the Wright Final Report of the Morefield Reservoir investigation, dated January 1998. It has a chart of tree ring data that show an annual average precipitation of 18 inches per year from 800 to 1100 A.D. - not much different from today in the Mesa Verde region, but there were good wet years and droughts. The Anasazi farmers, like today's, always perched between a sudden flood **[\*41]** and enduring scarcity. The reservoir likely operated from 750 to 1100 A.D.

It's getting near to lunch, and we better get back to Prater Canyon!

A tailgate lunch with a famished crew is what we enjoy. The Boise State University history professor from Idaho, Todd Shallat, peppers the sandwiches and canned ice tea with questions: "Did the ducks fly in to sit on the reservoir water and the Anasazi eat them?" Archeologist David Breternitz answers they ate the corn they grew and turkeys they kept. But, what about the ducks? says Todd. (Bobbie and I saw duck-headed petroglyphs on several hikes to Grand Gulch twenty years ago - Todd is onto something).

After lunch, Jim Kleidon leads us down canyon and we climb a southeast-facing slope. The rocks of house structures and the sink spot of kivas are clearly visible. Potsherds dot the landscape. Site 5MV3146. Jim did the post-Bircher fire survey of the ruins, identifying previously hidden additional houses and where they needed to be protected against erosion. Ute Indian teams then came in to place protective checks to divert water away from them. 275 new sites found at Mesa Verde after the fire!

Jim shows us how the houses were aligned west to east with the kivas dug on the south side. The midden - or waste pile - is down slope. These are the archeological treasure houses that reveal the discarded tools of a people working to survive in a hard but familiar homeplace.

We can see how they perched themselves on the southeast-facing slopes to take advantage of the light and warmth a winter-sinking sun parcels out to those who seek it well.

Jim says the large P-II community here - though smaller than the population of Morefield Canyon - probably was home to 300 people.

We spend hours marveling at the privilege of a dawning understanding. These were smart people who used the native materials - and their craft at making clay and stone tools - to grow and store corn and conserve water to survive and live. Their places of prayer, the kivas, could also have served as winter homes, out of the wind and cold.

We arrive back to the Box Elder core-drilling. Dick Wiltshire and Doug Ramsey have been prodigious workers! The soil samples in long rows are spread out on a white sheet and boxed for later lab analysis of the reservoir profile, as best it can be determined from the cores, to show how deep and for how long this water body served these people.

At 4:00 p.m. we pile our sore feet and wind-chapped faces back into the vehicles and unpile at the Comfort Inn. A short snooze, wake to dinner at the Mexican Fiesta, and retire to a fiery western sky. Day one is done, the intellectual day, bundled up to our persistent memories.

**[\*42]** May 3, 2003

Same clock radio goes on at the same time, 5:00 a.m., breakfast at 6:00 a.m., depart at 7:00 a.m. These engineers know how to organize a survey!

The "heavy lifters" are here. They turn out to be young people, strong and confident. They will do the hand augering and handle the precise surveying and global positioning instruments. They include engineers, geologists, biologists, and hydrologists: Jason Alexander, Eric Bikis, Chris Brown, David Foss, Pete Foster, Matt Gavin, Kurt Loptien, and Ryan Unterreiner.

Dr. Mary Gillam, a Quaternary geologist and soils stratification expert, also joins the team.

Ken announces the assignments for this day's work on the Prater Canyon Box Elder Reservoir survey. Peter Monkmeyer, Chairman of the Civil Engineering Department, University of Wisconsin - who was with us yesterday - will team up with Jason to see whether hand augering in the channel bottom will reveal groundwater. The surveyors will determine the channel parameters and locate natural and cultural features, the building blocks of an accurate map. The soils and sedimentation experts will ascertain the depth of the reservoir and the variety of its deposits. The archeologists will confirm the identity of cultural features and artifacts.

Greg will work with Jim Kleidon and Ernie Pemberton to identify the diversion point and canal alignment, if evidence of a canal can be found. Bobbie will accompany Eric Bikis and Jack Smith to fix, by GPS, the location of special cultural artifacts, like those Bobbie found yesterday. Jack will then accompany Jason in the afternoon to the abandoned Prater Brothers' homestead sites up the canyon, to auger for groundwater in the abandoned wells.

Ruth will continue photographing the work of all the teams, and Ken and Terri will continue with overall coordination and logistics. Todd will press his questions. He is editing the Wright report on the four Mesa Verde reservoirs for publication in a professional journal later this year.

We are at full strength and eager to get to work! At Prater Canyon we rivet and disperse to our assignments.

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831) set out with Jim and Ernie, walking north of the reservoir body. We have the map of the October 2002 field survey of the Wright Paleohydrological Institute, which this day's work will supplement. We check out "Ernie's ditch alignment." Ernie has hypothesized an alignment that takes us on a northern path from the reservoir's body onto an alluvial fan of material washed down from the canyon walls over the centuries.

Will we find cultural evidence similar to that in Morefield Canyon along the trace of an ancient ditch to a diversion point on the stream? Finding evidence will be difficult. It looks like a thousand years of washed-down soil has buried whatever may have been.

**[\*43]** Approximately a hundred yards north of the reservoir's upper end, we encounter a gully that cuts the alluvial fan with a slice towards the channel. We see the tops of stones aligned in an up-canyon direction! Jim thinks they may have been placed there - tentative evidence of ditch reinforcement and demarcation. We walk on.

Thirty feet farther on we see a number of large stones flanking the western slope of the stream channel. Ken and Ruth join us. We show them this stone grouping. Jim lights up. He is finding P-I gray ware shards on the embankment. Large stones apparently arranged for erosion control, and potsherds - this is physical evidence of ditch/ embankment armoring. Similar to Morefield Canyon, here in Prater Canyon is proof of an off-channel reservoir and canal - carefully tended water features operating at the same time in two canyons by people who could easily communicate and learn from each other by walking over the ridge.

Jim and I walk straight on. We find more scattered stones, too large to have been washed here, how many more are buried beneath? We reach the channel just below its confluence with a tributary channel running in from the northeast. Here's the likely diversion point into the canal.

We walk west up the main channel among the box elder trees. No more large placed stones on the bank, not a one! Jim and I believe we have confirmed that Ernie's tentative canal alignment is matched with on-the-ground cultural proof. We leave the gradient check to the surveyors (the Morefield canal had a one-percent gradient running from the diversion point to the reservoir).

Now we need to find the habitations of people who could have built and maintained this reservoir and canal. It's got to be a P-I site, as all the sherds Jim found along the ditch alignment were P-1. Nearby is a P-II site on the western canyon slope; there's another P-II site directly across on the eastern slope. Where's the P-I?

We climb up the western canyon wall. Jim is thinking out loud. P-I sites could be buried beneath the P-II structures, including the large down-canyon village we visited yesterday.

