

# Groundwater Law’s Limits

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*Concerns over groundwater quantity and quality have reached new heights, with headline after headline warning of an impending catastrophe. But often missing from the traditional narrative is an accounting of how the law has failed groundwater.*

*This Essay argues that the law has not only failed to address groundwater problems but exacerbated them. Groundwater law is inherently limited by its tethers to the past—past common law doctrines, past science, and past governance structures. These limits have made groundwater law stubbornly resistant to change, sustaining the groundwater crisis. California is a case in point, illustrating how groundwater law’s limits inhibit progress. Addressing our groundwater problems thus requires rethinking groundwater law with an understanding of its limits.*

I. INTRODUCTION .....	1
I. TETHERED TO THE PAST .....	2
A. Past Common Law Doctrines.....	3
B. Past Science.....	4
C. Past Governance Structures.....	6
II. RESISTANT TO CHANGE: A CALIFORNIA CASE STUDY .....	7
III. CONCLUSION .....	11

## I. INTRODUCTION

Even non-environmentalists know there is something rotten with the state of groundwater. A casual reader of the news is faced with headline<sup>1</sup> after headline<sup>2</sup> about the lack of groundwater. For some, drinking wells reliant on groundwater

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<sup>1</sup> See, e.g., Mira Rojanasakul, Christopher Flavelle, Blacki Migliozi & Eli Murray, *America Is Using Up Its Groundwater Like There’s No Tomorrow*, N.Y. TIMES (Aug. 28, 2023), <https://www.nytimes.com/interactive/2023/08/28/climate/groundwater-drying-climate-change.html>.

<sup>2</sup> See, e.g., Christopher Flavelle and Mira Rojanasakul, *As Groundwater Dwindles, Powerful Players Block Change*, N.Y. TIMES, (Nov. 24, 2023), <https://www.nytimes.com/interactive/2023/11/24/climate/groundwater-levels.html>.

have run dry.<sup>3</sup> Even amid a housing crisis, new housing developments have been halted due to a lack of access to groundwater.<sup>4</sup>

The science confirms these stories. A *New York Times* investigation into groundwater use across the country—using millions of readings from wells nationwide—concluded that groundwater “is being exhausted in much of the country, and in many cases it won’t come back.”<sup>5</sup> The implications for agriculture and drinking water are devastating.<sup>6</sup> Increasingly, the groundwater problem is termed a “crisis.”<sup>7</sup>

But often missing from the groundwater crisis narrative is the role that law has played, not just in allowing the current catastrophe to happen, but also in exacerbating it. Groundwater law is characterized by its limits, stubbornly resistant to change.

This Essay proceeds in two parts. Part I asserts that groundwater law is limited by its tethers to the past—past common law doctrines, past science, and past governance structures. Part II argues that these limits have made groundwater law resistant to change, sustaining the current groundwater crisis. California is a case in point; despite its best intentions, California’s progress on groundwater is inhibited by groundwater law’s limits. Addressing our groundwater problems thus requires rethinking our groundwater law with an understanding of its limits.

## II. TETHERED TO THE PAST

Groundwater law is almost hopelessly opaque.<sup>8</sup> Commentators and scholars for years have bemoaned the complexity—or anarchy, as one put it—of groundwater

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<sup>3</sup> See, e.g., Rachel Becker, *California Enacted a Groundwater Law 7 Years ago. But Wells are Still Drying up—and the Threat is Spreading*, CAL MATTERS (Aug. 18, 2021), <https://calmatters.org/environment/2021/08/california-groundwater-dry/>.

<sup>4</sup> See, e.g., Jeremy Duda, *Arizona Restricts New Phoenix Housing Over Groundwater Shortage*, AXIOS, (June 1, 2023); see also Christopher Flavelle, *Montana Court Restricts Use of Groundwater for New Homes*, N.Y. TIMES, (Feb. 16, 2024) <https://www.axios.com/2023/06/01/arizona-restricts-phoenix-housing-groundwater-shortage>; see also Christopher Flavelle, *Montana Court Restricts Use of Groundwater for New Homes*, N.Y. TIMES, (Feb. 16, 2024), <https://www.nytimes.com/2024/02/16/climate/montana-court-groundwater-development.html>.

