FRESNO STATE

California Water Institute

# Sustainable Groundwater Management Act Governance Strategies Summary Report

September 2021

Prepared by

California Water Institute Staff

# Bulletin 118 Groundwater Basins Subject to Critical Conditions of Overdraft – Update based on 2018 Final Basin Boundary Modifications

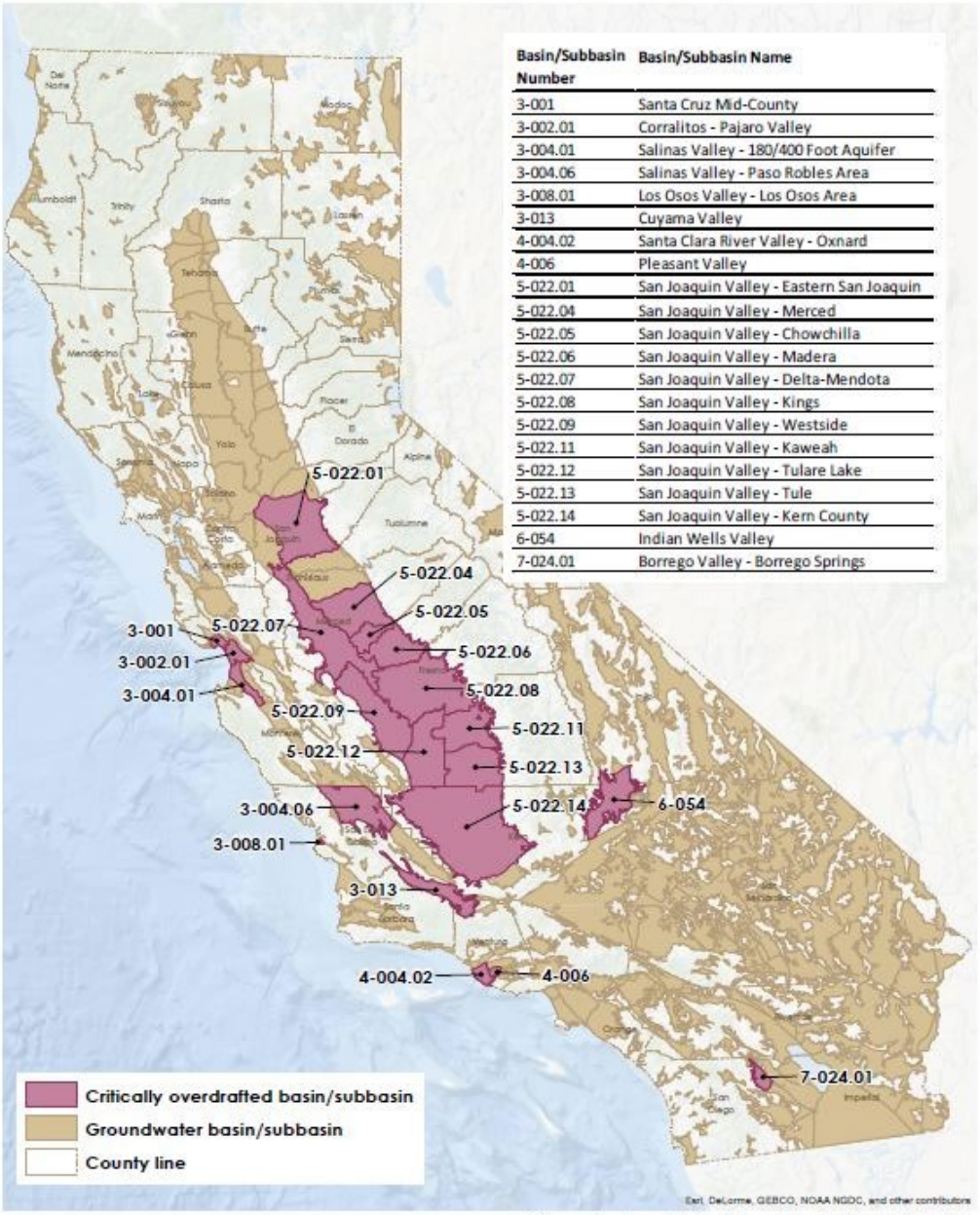


*Figure 1. Critically Overdrafted Groundwater Subbasins*

`

# EXECUTIVE SUMMARY

A three-bill legislative package[1], referred to as the Sustainable Groundwater Management Act (SGMA), created a fundamental change in the governance of California's groundwater. SGMA requires, with some exceptions, the formation of groundwater sustainability agencies (GSAs) for identified groundwater subbasins. Signed into law in 2014 by Governor Jerry Brown, it set forth a long-term, statewide framework to protect groundwater resources.

This report outlines the initial implementation of these new laws by the GSAs in 21 critically overdrafted groundwater subbasins[2]. Based on a review of multiple statutes, regulations, early research, official government documents and interviews with individuals involved in the process, the authors explain how these first GSAs were created and the organizational and governance challenges they navigated.

Once formed, the GSAs were charged with the development and implementation of groundwater sustainability plans (GSPs). The purpose of a GSP is to avoid the undesirable results of groundwater depletion and mitigate overdraft within 20 years. A review of the formation process for this set of GSAs was particularly instructive as they were required to meet a set of SGMA requirements two years earlier than the remaining legislatively identified basins.

Presented in an approach that moves from the general to the specific, this report documents the historic process of how 125 GSAs began to implement SGMA. In addition, this report provides important baseline information to help researchers, regulators, policy makers and GSAs themselves, in the development and evaluation of governance and future governance strategies, statutes and regulatory actions.

The report is organized into two major topics.

1. Governance structure choices available to GSAs and the GSA formation process set forth in SGMA, including:
    - Specific examples of GSA governance choices.
    - How governance choices were influenced by the preparation and financing of GSPs.
2. Summary findings and observations from interviews of policymakers, technical experts, and thought leaders on their perception of the GSA governance decision-making process and the improvements they believe would benefit SGMA outcomes.

The interviewees' insights reflect the experience they gained during the formation of the critically overdrafted basins GSAs. They identified key elements they felt would be helpful when forming future GSAs, most notably:

---

[1] SGMA is a series of three acts of the California Legislature signed into law by the Governor in 2014. The three laws included Senate Bill (SB) 1168 (Pavley F., 2014), Assembly Bill (AB) 1739 (Dickinson, 2014), and SB 1319 (Pavley F., SB 1319, Pavley, Groundwater, 2014).

[2] As defined by SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."

- Providing simplified groundwater science education information for managers, leaders, and groundwaters users.
- Implementing agency leadership training so the organizational structures and efforts of GSAs can be fully responsive to constituents.
- Heightening attention relative to some of the beneficial uses of groundwater that were not adequately addressed by GSPs, such as small domestic wells and environmental needs.

These experts also observed that implementation of SGMA is an iterative process and that time will be needed to develop, implement, measure, and improve the results of groundwater management strategies.

A variety of additional sources of information are offered throughout this report. In addition, Appendix A includes searchable links and information on GSAs, GSPs and other governance elements found in DWR's (Department of Water Resources) SGMA Portal.

