Stanford | Water in the West

Research Brief

FALL 2017

California's New Landscape for Groundwater Governance

Groundwater accounts for nearly 40% of California's water supply in average years, and up to 60% in drought years. Yet, until recently, oversight of this critical resource has been uneven and fragmented, with minimal state-level requirements. Groundwater levels in many areas of the state have experienced decades of decline, leading to land subsidence and other impacts, and leaving people and farms more vulnerable during droughts.

The passage of the Sustainable Groundwater Management Act (SGMA) has changed the landscape of groundwater governance dramatically. Enacted in 2014, SGMA requires the creation of Groundwater Sustainability Agencies (GSAs) in over 125 groundwater basins and subbasins[1] that the state has designated as high and medium priority. GSAs are responsible for defining sustainability goals for each basin, and developing and implementing Groundwater Sustainability Plans (GSPs) to achieve these goals by 2040 or 2042, depending on the state of the basin.

Over the past two years, local agencies across the state worked to form GSAs prior to SGMA's deadline of June 30, 2017. This research brief provides an overview of the results of the GSA formation process, and what this portends for the next phase of SGMA implementation: the development of GSPs. This brief updates the preliminary analysis of GSA formation presented in the report *To Consolidate or Coordinate: Status of the Formation of Groundwater Sustainability Agencies in California*, published in December 2016.

A key focus of our analysis has been to determine whether groundwater basins will be governed by a single or multiple entities. This is important because while SGMA allows multiple GSAs to form within a basin, GSP development and implementation must be coordinated at the basin scale. Multiple GSAs must either collaborate on a single GSP for the whole basin, or produce separate GSPs that rely upon the same "data and methodologies," including a common water budget and basinwide sustainable yield (California Water Code §10727.6).

Photo: Bruce Conrad

Groundwater well in Yolo County

1 Under SGMA, subbasins are treated as groundwater basins. For simplicity, we use the term "basin" for both.

About the Researchers

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Coverage of High and Medium Priority Basins

SGMA focuses primarily upon high and medium priority basins, as designated by the California Department of Water Resources (DWR). In order to avoid state intervention, SGMA requires one of three governance arrangements to be in place in these basins: 1) one or more GSAs; 2) an alternative plan; or 3) an adjudication (a court judgment). As of July 1, only very small areas of 12 basins where groundwater extractions are occurring were not covered by one of these arrangements. The small number of pumpers of more than 2 acre-feet per year in these areas are now required to report extractions to the state. Figure 1 provides additional details.

Our analysis shows that out of 134 basins[2], slightly less than half (64) are covered by a single management entity of one of these three types. The other half (70 basins) are managed by multiple entities. These include 49 basins with multiple GSAs, eight basins covered by alternative plans submitted by multiple entities or where multiple GSAs have also formed, and 13 basins covered by a combination of an adjudication, one or more GSAs, and/or unmanaged areas. As Figure 1 shows, basins managed by single entity tend to be smaller than those managed by multiple entities. In

2 In 2014, there were 127 high and medium priority basins. However, basin boundaries were modified in 2016, and DWR is in the process of re-prioritizing them. Our analysis utilized 2016 boundaries, and considered a basin as high or medium priority if a portion of it was designated as such in 2014. This resulted in 134 basins classified as high or medium priority, shown in Figure 1. This number is likely to change after DWR completes its re-prioritization by the end of 2017.

