
DROUGHT AND CALIFORNIA'S ROLE IN THE COLORADO RIVER COMPACT

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I. INTRODUCTION

“Whiskey’s for drinkin’. Water’s for fightin’ over.”¹ Commonly though mistakenly attributed to Mark Twain, this quote is often used to describe water politics in the Southwest United States and the history of conflict that they have endured.² As increasingly scarce resources attempt to satisfy the needs of a growing population, states are forced to collaborate more and more in their attempt to divide resources.³ One landmark attempt at compromise was the creation of the Colorado River Compact.⁴ In 1922, Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming entered into the Colorado River Compact (“Compact”), which was approved by Congress.⁵ In the Compact, they agreed to an equitable division and appropriation of water from the Colorado River System.⁶ The agreement divided the River System into the “Upper Basin” and “Lower Basin,” and allocated rights to each basin based on water levels in 1922.⁷

Each basin was allocated 7,500,000 acre-feet of water per year, “which shall include all water necessary for the supply of any rights which may now exist.”⁸ The Compact further allocated water rights by states, dividing the participating states into the “Upper Division” and the “Lower Division.” While the Upper Division consists of Colorado, Wyoming, New Mexico, and Utah, the Lower Division is Comprised of California, Arizona, and Nevada.⁹ More than simply governing the water allocation

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1. John Fleck, *What Seven States Can Do: Deal-Making on the Colorado River*, RURAL WEST INITIATIVE (Aug. 3, 2012), <http://web.stanford.edu/group/ruralwest/cgi-bin/drupal/content/what-seven-states-can-agree-do-deal-making-colorado-river> (citing Alex Breitler, *Whiskey is for Drinking, And . . . Well, You Know*, ENVIRONMENTAL BLOG (Oct. 13, 2011), <http://blogs.esanjoaquin.com/san-joaquin-river-delta/2011/10/13/whiskey-is-for-drinking-and-well-you-know/>).

2. *Id.*

3. Patricia Mulroy, *Collaboration and the Colorado River Compact*, 8 NEV. L.J. 890 (2008).

4. David H. Getches, *Competing Demands for the Colorado River*, 56 U. COLO. L. REV. 413, 416 (1985).

5. Colorado River Compact, 1922 (codified at COLO. REV. STAT. §37-61-101 (2012)) [hereinafter Colorado River Compact].

6. *Id.*

7. *Id.*

8. *Id.*

9. *Id.*

between these states, the Compact provided that Mexico would receive the surplus water that was not previously allocated to the states in the agreement.¹⁰ As a compact, the agreement has properties of both a statute and a contract.¹¹

Unfortunately, the shortsighted calculation of water levels in 1922 did not account for the effect of future droughts. This is particularly troubling in light of the “current 14 year-long drought,” the “most extreme drought since measurements began in the 1900s.”¹² This Note will explore the legal conflicts that follow from the Compact’s inability to plan for this extreme water shortage, particularly as it relates to California water law. Furthermore, it will analyze the legal implications of altering water rights now in order to meet civilian needs in the face of an environmental crisis. Part I will provide a history of water rights in California. Part II will analyze the law surrounding the Colorado River. Part III will address how these areas of law and how various facets of life in the west, and in particular in California, are implicated by the severe drought in the West. Finally, Part IV will argue that local and regional communities must work together to clarify the “Law of the River,” and work toward sustainable solutions to a persisting lack of resources. Rather than amending the Compact, states should seek to clarify its provisions. As the river’s use has developed from agriculture to hydroelectric power, the relative interests of the states have gradually shifted.¹³ This Note will discuss the implications of the drought on power use and how this shift in use has affected the states involved in the Colorado River Compact. Furthermore, this Note will discuss how these lessons may translate to other situations. It will concentrate on the effects of the Colorado River shortage in California, and discuss the lessons that the Law of the River may teach California as it moves forward in the face of the drought.

II. HISTORY OF CALIFORNIA WATER RIGHTS

Water law in California is categorized as a “dual system,” as it is composed of both of the fundamental water rights doctrines used throughout the United States: the riparian system used by the eastern states and the prior appropriation doctrine used by the western states.¹⁴ Riparian rights are rights given to land that is “contiguous to the source stream in which the right is claimed.”¹⁵ Such rights are “paramount.”¹⁶ As such, these rights must be satisfied before other classes of rights are considered. Riparian rights are not quantified by date or amount of use.¹⁷ Rather, they are “correlative,” and must account for all “reasonable and beneficial uses upon riparian

10. *Id.*

11. Douglas Kenney et al., *The Colorado River and the Inevitability of institutional Change*, 32 PUB. LAND & RESOURCES L. REV. 103, 131 (2011).

12. Mary Ann Capehart, *Drought Diminishes Hydropower Capacity in Western U.S.*, THE UNIVERSITY OF ARIZONA (last visited Feb. 7, 2016), <https://wrrc.arizona.edu/drought-diminishes-hydropower>.

13. Getches, *supra* note 4, at 428.

14. William R. Attwater & James Markle, *Overview of California Water Rights and Water Quality Law*, 19 PAC. L.J. 957, 959 (1988).

15. *Id.* at 970.

16. *Id.*

17. *Id.*

lands.”¹⁸ Despite the priority of riparian rights in California, the state is largely dominated by the prior appropriation doctrine, which has been adopted by 19 of the western states.¹⁹

Under the system of prior appropriation, an individual may apply for a water right if he or she demonstrates intent to appropriate water and if he or she makes a diversion of water from its natural source.²⁰ Furthermore, the individual must apply the water to a beneficial use without waste.²¹ In this way, non-use of a water right can lead to an abandonment of that right.²² Once these criteria have been met, and individual may establish a right to the amount of water appropriated at that time. Prior appropriation is characterized by a “hierarchy of water rights,” which favors “senior” water rights holders, individuals with older claims to the resource.²³ Thus, in instances of water shortage, individuals with more senior water rights are given their full water allocation before “junior” water rights holders are given what remains.

California began assigning appropriative water rights when it enacted the Water Commission Act in 1914.²⁴ This act established the state water board, which was given the power to issue permits to water rights holders and issue injunctions or civil penalties to those who used unauthorized diversions of water.²⁵ People who owned water rights before this time were traditionally “believed to be immune to cutbacks” and deemed to have “senior water rights.”²⁶ Nevertheless, after “four dry years” in the current crisis, senior water rights owners with claims between 1903 and 1914 in the Sacramento River watershed and the Sacramento-San Joaquin River Delta were temporarily asked to cut back on their water use.²⁷

In 1928, California built upon this legal structure by passing a constitutional amendment, which preserved riparian rights and prohibited the waste of water²⁸. The 1928 amendment provided that insofar as the waste of water is unreasonable, it is not part of a water right. This determination depends on the circumstances of each particular case, as well as the changing concept of reasonableness over time.²⁹

In light of legislation passed to clarify the method of obtaining and losing water rights, it is important to note that water rights are property rights.³⁰ As such, two

18. *Id.* at 971.

19. CHRISTINE A. KLEIN, FEDERICO CHEEVER & BRET C. BIRDSOING, *NATURAL RESOURCES LAW* 878 (3rd ed. 2013).

20. *Id.* at 879.

21. *Id.*

22. *Id.*

23. Kurtis Alexander, *California Allows Some With Historic Rights to Pump Again*, SFGATE (Sept. 18, 2015), <http://sfgate.com/bayarea/article/California-allows-some-with-historic-water-rights-6514259.php>.

