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### Title

Drought and Groundwater: Legal Hurdles to Establishing Groundwater Drought Reserves

### Permalink

<https://escholarship.org/uc/item/0b69p4hq>

### Journal

Environs: Environmental Law and Policy Journal, 91

### Author

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### Publication Date

2012-10-01

Peer reviewed

ARTICLE: Drought and Groundwater: Legal Hurdles to Establishing Groundwater Drought Reserves in California

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**LEXISNEXIS SUMMARY:**

... Additionally, while the state recently provided funding for the development of more sustainable groundwater management, no program has so far been established and implemented to proactively address drought through the establishment of long-term locally based groundwater drought reserves. ... Special groundwater management districts, created by the legislature in only a few areas, can manage groundwater to control in-basin pumping upon evidence or threat of overdraft, limit exports out of the district, regulate well spacing to minimize well interference, and levy fees for groundwater management activities and for water supply replenishment. ... Unsettled Legal Issues Several unsettled legal questions are currently under review that would affect groundwater management and reserve development: (1) Does the recent re-articulation of the test for a "subterranean stream" include water previously not under the jurisdiction of the SWRCB in the determination of surface water rights; (2) What is the scope of the SWRCB's authority to manage, monitor, limit, or regulate groundwater extractions from new or existing wells to ensure protection of public trust values under the Public Trust Doctrine? ... Additionally, what is the state's authority under the Doctrine of Reasonable and Beneficial Use to prevent the unreasonable use of groundwater that results in declining groundwater levels; (3) What is the federal government's role in groundwater regulation; and (4) Will groundwater regulation result in successful Fifth Amendment Takings challenges? ... Permits or licenses to appropriate water are required for surface waters and "subterranean streams flowing through known and definite channels," but not for percolating groundwater.

**HIGHLIGHT:**

Multi-year droughts are a natural occurrence in California with many communities experiencing a reduction in available water supplies. Climate change is predicted to increase the number and severity of droughts and exacerbate vulnerability to water shortages. Along with monitoring weather conditions, drought adaptation strategies typically focus on implementing water shortage contingency plans after a drought occurs. One proactive approach to reducing vulnerability to drought is to establish a local reserve water supply before a drought occurs. Groundwater offers many benefits for a long-term reserve. Aquifers can often store large volumes of water and groundwater generally does not suffer from significant evaporative losses. A groundwater reserve that is less reliant on imported water and that is both situated and used locally can be a less expensive and more environmentally friendly option. This is in contrast to current groundwater banking approaches that focus on short-term and seasonal storage, that rely primarily on imported water, and that utilize long distance energy-intensive transmission systems. While many water agencies are currently considering ways to improve storage and reduce overdraft, no programs have yet been implemented to sustain local long-term groundwater drought reserves. Moreover, many groundwater basins are in overdraft with declining groundwater levels, and reducing overdraft is central to establishing a local drought reserve. This paper discusses the legal issues surrounding the development of local groundwater drought reserves. Additionally, it discusses unsettled areas of the law that could affect reducing overdraft and the development of reserves.

**TEXT:**

[\*92]

I. Introduction

Droughts are a natural occurrence in California, and climate change is predicted to increase their number and severity.

<sup>n1</sup> Although precise localized impacts of climate change on water resources remain uncertain in California, fewer wet springs, and higher temperatures are expected to lead to elevated evaporation rates and reductions in stream flow. <sup>n2</sup>

Many communities in the state already experience water shortages during a drought,<sup>n3</sup> and climate change is likely to exacerbate this vulnerability.

Drought adaptation strategies in the state typically focus on monitoring weather conditions, generating surface and groundwater data, and implementing water shortage contingency plans after a drought occurs.<sup>n4</sup> One proactive [\*93] approach to reducing vulnerability to drought is to establish a reserve water supply before the occurrence of a drought. Groundwater offers significant benefits for a reserve. Many aquifers store large volumes of water and have the capacity to hold even more,<sup>n5</sup> and groundwater generally does not suffer from significant evaporative losses. Additionally, developing groundwater storage is less expensive and more environmentally friendly.<sup>n6</sup> The California Department of Water Resources (DWR) notes that utilizing groundwater aquifers as storage facilities will be particularly useful in the face of climate change impacts.<sup>n7</sup> Importantly, establishing groundwater drought reserves is a "no-regrets" strategy. This is defined as a policy that would have net social benefits whether or not there is anthropogenic climate change.<sup>n8</sup>

A significant problem is that many of California's groundwater basins are in overdraft with declining groundwater levels.<sup>n9</sup> This can impact surface stream flows and result in salt-water intrusion and land subsidence, as well as increase pumping costs.<sup>n10</sup> Reducing groundwater overdraft is a critical step in [\*94] establishing a drought reserve. Many water agencies are currently developing strategies to reduce overdraft and seasonal and short-term water shortages.<sup>n11</sup> Additionally, while the state recently provided funding for the development of more sustainable groundwater management, no program has so far been established and implemented to proactively address drought through the establishment of long-term locally based groundwater drought reserves. Rather, during the last 150 years when California experienced a slightly above average wet regime with a small number of short-duration dry periods, agriculture, a sector that relies significantly on groundwater for irrigation, utilized the relative abundance of water to expand production rather than to develop long-term groundwater drought reserves.<sup>n12</sup> While there are multiple physical, political, and institutional challenges involved in establishing groundwater drought reserves in the state, this paper focuses specifically on the legal issues.

It is important to note the distinction between local long-term drought reserves and current groundwater banks. As presently configured, groundwater banking in California relies primarily on imported water from the State Water Project and the Federal Central Valley Project and on extensive transmission from water source to groundwater bank to water user. Additionally, these systems utilize short storage and recovery periods.

In contrast, given the decreasing reliability of imported water and the high energy cost of transmission systems, this paper focuses on the legal issues to establish long-term groundwater drought reserves that are both situated and used locally. It first outlines the broad legal requirements for managing groundwater in the state and then discusses unsettled areas of the law that could affect reducing groundwater overdraft. Furthermore, it examines opportunities and constraints to improve groundwater management and conditions overall, including the development of local long-term groundwater reserves.<sup>n13</sup>

## [\*95]

### II. Broad Legal Issues

Although groundwater and surface water are hydrologically interconnected,<sup>n14</sup> the State of California manages them under different legal regimes based on their specific classification. Surface waters and "subterranean streams flowing in known and definite channels" are subject to the statutory water rights system,<sup>n15</sup> and the State Water Resources Control Board (SWRCB) administers a water right permit and license system for appropriations initiated after December 19, 1914. The permit process does not apply to riparian rights, pre-1914 appropriative rights, or percolating groundwater.<sup>n16</sup> Owners overlying a groundwater basin follow a correlative doctrine, which accords to each owner of land overlying a groundwater basin a right to the reasonable, beneficial use of the groundwater in connection with his overlying land. The right of use of each landowner is correlative with similar rights of all other overlying owners.<sup>n17</sup> The Correlative Rights Doctrine, along with the historical resistance of the California legislature to implement a permit-based process to regulate pumping, has limited the ability of the state to address groundwater declines in many areas.<sup>n18</sup> Reducing these declines is critical to establishing drought reserves.

#### A. Local Regulation

In lieu of state regulation through a permit system, more than twenty types of [\*96] local agencies have authority to manage some aspect of groundwater.<sup>n19</sup> Depending on their enabling legislation, these districts can, but do not have to, limit or regulate extraction, levy groundwater extraction fees, and collect fees to establish recharge programs that ad-

dress overdraft.<sup>n20</sup> Special groundwater management districts, created by the legislature in only a few areas, can manage groundwater to control in-basin pumping upon evidence or threat of overdraft, limit exports out of the district, regulate well spacing to minimize well interference, and levy fees for groundwater management activities and for water supply replenishment.<sup>n21</sup> Conflicts over groundwater are primarily settled in court and sometimes result in a groundwater basin adjudication where everyone's rights are spelled out and a watermaster oversees management of the aquifer.<sup>n22</sup> In theory, an adjudicated basin could require a locally based groundwater drought reserve as a management condition, but this has not occurred so far.