<sup>5</sup> Rojanasakul et al., *supra* note 1

<sup>6</sup> See *id.*

<sup>7</sup> See *id.* (“‘From an objective standpoint, this is a crisis,’ said Warigia Bowman, a law professor and water expert at the University of Tulsa. ‘There will be parts of the U.S. that run out of drinking water.’”).

<sup>8</sup> See, e.g., Jack Tuholske, *Trusting the Public Trust: Application of the Public Trust Doctrine to Groundwater Resources*, 9 VT. J. ENVTL. L. 189, 204 (2008) (“The authors of a popular water resources textbook opine that the common law of groundwater is designed ‘seemingly to confuse law students.’”).

law.<sup>9</sup> Many courts have followed suit, decrying the occult nature of the resource and the impossibility of the law to fashion rules for it.<sup>10</sup>

Part of the problem is that there is no unifying thread; there is no general federal law of groundwater.<sup>11</sup> States have, to different degrees, trudged in their own directions, both through common law and statute.<sup>12</sup> In New Mexico, for example, all groundwater is owned by the state, appropriated through an administrative process by the State Engineer.<sup>13</sup> In neighboring Texas, all groundwater is “a private property right allocated to the surface owner[.]”<sup>14</sup> with the common law rule capture the governing principle.<sup>15</sup> Layered in are the scores of local governments who have forged their own groundwater rules.<sup>16</sup> For instance, in Nebraska groundwater management is controlled by local natural resource districts, which can decide not only the kinds of groundwater regulations but also whether to impose any regulations at all.<sup>17</sup> To say that groundwater law is no monolith is an exercise in understatement.

But, despite its convolutions, groundwater law does have at least one common theme: it is tethered to the past. Three facets of that tethering are discussed here: (1) past common law doctrines; (2) past science; and (3) past governance structures.

#### A. Past Common Law Doctrines

In the nineteenth century, nearly a century before modern hydrological science, courts struggled to craft rules for groundwater. You can see, in an admirable display of candor, judges protest their lack of knowledge of groundwater. For

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<sup>9</sup> See, e.g., Susie Cagle, *Everything You Need to Know About California's Historic Water Law*, GUARDIAN (Feb. 27, 2020), <https://www.theguardian.com/environment/2020/feb/27/california-groundwater-sigma-law-what-does-it-mean>.

<sup>10</sup> See *infra* notes 18, 19 and accompanying text.

<sup>11</sup> See, e.g., Adrienne Paule, Note and Comment, *Underground Water: A Fugitive at the Border*, 13 PACE ENVTL. L. REV. 1129, 1136 (1996) (“Despite the interstate nature of groundwater and the potential for conflict between state laws regulating groundwater use and protection, no federal statute exists that has groundwater protection as its primary objective.”).

<sup>12</sup> See, e.g., *Sustainable Groundwater Management Act (SGMA)*, CAL. DEPT. OF WATER RES., <https://water.ca.gov/programs/groundwater-management/sgma-groundwater-management> (last visited Sep. 28, 2024)..

<sup>13</sup> See, e.g., *New Mexico*, STANFORD, WATER IN THE WEST, <https://groundwater.stanford.edu/dashboard/new-mexico.html>.

<sup>14</sup> Kameron B. Smith, *Surface Tension: The Conflicting Laws of Texas and New Mexico Over Shared Groundwater and New Mexico's Desire for Regulation*, 7 TEX. A&M L. REV. 453, 461 (2020) (comment).

<sup>15</sup> See, e.g., *Texas*, STANFORD, WATER IN THE WEST, <https://groundwater.stanford.edu/dashboard/texas.html>.

<sup>16</sup> See generally Stephen E. White & David E. Kromm, *Local Groundwater Management Effectiveness in the Colorado and Kansas Ogallala Region*, 35 NAT. RES. J. 275 (1995) (studying effectiveness of local groundwater districts).