24. *Id.*; see also Attwater & Markle, *supra* note 14, at 983.

25. Attwater & Markle, *supra* note 14, at 983.

26. Alexander, *supra* note 23.

27. *Id.* (“The State of California ordered San Francisco to stop drawing from [areas in the San Joaquin Watershed] but it refused to do so, claiming its stake went ‘even further’ than 1903. This is pending an investigation.”); see also Joseph L. Sax, *Selling Reclamation Water Rights: A Case Study in Federal Subsidy Policy*, 64 MICH. L. REV. 13 (1965), available at <http://scholarship.law.berkeley.edu/facpubs/1310>.

28. Attwater & Markle, *supra* note 14, at 979.

29. *Id.*

30. Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257, 260 (1990).

types of property disputes have developed regarding water legislation.³¹ First, “whatever uses an appropriator has been making, and that have been recognized as lawful in the past, must as a matter of property right be permitted to continue or be compensated as a taking.”³² Most states do not enforce waste laws strictly, finding it more efficient to allow individuals to buy and sell water according to its optimal use. The second kind of dispute arises when existing appropriators are asked to give up some water. In this situation, appropriators may claim that requiring reduced use constitutes “the most blatant sort of taking without compensation.”³³

Nevertheless, water rights are less protected than other property rights.³⁴ This is largely due to situations where there are original public claims or uses, or laws protecting commons.³⁵ Although California maintains the “old” appropriative rights of those who claimed the rights before 1914, and although appropriative water rights issued in conjunction with the Water Commission Act and California Water Code have “statutory sanction” and “benefit of a title document,” these rights depend largely upon determinations of “reasonableness” and the public trust.³⁶ Indeed, while riparian rights are determined by reasonableness on an “ad hoc basis,” appropriative rights are issued once the water board has made a determination of what is in the public interest.³⁷

Water rights are further restricted by “their original definition,” which is “limited to beneficial and non-wasteful uses.”³⁸ Indeed, these rights are subject to forfeiture if they are deemed wasteful or if they are no longer put to use. This is a more limiting constraint than that on other property. Finally, this can be attributed to the fact that water rights “are granted by permit” and as such are subject to the constraints of those permits.³⁹

III. COLORADO RIVER LAW

The Colorado River “is the drainage for about one-twelfth of the continental United States.”⁴⁰ It collects water from the Rocky Mountains in Wyoming and Colorado, the “Uintas of Utah,” the “San Juans in Colorado,” and runoff from flash floods in Arizona; it carries this supply to “parts of all seven states it touches” and flows into Mexico for approximately one hundred miles.⁴¹ This water, highly valued in the dry western states, serves competing demands by providing resources to family-owned ranches, corporate-owned farm operations, ski areas, mountain towns, and

31. *Id.* at 259.

32. *Id.* at 258.

33. *Id.* at 259.

34. *Id.* at 260.

35. *Id.*

36. Attwater & Markle, *supra* note 14, at 982.

37. *Id.*

38. Sax, *supra* note 30, at 260; *see also* A-B Cattle Co. v. United States, 589 P.2d 57, 60 (Colo. 1978).

39. Sax, *supra* note 30, at 260.

40. Getches, *supra* note 4, at 413.

41. *Id.*; *see also* Charles J. Meyers, *The Colorado River*, 19 STAN. L. REV. 1, 10 (1966).

“homes and industries in sprawling cities far from the River’s natural reach.”⁴²

As a result of these competing uses, “the history of the Colorado is a history of conflict.”⁴³ Indeed, without the resources of the Colorado River, “a state may be condemned to desert and destitution.”⁴⁴ Nevertheless, much of the conflict has been legally resolved by a series of “compacts, statutes, and court decisions known as the Law of the River.”⁴⁵

Many agreements help navigate the use of the Colorado River. For example, conflict between the Upper Basin states has been addressed by the Upper Colorado River Compact of 1948, while conflict between the Lower Basin states has been addressed by *Arizona v. California*.⁴⁶ Moreover, conflict between the United States and the Republic of Mexico was addressed in the Treaty of Mexico Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande.⁴⁷ Among these compromises, the Colorado River Compact of 1922 stands out as a landmark agreement governing the use of the river’s resources between the Upper Basin and Lower Basin.⁴⁸ As such, this Note will focus on the Colorado River Compact and the policies and agreements that have used it as a cornerstone in arranging water rights in the western United States.

The Colorado River Compact was created in 1922.⁴⁹ Prior to 1922, the Supreme Court applied the doctrine of prior appropriation to a case regarding water rights between Colorado and Wyoming, two states that used prior appropriation as a means of allocating water. At the time the Compact was signed, Upper Basin states feared that if water rights continued to be governed by prior appropriation, they would receive very little water because of the prior appropriations of the arid Lower Basin states. Thus, one motivation for the Compact was to ensure that Lower Basin states such as California and Arizona would not monopolize water rights by establishing “legal priorities.”⁵⁰

In 1922, Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming entered into the Colorado River Compact, which was approved by Congress.⁵¹ This Compact took 6 years for the party states to ratify. In fact, Utah did not ratify the Compact until after Congress approved the six-state Compact in 1928. Utah signed one year later, and Arizona did not ratify the agreement until 1944.⁵² As a statute, the Compact did not take effect until it was “approved by the Legislatures of

42. Getches, *supra* note 4, at 413–14.

43. *Id.*

44. Charles J. Meyers, *The Colorado River*, 19 STAN. L. REV. 1. 2 (1966).

45. Getches, *supra* note 4, at 414.

46. Meyers, *supra* note 44, at 1. “Arizona v. California allocated the flow of the Colorado River among the three Lower Basin states (Arizona, California, and Nevada) according to terms of the 1928 Boulder Canyon Project Act.” Robert Glennon and Jacob Kavkewitz, “Smashing Victory”? Was *Arizona v. California* a Victory For the State of Arizona? 4 ARIZ. J. ENVTL. L. & POL’Y 1 (2013).

47. *Id.* at 1–2.

48. Getches, *supra* note 4, at 416–17.

49. Colorado River Compact.

50. Getches, *supra* note 4, at 416–17.

51. Colorado River Compact.

52. Meyers, *supra* note 44, at 12.

each of the signatory states” and ratified by Congress in August of 1921.⁵³ Moreover, the Compact maintains components of a contract, for it was agreed to by the governor of each state party, as well as President Hoover, who served as the representative of the United States. As Article X of the Compact explains, the agreement “may be terminated at any time by unanimous agreement of the signatory states. In the event of such termination, all rights established under it shall continue unimpaired.”⁵⁴

In the Compact, the states agreed to an equitable division and appropriation of water from the Colorado River System. The agreement divided the River System into the “Upper Basin” and “Lower Basin,” and allocated rights to each basin based on water levels in 1922. Indeed, article III of the Compact allocated each basin 7,500,000 acre-feet of water per year for their beneficial consumptive use. The Compact instructed that this amount “shall include all water necessary for the supply of any rights which may now exist.”⁵⁵ Moreover, it specified that the allocation of water to each basin only pertained to water that could “reasonably be applied to domestic and agricultural uses.”⁵⁶ The Compact further allocated water rights by states, dividing the participating states into the “Upper Division” and the “Lower Division.”