### B. County Regulation

Along with local districts, more than twenty counties have groundwater management ordinances.<sup>n23</sup> The ordinances may include, for example, that a county will only issue a permit to export groundwater, if the export will not cause overdraft, affect safe yield, reduce water quality, cause subsidence, or injure water users within the county.<sup>n24</sup> County authority to regulate groundwater was upheld in *Baldwin v. County of Tehama*.<sup>n25</sup> There, the court stated that because state law does not occupy the field of groundwater management, cities and counties may adopt ordinances to manage their groundwater resources under their police powers.<sup>n26</sup> Through the use of such ordinances, counties can assert jurisdiction over water stored even temporarily in their aquifers.<sup>n27</sup> These [\*97] ordinances could be models for more sustainable groundwater management in the public interest and require the development of county drought reserves.<sup>n28</sup> However, most ordinances were adopted by groundwater rich counties to protect against the export of their groundwater resources outside the county.<sup>n29</sup> For example, a party could purchase land within a groundwater rich county and thereby obtain groundwater rights. The water could then be exported for a fee, to the detriment of users within the county.

### C. State Statutory Requirements

Although the state does not administer a permit process for groundwater, several regulations do address water supply planning and drought adaptation, albeit under relatively narrow circumstances. The California Environmental Quality Act (CEQA)<sup>n30</sup> requires a realistic discussion of a development's water supply in its Environmental Impact Report (EIR).<sup>n31</sup> For a source such as groundwater, an EIR would include groundwater usage and the condition of the groundwater aquifer. Additionally, a project's potential cumulative impact to groundwater resources (including overdraft) must be identified and analyzed.<sup>n32</sup> Regarding new proposed projects, CEQA requires that an inquiry be made with respect to whether the project would "substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level."<sup>n33</sup>

Legislation also addresses groundwater overdraft in Urban Water Management Plans (UWMPs).<sup>n34</sup> Water suppliers with 3,000 or more connections, or supplying more than 3,000 acre feet per annum (afa), are [\*98] required to evaluate water reliability over the next twenty years and include scenarios with normal, single, and multi-year dry periods.<sup>n35</sup> If groundwater is an available source of water, the evaluation must include groundwater management. Additionally, if the basin is in overdraft, the plan must detail efforts to eliminate any long-term overdraft.<sup>n36</sup> For new developments, in 2001 the state added a requirement for verification of water supply sufficiency as a precondition of final subdivision map approval for more than 500 dwelling units.<sup>n37</sup> If groundwater is a source available to a water supplier in a non-adjudicated basin, and if the basin is in overdraft, the plan must include current efforts to eliminate any long-term overdraft.<sup>n38</sup>

In 1992, Assembly Bill 3030 expanded the ability of agencies to address the problem of critical overdraft by increasing the number of public agencies authorized to develop a groundwater management plan (GMP).<sup>n39</sup> A significant issue is that agency participation in AB 3030 GMP creation is entirely voluntary and agency plans do not have to be filed with the DWR.<sup>n40</sup> This limits the reach of these plans and an understanding of their effectiveness. AB 3030 instructs, but does not require, participating agencies to monitor for change in groundwater levels, groundwater quality, land subsidence, and surface flow and quality affecting groundwater basins.<sup>n41</sup> However, the statutes do not authorize an agency to make a binding determination of water rights, nor authorize it to limit or suspend extractions.<sup>n42</sup> Fees or assessment for the replenishment or extraction of groundwater are prohibited unless approved by a majority vote at a local election.<sup>n43</sup> Drought planning utilizing drought reserves is not explicitly mentioned in the AB 3030 guidelines.

The state currently provides financial incentives for more sustainable local management of groundwater. These include that any public agency seeking state funds for groundwater projects prepare and implement a groundwater management plan that incorporates specific basin management objectives and monitoring protocols. Funding so far for water supply planning comes from [\*99] several state propositions. These include Proposition 204 in 1996,<sup>n44</sup> and the \$ 1.97 billion Proposition 13 in 2000.<sup>n45</sup> The Integrated Regional Water Management Act<sup>n46</sup> encourages local agencies to

work together to manage water supplies and California has provided funding for projects consistent with an adopted Integrated Regional Water Management Plan (IRWMP).<sup>n47</sup> Funding comes from the \$ 3.44 billion Proposition 50 in 2002<sup>n48</sup> and the \$ 5.4 billion Proposition 84 in 2006.<sup>n49</sup> Many communities receiving funding are moving in the direction of more sustainable groundwater management. Nevertheless, mandated requirements to reduce overdraft and to consider the development of drought reserves, would strengthen the ability of local and state entities to reduce drought vulnerability.

In 2009, Senate Bill SBX7 6 authorized local water management entities to assume responsibility for monitoring groundwater elevations in all groundwater basins and report results to DWR by January 2012.<sup>n50</sup> DWR is then required to report periodically to the public on the status of groundwater across the state.<sup>n51</sup> Local parties that do not conduct required monitoring are barred from receiving state grants and loans.<sup>n52</sup> But this information does not quantify overdraft or provide for an accounting of inputs and extractions,<sup>n53</sup> all of which are needed to reduce declining levels and establish a groundwater drought reserve.

Several additional sections of the California Water Code are also relevant to reducing groundwater overdraft and establishing groundwater drought reserves. [\*100] Water Code sections 1005.1-1013 provide a means for landowners who have a right to pump groundwater to protect the right when conserving water or substituting water from an alternate non-tributary source for previously pumped groundwater.<sup>n54</sup> Water Code section 1242 states that storing water underground is a beneficial use of water if the water stored is later put to the beneficial use for which the appropriation for storage was made.<sup>n55</sup> Where surface water is appropriated and then transferred to storage underground, the transfer also requires the approval of the SWRCB that it would not injure legal users or unreasonably effect fish, wildlife or other in-stream beneficial uses.<sup>n56</sup> Water Code Section 12922 states that the people of the state have a primary interest in preventing impaired use or irreparable damage to groundwater basins caused by overdraft and depletion.<sup>n57</sup> Section 105 states that the State shall determine in what way the water of the State, both surface and underground, should be developed for the greatest public benefit.<sup>n58</sup> Section 104 states that, "the people of the State have a paramount interest in the use of all the water of the State and ... the State shall determine what water of the State, surface and underground, can be converted to public use or controlled for public protection."<sup>n59</sup>

Despite past legislation, court rulings, and administrative efforts to implement more sustainable groundwater management strategies, overdraft remains a significant problem in many areas of the state, and reducing groundwater declines is a critical first step in developing drought reserves. Additionally, at present there are no mandated requirements to even consider the development of locally based drought reserves in either funding or planning guidelines.<sup>n60</sup>

#### D. State Public Interest Doctrines

Along with doctrines that specify the rules for private rights to water, there are several very important principles that oversee all water use in the state. Water rights are usufructory, conferring only a right to use water.<sup>n61</sup> The Public [\*101] Trust Doctrine and the Doctrine of Reasonable and Beneficial Use, articulate public interest principles. These principles are currently at the forefront of efforts to affirm the state's authority to manage a public resource, including establishing stronger requirements for more sustainable groundwater management.

The Public Trust Doctrine holds that the state, as an attribute of its sovereignty, has the right to regulate navigable waters, and lands underlying the waters for the benefit of the public.<sup>n62</sup> The question of whether the state can impose conditions on the management of groundwater under the Public Trust Doctrine is an unsettled area of the law discussed in Part III.

The Doctrine of Reasonable and Beneficial Use, as specified by Article X, Section 2 of the California Constitution, requires that the use of all water in the state, surface and groundwater, be exercised reasonably.<sup>n63</sup> The California Supreme Court held that Article X, Section 2 applies to both surface and groundwater rights.<sup>n64</sup> Whether the doctrine provides the state with authority to specifically regulate overdraft or depletion of a drought reserve is unsettled and discussed in Part III.

#### E. Federal Legal Authority

States generally assume primary responsibility for managing the nation's groundwater. Yet, the U.S. Supreme Court's 1982 decision in *Sporhase v. Nebraska* made clear that the federal government, through the Commerce Clause has "affirmative power ... to implement its own policies concerning [groundwater] regulation. Groundwater overdraft is a national problem and Congress has the power to deal with it on that scale."<sup>n65</sup> Examples where the federal government could be implicated in groundwater management include reserved rights to water on federal reservations and statutory

authority under the Endangered Species Act (ESA)<sup>n66</sup> and the Clean Water Act (CWA).<sup>n67</sup> These are [\*102] also discussed in the next section.