We climb to a site that perches way up near the top of the western canyon wall. Jim surveyed this site after the 2000 Bircher fire. Site 5MV3190. It's a glorious spot with a comprehensive view of the reservoir below and a southeast facing down-canyon view. We find many P-I sherds matching the type Jim found along the canal alignment.

We look directly out on the reservoir site below where the drill crew is busy drilling cores and laying out the telling proof of how these people stored their drinking water. I can see the paths those people walked, carrying their water pots, to fill them when the water was there, returning to their lofty homes in the sun. And how they must have thirsted when the reservoir was near-empty, watching and waiting for the skies to drop the weight of clouds into their storage bowl!

Jim and I see Bobbie walking amongst the ruins down below us. **[\*44]** We join her. She's been to a P-II site across the canyon with Jack Smith. They found an axe! Now she is looking for the hammer stone she found the day before. Jim and I recall it being at the P-II site northwest of the reservoir at the edge of the burned-out forest.

Bobbie finds the hammer stone again! The site marker reads 5MV3159. I go get Eric from the reservoir site. He locks in the coordinates with his global positioning unit.

N37 14.471

W 108 25.214

Elevation 7289 - hammer stone.

We go back to the reservoir berm to position in the arrowhead lying where Bobbie found it yesterday, site 5MV4505.

N37 14.585

W 108 25.228

Elevation 7289 - arrowhead.

We go across canyon to the P-II ruins on the east side of the channel downstream from the reservoir where the axe head is lying. Site 5MV3033. We lock it in.

N37 14.471

W 108 25.214

Elevation 7257 - axe.

It's lunchtime at the tailgates!

At lunch, Ken asks Greg and Bobbie if they will accompany Jason up to the Prater Brother homesteads for groundwater testing. The hand auguring in the vicinity of the reservoir, down to 10 feet, has not reached ground water. Will augering at the old well sites up-canyon show and ground water?

Jack Smith had planned to go with Jason, but isn't feeling well. It's a two-mile hike each way.

Jack briefs us before we start off. Brothers Albert and William Prater had adjacent homesteads in the canyon between 1900 - before Mesa Verde National Park was created (1906) - to the late 1920s when the Park bought them out. They grazed cattle and sheep. In 1974, Jack tested the water in the lower Prater well. It was about ten feet from the surface.

We hike up-canyon on an old road that disappears half way up. The canyon is lined on the east side with beautiful rim rock. We spot the first green tree - likely a Douglas fir - we've seen in Prater or Morefield Canyons in two days. The 2000 Bircher fire was devastating.

We pass the lower well. The windmill structure, without its turning wheel, stands forlornly in the middle of a deserted field. We reach the upper Prater homestead site. Two busted windmill wheels lie apart from each other. We see the charred remains of wooden foundations and fence posts. The well has caved in, forming an open pit about four feet deep, so Jason has a good start at the augering. Site 5MV3129, Middle Well.

He reaches a depth from surface of 10 ft. 8 inches. We hear a **[\*45]** sucking noise as Jason pulls out a core of peat - he's gone through quite a bit of it - but no groundwater, just a heap of moist peat.

The day is growing late, and we need to be back by 4 p.m. to the vehicles, so we don't have time to test in the vicinity of site 5MV2896, Lower Well.

When we return to the reservoir site we learn that the coring work has shown that that the reservoir is 20[fr1/4] feet deep - very close to the depth of the Morefield Reservoir.

The wind has been lashing us all afternoon, and we are exhausted. The core drilling team is still at work when we leave with Terri, Jack, and Peter. We join the group for dinner at 7 p.m., but Ken is worried. Jack Smith doesn't show for dinner.

May 4, 2003

We arrive for the wrap-up symposium on Chapin Mesa at the Recreation Hall in the old CCC camp. We learn that Jack slipped and fell last night and is still in the hospital recuperating. To our great relief, apparently he's all right.

The teams report their findings. Archeologist David Breternitz, Professor Emeritus, Archeology Department, University of ***Colorado***, sums up. We have confirmed that Box Elder Reservoir is a P-I site in Prater Canyon, the construction of which commenced somewhat later than the Morefield Reservoir. Both were in operation at the same time, although the Morefield Canyon Reservoir was longer-lived. Plainly the people in both canyons were in communication and learned from each other. Because the great kiva is in Morefield Canyon - David says the people from Prater Canyon "probably went to church over there."

Ken thanks all the members of the team for their work and says that a written report of the findings and a map will follow.

We say goodbye to each other, knowing we have shared a great privilege, to see - on their ground - how the organizational skills of these Pueblo people helped them live in a harsh environment they probably loved for its elevated light.

Bobbie and Greg visit the Chapin Mesa Museum and the Far View Reservoir and villages on their way out of the Park.

Like Sagebrush Reservoir, Far View Reservoir is on top of a mesa and was not fed by an intermittent stream channel. Instead, it intercepted rainstorm runoff from compacted soils and perhaps a collection ditch. You can see an inlet structure to the reservoir that likely conveyed water, and a separate set of stairs for the people to dip their water pots.

Driving out of the Park at the top of Prater Canyon, we see a big turkey cross the road right in front of us and head down through the burned-out oak brush. These faithful life-sustaining birds the Anasazi domesticated are still here! We hear this pilgrim sounding off for a good five minutes before disappearing across a high meadow into the **[\*46]** skeleton forest beyond.

We wind down out of the Park. Good views of the Mancos ***River*** bottom lands below, where farmers are planting this year's crops.

On the way home, we visit the BLM's Anasazi Heritage Center outside of Dolores. We see a photograph of David Breternitz on the wall! We've been in the company of famous archeologists these past two days.

We drive over Lizard Head Pass through Telluride, up and over the Dallas Divide, the glorious San Juan and Uncompahgre Mountains surround us.

It's snowing on Vail Pass. We arrive home Sunday night after 11 p.m. The lights of Denver are a long way from the silent mound of the Box Elder Reservoir. And we are glad, so glad, to have its location and purpose fixed in the context of the long - yet still unfolding - community of ***Colorado***.

PUEBLO PEOPLE OF MESA VERDE

You want to know where water's precious,

Where every scoop of dirt's a prayer of life;

And tomorrow's blessing - carried in a pot Of clay is a source of wonder up a slope

A thousand years away - perch upon

A buried kiva's rim and take within the Arcing southeast sun this light they saw -

You see - and may you keep this light

Within and speak it openly; They worked and loved, like we, this

Land, this calling, this Mesa Verde.

