Water Policy 19 (2017) 837–850

Roles of the Water Court and the State Engineer for water administration in Colorado

William C. McIntyre and David C. Mays*

Department of Civil Engineering, University of Colorado Denver, Campus Box 113, PO Box 173364, Denver, CO 80217-3364, USA

**Corresponding author. E-mail: david.mays@ucdenver.edu*

Abstract

Colorado manages water using an administrative structure that is unique among the United States following the doctrine of prior appropriation: Water rights are adjudicated not by the State Engineer, but by Water Courts – separate from and operating in parallel to the criminal and civil courts – established specifically for this purpose. Fundamental to this system is the notion that water rights are property, with consequent protections under the US Constitution, but with the significant constraint that changes in water rights must not injure other water rights, either more senior or more junior. Population growth and climate change will certainly trigger changes in water administration, to be guided by the recent Colorado Water Plan. To provide the foundation necessary to appreciate these changes, this paper reviews the history of Colorado water administration and summarizes the complementary roles of the Water Courts and the State Engineer. Understanding water administration in Colorado depends on a firm grasp on how these two branches of state government formulate and implement water policy.

Keywords: Adjudication; Administration; Colorado Constitutional Convention; Colorado Water Plan; Doctrine of prior appropriation; No injury rule; Property rights; State Engineer; Water Courts; Water rights

Introduction

Among the mechanisms created to manage scarce natural resources, water administration in Colorado presents a case study that is unique among the nine western United States using the doctrine of prior appropriation. This paper examines several facets of water resources administration, policy formulation, and judicial involvement by exploring the legislative history leading to the creation of Water Courts, which adjudicate water rights, and the Colorado Division of Water Resources, also called the Office of the State Engineer, which enforces water rights. Particular attention is given to the role of judicial review of State Engineer policy.

doi: 10.2166/wp.2017.145

This paper is structured as follows. The next section provides essential background on the doctrine of prior appropriation, the guiding principle of water administration in all states west of the 100th meridian and east of the Pacific coast states of Washington, Oregon, and California (Figure 1). The following section presents the role of the Water Courts, including the foundation of the doctrine of prior appropriation during Colorado's constitutional convention of 1875–1876 and the landmark court decisions that have guided its implementation since then. The next section focuses on the role of the State Engineer, beginning with an overview of its structure, and evaluating its policy-making authority in the context of judicial review. The discussion applies this background to two contemporary issues, the public trust doctrine and the Colorado Water Plan (Colorado Water Conservation Board, 2015). Taken together, this study provides the foundation necessary to appreciate the anticipated changes in water administration in Colorado triggered by population growth and climate change.