#### F. Water Quality and Public Health Regulation

Both a sufficient reserve supply and a supply that is of high quality are critical for a reserve. The federal government regulates water quality in navigable water bodies under the CWA.<sup>n68</sup> In California, the 1969 California Porter-Cologne Water Quality Control Act<sup>n69</sup> and the 1985 Pesticide Contamination Prevention Act<sup>n70</sup> mandate protection of water quality. The Porter Cologne Act directs the SWRCB and the Regional Water Quality Control Boards (RWQCB) to promulgate and enforce statewide regulations governing groundwater quality. The RWQCB's have authority to order the abatement of discharges, including nonpoint source discharges that create or threaten to create pollution.<sup>n71</sup> At the federal level under the CWA, National Pollutant Discharge Elimination System (NPDES) permit requirements apply to discharges of groundwater containing pollutants that may affect receiving water quality.<sup>n72</sup>

The California Department of Pesticide Regulation regulates pesticide pollution. In 2004, the Department designated about 2.4 million acres as Groundwater Protection Areas where soil conditions make shallow groundwater most vulnerable to pesticide contamination from leaching and runoff.<sup>n73</sup> New regulations for these areas prescribe actions to prevent pesticides from reaching groundwater before contamination actually occurs.<sup>n74</sup> But many groundwater basins in the state remain polluted.<sup>n75</sup>

The federal Environmental Protection Agency (EPA) also regulates injection wells under the authority of the Underground Injection Control (UIC) program, as provided for by Part C of the Safe Drinking Water Act.<sup>n76</sup> These wells, which [\*103] carry and permanently place fluids underground, are a potential groundwater contamination source if not properly sited, constructed, and maintained.

The most comprehensive groundwater quality monitoring required by the state is done by the Department of Public Health (DPH) through its drinking water monitoring programs. The DPH can impose terms and conditions on permits for public water systems to assure that sufficient water is available during a drought.<sup>n77</sup> However, groundwater quality is not protected under state regulation to the same extent as surface water quality. This is in part because it is more difficult to systematically monitor groundwater than surface water, and the state cannot conduct monitoring on private property without permission.

#### III. Unsettled Legal Issues

Several unsettled legal questions are currently under review that would affect groundwater management and reserve development:

- (1) Does the recent re-articulation of the test for a "subterranean stream" include water previously not under the jurisdiction of the SWRCB in the determination of surface water rights;
- (2) What is the scope of the SWRCB's authority to manage, monitor, limit, or regulate groundwater extractions from new or existing wells to ensure protection of public trust values under the Public Trust Doctrine? Additionally, what is the state's authority under the Doctrine of Reasonable and Beneficial Use to prevent the unreasonable use of groundwater that results in declining groundwater levels;
- (3) What is the federal government's role in groundwater regulation; and
- (4) Will groundwater regulation result in successful Fifth Amendment Takings challenges?

The resolution of these questions could increase the state's ability to regulate groundwater and promote more sustainable groundwater management under specific circumstances. This could help to reduce overdraft and encourage the development of drought reserves in many areas of the state.

#### A. Definition of groundwater

Although surface and underground waters are a single and interconnected resource in many systems,<sup>n78</sup> California manages these waters under different [\*104] legal regimes based on their classification. Permits or licenses to appropriate water are required for surface waters and "subterranean streams flowing through known and definite channels,"<sup>n79</sup> but not for percolating groundwater.<sup>n80</sup> The question is whether the courts or the legislature will provide the state with the authority to require a permit to use water in a subterranean stream that was previously classified as percolating groundwater.<sup>n81</sup> This could potentially increase more sustainable groundwater management in some basins and specifically address reducing overdraft and developing reserves.

In 1987, the SWRCB issued a decision holding that it must consider impacts on interconnected groundwater when reviewing applications to appropriate surface water and when conducting statutory adjudications.<sup>n82</sup> To determine the conditions under which groundwater falls within its permitting authority, in 1999 the SWRCB established a four-part test known as the Garrapata test: (1) "[a] subsurface channel must be present;" (2) "the channel must have a relatively impermeable bed and banks;" (3) "the course of the channel must be known or capable of being determined by reasonable inference; and" (4) "groundwater must be flowing in the channel."<sup>n83</sup> The SWRCB based the Garrapata test on its reading of an 1899 California Supreme Court case, *City of Los Angeles v. Pomeroy*.<sup>n84</sup> The Board utilized the test again in 2002 in a case involving the Pauma Valley Water Company.<sup>n85</sup>

Following administrative proceedings in the Pauma as well as the Pala basins in Southern California, the SWRCB contracted with Professor Joseph Sax<sup>n86</sup> to examine the history of Water Code section 1200. In his report, he recommended [\*105] an impacts test as one approach to reconcile the code with the current scientific understanding of the interrelationships between groundwater and surface water systems. His proposal was to read Water Code section 1200 as granting the SWRCB authority over groundwater when the extraction of that groundwater would have an "appreciable and direct impact" on a surface stream.<sup>n87</sup> Furthermore, he stated:

If the Board were to take the view that a channel must fit the definition of being 'like a trench, furrow, or groove' or 'a tubular passage' [the standard definition of the term from the American Heritage Dictionary] - that is, something essentially long and narrow - it would doubtless be drawn toward the more restricted view of its jurisdiction that some urge, sticking to the immediate confines of the channels of surface streams. On the other hand, if a channel can be quite broad and un-furrow like, so long as it is enclosed by relatively impermeable beds and banks, subterranean stream jurisdiction could be quite extensive.<sup>n88</sup>

In a subsequent case, *North Gualala Water Co. v. State Water Resources Control Board*,<sup>n89</sup> the court of appeal examined two main issues. First, the court examined the controversy over the definition of "subterranean stream."<sup>n90</sup> Second, the court considered whether the Board had jurisdiction over groundwater pumping not just in the vicinity of a surface stream, but also in a broad alluvial valley where it had not ordinarily exercised its jurisdiction in the past.<sup>n91</sup> The court rejected arguments that a proper interpretation of Water Code section 1200 requires that (1) for a channel to be "defined," its width must be narrowing as the groundwater flows through it; (2) the bed and banks of a subterranean channel must be a "significant boundary" rather than "relatively impermeable"; and (3) the groundwater flow direction must closely follow the course of a surface stream's channel. But at the same time, the court of appeal disclaimed any intent to extend the SWRCB jurisdiction to wide alluvial valleys,<sup>n92</sup> and rejected the trial court's suggestion that once the operation of a well is shown to have an impact on surface flows (the Sax impacts test), the SWRCB's jurisdiction follows automatically.<sup>n93</sup>

Looking to the future, the question is whether the courts, in other factual [\*106] contexts, will take the position that a channel must be long and narrow, or whether they will support an interpretation where, so long as a channel is enclosed by relatively impermeable beds and banks, the SWRCB's subterranean stream jurisdiction would apply.<sup>n94</sup> Andrew Sawyer<sup>n95</sup> argues that the SWRCB will likely stick with a narrow interpretation of the Pomeroy/Garrapata bed and banks test.<sup>n96</sup> However, if the SWRCB does take a more expansive view of the definition of "subterranean streams," the state will be further empowered to reduce overdraft, buttress more sustainable management in some groundwater basins, and support the development of drought reserves.

## B. The Public Trust Doctrine and Groundwater

The Public Trust Doctrine in California confers authority on the State to protect and manage public trust resources for the benefit of the people of the State.<sup>n97</sup> The question is whether that authority can be extended to manage, monitor, limit, or regulate groundwater extractions from new or existing wells that contribute to and help regulate the flow and quantity of a surface water to ensure protection of public trust values. Additionally, does interconnected groundwater need to be considered in any determination of surface water rights? This issue is the subject of a two pending actions.