What is more, Article III provided that Mexico would receive the surplus water that was not previously allocated to the states in the agreement. It explains that water allocated to Mexico “shall be supplied first from the waters which are surplus.”⁵⁷ In years where the surplus will not provide a sufficient amount, “the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin.”⁵⁸

In general, the Compact applies the doctrine of equitable apportionment to its state parties.⁵⁹ Furthermore, “[i]t permits one state to make temporary use of water originating in a less fully developed state, but provides that uses in excess of the apportionment are subject to termination when the latter state needs the water.”⁶⁰

Charles Meyers outlines five of the controversies that exist regarding the apportionment of Colorado River water. He first explains that the Compact apportions water according to “beneficial consumptive use,” though there is no universal standard for how to measure this term.⁶¹ Second, he points out the difficulty in determining a “priority for releases of water for electric power generation.”⁶² Next, he notes the difficulty in meeting water obligations to Mexico, and the difficulty in determining what quality of water the Upper basin must deliver to the Lower basin and Mexico.⁶³ Finally, he points to the difficulty in determining the proper procedure in accounting

53. *Id.*

54. *Id.*

55. *Id.* at n.70; §37-61-101

56. Colorado River Compact; *see also* Meyers, *supra* note 44, n.70.

57. Colorado River Compact.

58. *Id.*

59. Meyers, *supra* note 44, at 14.

60. *Id.* at 17.

61. Meyers, *supra* note 44, at 18. *See* Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919 (1998).

62. Meyers, *supra* note 44, at 18.

63. *Id.*

for groundwater.⁶⁴

First, the dispute over the definition of “beneficial” use divides the Upper and Lower Basins. While Upper Basin States define beneficial use using a “net depletion” formula, the Lower Basin states classify “consumptive use as ‘diversions less returns to the river.’”⁶⁵ This distinction is significant because the Upper Basin accounts for the nature of the river as a “wasting stream,” a “stream that loses water as it flows;” in this way, the Upper Basin “doesn’t charge users for water they apply to beneficial use if the water would have been lost anyway in a state of nature.”⁶⁶ Conversely, the Lower Basin definition defines use in terms of only the man-made, not nature-made, depletions of the water. This definition would require the Upper Basin to deliver more water to the Lower Basin than the definition put forth by the Upper Basin. As Meyers explains, this discrepancy in definitions stems from the lack of interpretation of Article III of the Compact, where “beneficial use” is discussed but not defined.⁶⁷ He notes, “this dispute over the meaning of consumptive use must be resolved. . .in construing” Article III(a),(b), and (c) of the Compact.⁶⁸

Second, the release of water for the generation of hydroelectric power is an area of tension between the basins. As Article III(e) dictates, water cannot be used by the Lower Basin, nor can it be withheld by the Upper Basin, unless it can be applied to “domestic and agricultural” uses, which includes the generation of power.⁶⁹ Consequently, Article III(e) calls into question the extent to which the Upper Basin may keep water from the Lower Basin to use in dams such as the Glen Canyon Dam, instead. While this is debated, it is ultimately the decision of the Secretary of the Interior. The Upper and Lower Basin states worked to resolve their issues regarding this provision when they worked to form an operating agreement for the Glen Canyon and Hoover Dams. The operating agreement “directs the Secretary of the Interior to promulgate ‘equitable criteria for the coordinated long-range operation of the reservoirs.’”⁷⁰

Third, Meyers points to ambiguities in Article III(c) regarding the treaty with Mexico.⁷¹ Article III did not indicate which conditions constitute a “deficiency” in water provided to Mexico, but it explained that both basins would be equally responsible in providing water in such an event.⁷² In fact, when the Compact is interpreted literally, a deficiency may be considered any amount less than sixteen million acre-feet of consumptive use.⁷³ This means that under the terms of the Compact, there may be a “deficiency” even when both the Upper Basin and the Lower Basin are

64. *Id.*

65. Meyers, *supra* note 44, at 19 (citing 43 U.S.C. §617c(a) (1964)).

66. *Id.*

67. *Id.* at 18–19.

68. *Id.* Meyers indicates that, “the Special Master in *Arizona v. California* construed the compact in dictum as adopting the formula ‘diversions less return flows.’” *Id.*

69. *Id.*

70. *Id.* at 23.

71. *Id.*; see also Charles J. Meyers & Richard L. Noble, *The Colorado River: The Treaty With Mexico*, 19 STAN. L. REV. 1, 367 (1966).

72. See Meyers, *supra* note 44, at 24.

73. *Id.*

receiving their full allotment. Moreover, the Compact did not specify the amount of water that the Upper Basin must supply in such an event.⁷⁴ Finally, the Compact leaves confusion regarding how often the Upper Basin will be responsible for delivering a portion of water to Mexico. While the provision detailing allocation of water between the basins calculates water levels “in continuous periods of ten years,” the Mexican treaty “requires annual deliveries.”⁷⁵ This discrepancy makes it unclear whether the surplus from one year may carry into the next. In years of extreme shortage, an inability to count past surpluses increases the burden that the Upper and Lower Basins face.⁷⁶

Fourth, the Compact fails to fully consider the issue of water quality in the river.⁷⁷ There is no explicit provision in the Compact regarding water quality; rather, it speaks only of the delivery of certain amounts of water.⁷⁸ Nevertheless, as this water is to be put to beneficial consumptive use, it may be important to regard the condition it is in when it is put to domestic and agricultural purposes.⁷⁹ This failing of the Compact has not translated into a dispute between the Upper and Lower Basins, but it may become a problem if the Upper Basin increases its use of water to an extent that increases the Lower Basin’s dependence on recycled water.⁸⁰

Finally, Meyers points to the Compact’s failure to address the allocation of groundwater. The Compact does not have a provision that expressly discusses groundwater. Article III, which determines the distribution of water, does not explicitly account for groundwater; this complicates matters insofar as groundwater and surface water are “often hydraulically inseparable.”⁸¹ Although there is no definitive answer to this problem, the Supreme Court in *Arizona v. California* “treated consumption of groundwater as a use to be charged.”⁸²

All five of these issues are exacerbated in times of water shortage, when distribution and quality of water become particularly important. California in particular has been allotted 4.4 million acre-feet per year of the Colorado River’s water supply.⁸³ This amounts to around thirty percent of the river’s allocated water, but as California’s water needs continue to grow, this amount “has proven to be insufficient” for the needs of the state’s “families and farmers.”⁸⁴ As the Southern California Water Committee has explained, this allocation causes “instability for our state’s water supply.”⁸⁵

There has been remarkably little interpretation of the Compact in the years that

74. *Id.*

75. *Id.* at 25.

76. *Id.*

77. *Id.*

78. *Id.* at 26.

79. *Id.*

80. *Id.* at 25–26.

81. *Id.* at 26.

82. *Id.* (quoting *Arizona v. California*, 283 U.S. 423 (1931)).

83. *Issues*, THE SOUTHERN CALIFORNIA WATER COMMITTEE, (Feb. 7, 2016), <http://www.socalwater.org/issues/colorado-river>.