<sup>17</sup> See, e.g., Kurt Stephenson, *Groundwater Management in Nebraska: Governing the Commons Through Local Resource Districts*, 36 NAT. RESOURCES J. 521, 524 (1996).

example, the Vermont Supreme Court disclaimed any expertise over the resource in 1855: “The laws of the existence of water under ground, and of its progress while there, are not uniform, and cannot be known with any degree of certainty, nor can its progress be regulated.”<sup>18</sup> The Ohio Supreme Court did much the same in 1861, holding that groundwater is “so secret, occult, and concealed, that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would be, therefore, practically impossible.”<sup>19</sup>

But these displays of modesty did not—and perhaps could not—stop legal rules from being established. The common law of groundwater is largely a nineteenth century creation.<sup>20</sup> Underscoring the difficulty of crafting rules from whole cloth, there are *five* different common law regimes that apply to groundwater, depending on the jurisdiction: (1) absolute dominion (also called “the rule of capture”); (2) correlative rights; (3) the reasonable use rule; (4) appropriative rights; and (5) regulated riparianism.<sup>21</sup> While these common law doctrines can overlap, each is unique.<sup>22</sup>

To be sure, any common law formulated in the nineteenth century risks being outdated. But groundwater law is singular in that it persists under these past common law doctrines. Many of the groundwater statutes enacted by states do not disturb or displace the existing common law doctrine; some even codify it.<sup>23</sup> Of course, some states do not have proactive groundwater statutes at all.<sup>24</sup> Thus, groundwater law remains unusually dependent on past common law doctrines.

### B. Past Science

The problem is that none of these doctrines is based on a sound understanding of groundwater as a resource or its hydrological complexity. Although the doctrines obviously differ in how they allocate groundwater use, they all suffer from the same two flaws.

First, the common law doctrines presume that groundwater is different from surface water.<sup>25</sup> But that misunderstands that groundwater and surface water are

<sup>18</sup> *Chatfield v. Wilson*, 28 Vt. 49, 54 (1855).

<sup>19</sup> *Frazier v. Brown*, 12 Ohio St. 294, 311 (1861), *overruled by* *Cline v. Am. Aggregates Corp.*, 15 Ohio St. 3d 384, 387 (1984).

<sup>20</sup> *See, e.g.*, Joseph W. Dellapenna, *A Primer on Groundwater Law*, 49 IDAHO L. REV. 265, 267 (2013) (“[T]he creation by courts in the United States and England of the common law of groundwater in the nineteenth century was steeped in ignorance.”).

<sup>21</sup> *See, e.g., id.* at 269.

<sup>22</sup> *See, e.g., id.* at 269–70.

<sup>23</sup> *See, e.g.*, Dellapenna *supra* note 20 at 291 (“In nine formerly reasonable use states, the legislature enacted a regulated riparian statute in large measure that draws upon the reasonable use rule.”).

<sup>24</sup> *See, e.g.*, Marvin W. Jones & Andrew Little, *The Ownership of Groundwater in Texas: A Contrived Battle for State Control of Groundwater*, 61 BAYLOR L. REV. 578, 586 (2009) (noting that Texas statutory law on groundwater merely confirms that the common law applies).

<sup>25</sup> *See, e.g.*, Zachary Bray, *Texas Groundwater and Tragically Stable “Crossovers,”* 2014 B.Y.U. L. REV. 1283, 1290 (2014) (“For much of human history, erroneous theories about the origin and

inextricably linked.<sup>26</sup> Christine Klein has described the law's "often unique treatment of groundwater, unmoored from its role in the hydrological cycle" as "groundwater exceptionalism."<sup>27</sup>

Second, the common law doctrines assume that groundwater operates in a linear fashion. That is, that pumping 100 gallons of groundwater from here will prevent the taking of 100 gallons of groundwater from there. This kind of linear zero-sum game *does* generally work for surface water. But groundwater's hydrology is often not so direct.<sup>28</sup> In fact, groundwater frequently does not flow in straight lines, flowing uphill in many cases.<sup>29</sup> Groundwater recharge resists simple linear relationships.<sup>30</sup> Not to mention that groundwater "is interconnected with surface waters in complicated and multifaceted ways that resist simple modeling and certainty about effects."<sup>31</sup>

The result is a body of law out of sync with the scientific realities of the natural resource it purports to govern. Or, put another way, groundwater's common law doctrines are designed for a resource that does not behave the way groundwater does.