The first involves a statutory adjudication of the Scott River Basin in Siskiyou County that includes surface and groundwater rights.<sup>n98</sup> A lawsuit is being brought by Oakland non-profit, Environmental Law Foundation (ELF) against the SWRCB and Siskiyou County. ELF alleges that the SWRCB and Siskiyou County are harming fish by failing to control groundwater pumping nearby. ELF is requesting a judicial determination of the SWRCB's authority under the Public Trust Doctrine of California to protect groundwater that is hydrologically connected to navigable public trust waterways.<sup>n99</sup>

Roderick Walston, the attorney for Siskiyou County, points to several potential obstacles for the protection of groundwater under the Public Trust Doctrine; (1) groundwater is not navigable, (2) conservation is not included among the traditional list of protected purposes; and (3) the scope of the doctrine's retroactive powers are uncertain.<sup>n100</sup> However, in *National Audubon [\*107] Society v. Superior Court*, the California Supreme Court "recognized the public trust as an ecological baseline that places fundamental limits on diversion of water for consumptive uses."<sup>n101</sup> Moreover, even though the contested water diversions were from non-navigable tributaries of Mono Lake, the court held that the Public Trust Doctrine protects navigable waters from harm caused by the diversion of non-navigable tributaries.<sup>n102</sup> Walston nevertheless argues that it justified this move only on the grounds that these waterways affected the navigability of other waters.<sup>n103</sup>

The *National Audubon* decision also held that the state had an affirmative duty to consider the public trust in deciding how to allocate water resources.<sup>n104</sup> This required the SWRCB to weigh and balance competing water uses to determine what level of protection would "preserve so far as consistent with the public interest, the uses protected by the trust."<sup>n105</sup> However, no vested right precluded it from reconsidering the allocation of existing water rights in the Mono Basin.

In *Environmental Law Foundation*, the petitioners argue that where groundwater is hydrologically connected to nearby rivers and streams, the groundwater extractions can have huge negative impacts on those water bodies. They hope that the outcome of their case will establish California's continuing duty under the Public Trust Doctrine to manage groundwater resources that affect public trust waters and resources.<sup>n106</sup>

## C. The Reasonable and Beneficial Use Doctrine and Groundwater

The use of the Reasonable and Beneficial Use Doctrine to address groundwater overdraft is another unsettled area of the law, and the full scope of this doctrine has not yet been defined through the courts. What is established is that in defining a right to use groundwater, a court must consider the reasonableness of the use. Furthermore, the water use must be reasonable for both the needs of water rights holders and in light of competing public uses of the resource. In *Joslin v. Marin Municipal Water District*, the court stated that **[\*108]** "what is a reasonable use of water depends on the circumstances of each case, such an inquiry cannot be resolved in vacuo isolated from statewide considerations of transcendent importance."<sup>n107</sup> Moreover, as declared in *Environmental Defense Fund v. East Bay Municipal Utility District*: "What constitutes reasonable water use is dependent upon not only the entire circumstances presented but varies as the current situation changes."<sup>n108</sup> In *City of Barstow v. Mojave Water Agency*, the leading case on the issue, the court made it clear that the constitutional amendment dictates the basic principles defining water rights "that no one can have a protectable interest in the unreasonable use of water, and that holders of water rights must use water reasonably and beneficially."<sup>n109</sup>

Sax points to how, despite the SWRCB's lack of permitting authority, it can issue remedial orders against water users not abiding by the reasonable use mandate.<sup>n110</sup> Moreover, the SWRCB could potentially institute litigation through the California Attorney General to control groundwater use that constitutes waste, unreasonable use, or method of use within the meaning of Article X, Section 2 of the California Constitution, and section 100 of the Water Code.<sup>n111</sup> Additionally, section 275 of the Water Code provides the Board and the DWR with its own authority to define and prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of water in the state.<sup>n112</sup> Thus, the Board could potentially assert its own jurisdiction to adjudicate and remedy complaints about unreasonable

groundwater use. The California Supreme Court has not expressly addressed whether section 275 provides an independent source of jurisdiction over groundwater pumpers. However, the lower courts did establish that the Board could assert jurisdiction over the pumping of percolating groundwater to adjudicate and remedy claims that come within the scope of section 275.<sup>n113</sup> This suggests that the Board has authority to remedy claims of pumping that cause overdraft of a basin and potentially to remedy unreasonable withdrawals that deplete a reserve.

Sawyer points to the state's authority to prevent waste and unreasonable use as a potential tool to also address impacts of groundwater diversions on surface waters.<sup>n114</sup> This occurred recently when the Board adopted a frost protection regulation that applies to all water diversions for frost protection uses in [\*109] Mendocino and Sonoma Counties downstream of Lake Mendocino and Lake Sonoma between March 15 and May 15. The regulation declares that such diversions are "unreasonable" under article X, section 2 of the California Constitution and section 100 of the Water Code, unless the diverter is complying with a SWRCB-approved Water Demand Management Program (WDMP) by February 1, 2012.<sup>n115</sup> This is also discussed in the next section.

#### D. Federal Issues in the Regulation of Groundwater

The federal government can influence and regulate both groundwater withdrawals and groundwater quality in specific circumstances. The Commerce Clause and the Property Clause of the U.S. Constitution provide the federal government with the authority to create federal reserved rights in groundwater.<sup>n116</sup> In *Cappaert v. United States*, the court indicated that the federal government could reserve water in an "underground pool."<sup>n117</sup> While subsequent lower court decisions have not been consistent regarding the federal government's reserved rights, *Cappaert* did affirm that the United States can protect its water from surface or groundwater diversions and that these water rights supersede groundwater pumping that is lawful under state law.<sup>n118</sup>

John Leshy<sup>n119</sup> proposes that if an aquifer lies under both federal and non-federal lands, state law might allow the United States to protect the waters associated with its lands against export schemes.<sup>n120</sup> Additionally, groundwater extraction, storage, and recovery projects sometimes require rights-of-way across federal lands.<sup>n121</sup> The federal government could also condition such permits on steps being taken to protect federal interests such as the limiting of groundwater pumping that is otherwise lawful under state law.<sup>n122</sup>

The federal government does not directly administer programs to regulate the quality of groundwater as it does with surface water under the CWA. However, the EPA "works with California Department of Public Health to ensure that groundwater drinking water supply sources comply with mandated federal [\*110] drinking water programs and standards."<sup>n123</sup> Also, it "administers grant and loan programs for water treatment and cleanup."<sup>n124</sup> Additionally, if there is a direct hydrologic connection to surface water where groundwater pollution will affect receiving surface water quality, a NPDES permit, is required.<sup>n125</sup> A NPDES permit regulates point-source discharges of pollutants to navigable waters of the United States. Two recent decisions by the Ninth Circuit expanded the definition of "point source." The court in the first case held that stormwater runoff flowing from roads "designed and constructed with systems of ditches, culverts, and channels that collect and convey stormwater runoff" constituted a "point source" for which an NPDES permit was required.<sup>n126</sup> In the second case, the Ninth Circuit clarified how liability can be imposed under the CWA in situations when it is impossible to pinpoint which particular entity or operation contributed to the stormwater pollution.<sup>n127</sup> Both of these Ninth Circuit cases have been granted certiorari by the U.S. Supreme Court as of June 25, 2012. The outcome could affect whether polluted stormwater will need to be treated before it is discharged into a watercourse. In turn, under certain circumstances this could potentially affect pollutants entering groundwater.<sup>n128</sup>

A common rationale for more recent federal intervention in state groundwater management has been to prevent jeopardy to listed species under the ESA by protecting groundwater in situ to support surface ecosystems and water flows.<sup>n129</sup> Changes in the natural interaction of groundwater and surface water caused by human activities - for example, groundwater withdrawals or the mixing of groundwater with surface water that results in the alteration of acidity, temperature, and dissolved oxygen - can potentially have a significant effect on aquatic environments,<sup>n130</sup> including species listed under the ESA. The act has been the trigger for several major disputes involving groundwater pumping. For example, it has been a catalyst for better management of the Platte River and its [\*111] associated aquifers in Colorado, Nebraska, and Wyoming.<sup>n131</sup> In general, it has been a key factor motivating many water agencies to undertake more sustainable water supply planning for drought.<sup>n132</sup> Examples include the Sonoma County Water Agency, where the listing of salmonids under the federal ESA served as motivation for the agency to re-examine its earlier quest for additional surface water rights and instead adopt alternative strategies. The alternative strategies include conservation and more sustainable groundwater management to build a more secure water supply system.<sup>n133</sup>

Most recently, the ESA was the catalyst for the SWRCB's adoption of the frost protection regulation discussed earlier. This regulation extends its jurisdiction to surface water and hydrologically connected groundwater withdrawals that deplete surface flows in the Russian River during the frost protection season.<sup>n134</sup> The regulation was initiated in response to the National Oceanic Atmospheric Administration Fisheries Service concern over the threat to federally threatened and endangered salmonids of frost protection irrigation in the watershed that could result in stranding the fish. What is noteworthy is, first, that this requirement applies to diversions made under all types of California water rights including the pumping of hydrologically connected groundwater, and second that the Board did this without explicit legislative authorization, as exists in the Scott River-Public Trust litigation situation discussed earlier.

