Drought Down Under and Lessons in Water Policy for the Golden State

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I. INTRODUCTION

California has been experiencing prolonged dry conditions for nearly a decade; seven of the nine years since 2007 (when the 2007-2009 drought began) have been dry.[1] Although the 2015-2016 El Niño delivered the wettest season since the 2012 drought began, one somewhat improved season does not compensate for four prior consecutive years of drought.[2] Ending the drought would require having enough precipitation and runoff throughout the state to mitigate the impacts of the past dry years.[3] Unfortunately, water year 2016 did not meet the mark.[4]

It is not all bad news though. The drought conditions in California created a favorable climate for a serious discussion about a topic that in other times might have been unthinkable: a comprehensive overhaul of water law and policy.[5] Even Governor Jerry Brown refers to the state's water rights system as "somewhat archaic."[6] Jerry Brown has also said that the water rights system built into California's legal framework will probably need to be examined.[7] As the conversation for reform gains momentum, scholars, politicians and non-governmental organizations alike are turning their sights to Australia, which is viewed as a model of comprehensive water policy.[8] In fact, in October 2015,

[1] *Water Conditions Update*, CALIFORNIA DEP'T OF WATER RES. (June 2016), http://www.water.ca.gov/waterconditions/docs/Water-Conditions-_Hi-res-june2016.pdf

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] *See e.g.* Richard M. Frank, *Another inconvenient truth: California water law must change*, SAN FRANCISCO CHRONICLE (Apr. 10, 2015), http://www.sfchronicle.com/opinion/article/Another-inconvenient-truth-California-water-law-6192703.php.

[6] Kristen Gelineau & Ellen Knickmeyer, *California drought: Can we learn from Australia's 'Big Dry'?*, SAN JOSE MERCURY NEWS (May 26, 2015), http://www.mercurynews.com /drought/ci_28185150/california-drought-can-we-learn-from-australias-big.

[7] Scott Smith, *Water mysteriously vanishing from California delta amid drought; farmers prime suspects*, U.S. NEWS & WORLD REPORT (Apr. 11, 2015), http://www.usnews.com /news/us/articles/2015/04/11/california-deltas-water-mysteriously-missing-amid-drought.

[8] Lee Godden, *Water Law Reform in Australia and South Africa: Sustainability, Efficiency and Social Justice*, 17 J. ENVTL. L. 181, 202 (2005); Clint Jasper, *As California enters its fifth year*

more than forty California legislators and water agency heads travelled to South Australia seeking policy solutions.[9]

Australia, like California, has had to grapple with the tension between common law doctrines rooted in history and variable water supplies that are often insufficient to serve every competing demand. Australia is the driest inhabited continent on Earth.[10] Many of Australia's 246 river basins do not permanently flow and large parts of the country may be in drought at any given moment.[11] In fact, "Australia has experienced two significant '100-year droughts' in the last 100 or so years;" a "100-year drought" is a drought of such severity that is only expected to occur *once* every one hundred years.[12] "Australia recently experienced its longest and most severe drought on record: the 'Millennium Drought,' which lasted from 1997 to 2010."[13]

Very much like California, Australian governments historically sought to address increases in water demand through taxpayer-funded infrastructure projects.[14] Australian farmers lobbied to ensure that water was available at a low price, while additional water entitlements were readily granted.[15] The result was an over-allocation of water and constant conflict amongst environmental groups and farmers.[16] However, particularly severe drought prompted Australia to make major changes, including: reforming its system for allocating water, creating better-defined water rights, and improving the water market.[17] These reforms were immensely successful, and today the price of water better reflects its scarcity and the cost of delivering water.[18] Australia's arid climate and similar legal history make it a worthwhile case study when considering options

of drought, state lawmakers undertake study mission to Australia, ABC (Oct. 19, 2015), http://www.abc.net.au/news/2015-10-20/californian-lawmakers-study-australian-drought-response/6869076.

[9] ABC, *Californian drought delegation tours South Australia for possible water saving solutions* (Oct. 19, 2015) http://www.abc.net.au/news/2015-10-20/californian-drought-delegation-to-tour-south-australia/6867608.

[10] THE WENTWORTH GRP. OF CONCERNED SCIENTISTS, *Blueprint for a Living Continent*, 5, (Nov. 1, 2002), http://wentworthgroup.org/wp-content/uploads/2013/10/Blueprint-for-a-Living-Continent.pdf [hereinafter *Blueprint for A Living Continent*].

[11] Godden, *supra* note 8, at 182-83; *Natural Disasters in Australia*, AUSTRALIAN GOV'T, http://www.australia.gov.au/about-australia/australian-story/natural-disasters.

[12] *Id*.

[13] Laura Tam, *Learning from Australia's "Millennium Drought"*, SPUR (July 7, 2016) http://www.spur.org/publications/urbanist-article/2016-07-07/learning-australia-s-millennium-drought.

[14] Julian Morris, *6 water reforms California can take from Australia*, THE SACRAMENTO BEE (July 18, 2015), http://www.sacbee.com/opinion/op-ed/soapbox/article27431986.html.

[15] *Id*.

[16] *Id*.

[17] *Id*.

[18] *Id*.

for water policy reform in California. However, understanding the challenges that California currently faces and analyzing potential solutions requires first understanding the origins of California's water law.

II. WATER RIGHTS LAW AND THE CALIFORNIA DOCTRINE

"It is a fundamental principle of water law that one may not withdraw water from its source without first acquiring 'water rights.'"[19] The right of property in water is generally considered usufructuary, meaning that a water right refers to the right to *use* water rather than ownership of water in the traditional sense.[20] California law provides "[a]ll water within the State is the property of the people of the State, but the right to the use of water may be acquired by appropriation in the manner provided by law."[21] California water law is unique when compared with the majority of the United States, because it recognizes both riparian and appropriative rights.[22]

This "dual" or hybrid system is sometimes referred to as the California Doctrine.[23] This hybrid system may have seemed like an innovative legislative solution at the time of its adoption in the 1850s. Today, however, it is unrealistic to expect that a system of law, which reflects both a doctrine developed in England before the birth of our nation as well as traditions brought to the state by miners during the gold rush, could adapt to support the eighth largest economy on the planet.[24] Understanding why the current legal system persists, despite the pressure of drought that frequently reveals its shortcomings, requires understanding the nature of the various rights that history conferred upon water users across the state.

A. The Riparian Doctrine: A Soggy Remnant of English Common Law

Riparian rights are traditionally associated with ownership of a parcel of land that is adjacent to a source of water.[25] Under the traditional riparian doctrine, those who own land contiguous to a watercourse have the right to divert the

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[19] U.S. v. State Water Res. Control Bd., 182 Cal. App. 3d 82, 100 (1986).

[20] *See id.*

[21] Cal. Water Code § 102.

[22] *See* People v. Shirokow, 26 Cal. 3d 301, 307 (1980).

[23] Edwyna Harris, *The Evolution of Water Rights in the Nineteenth Century: The Role of Climate and Asset Type*, 35 NAT. RESOURCES J. 217 (2013).

[24] Samantha Masunaga, *We're No. 8: California near top of world's largest economies*, LOS ANGELES TIMES (July 2, 2015), http://www.latimes.com/business/la-fi-california-world-economy-20150702-story.html.

[25] *The Water Rights Process*, STATE WATER RES. CONTROL BD., http://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.shtml [hereinafter *The Water Rights Process*].

water flowing by their land for use upon their land.[26] Riparian rights evolved in the presence of a rainfall abundant climate.[27] Riparian law was historically used in England, and continues to be used in England today.[28] Thus, riparian law in both the United States and Australia originated at English common law.[29] The riparian doctrine successfully developed in the eastern United States on the predicate of sufficient water for all users.[30] Given the aridity of both California and Australia, it may come as no surprise that the legal framework of the riparian doctrine presents significant challenges in times of shortage.

1. Riparian Rights in California

When California became a state in 1850, the legislature adopted the common law of England and thereby incorporated the riparian doctrine.[31] To this day, riparian rights do not require permits, licenses, or government approval.[32] However, riparian rights are somewhat restricted. For example, a riparian right does not entitle a water user to divert water for storage in a reservoir for use in the dry season.[33] Also, riparians cannot use water on land outside of the watershed of origin.[34] Riparian rights remain with a property when it changes hands, and parcels severed from an adjacent water source generally lose their right to the water.[35]

Given these restrictions and California's arid climate, the state could not have developed into the populous and economically productive powerhouse that it is today on the basis of riparian rights alone. One year after California adopted the common law of riparian rights, the legislature also gave the doctrine of prior appropriation the force of law.[36] This action by the legislature did not create a new legal doctrine. Rather, it was recognition of a practice that was already widespread throughout the state, thanks to the enormous influx of miners following the discovery of gold just prior to California's statehood.[37]

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[26] *See Miller & Lux v. Enter. Canal & Land Co.*, 169 Cal. 415 (1915).

[27] Harris, *supra* note 23, at 219.

[28] *Id*.

[29] *Id*.

[30] Judith V. Royster, *Winters in the East: Tribal Reserved Rights to Water in Riparian States*, 25 WM. & MARY ENVTL. L. AND POL'Y REV. 169 (2000), *available at* http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1233&context=wmelpr.

[31] *See Lux v. Haggin*, 69 Cal. 255, 337 (1886).

[32] *The Water Rights Process*, *supra* note 25.

[33] *Id*.

[34] *Id*.

[35] *Id*.

[36] *Id*.

[37] *Id*.