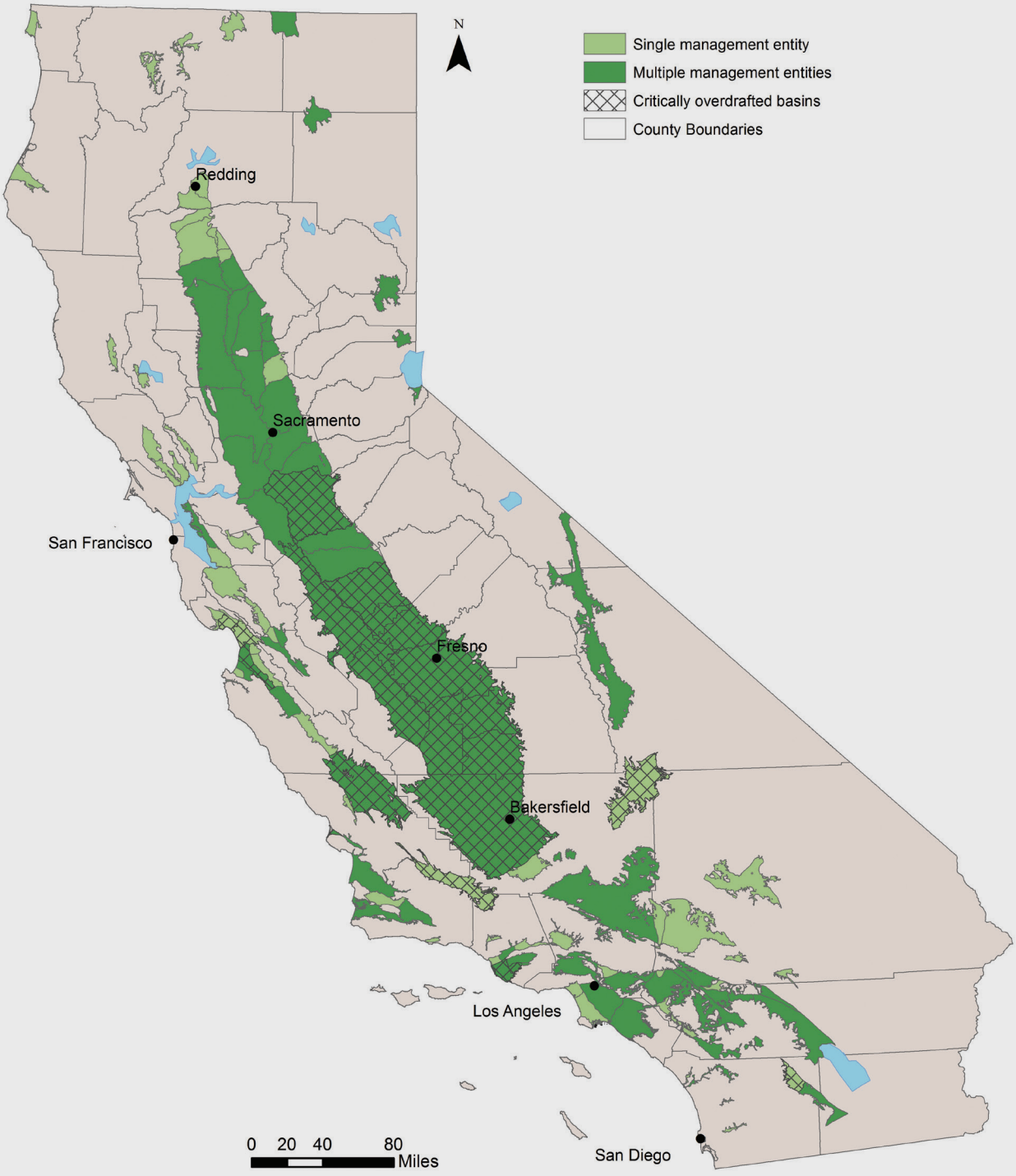
THREE FORMS OF GOVERNANCE UNDER SGMA

Under SGMA, high and medium priority basins may be managed through one of three governance arrangements in order to avoid state intervention.

1. **One or more GSAs.** Most high and medium priority basins are now governed by GSAs. Under SGMA, GSAs can be formed by one or more local public agencies with water supply, water management or land use responsibilities within a given basin. A water corporation or mutual water company can participate if local agencies consent. GSAs hold a range of authorities, including assessing fees, regulating well spacing and pumping, and more (CWC §10725 and §10730 et seq).
2. **An Alternative Plan.** SGMA allowed for the submission of alternative plans in basins that have existing groundwater management plans or laws, are being managed pursuant to an adjudication, or have operated within their sustainable yield for at least 10 years (CWC §10733.6). Alternative plans have been proposed in 22 basins and are being evaluated by DWR. These plans must cover an entire basin and satisfy SGMA's objectives (California Code of Regulations, Title 23, §358.4). GSAs need not be formed in basins with approved alternative plans; one or more existing agencies would manage the basin as described in the plan.
3. **Adjudication.** Areas that are subject to 26 groundwater adjudications concluded prior to SGMA, or three other adjudications underway at the time of its passage, need not form GSAs or develop GSPs. However, adjudicated areas do not necessarily match basin boundaries and "fringe areas" not covered by an adjudication must be covered by a GSA or an alternative plan.