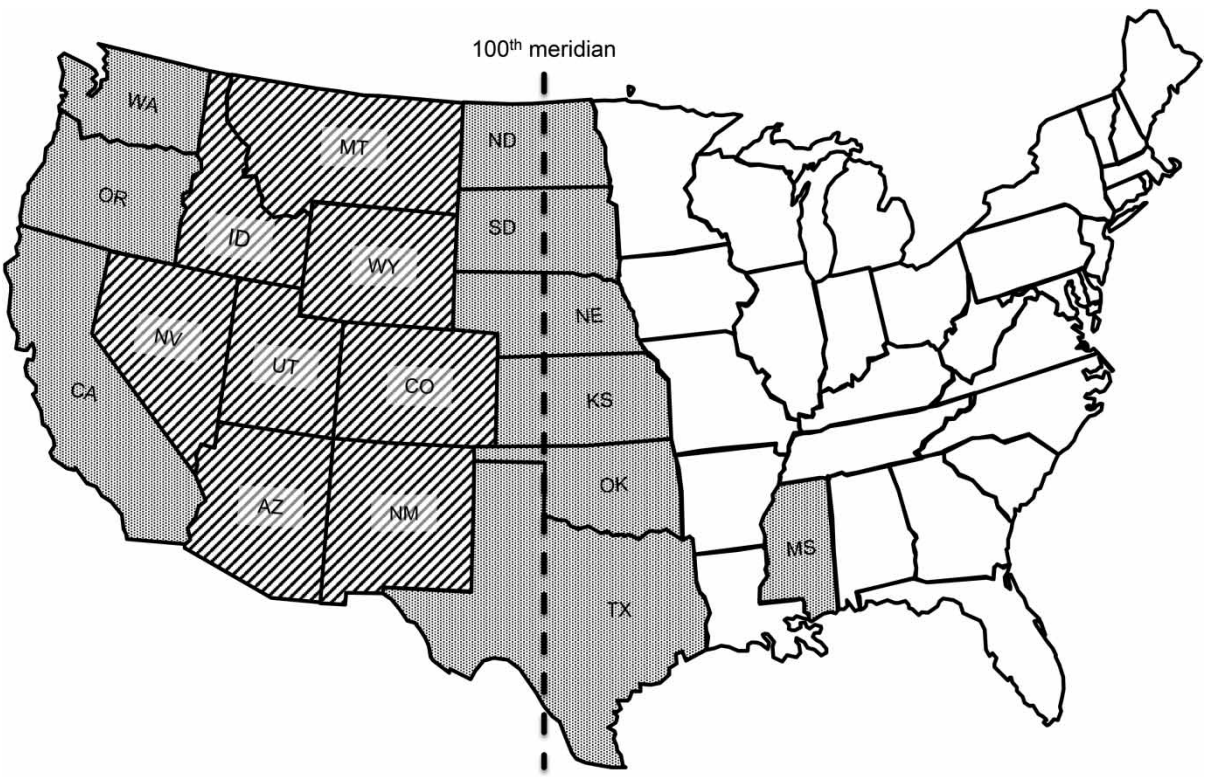

Fig. 1. Regional patterns of water administration in the United States. Cross-hatched states follow the doctrine of prior appropriation: Alaska (not shown), Arizona (AZ), Colorado (CO), Idaho (ID), Montana (MT), Nevada (NV), New Mexico (NM), Utah (UT), and Wyoming (WY). Dotted states use a hybrid system combining elements of the doctrine of prior appropriation and the riparian doctrine: California (CA), Kansas (KS), Mississippi (MS), Nebraska (NE), North Dakota (ND), Oklahoma (OK), Oregon (OR), South Dakota (SD), Texas (TX), and Washington (WA). The remaining states follow the riparian doctrine.

Doctrine of prior appropriation

According to State Engineer Dick Wolfe, there are four basic tenants of the doctrine of prior appropriation as practiced in Colorado (personal communication, Dick Wolfe, 2014). First, water must be used for a judicially-recognized beneficial use. Second, use of the water must not result in injury to other water right holders, which has been called the no injury rule (Squillace, 2015). Third, water must be used efficiently and not result in waste. Fourth, water must be physically diverted from its source, with exceptions for instream flow water rights for environmental preservation and recreational in-channel uses. Within these four tenants, the doctrine of prior appropriation assigns water rights in order of seniority, leading to the expression *first in time, first in right* (*Comstock v. Ramsay*, 1913). This doctrine is in contrast to the riparian doctrine, effective in most states east of the Mississippi River, which links water rights to land ownership, such that landowners may use water from lakes, streams, rivers, or groundwater on their land (Tarlock *et al.*, 2009). Indeed, the doctrine of prior appropriation is the law of the land in every state west of the 100th meridian and east of the Pacific coast states of Washington, Oregon, and California (Figure 1). To provide the background necessary to understand water administration in Colorado, we place the doctrine of prior appropriation into a geographic context, then review its basic tenants. By and large, this information is applicable not only to Colorado but to most western states.

Geographic range

To appreciate Colorado's water administration procedures and its complexity, it is instructive to review the geographic range of the doctrine of prior appropriation. As shown in Figure 1, this doctrine applies to nine western states (Getches, 2009, pp. 243–244): Alaska, Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. Each of these states is located entirely west of the 100th meridian, which separates the dry west (with average annual precipitation below 20 in =51 cm) from the wet east (with average annual precipitation above 20 in =51 cm). This pattern emphasizes how natural resources policy depends on geographic context. In the above states, the annual rainfall is insufficient to supply all agricultural needs, which were paramount in the 19th century when the western territories became states (Getches, 2009, p. 77). To put this in context, as of 2009, net farm income constituted only 0.3% of Colorado's gross domestic product (Squillace, 2015). But in 1876, during Colorado's constitutional convention, agriculture was considered so important that it outranked manufacturing for priority in assigning water rights.

Nine western and one eastern states use a combination of the doctrine of prior appropriation and the riparian doctrine referred to as the *hybrid system* (Figure 1). Those ten states are California, Kansas, Mississippi, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Texas, and Washington. Except for Mississippi, every state using the hybrid system is adjacent to a prior appropriation state. Once again, this reflects the importance of geography. In the Pacific coast states, the climate is wet (with annual precipitation exceeding 20 in =51 cm) on the ocean side of the Cascades and the Coast Range, but dry (with annual precipitation below 20 in =51 cm) farther inland. In the states straddling the 100th meridian, as discussed above, the climate is wet to the east and dry to the west. Viewed in this context, it is apparent why these nine hybrid states (all but Mississippi) would combine the doctrine of prior appropriation and the riparian doctrine.

Basic tenants

Within the framework outlined above – beneficial use, no injury, no waste, and physical diversion – priority is the essential feature of the doctrine of prior appropriation. In times of shortage, holders of senior water rights may take water from holders of junior water rights. This doctrine comprises several other basic tenants. First, as a general rule, private persons do not own water in its natural state; most states declare that water belongs to the public or to the state. However, the right to divert water for beneficial use is considered a usufructuary right. Second, in most states, the holder of a water right can, without loss or priority, sell it outright or transfer it to be used for a different purpose on another parcel of land. However, a person holding a senior water right cannot change its established use or its place of diversion to the detriment of a person holding a junior water right. Third, within each state, the priority system is subordinate to interstate compacts, which allocate flows between states, and to Federal law. For example, instream flows can receive protection under the Federal Wild and Scenic Rivers Act. Conversely, the priority system can take precedence over other intrastate regulations. For example, in Colorado, the Water Quality Control Commission regulates water quality but is prohibited by statute from interfering with the exercise of water rights. Most statutory schemes require water users to have decrees, which are typically issued by the State Engineer. Colorado is the only prior appropriation state with unitary administration of water rights, where a permit is issued through the Water Court rather than the State Engineer (University of Montana School of Law, 2014).