# TABLE OF CONTENTS

# LIST OF TABLES



# LIST OF FIGURES

# LIST OF ABBREVIATIONS AND ACRONYMS

| Abbreviation or Acronym | Definition |
|---|---|
| CA | California |
| CASGEM | California Statewide Groundwater Elevation Monitoring |
| CCC | California Corporations Code |
| CCR | California Code of Regulations |
| CDFW | California Department of Fish and Wildlife |
| CGC | California Government Code |
| CPUC | California Public Utilities Commission |
| CSD | Community Service District |
| CWC | California Water Code |
| CWI | California Water Institute |
| SWRCB | California State Water Resources Control Board |
| DWR | California Department of Water Resources |
| FCGMA | Fox Canyon Groundwater Management Agency |
| IS | Geographic Information System |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| ID | Irrigation District |
| IRWM | Integrated Regional Water Management |
| JPA | Joint Powers Agency or Authority |
| LLC | Limited Liability Company |
| MOA | Memorandum of Agreement |
| MOU | Memorandum of Understanding |
| NGO | Non-Governmental Organization |
| RCD | Resource Conservation Districts |
| RWQCB | Regional Water Quality Control Board |
| SB | Senate Bill |
| SGMA | Sustainable Groundwater Management Act |
| SNMP | Salt and Nutrient Management Plan |
| SWRCB | State Water Resources Control Board |
| USACE | United States Army Corps of Engineers |
| USBR | United States Bureau of Reclamation |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WMA | Water Management Agency |
| WD | Water District |

# ACKNOWLEDGMENTS

The authors and staff of the California Water Institute at California State University, Fresno, thank our sponsors and partners who assisted in designing and preparing this report. The report was made possible by support from the California Department of Water Resources Facilitation Services Support program.

**Partners**

The partners that participated in the funding and preparation of this report include:

- California Department of Water Resources
    - Headquarters: Simar Dhanota and Keith Wallace
    - Regional Coordinators: Amanda Peisch-Derby and Mike McGinnis

- Stantec
    - Craig Moyle, Lisa Beutler and Christy Clark: Program managers and partners in document preparation

**Authors**

The information contained in this report draws from research conducted by the California Water Institute staff, including former Interim Director Cordie Qualle, Programs Manager Laura Ramos, and Project Director, Sarge Green.

**Interviewed Experts**

This report involved interviewing several experts, leaders, and researchers who offered their assessment of the GSA formation process and governance structures that were created within the critically overdrafted basins. They are listed below, and we sincerely thank them for their time.

- Stephanie Anagnoson, Director of Water and Natural Resources, Madera County
- Christina Babbitt, Senior Manager, California Groundwater Program, Environmental Defense Fund
- Bill Blomquist, Political Science Professor, Indiana University, Purdue University, Indianapolis
- Paul Boyer, Program Director, Community Development Self-Help Enterprises
- Jennifer Clary, State Director, California Clean Water Action
- Will Halligan, Principal Hydrogeologist, Luhdorff and Scalmanini
- Thomas Harter, Professor and Specialist in Cooperative Extension on Groundwater, University of California, Davis
- Lacey (McBride) Kirakou, Water Resources Coordinator, Merced County
- Brian Lockwood, General Manager, Pajaro Valley Water Management Agency
- Sandi Matsumoto, California Water Program Director, The Nature Conservancy
- Amanda Monaco, Policy Coordinator, Water Programs, Leadership Counsel for Justice and Accountability

- Tara Moran, Chief Executive Officer, California Water Data Consortium
- Brian Pacheco, District 1 Supervisor, Fresno County Board of Supervisors
- Patty Poire, Executive Director, Kern Groundwater Authority
- Tim Quinn, Landreth Visiting Fellow, Stanford Water in the West
- Phyllis Stanin, Vice President and Principal Geologist, Todd Groundwater
- Ali Taghavi, Senior Principal & Senior Technical Practice Leader, Woodard and Curran
- Peter Vorster, Hydrologist and Hydrogeographer, The Bay Institute
- Chuck Winn, District 4 Supervisor, San Joaquin County Board of Supervisors

# CHAPTER 1: INTRODUCTION AND PURPOSE

A three-bill legislative package, referred to as the Sustainable Groundwater Management Act (SGMA), created a fundamental change in the governance of California's groundwater. SGMA requires, with some exceptions, the formation of groundwater sustainability agencies (GSAs) for identified groundwater subbasins. Signed into law in 2014 by Governor Jerry Brown, SGMA set forth a long-term, statewide framework to help protect groundwater resources. In signing the bill, Governor Brown emphasized that "groundwater management in California is best accomplished locally."

This **Sustainable Groundwater Management Act Governance Strategies Summary Report** documents the earliest phases of SGMA implementation by describing the formation of 125 Groundwater Sustainability Agencies (GSAs) with a specific focus on the 21 GSAs in critically overdrafted groundwater subbasins. Our analysis of the GSAs considered member composition, creation processes, and the various governance options selected and implemented. This compiled information establishes a formal record and creates a source of baseline information for future research. Our hope is that this work will support researchers, regulators, policy makers and GSAs themselves in the evaluation of their governance approaches and the development of future governance strategies, statutes and regulatory actions.

Passage of SGMA was considered transformational as many believed statewide groundwater management in California was politically unattainable. However, a convergence of events, including the historic drought of 2012–2016, created a tipping point. As chronicled by multiple researchers, severe over pumping resulted in widespread groundwater depletion. Entire communities lost access to water as their wells went dry, and subsidence caused significant infrastructure damage. These factors, and others, resulted in California's joining other western states in regulating its groundwater. These groundwater laws ushered in a new era of California water management and created an impact much like the regulatory structure developed for surface water one hundred years earlier under the Water Commission Act of 1914.

SGMA sets forth a long-term, statewide framework to protect groundwater resources and requires, with some exceptions, the formation of locally controlled GSAs for groundwater subbasins designated as high and medium priority. Basin Prioritization is a technical process conducted by the California Department of Water Resources (DWR) that utilizes the best available data to classify California's 515 groundwater basins. Classification is based on a variety of factors identified in SGMA, such as population, the amount and impact of groundwater pumping, the number of water wells, and other related factors. Under SGMA, these new GSAs were charged with the development and implementation of Groundwater Sustainability Plans (GSPs).

The SGMA 2019 Basin Prioritization process identified 94 high and medium priority basins and required them to create GSAs and GSPs. The GSPs are required to outline the steps to achieving groundwater sustainability within twenty years. Sustainability is defined as avoiding "significant and unreasonable" instances of six undesirable results: long-term declines in groundwater levels, reduction of groundwater storage, land subsidence, seawater intrusion, water quality degradation, and depletions of interconnected surface water. Responsibility was given to local stakeholders to develop institutions and

plans to achieve the objectives. SGMA reinforces the view that groundwater management is place based and that GSPs should reflect community needs.

This report, based on a review of multiple statutes, regulations, early research, official government documents and interviews with individuals involved in the process, focuses on SGMA implementation in the critically overdrafted subbasins. Reviewing the formation process for this set of GSAs is particularly instructive as they were required to meet a set of SGMA requirements in an accelerated timeframe. SGMA required that high priority groundwater basins in critical overdraft conditions be managed under a GSP after January 31, 2020. The remaining medium and high priority groundwater basins are to develop their GSP by January 31, 2022. All other groundwater basins, including adjudicated basins, were encouraged to form GSAs and develop GSPs but were not required to do so.

Presented in an approach that moves from the general to the specific, this report documents the historic process of how these GSAs undertook efforts to meet SGMA requirements and deadlines. The opening chapters consider information regarding the governance structure choices available to GSAs and the formation process set forth in SGMA. The discussion includes specific examples of GSA governance choices and how those choices were influenced by the preparation and financing of Groundwater Sustainability Plans (GSPs).

Later chapters summarize findings and observations from interviews of policymakers, technical experts, and thought leaders on their perception of the GSA governance decision process and the key changes they believe would improve SGMA outcomes.

A variety of additional sources of information are offered throughout the report. In addition, Appendix A includes searchable links and information on GSAs, GSPs, and other governance elements found in DWR's SGMA Portal.