According to the State Water Resources Control Board (SWRCB), as of July 1, 2017, more than 99% of high and medium priority basins were covered by one of these three forms of management. In small, so-called "unmanaged" areas, primarily in "fringe areas" of basins mostly governed through adjudications, SWRCB has notified pumpers extracting more than 2 acre-feet per year that they are required to report extractions and pay associated fees.

FIGURE 1
Coverage of high and medium priority basins by single or multiple management entities. These entities may take the form of 1) one or more GSAs; 2) an alternative plan; 3) an adjudication; 4) an "unmanaged" area; or 5) a combination thereof. Only high and medium priority basins are shown here.



fact, single-entity basins account for only 19% of the total area of high and medium priority basins.

The coverage of nearly half of all high and medium priority basins by a single entity represents a significant consolidation of previously fragmented management. Moreover, in 29 of these basins, multiple agencies took the significant step of coming together under a Joint Powers Agreement (JPA) or a Memorandum of Agreement (MOA) to form a single, basinwide GSA. Instead of acting separately with varying levels of responsibility and authority as they would have prior to SGMA, these agencies will now be working together to develop and implement a GSP for the entire basin. The GSA formation process also led to partial consolidation within some basins with multiple GSAs. For example, the over 1000-square mile Colusa subbasin is covered by just two GSAs: one in Glenn County and the other in Colusa County, composed of nine and 12 members, respectively.

Nonetheless, this leaves over 80% of the area covered by high and medium priority basins under the management of multiple entities. Of particular importance, this includes most of the 21 basins that have been designated as critically overdrafted, for which GSPs must be developed by 2020 rather than 2022. These basins, primarily located in the Central Valley, tend to be large and face the most significant challenges to achieve sustainability. Only five critically overdrafted basins are governed by a single management entity. The remaining 16 are covered by multiple GSAs, including eight that have between five and 22 GSAs.

Photo: Florence Low/ CA DWR

Meeting of the Yolo SGMA Implementation Working Group in April 2017.

While SGMA allows for multiple GSAs in a basin, they must all work together at the basin scale during the GSP development process. Forming a single GSA may be the most efficient approach to basinwide management. However, as discussed in the report *To Consolidate or Coordinate*, some local agencies chose not to do this for a number of reasons, including basin size, heterogeneity of basin conditions, and concerns about autonomy and representation, among others. The results of the GSA formation process suggest that consolidating under a single GSA has proved more difficult in larger basins, but further research is needed to understand the factors at play. As SGMA implementation proceeds, we will learn more about whether managing basins under a single GSA is indeed more efficient or effective in meeting sustainability goals as compared to coordination among multiple GSAs.

Number and types of GSAs

According to our analysis,[3] 253 agencies have filed GSA notices in 113 high and medium priority basins and in 27 low and very low priority basins.[4] A wide range of agencies are involved through a variety of governance structures. Seventy percent have filed notices establishing GSAs that represent a single agency. As shown in Table 1, these include water, irrigation and reclamation districts with a primary responsibility for water supply, cities, counties, special act districts established prior to SGMA as well as several created during the GSA formation process[5], and other types of districts and water agencies.

3 Our analysis counted the number of distinct agencies (or groups of agencies) that filed GSA notices. Some of these, such as counties that cover multiple basins, filed multiple GSA notices that could be considered as separate GSAs. As a result, the number of GSAs may exceed the number of agencies filing GSA notices.