Colorado was the first state to establish a system of Water Courts, separate from its civil courts and criminal courts, to administer water rights (Getches, 2009, p. 164). The Colorado Water Rights Determination and Administration Act of 1969 divided authority between the Water Courts and the State Engineer. Crucially, the Water Courts were established as the only venue for issuing water decrees (Hobbs, 1999). Correspondingly, the 1969 Act commands the State Engineer, Division Engineers, and Water Commissioners to administer the waters of natural streams in accordance with these decrees. As such, the 1969 Act codified, more forcefully and clearly than ever before, Colorado's unique approach to water administration: adjudication by the Water Courts executed by the State Engineer. Kassen (1999) contends that if Colorado were to follow a permit-based system like other prior appropriation states (Figure 1), in which the State Engineer issues water permits, then the State Engineer could also have responsibilities for resource management and planning, which could lead to efficiencies in water allocation and certainty of consistent procedures. Kassen's concerns with Colorado water administration have gained additional gravity recently in light of the now-widely recognized need to adapt water administration to climate change (Frisvold, 2015). Additionally, Squillace (2015) argues that the no injury rule imposes high transaction costs that present a barrier to maximum utilization. The decisions leading to this policy are outlined in the next section, and the executive role of the State Engineer is summarized in the following section.

Role of the Water Courts

Here we review the historical perspective necessary to appreciate the central role of the Water Courts, starting with the constitutional convention of 1875–1876, then turning to foundational court decisions. This analysis will show that Colorado's water administration has deep roots going back to the formation of the state government.

Constitutional convention of 1875–1876

The Colorado Constitutional Convention began on December 20, 1875 and included a nine-member committee on irrigation. Up until that time, riparian law was the default, but irrigation committee co-chair S.J. Plumb of Greeley was determined to change the system to prevent the upstream community of Ft. Collins and other proposed water diversions from commandeering the flow of the river during the next drought (Stenzel & Cech, 2013, p. 197). The water-related provisions of the Colorado Constitution appear in Article XVI Sections 5–8 (Colo. Const., 1876), whose evolution is shown in Tables 1–4, respectively. Let us consider each section in turn, summarizing details reported by O'Connor (1907, pp. 296–297).

The evolution of Section 5 (Water of Streams Public Property) is shown in Table 1. The original text included two key points. First, it assigned ownership of water 'at all times' to the State. Second, it assigned control to the General Assembly. The next iteration, introduced by Plumb on February 11, 1876, reversed both of these points. On the first point, Plumb's text assigned ownership to the People and removed the phrase 'at all times.' This change paved the way for subsequent court rulings that continued to recognize unappropriated water as public property, but interpreted water rights as property subject to protection under the US Constitution. On the second point, Plumb's text removed the reference to the General Assembly. This change would ultimately lead to Colorado's current water

Table 1. Draft and final text of the Colorado Constitution, Article XVI, Section 5 (Water of Streams Public Property).

Date and Author	Proposed Text	Changes from Previous
1/5/1876 Carr of Boulder	The primary right of ownership in the waters of all the streams in this State is and shall be at all times in the State, and the said streams and the waters therein are and shall be subject to the control of the Legislature.	
	↓	
2/11/1876 Plumb of Greeley	The water of every natural stream within the State of Colorado is hereby declared to be the property of the People of said State and the same is dedicated to their use forever.	• Removes reference to Legislature. • Changes ownership from State to People.
	↓	
2/18/1876 Felton of Gunnison	The unappropriated water of the natural streams within the State of Colorado is hereby declared to be dedicated to the use of the public, subject to the provisions of this Constitution and the laws of the General Assembly.	• Replaces reference to Legislature. • Adds appropriation.
	↓	
2/23/1876 (early) Plumb of Greeley	The water of every natural stream, not heretofore appropriated within the State of Colorado, is hereby declared to be the property of the public, and the same is dedicated to their use as herein provided by this Constitution.	• Removes reference to Legislature.
	↓	
2/23/1876 (late) Irrigation Committee	The water of every natural stream, not heretofore appropriated within the State of Colorado, is hereby declared to be the property of the public and the same is dedicated to the use of the people of the State, subject to appropriation as hereinafter provided.	• Adds 'as hereinafter provided' to appropriation.

Table 2. Draft and final text of the Colorado Constitution, Article XVI, Section 6 (Diverting Unappropriated Water – Priority Preferred Uses).