Greg Hobbs

5/2-4/2003

University of Denver Water Law Review

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**End of Document**

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3. 3 From Pittsburgh to the Rocky Mountains: Major Stephen Long's Expedition 1819-1820, at ii, viii-ix (Maxine Benson ed., 1988). [↑](#footnote-ref-4)
4. 4 Id. at 195. [↑](#footnote-ref-5)
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6. 6 Thomas Hornsby Ferril, Drought - 1824, in Thomas Hornsby Ferril and the American West 16 (Robert C. Baron et al. eds., 1996). [↑](#footnote-ref-7)
7. 7 John Wesley Powell, Report on the Lands of the Arid Region of the United States 5-6, 13-14, 42 (facsimile reprint, Harvard Common Press 1983) (2d ed. 1879) [↑](#footnote-ref-8)
8. 8 Wallace Stegner, Living Dry, in Marking the Sparrow's Fall 213, 226-27 (Page Stegner ed., 1998). [↑](#footnote-ref-9)
9. 9 David Lavender, The Southwest 20 (1980). [↑](#footnote-ref-10)
10. 10 Carl Abbott et al., ***Colorado***: A History of the Centennial State 173 (3d ed. 1994). [↑](#footnote-ref-11)
11. 11 Mary Austin, The Land of Little Rain 1 (1950). [↑](#footnote-ref-12)
12. 12 Norris Hundley, Jr., Water and the West: The ***Colorado*** ***River*** Compact and the Politics of Water in the American West, at ix (1975). [↑](#footnote-ref-13)
13. 13 See W. H. Jackson, Ancient Ruins in Southwestern ***Colorado***, in 1 Bulletin of the United States Geological and Geographical Survey of the Territories, 1874 and 1875, at 17 (Washington, D.C, Gov't Printing Office 1875). [↑](#footnote-ref-14)
14. 14 Id. at 17-38. [↑](#footnote-ref-15)
15. 15 Id. at 20-21. [↑](#footnote-ref-16)
16. 16 Id. at 21. [↑](#footnote-ref-17)
17. 17 G. Nordenskiold, The Cliff Dwellers of the Mesa Verde 73 (Mesa Verde Museum Association, Inc. 1990) (1893). [↑](#footnote-ref-18)
18. 18 Id. at 74. [↑](#footnote-ref-19)
19. 19 Id. [↑](#footnote-ref-20)
20. 20 Id. [↑](#footnote-ref-21)
21. 21 Jack E. Smith, Mesas, Cliffs, and Canyons: The University of ***Colorado*** Survey of Mesa Verde National Park 1971-1977, at 14-15, 21 (1986). [↑](#footnote-ref-22)
22. 22 The following Reports by Wright Paleohydrological Institute each discuss one of the four ancient reservoirs: David A. Breternitz, The 1969 Mummy Lake Excavations: Site 5MV833, at 27 (1999); Jack E. Smith & Ezra Zubrow, 1967 Excavations at Site 5MV1931, Morefield Canyon, Mesa Verde National Park, ***Colorado*** 35 (1993); Kenneth R. Wright, Mesa Verde Paleohydrology, Sagebrush Reservoir Site 5MV1936, at 74 (2002); see Wright Water Engineers, Final Report: Morefield Canyon Reservoir Paleohydrology, Mesa Verde National Park; Site 5mv1931, Project # 96-02-090 (1998); Wright Paleohydrological Inst., Mummy Lake Paleohydrology Study 48 (2000). [↑](#footnote-ref-23)
23. 23 Ruth Wright, Prehistoric ***Colorado*** Reservoirs at Mesa Verde National Park 1 (2003). [↑](#footnote-ref-24)
24. 24 [*Wright Water Engineers, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) note 22, at iii, 15. [↑](#footnote-ref-25)
25. 25 Kenneth R. Wright, Water for the Anasazi: How the Ancients of Mesa Verde Engineered Public Works 19, 26 (2003). I had the privilege in May of 2003 to be part of a Wright/National Park Service/***Colorado*** Historical Society survey team for the Box Elder Reservoir in Prater Canyon. Appendix A to this article is a journal I kept of the May 2-4, 2003, investigations at the Box Elder and Morefield reservoir sites. [↑](#footnote-ref-26)
26. 26 [*Wright Water Engineers, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) note 22, at 1. [↑](#footnote-ref-27)
27. 27 Kenneth R. Wright, supra note 25, at 26. [↑](#footnote-ref-28)
28. 28 Id. at 21. [↑](#footnote-ref-29)
29. 29 Id. at 19-21. [↑](#footnote-ref-30)
30. 30 [*Wright Water Engineers, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) note 22, at 21. [↑](#footnote-ref-31)
31. 31 Id. at 22. [↑](#footnote-ref-32)
32. 32 Id. [↑](#footnote-ref-33)
33. 33 Id. at 23. [↑](#footnote-ref-34)
34. 34 Id. at 22. [↑](#footnote-ref-35)
35. 35 There is evidence that Native Americans grew maize in the center of the ***Colorado*** Plateau 3000 years ago. R.G. Matson, The Origins of Southwestern Agriculture 258 (1991). [↑](#footnote-ref-36)
36. 36 Richard G. Milo, Corn Production on Chapin Mesa: Growing Season Variability, Field Rotation, and Settlement Shifts, in Proceedings Of The Anasazi Symposium, 1991, at 35, 39-40 (Art Hutchinson & Jack E. Smith eds., 1991). [↑](#footnote-ref-37)
37. 37 Kenneth R. Wright, supra note 25, at 19. [↑](#footnote-ref-38)
38. 38 [*Wright Water Engineers, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) note 22, at 13. [↑](#footnote-ref-39)
39. 39 Kenneth R. Wright, supra note 25, at 21. [↑](#footnote-ref-40)
40. 40 [*Wright Water Engineers, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) note 22, at 11-12. [↑](#footnote-ref-41)
41. 41 Gregory Hobbs, May 2-4, 2003. [↑](#footnote-ref-42)
42. 42 Ruth Wright, supra note 23, at 1. [↑](#footnote-ref-43)
43. 43 Id. at 3. [↑](#footnote-ref-44)
44. 44 Id. [↑](#footnote-ref-45)
45. 45 Id. [↑](#footnote-ref-46)
46. 46 Jeffrey S. Dean & Carla R. van West, Environment-Behavior Relationships in Southwestern ***Colorado***, in Seeking the Center Place: Archaeology and Ancient Communities in the Mesa Verde Region 81, 87 (Mark D. Varien & Richard H. Wilshusen eds., 2002) (From tree ring studies, droughts of 15 or more years' durations are evident for AD 990-1015, 1030-1050, and 1276-1299.). [↑](#footnote-ref-47)