84. *Id.*

85. *Id.*

followed its formation in 1922. Nevertheless, one landmark case helps explain some of the terms of the Compact. In *Arizona v. California*, the court issued a declaration that helped to clarify some of the terms of the Compact.⁸⁶ Moving forward, when individual states such as California address their dire need for water in the face of a long-term drought, it is important not only to look to methods of water conservation and efficient use, but also to reexamine which of these ambiguous terms may yield the best outcomes for the state. In order for states to collaborate in the face of a water shortage, it is therefore all the more important to resolve these areas of ambiguity.

IV. DROUGHT, THE COLORADO RIVER, AND CALIFORNIA

The flow of the Colorado River is “extremely erratic.”⁸⁷ Reaching a high of 19.2 million acre-feet (maf) in 1929, it averaged 16.5 million acre-feet between 1896 and 1963.⁸⁸ Despite this erratic flow, the Compact was decided at “a time when the region was going through an unusually wet period.”⁸⁹ Notably, state allotments do not change as water levels change; as a result, some states are affected by periods of drought more than others.⁹⁰

In particular, the Upper Basin is restricted more than the Lower Basin when facing water shortages. The Compact requires the Upper Basin to deliver 7.5 million acre-feet of water to the Lower Basin each year.⁹¹ This is different from requiring the Upper and Lower Basins to divide water equally. If they divided water equally, both basins would divide the impact of a water shortage. Instead, in years of shortage, this 7.5 million acre-feet of water must be delivered to the Lower Basin even if this means the Upper Basin will retain less than their 7.5 million acre-feet share.

Nevertheless, Lower Basin states, which have grown accustomed to the “‘surplus’ water flowing downstream from the [U]pper [B]asin,” suffer when there is no surplus available.⁹² These arid states must learn to adjust to their reduced water supplies as well. In California, this particularly affects the agricultural and urban health of the arid communities in the south.

In order to deal with the uneven flow of water from month to month and year to year, the communities of the Colorado River Basin erected dams upon the two prominent lakes of the Colorado River. Situated on Lake Mead and Lake Powell, two lakes along the Colorado River, the “Hoover and Glen Canyon Dams were built to regulate and even out this variable supply.”⁹³ The Glen Canyon Dam provides enough water

86. See generally *Arizona v. California*, 373 U.S. 546 (1963) (confirming the amount of water allocated to each state under the Colorado River Compact).

87. Meyers, *supra* note 44, at 9.

88. Robert W. Adler, *Revisiting the Colorado River Compact: Time for a Change*, 28 J. LAND RESOURCES & ENVTL. L. 19, 30 (2008); Meyers, *supra* note 44, at 9.

89. Alicia Acuna & Kelly David Burke, *Colorado to California: Hands Off Our Water*, FOX NEWS (Jan. 28, 2015), <http://www.foxnews.com/politics/2015/01/28/colorado-to-california-hands-off-our-water.html>.

90. *Id.*

91. Adler, *supra* note 88, at 28.

92. *Id.* at 29.

93. Meyers, *supra* note 44, at 9.

storage for the Upper Basin to meet its delivery requirements to the Lower Basin, while the Hoover Dam helps the Bureau of Reclamation to meet other water delivery needs to customers along the “entire reach of the river, including Mexico.”⁹⁴ Initially constructed to even out the short term discrepancies in water flow from the summer to the winter, these dams are critical elements in governing the relations between the Upper and Lower Basins by regulating the water flow over years and even decades.

In addition to regulating the variable water supply, the Hoover and Glen Canyon Dams serve as important sources of energy to the western states. Built in 1936 and aided by hydropower, the Hoover Dam helps satisfy “peak-demand electricity for Las Vegas, Los Angeles, and other southwestern cities.”⁹⁵ Receiving its water from Lake Mead, the Hoover Dam’s electricity is greatly diminished by reduced water levels in the lake caused by the drought. Lake Mead’s water level has dropped over 130 feet since 1999.⁹⁶ As a result, the Hoover Dam’s output “has been significantly curtailed.”⁹⁷ In fact, the output fell from a normal level of 2,074 megawatts to 1,592 megawatts by July of 2014. If Lake Mead’s water level continues to drop, there could be severe repercussions for the Lower Basin states.⁹⁸ If water levels drop to 1,075 feet, “rationing begins,” and if they drop to 1,050 feet, “the uppermost water intake for Las Vegas shuts down.”⁹⁹ Thus, even though the Lower Basin appears to benefit from the provisions of the Compact, insofar as it allows them to “call” upon the Upper Basin for a disproportionate amount of water, the implications of water shortage in the context of the dams demonstrates that the desert-like nature of the Lower Basin states puts them at a significant risk when water levels fall.

Similarly, the Glen Canyon Dam produces a significant amount of hydropower, serving as the “largest hydropower producer in the Reclamation’s Colorado River Storage Project.”¹⁰⁰ The Glen Canyon Dam receives water from Lake Powell, and when water levels drop below 3,490 feet above sea level, or 100 feet below its water level as it did in August of 2013, “vortex action would draw air into the turbines and damage them.”¹⁰¹ At this level, generators that supply enough electricity to power 350,000 homes would shut down.¹⁰²

Thus, as Lake Mead and Lake Powell experience reduced water levels, and the Hoover and Glen Canyon Dams are unable to produce past amounts of electricity, states such as California are forced to look elsewhere for their power supply. California receives hydroelectric power from three other lakes in addition to the power it

94. *Id.*

95. Capehart, *supra* note 12.

96. *Id.*

97. *Id.*

98. See Alexandra Icenhower & Shawn Dhar, *5 Facts You Need to Know About Lake Mead’s Water Crisis*, BROOKINGS (May 2, 2015), <http://www.brookings.edu/blogs/planetpolicy/posts/2015/05/02-water-crisis-lake-mead-mulroy>.

99. Michael Wines, *Colorado River Drought Forces a Painful Reckoning for States*, N.Y. TIMES (Jan. 5, 2014), <http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html>.

100. Capehart, *supra* note 12.

101. *Id.*

102. Wines, *supra* note 99.

receives from the lakes of the Colorado River: Lake Shasta, Lake Oroville, and Folsom Lake.¹⁰³ These lakes, which have reached only forty-one percent, forty-seven percent, and sixty-two percent of their capacity respectively, are unable to make up for a loss in power from the dams of the Colorado River.¹⁰⁴ Previously accounting for twenty percent of California's energy supply, their capacity fell to ten percent in 2014.¹⁰⁵ As a result, the state has begun to purchase more of its energy and rely more heavily on thermal power.¹⁰⁶ Going forward, California must continue to invest in these alternate sources of energy for studies indicate that even a short-term rise in water levels may be short-lived.

Legally, the Upper Basin states bear the brunt of water shortages, not only because they have less natural access to water and because of the provisions of Article III of the Compact, but also because they have less capacity to store water. Indeed, the Upper Basin states have access to only forty percent of stored water.¹⁰⁷ David Getches argues that this limited access to storage should be read into the interpretation of the Compact, implying that other measures must be taken to ensure that both basins maintain their roughly equal allotments. As he explained, "[t]he ultimate problem for the Upper Basin is how to build a future on the right to leftovers."¹⁰⁸ Indeed, "[i]f the upper basin cannot make its compact deliveries to the lower basin, the lower basin can enact a 'call'," meaning that the "upper basin has to cut off all its uses until it has delivered to the lower basin the amount that it committed to in 1922."¹⁰⁹ In this way, Getches's view benefits the Upper Basin but at a cost to the Lower Basin. Thus, he demonstrates the manner in which an interpretation of terms in the Compact could have a vast affect on an array of communities depending on this water.