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nature of underground water, and its relationship to water on the surface and precipitation, were at least as prominent as theories that resemble our current understanding. In short, the courts, lawyers, and parties who helped develop the common law of groundwater were overwhelmed by ignorance — often by their own admission—about the nature of the resource at issue.”); *see also* Dave Owens, *Taking Groundwater*, 291 WASH. U. L. REV. 253, 268 (2013) (“But even as scientists became increasingly cognizant of the close relationship between ground and surface water systems, the legal system continued to insist that groundwater and surface water were separate, with the complex laws applicable to the latter unnecessary to the former.”).

<sup>26</sup> *See, e.g.*, Dellapenna *supra* note 18,20 at 267 (“To scientists, the relationship of groundwater to surface waters is now a well-known fact[.]”).

<sup>27</sup> Christine A. Klein, *Groundwater Exceptionalism: The Disconnect Between Law and Science*, 71 EMORY L.J. 487, 489 (2022).

<sup>28</sup> *See, e.g.*, William A. Paddock, *Implementation of Integrated Surface and Groundwater Administration Under the 1969 Act in the Rio Grande Basin*, *Water Division No. 3*, 22 U. DENV. WATER L. REV. 247, 249 (2019) (“In Water Division No. 3, the Rio Grande Basin, the groundwater flow system is not linear. This means that not all groundwater consumption results in a depletion to stream flow. Rather, a portion of groundwater consumption comes from groundwater storage.”).

<sup>29</sup> *See, e.g.*, Steven Earle, *Groundwater Flow*, PHYSICAL GEOLOGY, <https://opentextbc.ca/geology/chapter/14-2-groundwater-flow/#:~:text=As%20already%20noted%2C%20groundwater%20does,meaning%20lines%20of%20equal%20pressure>.

<sup>30</sup> *See, e.g.*, Huang X, Gao L, Crosbie RS, Zhang N, Fu G, Doble R., *Groundwater Recharge Prediction Using Linear Regression, Multi-Layer Perception Network, and Deep Learning*, 11 WATER 1, 1 (2019), (finding that the linear regression model had the “poorest fitting performance” in predicting groundwater recharge). <https://doi.org/10.3390/w11091879> (finding that the linear regression model had the “poorest fitting performance” in predicting groundwater recharge).

<sup>31</sup> Craig Anthony Arnold, *Fourth-Generation Environmental Law: Integrationist and Multimodal*, 35 WM. & MARY ENV'T. L. & POL'Y REV. 771, 811–12 (2011).

### C. Past Governance Structures

Groundwater law is also uniquely tethered to past governance structures. Environmental problems are largely transboundary problems.<sup>32</sup> The federalizing of environmental law in the 1970s and 1980s was in part a recognition that no one state or locality could singlehandedly tackle environmental harms.<sup>33</sup>

But not so for groundwater. There is no federal groundwater law.<sup>34</sup> And few states have statutes that even attempt to regulate the whole of groundwater, with many opting instead for codifying a particular common law doctrine<sup>35</sup> or regulating a portion of groundwater use like drilling new wells.<sup>36</sup> To be sure, some states—California and Arizona among them—have significant groundwater laws.<sup>37</sup> But, for reasons that will be detailed *infra*,<sup>38</sup> there are reasons to doubt the efficacy of those laws.

The upshot is that groundwater is often controlled, whether intentionally or not, by local governments. Local governments—including counties and water districts—are frequently responsible for administering and controlling access to groundwater. In Texas, for example, state law gives local “groundwater conservation districts” the authority to manage groundwater resources.<sup>39</sup> In Arkansas, a state groundwater law insists that the state should make “‘every effort’ to delegate water management powers to qualified local districts, including day-to-day water management.”<sup>40</sup> Even California, with probably the most noteworthy recent groundwater law, the 2014 Sustainable Groundwater Management Act, defers to local governments to implement its groundwater policies.<sup>41</sup>

<sup>32</sup> See, e.g., Noah D. Hall, *Transboundary Pollution: Harmonizing International and Domestic Law*, 40 U. MICH. J. L. REFORM 681, 681 (2007) (noting that “transboundary pollution problems can be found along political borders at any level of government[.]”)