B. Prior Appropriation: A Remaining Legal Nugget of the Gold Rush

The doctrine of prior appropriation is the primary method for allocation of water in the arid western United States.[38] While riparian rights are generally associated with ownership of a waterfront parcel of land and use of water upon that same land, appropriative rights allow a water user to divert water from its natural course for use on noncontiguous land.[39]

In 1849, thousands flocked to California following the discovery of gold.[40] In order to work their claims, miners built extensive networks of flumes and waterways that often had to carry water great distances from the original watercourse.[41] Self-regulating miners adhered to the principle of "first come, first served" with respect to the legitimacy of land claims, and they allocated water necessary for mining on the same basis.[42] To stake their water claims, miners developed a "posting notice" system, which was the birth of today's appropriative right system.[43] This system allowed others to divert water from the same source, but created a hierarchy of priorities amongst all of the diverters.[44] Hence, the doctrine of prior appropriation adheres to the rule of "first in time, first in right."[45] Furthermore, "[a] miner was expected to act diligently to put his land and water allotment to beneficial use or forfeit all 'rights' to it."[46] Therefore, another principle common to appropriators is that they must "use it or lose it," meaning that water rights may be forfeited through nonuse under certain circumstances.[47]

Through the early 1900's, appropriators simply took the water they needed and used it without first obtaining formal permission from any administrative or judicial body.[48] These so called "early appropriators" were mostly miners and farmers.[49] The Water Commission Act of 1914 established the permit process for obtaining post-1914 appropriative rights; today the State Water Resources Control Board administers these permits.[50]

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[38] Lisa Greenberg, Note, *Trusting the Public: Reshaping Colorado Water Law in the Face of Changing Public Values*, 40 B.C. ENVTL. AFF. L. REV. 259 (2013).

[39] *Millview County Water Dist. v. State Water Res. Control Bd.*, 229 Cal. App. 4th 879, 888 (2014) ("*Millview*").

[40] *The Water Rights Process*, *supra* note 25.

[41] *Id.*

[42] Marybelle D. Archibald, *Appropriative Water Rights in California, Background and Issues*, GOVERNOR'S COMM'N TO REVIEW CAL. WATER RIGHTS LAW, 4, (1977), http://www.waterboards.ca.gov/publications_forms/publications/general/docs/l597.pdf.

[43] *The Water Rights Process*, *supra* note 25.

[44] *Id.*

[45] Archibald, *supra* note 42, at 4.

[46] *Id.*

[47] *Millview*, 229 Cal. App. 4th at 888.

[48] *The Water Rights Process*, *supra* note 25.

[49] *Id.*

[50] Archibald, *supra* note 42, at 10, 15.

C. Criticisms of California Water Law

The origins of California's water law reveal why leaders and scholars increasingly refer to the system as "archaic,"[51] "outdated and inefficient."[52] There is no doubt that these criticisms are both valid and justified. The two main doctrines in California water law developed long before the state even entered the Union, when the social and environmental conditions were vastly different than they are today.

At the time of statehood, the federal census tallied California's population at 92,597.[53] Today, California is the most populous state in the Union, with a current population of nearly 40 million.[54] The reality is that California's current legal framework developed to accommodate common law principles adopted from a wet European climate and traditions familiar to miners.

Today, irrigation has enabled the California Central Valley to produce two thirds of the United States' produce, as well as eighty percent of the world's almonds.[55] However, the current drought and dwindling water supplies are responsible for the fallowing of over one million acres of farmland in recent years.[56] California's experiences are not unique, though. Australia, and in particular, the Australian state of New South Wales, recently overhauled its water law and policy in the face of unprecedented drought.

III. INTRODUCTION TO AUSTRALIA'S GOVERNMENTAL STRUCTURE

Australia's formal name is "the Commonwealth of Australia."[57] The Commonwealth of Australia was formed on January 1, 1901, when six British colonies united to become states of a nation.[58] The creation of the Commonwealth of Australia is referred to as "federation."[59] This is because the

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[51] Gelineau & Knickmeyer, *supra* note 6.

[52] Carlos F. Ugalde, *Reforming California's Water System: A Model for the Future?*, CITY SQUARE BY THE FORDHAM URBAN LAW JOURNAL (Apr. 14, 2015), http://urbanlawjournal.com/reforming-californias-water-system-a-model-for-the-future/.

[53] *California State Census, 1852*, ANCESTRY.COM, http://search.ancestry.com/search/db.aspx?dbid=1767.

[54] *Florida Passes New York to Become the Nation's Third Most Populous State, Census Bureau Reports*, U.S. CENSUS BUREAU (Dec. 23, 2014), http://www.census.gov/newsroom/press-releases/2014/cb14-232.html.

[55] Natasha Geiling, *California's Drought Could Upend America's Entire Food System*, CLIMATE PROGRESS (May 5, 2015), http://thinkprogress.org/climate/2015/05/05/3646965/california-drought-and-agriculture-explainer/.

[56] *Federal Agencies Release Data Showing California Central Valley Idle Farmland Doubling During Drought*, NASA (Oct. 21, 2015), http://landsat.gsfc.nasa.gov/federal-agencies-release-data-showing-california-central-valley-idle-farmland-doubling-during-drought/.

[57] *How Government Works*, AUSTRALIAN GOV'T, http://www.australia.gov.au/about-government/how-government-works [hereinafter *How Government Works*].

[58] *Id.*

[59] *Id.*

Australian Constitution created a federal system of government, wherein the powers are divided between the central government and the six individual Australian states.[60] Thus, like the United States, Australia has a constitutionally based federal governance system.[61]

Australia is both a representative democracy as well as a constitutional monarchy.[62] The Australian Constitution contains the rules of government for the nation; it defines how the Commonwealth government operates, as well as on what issues the Commonwealth can pass laws.[63] The legislature of the Commonwealth of Australia (also known as "Parliament") consists of a Senate, a House of Representatives, as well as the Queen (who is represented by the Governor General).[64] Like the United States Congress, Parliament passes laws that affect the entire country.[65] Australia also has the same three branches (or "arms") of government as the United States federal government: the legislature, the executive, and the judiciary.[66] Thus, Australia's governmental structure is very similar to that of the United States.

IV. EARLY APPROACHES TO WATER MANAGEMENT IN AUSTRALIA

Like California, Australia inherited the common law of riparian rights from Great Britain.[67] Considering the arid conditions of Australia, it should come as no surprise that even before federation, and as early as the 1800's, each of the Australian colonies started to address the shortcomings of the riparian doctrine.[68] Also like California, Australia adopted the doctrine of prior appropriation as a result of water use on the Australian goldfields in the 1850s.[69] Appropriation in Australia was based on the familiar "first in time, first in right" principle.[70] Like California's doctrine, prior appropriation in Australia also included a seniority rule and forfeiture for non-use.[71]

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[60] *Id.*

[61] Brian Haisman, *Impacts of Water Rights Reform in Australia*, in WATER RIGHTS REFORM: LESSONS FOR INSTITUTIONAL DESIGN, 113, 114 (Bryan Randolph Bruns, et al. eds., 2005).

[62] *How Government Works*, *supra* note 57.

[63] *Id.*

[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] Arlene J. Kwasniak, *International Perspective: Water Scarcity and Aquatic Sustainability: Moving Beyond Policy Limitations*, 13 U. DENV. WATER L. REV. 321, 357-58 (2010).

[68] ICM Agric. Pty Ltd v. Commonwealth (2009), 51 CLR 1, at 50, 53-54, 119-20, (Austl.), http://www.austlii.edu.au/cgibin/sinodisp/au/cases/cth/HCA/2009/51.html?stem=0&synonyms=0&query=water%20act#disp1

[69] Harris, *supra* note 23, at 221.

[70] *Id.* at 220.

[71] *Id.*

V. HISTORY OF AUSTRALIAN WATER POLICY REFORM

Before the Commonwealth of Australia even came into being, the soon to be states were already at work managing water resources. At the end of the 19th century, each of the Australian colonies conducted inquiries into the management of their water resources and all of these inquiries recommended bringing water resources under statutory control.[72] Consequently, the Water Rights Act of 1896 vested in the Crown the right to water in rivers and lakes.[73] This, and other "early Australian statutes during the late 19th and early 20th centuries (commencing with the *Victorian Irrigation Act of 1886*) . . . sought to limit riparian rights by vesting the right to 'the use and flow, and to the control of water resources' in the Crown (that is, the states)."[74] This allowed each of the states to establish centralized systems for allocating water rights that were administered and closely controlled by public authorities.[75] The Victorian Irrigation Act of 1886, for example, "effectively abolished any new riparian rights, and replaced existing rights with statutory rights in order to assert State authority."[76] These water rights, referred to as licenses or entitlements, could always be "legally amended or cancelled at any time without payment of compensation."[77]

Since Australia's federation in 1901, the states have had responsibility for water management.[78] The Australian Constitution states: "the Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a state or of the residents therein to the reasonable use of the waters of rivers for conservation or irrigation."[79] Australia's national government is unable to dictate water policy because of the way in which this section of the Constitution is interpreted.[80] However, the federal government of Australia is not entirely precluded from influencing water management policies. Although the

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[72] Michael McKenzie, *Water Rights in NSW: Properly Property*, 31 SYDNEY L. REV. 443 (2009).

[73] *Water Rights Act 1896* (N.S.W.) s 1(1) (Austl.)

