

Water Scarcity in the U.S.: Two Systems of Law and their Effects on Future Policy

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Water law in the United States is a complicated issue and a growing field of importance due to scarcity of the resource and population growth. Two schools of legal thought govern water rights in the United States and are based on geographic region and grounded on principles of property law. Prior appropriation is the law in the Western United States, and riparian rights govern the Eastern United States. This paper will discuss the various systems and recent policy implications of each system, specifically in Nevada, California, Tennessee, and Georgia.

The prior appropriation doctrine, which is law in the Western U.S. is based on the principles of “beneficial use” and first use.¹ This doctrine transfers water rights to the person who first used that water for something deemed to be a beneficial use. This first use right is a product of the history of how the west was settled (through pioneers and land grants). Beneficial use is more subjective, but today refers mainly to agriculture.² Prior appropriation makes sense for the West because the climate is dry and requires more regulation of a limited supply of water.³ Further, since water sources are few and far between, adjacent rights would not be effective. Most farms require irrigation, and riparian rights (based on the doctrine of property border use rights) would exclude large regions of the West.⁴ Prior appropriation, importantly, allows water to be diverted for beneficial use. Again, this is mostly a function to serve

¹ *Prior Appropriation Law*, COLO. DEP’T OF NAT. RES. DIV. OF WATER, <http://water.state.co.us/SurfaceWater/SWRights/Pages/PriorApprop.aspx> (last visited Jan. 13, 2016); *See* Boulder Canyon Project Act, 43 U.S.C. § 617 (2015) (explaining the first in line appropriation doctrine relying on first beneficial use).

² Glen MacDonald, *Beyond the Perfect Drought: California’s Real Water Crisis*, YALE ENVIRONMENT 360 (June 15, 2015), http://e360.yale.edu/feature/beyond_the_perfect_drought_californias_real_water_crisis/2885/.

³ Rob McDonald, *Why the California Water Crisis is a Foretaste of Crises to Come*, NATURE CONSERVANCY: COOL GREEN SCI. (June 24, 2015), <http://blog.nature.org/science/2015/06/24/california-water-crisis-future-change-cities-urban-climate/>.

⁴ *See* MacDonald, *supra* note 2; Abraham Lustgarten, *Use it or Lose It, Across the west, exercising one’s right to waste water*, PROPUBLICA (June 9, 2015), <https://projects.propublica.org/killing-the-colorado/story/wasting-water-out-west-use-it-or-lose-it>.

agriculture today, but also developed to service mining communities.⁵ Given that rivers and bodies of water naturally flow downstream, this puts those individuals closer to the source in an advantageous position relative to water rights and usage. Those below are proportionally allocated only what is left in the system.

This “priority” in the system is a particularly difficult challenge in the West. As populations grow in the western United States, water becomes more scarce, and increasingly lengthy severe droughts continue to plague the region.⁶

The Southwest apportions most of their water from the Colorado River, based on the rights allocated in the Colorado River Compact (CRC) and more generally, the “Law of the River,” which contains the body of laws and regulations pertaining to the Colorado River Basin.⁷ The CRC was drafted in 1922, and allowed for the allocation of water within the Colorado River system to each state in the basin.⁸ The CRC is a document that has been updated over time by various agreements between the States based on the most current water availability and necessity. No state has suffered more from this policy implication than Nevada. *Arizona v. California* has been re-litigated on multiple occasions and over time has determined and affirmed the percentages and amounts of water designated to each state in the lower basin (rights originally established by the Boulder Canyon Project Act).⁹

The *Arizona* decision supersedes the priority rights established in the prior appropriation doctrine and specifically allocates certain percentages of water to each state and Native

⁵ See Boulder Canyon Project Act, 43 U.S.C. § 617 (2015); See also Lustgarten, *supra* note 4.

⁶ See MacDonald, *supra* note 2.

⁷ See *Law of The River*, U.S. DEP’T OF THE INTERIOR BUREAU OF RECLAMATION (Mar. 2008), <http://www.usbr.gov/lc/region/g1000/lawofrvr.html> (last updated Mar. 2008).