4 GSA formation is allowed but is not required in low and very low priority basins.

5 SGMA identifies 15 special act districts that had been previously established by the state legislature with special authority to manage groundwater, and grants them an exclusive right to form a GSA (CWC §10723(c)(1)). In 2016, two new special act districts were created to serve as GSAs in the Kings basin in the San Joaquin Valley, and legislation was passed in September 2017 to create another in the Delta-Mendota basin.

The remaining 30% (76 agencies) have established GSAs that are governed through collaboration among multiple entities, formalized through a JPA or MOA. Four of these had existed prior to SGMA, but the remaining 72 were created during the GSA formation process. The largest of these partnerships is the Yolo Subbasin Groundwater Agency, a JPA with 19 members (including one tribe) and five affiliated parties (the county Farm Bureau, an environmental organization, two mutual water companies and a university).

TABLE 1
Number and types of agencies filing GSA notices.

	Agency Type	Number
Single agencies	Water district (primary water supply focus, domestic or agricultural)	44
	City	36
	Reclamation district	26
	County	24
	Irrigation district	19
	Special act district (pre-SGMA; listed in CWC §10723(c)(1))	9
	Special act district (established during GSA formation process)	2
	Multi-purpose utility/water agency	8
	Community services district	5
	Flood control district	3
	Resource conservation district	1
	TOTAL	**177**
Multiple agencies	JPA (established during GSA formation process)	37
	JPA (pre-SGMA)	4
	MOA (established during GSA formation process)	35
	TOTAL	**76**
	TOTAL AGENCIES FILING GSA NOTICES (AS OF JUNE 30, 2017)	**253**

Photo: Wikicommons: Coolcaesar

California's Central Valley.

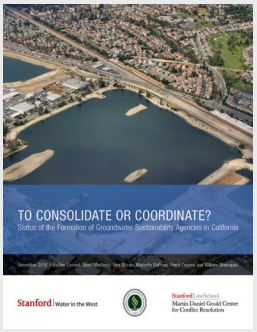
Research Brief

The Path Forward

The GSA formation process has been successful in terms of ensuring basin coverage by GSAs, adjudicated areas, or alternative plans. The creation of new basinwide governance structures in approximately half of all high and medium priority basins may make it easier to develop cohesive plans for groundwater management in these basins.

Yet, many of the state's largest basins, including most of those in critical overdraft, are being managed by multiple GSAs. Building capacity for effective basin-scale governance will be critical in the next stages of SGMA implementation. GSP regulations require that all GSAs agree upon the basic hydrologic features of their basin, a common sustainability goal and measurable objectives, and a suite of management actions to achieve them. Coordination processes will need to be robust enough to delve deeply into technical issues, while also enabling active engagement and buy-in from a wide array of stakeholders.

Experience with regional-scale collaboration shows that this can be achieved, but requires a significant investment of time and resources, and ideally, such processes are convened by an entity trusted by all parties. In some large, multi-GSA basins, basinwide governance structures have already been developed. For example, the 17 GSAs in the Eastern San Joaquin basin have established a basinwide JPA, tasked with developing a single GSP. Supported by facilitation services and other technical assistance being made available through DWR, GSAs should begin building effective mechanisms for knowledge-sharing and decision-making at the basin scale as soon as possible.



This research brief provides an update to the preliminary GSA formation results presented in the report *To Consolidate or Coordinate? Status Formation of Groundwater Sustainability Agencies in California* (December 2016). The report examined reasons why local agencies were pursuing consolidated (single GSA) or coordinated (multiple GSA) approaches to managing groundwater basins. It also contains an overview of the GSA formation process, and details about how the GSA formation process unfolded in eight case study basins across the state.

About Water in the West

Water in the West, a joint program of the Stanford Woods Institute for the Environment and the Bill Lane Center for the American West, marshals the resources of one of the world's preeminent research universities to answer one of the most urgent questions about the American West's future—how can the region continue to thrive despite growing water scarcity? Through Water in the West, Stanford University's world-class faculty, researchers and students are working to address the West's growing water crisis and to create new solutions that move the region toward a more sustainable water future. Learn more: waterinthewest.stanford.edu

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