The report draws heavily on statutory directives and regulatory direction and references to California Water Code and other regulation and statutes that serve as the foundation of this report. Citations are offered throughout the text

# CHAPTER 2: METHODOLOGY

Preparation of this report began with a review of statutes and regulations, published resources and research papers. This research was augmented by the personal experiences of the California Water Institute (CWI) authors and interviews with individuals directly involved in the formation of GSAs.

## Review of Statute and Regulations

CWI began the review of statutes and regulations by considering the enacting legislation and legislative history. SGMA is a series of three acts of the California Legislature signed into law by the Governor in 2014. The three laws included Senate Bill (SB) 1168 (Pavley F., 2014), Assembly Bill (AB) 1739 (Dickinson, 2014), and SB 1319 (Pavley F., SB 1319, Pavley, Groundwater, 2014). The team then considered the incorporation of the legislation into statute. Most of the act was incorporated into the California Government Code (CGC)[3] and into the California Water Code (CWC) [4]. SGMA is contained in Division 6 of CWC. In 2015 an amendment, SB 13 (Pavley F., 2015) provided updates to address issues being experienced in implementing the law.

CWI also reviewed the regulatory process and final regulations. The regulations supply the details agencies need to implement laws. Under the requirements of the Administrative Procedure Act, state agencies that propose a regulation must justify its necessity. To do this, they explain the rationale for the regulation in a document called the "Initial Statement of Reasons." California Codes of Regulations (CCR) are organized by Title then Division. The SGMA regulations are in Title 23, Division 2. SGMA related CCRs established the rules for modification of groundwater basin boundaries and the rules and criteria to be used in evaluating GSPs.

## Literature Review

Many researchers sought to learn more about the motivation and rationale of the governance decisions made by GSAs and how those decisions influenced the implementation of SGMA. CWI selected ten papers out of an initial list of 34 publications for a more in-depth review. Selection of the ten papers was based on reviewing each one, then determining the applicability of research topics to questions being examined in this report. The selected papers were then sorted by content and included works which:

- Discuss the need for governance under SGMA.
- Illustrate examples of governance structure.
- Illustrate examples of GSA governance implementation and serve as case studies.
- Present perspectives of governance structure.
- Provide critiques of GSA governance.

Knowledge from this review informed the development of research questions and was also incorporated into analysis of the governance choices made by GSAs. Appendix B lists the papers and includes hyperlinks and URLs to original sources.

[3] Sections 65350.5, 65352, and 65352.5

[4] Divisions 1, 2 and 6

## Interview Process

The literature review and more background research identified potential interview candidates. Nineteen interviewees representing six categories of stakeholders (technical consultants, disadvantaged community advocates, elected officials, Environmental advocates, GSA managers, and researchers) took part in the interviews. Each interviewee had been involved in the formation of one or more GSAs within critically overdrafted basins and the development of GSPs by those GSAs.

Two-part, Zoom-enabled interviews were conducted from February 10 to March 23, 2021. The first part of the interview consisted of prepared questions posed by the interviewer, Sarge Green. Each group received a set of prepared questions before their group interview. The second part of the interview featured an open discussion of interviewees' impressions of the formation process and governance choices. See Appendix C for a copy of the questions and chapter 6 for recaps interview responses. Table 1 includes the full list of interviewees.

*Table 1. Interviewees*

| Name | Title | Affiliation |
|---|---|---|
| Stephanie Anagnoson | Director of Water and Natural Resources | Madera County |
| Christina Babbitt | Senior Manager, California Groundwater Program | Environmental Defense Fund |
| Bill Blomquist | Political Science Professor | Indiana University Purdue University, Indianapolis |
| Paul Boyer | Program Director, Community Development | Self Help Enterprises |
| Jennifer Clary | State Director, California | Clean Water Action |
| Will Halligan | Principal Hydrogeologist | Luhdorff and Scalmanini |
| Thomas Harter | Professor and Specialist, Cooperative Extension on Groundwater | University of California, Davis |
| Lacey Kirakou (McBride) | Water Resources Coordinator | Merced County |
| Brian Lockwood | General Manager | Pajaro Valley Water Management Agency |
| Sandi Matsumoto | California Water Program Director | The Nature Conservancy |
| Amanda Monaco | Policy Coordinator, Water Programs | Leadership Counsel for Justice and Accountability |
| Tara Moran | Chief Executive Officer | California Water Data Consortium |
| Brian Pacheco | Board of Supervisors, District 1 | Board of Supervisors, Fresno County |

| Name | Title | Affiliation |
|---|---|---|
| Patty Poire | Executive Director | Kern Groundwater Authority |
| Tim Quinn | Landreth Visiting Fellow | Stanford Water in the West |
| Phyllis Stanin | Vice President and Principal Geologist | Todd Groundwater |
| Ali Taghavi | Senior Principal & Senior Technical Practice Leader | Woodard and Curran |
| Peter Vorster | Hydrologist and Hydrogeographer | The Bay Institute |
| Chuck Winn | Supervisor, District 4 | Board of Supervisors, San Joaquin County |

# CHAPTER 3: THE SGMA FRAMEWORK

SGMA is, at its core, a regulatory framework created by the State of California to manage groundwater. It is a bottom-up/top-down approach that relies on local control to manage groundwater (bottom-up) based on the framework and guidance from the State (top-down). Should local control fail to meet the law's requirements, the State assumes control. California Water Code (CWC) affirms this structure in stating, "Sustainable groundwater management is best achieved locally through the development, implementation, and updating of plans and programs based on best available science." However, the law equally provides for strong oversight by the State Water Resources Control Board (SWRCB) should local control fail to achieve sustainable management.

The law encapsulates the local control concept by authorizing the formation of GSAs. Under SGMA, (with some exceptions) "any local agency or combination of agencies overlying a groundwater basin may decide to become a groundwater sustainability agency for that basin." A "local agency" means a local public agency that has water supply, water management, or land use responsibilities within a groundwater basin. SGMA applies to every groundwater basin in the State, although additional requirements are imposed on GSAs located in medium or high priority groundwater subbasins.

The following sections introduce and explain the bottom-up part of the SGMA process. It describes GSAs, their powers, their regulatory responsibilities, and their governance options.

## Entities Eligible to be a GSA

CWC provides the guidelines and definitions for agencies eligible to become a GSA[5]. In general, any SGMA-defined local agency or combination of local agencies overlying a groundwater basin may decide to become a GSA for that basin. One exception was in circumstances where an agency had already been created and designated by statute to manage groundwater. Nineteen agencies[6] were deemed by SGMA as the exclusive local agencies to be designated as GSAs within their respective statutory boundaries. These 19 agencies had the option of declining to be the exclusive GSA by sending a notice to DWR. If that occurred, another local agency or combination of local agencies operating within the statutory boundaries of the agency would be allowed to become the GSA for the area. None of these 19 agencies declined to be an exclusive GSA.

[5] See CWC, Division 6, Chapter 4, Establishing Groundwater Sustainability Agencies [10723 - 10724].

[6] Alameda County Flood Control and Water Conservation District, Desert Water Agency, Kings River East Groundwater Sustainability Agency, Mono County Tri-Valley Groundwater Management District, Ojai Groundwater Management Agency, Willow Creek Groundwater Management Agency, San Joaquin River Exchange Contractors Groundwater Sustainability Agency, Zone 7, Fox Canyon Groundwater Management Agency, Long Valley Groundwater Management District, Monterey Peninsula Water Management District, Orange County Water District, Santa Clara Valley Water District, Alameda County Water District, Honey Lake Valley Groundwater Management District, Mendocino City Community Services District, North Fork Kings Groundwater Sustainability Agency, Pajaro Valley Water Management Agency, and Sierra Valley Groundwater Management District.