47. 47 Eric Blinman, Adjusting the Pueblo I Chronology: Implications For Culture Change At Dolores and In The Mesa Verde Region At Large, in Proceedings of the Anasazi Symposium, 1991, at 51, 55 (Art Hutchinson & Jack E. Smith eds., 1991) "A major series of droughts hit the Mesa Verde region in the AD 805-825 period, probably terminating the early villages as viable farming communities … ." Id. See also Richard H. Wilshusen, Estimating Population in the Central Mesa Verda Region, in Seeking the Center Place, Archaeology and Ancient Communities in the Mesa Verde Region 101, 107, 111, 119-120 (Mark D. Varien & Richard H. Wilshusen eds., 2002) (A substantial reduction in the population of the area may have occurred between AD 880 and AD 940, with population increases between AD 950 and AD 1200, for a total population of 11,000 to 14,000 persons, one-sixth of whom were at Mesa Verde, the rest located on the Great Sage Plain and Dolores areas of Southwestern ***Colorado***; by AD 1200, total migration occurred, not, apparently, in response solely to drought as populations had persisted in the area throughout prior droughts). [↑](#footnote-ref-48)
48. 48 Carla R. van West, Reconstructing Prehistoric Climatic Variability And Agricultural Production In Southwestern ***Colorado***, A.D. 901-1300: A GIS Approach, in Proceedings of the Anasazi Symposium, 1991, at 25, 28-31 (Art Hutchinson & Jack E. Smith eds., 1991). [↑](#footnote-ref-49)
49. 49 Id. at 30-31. [↑](#footnote-ref-50)
50. 50 Id. at 31. [↑](#footnote-ref-51)
51. 51 Joseph C. Ives, Corps of Topographical Engineers, 36th Cong., Report Upon the ***Colorado*** ***River*** of the West, Explored in 1857 and 1858, at 81-82, 119-20 (1st Sess. 1861). [↑](#footnote-ref-52)
52. 52 Id. at 98-99. [↑](#footnote-ref-53)
53. 53 Id. at 110. [↑](#footnote-ref-54)
54. 54 Id. at 119. [↑](#footnote-ref-55)
55. 55 Id. at 120 (describing water works at Mooshahneh). [↑](#footnote-ref-56)
56. 56 Id. at 124 (describing water works at Oraybe). [↑](#footnote-ref-57)
57. 57 Id. at 125-131. [↑](#footnote-ref-58)
58. 58 Ira G. Clark, Water in New Mexico 1 (1987) (quoting letter of Coronado to Mendoza written on 3 Aug. 1540). The Hohokam understood the importance of laying out the canal with good gradient for water flow, and may have plastered the bottom of canals with adobe to prevent leakage. Michael C. Meyer, Water in the Hispanic Southwest, A Social and Legal History, 1550-1850, at 12 (1984). [↑](#footnote-ref-59)
59. 59 Meyer, supra note 58, at 8-9. [↑](#footnote-ref-60)
60. 60 Clark, supra note 58, at 1. [↑](#footnote-ref-61)
61. 61 Id. at 2. [↑](#footnote-ref-62)
62. 62 Id. [↑](#footnote-ref-63)
63. 63 Meyer, supra note 58, at 16-17. [↑](#footnote-ref-64)
64. 64 Josiah Gregg, Commerce of the Prairies, at xix (Max L. Moorhead ed., 1954). [↑](#footnote-ref-65)
65. 65 Id. at 107-08 [↑](#footnote-ref-66)
66. 66 New Mexico State Engineer's Office, Acequias (July 1997), available at [*http://www.seo.state.nm.us/water-info/acequias/acequias-d*](http://www.seo.state.nm.us/water-info/acequias/acequias-d) itches.html (last modified Oct. 29, 1998). [↑](#footnote-ref-67)
67. 67 Meyer, supra note 58, at 106-11. [↑](#footnote-ref-68)
68. 68 Id. at 157-58. [↑](#footnote-ref-69)
69. 69 Id. at 36. [↑](#footnote-ref-70)
70. 70 Id. at 37. [↑](#footnote-ref-71)
71. 71 Id. [↑](#footnote-ref-72)
72. 72 Id. at 36. [↑](#footnote-ref-73)
73. 73 Clark, supra note 58, at 17. [↑](#footnote-ref-74)
74. 74 Meyer, supra note 58, at 47-49. [↑](#footnote-ref-75)
75. 75 Jane E. Norris & Lee G. Norris, Written in Water: The Life of Benjamin Harrison Eaton 24 (1990); see also Gregory A. Hicks & Devon G. Pe<tild n>a, Community Acequias in ***Colorado***'s Rio Culebra Watershed: A Customary Commons in the Domain of Prior Appropriation, [*74 U.* ***Colo.*** *L. Rev. 387 (2003).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:492W-4ST0-00CV-N07W-00000-00&context=1516831) [↑](#footnote-ref-76)
76. 76 [*Lobato v. Taylor, 71 P.3d 938, 943 (****Colo.*** *2002).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:4656-C5N0-0039-4562-00000-00&context=1516831) [↑](#footnote-ref-77)
77. 77 Norris & Norris, supra note 75, at 32, 220-22. [↑](#footnote-ref-78)
78. 78 Id. at 94, 221-22. [↑](#footnote-ref-79)
79. 79 Id. at 94, 104, 122, 139, 140, 146, 214. [↑](#footnote-ref-80)
80. 80 David Lavender, Westward Vision: The Story of the Oregon Trail 27 (1963). [↑](#footnote-ref-81)
81. 81 Randolph B. Marcy, The Prairie Traveler: A Hand-Book for Overland Expeditions 45 (Harper & Brothers 1959) (1859). [↑](#footnote-ref-82)
82. 82 Walter Prescott Webb, The Great Plains 385 (1931). [↑](#footnote-ref-83)
83. 83 Abbot et al., supra note 10, at 157. [↑](#footnote-ref-84)
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85. 85 [*Id. at 553*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRR-34H0-0040-045D-00000-00&context=1516831) [↑](#footnote-ref-86)
86. 86 ***Colorado*** law initially focused exclusively on irrigation, despite the stereotypical belief that mining produced the water law. Not until 1903 did ***Colorado*** adopt an adjudication act that provided for decreeing the priority dates of all beneficial uses, not just irrigation. See Gregory J. Hobbs, Jr., ***Colorado***'s 1969 Adjudication and Administration Act: Settling In, [*3 U. Denv. Water L. Rev. 1, 9 (1999).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42FS-2VV0-00C3-W0TR-00000-00&context=1516831) [↑](#footnote-ref-87)
87. 87 [*Yunker, 1* ***Colo.*** *at 552-53.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRR-34H0-0040-045D-00000-00&context=1516831) [↑](#footnote-ref-88)
88. 88 [*Id. at 556, 559.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRR-34H0-0040-045D-00000-00&context=1516831) [↑](#footnote-ref-89)
89. 89 Act of Nov. 5, 1861, sec. 1-6, 1861 ***Colo.*** Sess. Laws 67-68 (protecting and regulating the irrigation of lands). [↑](#footnote-ref-90)
90. 90 [*Yunker, 1* ***Colo.*** *at 570*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRR-34H0-0040-045D-00000-00&context=1516831) (Wells, J., concurring). [↑](#footnote-ref-91)
91. 91 ***Colo.*** Const. art. XVI (1876). [↑](#footnote-ref-92)
92. 92 [*Bd. of County Comm'rs v. Park County Sportsmen's Ranch, 45 P.3d 693, 706 (****Colo.*** *2002).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:45J9-VSF0-0039-427X-00000-00&context=1516831) [↑](#footnote-ref-93)
93. 93 ***Colo.*** Const. art. XVI (1876); Act of Feb. 19, 1879, 1879 ***Colo.*** Sess. Laws 94. [↑](#footnote-ref-94)