More than relations between the Upper Basin and the Lower Basin, a shortage in Colorado River water affects the relationships between individual states. For example, as California faces water shortages in the Colorado River as well as its other rivers in the Northern half of the state, it might choose to lean on Arizona to maintain its water supply. In the 1960s, California legislators "demanded first dibs on lower-basin water as a condition for supporting federal legislation to build the Central-Arizona Project," a "web of canals irrigating" Arizona's farms and cities.¹¹⁰ Thus, in a water shortage, California may face a relatively small fraction of rationing in comparison to what Arizona would endure. As a result, the Central Arizona project, which was designed to prevent farmers from over-pumping groundwater, would lose revenue from selling water. This in turn would force farmers to return to their practice of groundwater pumping. This issue contributes to the pre-existing issues of the Compact, especially its inability to establish how groundwater should be treated. Moreover, the over-pumping of groundwater could have lasting effects on Arizona and the

103. Capehart, *supra* note 12.

104. *Id.*

105. *Id.*

106. *Id.*

107. Getches, *supra* note 4, at 419.

108. *Id.* at 420.

109. Fleck, *supra* note 1.

110. Wines, *supra* note 99.

Southwest United States, for it could take a number of years to replenish these resources once depleted.

Furthermore, the water shortage can affect relationships between individual states that belong to different basins. For example, while some states face a water shortage, other states such as Colorado have more water than they need. Such discrepancies can cause conflict between the states. Although Colorado has previously permitted California to “dip into its surplus,” modern water plans in Colorado call for surplus water to be saved for the future.¹¹¹ In fact, the director of the Colorado Water Conservation board gave a statement that highlighted the tensions between the states regarding this prized resource. In an interview with the Associated Press, he stated, “If anybody thought we were going to roll over and say, ‘OK, California, you’re in a really bad drought, you get to use the water that we were going to use,’ they’re mistaken.”¹¹² Although he clarified that this statement was not an attempt to flex his muscle, it nevertheless represents Colorado’s intention to maintain its allocation requirements provided by the 1922 Compact. Even though the state itself is not facing a drought, it intends to store as much water as the 1922 Compact permits, in order to prepare for the future rather than “spread the wealth.”¹¹³ This provides a source of conflict between Colorado and California, a state that is facing one of the most severe droughts of a century.

The effects of a drought have implications not only on the relations between states but also on the relationship between the United States and Mexico. The Mexican treaty regarding the Colorado River promises to deliver 1,500,000 acre-feet to Mexico annually. Article III(c) of the Compact stipulates that “if any Mexican rights could not be adequately supplied from ‘surplus,’ the Upper and Lower Basins would be obliged to share the burdens equally.”¹¹⁴ It is unclear what is meant by “surplus,” but it is thought to mean the amount of water that exceeds the allotted 16,000,000 acre-feet a year allotted to the Upper and Lower Basins, combined. Such a lack of water poses a risk to the Lower Basin, which would be required to supplement the amount of water that reached Mexico. Therefore, in order to protect the lower basin in this situation, the Upper Basin would be allowed to store up to their original water allotment only if such water went to reasonable applications of domestic and agricultural use.

At the time of the agreement, the hydrological record, or the record of water flows, was not “entirely reliable,” and did not account for the entire life cycle of the Southwest climate.¹¹⁵ Thus, although sixteen million acre feet may have seemed like an appropriate water level on which to base the agreement, subsequent decades have manifested a consistently lower water level.¹¹⁶ As Adler explains, “The average flow

111. Acuna & Burke, *supra* note 89. Nevertheless, he asserted a belief that all states should work together during the drought and that his measures reflected an understanding that water in Colorado is always in finite supply.

112. *Id.*

113. *Id.*

114. Getches, *supra* note 4, at 421 (citing Colorado River Compact).

115. Adler, *supra* note 88, at 30.

116. *Id.*

from 1896 to 2004 was less than fifteen maf.”¹¹⁷ Between 1922 and 1982, this average dropped to just over fourteen maf.¹¹⁸ Most significantly, severe drought conditions have “persisted since 1999.”¹¹⁹ In fact, water levels were below the average every year between 2000 and 2007 except in 2006.¹²⁰

Moreover, scientists looked to tree rings to evaluate the long-term climate history of the area surrounding the Colorado River. These rings indicated droughts that were more severe and lasted longer than any drought of the Twentieth Century. This evidence of long-term droughts points to the serious probability that water levels will not return to the sixteen million acre-feet for many years, if they do at all. What is more, water shortages may be exacerbated by climate change. In fact, some predict a forty-five percent decline in water flow by 2060.¹²¹ As such, the difficulties caused by this drought must not be discarded as temporary problems that will be fixed by short-term solutions. In fact, the Bureau of Reclamation has “predicted that Lakes Powell and Mead may never again be full.”¹²² Thus, rather than searching for a quick fix to this problem, states affected by the water shortage in the Colorado River must search for solutions that will continue to address this problem on a larger scale.

V. MOVING FORWARD - COLLABORATING FOR SUSTAINABILITY

Thus far, this Note has discussed both the water law in California and the “Law of the River,” which pertains to the entire Colorado River Basin. As the Colorado River Compact affects the amount of water that California receives, it indirectly implicates water rights within the State. It is important to analyze the manner in which the Law of the River impacts California Water law, for this will have far reaching affects on the agricultural life of the state, as well as the day-to-day lives of individuals in urban areas. California’s reaction to its reduced water supply will have legal implications, for the state must decide how much weight to give to the “public interest” when it attempts to affect senior water rights. Most significantly, the drought will affect the lives of individuals in small communities who have seen their water resources completely depleted as a result of their lack of groundwater as well as water that had previously been delivered to them. For these reasons, it is necessary to assess the best manner of approaching the Law of the River moving forward. At this time of great change in the environment of the area, California would do well to learn from, and build off, collaborative efforts on local and regional levels.

During the course of the current drought, numerous levels of government have worked together to attempt to alleviate the crisis. Administrative guidelines, international agreements, and discussion in the Senate are just some of the ways in which government entities have searched for solutions to this problem. As an actor in these agreements, California may learn from and build upon the progress that has been made to address the problems brought by the water crisis in the state.

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.*

121. *Id.* at 32 (referring to a report from the National Academy of Science).

122. *Id.*

On December 13, 2007, the Secretary of the Interior signed “Interim Guidelines for Lower Basin Shortages and the Coordinated Operation for Lake Powell and Lake Mead,”¹²³ an “historic decision that will implement innovative strategies for Colorado River management.”¹²⁴ At this point, the Colorado River Basin was only in its eighth year of drought, but even at that point it was deemed “the worst eight year period in over a century.”¹²⁵

In order to create these guidelines, the Secretary charged the Bureau of Reclamation with the duty of preparing an Environmental Impact Statement, a report required by the National Environmental Policy Act, to assess the environmental effects of proposed guidelines. This Environmental Impact Statement required input from the public living along and affected by the River Basin. In the end, the Secretary of the Interior recommended guidelines that will remain in effect through 2025. These guidelines include the coordinated operation of Lake Mead and Lake Powell to the end of avoiding curtailments of the Upper Basin Supply as well as shortages of the Lower Basin Supply.