#### E. Fifth Amendment Takings and the Regulation of Groundwater

An unsettled question is whether the Takings Clause of the Fifth Amendment, which requires the government to pay just compensation when it takes private property for public use, applies to groundwater regulation.<sup>n135</sup> Requiring the government to compensate for any restrictions on groundwater pumping would be excessively expensive and could have the effect of eviscerating rules to limit overdraft.

In *Allegretti & Co. v. County of Imperial*, the court held that the County of Imperial did not "take" a landowner's overlying water rights when the county issued a conditional use permit to the landowner limiting the amount of water [\*112] the landowner could extract from the aquifers under its land.<sup>n136</sup> The court rejected the argument by the landowner, Allegretti, that the county's requirement amounted to a total regulatory taking because he had been deprived of all "economically beneficial or productive use" of its property. The court dismissed this argument, stating that:

Allegretti has not demonstrated any economic impact from county's 12,000 acre-feet per year limitation other than un-specific lay testimony regarding reduced profits via a below market rental rate or diminution in value as a result of its inability to use the entirety of its 2,400-acre property for farming ... . [A] mere diminution in value of property, however serious, does not constitute a taking.<sup>n137</sup>

Moreover, although Allegretti has superior groundwater rights as an overlying user, those rights are restricted to reasonable beneficial use consistent with Article X, section 2 of the California Constitution.<sup>n138</sup> Furthermore, the California Supreme Court has consistently held that no one has a compensable property right in an unreasonable use of water, including groundwater.<sup>n139</sup>

The Environmental Law Foundation case discussed earlier also addresses takings issues. In that case, Siskiyou County officials are arguing that the Scott River is "real property," which consists of land or things attached to land. ELF argues that no court has held that water in its natural state is real property. If the river is declared to be real property, the government could be subject to Fifth Amendment takings claims. Then potentially any limitation or control on the use of water for the public good would become a compensable taking where the government would be required to make substantial payments to water users if it cut their supplies.

#### IV. Conclusion

Establishing locally based groundwater drought reserves could increase resilience to drought for many regions. Curtailing groundwater depletion and supporting aquifer recharge are critical to this process. While many local jurisdictions are attempting to address overdraft and are working towards more sustainable groundwater management, the rules affecting groundwater management in California have not yet been effective in reducing the significant overdraft that exists in many basins.

A first problem is that while scientists have demonstrated that surface waters [\*113] interact with groundwater in all types of landscapes and in many systems,<sup>n140</sup> California law provides only limited recognition of this hydrologic connection and treats surface and groundwater as two physically separate resources. The state can only regulate surface water and underground streams flowing in known and definite channels. Yet, where local management has failed to reduce declining groundwater levels, the state could potentially address unsustainable groundwater pumping.

The California legislature has been resistant to establishing a state mandated permit system for groundwater withdrawal, but pressed by the recent lawsuits discussed in this paper, the SWRCB could expand its jurisdiction under limited conditions. One example is establishing a broader definition of "underground streams flowing in known and definite channels," where public trust values are implicated, or where the California Constitution, Article X, Section 2 pro-

vides authority to prevent waste and unreasonable use. The federal government could also step in where threatened and endangered species are involved, as it has in pressuring the SWRCB to issue its Russian River frost protection rule.

A second issue is that no mandated requirements exist to encourage the establishment of local groundwater drought reserves as a key adaptation to reduce vulnerability to a future severe drought. As a first step, rules to consider the establishment of drought reserves could be incorporated into UWMPs, GMPs and IRWMPs, and implementation of more sustainable groundwater management practices could be required in order to receive funding provided by the state.

These proposals can be developed within a federal-state-local framework. But reshaping water law to encourage effective, proactive adaptation to drought is essential. Laws must provide more explicit goals and rules, along with incentives, for local, regional, and state institutions to reduce overdraft and develop locally based drought reserves.

### Legal Topics:

For related research and practice materials, see the following legal topics:

Governments  
State & Territorial Governments  
Water Rights  
Real Property Law  
Water Rights  
Beneficial Use  
Real Property Law  
Water Rights  
Groundwater

### FOOTNOTES:

n1. Cal. Natural Res. Agency, California Climate Adaptation Study: A Report to the Governor of the State of California in Response to Executive Order S-13-08, 2009, at 15 (2009), available at <http://www.climatechange.ca.gov/adaptation/strategy/index.html>.

n2. *Id.* at 16-22, 80, 84.

n3. See, e.g., Felicity Barringer, Signs of Another California Drought Year, *N.Y. Times*, Jan. 2, 2009, at A15, available at [http://www.nytimes.com/2009/01/02/us/02water.html?\\_r=0](http://www.nytimes.com/2009/01/02/us/02water.html?_r=0).

n4. See Ruth Langridge, Confronting Drought: Water Supply Planning and the Establishment of a Strategic Groundwater Reserve, 12 *U. Denv. Water L. Rev.* 295, 297 (2009). Desalination, recycled water, new surface storage facilities, and increased water use efficiency are also commonly proposed approaches for balancing supply and demand during droughts. These strategies are effective, but they can lead to a pernicious, unintended consequence: expanded supplies and reduced usage can prompt growth in water-stressed regions during wet periods, causing an eventual increase in future water requirements and a hardening of demand side conservation strategies. This can actually increase vulnerability to future water shortages during a severe drought. *Id.*

n5. The storage capacity of surface reservoirs in California has been estimated at 43 million acre feet (af), while as much as 143 million af of storage may be available in the state's groundwater basins. Russell Kletzing, Imported Groundwater Banking: The Kern Water Bank - A Case Study, 19 *Pac. L.J.* 1225, 1225 (1998).

n6. Barton H. Thompson, Jr., Institutional Perspectives on Water Policy and Markets, 81 *Calif. L. Rev.* 671, 686 (1993) ("One of the least expensive and environmentally safest means of stretching available water supplies is to store surplus surface water during wet periods in groundwater aquifers for use in later dry spans.").

n7. Cal. Dep't of Water Res., Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water 25 (2008), available at <http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf>.