⁸ Colorado River Compact, 1922, U.S. DEP’T OF THE INTERIOR BUREAU OF RECLAMATION (1922), <http://www.usbr.gov/lc/region/g1000/pdfiles/crcompct.pdf>; see *Law of The River*, *supra* note 7.

⁹ *Arizona v. California*, 373 U.S. 546, 593 (1963); see also Boulder Canyon Project Act, 43 U.S.C. § 617 (2015)

American tribes in the basin.¹⁰ So while Nevada has access to water before California, Nevada is restricted to four percent of the annual flow (300,000 acre feet).¹¹ California takes fifty-eight percent (4,400,000 acre feet) and Arizona takes the excess (an amount that depends on the flow levels).¹²

This apportionment has recently come into critique for two reasons. First, population in Nevada (mainly due to the growth of Las Vegas) has grown by thirty-five percent since 2000.¹³ This population increase skews the water allocation and leaves Las Vegas desperate for water. Conservation efforts have been extremely successful, but with further growth estimates, Las Vegas and Nevada cannot thrive under the current agreement based on further growth estimates. Exacerbating the problem is the ongoing drought throughout the Southwest, further restricting the flows of the Colorado River. Lake Mead is shrinking and current estimates say the lake could run dry by as early as 2021.¹⁴

Second, agriculture in California has come under fire as a major culprit of excess water usage. California adopts a hybrid form of water rights, blending the riparian and prior appropriation doctrines.¹⁵ Most notably, a stipulation is included that rights to use may be lost due to non-use.¹⁶ This incentivizes users to maintain usage beyond necessity or beneficial use. In times of drought, this becomes extremely problematic because it conflicts with the prior

¹⁰ *Id.*

¹¹ *Law of The River*, *supra* note 7.

¹² *Arizona*, 373 U.S. at 583; *See also Arizona v. California* 439 U.S. 419, 421-36 (1979) (allotting water distribution to each state and tribe in the region).

¹³ Conor Shine, *Nevada's projected population growth puny compared to boom years*, LAS VEGAS SUN (Oct 16, 2013), <http://lasvegassun.com/news/2013/oct/16/nevada-set-top-national-average-population-growth/>.

¹⁴ NAT. CONF. OF ST. LEG., NEV., ASSESSING THE COSTS OF CLIMATE CHANGE, 1 (2008) <http://cier.umd.edu/climateadaptation/Climate%20change--NEVADA.pdf>.

¹⁵ Craig Wilson, *California Neglects its 'Super Water Right' to Manage Drought*, (July 30, 2015)

<http://www.waterdeeply.org/op-eds/2015/07/8133/california-neglects-super-water-right-manage-drought/>.

¹⁶ *Id.*

appropriation rights and can leave those further down the line without adequate water.¹⁷ While California agriculture is no doubt a crucial industry for the United States, there should be more foresight with regards to water usage in the system in order to maintain its ongoing sustainability. California is experiencing its worst drought in modern history and it is exacerbated by a lack of foresight that drought could occur and planning for the future regardless of the conditions.¹⁸

Creative policy solutions can help mitigate the problems in California and it should look to Las Vegas as a model for successful water conservation. Clark County, Nevada has managed to sustain thirty-five percent growth since 2000, while also decreasing water usage by one third during the same time frame.¹⁹ The most obvious solution, which California has enacted, is mandatory water conservation among all citizens.²⁰ Landscaping reforms should also be incentivized. Las Vegas created a successful program of crediting citizens for adopting desert landscaping on their property.²¹ However, these policies mainly affect residential communities, whereas for California, agriculture should be the primary target. California should push legislation to enact more oversight over agriculture, including limiting or preventing extraordinarily high water intensive crops relative to their cash crop value from being produced. Almonds and alfalfa are two examples of such crops. Efficient farming should be a goal, and this

¹⁷ See Lustgarten, *supra* note 4.