Date and Author	Proposed Text	Changes from Previous
1/5/1876 Carr of Boulder	It shall be the duty of the Legislature from time to time to pass such laws as may be necessary to secure a just and equitable distribution of the water in the streams of the State, for mining, irrigating and manufacturing purposes, in such a manner as to best foster and encourage these great industries of the State; promote the greatest good to the greatest number of citizens of the State; and at the same time to provide for the security and protection of all person in their individual rights.	
	↓	
2/11/1876 Plumb of Greeley	Priority of appropriation shall give priority of right except from the first day of June until the first day September in each and every year, when lands used for agricultural purposes shall have the preference.	• Removes Legislature. • Adds prior appropriation. • Adds summer exception.
	↓	
2/23/1876 Irrigation Committee	Except for domestic purposes, priority of appropriation shall give priority right, except from the last day of May until the first day September, in each and every year, when lands used for agricultural and horticultural purposes shall have the preference over manufacturing establishments.	• Adds horticulture to summer exception. • Adds domestic preference. • Adds manufacturing aversion.
	↓	
3/1/1876 Pease of Park and Lake Counties	The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose, but when the waters of any natural stream are not sufficient for the service of all those desiring to use the same, those using the water for agricultural purposes shall have preference over those using the same for the purpose of manufacturers.	• Removes summer exception. • Removes domestic preference. • Adds unappropriated waters. • Adds beneficial use.
	↓	
FINAL	The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose; but when the waters of any natural stream are not sufficient for the service of all domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes.	• Replaces domestic preference. • Replaces manufacturing aversion.

administration policy, in which the judicial branch and the executive branch (i.e., the Water Courts and the State Engineer) have more active roles while the legislative branch has a less active role. The next iteration replaced the reference to the General Assembly, although that change was short-lived, being removed in the next iteration. But this iteration replaced 'water' with 'unappropriated water', imposing a significant constraint on the notion of public ownership, because it specified that the public only owns

Table 3. Draft and final text of the Colorado Constitution, Article XVI, Section 7 (Right-Of-Way for Ditches, Flumes).

Date and Author	Proposed Text	Changes from Previous
2/11/1876 Plumb of Greeley	All persons and corporations shall have the right of way across public, private and corporate lands for the construction of ditches, canals and flumes for the purpose of conveying water for the irrigation of agricultural lands and for mining and manufacturing purposes and for drainage.	
	↓	
2/23/1876 Irrigation Committee	All persons and corporations shall have the right of way across public, private and corporate lands, for the construction of ditches, canals and flumes for the purpose of conveying water for domestic purposes and for the irrigation of agricultural lands and for mining and manufacturing purposes and for drainage, upon payment of just compensation.	• Adds domestic purposes. • Adds just compensation.

Table 4. Draft and final text of the Colorado Constitution, Article XVI, Section 8 (County Commissioners to Fix Rates for Water, When).

Date and Author	Proposed Text	Changes from Previous
2/11/1876 Plumb of Greeley	The Board of County Commissioners in their respective counties shall regulate the price to be charged for the use of water, whether furnished by individuals or by corporation, so as to secure justice between the contracting parties.	
	↓	
FINAL	The General Assembly shall provide by law that the Board of County Commissioners in their respective counties, shall have power, when application is made to them by either party interested, to establish reasonable maximum rates to be charged for the use of water, whether furnished by individuals or corporations.	• Removes 'to secure justice'. • Adds reference to Legislature. • Adds applications. • Adds maximum rates.

unappropriated water. This was a second paving stone on the path to establishing water rights as property. The final text qualified the concept of appropriation 'as hereinafter provided,' suggesting that the State would henceforth be developing a system to administer water rights. This would certainly be the case.

The evolution of Section 6 (Diverting Unappropriated Water – Priority Preferred Uses) is shown in Table 2. The original text assigned the responsibility for water allocation to the General Assembly and called for water allocation for 'the greatest good for the greatest number of citizens,' which anticipated the public trust doctrine (Walters, 2015). The first iteration made fundamental changes on both points, removing any reference to the General Assembly and 'the greatest good …' and replacing it with the first mention of prior appropriation. Here we see the legal origin of the doctrine of prior appropriation. The first iteration also added a summer exception for agriculture, which was modified in the second iteration to rank priority of use in the order domestic, agricultural, and manufacturing. The third iteration added the key phrase 'beneficial use,' which became a building block in the doctrine of prior appropriation.

The evolution of Section 7 (Right-Of-Way for Ditches, Flumes) is shown in Table 3. The original text made a major departure from the riparian doctrine granting water rights easements across the property of others. Only one iteration of this Section is documented, softening the blow by adding 'just compensation' for property owners compelled to allow construction of ditches, canals, or flumes. This easement rule clearly signaled that water was important business in Colorado – important enough to take precedence over other property rights.

Finally, the evolution of Section 8 (County Commissioners to Fix Rates for Water, When) is shown in Table 4. This Section assigned regulatory authority to county commissioners, perhaps reflecting an implicit understanding that water supply infrastructure is a natural monopoly. The final text adds a reference to the General Assembly, but – importantly – without actually assigning the General Assembly any substantial authority over water administration.

Taken together, several themes emerge from the constitutional convention of 1875–1876. First, from the first draft, it was recognized that water administration would be necessary in an arid state such as Colorado. The riparian doctrine is absent; its replacement, the doctrine of prior appropriation, had yet to be formulated. Through the iterations shown in Tables 1–4, we see the public trust-like notion of 'the greatest good for the greatest number' removed and replaced with a priority system based on beneficial use.