- n8. Paul Siegel, "No Regrets" Approach to Decision-Making in a Changing Climate: Toward Adaptive Social Protection and Spatially Enabled Governance, *World Resources Rep.* (2010-2011), <http://www.worldresourcesreport.org/responses/no-regrets-approach-decision-making-changing-climate-toward-adaptive-social-protection-a>.
- n9. J.S. Famiglietti, et al., Satellites Measure Recent Rates of Groundwater Depletion in California's Central Valley, 38 *Geophysical Res. Letters* 1, 4 (2011), available at <http://www.agu.org/contents/journals/ViewJournalContents.do?journalCode=GL&days=30&viewBy=date&year=2011&month=Feb&sortBy=pubDate>. Between 1962 and 2003, Central Valley groundwater extractions exceeded recharge by approximately sixty million af. See U.S. Geological Service, *Groundwater Availability of the Central Valley Aquifer, California 115* (Claudia C. Faunt, ed., 2009), available at <http://pubs.usgs.gov/pp/1766/>.
- n10. Governor's Commission to Review California Water Rights Law, Final Report 140-41 (1978). When a groundwater basin is in overdraft, groundwater users must often deepen wells and install more powerful pumps to extract water from ever greater depths. Overdraft can also result in subsidence of overlying land, loss of surface vegetation and wetlands habitat, depletion of water flow in hydrologically-connected surface water systems, and degradation of groundwater quality. Seawater intrusion into coastal aquifers can lead to contamination of freshwater supplies. Extended periods of overdraft can cause the water-bearing rock or soil in a basin to compact permanently and thereby reduce the amount of storage space available in the basin for use in the future. Ella Foley-Gannon, *Institutional Arrangements for Conjunctive Water Management in California and Analysis of Legal Reform Alternatives*, 6 *Hastings W.-Nw. J. Environ. L. & Pol'y* 273, 275, 281-83 (2000). All these problems are more significant during a drought, when river flows and infiltration are low and the amount of water extracted from groundwater aquifers is increased to compensate for more limited surface supplies. Cf. *id.* at 273, 276.
- n11. Ruth Langridge, Andrew Fisher, Andrew Racz, Bruce Daniels, Kirsten Rudestam & Blake Hihara, *Cal. Energy Comm'n, Climate Change and Water Supply Security: Reconfiguring Groundwater Management to Reduce Drought Vulnerability* 20-39 (2012).
- n12. Devin Galloway & Francis S. Riley, *San Joaquin Valley, California: Largest Human Alteration of the Earth's Surface*, in *Land Subsidence* 23 (Devin Galloway et al. eds., 2009), available at [pubs.usgs.gov/circ/circ1182/pdf/06SanJoaquinValley.pdf](http://pubs.usgs.gov/circ/circ1182/pdf/06SanJoaquinValley.pdf); Mechel Paggi, *California Agriculture's Role in the Economy and Water Use Characteristics*, 9-11 (2011), available at [www.californiawater.org/docs/AWU\\_Economics.pdf](http://www.californiawater.org/docs/AWU_Economics.pdf) (describing growth of irrigation since the gold rush and agriculture's dependence on water supply projects); Cook et al., *Long Term Aridity Changes in the Western United States*, 306 *Science* 1015, 1015-18, (2004), available at <http://www.sciencemag.org/content/306/5698/1015.full>; B. Lynn Ingram et al., *A 2,000-yr Record of San Joaquin and Sacramento River Inflow to San Francisco Bay, California*, 24 *Geology* 331, 331-34 (1996), available at <http://geology.gsapubs.org/content/24/4/331.full.pdf>.
- n13. An improvement in groundwater conditions is critical for groundwater dependent communities and can also restore ecosystem function to wetlands and streams that have been impacted by declining water levels as a result of overdraft. W. Alley et al., *The Journey from Safe Yield to Sustainability*, 42 *Groundwater* 12, 12-16, (2004).
- n14. Joseph Sax et al., *Legal Control of Water Resources* 399 (4th ed. 2006) [hereinafter *Legal Control*]. See generally T.C. Winter, J.W. Harvey, O.L. Franke & W.M. Alley, *U.S. Geological Survey, Ground Water and Surface Water a Single Resource* (1998), available at <http://pubs.usgs.gov/circ/circ1139/pdf/circ1139.pdf>.
- n15. *Cal. Water Code* § 1200, 1202 (West 2012). Riparian and appropriative doctrines primarily govern private rights to use surface water and subterranean streams. Riparian rights are correlative and land based. Appropriative rights to surface water are priority based and require diversion to demonstrate beneficial use.
- n16. Water Operations Div., U.S. Fish & Wildlife Serv., *Summary of California Water Rights* 1-1 to 1-3, 1-8 to 1-9 (2006), available at [www.fws.gov/cno/fisheries/docs/Section1SummaryofCAWaterRights.pdf](http://www.fws.gov/cno/fisheries/docs/Section1SummaryofCAWaterRights.pdf); cf. *Cal. Water Code* § 1200 (West 2012).
- n17. *Katz v. Walkinshaw*, 141 *Cal.* 116, 134 (1903). If the supply of water is insufficient for all needs, each user is entitled to a fair and just proportion of the water. *Id.* at 136; see also *City of Barstow v. Mojave Water Agency*, 23 *Cal.* 4th 1224, 1240 (2000). Overlying owners have priority over the appropriation of water for uses off the land or for export out of the basin. *Id.* at 1241.

n18. Groundwater can be described as a common-pool resource with the characteristics of subtractability (water level drops with each unit extracted) and low excludability (it is difficult to exclude water users from pumping). Insa Theesfield, *Institutional Challenges for National Groundwater Governance: Policies and Issues*, 48 *Ground Water* 131, 132 (2010). Moreover, when there are minimally enforced rules related to withdrawing groundwater, the system can be described as a de facto open access regime with the potential for significant degradation of the resource. Roy Gardner et al., *Governing a Groundwater Commons: A Strategic and Laboratory Analysis of Western Water Law*, 35 *Econ. Inquiry* 218, 219 (1997).

n19. These include, for example, water replenishment districts and water conservation districts. See *Local Management Through Authority Granted to Local Water Agencies*, Cal. Dep't of Water Res. (2012) [hereinafter Cal. Dep't of Water Res., Local Management], [http://www.water.ca.gov/groundwater/gwmanagement/local\\_agencies.cfm](http://www.water.ca.gov/groundwater/gwmanagement/local_agencies.cfm).

n20. Cal. Water Code §§ 60221, 60230, 74508 (West 2012).

n21. Currently, thirteen local agencies have specific groundwater management authority as a result of being special act districts. Cal. Dep't of Water Res., *Local Management*, supra note 19.

n22. *Court Adjudications*, Cal. Dep't of Water Res. (2012), [http://www.water.ca.gov/groundwater/gwmanagement/court\\_adjudications.cfm](http://www.water.ca.gov/groundwater/gwmanagement/court_adjudications.cfm).

n23. Cal. Water Code § 10753; *Local Groundwater Ordinances*, Cal. Dep't of Water Res. (2012), [http://www.water.ca.gov/groundwater/gwmanagement/local\\_gw\\_ordinances.cfm](http://www.water.ca.gov/groundwater/gwmanagement/local_gw_ordinances.cfm).

n24. Dep't of Water Res., *California's Groundwater Bulletin*: 118, at 36, 39 (2003) [hereinafter Dep't of Water Res., *Bulletin*], available at [http://www.water.ca.gov/pubs/groundwater/bulletin\\_118/california's\\_groundwater\\_bulletin\\_118-update\\_2003/bulletin118entire.pdf](http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater_bulletin_118-update_2003/bulletin118entire.pdf).

n25. *Baldwin v. Cnty. of Tehama*, 31 Cal. App. 4th 166, 179 (1994).

n26. *Id.* at 175; see also Dep't of Water Res., *Bulletin*, at 36.

n27. Cal. State Water Res. Control Bd., *Water Transfer Issues in California: Final Report to the California State Water Resources Control Board by the Water Transfer Workgroup* 36 (2002), available at [www.waterboards.ca.gov/waterrights/water\\_issues/programs/water\\_transfers/](http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_transfers/).

n28. *Id.* However, the precise nature and extent of the police power of cities and counties to regulate groundwater is uncertain. Dep't of Water Res., *Bulletin*, supra note 24, at 37.

n29. See Ellen Hanak, *Pub. Pol'y Inst. of Cal., Who Should Be Allowed to Sell Water in California?: Third-Party Issues and the Water Market* 36 (2003), available at [web.ppic.org/content/pubs/report/R\\_703EHR.pdf](http://web.ppic.org/content/pubs/report/R_703EHR.pdf); Arthur L. Littleworth & Eric L. Garner, *California Water II*, at 87 (2007).