[74] *Water Markets in Australia*: *A Short History*, AUSTRALIAN GOV'T (Dec. 2011), http://apo.org.au/files/Resource/water-markets-in-australia-a-short-history.pdf [hereinafter *Water Markets in Australia*].

[75] *Id*.

[76] WATER MARKETS FOR THE 21ST CENTURY: WHAT HAVE WE LEARNED? 165 (K. William Easter & Qiuqiong Huang eds., 2014).

[77] *Water Markets in Australia*, *supra* note 74, at 30.

[78] Robert David Pilz, *Lessons in Water Policy Innovation from the World's Driest Inhabited Continent: Using Water Allocation Plans and Water Markets to Manage Water Scarcity*, 14 U. DENV. WATER L. REV. 97, 102 (2010).

[79] *Australian Constitution* s 100.

[80] Michael D. Young, *Environmental Effectiveness and Economic Efficiency of Water Use in Agriculture: The Experience of and Lessons from the Australian Water Reform Programme*, ORG. FOR ECON. CO-OPERATION AND DEV, 8. (2010), http://www.myoung.net.au/water/publications /OECD_Lessons_paper.pdf.

Constitution ultimately leaves water management to the states, this has not proved to be a barrier for negotiation of agreements across different basins and states.[81] The federal government of Australia actually plays a large role in the evolution of water policy in the country.

Modern water policy reforms in Australia sparked in the 1990's after a particularly severe drought that resulted in the federal government of Australia effecting change throughout the states by outlining broad reform principles in intergovernmental agreements and through multijurisdictional agreements between the states that governed the Murray-Darling Basin. [82] These principles and agreements, described in further detail below, were initiated at the national level, but laid the foundation for even greater reforms that would take place at the turn of the century at the state level.

A. The 1994 Council of Australian Governments Water Reform Framework

The Council of Australian Governments **(**COAG) is a group comprised of heads of states, territories and the federal government of Australia.[83] COAG's Water Reform Framework in 1994 aimed "to implement a strategic framework to achieve an efficient and sustainable water industry."[84] The main reforms suggested the development of water markets and water trading to maximize the resource's economic and social contributions.[85] Implementation of clearly defined water property rights that were detached from land title is a key aspect of this framework that enabled the success of water markets and water trading.[86]

The reforms also recognized the environment as a legitimate water user, and states were called upon to formally determine environmental water allocations.[87] Another reform was the "separation of water regulation and policy authority away from water service providers . . ."[88] Finally, the reforms called for water pricing to reflect the full cost of provision, including externalities.[89]

One year later, in 1995, COAG agreed to a National Competition Policy.[90] This policy fortified the 1994 framework by creating financial incentives and

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[81] *Id*.

[82] Haisman, *supra* note 61, at 125, 130.

[83] Pilz, *supra* note 78, at 103.

[84] *Id*.

[85] *Id*.

[86] Council of Australian Governments Communique 'Attachment A – Water Resources Policy', COUNCIL OF AUSTL. GOV'TS (Feb. 25, 1994) http://ncp.ncc.gov.au/docs/Council%20of%20Australian%20Governments'%20Communique%20%2025%20February%201994.pdf.

[87] Pilz, *supra* note 78, at 103.

[88] *Id*.

[89] *Id*.

[90] *Id*.

penalties on state implementation of reforms.[91] Under the National Competition Policy, states could either receive rewards of funding, or alternatively, penalties of withheld funding, depending upon effective implementation of the Water Reform Framework.[92] The policy had real consequences. One state's failure to meet a water reform goal resulted in a penalty of $24 million Australian dollars.[93]

Though COAG established the framework for the more modern reforms that Australia is known for today, the state of New South Wales had already been gradually modifying its water law and policy for many decades prior to the existence of COAG or the National Competition Policy. These prior state reforms laid the groundwork for New South Wales to take even more progressive steps at the turn of the 21st century in the face of the Millennium Drought.

1. State Reform in New South Wales

The first comprehensive piece of water legislation in the state of New South Wales was the Water Act of 1912.[94] This Act permitted landowners to retain some limited riparian rights for livestock watering and domestic purposes, but required landholders to apply for a license for all other extractions of water.[95] These licenses contained fixed terms, but did not originally contain volumetric allocations.[96] However, volumetric allocations on 'regulated' streams were introduced in 1977.[97] The 1912 Act became subject to the changes of the 1986 Water Administration Act, which vested rights to water in the Water Administration Ministerial Corporation.[98] Transfers of water allocations on either a temporary or permanent basis also became possible in 1986.[99] However, irrigation farms were exempt from licensing and were allocated a water right that was an annual volume of water that was effectively guaranteed as a minimum supply.[100]

At the turn of the century, New South Wales sought to give effect to COAG's framework for water reform, and even took steps beyond the requirements of federal law when it implemented the Water Management Act of 2000.[101] Other

91 *Id.*

92 *Id.*

93 *Id.*

94 McKenzie, *supra* note 72, at 445.

95 *Water Act 1912* (N.S.W.) s 7(1)(a), 10 (Austl.).

96 *Id.* at s 20W (Austl.).

97 *See id.*

98 *Water Administration Act 1986* (N.S.W.) s 12 (Austl.).

99 McKenzie, *supra* note 72, at 446.

100 *Id.*

101 James A. Folger, Comment, *From Australia to California: Solving California's Water Crisis*

states and territories also passed similar legislation.[102] The New South Wales Water Management Act 2000 (WMA) expressly abolished common law riparian rights and vested "in the Crown the right to the 'control, use and flow' of (i) all water in rivers, lakes and aquifers, (ii) all water conserved by works under the control of the Minister, and (iii) all water occurring naturally on or below the surface of the ground (the State's water rights)."[103] With respect to the state's water rights, the WMA also "separated the right to extract or divert water ('access licenses') from the right to use water for a specific purpose at a precise location ('water use approvals')."[104]

The abolition of riparian rights may sound drastic to readers who are more familiar with riparian rights in the United States. In fact, such an abolition would be unconstitutional under the Fifth Amendment Takings Clause. However, the Water Act of 1912 already drastically scaled back the existence of riparian rights in New South Wales before the inception of WMA in the year 2000. Thus, previous legislation had already vested "rights to water in rivers and lakes, water occurring naturally on the surface or ground, and water conserved by any works and subsurface water, in the Water Administration Ministerial Corporation," and subsequently in the Crown.[105]

B. The 1994 Murray-Darling Basin Agreement

The Murray-Darling Basin is Australia's "most important agricultural area, generating thirty-nine percent of national income derived from agricultural production."[106] Given its agricultural productivity, and the extensive wetlands it contains, some have analogized this basin to the Sacramento-San Joaquin Delta.[107] Like California and the Sacramento-San Joaquin Delta, the Murray-Darling Basin is also severely impacted by water scarcity.[108] However, unlike the Sacramento-San Joaquin Delta, the Murray-Darling Basin spans multiple states, including New South Wales, Victoria, Queensland, South Australia, as well as the Australian Capital Territory.[109]

During the same period as the COAG Water Reform Framework, the four states and the territory spanning the region formed the 1994 Murray-Darling Basin Agreement.[110] This agreement imposed a "cap" on future extractions of

by Applying Lessons Learned Down Under, 45 U.S.F. L. REV. 243, 258 (2010).

102 McKenzie, *supra* note 72, at 447.

103 *Id.*

104 Folger, *supra* note 101, at 258.

105 McKenzie, *supra* note 72, at 446.

106 Folger, *supra* note 101, at 252.

107 *Id.*

108 Kwasniak, *supra* note 67, at 357.

109 *Id.*; Folger, *supra* note 101, at 252.

110 Pilz, *supra* note 78, at 103-04.

water "in order to protect and enhance the riverine environment."[111] The cap froze diversion levels in the basin states and Capital Territory at "baseline conditions," meaning 1993-1994 levels of development.[112] The cap aimed to limit diversions, not development, and so it did not set a growth limit on any water dependent sector.[113] In practice, though, the cap prevented states from issuing more water licenses, and this resulted in some unintended consequences.[114] For example, following the Murray-Darling Basin Agreement, the development of groundwater resources enabled a significant expansion of water use that resulted in a decline of water dependent ecosystems that were impacted by the groundwater extractions.[115] Later reforms would attempt to address these impacts by managing surface and groundwater, rather than surface water alone.

Following the COAG Water Reform Framework, the National Competition Policy and the Murray-Darling Basin Agreement, the states began to make progress in implementing the broad principles that were set out for them.[116] However, the turn of the century brought an increase in demand for water, an increased understanding of the interconnectivity between surface and groundwater, as well as experience in operating water markets.[117] Furthermore, from 1997 to 2009, Australia faced the Millennium Drought, the worst drought in the country's recorded history, fueling the political will for even more reforms.[118] In 2003, COAG agreed to the development of a National Water Initiative (NWI) that would build upon the 1994 Water Reform Framework.[119] Thus, the Australian government began to work on what has since become the international standard for water reform.[120]

C. The 2004 National Water Initiative

The primary objective of the NWI was to create "a nationally-compatible, market, regulatory, and planning based system of managing surface and groundwater resources for rural and urban use that optimizes economic, social

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111 *Murray Darling Basin Agreement 2006* (Cth) pt X div 1 sch F s 1(a). (Austl.), www2.mdbc.gov.au/data/page/44/Murray-Darling_Basin_Agreement.pdf (agreement no longer in force).

112 *Id*.

113 *Id*.

114 Young, *supra* note 80, at 8.

115 *Id*.

116 Pilz, *supra* note 78, at 104.

117 *Id*.