Second, the constitutional convention laid the foundation for the subsequent establishment of water rights as property. Water was assigned to the people, not the state. The phrase 'at all times' was removed, allowing flexibility in the interpretation of public ownership. The availability of water was limited to unappropriated water, suggesting that appropriated water was not available. The final language in the Colorado Constitution still contains an explicit ranking of preference for use, with domestic first, agriculture second, and manufacturing third. But, as will be shown below, this ranking has been interpreted narrowly in the context of unappropriated water, rather than giving higher-preference users the right to take possession of water appropriated to lower-preference users. Once again, this policy stems from the interpretation of water rights as property. To understand this interpretation, we now turn to two foundational Colorado Supreme Court decisions.

Foundational Supreme Court decisions

In the late 19th century, the Colorado Supreme Court rendered two building blocks for Colorado water law. The first case was *Fuller v. Swan River Placer Mining Company* (1888), which granted the right to change a water right's place of diversion and place of use. The Swan River Company changed their place of diversion and place of use, to which Fuller *et al.* objected. The Colorado Supreme Court specifically cited *Sieber v. Frink* (1884), 'that the point of diversion may be changed without affecting the right of priority, where no change is made in the quantity of water diverted, and no one is injured by the change,' and referenced several California Supreme Court opinions allowing holders of water rights to change the place of diversion or place of use with the restriction that such changes may not injure the water rights of others.

The second case was *Strickler v. City of Colorado Springs* (1891), which declared water rights to be property protected by the US Constitution. Colorado Springs purchased agricultural water rights on Fountain Creek and requested to transfer the point of diversion to take advantage of a ditch, reservoir and pipeline constructed previously. Strickler objected, arguing that a water right is tied to the land and should not be moved upon sale of the property. The Colorado Supreme Court ruled that agricultural

water rights may be transferred by sale for municipal uses with the same priority date. However, the court ruled that despite the domestic priority in the Colorado Constitution, a domestic user such as a municipality does not have the right to take waters previously appropriated for agricultural purposes. This decision was based on a new principle, that water rights are property, such that taking them without compensation would violate the US Constitution. Accordingly, the domestic preference for water appropriation in the Colorado Constitution (1876) henceforth applied only to new water rights.

Role of the state engineer

The administration of Colorado's water resources is the purview of the State Engineer, which has seven division offices located in each of the major basins (Figure 2). This section summarizes