¹⁸ See McDonald, *supra* note 3.

¹⁹ John M. Glionna, *Drought- -- and neighbors -- press Las Vegas to conserve water*, L.A. TIMES (April 20, 2014), <http://articles.latimes.com/2014/apr/20/nation/la-na-las-vegas-drought-20140421>.

²⁰ *Emergency Conservation Regulation*, CAL. ENVTL. PROT. AGENCY ST. WATER RES. CONTROL BD., http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/emergency_regulation.shtml. (last updated Jan. 6, 2016).

²¹ Henry Brean, *Turf-rebate program sees success*, LAS VEGAS REV. J. (Feb. 21, 2011) <http://www.reviewjournal.com/news/water-environment/turf-rebate-program-sees-success>.

is definitely a feasible option, since farmers in the Delta farming region have voluntarily reduced water use by 25% in response to the drought over this past year.²²

The water shortage in California has actually been a problem for years, but was not recognized since groundwater supplies were always available to cover shortages.²³ This is especially true for the agriculture industry. California does not even have a system for regulating groundwater use besides specific injunctive court orders.²⁴ This system is obviously ineffective at regulating all instances of groundwater use. The California Supreme Court ruled that groundwater use is only restricted to “reasonable use”.²⁵ Farms were allowed unregulated use of their groundwater, and it was used to excess during periods of drought.²⁶ However, given this continued reliance on groundwater, the sources are largely depleted and NASA claims the groundwater supply in the Central California farmland region will only last a few more decades at the current rate of use.²⁷ The lack of groundwater reserves is actually a larger problem than the current drought. The drought will ebb and flow in intensity, and may even end. Groundwater reserves do not recharge at a constant or predictable rate.²⁸ Lack of groundwater gives California no safety net for the future.

Water trading and leasing is the next policy solution, and it seems to be paving a way for the future of the West. The first major water trading agreement was negotiated in September

²² Monte Morin, *Water agency approves farmers' voluntary water reduction plan*, L.A. TIMES (May 22, 2015) <http://www.latimes.com/local/lanow/la-me-ln-water-rights-20150522-story.html>.

²³ Bettina Boxall, *Overpumping of Central Valley groundwater creating a crisis, experts say*, L.A. TIMES (March 18, 2015), <http://www.latimes.com/local/california/la-me-groundwater-20150318-story.html>

²⁴ Bettina Boxall, *California moves to restrict water pumping by pre-1914 rights holders*, L.A. TIMES (June 12, 2015), <http://www.latimes.com/local/lanow/la-me-ln-drought-water-rights-20150612-story.html>.

²⁵ *Senior v. Anderson*, 62 P. 563, 566 (1900).

²⁶ Craig Wilson, *California Neglects its 'Super Water Right' to Manage Drought*, WATER DEEPLY (July 30, 2015) <http://www.waterdeeply.org/op-eds/2015/07/8133/california-neglects-super-water-right-manage-drought/>.

²⁷ Adam Voiland, *Earth's Disappearing Groundwater*, NASA: EARTH OBSERVATORY (NOV. 5, 2014), <http://earthobservatory.nasa.gov/blogs/earthmatters/2014/11/05/earths-disappearing-groundwater/>; See also MacDonald, *supra* note 2.

²⁸ Janny Choy, Geoff McGhee, & Melissa Rohde, *Recharge: Groundwater's Second Act*, STAN. WOODS INST. FOR THE ENV'T (Dec. 19, 2014), <http://waterinthewest.stanford.edu/groundwater/recharge/>.