94. 94 Robert G. Dunbar, Forging New Rights in Western Waters 88-89 (1983). [↑](#footnote-ref-95)
95. 95 Gregory J. Hobbs, Jr., ***Colorado*** Water Law: An Historical Overview, 1 U. Denv. Water L. Rev. 9, 10 (1997). [↑](#footnote-ref-96)
96. 96 [*Coffin v. Left Hand Ditch* ***Co****., 6* ***Colo.*** *443, 446-47 (****Colo.*** *1882)*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRR-30P0-0040-03G0-00000-00&context=1516831) (citing Territorial Legislative Acts, 32, 1864 ***Colo.*** Sess. Laws 58). [↑](#footnote-ref-97)
97. 97 [*People ex rel. Rogers v. Letford, 79 P.2d 274, 280-81 (****Colo.*** *1938).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRM-Y3Y0-0040-01BD-00000-00&context=1516831) [↑](#footnote-ref-98)
98. 98 [*Bd. of County. Comm'rs v. Denver Bd. of Water Comm'rs, 718 P.2d 235, 239 (****Colo.*** *1986).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-12N0-003D-904B-00000-00&context=1516831) [↑](#footnote-ref-99)
99. 99 Gregory J. Hobbs, Jr., Priority: The Most Misunderstood Stick in the Bundle, [*32 Envtl. L. 37, 48 (2002).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:45R7-VBT0-00CW-B478-00000-00&context=1516831) [↑](#footnote-ref-100)
100. 100 See generally Daniel S. Young & Duane D. Helton, Developing a Water Supply in ***Colorado***: The Role of an Engineer, [*3 U. Denv. Water L. Rev. 373-90 (2000).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42FS-2W30-00C3-W0XW-00000-00&context=1516831) [↑](#footnote-ref-101)
101. 101 [*Simpson v. Bijou Irrigation* ***Co****., 69 P.3d 50, 55 (****Colo.*** *2003).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:48GW-CRR0-0039-44HJ-00000-00&context=1516831) [↑](#footnote-ref-102)
102. 102 Powell, supra note 7, at 42-43. [↑](#footnote-ref-103)
103. 103 Id. at 43. [↑](#footnote-ref-104)
104. 104 Donald Worster, A ***River*** Running West: The Life of John Wesley Powell 378 (2001). [↑](#footnote-ref-105)
105. 105 The rise of the cities and of commerce, in addition to agriculture, requires a water law that recognizes security, reliability, and flexibility. "Security resides in the system's ability to identify and obtain protection for the right of water use. Reliability springs from the system's assurance that the right of water use will continue to be recognized and enforced over time. Flexibility emanates from the fact that the right of water use can be changed, subject to quantification of the appropriation's historic beneficial consumptive use and prevention of injury to other water rights." [*Empire Lodge Homeowners' Ass'n v. Moyer, 39 P.3d 1139, 1147 (****Colo.*** *2001).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:44PW-3160-0039-4363-00000-00&context=1516831) [↑](#footnote-ref-106)
106. 106 Worster, supra note 104, at 371. [↑](#footnote-ref-107)
107. 107 Powell, supra note 7, at 10. [↑](#footnote-ref-108)
108. 108 William Gilpin, ***Colorado***'s first Territorial Governor, promoted western settlement during a cycle of wet weather, proclaiming another of the western great false prophecies: "rain follows the plow." Joni Louise Kinsey, Thomas Moran and the Surveying of the American West 110 (1992). After President Lincoln removed him as Territorial Governor after one year in office, Gilpin became a land development, railroad, and irrigation proponent. In numerous speeches and writings that received nationwide attention, he argued, "***Colorado***'s dryness was an advantage, for irrigated farming was the most efficient form of agriculture … ." Thomas L. Karnes, William Gilpin: Western Nationalist 318 (1970). [↑](#footnote-ref-109)
109. 109 Powell, supra note 7, at 11. [↑](#footnote-ref-110)
110. 110 Id. at 12-14. [↑](#footnote-ref-111)
111. 111 Kinsey, supra note 108, at 99. [↑](#footnote-ref-112)
112. 112 Powell, supra note 7, at 40-45; Worster, supra note 104, at 479-86. [↑](#footnote-ref-113)
113. 113 David Lavender, ***Colorado*** ***River*** Country 173 (1982). [↑](#footnote-ref-114)
114. 114 William deBuys, Seeing Things Whole: The Essential John Wesley Powell 214-15 (2001). [↑](#footnote-ref-115)
115. 115 Kinsey, supra note 108, at 98; Worster, supra note 104, at 356-58. [↑](#footnote-ref-116)
116. 116 Worster, supra note 104, at 494-95. [↑](#footnote-ref-117)
117. 117 See Nolan Doesken & Tom McKee, Drought in ***Colorado***, 1 ***Colo.*** Climate, Winter 1999/2000, at 13, 20. [↑](#footnote-ref-118)
118. 118 [*43 U.S.C. 371*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-7344-00000-00&context=1516831)-390 (2002). [↑](#footnote-ref-119)
119. 119 See [*Kansas v.* ***Colorado****, 185 U.S. 125 (1902).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-CF60-003B-H50Y-00000-00&context=1516831) [↑](#footnote-ref-120)
120. 120 [***Colo.*** *Rev. Stat. 37-60-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J31N-00000-00&context=1516831) to -130 (2002). [↑](#footnote-ref-121)
121. 121 Id. 37-46-101 to -151. [↑](#footnote-ref-122)
122. 122 Id. 37-45-101 to -153. [↑](#footnote-ref-123)
123. 123 ***Colo.*** Water Resources Research Inst., ***Colorado*** Water Conservancy Districts, at [*http://waterknowledge.colostate.edu/cnsvancy.htm*](http://waterknowledge.colostate.edu/cnsvancy.htm) (last visited Jan. 12, 2004). [↑](#footnote-ref-124)
124. 124 [*43 U.S.C. 620a*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-73SY-00000-00&context=1516831)-[*6*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T4F2-D6RV-H37N-00000-00&context=1516831)[*20*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T262-8T6X-730V-00000-00&context=1516831)o (2002). [↑](#footnote-ref-125)
125. 125 See id. [↑](#footnote-ref-126)
126. 126 Doesken & McKee, supra note 117, at 20. [↑](#footnote-ref-127)
127. 127 David H. Getches & Charles J. Meyers, The ***River*** of Controversy: Persistent Issues, in New Courses for the ***Colorado*** ***River***: Major Issues for the Next Century 51, 56 (Gary D. Weatherford & F. Lee Brown eds., 1986). [↑](#footnote-ref-128)