118 Brittany Patterson, *What Australia Can Teach the World about Surviving Drought*, SCIENTIFIC AMERICAN (May 28, 2015), http://www.scientificamerican.com/article/what-australia-can-teach-the-world-about-surviving-drought/.

119 McKenzie, *supra* note 72, at 448.

120 Pilz, *supra* note 78, at 104.

and environmental outcomes."[121]

The NWI aimed to complete the modernization of Australia's water management system by requiring certain commitments from the states, including that each state had to prepare and implement a NWI plan.[122] Specifically, under the NWI, the Australian state governments committed to: (1) prepare water plans with provisions for environmental protection; (2) address issues of over-allocated or stressed water systems; (3) introduce registers of water rights and standards for water accounting; (4) expand the trade in water; (5) improve pricing for water storage and delivery; and (6) meet and administer urban water demands.[123]

The states also committed to action on eight aspects of water management that were outlined as "Key Elements" by the NWI, including: (1) improved water access entitlements and planning; (2) improved water markets and trading; (3) improved water pricing, which would advance economically efficient and sustainable uses of water; (4) integrated management of water for environmental and other public benefits; (5) improving water resource accounting by achieving proper measurement, monitoring and reporting systems; (6) reforming urban water systems to ensure healthy, safe, and reliable water supplies; (7) increasing knowledge and capacity in order to ensure future support and execution of the agreement by identifying and implementing proposals; and lastly (8) involving water users and other stakeholders in reaching the NWI objectives by improving transparency and public-private partnerships.[124]

"The NWI also avoided providing complete perpetual rights to water access and, alternatively established perpetual rights to a share of available water resources," with the volume of that particular share subject to change from year to year.[125] Specifically, the NWI defines "water access entitlement" as "a perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool as defined in the relevant water plan."[126] The NWI defines "water allocation" as "the specific volume of water allocated to water access entitlements in a given season, defined according to rules established in the relevant water plan."[127] While the NWI left the task of implementation to the states, the next federal enactment did not grant the same autonomy, but rather took a hands-on approach to water management.[128]

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[121] *Intergovernmental Agreement on a National Water Initiative 2004* (Cth) para 3 (Austl.). http://www.bom.gov.au/water/about/consultation/document/NWI_2004.pdf.

[122] Pilz, *supra* note 78, at 105.

[123] *NWI Objectives*, AUSTRALIAN GOV'T, http://webarchive.nla.gov.au/gov/20160615061116/http://www.nwc.gov.au/nwi/objectives.

[124] Folger, *supra* note 101, at 255-56.

[125] *Id*. at 257.

[126] Young, *supra* note 80, at 9.

[127] *Id*.

[128] Pilz, *supra* note 78, at 105.

D. The 2007 Water Act

Alongside the broader reform process described above, a specific program of reform occurred in relation to the management of the water resources of the Murray-Darling Basin.[129] Recognizing the importance of sustainable water management, the states of that basin negotiated to give up their constitutional powers for water resource planning to allow the federal government of Australia to play a larger role in managing the declining Murray-Darling Basin.[130] Parliament passed the 2007 Water Act, a national law that sought to set forth details for how to manage Australia's water resources in the Murray-Darling Basin by creating the Murray-Darling Basin Authority.[131] This Act required the development of a Basin Plan that would provide a coordinated approach to water use across the Basin's four States and the Capital Territory.[132] The Basin Plan limits water use at environmentally sustainable levels by determining long-term average Sustainable Diversion Limits for both surface water and groundwater resources.[133]

A shared characteristic between the NWI and the Water Act 2007 is that they both place environmental water use equal to or ahead of consumptive use in priority.[134] Central features of both the NWI as well as the 2007 Water Act are water allocation planning, water markets and water trading. The following is an overview of how these tools are utilized today to manage Australia's water.

VI. OVERVIEW OF WATER MANAGEMENT IN AUSTRALIA TODAY

The history of Australia's water reforms is a lengthy series of state and federal enactments as well as intergovernmental agreements. Today, despite the complex institutional framework, water management in Australia serves as a model for other jurisdictions across the globe. While these reforms did not happen overnight, there are several key features of Australia's water management structure that enable its success: water allocation planning, water markets and water trading.

A. Water Allocation Planning in Australia

The NWI recognized the importance of water plans and provided broad

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129 McKenzie, *supra* note 72, at 448.

130 Pilz, *supra* note 78, at 106.

131 *Id.* at 105.

132 *Id.* at 104-06.

133 *Fact Sheet 3: Sustainable Diversion Limits (SDLs) and The Impacts Of Environmental Water Purchases*, AUSTL. GOV'T, MURRAY-DARLING BASIN AUTH., http://www.mdba.gov.au /sites/default/files/pubs/Basin-Plan-SDL-fact-sheet.pdf

134 Pilz, *supra* note 78, at 112.

guidelines for the states to undertake their own planning efforts.[135] Approaches to water planning vary "dramatically from jurisdiction to jurisdiction, and indeed between regions within jurisdictions."[136] In all states, rights to use water are defined in legislation and managed through a variety of licensing and planning arrangements.[137] Water is controlled by states and water users are issued licenses to use water.[138] The states vary in how they implement their water plans, and they can be incredibly complex. For a simplified example, a state could define different "pools" of water for different uses, "such as a consumptive use pool, an environmental pool and a river operation pool."[139] Water planners can vary the sizes of the pools subject to the specific laws of each state, and relevant water plans "determine which of these pools are 'filled' first by available water."[140] The most important function of a water plan is its ability to influence yearly allocation decisions.[141] The nature of Australian water rights enables these annually fluctuating allocation decisions.

1. Consumptive Water Rights Under the NWI

The NWI refers to permanent water rights as "water access entitlements" or simply "entitlements."[142] As a brief reminder, Australian water rights are a combination of both a permanent entitlement as well as a yearly allocation. Entitlements are permanent and perpetual water rights held with the state government that determine how much water an individual can use, based on the total volume of water available in a basin in any given year.[143] An entitlement is like a pool of water that is promised to a user, but the size of the pool varies from year to year, depending on how much total water there is that year for everyone who owns a pool in a specific basin.[144] Essentially, an entitlement defines a water users' share of the consumptive pool of a specified water resource.[145] "The actual amount of the share available for use under an entitlement changes each year depending on water availability and relevant

135 *Id.* at 110.

136 *Water Allocation Planning in Australia – Current Practices and Lessons Learned*, AUSTL. GOV'T, http://www.mdba.gov.au/kid/files/178%20%20Water%20allocation%20planning%20in%20Australia.pdf

137 Young, *supra* note 80, at 8.

138 *Id.*

139 Pilz, *supra* note 78, at 110.

140 *Id.*

141 *Id.* at 107.

142 *Id.*

143 Andrew Maddocks, *Australia's Water Markets Succeeding, Yet Severe Challenges Loom*, CIRCLE OF BLUE (Feb. 20, 2013), http://www.circleofblue.org/waternews/2013/world/australias-water-markets-succeeding-yet-severe-challenges-loom/.

144 *Id.*

145 Pilz, *supra* note 78, at 107.

water plan guidelines."[146] Relevant water plan guidelines can affect the amount of water an entitlement holder will receive because water plans define how allocations "to entitlements will change as conditions change to meet broad goals of resource use and environmental health."[147]

"The volumetric amount of water assigned to an entitlement holder to use in any one water year is called an 'allocation.'"[148] Thus, State governments initially determine the total quantity of water that will be available to users in a given year, and then each user, or rather entitlement holder, receives their allotment.[149] Each user must adhere to the state government-regulated limit on how much naturally available water can be used.[150] Each user must adhere to the state government-regulated limit on how much naturally available water can be used.[151] Australian water managers are said to "mak[e] allocations to entitlements" and these allocations reflect the scarcity of water for that year.[152] This system of entitlements and allocations can be analogized to owning stock within a company, with the value of that stock changing from year to year. Water rights can also contain some form of use approval that allows water to be used on a specific site.[153] Furthermore, since water metering is strictly enforced in Australia, unauthorized extractions are rare and every drop in the system is accounted for.[154]

2. Varying Degrees of Entitlement Reliability

Despite federal reforms, the state-based approach resulted in significant differences in water access entitlements between jurisdictions.[155] "Some states differentiate between high and low reliability entitlements, making allocations to high reliability entitlements first before allocating any water to low reliability entitlements."[156] Alternatively, the state of South Australia classifies all entitlements as high reliability.[157] Reliability is referred to in other jurisdictions, such as New South Wales, as security, which is divided into three tiers.[158] High-

146 *Id*.

147 *Id*. at 109.

148 *Id*. at 107.

149 Maddocks, *supra* note 143.

150 *Id*.

151 *Id*.

152 Pilz, *supra* note 78, at 107.

153 *Id*.

154 Maddocks, *supra* note 143.

155 *Water Markets in Australia*, *supra* note 75, at 58.

156 Pilz, *supra* note 78, at 107-08.

157 *Water Markets in Australia*, *supra* note 75, at 58.

158 *Water Resources*, AUSTL. GOV'T, http://www.nationalwatermarket.gov.au/about/resources.html (last updated June 22, 2015) ("Entitlements in regulated systems are categorized by the degree of reliability. Reliability is referred to in some jurisdictions as security, for example 'high

security rights promise a full supply of promised water 95 percent of the time and so are generally held and purchased by farms with permanent plantings, such as vineyards or orchards.[159] General rights vary from 30 to 80 percent reliability and so are held or purchased by annual crop farms that might grow rice or cotton, for example.[160] Finally, low security rights are only available in years of unusual rainfall or flooding.[161] These different entitlements are bought and sold on the water market, which is explained in further detail below.