Further, they called for a “mechanism to encourage and account for augmentation and conservation of water supplies, referred to as Intentionally Created Surplus (ICS),” to “minimize the likelihood of future shortages,” and the “modification and extension” of 2001 interim guidelines through 2026. Finally, the guidelines propose that “discrete levels of shortage volumes” be associated with Lake Mead elevations so that parties in the Lower Basin will have more certainty about “when, and by how much, water deliveries will be reduced in the drought”¹²⁶

The theme of collaboration continued in 2012 when the United States and Mexico struck an agreement regarding water storage in Lake Mead. This five-year agreement permitted Mexico to continue storing water in Lake Mead, provided that certain water providers from the United States could purchase some of the water conserved by Mexico’s efforts to improve its “canals and other storage infrastructure.”¹²⁷ Mexico will employ the profit from this sale to continue to develop its infrastructure and to improve the habitat in Mexico’s Colorado River Delta.

This agreement also requires Mexico to give up some of its water in Lake Mead when water levels drop below 1,075 feet, but provides that Mexico will receive some of the surplus when the water levels rise.¹²⁸ In this way, the agreement between the United States and Mexico serves as an example of international collaboration aimed at creating sustainable solutions to the water crisis in the Colorado River Basin. It also demonstrates the way in which economic solutions can help to alleviate political

123. U.S. Dep’t of the Interior, Opinion Letter on Interim Guidelines for the Operation of Lake Powell and Lake Mead (Dec. 13, 2007), <http://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf> [hereinafter Interim Guidelines for the Operation of Lake Powell].

124. RECLAMATION LOWER COLORADO REGION PROGRAMS AND ACTIVITIES, <http://www.usbr.gov/lc/region/programs/strategies.html> (last visited Mar. 20, 2016).

125. Interim Guidelines for the Operation of Lake Powell, at 1.

126. *Id.* at 4.

127. Matt Williams, U.S., *Mexico Sign Historic Agreement on Colorado River Water*, ASS’N OF CAL. WATER AGENCIES (Nov. 20, 2012), <http://www.acwa.com/news/federal-relations/us-mexico-sign-historic-agreement-colorado-river-water>. Mexico’s storage infrastructure was damaged by a 7.2 magnitude earthquake in 2010. This damage necessitated its storage in Lake Mead and the resulting repairs. *Id.*

128. *Id.*

and environmental problems.

Further efforts at collaboration were demonstrated in the Senate in 2013. In 2013, the Subcommittee on Water and Power, a subcommittee of the Senate's Committee on Energy and Natural Resources, conducted a hearing regarding the Aging Water Infrastructure in the West.¹²⁹ Moreover, at an oversight hearing regarding the Colorado River Basin Water Supply and Demand Study, Tanya Trujillo, the executive director of the Colorado River Board of California, was given the opportunity to speak for California. Her testimony focused on the critical need for addressing water conservation using multiple approach, for "no single solution will be sufficient to meet the future potential water demand"¹³⁰ She emphasized the need for creative solutions and continued collaboration between the states as tensions continue to build.¹³¹

In her testimony, Trujillo mentioned California's efforts to not only conserve water, but to recycle and reuse groundwater "to supplement water supplies."¹³² Emphasizing the need for collaboration amidst the search of sustainable solutions, Trujillo also identified multiple groups designated to evaluate existing programs: the Healthy Flows Workgroup, the Municipal and Industrial Conservation and Reuse Workgroup, and the Agricultural Conservation and Transfers Workgroup, among others.¹³³

These efforts not only demonstrate the need for collaboration in finding solutions to the water crisis in the Colorado River Basin, but they also demonstrate the need for creativity in finding a solution. Law regarding the Colorado River has been stable for decades. Over time, as more communities and laws base themselves around the premise of the Colorado River Compact, it becomes more and more entrenched in the law and live of those in the West. Commonly referred to as "The Law of the River," the Compact involves water law that contains not only local, but also state and nation-wide layers, which all develop slightly different methods of allocating water.¹³⁴

Renegotiation of the Compact would not only require collaboration of the seven Compact States, but would also require further collaboration with the United States and Mexico.¹³⁵ The Compact's mixed attributes of both contract and legislation further complicate a potential amendment process. When initially created, the Compact was signed by representatives from all seven states.¹³⁶ Nevertheless, the agreement was not ratified by all seven state legislatures for an additional seven years.¹³⁷ The

129. *Aging Water Infrastructure: Hearing before the Subcommittee on Water and Power of the Committee on Energy and Natural Resources*, 113th Cong. 1 (2013).

130. *Oversight Hearing Regarding the Colorado River Basin Water Supply and Demand Study*, 113th Cong. 4(2013) (statement of Tanya Trujillo, Executive Director, Colorado River Board of California).

131. *Id.* at 5.

132. *Id.* at 4.

133. *Id.* at 3.

134. Adler, *supra* note 88, at 23.

135. *Id.*

136. *Id.*

137. *Id.*

Compact itself seems built to resist significant change.¹³⁸ Article X of the Compact states that “[t]his compact may be terminated at any time by the unanimous agreement of the signatory states. In the event of such termination all rights established under it shall continue unimpaired.”¹³⁹

In addition to the legal difficulties in changing the Compact, numerous political and social changes make substantive change seem nearly prohibitive. Indeed, as Robert Adler explains, the Compact and all the agreements that rely on it are deeply relied upon by a vast array of private and public parties.¹⁴⁰ If this agreement were significantly altered, it would “prompt cries of significant unfairness and adverse economic and other consequences.”¹⁴¹ It would impact “the well-being of millions of residents, the economy of the entire Southwest, international relations with Mexico, and the health of ecosystems throughout the Colorado River basin.”¹⁴²

Nevertheless, the Compact continues to exhibit flaws that make finding solutions to the crisis more difficult for members of both the Upper and Lower Basins. Vague definitions of “beneficial use,” terms regarding the delivery of water to Mexico and the Lower Basin, and the absence of a distinction between groundwater and surface water serve as legal challenges that inhibit collaboration. These defects affect California by leaving uncertainty as to the amount of water it is allocated. While California must compete with other Lower Basin states for their share of allocated water, it must also collaborate with them, and with the Upper Basin states, to ensure that Lake Mead and Lake Powell sustain water levels that will support hydroelectricity. Clarity in the area of “beneficial use” would help the state work with other Lower Basin states to establish how much water they must receive. In the face of these defects, is it feasible to change the Compact or start afresh in order to correct for its flaws? Though not impossible in theory, throughout its history the Compact has never been amended.¹⁴³ As evidenced by the necessity of the Bureau of Reclamation’s Environmental Impact Statement when putting forth guidelines for the coming years, such an action would constitute major government action, and many communities would stand to lose their livelihoods upon a change in either direction.

Thus, recent history has demonstrated that the best approach to future conservation methods will rely on creativity and collaboration between communities and states. Some steps have already been taken by the Lower Basin States to limit the effects of the crisis posed by the drought in the Colorado River. While San Diego has begun to build a desalination plant “on the Pacific shore” as a new source of water, others have begun to implement considerable conservation measures.¹⁴⁴ Arizona has limited its water consumption to rates equaling those of 1955. One method it has employed is the use of laser technology to ensure that their fields are table flat; this is intended to increase the efficiency of water use.¹⁴⁵

138. *Id.* at 21.

139. Colorado River Compact.

140. Adler, *supra* note 88, at 25.

141. *Id.*

142. *Id.* at 32.