128. 128 Based on tree ring studies, the long term average flow of the ***Colorado*** ***River*** Basin is 13.5 million acre-feet, but the Compact negotiators assumed there was at least an average of 16 million acre-feet. "The system of reservoirs now in place in the ***Colorado*** Basin is capable of storing approximately four times the average annual flow of the ***river***." Kathleen A. Miller, Nat'l Center for Atmospheric Research, Climate Variability, Climate Change, and Western Water 42 (1997), at [*http://www.esig.ucar.edu/wwprac/report.pdf*](http://www.esig.ucar.edu/wwprac/report.pdf). [↑](#footnote-ref-129)
129. 129 [*16 U.S.C. 1131*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H4B8-00000-00&context=1516831)-1136 (2002). [↑](#footnote-ref-130)
130. 130 The Reclamation and Disposal of the Arid Public Lands of the West: Hearings Before the House Committee on the Public Lands, 56th Cong. (1901). [↑](#footnote-ref-131)
131. 131 Id. at 11 (statement of Hon. F.G. Newlands, of Nevada). [↑](#footnote-ref-132)
132. 132 Id. at 31. [↑](#footnote-ref-133)
133. 133 Id. at 13. [↑](#footnote-ref-134)
134. 134 Id. at 33 (statement of Hon. John F. Shafroth, of ***Colorado***). [↑](#footnote-ref-135)
135. 135 Id. [↑](#footnote-ref-136)
136. 136 Id. at 65 (statement of Gifford Pinchot, chief forester, United States Department of Agriculture). [↑](#footnote-ref-137)
137. 137 Duane A. Smith, Henry M. Teller: ***Colorado***'s Grand Old Man 229-30 (2002). [↑](#footnote-ref-138)
138. 138 See G. Michael McCarthy, Hour of Trial: The Conservation Conflict in ***Colorado*** and the West 1891-1907, at 88 (1977). [↑](#footnote-ref-139)
139. 139 Justice Gregory J. Hobbs, Jr., ***Colo.*** Found. for Water Educ., Citizen's Guide to ***Colorado*** Water Law 25 (2003). [↑](#footnote-ref-140)
140. 140 See McCarthy, supra note 138, at 88. [↑](#footnote-ref-141)
141. 141 Id. at 57. [↑](#footnote-ref-142)
142. 142 [*16 U.S.C. 471*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H2J4-00000-00&context=1516831)-539 (2002). [↑](#footnote-ref-143)
143. 143 Id. 524, 525. [↑](#footnote-ref-144)
144. 144 [*43 U.S.C. 371*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-7344-00000-00&context=1516831)-390 (2002). [↑](#footnote-ref-145)
145. 145 Donald J. Pisani, Federal Reclamation in the Twentieth Century: A Centennial Retrospective 33 (2002) (unpublished manuscript, prepared for the U.S. Bureau of Reclamation Centennial Symposium, June 18-19, 2002). Powell had estimated that thirty million acres could be irrigated; the actual productive area today is closer to ten million. Shelly C. Dudley, The First Five: A Brief Overview of the First Reclamation Projects Authorized by the Secretary of the Interior March 14, 1903, at 30 (2001) (unpublished manuscript, prepared for the U.S. Bureau of Reclamation Centennial Symposium, June 18-19, 2002). [↑](#footnote-ref-146)
146. 146 Jay Brigham, From Water to Water and Power: The Changing Charge of the Bureau of Reclamation 15 (2002) (unpublished manuscript, prepared for the U.S. Bureau of Reclamation Centennial Symposium, June 18-19, 2002). [↑](#footnote-ref-147)
147. 147 Pisani, supra note 145, at 15-16. [↑](#footnote-ref-148)
148. 148 Brigham, supra note 146, at 3. [↑](#footnote-ref-149)
149. 149 Pisani, supra note 145, at 14, 32. [↑](#footnote-ref-150)
150. 150 Patricia Nelson Limerick, One Hundred Years of The Bureau of Reclamation: Looking from the Outside In 11, 15-16 (2002) (unpublished manuscript, prepared for the U.S. Bureau of Reclamation Centennial Symposium, June 18-19, 2002). [↑](#footnote-ref-151)
151. 151 See generally Dudley, supra note 145 (discussing the Bureau's first five projects). The other three of the earliest projects were the Milk ***River*** (Montana), Newlands (Truckee, Nevada), and Salt ***River*** (Arizona) projects. Id. [↑](#footnote-ref-152)
152. 152 David Lavender, supra note 113, at 175-77 (1982). [↑](#footnote-ref-153)
153. 153 Dudley, supra note 145, at 12. [↑](#footnote-ref-154)
154. 154 Id. [↑](#footnote-ref-155)
155. 155 Id. at 13. [↑](#footnote-ref-156)
156. 156 William E. Hill, The Oregon Trail: Yesterday and Today 32-38 (1994) (containing copies of the Fremont-Preuss maps). [↑](#footnote-ref-157)
157. 157 See generally Merrill J. Mattes, The Great Platte ***River*** Road: The Covered Wagon Mainline Via Fort Kearny To Fort Laramie 378-521 (1969) (presenting the important role the Platte ***River*** Road played in opening the West). [↑](#footnote-ref-158)
158. 158 See Dudley, supra note 145, at 17-18. [↑](#footnote-ref-159)
159. 159 Id. at 18. [↑](#footnote-ref-160)
160. 160 Id. [↑](#footnote-ref-161)
161. 161 Id. [↑](#footnote-ref-162)
162. 162 [*43 U.S.C. 523*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-73J8-00000-00&context=1516831)-525 (2002). [↑](#footnote-ref-163)
163. 163 Dudley, supra note 145, at 17-18; Alan S. Newell, Did The Secretary Sell Us "Blue Sky'? Inclusion of Warren Act Contractors in the North Platte ***River*** Project 2-3 (2002) (unpublished manuscript, prepared for the U.S. Bureau of Reclamation Centennial Symposium, June 18-19, 2002). [↑](#footnote-ref-164)
164. 164 [*Kansas v.* ***Colorado****, 185 U.S. 125, 138 (1902).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-CF60-003B-H50Y-00000-00&context=1516831) [↑](#footnote-ref-165)
165. 165 Id.; [*Kansas v.* ***Colorado****, 206 U.S. 46 (1907).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) [↑](#footnote-ref-166)
166. 166 [*206 U.S. at 85.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) [↑](#footnote-ref-167)
167. 167 [*Id. at 117-18.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) [↑](#footnote-ref-168)
168. 168 [*Id. at 92, 97;*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) accord [*Simpson v. Highland Irrigation Company, 917 P.2d 1242, 1247 (****Colo.*** *1996)*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX3-YX20-003D-91KF-00000-00&context=1516831) (referencing and summarizing the U.S. Supreme Court's 1907 decision). The Supreme Court pointed out that section 8 of the Reclamation Act requires the secretary to proceed "in conformity" with state laws. [*Kansas v.* ***Colorado****, 206 U.S at 93.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) [↑](#footnote-ref-169)