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n30. Cal. Pub. Res. Code §§21000-21177 (West 2012). CEQA, passed in 1970, requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts. See *id.*

n31. See *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 4th 412, 432 (2007).

n32. CEQA Guidelines require preparation of an EIR "if the cumulative impact may be significant and the project's incremental effect, though individually limited, is cumulatively considerable." 14 Cal. Code Regs. § 15064 (West 2012). However, in *Santa Monica Baykeeper v. City of Malibu*, 193 Cal. App. 4th 1538, 1561 (2011), the court affirmed that CEQA does not require cumulative impact analysis where a project makes no contribution to groundwater impacts.

n33. See Cal. Code Regs. tit. 14 app. G (West 2012).

n34. Cal. Water Code §§10610-10656 (West 2012).

n35. *Id.* §§10617, 10631, 10635.

n36. *Id.* § 10631(b)(1)-(2).

n37. Cal. Gov't Code § 66455.3 (West 2012); Cal. Water Code § 10910. The California Government Code provides criteria to define "sufficient water supply" under normal, single-dry, and multiple-dry year hydrology. Cal. Gov't Code § 66473.7(a)(2).

n38. Cal. Water Code § 10631(b)(2).

n39. *Id.* § 10753.

n40. Assembly Bill 3030, Cal. Dep't of Water Res. (2012), [http://www.water.ca.gov/groundwater/gwmanagement/ab\\_3030.cfm](http://www.water.ca.gov/groundwater/gwmanagement/ab_3030.cfm); see Littleworth & Garner, *supra* note 29, at 86-87.

n41. Cal. Water Code § 10753.7 (a)(1). Agencies can then use the information to design a plan to meet basin management objectives that could address saltwater intrusion, recharge, and overdraft mitigation. *Id.* § 10753.8.

n42. *Id.* § 10753.9 (b)-(c).

n43. *Id.* § 10754.3.

n44. Safe, Clean, Reliable Water Supply Act, Cal. Water Code §§13459.5, 14058, 78500-78702 (1996).

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- n45. Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act, Cal. Water Code §§79000-79221 (2000).
- n46. Integrated Regional Water Management Planning Act of 2002, Cal. Water Code § 10530 (West 2012).
- n47. Cal. Water Code §§10530-10550.
- n48. Water Security, Clean Drinking Water, Coastal and Beach Protection, Cal. Water Code §§79500-79590 (2002).
- n49. The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Act, Cal. Pub. Res. Code §§75001-75130 (2006).
- n50. See Cal. Water Code § 10920 (West 2012); see also S.B. X7 6, 2009 Leg., 7th Extraordinary Sess. (Cal. 2009), available at [http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb\\_0001-0050/sbx7\\_6\\_bill\\_20091106\\_chaptered.html](http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0001-0050/sbx7_6_bill_20091106_chaptered.html).
- n51. Liquid Assets: Improving Management of the State's Groundwater Resources, Legislative Analysts Office (Mar. 24, 2010), [http://www.lao.ca.gov/reports/2010/rsrc/groundwater/groundwater\\_032410.aspx](http://www.lao.ca.gov/reports/2010/rsrc/groundwater/groundwater_032410.aspx).
- n52. California Statewide Groundwater Elevation Monitoring (CASGEM), Dep't of Water Res. (last modified Oct. 22, 2012), <http://www.water.ca.gov/groundwater/casgem/> ("If local parties (for example, counties) do not volunteer to perform the groundwater monitoring functions, and DWR assumes those functions, then those parties become ineligible for water grants or loans from the state.").
- n53. Andrew Sawyer, Subterranean Blues: Groundwater Classification in California, 6 Cal. Water L. Symp. 1, 15 (Jan. 13, 2010), available at <http://www.waterlawsymposium.com/papers/subterranean-blues-andrew-h-sawyer>.
- n54. Cal. Water Code §§1005.1-1013.
- n55. Id. § 1242.
- n56. Id. § 1702 (applying when a change order from the SWRCB is required).
- n57. Id. § 12922.
- n58. Id. § 105.
- n59. Id. § 104.

n60. For example, while Integrated Regional Water Management (IRWM) guidelines specify water supply reliability as a goal, they do not specifically include drought management or drought reserves as a program preference. Cal. Dep't of Water Res., 2010 Proposition 84 and Proposition 1E: IRWM Guidelines 12-13 (2010), available at <http://www.water.ca.gov/irwm/grants/guidelines.cfm>. Thus, with respect to climate change, requirements include "an evaluation of the IRWM region's vulnerabilities to the effects of climate change and potential adaptation responses to those vulnerabilities." *Id.* at 24.

n61. *People v. Shirokow*, 26 Cal. 3d 301, 307 (1980).

n62. *Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cnty.*, 658 P.2d 709, 724 (Cal. 1983).

n63. Cal. Const. art. X, § 2.

n64. *Peabody v. City of Vallejo*, 2 Cal. 2d 351, 367 (1935) ("The right to the use of water ... does not extend to unreasonable use or unreasonable method of use or unreasonable method of diversion of water ... . The foregoing mandates ... apply to the use of all water ... .").

n65. *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941, 953-54 (1982) (citation omitted).

n66. The Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1973). ESA's goals are to prevent the extinction of imperiled plant and animal life and to recover and maintain those populations by removing or lessening threats to their survival. See *id.*

n67. Clean Water Act, 33 U.S.C. §§ 1251-1387 (2006). The CWA prohibits "the discharge of any pollutant by any person" into "navigable waters from any point source" unless done in compliance with the provisions of the CWA. *Id.* § 1362(12). A point source is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." *Id.* § 1362(14). To discharge pollutants from a point source in compliance with the CWA, one must first obtain a National Pollutant Discharge Elimination System (NPDES) permit, which requires compliance with numerous requirements, including effluent limitations, water-quality standards, water monitoring and public reporting obligations, as well as specific discharge requirements. *Id.* §§ 1311, 1312, 1316-1318, 1343.

n68. *Id.* § 1311.

n69. California Porter-Cologne Water Quality Control Act, Cal. Water Code §§ 13000-16104 (West 2012).

n70. Pesticide Contamination Prevention Act, Food & Agric. Code §§ 13141-13152 (1985).

n71. In California, the State Water Resources Control Board and nine regional water quality control boards issue NPDES permits.

n72. *N. Plains Res. Council v. Fid. Exploration & Dev. Co.*, 325 F.3d 1155, 1160 (9th Cir. 2003).

n73. See Ground Water Protection Program, Cal. Dep't of Pesticide Regulation (2010), <http://www.cdpr.ca.gov/docs/emon/grndwtr/index.htm>.

n74. Cal. Code Regs. tit. 3, §§6487.3-6487.5 (West 2012); see Pesticide Use Regulations to Protect Groundwater, Cal. Dep't Pesticide Regulation (2010), [http://www.cdpr.ca.gov/docs/emon/grndwtr/regs/pesticide\\_use.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/regs/pesticide_use.htm).

n75. See Groundwater Protection, State Water Res. Control Bd. (2012), [http://www.waterboards.ca.gov/sanfranciscobay/groundwater\\_protection.shtml](http://www.waterboards.ca.gov/sanfranciscobay/groundwater_protection.shtml).

n76. Safe Drinking Water Act, 40 C.F.R. §§144-147 (2011).

n77. Drought Preparedness and Water Conservation, Cal. Dep't of Public Health (last updated Mar. 9, 2009), <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/DroughtPreparedness.aspx>; Legislative Analysts Office, *supra* note 51.

n78. Winter et al., *supra* note 14, at 2.

n79. Cal. Water Code § 1200 (West 2012).

n80. Classification distinguishing between subterranean streams and percolating groundwater was adopted in Water Commission Act and was retained in the 1943 Water Code. Sawyer, *supra* note 53, at 4-5.

n81. See generally Kevin O'Brien, Alice in Groundwater Land: Court Defines State Board "Subterranean Stream" Jurisdiction, *Cal. Water L. & Pol'y Rep.*, Oct. 2006, available at [http://www.downeybrand.com/publications/articles/061001\\_californiawaterlawreporter.php](http://www.downeybrand.com/publications/articles/061001_californiawaterlawreporter.php), for a detailed discussion of this question.

n82. *Blue Mountain Vineyard, Inc. v. Monterey Cnty. Flood Control & Water Conservation Dist.*, Cal. State Water Res. Control Bd., Decision 1614, at 16-17 (Jan. 1987), available at [http://www.swrcb.ca.gov/waterrights/board\\_decisions/adopted\\_orders/decisions/d1600\\_d1649/wrd1614.pdf](http://www.swrcb.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1614.pdf).

n83. *Garrapata Water Co.*, Cal. State Water Res. Control Bd., Decision 1639, at 4 (June 17, 1999), available at [http://www.waterboards.ca.gov/waterrights/board\\_decisions/adopted\\_orders/decisions/d1600\\_d1649/wrd1639.pdf](http://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1639.pdf).