143. *Id.* at 22.

144. Wines, *supra* note 99.

145. *Id.*

Furthermore, Nevada has reduced its water use by treating nearly all of the water used indoors so that it can be returned to Lake Mead. In California, the Southern California Metropolitan Water District (SCMWD) “is recycling sewage effluent” and subsidizing water-reducing measures such as artificial turf, “zero-water urinals,” and high-efficiency bathroom appliances.¹⁴⁶

Other collaborative efforts focus on the quality of the water received by the Lower Basin states. These include the Bureau of Reclamation’s Yuma Desalting Plant, designed to process “salty, mineralized Arizona drain water.” In an experimental run between May of 2010 and March of 2011, the plant desalinated ten billion gallons of water. This might be one way to help the United States meet the allotment that it promised to Mexico.¹⁴⁷ Although this is a small effort in relation to the problem as a whole, “it is an example of collaboration rather than warfare.”¹⁴⁸ Another effort that reflects collaboration among the states is the Warren H. Brock Reservoir, built to capture water “lost downstream” on its way to Mexico.

Moreover, the water shortage has led to statewide policies in California that have stirred attention in urban areas in particular. In 2015 when Governor Brown required urban areas in California to cut water use by twenty-five percent, this mandatory cut served as the first mandatory water rationing in California history.¹⁴⁹ Agriculture makes up eighty percent of California’s water use, but only accounts for two percent of the economy.¹⁵⁰ Nevertheless, Governor Brown defends placing a heavier burden of water cuts on urban areas. He explained, “Agriculture has already suffered major cutbacks.”¹⁵¹ Indeed, 400,000 acres went unplanted in 2014.¹⁵² While this historic rationing caused tensions between water uses in the state, a majority of urban areas surpassed the water rationing levels that they were required to meet during 2015.¹⁵³

Nevertheless, effects of the drought in California were far-reaching.¹⁵⁴ Some medium-sized communities in California, such as Folsom and Santa Cruz, were hit hard as their wells dried up and the state was forced to provide them with emergency assistance.¹⁵⁵ Moreover, surface water deliveries to farms was reduced by one-third in 2014, leading to an increase in groundwater pumping and decreased water supply to

146. *Id.*

147. Fleck, *supra* note 1.

148. *Id.*

149. Monte Morin & Matt Stevens, *California Residents Cut Water Use by Hefty 29% in May, Officials Say*, L. A. TIMES, (Jul. 1, 2015), <http://www.latimes.com/local/lanow/la-me-ln-may-water-conservation-20150701-story.html> (In response to these cuts, residential use dropped by 29% in May of 2015, and 28,555 complaints were issued by residents concerned with wasteful uses of water, an amount that doubled that of previous months).

150. Jeff Guo, *Agriculture is 80 Percent of Water Use in California. Why Aren’t Farmers Being Forced to Cut Back?*, WASH. POST, (Apr. 3, 2015), <https://www.washingtonpost.com/blogs/govbeat/wp/2015/04/03/agriculture-is-80-percent-of-water-use-in-california-why-arent-farmers-being-forced-to-cut-back/>

151. George Skelton, *Why Do Farmers Get a Free Pass From Brown?*, L.A. TIMES, (Apr. 5, 2015), <http://www.latimes.com/local/politics/la-me-cap-drought-20150406-column.html>

152. *Id.*

153. Morin & Stevens, *supra* note 149.

154. PUBLIC POLICY INSTITUTE OF CALIFORNIA, *MANAGING DROUGHTS: CALIFORNIA MUST KEEP IMPROVING ITS ABILITY TO WEATHER DROUGHTS*, (2015), *available at* http://www.ppic.org/content/pubs/report/R_415MDR.pdf.

155. *Id.*

the more recent agricultural water-rights holders. This triggered “losses of more than \$2 billion and 17,000 full- and part time jobs.”¹⁵⁶ Further, the drought in California “exposed weaknesses in groundwater management.”¹⁵⁷ Indeed, as farmers relied more heavily on groundwater, groundwater tables have lowered, causing the land to sink and damaging aqueducts and other infrastructure. In response, “new legislation enacted in 2014 requires local agencies with the most stressed basins to adopt sustainable groundwater management plans by 2020.”¹⁵⁸

As the Public Policy Institute of California has noted, this crisis has “exposed weaknesses in the current water allocation system.”¹⁵⁹ Not only has it exposed weaknesses in reporting systems used to manage water use, but it has also illuminated the lack of a comprehensive policy, which would ideally develop clear priorities of use in the event of a shortage; for example, the priority of uses between protecting public health and aquatic ecosystems.¹⁶⁰ Finally, the Public Policy Institute has pointed to the State’s inability to fully consider the doctrines of “reasonable use” and “public trust.”¹⁶¹ These doctrines, which have been fundamental in California water law, require the state to consider the effect of water allocation on water quality, fisheries, and ecosystems, and to protect various uses to the greatest extent possible.

Although the drought has taught California about areas for improvement in its water allocation system and water law, these problems are exacerbated by the national crisis in the Colorado River. In fact, water shortage in California is not a novel problem, but rather one that has been developing for years. In the years before the current drought, Southern California utilized the surplus water not allocated by the Colorado River Compact to supply its “growing coastal cities.”¹⁶² In 2001, as the surplus began to diminish and as other southwestern states began to employ the surplus waters of the Colorado, California was forced to develop a plan to reduce its use by January of 2003.¹⁶³ The 2001 conflict in the House of Representatives has roots in *California v. Arizona*, which paved the way for the Central Arizona Project, the first significant limitation on California’s claim to surplus water from the Colorado River.¹⁶⁴

Despite the efforts individual states have taken to manage the crisis, more collaborative efforts would better help to create a sustainable solution for a consistently lower water level in the Colorado River. As Jennifer Gimbel of the Colorado River Conservation Board explained to Congress in a 2010 hearing, “[h]istory has shown

156. *Id.*

157. *Id.*

158. *Id.*

159. *Id.*

160. *Id.*

161. *Id.*

162. Fleck, *supra* note 1.

163. *Id.* At the 2001 hearing, California Congresswoman Grace Napolitano asked for more time to meet this deadline, saying “California cannot afford the immediate reduction by that amount of water.” She continued, “Our economy reaches out to the neighboring states so that if we suffer, so do the rest of the states around us.” This plea, which “contained a hint of a threat,” was denied.

164. *Id.*

that collaboration is a necessary ingredient for action in the Colorado River Basin.”¹⁶⁵ Moreover, David Getches posits that in the face of the changing use of the river’s water, decisions will be made less by the courts and more by interstate cooperation in the face of economic arrangements.¹⁶⁶ Further, he argues that this will encourage a more efficient use of resources, especially as the value of water increases.¹⁶⁷

Because basin states are hesitant to depart from the “Law of the River” in finding new solutions, and although a “Lower Basin Agreement would be a tacit recognition of the validity of the Compact,” such a contractual arrangement would be unlikely to succeed without the consent of all of the states that were party to the Compact.¹⁶⁸ Thus, they would do better to increase water efficiency through collaborative, and economic, solutions. In particular, the states in the Colorado River Basin may consider water banking as one way to increase the efficient use of water.¹⁶⁹ A water bank allows “willing owners of water to lease water to the ‘bank’ for re-lease to ‘renters’ on a short term basis.”¹⁷⁰ States may implement some form of leasing scheme as a way to collaborate more closely between Upper Basin and Lower Basin states.¹⁷¹ This idea serves an intra-state benefit as well. California would do well to increase its ability to lease senior water rights. Although this may have the same effect as temporarily restricting rights for the public interest, the state may be able to achieve these ends more fluidly by leasing rather than taking the rights. This solution fits well with California’s prior appropriation scheme and the Colorado River Compact, which both premise the allocation of water upon beneficial consumptive use of water, because it would eliminate water that was wasted by individuals, and the Lower Basin as a whole.