<sup>33</sup> See, e.g., Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669, 674–75 (2010) (observing that “local governments are largely overlooked as relevant actors in academic discussions of environmental law.”).

<sup>34</sup> See *supra* notes 12, at 674.11

<sup>35</sup> See, e.g., Dellapenna *supra* notes 20, at 291.

<sup>36</sup> See, e.g., Jeremiah Zac, *Is it Legal to Drill Your Own Well? A State by State Guide*, WORLD WATER RESERVE, (Aug. 7, 2024).

<sup>37</sup> See, e.g., *Sustainable Groundwater Management Act (SGMA)*, CAL. DEPT. OF WATER RES. ; see also ARIZ. REV. STAT. ANN. §§ 45-401 to 704 (The Arizona Groundwater Management Act) <https://water.ca.gov/programs/groundwater-management/sgma-groundwater-management>; see also ARIZ. REV. STAT. ANN. § 45-401–45-704 (amended 2024).

<sup>38</sup> See *infra* Part II.

<sup>39</sup> See, e.g., Amy Hardberger, *New Strategies for Groundwater Litigation in Texas*, 46 WM. & MARY ENV'T. L. & POL'Y REV. 355, 364 (2022) (noting that “the legislature opted to manage groundwater resources through local GCDs instead of a statewide regulatory agency.”).

<sup>40</sup> J.W. Looney, *Enhancing the Role of Water Districts in Groundwater Management and Surface Water Utilization in Arkansas*, 48 ARK. L. REV. 643, 682 (1995).

<sup>41</sup> See, e.g., *Sustainable Groundwater Management Act (SGMA)*, CAL. DEPT. OF WATER RES. <https://water.ca.gov/programs/groundwater-management/sgma-groundwater-management> (“In

And that's just the formal role that local entities play. Informally, local governments have significant impacts on groundwater use through their traditional land use powers.<sup>42</sup> Well permitting, lot size requirements, and zoning all play a part in groundwater quantity and quality; all are in the domain of local governments.<sup>43</sup>

In this way, groundwater law looks like much of environmental law before the 1970s: piecemeal, fragmented, and oftentimes local in nature.<sup>44</sup> Groundwater law, then, is a relic. It reflects a very different approach to environmental policy than other areas of environmental law. Groundwater law is thus tethered to past governance structures, decentralized and locally focused ones.

### III. RESISTANT TO CHANGE: A CALIFORNIA CASE STUDY

What has this tethering done to groundwater law? It has limited groundwater law's efficacy, making groundwater law stubbornly resistant to change.

Although this outcome can be seen in many states, it is perhaps no better illustrated than by California. In many ways, California presents an unusual case; unlike most other states, California has recently taken significant and aggressive legislative action to deal with groundwater in the 2014 Sustainable Groundwater Management Act (SGMA).<sup>45</sup> When it was passed, SGMA was hailed as a massive

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signing SGMA, then-Governor Jerry Brown emphasized that 'groundwater management in California is best accomplished locally.'").

<sup>42</sup> See, e.g., Lindsey, B.D., Dondero, A.M., Watson, E., and Johnson, T.D., *Data from Decadal Change in Groundwater Quality Web Site, 1988-2022*, UNITED STATES GEOLOGICAL SURVEY (2023); see also Douglas A. Yanggen & Leslie L. Amrhein, *Groundwater Quality Regulation: Existing Governmental Authority and Recommended Roles*, 14 COLUM. J. ENVTL. L. 1, 11 (1989) ("Land use controls such as zoning and subdivision regulations can clearly play an important role in regulating land use to protect groundwater quality.").<https://nawqatrends.wim.usgs.gov/Decadal/>; see also Douglas A. Yanggen & Leslie L. Amrhein, *Groundwater Quality Regulation: Existing Governmental Authority and Recommended Roles*, 14 COLUM. J. ENVTL. L. 1, 11 (1989) ("Land use controls such as zoning and subdivision regulations can clearly play an important role in regulating land use to protect groundwater quality.").