3. Risk Allocation Amongst Entitlement Holders

The NWI also placed a great deal of importance on laying out guidance for how to spread the risks associated with changes resulting from potential reallocation of water among consumptive, environmental, and other uses.[162] The NWI requires water plans to "include mechanisms that spread the burden of possible changes, including reductions in water allocations."[163] The NWI also permits entitlement holders, the government and environmental stakeholders to agree on a voluntary basis to different risk sharing formulas than what is provided for in the NWI.[164]

The NWI's framework for assigning risks to changes in allocations through the water allocation planning process is quite detailed.[165] For example, the NWI suggests that entitlement holders bear the risk of any reduction or less reliable water allocation under an entitlement that results from changes in climate, wildfires or drought.[166] Alternatively, governments must bear the risks of any reduction or less reliable water allocation that arises from changes in government policy (for example, new environmental objectives).[167] This means that the government must bear the cost of either purchasing additional water on the water market for desired environmental outcomes, or make other investments to achieve the same result.[168]

B. Water Markets in Australia

The development and utilization of water markets throughout Australia is an

security' or 'general security'.")

159 Maddocks, *supra* note 143.

160 *Id.*

161 *Id.*

162 Pilz, *supra* note 78, at 114.

163 *Id.*

164 *Intergovernmental Agreement on a National Water Initiative*, *supra* note 121, at 9.

165 *See id.* at 8-9 ("Assigning Risks for Changes in Allocation" section describes the framework for assigning changes in risks during the water allocation planning process).

166 *Id.* at 8.

167 *Id.* at 9.

168 See *id.* at 16-17.

essential component of their success story. Australia's water reform journey required various state and national initiatives that enabled the development of efficient water markets.[169] Water markets are the primary vehicle through which Australia has achieved various reform goals, including providing water security to water users in times of drought, as well as shifting water from consumptive to environmental uses.[170]

Australian state governments instituted bans on issuing additional licenses to access water starting as early as 1969.[171] These bans on issuing more licenses acted as a sort of "cap" before the proliferation of what can be described as a "cap and trade" water market.[172] Therefore, a water user seeking access to water must convince another user to sell either an allocation for use this year or an entitlement for use in perpetuity; the water market is the only way to obtain additional naturally occurring water.[173] However, state-enforced limits only apply to naturally occurring water, so some users may opt to purchase water from a desalinator or importer.[174]

Australia's system aims to make transfers "as smooth as possible; you can view real-time prices or trade water rights online."[175] Additionally, data needed to set prices, such as up-to-the-minute water usage and records of water rights, is all online and publicly available.[176] However, these markets do not function quite like the U.S. stock market because the market only serves to facilitate transactions and track prices.[177] Buyers and sellers negotiate the transaction price amongst themselves.[178] Water rights trading can even happen between two individuals, without any market involvement, just as if the transaction was one farmer independently selling livestock to another.[179]

C. Water Trading in Australia

The water market in Australia allows entitlement holders to trade across different river systems and across state boundaries.[180] Within this framework,

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169 Young, *supra* note 80, at 6.

170 Pilz, *supra* note 78, at 116.

171 *Water Markets in Australia*, *supra* note 74.

172 *Id*.

173 Maddocks, *supra* note 143.

174 *Id*.

175 Editorial Board, *California's Future Is in Australia*, BLOOMBERG VIEW (May 15, 2015), http://www.bloombergview.com/articles/2015-05-15/can-california-have-a-water-market-; *Water Trading Explained*, WATERFIND, http://www.waterfind.com.au/water-trading/.

176 *Id*.

177 Maddocks, *supra* note 143.

178 *Id*.

179 *Id*.

180 Jeff Simonetti, *Australia's Water Rights System – A Look of Things to come in the State of California post-Drought?*, HYDROWONK BLOG (May 22, 2015), http://hydrowonk.com/blog/2015

all water users can trade amongst themselves for both short and long term water rights.[181]

Allocations are volumes of water that can be traded by entitlement holders to deal with immediate, day-to-day supply issues.[182] This is called temporary trading.[183] These exchanges are a one-time transaction, and essentially allow entitlement holders to buy water just for that year from someone else's "pool."[184] The second category of trading includes the trading, or rather, the permanent transfer of water entitlements.[185] Entitlements can be sold to other water users or to the government for environmental purposes.[186]

Water trading occurs for a variety of reasons. For example, water trading enables irrigators to manage uncertainty and ensure they have enough water for their crops. In the Murray-Darling Basin, it has been observed that "the lower the seasonal allocation, the larger the proportion of total water use is provided through market exchange."[187]

1. Water Trading in Agriculture

Three factors affect agricultural irrigators demand for water. First, allocations by definition will shift from year to year, and some years' allocations may be insufficient to meet irrigator's demands.[188] Second, market conditions, such as the price of crops also fluctuate annually.[189] "Finally, some irrigators grow crops that require water every year, such as fruit trees or grape vines, while other irrigators plant a yearly crop that may fallow if necessary."[190] Thus, water markets permit irrigators to manage these changing conditions in unique ways.

In any given year, some users may decide it is most economical to buy or sell water, while others might decide to manage their water more efficiently.[191] For example, an irrigator growing a yearly crop such as rice may decide that selling their water will provide a better return on investment for the year than selling their crop.[192] On the other hand, a vineyard owner who has a significant long-term investment (since vines cannot survive a year without water) would opt to

/05/22/australias-water-rights-system-a-look-of-things-to-come-in-the-state-of-california-post-drought/.

181 Maddocks, *supra* note 143.

182 *Id.*

183 Pilz, *supra* note 78, at 116.

184 Maddocks, *supra* note 143.

185 Pilz, *supra* note 78, at 116.

186 Maddocks, *supra* note 143.

187 Pilz, *supra* note 78, at 116.

188 *Id.*

189 *Id.*

190 *Id.*

191 Maddocks, *supra* note 143.

192 *See id.*

purchase water.[193] In this scenario, neither the buyer nor the seller would jeopardize their long-term viability. Thus, water markets have enabled Australian irrigators to stay viable even in times of long-term drought.[194]

Some irrigators have opted to almost exclusively sell their yearly water allocations, rather than conducting their normal farming operations; a phenomenon sometimes referred to as "farming water."[195] This flexibility to choose has not displaced famers and, rather, has enabled farmers to remain living on their farms within their farming community.[196] Furthermore, Australian water markets increase agricultural investment security by allowing farms "to remain viable businesses without water, with significantly less water, or with widely variable seasonal water allocations."[197] Thus, farmers and environmentalists are no longer in constant, litigious "fish versus farms" conflict, since water can be purchased for environmental conservation purposes as well.

2. Environmental Protection Through Water Trading

The Australian government spent billions of dollars buying permanent water rights to protect the environment; and once the government owns water, individual users cannot purchase it back.[198] Approximately half of the total available water in any Australian basin is reserved for the environment, whereas the other half of the water is divided into individual, useable entitlements.[199] Since every drop is accounted for in the Australian market, users seeking more water cannot just take it from the environment.[200]

However, "water market development ha[s] also negatively impacted the environment and water availability."[201] One issue "is that the increasing value of water entitlements has activated the use" of previously unused entitlements.[202] A water user who may not have previously used a portion of their entitlement will likely be motivated to use or sell that water as water becomes increasingly scarce as well as more valuable, thus creating even further competition for an already limited water supply and leaving less in the system for environmental purposes.[203]

193 *See id.*
194 Pilz, *supra* note 78, at 117.
195 *Id*.
196 *Id*.
197 *Id*.
198 Maddocks, *supra* note 143.
199 *Id*.
200 *Id*.
201 Pilz, *supra* note 78, at 119.
202 *Id*.
203 *Id*.

VII. POTENTIAL APPLICATION OF AUSTRALIAN METHODS TO CALIFORNIA'S CURRENT WATER CRISIS

Although California and Australia share common historical and governmental characteristics, including riparian and appropriative rights, as well as state control over water management, the two jurisdictions are actually far more different than they are similar.

A. The Challenge of Transitioning Existing Rights

Unlike the seniority based appropriative water rights used in California today, Australian water entitlement systems define pools of water that are shared in proportion to each person's entitlement.[204] Since all entitlement holders have the same status and therefore equal seniority, the costs of entitlement trading are much lower because there is no need to check to see if a trade would disadvantage other entitlement holders.[205] As a result, Australia has developed relatively low-cost water markets where willing irrigators can buy and sell entitlements and annual allocations with one another.[206] Abolishing the existing California Doctrine and instead adopting a more Australia-like water market based on water access entitlements is not just a painful reform that would present some serious challenges, but it is likely that this proposition is actually illegal because abolishing water rights would amount to an unconstitutional taking under the Fifth Amendment of the United States.

The existence of riparian rights is a significant barrier to the development of water markets in California, since each riparian right is different and location specific.[207] Therefore, successful implementation of an Australia-like system would require abolishing riparian rights. Although riparian rights still exist in some parts of Australia, riparian rights were always very limited and practically non-existent even before they were abolished in many of the Australian states.[208] In contrast, riparian rights are widespread throughout California and indeed remain an integral part of our water rights system. In order to establish a water rights system akin to that of Australia's, seniority among appropriative water rights holders would also need to be abolished.