California must consider these measures as it attempts to approach conservation techniques in an aggressive manner. Furthermore, California must employ its economic power in order to negotiate with other states. As it did with Arizona upon the formation of the Compact, and as the United States did with Mexico, California may attempt to collaborate with Colorado in order to purchase water in a way that will be sustainable in the future. Just as the treaty with Mexico allows the United States to buy water from Mexico, which in turn uses the money to create sustainable solutions, Colorado’s play for sustainability may benefit from the revenue it would receive from the purchase of its surplus water. In these events, agreements must learn lessons from the pitfalls of the 1922 Compact, and learn to create agreements that do not leave terms such as “surplus” to future interpretation.

165. *Id.* (citing Jennifer Gimbel, WRITTEN STATEMENT OF JENNIFER GIMBEL, DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD, BEFORE THE SUBCOMMITTEE ON NATURAL RESOURCES, US HOUSE OF REPRESENTATIVES (2010), <http://naturalresources.house.gov/uploadedfiles/gimbeltestimony04.09.10.pdf>).

166. Getches, *supra* note 4, at 414.

167. *Id.* at 454.

168. *Id.* at 477.

169. See Kevin B. Pratt, *Water Banking: A New Tool for Water Management*, 23 COLO. LAW. 595, 595 (1994).

170. *Id.*

171. See generally S.E. Reynolds, Book Review, 11 NAT. RESOURCES J. 202 (1970) (reviewing L.M. HARTMAN & D. SEASTONE WATER TRANSFERS: ECONOMIC EFFICIENCY AND ALTERNATIVE INSTITUTIONS (1970)), available at http://lawschool.unm.edu/nrj/volumes/11/1/13_reynolds_hartman.pdf.

VI. CONCLUSION

The Colorado River Basin serves a critical role in the environments, economies, and survival of communities in California, Nevada, Arizona, Utah, Wyoming, Colorado, and Idaho. Governed by the Colorado River Compact since 1922, the “Law of the River” has entrenched itself in the West over decades, as communities continue to use it as a foundation for their water laws and agreements. While states vary in their systems of water law, from riparian rights to prior appropriation, they have evolved to incorporate the law of the river into their systems. Unfortunately, the Colorado River Compact formed under false premises, producing a system that is well equipped to distribute water when it reaches 16.5 million acre-feet.

Now, faced with a dearth of resources, flaws in the foundational document serve as areas of contention as communities scramble to obtain whatever resources they are able to find. These areas of contention should not be dismissed in light of temporary storms such as El Nino, as even this storm has improved the conditions of the drought only 2% in California.¹⁷² As the Compact required the division of water for “beneficial use” between the Upper Basin and Lower Basin, it pitted the two basins against each other, not only in deciding upon the definition of beneficial use, but also in addressing issues regarding how much water the Upper Basin may withhold each year in its reservoirs. Conflicts regarding energy and water resources are equally present between the states within each of the Basins, who must compete for water within their given allotments. In this sense, the formation of the Compact, especially as it pertains to Arizona, demonstrates the manner in which states negotiate with each other for resources. In addressing these conflicts, cracks within the Colorado River Compact risk turning into canyons, barring collaboration between the states and regions.

Despite these potential difficulties, no amendments have been made to the Colorado River Compact since 1922. Nevertheless, *Arizona v. California* helped to clarify terms in a way that helped prevent future conflict. While some scholars believe that the combination of the current crisis and imprecision of key articles in the Compact demonstrate a need to amend the Compact’s key terms, a wide array of government action has pointed to the unlikelihood of this action.

Indeed, in the face of the worst drought in a century, and with the likelihood that water levels may never return to their originally evaluated amounts, local, state, regional, and the national government have demonstrated the desire to look for ways to adapt and govern with less natural resources. While the stability of the Law of the River provides stability for the many communities along the Colorado River Basin, it also makes the process of amending the foundational document nearly insurmountable.

Instead, groups have created economic and legal agreements aimed to address

172. Jonathan Llyod, *Exceptional Drought Improves only 2 Percent After California Storms*, NBC LOS ANGELES (Jan. 14, 2016), <http://www.nbcalosangeles.com/news/california/California-Drought-El-Nino-Storms-Rain-Snow-Water-365280731.html>. In fact, more, than eighty-seven percent of California remains under severe drought.

deficiencies in past agreements going forward. These agreements range from the national to the local level. While on the national level guidelines for future use have been conducted through the Bureau of Reclamation and have employed administrative law to enlist the input of the community in the creation of an Environmental Impact Statement, movement has been made at the local level as well.

Moving forward, California may learn not only from the creation of the Compact, but also from the modern efforts at collaboration, as it seeks to address its water crisis. California is affected by the drought and the water shortage in the Colorado River in a number of ways. Normally dependent on the surplus of water given to the Lower Basin for agriculture and for the functioning of its arid Southern California cities, California must adapt to a consistently lower input of water into these communities. Moreover, when Lake Mead and Lake Powell are not able to sustain the dams that provide the state with hydroelectricity, the entire state must turn to other areas of energy. In this way, California's policies are affected both directly and indirectly by the water shortage in the Colorado River Basin.

This affects water law in California in a myriad of ways. Amidst efforts to conserve waters and protect agriculture, urban citizens have been asked to reduce their consumption of water. Dams that depend on tributaries of the Colorado struggle to produce energy, and senior water rights holders have seen their water rights temporarily suspended as a result. This calls into question the importance of the provisions in California water law to regulate water for the "public benefit" or the "public trust." Thus, in this way, the legal ramifications of the drought are far reaching.

With these legal ramifications in mind, California may look to existing methods as it moves forward in the drought. Currently in the state, water rationing, desalination plants, and efforts to improve the efficiency of water storage and transportation serve as some local attempts to use water most efficiently. Other states such as Arizona have implemented agricultural techniques that allow them to use water most efficiently. California may build off of these attempts on a larger scale if it considers collaborative efforts such as water banking, both within the state and with other states.

In particular, California may learn from its history with Arizona, and from its recent agreement with Mexico regarding Lake Mead Water Storage, that it should work closely with Upper Basin states such as Colorado to find a sustainable and mutually beneficent use of its surplus water. Not only will these measures to increase sustainability benefit California as a state, but it will also benefit the Lower Basin as a whole, by increasing the proportion of water that it puts to beneficial consumptive use. Although the Colorado River Compact displays a number of flaws, it serves as a stable foundation for a vast number of communities. In the face of crisis, when lives and economies of entire communities are at stake, it is best to move forward together with this unique piece of law rather than using it as a tool to pit communities against one another. Over time, as water use evolved from a primarily agricultural resource to a resource that provides energy to urban areas, the use of water changed the demand of water in the river. Now, efforts to find new sources of energy and to use water more efficiently must continue this trend in response to changes in the river.