<sup>43</sup> See e.g., John R. Nolon, *Calming Troubled Waters: Local Solutions*, 44 VT. L. REV. 1, 30–7 (2019) (detailing how land use planning, zoning, and site plan regulations can protect water, including groundwater); see also *Whatcom Cnty. v. Hirst*, 381 P.3d 1, 15 (2016) ("[T]he [Washington groundwater law] clearly places sole responsibility for land use decisions affecting groundwater resources on local governments. Counties are authorized by statute to grant or deny building permits, and the legislature has imposed on the counties the responsibility of protecting the availability of water, [] protecting groundwater resources.").

<sup>44</sup> See, e.g., Robert V. Percival, *Regulatory Evolution and the Future of Environmental Policy*, 7 U. CHICAGO L. FORUM 159, 159 (1997) ("During the 1970s, U.S. environmental law made a dramatic transformation from a highly decentralized system built on private law principles to one dominated by federal legislation requiring agencies to implement comprehensive, national regulatory programs.").<https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1227&context=uclf>.

<sup>45</sup> See, e.g., *Sustainable Groundwater Management Act*, CAL. DEP'T OF WATER RES. <https://water.ca.gov/programs/groundwater-management/sgma-groundwater-management>.

change in groundwater law.<sup>46</sup> And, to be sure, there are laudable components of SGMA and its aims. No other state has been so proactive.

California is also unique in that it has borne the brunt of the groundwater crisis. A long drought began in the early 2000s in the southwestern United States, the driest in 1200 years.<sup>47</sup> Turning to groundwater as a primary water source, Californians depleted already decreasing groundwater at an increasing clip.<sup>48</sup> Nearly three-quarters of California faced extreme or exceptional drought as measured by the United States Drought Monitor.<sup>49</sup> Drinking and irrigation wells have run dry.<sup>50</sup> Entire swaths of the state have been threatened as unlivable or unusable as farm land.<sup>51</sup> Thus, more than many states, California has faced tangible and serious consequences from the groundwater crisis. In these respects, California is an outlier.

But it is precisely this outlier status that makes California illustrative. Ten years after passage of SGMA, even California—with the best intentions and the most incentive to act—has had difficulties implementing the law. These challenges are due, at least in part, to groundwater law’s limits.

First, past common law doctrines are still applicable in California. Although SGMA sought to change how groundwater is allocated, it did not seek to sweep away the existing common law regime.<sup>52</sup> For one thing, by its terms SGMA does not apply to *all* groundwater.<sup>53</sup> For another, SGMA empowers the state and local governments to “enforce the state’s longstanding correlative rights doctrine[.]” a

<sup>46</sup> See, e.g., *Reactions: Legislators and Organizations Respond to the Passage of Groundwater Legislation*, MAVEN’S NOTEBOOK, (Aug. 30, 2014) <https://mavensnotebook.com/2014/08/30/reactions-legislators-and-organizations-respond-to-the-passage-of-groundwater-legislation/>.

<sup>47</sup> See, e.g., *Research Spotlight: Climate-Driven Megadrought*, DROUGHT.GOV <https://www.drought.gov/research-spotlight-climate-driven-megadrought>.

<sup>48</sup> See, e.g., Liu, Pang-Wei et al., *Groundwater Depletion in California’s Central Valley Accelerates During Megadrought*, 13 NAT COMMUN, 7825 (2022) (). <https://www.nature.com/articles/s41467-022-35582-x#citeas>.

<sup>49</sup> See, e.g., Anne C. Mulkern, *California’s Megadrought is Worse Than You Think*, E&E NEWS, (Aug. 2, 2022, 6:29 AM), <https://www.eenews.net/articles/californias-megadrought-is-worse-than-you-think/>.

<sup>50</sup> See, e.g., *id.*

<sup>51</sup> See, e.g., *id.*

<sup>52</sup> See, e.g., Burke W. Griggs, *Reaching Consensus About Conservation: High Plains Lessons for California’s Sustainable Groundwater Management Act*, 52 U. PAC. L. REV. 495, 542 (2021) (“SGMA neither creates, nor determines, nor comments upon California’s common-law property rights regime. SGMA does not displace the common law.”).