2015.²⁹ The City of Las Vegas—which has surplus water supplies due to its successful conservation efforts—has agreed to trade water to Los Angeles.³⁰ Las Vegas will be providing enough water to supply 300,000 homes in Los Angeles each year in exchange for \$45 million each year.³¹ If this plan is successful, it could be a model for future negotiations between the Western States in times of need. The plan could be expanded to water rich states in the Northwest, providing water to the desert regions of the Southwest. Existing infrastructure is a concern, but there are already discussions to build pipelines from Northern Nevada to Las Vegas, funneling water from the North down to the major population centers in the Southwest.³²

Another foreseeable policy option for California is to create a water banking system similar to Arizona’s water bank (although, this presumes there is surplus water to bank). Arizona and Las Vegas have been storing unused allotments of their Colorado River water in underground aquifers, which can be withdrawn in times of need.³³ Since 1996, Arizona and Nevada have been able to bank over nine million acre-feet of water (just over two times California’s yearly allotment).³⁴ Las Vegas has gained valuable experience dealing with issues of drought for years. Drought is not a unique problem, but Las Vegas was simply affected earlier than other cities. In the near future, the effects of drought will be seen across the West as a whole and could strain the entire water distribution system currently in place.

In contrast to the Western water policy issues relating to prior appropriation, the Eastern United States adopted a fundamentally different legal right to water. The Eastern states have adopted riparian rights doctrine. This doctrine establishes that property owners are permitted to

²⁹ Henry Brean, *SNWA could lease water to drought stricken California*, *LAS VEGAS REV. J.* (Sept. 15, 2015), <http://www.reviewjournal.com/news/water-environment/snwa-could-lease-water-drought-stricken-california>.

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ Erica Gies, *Water in the Bank: One Solution For Drought-Stricken California*, *YALE ENVIRONMENT 360* (May 7, 2015), http://e360.yale.edu/feature/water_in_the_bank_one_solution_for_drought-stricken_california/2872/.

³⁴ *Id.*

use water that borders their land or property. This doctrine also requires reasonable use, and does not allow for interference with the right to the water of others.³⁵ This system was adopted in part due to the relative abundance of water in the East. It was not foreseen that allocation, or shortages would arise. This certainly creates problems when shortages do occur, leading to no assurances of water access or availability.³⁶

The most recent issue regarding riparian rights is a current and ongoing border dispute between Georgia and Tennessee.³⁷ Due to population growth in Georgia, the current water supplies have been strained by efforts to provide adequate resources to the state, particularly in the Atlanta metro area.³⁸ This has given rise to a dispute over a historical border issue. When state lines were drawn, the border of Georgia and Tennessee was supposed to be split at the 35th parallel. However in application, the border is one mile south of this line.³⁹ Unfortunately, located in this one mile region is the Tennessee River, which would be able to provide substantial water resources for Atlanta.⁴⁰ Under the riparian system, Georgia has no claim to the river, unless its land actually bordered that body of water.⁴¹ Georgia has advocated for its right to the water, citing the mistake in drawing the state lines in the 1800s, however Tennessee has been unwilling to comply with the proposal.⁴² This resolution by Georgia directs the Attorney

³⁵ See *Hendrick v. Cook*, 4 Ga.241, 256 (1848) (establishing that property owners are allowed reasonable use of water so as not to diminish the quantity available to others)

³⁶ Andrew Yeager, *Sustainability: The Problem with Alabama's Water Management*, WBHM 90.3FM (Mar. 18, 2014), <https://news.wbhm.org/feature/2014/sustainability-the-problem-with-alabamas-water-management/>.

³⁷ Cameron McWhirter, *In Latest War Between the States, Georgia Says Tennessee Is All Wet*, WALL ST. J. (April 10, 2013), <http://www.wsj.com/articles/SB10001424127887324000704578388472029592836>.

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ See *Hendrick v. Cook*, 4 Ga.241, 256 (1848) (holding that water rights are determined by proximity of one's property to the banks of water).

⁴² Tim Omarzu, *Time running out to move Tennessee-Georgia state line before case goes to Supreme Court*, TIMES FREE PRESS (Feb. 18, 2014), <http://www.timesfreepress.com/news/local/story/2014/feb/18/flush-with-power-or-just-all-wetdeadline-looms-in/132011/>.