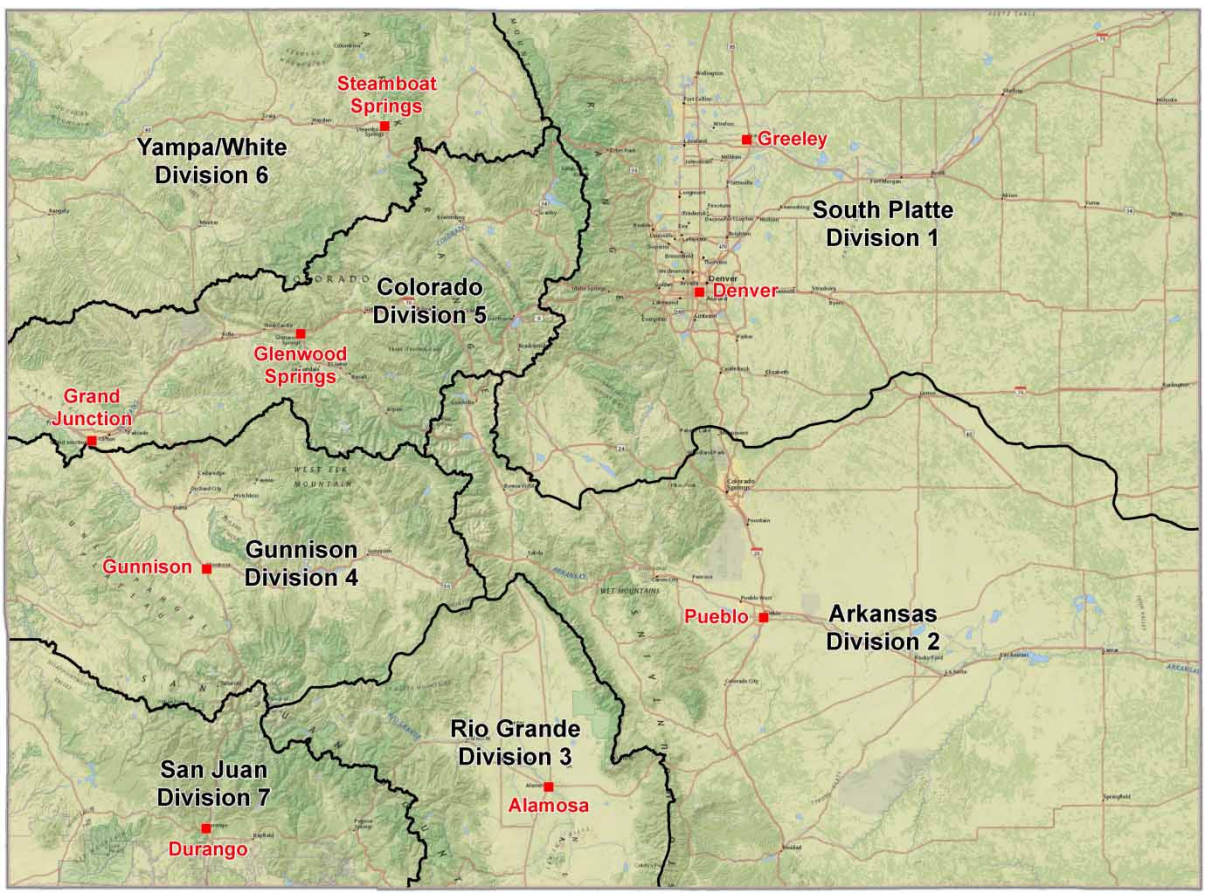

Fig. 2. Divisions of the Colorado State Engineer. The South Platte River (Division 1) office is located in Greeley; the Arkansas River (Division 2) office is located in Pueblo; the Rio Grande (Division 3) office is located in Alamosa; the Gunnison River (Division 4) office is located in Montrose; the Colorado River (Division 5) office is located in Glenwood Springs; the Yampa/White River (Division 6) office is located in Steamboat Springs; and the San Juan/Dolores (Division 7) office is located in Durango. Graphic courtesy of the Colorado Division of Water Resources and reproduced with permission.

the State Engineer's structure and function, and reviews how the State Engineer operates under judicial review.

Structure and function

For 125 years, water commissioners under the supervision of the State Engineer have implemented decrees of the Water Court. The responsibilities of the State Engineer are varied and complex. The State Engineer administers 170,000 water rights for over 47,000 structures (Wolfe, 2013). In addition, the State Engineer, through the seven division engineers (Figure 2), annually completes 450,000 observations of structures and records 30,000 water diversions and storage releases. As required by statute, the division engineers annually provide 1,000 consultations on water right applications. The State Engineer also evaluates and generates 200–300 replacement plans annually, which are essentially temporary augmentation plans or changes-in-use plans, while the Dam Safety Branch inspects 1,940 dams and reservoirs to determine the safe storage level in each structure. The State Engineer is also responsible for the administration of 2,900,000 acre-feet of annual pumping from over 300,000 production water wells including domestic wells (personal communication, Dick Wolfe, 2017). Other legislated responsibilities include public safety through construction inspection of water wells, interstate compacts, satellite monitoring, groundwater well permitting, litigation services, decision support systems, and public information services. These responsibilities are carried out by 280 professional engineers, geologists, information technology professionals, technicians and support staff.

Judicial review

Administrative agencies, such as the State Engineer, are granted varying levels of discretion, which is considered necessary to interpret laws and court rulings. According to the Federal Administrative Procedures Act (Burrows & Garvey, 2011), judicial review of administrative agencies is intended (1) to resolve conflicts with the constitution and (2) to override agency actions found to be arbitrary and capricious, in excess of statutory jurisdiction, without observance of procedure required by law, or unsupported by substantial evidence. Courts grant various levels of deference to agency interpretations of statutes. As an administrative agency, the State Engineer is subject to judicial review, so an appreciation of judicial review is necessary to understand the role of the State Engineer. Two case studies, one Federal and one State, illustrate the scope, dynamics, and authority of judicial review relevant to water administration in Colorado.

The Federal case is *Chevron v. Natural Resources Defense Council* (1984), in which the US Supreme Court granted deference in the application of statutes to the administrative agency rather than the judiciary. The Chevron case centered on the definition of a stationary source under the Clean Air Act Amendments of 1977 and whether the Environmental Protection Agency (EPA) guidelines were a reasonable construction of the statutory term *stationary source*. The US Supreme Court ruled the EPA's construction was reasonable, rendering a landmark case granting agencies deference for reasonable policy-making decisions. The Chevron case is relevant to Colorado because the State Engineer administers the decrees of the water court, which is necessary to interpret the 31 statutes and numerous court rulings relevant to water administration in Colorado. The Chevron case shows that, unless there is clear and unambiguous legislative guidance, it is reasonable for administrative agencies to create their

own interpretation, within reason, and subject to review. The dynamics of this review are illustrated in the following case study.

The Colorado case is *Simpson v. Bijou Irrigation Company* (2003). Between 1970 and 2002, the State Engineer reviewed and approved over 1,500 replacement plans, which allowed out-of-priority beneficial use of water contingent upon replacement of the water in quantity, quality, location, and time and without injury to other water rights. These replacement plans were based on the State Engineer's interpretation of the relevant statute, and from 1970 to 2002, no approved plans were overturned by the Water Courts. Bijou Irrigation Company contested the State Engineer's interpretation and the Water Court for Water Division 1 (South Platte) found that the State Engineer had acted outside its legislated authority. The State Engineer appealed to the Colorado Supreme Court, which affirmed the lower court's ruling and therefore vacated the replacement plans. Perhaps by coincidence, on the same day as the Simpson decision, the General Assembly enacted legislation that specifically permitted the Water Division 2 (Arkansas River) office authority to review and issue replacement plans in their division without judicial oversight. This small step by the legislature shifted more technical matters under the purview of the State Engineer and concurrently reduced those of the Water Courts in Water Division 2.

Discussion

Understanding the complimentary roles of the Water Courts and the State Engineer provides a foundation for discussing the history, policy, and administration of water in Colorado. In this part, we consider two contemporary issues related to water administration, specifically the public trust doctrine, and the recent Colorado Water Plan.