169. 169 William A. Paddock, The Rio Grande Compact of 1938, [*5 U. Denv. Water L. Rev. 1, 13 (2001);*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:459P-SCT0-00SW-5050-00000-00&context=1516831) see Daniel Tyler, Silver Fox of the Rockies: Delphus E. Carpenter and Western Water Compacts 119, 154, 169, 314 n.58 (2003). [↑](#footnote-ref-170)
170. 170 [*Wyoming v.* ***Colorado****, 259 U.S. 419 (1922).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-45S0-003B-H2C4-00000-00&context=1516831) [↑](#footnote-ref-171)
171. 171 Tyler, supra note 169, at 119. [↑](#footnote-ref-172)
172. 172 Id. at 8. [↑](#footnote-ref-173)
173. 173 See James S. Lochhead, An Upper Basin Perspective on California's Claims to Water from the ***Colorado*** ***River***, [*4 U. Denv. Water L. Rev. 290, 291, 299 (2001).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:43XH-WN80-00SW-5022-00000-00&context=1516831) [↑](#footnote-ref-174)
174. 174 [*Wyoming v.* ***Colorado****, 259 U.S. at 496.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-45S0-003B-H2C4-00000-00&context=1516831) [↑](#footnote-ref-175)
175. 175 Lochhead, supra note 173, at 294. [↑](#footnote-ref-176)
176. 176 ***Colorado*** ***River*** Compact, [***Colo.*** *Rev. Stat. 37-61-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J33S-00000-00&context=1516831) (2002). [↑](#footnote-ref-177)
177. 177 Doesken & McKee, supra note 117, at 20. [↑](#footnote-ref-178)
178. 178 Lochhead, supra note 173, at 319. [↑](#footnote-ref-179)
179. 179 See Steven C. Schulte, Wayne Aspinall and the Shaping of the American West 25, 68 (2002); see also Carol Edmonds, Wayne Aspinall: Mr. Chairman (1980). [↑](#footnote-ref-180)
180. 180 See generally Daniel Tyler, The Last Water Hole in the West: The ***Colorado*** - Big Thompson Project and the Northern ***Colorado*** Water Conservancy District 4, 19-25 (1992) (describing the development and construction of the C-BT project). [↑](#footnote-ref-181)
181. 181 [***Colo.*** *Rev. Stat. 37-60-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J31N-00000-00&context=1516831) to -130 (2002). [↑](#footnote-ref-182)
182. 182 Id. 37-46-101 to -151. [↑](#footnote-ref-183)
183. 183 Id. 37-45-101 to -153. [↑](#footnote-ref-184)
184. 184 ***Colorado*** Water Resources Research Institute, ***Colorado*** Water Conservancy Districts, at [*http://waterknowledge.colostate.edu/cnsvancy.htm*](http://waterknowledge.colostate.edu/cnsvancy.htm) (last visited Jan. 12, 2004). [↑](#footnote-ref-185)
185. 185 [***Colo.*** *Rev. Stat. 37-48-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J2VH-00000-00&context=1516831) to -195 (2002). [↑](#footnote-ref-186)
186. 186 Id. 37-47-101 to -151. [↑](#footnote-ref-187)
187. 187 See, e.g., [*43 U.S.C. 485h*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:6483-73C3-GXJ9-33R2-00000-00&context=1516831)(c) (2002). [↑](#footnote-ref-188)
188. 188 [***Colo.*** *Rev. Stat. 37-45-121*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J2N1-00000-00&context=1516831) to -131 (2002). [↑](#footnote-ref-189)
189. 189 See, e.g., id. 37-45-102(1). [↑](#footnote-ref-190)
190. 190 Id. 37-60-104(1). [↑](#footnote-ref-191)
191. 191 See id. 37-60-106. [↑](#footnote-ref-192)
192. 192 Id. 37-92-301. [↑](#footnote-ref-193)
193. 193 Id. 37-90-107. [↑](#footnote-ref-194)
194. 194 See Hobbs, supra note 139, at 19. [↑](#footnote-ref-195)
195. 195 Getches & Meyers, supra note 127, at 56. [↑](#footnote-ref-196)
196. 196 [***Colo.*** *Rev. Stat. 37-61-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J33S-00000-00&context=1516831) art. III(d); Hobbs, supra note 139, at 23. [↑](#footnote-ref-197)
197. 197 Edward W. Clyde, Institutional Response to Prolonged Drought, in New Courses for the ***Colorado*** ***River***: Major Issues for the Next Century 113 (Gary D. Weatherford and F. Lee Brown eds., 1986). [↑](#footnote-ref-198)
198. 198 ***Colorado*** ***River*** Storage Project Act, [*43 U.S.C. 620*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-73SX-00000-00&context=1516831)-[*6*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T4F2-D6RV-H37N-00000-00&context=1516831)[*20*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T262-8T6X-730V-00000-00&context=1516831)o (2002). [↑](#footnote-ref-199)
199. 199 ***Colorado*** ***River*** Basin Act, [*43 U.S.C. 1501*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-74D2-00000-00&context=1516831)(a) (2000); [*Bd. of County Comm'rs v. Crystal Creek Homeowners' Ass'n., 14 P.3d 325, 333, 339-340 (****Colo.*** *2000).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:41PW-C4S0-0039-403H-00000-00&context=1516831) [↑](#footnote-ref-200)
200. 200 [*Crystal Creek Homeowners' Ass'n, 14 P.3d at 334;*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:41PW-C4S0-0039-403H-00000-00&context=1516831) Hobbs, supra note 139, at 20-21. [↑](#footnote-ref-201)
201. 201 See Norris Hundley, Jr., The Great Thirst, Californians and Water, 1770s-1990s, at 307-309 (1992). For a wonderfully readable account of the construction of Glen Canyon Dam, see Russell Martin, A Story That Stands Like a Dam, Glen Canyon and the Struggle for the Soul of the West (1989) [↑](#footnote-ref-202)
202. 202 Schulte, supra note 179, at 66. [↑](#footnote-ref-203)
203. 203 Robert W. Karrow, Jr., George M. Wheeler and The Geographical Surveys West of the 100th Meridian 1869-1879, in Exploration and Mapping of the American West: Selected Essays 121-124 (Donna P. Koepp ed., 1986). [↑](#footnote-ref-204)
204. 204 Harper's Weekly - which modestly called itself "A Journal of Civilization" - described Denver as an oasis community created in the desert a little over 25 years after the 1858 gold strike at the junction of Cherry Creek and the South Platte ***River***:

     If the city were less substantial in appearance than it is, if it possessed certain glaring peculiarities, it would be much easier to describe it. But it so belies its age, and seems so much older than it really is, that one falls to taking for granted that which should be surprising. Wide, shaded, and attractive-looking streets, handsome residences surrounded by spacious grounds, noble public buildings, and the many luxuries of city life, tempt one to forget that Denver has gained all these excellencies in less than twenty-five years. Every tree that one sees has been planted and tended; every attractive feature is the result of good judgment and careful industry. Nature gave Denver the mountains which the city looks out upon; but beyond those hills and the bright sky and the limitless plains, she gave nothing to the place which one has only to see to admire. The site originally was a barren waste, dry and hilly. Never was it green, except perchance in early spring, and not a tree grew, save a few low bushes clinging to the banks of the ***river***. Surrounded on the east, south, and north by the extended prairie lands, fast being converted into productive farms, and having on the west the mountains with their treasures of gold, silver, coal, iron, and lead, Denver is the natural concentrator of all the productions of ***Colorado***. From it are sent forth the capital, the machinery, and the thousand and one other necessities of a constantly increasing number of people engaged in developing a new country.

     The West: A Collection from Harper's Magazine 52-53 (1990). [↑](#footnote-ref-205)
205. 205 See generally Kevin J. Fernlund, William Henry Holmes and the Rediscovery of the American West 102-122 (2000); William Henry Jackson & John Fielder, ***Colorado*** 1870-2000 (2000); John Muir, Our National Parks, in John Muir: The Eight Wilderness Discovery Books 457-605 (1992); Thomas J. Noel & John Fielder, ***Colorado*** 1870-2000 Revisited: The History Behind The Images (2001); Paul D. Sheats, After Yosemite: John Muir and the Southern Sierra, in John Muir: Life and Work 245-264 (Sally M. Miller ed., 1993); Douglas Waitley, William Henry Jackson: Framing the Frontier 105-141 (1998); Thurman Wilkins, Thomas Moran: Artist of the Mountains 106-135 (2d ed. 1998). [↑](#footnote-ref-206)
206. 206 John Muir, The Yosemite, in The Eight Wilderness Discovery Books 715 (1992). [↑](#footnote-ref-207)
207. 207 [*16 U.S.C. 1131*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H4B8-00000-00&context=1516831)-1136 (2002); [*Sierra Club v. Yeutter, 911 F.2d 1405, 1408 (10th Cir. 1990).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-3B60-003B-53MR-00000-00&context=1516831) [↑](#footnote-ref-208)
208. 208 See Roderick Nash, Wilderness and the American Mind 215-219 (1967). [↑](#footnote-ref-209)
209. 209 Id. at 219. [↑](#footnote-ref-210)
210. 210 Wallace Stegner, Wilderness Letter, in Marking the Sparrow's Fall: Wallace Stegner's American West 112 (Page Stegner ed., 1998). [↑](#footnote-ref-211)
211. 211 See Hobbs, supra note 139, at 13. [↑](#footnote-ref-212)
212. 212 Id. at 23. [↑](#footnote-ref-213)
213. 213 Id. at 20. [↑](#footnote-ref-214)
214. 214 Id. at 22. [↑](#footnote-ref-215)
215. 215 Id. [↑](#footnote-ref-216)
216. 216 Id. at 21. The reliance of the United States on storage is shown by an illustration that storage capacity increased from less than 50 million acre-feet in 1925 to 450 million acre-feet in 1990. Wayne B. Solley, U.S. Geological Survey, Estimates of Water Use in the Western United States in 1990 and Water-Use Trends 1960-90, at 2 (1997), available at [*http://www.waterwest.org/reading/readingfiles/fedreportfiles/wat*](http://www.waterwest.org/reading/readingfiles/fedreportfiles/wat) eruse.pdf. [↑](#footnote-ref-217)
217. 217 Hobbs, supra note 139, at 4. [↑](#footnote-ref-218)
218. 218 Id. at 7. [↑](#footnote-ref-219)
219. 219 Id. [↑](#footnote-ref-220)
220. 220 See id. at 13. [↑](#footnote-ref-221)
221. 221 Id. at 7. [↑](#footnote-ref-222)
222. 222 See id. at 15. [↑](#footnote-ref-223)
223. 223 See id. at 16. [↑](#footnote-ref-224)
224. 224 [***Colo.*** *Rev. Stat. 37-92-102*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J3FN-00000-00&context=1516831), -60-122.2 (2002). [↑](#footnote-ref-225)
225. 225 Id. 37-92-102(5)-(6), -92-103(4). [↑](#footnote-ref-226)
226. 226 Id. 37-92-102(3), -102(5). [↑](#footnote-ref-227)
227. 227 Donald Wilhite, Nat'l Drought Mitigation Ctr., Improving Drought Management in the West 17 (June 1997), available at [*http://www.waterwest.org/reading/readingfiles/fedreportfiles/drought.pdf*](http://www.waterwest.org/reading/readingfiles/fedreportfiles/drought.pdf). [↑](#footnote-ref-228)
228. 228 Id. at 18. [↑](#footnote-ref-229)
229. 229 S. 03-073, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (substitute, temporary, and emergency water supply plans); H.R. 03-1001, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (prohibiting new restrictive covenants limiting use of drought tolerant vegetation, providing technical assistance for customer water use and billing systems, allowing State Engineer approval of temporary changes of water rights); H.R. 03-1008, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (water rights for conservation easements); H.R. 03-1318, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (water banks to all seven water divisions); H.R. 03-1320, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (loans of water rights for instream flow use in drought emergencies); H.R. 03-1334, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (temporary interruptible water supply agreements during time of drought emergency). [↑](#footnote-ref-230)
230. 230 S. 03-115, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (financial mitigation to counties for removal of agricultural water); [↑](#footnote-ref-231)
231. 231 S. 03-110, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003) (Water Conservation Board funding, section 14). [↑](#footnote-ref-232)
232. 232 Bernard DeVoto, The Course of Empire 507 (1952). [↑](#footnote-ref-233)