General to sue, and assuming the states cannot find an acceptable compromise it is likely that the Supreme Court will settle this border dispute in the near future.⁴³

This event demonstrates problems that can occur under the riparian system, especially when water becomes scarce. Drought is a difficult problem to address under this regime, because there is little flexibility for establishing a right to the water such as is available under the system of prior appropriation in the Western United States. Access is determined by proximity to the water and not by relative beneficial use. No doctrines equivalent to the “Law of the River” exist in Georgia and Tennessee, which could possibly provide Georgia access to the Tennessee River given that its tributaries feed into the river. This dispute should be taken as a warning sign for the future of water availability in the Southeast. The circumstances here are unique, but the fact that Georgia and Atlanta specifically are suffering from water scarcity is not something to take lightly. The population in the Southeast is continuing to grow, and this will further strain the water resources in the region.⁴⁴ This border dispute is not an isolated incident either. Georgia and Florida are currently involved in a lawsuit alleging that Georgia’s depletion of rivers flowing into Florida has impacted Florida’s Apalachicola fishing industry, as well as the ecological viability of this region.⁴⁵ Both States are preparing for a long and expensive legal battle.⁴⁶

Riparian rights were designed for a region that had not typically faced water shortages. Policy considerations are now a more difficult proposition, since there is little experience with water shortages and long term planning around drought in this region of the country. Often times water management is only discussed during flashpoints when there is actually a drought

⁴³ *Id.*

⁴⁴ Emily Badger, *What the rapidly urbanizing Southeast could look like come 2060*, WASH. POST (July 30, 2014) <https://www.washingtonpost.com/news/wonkblog/wp/2014/07/30/what-the-rapidly-urbanizing-southeast-could-look-like-come-2060/>.

⁴⁵ Greg Bluestein, *Georgia Flatly Rejects Florida’s Water Wars Arguments* ATLANTA J. CONST. (Jan. 24, 2015), <http://politics.blog.ajc.com/2015/01/24/georgia-flatly-rejects-floridas-water-wars-arguments/>

⁴⁶ *Id.*

occurring. This is comparatively different from the West, where water management is a necessarily constant area of focus. Riparian rights also do not allow for non adjacent land owners to access the water, leaving unfortunately located water users, like Georgia, in a bind.⁴⁷

The issues surrounding drought on the Southeast are not an impending crisis like that in California, but the future could bring such issues. The scenarios could mirror those faced in the Southwest, mainly due to booming population growth outstripping the ability for water resources and allocation to respond. Policy makers in the Southeast should carefully watch how the drought situation unfolds in the Southwest and adopt proactive conservation policies to prevent a crisis like the one California is currently experiencing.

Recent proposals have started bridging the gap between Eastern and Western water issues. The two regions, with fundamentally different water laws could start working together toward a common goal in the future. To do this, the East and West would need to combine the best practices of both legal doctrines to create a comprehensive reform. The most striking of these proposals is a preliminary scenario that would divert the Mississippi River into Colorado.⁴⁸ This would connect parts of the Mississippi River to the Colorado River Basin system.⁴⁹ The benefits would be two-fold. The West would have greater access to water, and the Mississippi Delta and Louisiana would face less risk of flooding. The plan is extensive and expensive, (estimates forecast the project at \$23 billion), but it has support from both sides as a feasible idea

⁴⁷ Hendrick v. Cook, 4 Ga.241, 255 (1848)(holding that water rights are determined by proximity of property to banks of water).

⁴⁸ Henry Brean, *Mississippi may help ease West drought, Mulroy tells chamber*, LAS VEGAS REV. J. (July, 20, 2011), <http://www.reviewjournal.com/news/water-environment/mississippi-may-help-ease-west-drought-mulroy-tells-chamber>.