n84. See, *id.* at 3-4; see also *City of L.A. v. Pomeroy*, 124 Cal. 597, 632-34 (1899).

n85. *Pauma and Pala Basins etc.*, State Water Res. Control Bd. Decision 1645, at 5-7 (Oct. 17, 2002).

n86. James H. House and Hiram H. Hurd Professor of Environmental Regulation (Emeritus) at Berkeley Law, University of California, noted water law scholar, fellow of the American Academy of Arts and Sciences and recipient of numerous awards in the field of environmental law. From 1994 to 1996, Sax served in President Clinton's administration as the counselor to the secretary of the interior and deputy assistant secretary for policy at the U.S. Department of the Interior.

n87. Joseph Sax, *Review of the Laws Establishing the State Water Board's Permitting Authority Over Appropriations of Groundwater Classified as Subterranean Streams and the State Water Board's Implementation of Those Laws 7* (2002) [hereinafter Sax Report].

n88. *Id.* at 49-50.

n89. *N. Gualala Water Co. v. State Water Res. Control Bd.*, 139 Cal. App. 4th 1577 (2006).

n90. *Id.* at 1590.

n91. *Id.* at 1605-06.

n92. *Id.*

n93. *Id.* at 1606.

n94. See O'Brien, *supra* note 81, at 7.

n95. Assistant Chief Counsel at the State Water Resources Control Board (State Water Board) in Sacramento, California.

n96. Sawyer, *supra* note 53, at 10.

n97. *Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cnty.*, 33 Cal. 3d 419, 425 (1983).

n98. Cf. Cal. Water Code § 2500.5 (West 2012).

n99. James Wheaton, President and Legal Director, Environmental Law Foundation, Oakland, Presentation at the 26th California Water Law and Policy Conference: Water Rights, Property Rights & Groundwater: the Siskiyou County Case, at 5.2.2.-5.2.3 (Jan. 13, 2011).

n100. See Roderick E. Walston, Presentation at the 26th California Water Law and Policy Conference: Does the SWRCB Have Authority to Regulate Groundwater?, at 5.1.3-5.1.9 (Jan. 13, 2011).

n101. Brian Gray, *Ensuring the Public Trust*, 45 UC Davis L. Rev. 973, 997 (2012), available at [lawreview.law.ucdavis.edu/issues/45/3/Topic/45-3\\_Gray.pdf](http://lawreview.law.ucdavis.edu/issues/45/3/Topic/45-3_Gray.pdf); see *Nat'l Audubon*, 33 Cal.3d at 452.

n102. *Nat'l Audubon*, 33 Cal. 3d at 437.

n103. Walston, *supra* note 100, at 5.1.1 n.2.

n104. Nat'l Audubon, 33 Cal. 3d at 446.

n105. *Id.* at 447.

n106. Petition for Writ of Mandamus and Complaint for Declaratory and Injunctive Relief, at 11-13, *Env'tl. Law Found. et al. v. State Water Res. Control Bd. & Siskiyou Cnty.*, No. 34-2010-80000583, filed (Super. Ct. of Sacramento Cnty. June 23, 2010); Press Release, *Env'tl. Law Found., Fishing and Conservation Groups Sue Over Poor Water Management on Northern California's Scott River* (June 24, 2010), available at <http://www.envirolaw.org/documents/ScottRiverPTDSuit-PR.pdf>.

n107. *Joslin v. Marin Mun. Water Dist.*, 67 Cal. 2d 132, 140 (1967).

n108. *Env'tl. Def. Fund v. E. Bay Mun. Util. Dist.*, 26 Cal. 3d 183, 194 (1980).

n109. *City of Barstow v. Mojave Water Agency*, 23 Cal. 4th 1224, 1242 (2000).

n110. Joseph L. Sax, *We Don't Do Groundwater: A Morsel of California Legal History*, 6 *U. Denv. Water L. Rev.* 269, 308-09 (2003).

n111. *Id.* at 309.

n112. Cal. Water Code § 275 (2003).

n113. Sax Report, *supra* note 87, at 85.

n114. Sawyer, *supra* note 53, at 14.

n115. Cal. Code Regs. tit. 23, § 862 (2011).

n116. *Arizona v. California*, 373 U.S. 546, 598 (1963) ("No doubt about the power of the United States under these clauses to reserve water rights for its reservations and property.").

n117. *Cappaert v. United States*, 426 U.S. 128, 128 (1976).

36 *Environ. L. & Pol'y J.* 91, \*

n118. *Id.* at 129. See generally John Leshy, *Interstate Groundwater Resources: The Federal Role*, 14 *Hastings W.-Nw. J. Environ. L. & Pol'y* 1475 (2008) for a detailed discussion of the federal role in groundwater management.

n119. The Harry D. Sunderland Distinguished Professor of Real Property Law at University of California's Hastings School of Law. He was on President Barack Obama's Interior Department transition team, the leader of the Clinton-Gore transition team and served as President Clinton's Solicitor of Interior.

n120. Leshy, *supra* note 118, at 1488.

n121. *Id.* at 1490-91.

n122. *Id.* at 1488-89.

n123. Legislative Analysts Office, *supra* note 51.

n124. *Id.*

n125. *N. Plains Res. Council v. Fid Exp. & Dev. Co.*, 325 F.3d 1155, 1162-63 (9th Cir. 2003).

n126. *Nw. Environ. Def. Ctr. v. Brown*, 640 F.3d 1063, 1085 (9th Cir. 2011), cert. granted, 80 U.S.L.W. 3143 (U.S. June 25, 2012) (No. 11-347).

n127. *Natural Res. Def. Council v. Cnty. of L.A.*, 636 F.3d 1235, 1252-53 (9th Cir. 2011), withdrawn on denial of reh'g en banc, 673 F.3d 880 (9th Cir.), cert. granted in part sub nom. *L.A. Cnty. Flood Dist. v. Natural Res. Def. Council*, 80 U.S.L.W. 3700 (U.S. June 25, 2012) (No. 11-460).

n128. Cf. James W. Hayman, *Regulating Point-Source Discharges to Groundwater Hydrologically Connected to Navigable Waters: An Unresolved Question of Environmental Protection Agency Authority Under the Clean Water Act*, 5 *Barry L. Rev.* 95, 96 (2005) (noting some federal courts recognize the NPDES permit system may regulate pollutants entering groundwater when it is hydrologically connected to surface water).

n129. Leshy, *supra* note 118, at 1489.

n130. Winter et al., *supra* note 14, at VII.

n131. J.D. Echeverria, *No Success Like Failure: The Platte River Collaborative Watershed Planning Process*, 25 *Wm. & Mary Environ. L. & Pol'y Rev.* 559, 560 (2001); see Editorial, *A Solution on the Platte River Fight*, *Denver Post*, Aug. 9, 2004, at B-07 (underscoring the importance of the federal government driving the solution to a water conflict, and noting that the endangered species concerns are forcing Nebraska to stop "ignoring the physical reality that excessive pumping of shallow aquifers near a river reduces the river's water levels ... [which is a] big problem on the Platte").

n132. Langridge, *supra* note 4, at 299.

n133. *Id.* at 330-31.

n134. Cal. Code Regs. tit. 23, § 862 (2011).

n135. U.S. Const. amend. V.

n136. *Allegretti & Co. v. Cnty. of Imperial*, 138 Cal. App. 4th 1261, 1278 (2006).

n137. *Id.* at 1278.

n138. Cal. Const. art. X, § 2.

n139. *City of Barstow v. Mojave Water Agency*, 23 Cal. 4th 1224, 1242 (2000); *Env'tl. Def. Fund v. E. Bay Mun. Util. Dist.*, 26 Cal. 3d 183, 190 (1980); *Joslin v. Marin Mun. Water Dist.*, 67 Cal. 2d 132, 138 (1967); *Peabody v. City of Vallejo*, 2 Cal. 2d 351, 366 (1935).

n140. Pumping-induced changes in the flow direction to and from streams for example, may affect temperature, oxygen levels, and nutrient concentrations in the stream, which may in turn affect aquatic life in the stream. Additionally, long-term reductions in stream flow from groundwater withdrawals can affect vegetation along riparian zones that serve critical roles in maintaining wildlife habitat. See Winter et al., *supra* note 14, at 2-5.