The public trust doctrine is the notion that the state holds natural resources in trust for public benefit (Walters, 2015). Originally applied to streambeds, the public trust doctrine has been interpreted by states to allow protection for a variety of public uses including navigation, commerce, fishing, hunting, swimming, and recreation (*Marks v. Whitney*, 1971). Some state courts have held that states have a public trust obligation not to allow water to be used inconsistently with public purposes (Getches, 2009, pp. 243–244). Accordingly, the degree to which the public trust doctrine conflicts with the doctrine of prior appropriation has been a subject of debate and discussion (Walters, 2015). However, other scholars have presented a more nuanced view, arguing that one can frame water administration so as to accommodate both the public trust doctrine and the doctrine of prior appropriation. This nuanced view is expressed by Walston, who writes, 'The public trust doctrine has relevance in the water rights context, but not in the manner currently suggested by some environmental advocates… It does not, however, require that the state put such resources to a particular use' (Walston, 1982). For this reason, Owen found pre-existing water rights are generally secure from public trust doctrine intervention (Owen, 2012).

In parallel to this debate, there is an argument that, in practice, Colorado water administration already incorporates key elements of the public trust doctrine (Bushong, 2015). This argument calls upon three lines of evidence. First, states have an interest in assuring that water is devoted to purposes consistent with the public good, which is the basis for the requirement that water be applied to a beneficial use (Getches, 2009, pp. 243–244). Second, since 1973, the Colorado Water Conservation Board (CWCB) has administered an instream flow program for environmental protection on some 14,900 km (9,250 mi) of streams and 480 natural lakes (Colorado Water Conservation Board, 2013).

Accordingly, the CWCB's instream flow program embodies at least some of the environmental protection aspects of the public trust doctrine. And third, the Water Courts have granted numerous in-channel water rights to eligible governmental agencies for recreational purposes, which have been ruled as a beneficial use (Bushong, 2015). Taken together, it appears unlikely that Colorado will adopt a formal version of the public trust doctrine, both because of its limited reach *vis-à-vis* the doctrine of prior appropriation, and because some of its key elements are already incorporated in existing Colorado water administration.

The complementary roles of the Water Courts and the State Engineer also provide a basis for understanding the Colorado Water Plan (Colorado Water Conservation Board, 2015). In 2013, Colorado Governor John Hickenlooper issued an executive order for the CWCB to develop a statewide water plan, which was finalized in late 2015. The plan documents that statewide water demand is expected to outstrip statewide water supply by 0.69 km^3/yr (560,000 ac-ft/yr), and outlines a strategy to fill this gap using a combination of domestic water conservation, agricultural efficiency improvements, and administrative adjustments such as lease-fallowing agreements, water banking, and interruptible supply agreements. This strategy is very much a case study in constrained optimization, because the plan supports key principles of Colorado water administration: (1) preserving existing compacts, equitable apportionment decrees, and other interstate agreements; (2) continuing to administer water through a local control structure; and (3) upholding the doctrine of prior appropriation. This last point, once again, underscores how Colorado water administration is guided by the simple principle that water rights are property and their consequent adjudication by the Water Courts and implementation by the State Engineer.

Conclusions

This paper has summarized the definition, history, and administration of the doctrine of prior appropriation as practiced in Colorado. Like other states west of the 100th meridian, Colorado adopted the doctrine of prior appropriation to manage its water – perhaps its most important natural resource. After reviewing the geographic range of the doctrine of prior appropriation, we listed its basic tenants. We then focused on the doctrine of prior appropriation in Colorado, specifically the assignment of adjudication authority to the Water Courts and enforcement authority to the State Engineer. This background on the doctrine of prior appropriation in Colorado laid the foundation necessary for detailed discussion of the roles of the Water Courts and the State Engineer.

The primary role of the Water Courts stems from the Colorado Constitution, two landmark Colorado Supreme Court rulings in 1888 and 1891, and a number of other rulings and laws – each of which were discussed in turn. Examination of the draft text from the Colorado Constitutional Convention of 1875–1876 and the landmark rulings of 1888 and 1891 reveals a deliberate and dramatic shift in the assignment of power from the legislative branch (i.e., the General Assembly) to the judicial branch (i.e., the Water Courts), which largely resulted from the construction of water rights as property. This construction, and the accompanying no injury rule, paved the way for the primary role of the Water Courts – for example, by limiting the Colorado Constitution's preference of uses (first domestic, then agricultural, then manufacturing) only to unappropriated water. Considering that essentially all of the water in Colorado has been allocated, the result is that water policy depends largely on the exercise of property rights, albeit with the significant constraint of the no injury rule. A thorough appreciation of this key point is

essential for any consideration of how Colorado can adapt to the local pressure of increasing population and to the global pressure of climate change.

The primary role of the State Engineer is to administer water rights as adjudicated by the Water Courts. As discussed above, the administrative infrastructure necessary to accomplish this task is not trivial, considering the sheer number of water rights in Colorado and the complexity imposed by 31 laws and numerous court rulings. Even so, lacking authority for water adjudication in Colorado, the responsibility of the State Engineer is significantly less than that of similar offices in other prior appropriation states. This study devoted considerable attention to the process of judicial review, which provides oversight for administrative agencies such as the State Engineer. One the one hand, judicial review limits the authority of agencies. On the other hand, the landmark Federal case Chevron established that agencies do indeed have authority to interpret legislation when necessary. This is a general legal principle that is particularly relevant to Colorado, as illustrated in the case Simpson, which curtailed the authority of the State Engineer but simultaneously prompted the General Assembly to reallocate some authority from the Water Courts to the State Engineer. This action by the General Assembly shows that water administration in Colorado continues to be a dynamic and evolving system, but it did not fundamentally alter the basic allocation of power over water resources.