⁴⁹ Amy Joi O'Donoghue, *The fight for water: Can the mighty Mississippi save the West?*, DESERET NEWS (May 13, 2012), <http://www.deseretnews.com/article/865555735/The-fight-for-water-Can-the-mighty-Mississippi-save-the-West.html?pg=all>.

for long term water policy planning.⁵⁰ Policy makers in the Southeast, particularly Mississippi and Louisiana are optimistic about the idea due to their recent experience with Hurricane Katrina and the potential for increased flooding caused by climate change.⁵¹ Such a plan would be mostly beneficial for environmental reasons in the Mississippi Delta region and along the Gulf Coast.⁵² It would curb the widespread erosion on the Gulf. The Mississippi River spews 120 million tons of earth into the Gulf of Mexico every year, and this is shrinking the landmass of the swamp and marshland of Louisiana.⁵³

This type and scope of project would provide much surplus water for the West and could serve as a safety net for the future. Population growth might no longer be an impending crisis in the Southwest with a Mississippi River pipeline. Key figures in water policy, like Pat Mulroy (the former Chief of the Southern Nevada Water Authority) have championed the proposal as a comprehensive reform to Southwestern water scarcity struggles.⁵⁴ She also claims that the water problems will not be solved unless a reform of such a magnitude is undertaken.⁵⁵ Cooperation between the states is essential to solving disputes over water rights and supplies. Even though the project is estimated to take decades to complete, it could be a huge step in solving problems for both the Southeast and Southwest.⁵⁶

⁵⁰ John Ingold, *Ship the Mississippi to Colorado?* DENV. POST (March. 19, 2009), http://www.denverpost.com/news/ci_11946032; Michael Clark, *A plan to divert Mississippi flood waters to west is proposed*, EARTH TIMES (Aug. 2, 2011), <http://www.earthtimes.org/business/plan-divert-mississippi-flood-waters-west-proposed/1206/>.

⁵¹ Cornelia Dean, *Time to Move the Mississippi, Experts Say*, N.Y. TIMES (Sept. 19, 2006), http://www.nytimes.com/2006/09/19/science/19rive.html?pagewanted=all&_r=1&.

⁵² *Id.*

⁵³ *Id.*

⁵⁴ See Brean, *supra* note 46.

⁵⁵ *Id.*

⁵⁶ See Clark, *supra* note 49.

The project would likely have significant backlash, however, due to engrained water rights along the Mississippi River and would likely be fought in court.⁵⁷ The riparian rights doctrine gives those on or adjacent to the river access to the water. Diverting the river to Colorado would be an infringement of their legal claim to access water.⁵⁸ The Eastern States would likely fight a proposal like this, regardless of the environmental benefits that would be reaped.⁵⁹ The legal ramifications in the West would be drastic as well. With the new influx of water into the region, it is likely the Colorado River Compact would have to be updated, and the percentages allotted under the *Arizona* decision would need to be re-litigated.⁶⁰

Overall, the water laws in the United States are complicated issues that pose environmental and policy problems that are different in the regions of the Southwest and Southeast. Due to the climate and lack of water in the Southwest, prior appropriation makes the most sense for distributing water, however drought and population growth make future planning essential. The Southeast faces fewer problems of quantity because drought is a less frequent occurrence. However, growth is still a potential problem, and disputes over water can occur in times of drought. The riparian rights doctrine makes mitigating issues of drought more difficult since it is inflexible regarding rights and apportionment. The future, it seems, may lie in comprehensive multi-region, cooperative solutions that could bridge the gap in water laws and solve multiple issues of under and over supply. Projects such as the Mississippi River diversion will require statewide and region wide cooperation and a restructuring of water law and policy

⁵⁷ *Id.*

⁵⁸ *Hendrick v. Cook*, 4 Ga.241, 256 (1848).

⁵⁹ *See Clark, supra* note 49.

⁶⁰ Ben Merriman, *A New Deal for the Colorado River* BOSTON REV. (Mar. 9, 2015), <http://bostonreview.net/blog/ben-merriman-new-deal-colorado-river>; *See Arizona v. California*, 373 U.S. 546, 583 (1963).

across the two systems. As climate change and population growth continue to impact regions across the United States, large-scale reforms will be necessary.