While not directly prescribed by SGMA, eligible agencies are typically guided by a body of decision makers composed of elected or appointed officials. Each also has a decision-making structure able to exercise SGMA granted authorities. This includes an ability to adopt ordinances, impose charges and fees, and prepare, adopt, and implement the GSP to avoid undesirable results.

SGMA also requires that all geographic sections of a groundwater subbasin be represented by a GSA. Because water boundaries and political jurisdictions do not always match, SGMA presumes that counties will assume responsibility as a GSA for areas within county boundaries not included in another GSA. Counties, as in the case of Kern County, may opt out of this role with proper notification to the State. In the event no other GSA provides coverage for an area, the State assumes (and would charge for) management of that section of a subbasin.

## Responsible State Agencies

While SGMA grants significant authority to local agencies, oversight of the GSA formation process, the development of the GSPs, and the performance of the GSAs relative to implementation of their GSPs was bifurcated between DWR and the SWRCB. This approach constituted what is often referred to as a "carrot and stick." DWR offered benefits and incentives for participating agencies, and the SWRCB created disincentives for those inclined to not comply. Other State agencies were directed to consider GSPs in their planning processes. More about the State's agency roles follows.

### Department of Water Resources (DWR)

DWR serves as a regulating and assistance agency. DWR formulates SGMA regulations; the California Water Commission adopts the regulations; and the State Water Resources Control Board serves initially as an advisor. Under SGMA, DWR had to develop emergency regulations[7] to provide the methodology and criteria it planned to use in reviewing and approving requests from local agencies to modify groundwater basin boundaries. DWR was also required to draft and implement emergency regulations for the evaluation of GSPs and alternatives to the GSPs known as Alternative Plans[8], the implementation of GSPs and Alternative Plans, and Coordination Agreements. (See Appendix A for an example of an Alternative Plan.) The GSP regulations related to development processes followed a comprehensive, multi-phased, public outreach and engagement initiative.

As a regulator, DWR determines the following.

- Whether a GSA meets the law's formation requirements
- Basin boundaries
- GSP adequacy
- Effectiveness of GSP implementation

[7] A state agency may adopt emergency regulations in response to a situation that calls for immediate action to avoid serious harm to the public peace, health, safety, or general welfare, or if a statute deems a situation to be an emergency under the Administrative Procedures Act. Because emergency regulations are intended to avoid serious harm and require immediate action, the emergency rulemaking process is substantially abbreviated compared to the regular rulemaking process.

[8] SGMA allows a GSA to develop an Alternative Plan that meets the goals and objectives set forth in SGMA to achieve groundwater sustainability in lieu of a GSP.

- Adequacy of annual reports and 5-year Updates.

As an assisting agency, DWR provides the following.

- A State well data system and data management
- Monitoring of well eligibility for the California Statewide Groundwater Elevation Monitoring Program (CASGEM)
- Flood management integration with SGMA
- Other programs including water conservation and integrated regional water management planning
- Financial support (as authorized by law)
- Guidance and technical support
- Facilitation services (assisting GSAs with communication, outreach and conflict resolution)
- Leadership of overall communication, engagement, and coordination efforts at a statewide level

### Water Boards

The Water Boards are composed of two distinct functions, a State Water Resources Control Board (SWRCB) and a Regional Water Quality Control Board (RWQCB). The mission of the SWRCB is: "To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations."

There are nine RWQCBs. The mission of the RWQCBs is to develop and enforce water quality objectives and implementation plans that best protect the beneficial uses of the State's waters. The RWQCB structure accommodates the local differences in climate, topography, geology and hydrology.

Under SGMA, the SWRCB serves as an enforcing agency for implementation of SGMA framework. More specifically, SGMA authorizes the SWRCB to:

- Require reports of groundwater extraction, filing fees and related data.
- Hold evidentiary hearings on water extractions.
- Assume control of groundwater basins not in compliance with SGMA.
    - Develop interim plans and directly manage the groundwater resources.
    - Require well metering.
    - Assess fees for purposes of supporting interim plan intervention.

Under separate authority the SWRCB regulates maximum contaminant levels in drinking water and drinking water systems for compliance with mandated levels.[9]

Intervention is triggered by a failure of a local agency to create a GSA to provide governance for a designated subbasin or adopt and implement a GSP by the deadlines outlined in Table 2.

[9] More information on SWRCB drinking water regulations may be found here: https://www.waterboards.ca.gov/laws_regulations/docs/drinking_water_code_2021.pdf (link confirmed 12.17.2021)

*Table 2. Deadlines for Compliance prior to SWRCB Intervention*

| Deadlines for Compliance prior to SWRCB Intervention | |
|---|---|
| **After** | **Intervention Trigger** |
| June 30, 2017 | Unmanaged Areas |
| January 31, 2020 | Basin in critical overdraft and either: 1) No plan 2) Inadequate plan |
| January 31, 2022 | 1) No plan or 2) Basin in long-term overdraft and inadequate plan |
| January 31, 2025 | Significant depletions of interconnected surface waters and inadequate plan |

In the spirit of the law, the SWRCB made clear its intention that agencies should participate in local governance structures rather than seek State intervention. They also established a multi-step process to create compliance, beginning with reporting, moving to a probationary status (allowing local agencies an opportunity to correct deficiencies), and finally experiencing SWRCB intervention to develop corrective actions.

Should management of a basin still not be in compliance, the State would assume control, and their management activities will result in costs the SWRCB must recover through fees. Table 3 provides the current (2021) published SWRCB fee schedule.

*Table 3. SWRCB Fee Schedule*

| Fee Category | Fee Amount | Applicable Parties |
|---|---|---|
| Base Filing Fee | $300 per well | All extractors required to report (excludes de minimis extractors). |
| Unmanaged Area Rate | $10 per AF (metered)<br>$25 per AF (unmetered) | Extractors in unmanaged areas (excludes de minimis extractors). |
| Probationary Rate | $40 per AF | Extractors in probationary basins (excludes de minimis extractors). |
| Interim Plan Rate | $55 per AF | Extractors in probationary basins where the State Water Board determines an interim plan is required (excludes de minimis extractors). |
| De minimis Fee | $100 per well | De minimis extractors in probationary basins. |
| Automatic Late Fee | 25% per month | Extractors that do not file reports by the due date. |

AF = acre-feet

The RWQCBs develop and implement regional water quality control plans with water quality goals and objectives for groundwater; they also develop plans of correction of known groundwater quality problems. SGMA does not explicitly vest authority for the implementation of SGMA with RWQCBs; however, the RWQCBs are responsible for developing basin plans for each of the State's nine regions. These plans provide guidance for regulating discharges that may affect groundwater quality.

More about the role of water quality in SGMA and the requirements under GSP regulations (23 CCR Section 350), are available on the Water Boards website.[10]

### California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) has an advisory role relative to certain environmental conditions that may be impacted by groundwater extraction. Its responsibilities and oversight authorities include adopting and enforcing CDFW policies and regulations, and issuing orders or determinations to mitigate ecosystem impacts, especially for groundwater-dependent ecosystems or surface water under the influence of groundwater.

### California State Water Project

The State Water Project, administered by DWR, maintains water infrastructure facilities that have a direct influence on the success of some of SGMA governing agencies through surface water deliveries. Some of these facilities and delivery capabilities have been impacted by subsidence.