<sup>53</sup> See, e.g., Nick Bowlin, *How ‘Sustainable’ is California’s Groundwater Sustainability Act?* HIGH COUNTRY NEWS, (May 10, 2021), (“The law actually leaves out quite a lot of water. It applies to “alluvial” basins — water stored in deposits of sediment, in other words. But it does not apply to brackish groundwater, which often sits below alluvial basins and can be treated and used. It also doesn’t govern water stored in fractured hard-rock and volcanic aquifers, since they are not alluvial basins. This is a problem, because these forms of storage hold the majority of the state’s groundwater, and this leaves 40% of its wells unregulated and vulnerable to over-pumping[.]”). <https://www.hcn.org/issues/53-6/south-water-how-sustainable-is-californias-groundwater-sustainability-act/>

common law doctrine.<sup>54</sup> In fact, water rights established at common law are not disturbed or determined by SGMA at all.<sup>55</sup> Likely, this design was an attempt to ward off legal challenges under the Takings Clause.<sup>56</sup> But the end result is that the pre-existing common law—here the correlative rights doctrine—is the medium through which SGMA must negotiate.<sup>57</sup> In other words, past common law doctrines are still the coin of the realm, SGMA notwithstanding.

Second, SGMA has had to contend with past science. To its credit, SGMA—for the first time in California law—expressly recognizes that surface water and groundwater are linked.<sup>58</sup> But the devil is in the details. SGMA “charges groundwater agencies with avoiding surface water depletion[.]” but does not prescribe any particular method for doing so.<sup>59</sup> This is troublesome for many groundwater agencies, some of which lack technical and scientific expertise in surface water and groundwater interactions.<sup>60</sup> There is also a lack of established means of managing surface water depletions.<sup>61</sup> Further compounding the problem is the fact that the existing common law—that was explicitly preserved by SGMA—does not see such connections. SGMA essentially tries to remedy groundwater law’s scientific limitations by passing the buck to local groundwater agencies.

Third, past governance structures—embodied in local groundwater agencies—are the core of SGMA. SGMA’s very design was a concession to the reality that local governments control groundwater.<sup>62</sup> Indeed, SGMA grants authority to local

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<sup>54</sup> Justin Anthony Brown, *Uncertainty Below: A Deeper Look into California’s Groundwater Law*, 39 ENVIRONS ENV’L. L. & POL’Y J. 45, 47 (2015).

<sup>55</sup> GRIGGS, *supra* note 47, at 510-11.

<sup>56</sup> See, e.g., Justin Anthony Brown, *Uncertainty Below: A Deeper Look Into California’s Groundwater Law*, 39 ENVIRONS ENV’L. L. & POL’Y J. 45, 74 (2015).

<sup>57</sup> See GRIGGS, *supra* note 47, at 542-43.

<sup>58</sup> See, e.g., Alida Cantor, et al., *Navigating Groundwater Surface-Water Interactions Under the Sustainable Groundwater Management Act*, UC BERKELEY LAW, (March 2018), [https://www.law.berkeley.edu/wp-content/uploads/2018/03/Navigating\\_GW-SW\\_Interactions\\_under\\_SGMA.pdf](https://www.law.berkeley.edu/wp-content/uploads/2018/03/Navigating_GW-SW_Interactions_under_SGMA.pdf).

<sup>59</sup> Dave Owen, Alida Cantor, & Michael Kiparsky, *State Law Recognizes Rivers and Groundwater are Connected—Now What?* MERCURY NEWS, (May 11, 2018) <https://www.mercurynews.com/2018/05/09/opinion-state-law-recognizes-rivers-and-groundwater-are-connected-now-what/>.

<sup>60</sup> See *id.*

<sup>61</sup> See, e.g., Maurice Hall, *How Water Managers Can Address Surface Water Depletions—California’s ‘Sixth Deadly Sin*, ENVIRONMENTAL DEFENSE FUND, (Aug. 15, 2018) <https://blogs.edf.org/growingreturns/2018/08/15/california-surface-water-depletions-sgma/>.