The nature of both riparian rights and appropriative rights in Australia as they existed prior to modern reforms versus riparian and appropriative rights in California today is striking.

Although California law provides that "[all] water within the State is the property of the people of the State," and Australian legislation similarly provides

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204 Young, *supra* note 80, at 20.

205 *Id.*

206 *Id.*

207 *The Water Rights Process*, *supra* note 25.

208 *See* Haisman, *supra* note 61, at 123.

that all water belongs to the Australian states, the manner in which these principles have been applied in the courts of California versus Australia is where the true irreconcilable dichotomy of the two water rights systems surfaces.[209]

Australian reform changed the paradigm from one that focused on individual property rights to one that favored social policy. For example, the 1994 COAG framework aimed to maximize the resource's economic and social contributions.[210] Moreover, the court system in Australia has reinforced this paradigm. For example, in 2009, the High Court of Australia (equivalent to the United States Supreme Court) heard *ICM Agriculture Pty Ltd. v. The Commonwealth*, which challenged a funding scheme that compensated for losses incurred by entitlement holders that were affected by the replacement of groundwater "bore" licenses issued under the Water Act 1912 with aquifer licenses under the 2000 WMA.[211] Under the funding agreement, New South Wales agreed to reduce entitlements to groundwater under the WMA, and the Commonwealth provided financial assistance for payments to affected entitlement holders.[212] The replacement of the old licenses with the new licenses resulted in plaintiffs being permitted to take roughly a third less water than they were previously able to, and they were offered structural adjustment payments by the state, comprising a total of $818,730 and $93,830 to the respective plaintiffs.[213]

The plaintiffs complained of the inadequacy of the proposed structural adjustment payments, and therefore "argued that the reduction in water entitlements amounted to an acquisition of property other than on just terms, contrary to s 51(xxxi) of the Commonwealth Constitution."[214] Section 51(xxxi) of the Commonwealth Constitution "provides that the Commonwealth may make laws with respect to acquisition of property on just terms from any state or person for any purpose in respect of which the Parliament has power to make laws."[215] A majority of the High Court found that since 1966 the New South Wales legislation vested in the state the right to the use, flow and control of groundwater, and therefore, the reduction in the plaintiffs' entitlements to groundwater did not confer an "identifiable benefit on New South Wales (or anyone else) that New South Wales did not already have."[216] Therefore, there was "no acquisition of the plaintiffs' property within the meaning of s 51(xxxi)

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209 Cal. Water Code § 102; *Water Markets in Australia*, *supra* note 74.

210 Council of Australian Governments Communique, *supra* note 86.

211 *See* ICM Agric. Pty. Ltd. v. Australia (2009), 51 C.L.R. 1, http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/cth/HCA/2009/51.html?stem=0&synonyms=0&query=water%20act#disp1.

212 *The Gateway to Environmental Law*, ECOLEX, http://www.ecolex.org/ecolex/ledge/view/RecordDetails?index=courtdecisions&id=COU-156686.

213 *See* ICM Agric. Pty. Ltd. v. Australia (2009), *supra* note 211.

214 *The Gateway to Environmental Law*, *supra* note 212.

215 *Id.*

216 *Id.*

of the Commonwealth Constitution."[217] A similar challenge in the United States Supreme Court would likely have a very different outcome, as water rights are very strongly protected private property rights, and the United States Constitution provides very strong protection against government interference with private property rights.

The Fifth Amendment of the United States Constitution prohibits the government from taking private property for public use without just compensation. The United States Supreme Court held that a state, in the exercise of its police power, can limit riparian rights in order to maintain its rivers substantially undiminished.[218] In the opinion, Justice Holmes wrote that "few public interests are more obvious, [and] indisputable" than the "interest of the public of a State to maintain the rivers that are wholly within it substantially undiminished" and "that the private property of riparian proprietors cannot be supposed to have deeper roots."[219] However, this case is over a century old and is not a Fifth Amendment takings challenge.

Alternatively, modern United States courts have held that limitations upon water rights can be the subject of physical takings claims that require compensation.[220] In the 2001 case *Tulare Lake Basin Water Storage District v. U.S.*, the Court of Federal Claims concluded that federally mandated reductions of water deliveries under state contracts in response to Endangered Species Act concerns were takings of property rights.[221] The court found that the federal government became the sole beneficiary of the contract right by preventing the plaintiffs from using the water, thus affecting a complete physical taking.[222] This is clearly a very different outcome from the Australian *ICM Agriculture Pty Ltd. v. The Commonwealth* case.[223] Both are cases where legislation intended to improve the environment affected the amount of water that certain users could withdraw. However, despite two federal constitutions with similar provisions for the taking of private property, the outcomes of the two cases in the respective countries are diametrically opposed. What can account for the differing results of these cases?

The fact that water resources were truly vested in Australian state governments through legislation a century before modern reforms certainly made for a smoother transition.[224] Furthermore, Australian states were actually always able to legally amend or cancel licenses at any time without payment of

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217 *Id.*

218 Hudson County Water Co. v. McCarter, 209 U.S. 349, 356 (1908).

219 *Id.*

220 Tulare Lake Basin v. U.S., 49 Fed. Cl. 313, 319 (2001).

221 *Id.*

222 *Id.*

223 *See* ICM Agric. Pty. Ltd. v. Australia (2009), *supra* note 211.

224 Godden, *supra* note 8, at 187.

compensation.[225] If the California Legislature abolished riparian rights via legislation as New South Wales did, countless takings claims would undoubtedly ensue. All California water right-holders are subject to the state constitution's mandate of reasonable use.[226] Beyond this common mandate, California has a fragmented system of federal, state and local water rights that would need to be overhauled in order to set up a water market similar to Australia's. However, because of cases like *Tulare Lake Basin* and the fact that water rights in California are treated in many ways like other real property rights, there is no doubt that transitioning from the current system would lead to countless, likely paralyzing, challenges in the court system.[227]

VIII. LESSONS FOR CALIFORNIA

Though the origins of water law, the federal governance structure and the constitutional provisions between Australia and California are incredibly similar, the evolution of the law in these two jurisdictions clearly diverge on the question of whether the government has the ability to change the nature and form of water rights held by water users. On the one hand, Australia has been able to effectuate numerous legislative changes regarding the nature of water rights because the state governments support the view that water is a resource that must be managed in a way that is equitable to environmental and consumptive uses alike. Although many Californians might like to see a similar system replace our antiquated California Doctrine, the truth is that any reform must leave in place the existing priority system that defines and governs water rights. Maintaining the current system of water rights amounts to an insurmountable barrier to following exactly in the footsteps of Australia. Ultimately, California and Australia take, and will continue to take, two fundamentally different approaches to managing water resources. However, that is not to say that reform in California is impossible, or that the Golden State cannot learn valuable lessons from Australia's reforms.

A. Widespread Water Metering is the Foundation of Water Use Management

The existence of a comprehensive network of water meters to monitor the taking of water by irrigators was an important prerequisite for the establishment of a water market in Australia.[228] Water meters that could measure the amount of water being supplied to a property were invented in Australia in 1910 and are

225 *Water Markets in Australia*, *supra* note 74.

226 Cal. Const, art. X § 2.

227 Simonetti, *supra* note 180.

228 *Water Markets in Australia*, *supra* note 74.

now widespread.[229] Thus, as mentioned previously, every drop in the Australian water system is accounted for.[230]

Conversely, the water rights system in California is largely based on self-reporting with little oversight.[231] This self-reporting is incomplete and sometimes of questionable accuracy.[232] Additionally, many businesses, residences and even water districts are still not metered.[233] While there is a new state law that will require proliferation of water metering, it does not go into effect until 2025.[234] Other "legislation enacted in 2015 will improve water use information by tightening reporting requirements for surface water users, making well logs public, and requiring all surface water diverters above a certain threshold to meter water use."[235] Despite these improvements, "the water allocation system remains hampered by inconsistencies, unclear regulatory authorities, and a lack of transparency and information."[236]

The lack of information regarding who is actually using how much water is a considerable obstacle that must be overcome before further steps toward efficient water allocation planning can be taken or the creation of anything close to an Australia-like water market can be contemplated.

"You can't manage what you don't measure" is a familiar colloquialism in California these days.[237] It is a reality, though, that without widespread metering, monitoring and accurate reporting; accounting for every drop in the system the way that Australia does will be impossible. Without the necessary data, California will not be able to plan for equitable annual distribution amongst consumers in the system. Just last year, in the midst of unprecedented drought, "huge amounts of water" mysteriously vanished from the Sacramento-San Joaquin Delta.[238] It is thus clear that California has a long way to go in terms of reliable information gathering before the state will be able to implement water plans or truly efficient water markets.

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229 *Id*.

230 Maddocks, *supra* note 143.

231 Smith, *supra* note 7.

232 Brian Gray, et al., *Allocating California's Water, Directions for Reform*, PUBLIC POL'Y INST. OF CAL., (Nov. 2015), http://www.ppic.org/content/pubs/report/R_1115BGR.pdf.

233 Scott Herhold, *California Homes Lack Water Meters During Drought*, SAN JOSE MERCURY NEWS (Sep. 6, 2014), http://www.mercurynews.com/drought/ci_26482196/california-homes-lack-water-meters-during-drought.

234 *Id*.

235 Gray, *supra* note 232, at 5.

236 *Id*.

237 UC Davis Ctr. for Watershed Sciences, *California water rights: You can't manage what you don't measure*, CAL. WATERBLOG (Aug. 20, 2014), https://californiawaterblog.com/2014/08/20/california-water-rights-you-cant-manage-what-you-dont-measure/.