### Federal Agencies and California Native American Tribes

GSAs may, but are not required to, collaborate with federal agencies and California Native American tribes. The federal government, including, but not limited to, the military and other managers of federal lands, are listed in SGMA as beneficial users that must be considered in the development of GSPs.

Conversely, the federal government or any federally recognized Native American tribe may voluntarily agree to participate in the preparation or administration of a GSP or groundwater management plan under a joint powers authority[11] or other agreement with local agencies in the basin. Tribes are eligible to participate fully in planning, financing, and management, including obtaining grants and technical assistance, if the exercise of regulatory authority, enforcement, or imposition and collection of fees is already part of a tribe's independent authority. SGMA does not provide any new authority to the federal government or tribes.

[10] See https://www.waterboards.ca.gov/water_issues/programs/sgma/docs/sgma/sgma_wtr_qual.pdf (link confirmed 12.17.21)

[11] Under the California Joint Exercise of Powers Act (Government Code section 6500 et seq.), two or more public agencies may create a third independent agency through a joint powers agreement. In general, these Joint Powers Agencies (JPAs), are created in order for the founding public agencies to jointly share a common power, implement a program, build new facilities, or deliver a service.

SGMA affirms existing law that federally reserved water rights to groundwater must be respected in full and further recognizes that in case of conflict between federal and State law relative to adjudication or management, federal law prevails.

Federal agencies and tribes may also inform GSAs when GSAs are formulating their approach to groundwater management. Examples include:

- U.S Fish and Wildlife Service serves the same role as CDFW as it pertains to the operation of federal wildlife facilities.
- United States Geological Survey provides subsidence data and groundwater modeling of likely conditions.
- United States Bureau of Reclamation experiences the impacts of subsidence to the Central Valley Project's facilities, which interferes with their ability to deliver water. USBR water deliveries are directly related to the GSAs' ability to meet their mandated responsibilities through facilities that deliver surface water, which reduces groundwater use.
- The National Park Service, Bureau of Land Management, Department of Defense, Forest Service, and US Fish and Wildlife Service National Wildlife Refuges, are land management agencies that may all have significant land holdings and/or watershed management responsibilities that could potentially impact the viability of a GSP.
- California Native American tribes may also have significant land holdings within a basin. Tribal governments and tribal communities have sovereign authority over their members and territory and a unique relationship with California's resources. California tribes and tribal communities, whether federally recognized or not, have distinct cultural, spiritual, environmental, economic and public health interests and valuable traditional cultural knowledge about California resources.

#### Non-governmental Organizations

Other SGMA identified beneficial users include environmental users of groundwater (e.g., wildlife refuges and riparian habitats) and disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.

As a result, numerous environmental and disadvantaged community organizations have been very active in SGMA processes due to their concerns about the impacts of decisions of GSAs on conservation of groundwater and the economic impacts of lowering groundwater tables on their constituents. Representative examples are presented further in this report, especially in the focus group interview findings.

### SGMA Alternate Governance Entities

Some groundwater basins have been adjudicated[12] through California court procedures that result in management decrees that precede SGMA. The decrees created the governance structure for the

[12] (1) Beaumont Basin, (2) Brite Basin, (3) Central Basin, (4) Chino Basin, (5) Cucamonga Basin, (6) Cummings Basin, (7) Goleta Basin, (8) Lytle Basin, (9) Main San Gabriel Basin, (10) Mojave Basin Area, (11) Puente Basin,

adjudicated basins and prescribed how groundwater is to be managed within those basins. These groundwater basins were identified in SGMA [CWC § 10720.8] and exempted from most of the law's requirements. Adjudicated basins are still required to submit SGMA equivalent information, including rates of groundwater extraction.

In certain basins, the courts or the legislature determined the governance structure prior to SGMA. As a result, some changes to their structure and management efforts may be necessary to respond to evolving groundwater management challenges. These may include the following.

- Adjudicated or special act district areas may not completely cover a groundwater basin they share and therefore may need new SGMA-equivalent agreements with other GSAs to develop complete basin or subbasin coverage or in the case of special act agencies, expand their existing boundaries to cover the balance of the basin or subbasin.
- Groundwater quality conditions may need more attention as the result of correction program considerations by the SWRCB or RWQCB.
- One of the remedies for curing adjudicated basin overdraft has been importing surface water which may not be as reliable in the future. The result is some of the adjudicated area agreements and sustainability strategies may need several amendments with SGMA-equivalent updates.

The adjudicated and the pre-SGMA established groundwater management agencies may find the information provided on collaborative governance options in this report helpful if and when they encounter these or other scenarios that challenge their existing groundwater management efforts.

(12) Raymond Basin, (13) Rialto-Colton Basin, (14) Riverside Basin, (15) San Bernardino Basin Area, (16) San Jacinto Basin, (17) Santa Margarita River Watershed, (18) Santa Maria Valley Basin, (19) Santa Paula Basin, (20) Scott River Stream System, (21) Seaside Basin, (22) Six Basins, (23) Tehachapi Basin, (24) Upper Los Angeles River Area, (25) Warren Valley Basin, and (26) West Coast Basin. Additionally, several court judgments, orders, or decrees, have the same effect as adjudication as it pertains to SGMA. These included the Antelope Valley Basin (as described in Judicial Council Coordination Proceeding Number 4408), any groundwater basin or portion of a groundwater basin in Inyo County managed pursuant to the terms of the stipulated judgment in City of Los Angeles v. Board of Supervisors of the County of Inyo, et al, (Inyo County Case No, 12908), the Los Osos Groundwater Basin at issue in Los Osos Community Service District v. Southern California Water Company [Golden State Water Company] et al,, (San Luis Obispo County Superior Court Case No, CV 040126).

# CHAPTER 4: GSA FORMATION

SGMA's basic organizational unit is the GSA formed by a local agency or a combination of local agencies. Local agencies (counties, cities, and water agencies) formed most of the GSAs. The process to form a GSAs is unambiguous. Eligible agencies are all public agencies with the qualifying responsibilities identified in SGMA. These responsibilities include water supply or other water management, or land use authority within a groundwater basin.

None of the agencies, including the agencies specifically named in the Act are required to become GSAs. However, they may decide to become a GSA by following the procedures described in Table 4.

*Table 4. Steps to Become a GSA*

| # | STEP |
|---|---|
| 1. | Prepare a resolution to form a GSA. |
| 2. | Notify the public of their intent to become a GSA. (A GSA can be a single agency or a combination of agencies). |
| 3. | Hold a public hearing on the decision within the counties that are included in the agency's boundaries.[13] |
| 4. | Publish the groundwater management agency formation proposal in a qualified media outlet.[14] |
| 5. | Schedule a protest hearing on the formation proposal:<br>• If less than a majority of the eligible voters in the proposed GSA area of jurisdiction protest the formation plan, the agency can move forward with a hearing to adopt a resolution for formation. |
| 6. | Adopt the resolution to form the GSA and adopt any new bylaws, ordinances, and/or new authorities needed to complete the responsibilities of a GSA.<br>• Follow meeting noticing and resolution adoption requirements.[15] The list of items that constitute a complete notification to DWR include the following.<br>○ The formation resolution<br>○ A service area map that meets DWR regulations regarding conforming to groundwater basin boundaries defined in CA DWR Bulletin 118 and in a "geographic information system" (GIS) digital file<br>○ Any new by-laws or authorities the agency may have adopted<br>○ An interested party list along with an explanation of how the third-party interests will be considered initially and during the implementation of any plans |
| 7. | Inform DWR of their decision to become a GSA and submit the required information within 30 days of the adoption to DWR via the Department's SGMA web portal.[16] |

[13] SGMA does not specify the items of business that must be accomplished at the public hearings however, the most common mechanism used to complete these required steps of the process in the critically overdrafted basins was the adoption of a resolution regarding the intent to become a GSA.