<sup>62</sup> See, e.g., Rebecca R.A. Smith, *SGMA in the Field: Early Efforts at Defining Sustainability in California’s Critically Overdrafted Basins*, 52 U. PAC. L. REV. 549, 549 (2021) (“In signing SGMA into law, then-Governor Edmund J. Brown wrote of the State’s ‘recognition that groundwater management in California is best accomplished locally. Local agencies will now have the power to assess the conditions of their local groundwater basins and take the necessary steps to bring those basins in a state of chronic long-term overdraft into balance.’”).

and regional governments to sustainably manage groundwater, only allowing the state to intervene if local entities do not achieve this goal.<sup>63</sup>

That design has led to a dizzying number of parties at the table. In Kern County alone, there are twenty-two groundwater sustainability agencies.<sup>64</sup> Statewide, the current number of groundwater sustainability agencies is over 260.<sup>65</sup>

These three facets of groundwater law—past common law doctrines, past science, and past governance structures—have hindered SGMA’s implementation. A 2020 study found that the groundwater plans for the most critically depleted basins do little to prevent the drying of thousands of household wells.<sup>66</sup> A 2023 study was more dire, concluding that proposed groundwater sustainability plans were “consistent with business as usual groundwater level decline, and if reached, could impact over 9000 domestic wells and around 1000 public supply wells.”<sup>67</sup> The 2023 study also found that SGMA’s implementation had procedural faults as well; less than 40% of groundwater plans included diverse stakeholder groups, 25% of groundwater plans failed to focus on disadvantaged communities, and 65% of groundwater plans failed to consider impacts on household wells.<sup>68</sup> As one commentator bluntly put it, “[m]any challenges remain in implementing” SGMA.<sup>69</sup>

This is not, of course, to discount that SGMA has made an impact. Some areas of the state are seeing some signs of progress in getting stakeholders to reduce groundwater usage and increase groundwater recharge.<sup>70</sup> But the fact remains that SGMA is still subject to groundwater law’s limits. Even the best intentions are blunted by groundwater law’s stubborn resistance to change. The resulting conclusion is that the groundwater crisis is inextricably linked to groundwater law’s limits.

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<sup>63</sup> See, e.g., Justin Anthony Brown, *Uncertainty Below: A Deeper Look Into California’s Groundwater Law*, 39 ENVIRONS ENV’T. L. & POL’Y J. 45, 63 (2015).

<sup>64</sup> See, e.g., Corey O’Leary, *At Kern County Water Summit Experts Speak About Path Towards SGMA Compliance*, 23 ABC BAKERSFIELD, (March 8, 2024), <https://www.turnto23.com/news/in-your-neighborhood/lake-isabella-kernville-wofford-heights/at-kern-county-water-summit-experts-speak-about-path-towards-sigma-compliance>.

<sup>65</sup> See, e.g., Groundwater Sustainability Agencies, CAL. DEPT. OF WATER RES., <https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainable-Agencies>.

<sup>66</sup> Bowlin, *supra* note 54

<sup>67</sup> Bostic, D., Mendez-Barrientos, L., Pauloo, R. et al., *Thousands of domestic and public supply wells face failure despite groundwater sustainability reform in California’s Central Valley*, SCI REP 13, 14797 (2023) <https://www.nature.com/articles/s41598-023-41379-9#citeas>.

<sup>68</sup> See *id.*

<sup>69</sup> *Many Obstacles Remain in SGMA Implementation*, FARMPROGRESS, (June 30, 2023) <https://www.farmprogress.com/conservation-and-sustainability/many-obstacles-remain-in-sigma-implementation>.

<sup>70</sup> Bowlin, *supra* note 54

## IV. CONCLUSION

Groundwater law's limits remain an obstacle to progress. But that is not to say that all is lost. Some states—like California—are fighting upstream against groundwater law's limits, and, in measurable ways, making progress. However, any attempts to address the groundwater crisis must confront the fundamental nature of groundwater law's limits: tethered to the past and resistant to change.