238 Smith, *supra* note 7.

B. Water Must Be Managed as a Single Resource

Consistent and holistic management of water as a single resource is imperative. Inconsistent water management policies lead to conflict and even irreparable damage. This is an issue that Australia is still working out as well, but it is essential that as California aspires to improve its water management system the way Australia has, that mistakes are learned from rather than repeated. Currently in California, "[g]roundwater and surface water rights are legally separate, even when the two resources are hydrologically connected."[239]

"Groundwater pumping reduces stream flow available to surface water users as well as fish and wildlife."[240] As mentioned above, independently managing surface and groundwater in the Murray Darling Basin initially resulted in expanded groundwater pumping and subsequent ecosystem decline that is now being corrected.[241] Similarly in California, irrigators historically made up for the restrictions on their surface water use by pumping additional groundwater.[242] Failure to manage groundwater resources in California's Scott River sub-basin caused decreased river flow levels and consequently jeopardized the salmonid species that spawn there.[243] Unregulated groundwater pumping has also led to documented land subsidence across the state, resulting in millions of dollars of damage.[244]

In 2014, California became one of the last states in the West to adopt a law that creates a system of statewide groundwater regulation and planning.[245] The uncodified findings of the Sustainable Groundwater Management Act (SGMA) declare that "[g]roundwater accounts for more than one-third of the water used by Californians in an average year and more than one-half of the water used by Californians in a drought year when other sources are unavailable."[246] While it

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239 Gray, *supra* note 232, at 6.

240 *Id*.

241 Young, *supra* note 80, at 8.

242 Sustainable Groundwater Management Act of 2014 (Stats. 2014, chs. 346, 347, 348), Uncodified Findings, http://www.water.ca.gov/cagroundwater/docs/2014%20Sustainable %20Groundwater%20Management%20Legislation%20with%202015%20amends%201-15-2016.pdf ("Groundwater provides a significant portion of California's water supply. Groundwater accounts for more than one-third of the water used by Californians in an average year and more than one-half of the water used by Californians in a drought year when other sources are unavailable.").

243 *Envtl. Law Found. v. State Water Res. Control Bd, et al*., Case No. 34-2010-80000583 (Cal. Super. Ct. July 14, 2014).

244 Scott Smith, *Damage from sinking land costing California billions*, THE DAY (Dec. 27, 2015), http://www.theday.com/article/20151227/NWS13/151229300.

245 Emily Allshouse, *Governor Brown Signs Sustainable Groundwater Management Act*, ASS'N OF CAL. WATER AGENCIES (Sept. 16, 2014), http://www.acwa.com/news/groundwater/governor-brown-signs-sustainable-groundwater-management-act; Amy Quinton, *First Step In California Groundwater Law Stirs Debate*, Capital Public Radio (June 16, 2016), http://www.capradio.org/articles/2016/06/16/first-step-in-california-groundwater-law-stirs-debate.

246 2014 Cal. Legis. Serv. Ch. 346 (S.B. 1168); *see also* Cal. Water Code, §§ 10720-10728.6, enacted as portions of 2014 Stats. ch. 346 (West 2015) (codifying S.B. 1168).

is clear that groundwater is incredibly important throughout the state, we are only just in the beginning stages of achieving sustainable use and management. The SGMA requires "coordination and consultation between California's water supply or management agencies,"[247] with an ultimate goal of achieving sustainability in groundwater basins across the state by the year 2040.[248] While the SGMA is certainly a step in the right direction, its lengthy implementation timeline may permit irreparable consequences to occur before sustainability can ever be achieved.

C. Water Markets Are a Valuable Management Tool

Australia's historical experience with water markets reveals both their strengths and weaknesses. On the one hand, water markets can provide flexibility and security to irrigators. "Trading is an essential tool that can enable water right-holders to voluntarily reallocate water in order to reduce the economic and environmental costs of shortages."[249] Markets have the ability to encourage conservation, efficiency, improvements, and preserve long term agricultural investments. On the other hand, markets can increase demand upon already overdrawn systems by encouraging the utilization of previously dormant rights. Adoption of a water market like Australia's would provide more security and flexibility for farmers, but could also pose threats to the environment as well as farming based community economies that depend upon active agricultural operations to hire workers.

California does have a water market, but this market is nothing like the Australian water market, as it operates without transparent pricing or simple and consistent rules.[250] Water in California is in many ways insulated from market forces.[251] Steep transaction costs, the lack of a transparent online marketplace, and other barriers have resulted in an underused water market.[252] For example, some California "communities have used local ordinances and other steps to block sales in order to protect the local economy and their own water supply."[253] These "'area-of-origin' laws allow individuals and communities to establish new rights for surface water in their local watersheds. These rights are senior to those of water users who export water from these areas."[254] Furthermore, "[d]ifferent rules apply to different types of water rights and water

[247] Cal. Gov't Code § 65352.5(a).

[248] *Sustainable Groundwater Management Act*, UNIV. OF CAL., DIV. OF AGRIC. AND RES., http://groundwater.ucdavis.edu/SGMA/.

[249] Gray, *supra* note 232, at 4.

[250] *California's Future Is in Australia*, *supra* note 175.

[251] *Id.*

[252] *Id.*

[253] *Id.*

[254] Gray, *supra* note 232, at 9.

agencies. There is also a lack of clarity on some basic issues, such as how much water can be traded when land is fallowed."[255]

"The volume of trading barely increased during the two most recent droughts, despite especially high demand from water users facing shortages."[256] "Although some trading occurred during this drought, the approval process is is hampered by a complex and often opaque set of rules."[257] This is in part a reflection of "the underlying fragmentation of water rights administration and associated information gaps."[258] In 1998, the statewide market represented only of all water used by Californians for municipal, industrial and agricultural purposes.[259] Despite various attempts to reform and improve the water market over the past two decades, California's water market still only accounts for about three percent of all water used, with most trading occurring within the same county (38 percent) or region (41 percent).[260]

In February 2016, Assembly member Bill Dodd of Napa introduced new legislation that aimed to create a more robust water market.[261] The bill, known as the Open and Transparent Water Data Act, would create a water transfer information clearinghouse in order to provide a platform for sharing water data across the state.[262] The bill stated:

> California has a number of databases containing information on hydrology, biology, water quality, the physical environment, and water rights and use. . . . Unfortunately, current water data is often challenging to obtain, outdated, and not always readily available to water managers and the public due to its collection by numerous entities and storage in disparate databases that often rely on tools that do not keep pace with technological advances.[263]

The bill also would require that water data and research gathered using state

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[255] *Id*.

[256] *Id*.

[257] *Id*.

[258] *Id*.

[259] Ellen Hanak, *California's Water Market By the Numbers*, PUBLIC POL'Y INST. OF CAL., 8 *(*Oct. 2002), http://www.ppic.org/content/pubs/op/OP_1002EHOP.pdf [hereinafter *Water Market By the Numbers 2002*].

[260] Ellen Hanak & Jelena Jezdimirovic, *California's Water Market*, PUBLIC POL'Y INST. OF CAL., (Mar. 2016),
http://ppic.org/content/pubs/jtf/JTF_WaterMarketJTF.pdf.

[261] *Asm. Dodd Seeks to Improve Reliability of State Water Supply with New Bill*, ASSEMBLYMEMBER BILL DODD DISTRICT 4 (Feb. 3, 2016), http://asmdc.org/members/a04/news-room/press-releases/asm-dodd-seeks-to-improve-reliability-of-state-water-supply-with-new-bill.

[262] *Id*.

[263] Open and Transparent Water Data Act, A.B. 1755, 2015-2016 Cal. Leg. (as amended Apr. 5, 2016), https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB1755.

funds be made publicly accessible.[264] The bill further stated: "An effective water market is one of several water management tools needed to improve the state's water supply reliability."[265] This bill was signed into law by Governor Jerry Brown on September 23, 2016.[266] This is certainly a step in the right direction, since the new law aims to improve ease of access to existing data in order to improve utilization of California's water market. However, this is only the first step of many that needs to be taken in order to lower the transaction costs that are currently associated with transfers in California's water market.

Creating a more efficient market would require standardized, statewide rules aimed at encouraging water trading.[267] Currently, water transfers in California are approved on a transfer-by-transfer basis, which is very costly and time consuming, and thus discourages transfer.[268] Increasing the use of the water market would likely require adoption of statewide rules and regulations that would allow most transfers to go through with virtually no individual review. However, this would be difficult to achieve since transfers of these rights do require public notice and review under the California Environmental Quality Act.[269] "The large role of the federal government, as owner of the Central Valley Project, adds to the complexity because federal water trades require additional layers of review," including under the National Environmental Policy Act.[270] Australia's experience has demonstrated that even though water markets are a valuable tool, they are only part of a comprehensive solution to supply and demand problems.

D. Desalination Can Be Part of, But Not All of the Solution

In times of shortage in California, junior rights are curtailed and right-holders must either reduce their water use or rely on water from other sources.[271] Thus during droughts, farmers traditionally have relied heavily on groundwater in order to replace lost surface water supplies.[272] However, the current rate of groundwater withdrawals is unsustainable in many areas, making this resource less reliable, especially in light of SGMA.[273] Some Californians may wonder

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264 *Id.*

265 *Id.*

266 *Id.*

267 *California's Future Is in Australia*, *supra* note 175.

268 *Water Market By the Numbers 2002*, *supra* note 259.