[14] See CGC § 6066

[15] Much of the information included in the notice package sent to DWR is technical and requires qualified staff or consultants to prepare the package.

[16] https://sgma.water.ca.gov/portal/#gsa

DWR posts the completed notices filed by the agencies on the SGMA web portal within 15 days of receipt of the complete notice package. Unless there are unresolved jurisdictional conflicts (e.g., boundaries of agencies overlapping), the agency or combination of agencies will become a GSA 90 days after DWR posts the completed notice for the GSA on the SGMA web portal.

### Irrigation and Water Management Agencies, General Act Water Agency GSAs

Irrigation and Water Districts were some of the earliest local government entities in rural agricultural areas of California. Many have a substantial number of overlapping groundwater subbasins. Of these agencies, Irrigation Districts (IDs) represent the oldest water supply agencies. Over the years the CWC was amended to include additional agencies, including water management agencies. The principal differences between the subsequent water management agencies and the IDs are the scope of the authorities granted to the agencies within the CWC. As the earliest agencies, IDs tend to have more authority to provide services than do later water management agencies. Given their history, their broad authorities, and their large geographic areas, many IDs and closely related water districts decided to become individual GSAs. A full list of the General Act Water Agency GSAs is provided in Table 5.

### Cities, Community Service Districts, and County GSAs

Cities and counties meet SGMA governance criteria for forming GSAs as "land use agencies." Many are also water management agencies because they operate drinking water and wastewater systems. Community Service Districts (CSDs) and Resource Conservation Districts (RCDs) may offer water services and, therefore, are also eligible to be GSAs. The impetus for becoming a GSA is the same for these districts as for all other agencies, the desire to have control over their groundwater use.

Cities have also enjoyed what is known in the CWC as "municipal preference." They are appropriators. They are not correlative-right[17] groundwater users because they do not own most of the land they serve. The underlying principle for this status is that the landowners within a city service area exchange their groundwater rights for city service. SGMA provides that all land-use plans shall be honored unless there is insufficient sustainable yield to meet the needs identified in the local jurisdiction's General Plan.[18] If groundwater is insufficient, the water needed for future growth outlined in a general plan may not be available, which would hamper cities' growth. Experts consulted in preparation of this document indicated that for these cities, conservation will be one essential tool to reduce near-term use and allow for some growth; however, land-use plans may need to change in some cases. It is also likely cities will be looking for groundwater banking projects with their GSA and GSP partners to cover future needs. Finally, many cities are working with surface water agencies to diversify their water supply sources, which can help address groundwater supply and quality issues.

Some cities and other agencies involved in SGMA implementation had long-standing relationships with larger, often regionally based, agencies. In these circumstances they utilized previously developed legal

[17] Correlative groundwater rights represent a right of reasonable use of the shared water resource, typically (but not always) based on the amount of land owned by each party on the surface above.

[18] A General Plan is each local government's blueprint for land use that achieves the community's long-term vision. Since the 1950's, every city and county in California must prepare a General Plan under State law.

agreements to manage their efforts collectively. An example is the San Luis and Delta-Mendota Water Authority's agreement with its agency members in the Delta-Mendota Subbasin. The Authority is not directly involved in groundwater management. It is a major water supplier to member agencies. That agreement allowed all of the member GSAs to collaborate in GSP development. The Authority separately executed a participation agreement to manage the subbasin's GSP-related financial matters.

### Cities

Numerous cities elected to become their own GSAs with the city council and staff serving as leadership and providing governance of the GSA. Since cities are often located within a larger subbasin, many have also joined other cities and/or water districts within the subbasin to form a larger GSA. They most commonly join together using either Memorandums of Agreement or Understanding (MOAs-MOUs)[19] or JPAs.

In addition to concerns about water availability, cities that use groundwater for their water supply are often interested in groundwater management specifically as it relates to water quality. Their concerns include the following.

- Land use decisions that may influence groundwater quality
- The need to maintain drinking water quality standards
- The activities of industry and commerce that may create contaminated sites or adversely affect groundwater quality
- Their responsibilities for operating wastewater treatment plants that provide effective recharge without contaminating groundwater sources

Related to water availability, cities may operate well construction permitting programs and often adopt city ordinance provisions to deny new individual wells when community systems are reasonably available.

### Community Service Districts

Among the critically overdrafted basins, two CSDs decided to become GSAs. CSDs are formed under the California Government Code[20] to provide city-equivalent services. Water resources management services, including drinking water and wastewater treatment, may be part of those services. A CSD has the same interests in groundwater as a small city. Because CSDs are often geographically limited in size, most are contained within a basin and must cooperate with other GSAs in that basin. Cooperation may take the form of an MOA, a JPA, or other legal agreement, such as a coordination agreement.

### Counties

As with cities, counties can be GSAs or can form the same relationships noted in the city alternatives above. Counties also have a unique responsibility designated by SGMA. They are the default organizing entity for groundwater users with no other eligible local agency to cover them. However, the

[19] Memorandum of Understanding (MOU) are used for simple common-cause agreements which are not legally binding. MOAs establish common legal terms that establish a "conditional agreement" where the transfer of funds for services is anticipated.

[20] [GC § 61000 – 61250]

responsibility is voluntary. Should a county not assume such responsibility, as was the case with Kern County, the governance responsibility falls to other agencies willing to include the county areas not already covered by a GSA or the State. There do not appear to be any areas in the critically overdrafted basins and subbasins that are not covered by an agency or county GSA.

There are notable differences between cities and counties.

- Counties typically have a much larger geographical footprint than most cities. Most cities are embedded within a county.
- Counties influence land-use decisions to a larger extent than cities due to their size.
- Counties grant well construction permits for private, community, industrial, and agricultural use.
- Counties often manage and govern water delivery and wastewater systems through CSAs (county service areas or agencies). The county Board of Supervisors (or equivalent) is usually the governing board for the CSAs.
- Under SGMA, counties are the default GSA for areas where no other eligible local public agency has jurisdictional coverage or where none chooses to form a GSA. Counties can notify the State that they will become the GSA for these areas. Counties can also opt out, leaving responsibility to the State.

When counties form single GSAs for their uncovered areas, the Board of Supervisors and county staff must manage the GSA or GSAs. The predominant governance structure used by counties in the critically overdrafted basins are MOAs-MOUs, in which the counties adopt resolutions to develop a coordinated effort with other GSAs in the subbasin or basin. The MOAs-MOUs describe the authority and activities the counties agree to implement with their GSA partners, including the required basin coordination agreements.

Counties also have joined JPAs to coordinate and share groundwater management responsibilities. JPA governance is usually a JPA Board of Directors, which is prescribed in the legal structure of the JPA. Member GSAs may hire consultants or provide staff as defined in the JPA.

If a county elects not to form a GSA for their uncovered areas, groundwater extractors in these areas would come directly under the control of the State.

A full list of the Irrigation and Water Management, City, Community Service Districts, and County-formed GSAs in critically overdrafted subbasins are listed in Table 5, by jurisdiction, location and GSP.