Understanding the prior appropriation doctrine and the complementary roles of the Water Courts and the State Engineer shed light on two contemporary issues, (1) the public trust doctrine and (2) the Colorado Water Plan. The public trust doctrine appears unlikely to be enacted in Colorado, although there is an argument that certain elements of the public trust doctrine are already in place within the existing context of prior appropriation. Similarly, the Colorado Water Plan offers a framework for new cooperation among water stakeholders in Colorado, but again this framework exists within the existing context of prior appropriation. These two issues underscore that water administration in Colorado will continue to be played out through the complimentary roles of the Water Courts and the State Engineer.

Acknowledgements

The authors acknowledge Kevin Rens and Dick Wolfe for helpful discussion and thank Chris Brown for Figure 2. Financial support was provided by the University of Colorado Denver, which played no role in study design, data analysis, or report writing.

References

Burrows, V. K. & Garvey, T. (2011). *A Brief Overview of Rulemaking and Judicial Review*. 7-5700 R41546, Congressional Research Service, Washington, DC.

Bushong, L. R. (2015). How Colorado's prior appropriation system addresses environmental and recreational concerns without a public trust doctrine. *U. Denver Water L. Rev. 18*, 462.

Chevron U.S.A. v. Natural Resources Defense Council (1984). 467 U.S. 837.

Colo. Const. (1876). Art. XVI, § 5–8.

Colorado Water Conservation Board (2013). *Instream Flow Program*. Available at: http://cwcb.state.co.us/environment/instream-flow-program/Pages/main.aspx (accessed 6 November 2015).

Colorado Water Conservation Board (2015). *Colorado's Water Plan, State of Colorado*. Department of Natural Resources, Denver, CO.

Comstock v. Ramsay (1913). 133 P. 1107, 1110 (Colo. 1913).

Frisvold, G. B. (2015). Water, agriculture, and drought in the west under changing climate and policy regimes. *Nat. Resour. J. 55*, 293–328.

Fuller v. Swan River Placer Mining Co. (1888). 12 Colo. 12, 19 P. 836 (Colo. 1888).

Getches, D. H. (2009). *Water Law in A Nutshell.* West Publishing Co., St. Paul, MN.

Hobbs Jr, G. J. (1999). Colorado's 1969 Adjudication and Administration Act: settling in. *U. Denver Water L. Rev. 3*, 1–18.

Kassen, M. (1999). A critical analysis of Colorado's Water Right Determination and Administration Act of 1969. *U. Denver Water L. Rev. 3*, 58–69.

Marks v. Whitney (1971). 491 P.2d 374 (Cal. 1971).

O'Connor, T. (1907). *Proceedings of the Constitutional Convention Held in Denver, December 20, 1875 to Frame A Constitution for the State of Colorado.* Smith-Brooks Press, Denver, CO.

Owen, D. (2012). The Mono Lake case, the public trust doctrine, and the administrative state. *U. Cal. Davis L. Rev. 45*, 1099–1153.

Sieber v. Frink (1884). 7 Colo. 148, 2 P. 901 (Colo. 1884).

Simpson v. Bijou Irrigation Co. (2003). 69 P.3d 50, 67 (Colo. 2003).

Squillace, M. (2015). Water transfers for a changing climate. *Nat. Resour. J. 53*, 55–116.

Stenzel, R. & Cech, T. (2013). *Water, Colorado's Real Gold: A History of the Development of Colorado's Water, the Prior Appropriation Doctrine, and the Colorado Division of Water Resources.* Cech Press LLC, Ft. Collins, CO.

Strickler v. City of Colorado Springs (1891). 16 Colo. 61, 26 P. 313 (Colo. 1891).

Tarlock, A. D., Corbridge Jr., J. N., Getches, D. H. & Benson, R. D. (2009). *Water Resource Management: A Casebook in Law and Public Policy,* 6th edn. Foundation Press, St. Paul, MN.

University of Montana School of Law (2014). *Water Rights in Montana, Report for the Montana Supreme Court*. Prepared by the Land Use and Natural Resources Clinic, University of Montana School of Law, Missoula, MT.

Walston, R. (1982). The public trust doctrine in the water rights context: the wrong environmental remedy. *Santa Clara L. Rev. 22*, 63–93.

Walters, B. C. (2015). A brief history of the public trust doctrine in Colorado: Arguments made for and against its application. *U. Denver Water L. Rev. 18*, 455.

Wolfe, D. (2013). The state's administrative authority: the state engineer's view. In: *11th Annual Conference – Colorado Water Law – Water Administration for the 21st Century*, February 1, 2013, Colorado Law Institute, Denver, CO.

Received 30 September 2016; accepted in revised form 19 February 2017. Available online 29 April 2017