269 Ellen Hanak, *California's Water Market By the Numbers: Update 2012*, PUBLIC POL'Y INST. OF CAL., 14 (Nov. 2012), http://www.ppic.org/content/pubs/report/R_1112EHR.pdf.

270 Gray, *supra* note 232, at 4.

271 *The Water Rights Process*, *supra* note 25.

272 *See* 2014 Cal. Legis. Serv. Ch. 346 (S.B. 1168); *see also* Cal. Water Code, §§ 10720-10728.6, enacted as portions of 2014 Stats. ch. 346 (West 2015) (codifying S.B. 1168).

273 Ellen Hanak, *Reforming California's Groundwater Management*, PUBLIC POL'Y INST. OF CAL., http://www.ppic.org/main/publication_show.asp?i=1106.

why a state with 840 miles of ocean coastline doesn't turn more readily towards desalination.[274] Desalination is another water policy area in which California can learn from Australia's historical experiences.

Australia's impressive water policy reforms and efficient water markets are not the only means by which the country has secured a stable water supply. The Millennium Drought prompted many of Australia's major cities to construct large-scale desalination plants in order to provide a rainfall-independent source of drinking water.[275]

Perth is the capital of Western Australia and has a population of 2 million people.[276] Australia's first major desalination plant was commissioned in 2006 to service this coastal city that has long faced serious water security problems.[277] As Perth continued to experience low rainfall, public acceptance of desalination was very high, despite its enormous cost, and a second plant was commissioned in 2011.[278] These two plants combined produce 145 billion liters (or 38.3 billion gallons) per year, amounting to nearly half of Perth's water needs.[279] Adelaide, the South Australian state capital, also has a 100 billion liters (22.7 billion gallons) per year plant and another facility in the heavily populated southeastern state of Queensland can produce 48 billion liters (approximately 10.9 billion gallons) per year.[280]

Not all of Australia's desalination plants are widely supported, though. Australia's most recent addition to its arsenal of desalination plants is also the largest and the most controversial—the Wonthaggi desalination plant is capable of providing the east coast city of Melbourne (the nation's second largest city, with a population of just over 4 million) with a third of its water supply (150 billion liters).[281] Heavy rains delayed completion of this facility while it was under construction. Furthermore, the rain also "boosted water at the dams to levels that ma[d]e desalination unnecessary."[282] Due to the increased water

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[274] *The Geography of California*, NETSTATE (Feb. 26, 2016), http://www.netstate.com/states/geography/ca_geography.htm.

[275] Murray Griffin, *Drought Prompts Australia to Turn to Desalination Despite Cost*, BLOOMBERG (Mar. 6, 2013), http://www.bloomberg.com/news/2013-03-06/drought-prompts-australia-to-turn-to-desalination-despite-cost.html.

[276] Peter Law, *Perth's Population Hits Two Million People and Remains Australia's Fastest Growing Capital City*, PERTH NOW (Mar. 30, 2015), http://www.perthnow.com.au/news/western-australia/perths-population-hits-two-million-people-and-remains-australias-fastest-growing-capital-city/news-story/7ddd25a210184b7c344a7dc00d7b48f5.

[277] Griffin, *supra* note 275.

[278] *Id.*

[279] *Southern Seawater Desalination Plant*, WATER CORP., http://www.watercorporation.com.au/water-supply-and-services/solutions-to-perths-watersupply/desalination/southern-seawater-desalination-plant.

[280] Griffin, *supra* note 27558.

[281] *Id.*

[282] *Id.*

supply, the project was put on standby, but water consumers still had to pay for the plant through water surcharges.[283] Another plant on the east coast, in Sydney, is also currently on standby mode until dam levels (currently at 88%) fall below 70%.[284] Nevertheless, Australian Water Association Chief Executive Tom Mollenkopf maintains that even if these plants do not run all of the time, they are a very important part of Australian domestic supply security.[285]

Carlsbad, California is home to the largest desalination project in Western Hemisphere.[286] The plant began operations at the end of 2015 and produces "50 million gallons of fresh water each day, meeting 7 percent to 10 percent of the San Diego County Water Authority's demands."[287] The plant cost $1 billion to build and the water it produces currently costs "twice as much as the water San Diego gets from the Metropolitan Water District (MWD) of Southern California, which provides the bulk of San Diego's supplies."[288] However, San Diego officials say desalination eventually will become competitive with the region's other water sources, due to rising costs, such as those associated with obtaining water from MWD.[289] Desalination is generally controversial because it is expensive, energy intensive and there are environmental concerns regarding the marine ecosystems adjacent to desalination plants.[290] Still, in the face of unprecedented drought and climate change, the Carlsbad plant has been deemed a test case for potential expansion of desalination in California.[291]

California state policy is also paving the way for expanded desalination. "Proposition 1, the $7.5 billion water bond measure approved by voters in 2014, allocate[d] $100 million to help local water agencies build desalination plants. Several coastal communities are looking at building small desalination plants."[292] Moreover, in 2015, the State Water Resources Control Board adopted the first ever in the world comprehensive desalination policy. The Desalination Amendment to the Water Quality Control Plan for Ocean Waters of California intends "to protect ocean water quality and marine life from impacts associated

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283 *Id*.

284 *Operational Status*, SYDNEY DESALINATION PLANT, http://www.sydneydesal.com.au/ (last visited October 30, 2016).

285 Griffin, *supra* note 275.

286 Dale Kasler, *Southern California Desalination Plant Will Help Ease Water Crunch, But Price is Steep*, THE SACRAMENTO BEE (Dec. 12, 2015), http://www.sacbee.com/news/state/california/water-anddrought/article49468770.html#storylink=cpy.

287 *Id*.

288 *Id*.

289 *Id*.

290 *Id*.

291 *Id*.

292 *Id*.

with the construction and operation of seawater desalination facilities."[293] The Desalination Amendment establishes a "uniform statewide approach for protecting ocean waters from degradation due to seawater intake and discharge of brine wastes from desalination facilities."[294] The Desalination Amendment applies "intake-related provisions to all new and expanded seawater desalination facilities," whereas discharge requirements apply to all desalination facilities.[295] This policy is so new that whether or not it is able to effectively protect marine ecosystems remains to be seen. However, it certainly has laid the groundwork to address some very important environmental concerns should more desalination plants come to fruition along the coast.

Australia's experience demonstrates that prolonged drought periods can increase public support and acceptance for desalination, despite its high costs.[296] However, it is important to remember that the entire population of the continent of Australia is just over 24 million, whereas the population of the state of California is nearly 40 million.[297] Moreover, Australia's $10 billion seawater desalination program, though immensely successful, is just one of a number of strategies employed to ensure a secure water supply "down under."[298] Therefore it is clear that although desalination is an excellent addition to a portfolio of water resources, it can only be a part of the strategy for securing a stable water supply. Other strategies such as water recycling, water conservation, storm water reuse and economic instruments, such as water markets, are all also important tools that should be utilized in order to ensure a stable and reliable water supply.

IX. CONCLUSION

California's water allocation system is long overdue for a major upgrade that will enable it to more effectively serve the 21st century economy, society, and environment. The Golden State cannot expect its century old water rights system to adequately support the needs of a state that has less water, yet an exponentially increased population and agricultural production. However,

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[293] *Amendment to the Water Quality Control Plan for Ocean Waters of California*, STATE WATER RES. CONTROL BD. (May 6, 2015), http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf.

[294] *Id*.

[295] *Id*.

[296] Griffin, *supra* note 275.

[297] *Population Clock*, AUSTL. BUREAU OF STATISTICS, http://www.abs.gov.au/ausstats/abs@.nsf/0/1647509ef7e25faaca2568a900154b63?OpenDocument (last visited Oct. 31, 2016); *Florida Passes New York to Become the Nation's Third Most Populous State, Census Bureau Reports*, U.S. CENSUS BUREAU (Dec. 23, 2014), http://www.census.gov/newsroom/press-releases/2014/cb14-232.html.

[298] Neil Palmer, *Australia Proves Desalination Works*, THE SACRAMENTO BEE (Dec. 9, 2014), http://www.sacbee.com/opinion/op-ed/soapbox/article4392261.html#storylink=cpy.

Australia is literally decades ahead of California in terms of water metering, restrictions upon issuing new licenses, and groundwater management. The modern Australian reforms of water allocation planning and the proliferation of the water market would not have been possible without the foundation of widespread water metering and management of groundwater resources. Even if adopting a similar system in California was legally possible, it is most likely politically infeasible. Furthermore, it is practically impossible at this point in time for California to dramatically shift its water management policies.

California simply does not presently possess sufficient data or enforcement mechanisms that could support water planning or a water market like those that currently exist in Australia. Once water metering is widespread, reforming our current system will be much more feasible. However, only time will tell whether the public support for reforms of water policy will remain intact a decade from now. Passing legislation to require water meters, the Sustainable Groundwater Management Act, making well completion logs public and the Desalination Amendment all demonstrate that California has taken significant steps to catch up in terms of managing water resources sustainably. If drought continues to persist in the Golden State, surely the political climate will be amenable to further upgrades of our current system. Until we have widespread metering, monitoring and enforcement, an Australia-like model is simply not feasible in California. Australia's overhaul of their system is often discussed as if it happened overnight, but the truth is that the progression of water policy in Australia took place over many decades and was enabled by water metering implemented over a century ago. California has taken some incremental steps toward improving the management of our water resources and that should not be discounted, however there are still many lessons left to be learned from the experiences of Australia in the droughts down under.