*Table 5. GSAs and GSPs by Jurisdiction for Critically Overdrafted Basins*

| Jurisdiction | Location | Name |
|---|---|---|
| **Irrigation District and Water Management Agencies GSAs** | **Basin/Subbasin** | **Area Covered by GSP** |
| Aliso WD | Delta-Mendota | Aliso |
| Buena Vista WSD | Kern | Buena Vista |
| Camrosa WD | Pleasant Valley and Oxnard | Fox Canyon GMA |
| Cawelo WD | Kern | Kern Groundwater Authority |

| Jurisdiction | Location | Name |
|---|---|---|
| Central Delta WA | Eastern San Joaquin | Eastern San Joaquin GWA |
| Central San Joaquin WCD | Eastern San Joaquin | Eastern San Joaquin GWA |
| Chowchilla WD | Chowchilla | Chowchilla Subbasin |
| Delano-Earlimart | Kern and Tule | Delano-Earlimart |
| DM II | Delta-Mendota | North and Central Delta-Mendota |
| Farmers WD | Delta-Mendota | Farmers |
| Grasslands WD | Delta-Mendota | Grasslands |
| Gravelly Ford | Madera | Gravelly Ford |
| Greenfield County WD | Kern | Kern River |
| Henry Miller WD | Kern | Henry Miller |
| James | Kings | James |
| Lower Tule River ID | Tule | Lower Tule River |
| Marina Coast WD | Salinas Valley 180-400 Aquifer | Salinas Valley 180-400 Aquifer |
| New Stone WD | Madera | New Stone |
| North San Joaquin WCD | Eastern San Joaquin | Eastern San Joaquin GWA |
| Oakdale ID | Eastern San Joaquin | Eastern San Joaquin GWA |
| Olcese WD | Kern | Olcese |
| Oro Loma WD | Delta-Mendota | North and Central Delta-Mendota |
| Patterson ID | Delta-Mendota | North and Central Delta-Mendota |
| Pioneer | Kern | Kern Groundwater Authority |
| Root Creek WD | Madera | Root Creek |
| Semitropic WSD | Kern | Kern Groundwater Authority |
| Shandon-San Juan WD | Paso Robles | Paso Robles Subbasin |
| South Delta WA | Eastern San Joaquin | Eastern San Joaquin GWA |
| South San Joaquin ID | Eastern San Joaquin | Eastern San Joaquin GWA |
| Stockton East WD | Eastern San Joaquin | Eastern San Joaquin GWA |
| Triangle T WD | Chowchilla | Chowchilla Subbasin |
| Turner Island #1 | Merced | Merced Subbasin |
| Turner Island #2 | Delta-Mendota | SJR Exchange Contractors Group |
| West Kern WD | Kern | Kern Groundwater Authority |
| Westlands WD | Westside | Westside |
| West Stanislaus | Delta-Mendota | North and Central Delta-Mendota |
| Widren WD | Delta-Mendota | North and Central Delta-Mendota |
| Woodbridge ID | Eastern San Joaquin | Eastern San Joaquin GWA |
| **City GSAs** | Basin/Subbasin | GSP |
| City of Dos Palos | Delta-Mendota | SJR Exchange Contractors Group |
| City of Firebaugh | Delta-Mendota | SJR Exchange Contractors Group |
| City of Gustine | Delta-Mendota | SJR Exchange Contractors Group |
| City of Lodi | Eastern San Joaquin | East San Joaquin GWA |
| City of Los Banos | Delta-Mendota | SJR Exchange Contractors Group |
| City of Madera | Madera | City, County, MID, MWD JPA |
| City of Manteca | Eastern San Joaquin | East San Joaquin GWA |
| City of Marina | Salinas Valley 180-400ft Aquifer | City of Marina |
| City of McFarland | Kern | Kern Groundwater Authority |

| Jurisdiction | Location | Name |
|---|---|---|
| City of Mendota | Delta-Mendota | SJR Exchange Contractors Group |
| City of Newman | Delta-Mendota | SJR Exchange Contractors Group |
| City of Paso Robles | Paso Robles | Paso Robles Subbasin JPA |
| City of Patterson | Delta-Mendota | North and Central Delta-Mendota JPA |
| City of Stockton | Eastern San Joaquin | East San Joaquin GWA |
| **CSD GSAs** | **Subbasin** | **GSP** |
| Lockeford Community Services District | Eastern San Joaquin | East San Joaquin GWA |
| San Miguel Community Services District | Paso Robles | Paso Robles Subbasin JPA |
| **County GSAs** | **Subbasin** | **GSP** |
| County of Fresno – Delta-Mendota - North and Central Delta-Mendota Management Area A | Delta-Mendota | Fresno County – Delta-Mendota – Areas A and B |
| County of Fresno - Delta-Mendota – SJR Exchange Contractors – Management Area B | Delta-Mendota | Fresno County – Delta- Mendota – Areas A and B |
| County of Madera - Chowchilla | Chowchilla | Chowchilla Subbasin |
| County of Madera #3 – Delta-Mendota – SJR Exchange Contractors | Delta-Mendota | SJR Exchange Contractors |
| County of Madera GSA - Madera | Madera | City, County, MID, MWD Joint |
| County of Merced - Chowchilla | Chowchilla | Chowchilla Subbasin |
| County of Merced - Delta-Mendota GSA - Grasslands | Delta-Mendota | Grasslands |
| County of Merced – Delta-Mendota – SJR Exchange Contractors | Delta-Mendota | SJR Exchange Contractors |
| County of Monterey GSA - Salinas Valley 180-400 Aquifer | Salinas Valley 180-400 Aquifer | Salinas Valley Basin180-400 |
| County of San Joaquin – Eastern 1 | Eastern San Joaquin | Eastern San Joaquin GWA |
| County of San Joaquin – Eastern 2 | Eastern San Joaquin | Eastern San Joaquin GWA |
| County of San Luis Obispo PR GSA | Paso Robles | Paso Robles Subbasin |
| County of Tulare GSA - Kaweah | Kaweah | Greater Kaweah |
| County of Tulare GSA – Kings | Kings | Kings Subbasin |

| Jurisdiction | Location | Name |
|---|---|---|
| County of Tulare GSA - Tule | Tule | Tri-County Water Authority |
| County of Ventura GSA – Oxnard Outlying Areas | Santa Clara River - Oxnard | Fox Canyon GMA |

## Joint Power Agreements/Agencies/Authorities and Memorandum of Agreement or Memorandum of Understanding GSAs

SGMA recognizes that the groundwater basin or subbasin is a hydrogeological unit that may not always neatly fit within an agency's or a group of agencies' legal boundaries. In such cases, local agencies or GSAs within the basin or subbasin must cooperate to meet the requirements of SGMA. Local agencies and GSAs within a basin or subbasin have many organizational options to achieve that cooperation. In addition to forming a single jurisdiction GSA, options include those below.

- An eligible local agency forms a GSA and then joins other single-jurisdiction GSAs in the basin to create a larger GSA.
- An eligible local agency forms a GSA and then affiliates with other GSAs in the basin in an alliance with an agency that encompasses their common boundaries.
- Eligible agencies all join together to create a single GSA.

SGMA suggests some mechanisms local agencies and GSAs can use to join their governance processes together. GSAs have developed others. Such mechanisms include:

- JPA as a separate entity granted authority by its partners.
- MOA or MOU.
- Special act district legislation/formation.
- Other legal agreements.

We discuss the various organizational mechanisms that agencies and GSAs can use to join their governance processes together in more detail below.

### Joint Powers Agreement

The regulation of groundwater over large, shared areas is a clear opportunity for GSAs and agencies to join their authorities together using a JPA. In critically overdrafted basins, the predominant type of agreement is a JPA that forms an umbrella GSA consisting of several GSAs. There appear to be several considerations driving the use of a JPA.

- The ability to share the cost for the complicated and costly GSPs is a strong incentive.
- The required coordination requirements of SGMA[21] meant that GSAs would have to work together in some fashion regardless of the initial organizational choice.
- The JPA organizational structure offers a simplified coordination agreement process for member GSAs.

[21] CWC § 10727.6

- Numerous agencies that formed the JPAs had previous success with that type of organizational process. This experience helped overcome any reluctance about working with each other even though some of the member agencies and organizations may have had somewhat disparate duties and responsibilities.
- JPAs have a separate governance board and shared staff. Typically, this would lead to a more unified and consistent implementation of SGMA.

### Memorandum of Agreement - Memorandum of Understanding

MOA-MOUs were the other form of collaboration used by GSAs. The MOA-MOUs may be considered an alliance of GSAs. The GSAs agree to work together using the guidelines in the MOA-MOU, but the GSAs do not share governance and staff. Well-crafted MOA-MOUs have all the capabilities necessary to comply with SGMA fully, but compared to JPAs, are less centralized.

### Cooperation or Participation Agreements

Cooperation or participation agreements, which are also called coordination agreements (and which are different from those used to coordinate GSPs within a basin), are much like MOA-MOUs. They are formal agreements between GSAs that describe how resources will be pooled to coordinate and carry out certain groundwater management operations necessary to fulfill SGMA's requirements.

The JPAs, MOA-MOUs, and Other Legal Agreement Organizations are listed in Table 6.

*Table 6. JPA, MOA-MOU, & Coordination Agreement GSAs*

| MOA- MOUs/JPAs/Coordination Agreements | Basin/Subbasin | GSP |
|---|---|---|
| Alpaugh ID GSA JPA | Tule | Alpaugh |
| Chowchilla Subbasin JPA | Chowchilla | Chowchilla Subbasin |
| Cuyama Basin JPA | Cuyama | Cuyama Basin |
| Grasslands MOA-MOU | Delta-Mendota | Grasslands |
| Central Delta-Mendota JPA | Delta-Mendota | North and Central Delta-Mendota |
| City of Madera, County of Madera, Madera ID, Madera Water District GSA JPA | Madera | City, County, MID, MWD |
| East Kaweah GSA JPA | Kaweah | East Kaweah |
| Eastern San Joaquin Groundwater Authority JPA | Eastern San Joaquin | Eastern San Joaquin Groundwater Authority |
| Eastern Tule JPA | Tule | Eastern Tule |
| Greater Kaweah GSA JPA | Kaweah | Greater Kaweah |
| Indian Wells Valley JPA | Indian Wells Valley | Indian Wells Valley |
| Kern Groundwater Authority JPA | Kern | Kern Groundwater Authority |
| Kern River MOA-MOU | Kern | Kern River |
| McMullin GSA JPA | Kings | North Kings |

| | | |
|---|---|---|
| Merced Subbasin Coordination Agreement | Merced | Merced Subbasin GSAs |
| Mid-Kaweah GSA JPA | Kaweah | Mid-Kaweah |
| North Kings River GSA JPA | Kings | North Kings River |
| Pixley ID GSA MOA-MOU | Tule | Pixley |
| Salinas Valley Basin 180-400 Aquifer JPA | Salinas Valley Basin 180-400 Aquifer | Salinas Valley Basin 180-400 Aquifer |
| San Joaquin River Exchange Contractors Coordination Agreement | Delta-Mendota | San Luis and Delta-Mendota WA Coordination and Participation Agreement |
| Santa Cruz Mid-County GSA JPA | Santa Cruz Mid-County | Santa Cruz Mid-County |
| South Kings GSA JPA | Kings | South Kings |
| Tri-County Water Authority JPA | Tulare Lake and Tule | Tri-County WA |
| Tulare Lake Subbasin JPA | Tulare Lake | Tulare Lake |

### Additional Organizing Arrangements

GSAs can engage in other organizational arrangements using special participation or activity agreements. Such agreements are useful for connecting subset members or areas of GSAs or MOA-JPA participants for specific activities and responsibilities unique to the subset. For example, a basin may have subsidence in limited areas. In that case, a subsidence monitoring network might be established and financed by a subset of GSA partners within the known subsidence areas through a specific-activity or participation agreement.

The San Luis and Delta-Mendota Water Authority provided coordination of 24 GSAs and 6 GSPs in the Delta-Mendota Subbasin and consolidated the subbasin information into a single website. (See link in Appendix A.) That coordination also came at a cost. The cost-sharing agreement is detailed in a "financial participation agreement" of all the members under the agreement.

Another variation of activity or participation agreements is used by similar agencies within a basin or subbasin to construct projects or carry out joint activities. The projects or activities do not necessarily apply to all the members of the JPA or MOA-MOU. For example, a GSA has only a few cities that need new infrastructure to meet the goals of SGMA. That group of cities could use the participation agreement to develop the infrastructure design, construction, and financing strategies under the larger organization's umbrella. This type of agreement can ostensibly reduce the costs of multiple individual efforts.

### Special Agreements Authorized in SGMA for CPUC Regulated Water Systems and Mutual Water Companies

As noted previously, SGMA recognized that non-public, groundwater-using entities, specifically private water systems regulated by the California Public Utilities Commission (CPUC) [CPUC § 2701] and mutual water companies (which are usually small, shareholder water companies authorized under the California Corporations Code [CCC § 14300]), needed the opportunity to participate in the GSAs. GSAs may allow these entities to participate in their governance process through an organizational agreement between the GSA and the entity. The agreements can be either an MOA, an MOU, or a cooperation or

participation agreement. Examples include the MOU between the Bakman Water Company, a CPUC regulated drinking water system; the North Kings GSA (North Kings JPA Agreement, Attachment to Notice, page 38); and the MOU Oildale/North of the River Mutual Water Company has in the Kern River GSA (Kern River GSA GSP Appendices, Exhibit C-1, page 4-34). The City of Stockton has a cooperative agreement with California Water Service Company to share involvement in the City of Stockton GSA.

## Special Act Districts

Special Act Districts have been used for groundwater management for decades. One of the oldest is Alameda County Water District in the Eastern San Francisco Bay Area, which includes communities in southwestern Alameda County. It was formed in December 1913 to serve its communities with drinking water and preserve and enhance the Niles Cone groundwater aquifer. One of the first Special Act Districts created strictly to manage groundwater was the Fox Canyon Groundwater Management Agency in Ventura County, created in 1982. The full list of Special Act Districts includes twelve pre-SGMA agencies, which are a mix of various types of water districts managing groundwater and groundwater management agencies. Three Special Districts were added through subsequent legislation.

Special Districts that assumed SGMA responsibilities include existing groundwater management districts with groundwater management plans. In response to general basin dynamics, several agencies sought this special status and became Special Districts during the beginning of SGMA implementation.

Table 7 provides a sample of the reviewed Special Act Districts that participated in GSA formation and GSP development in critically overdrafted subbasins. Two are older districts and three are newer. Entities are considered by their governance choices and their approach to complying with SGMA.

*Table 7. Special Act Districts Recognized in SGMA*

| Special Act Districts Recognized by SGMA | Basin/Subbasin | GSP |
|---|---|---|
| Fox Canyon Groundwater Management Agency | Pleasant Valley and Santa Clara River - Oxnard | Fox Canyon Groundwater Management Plan |
| Kings River East GSA | Kings | Kings River East |
| North Fork Kings GSA | Kings | North Fork Kings |
| Pajaro Valley Water Management Agency | Pajaro Valley - Corralitos | Pajaro Valley WMA Groundwater Management Plan |
| San Joaquin River Exchange Contractors GSA | Delta-Mendota | San Joaquin River Exchange Contractors |

## Augmented Governance Approaches – Support Committees

GSAs may elect to utilize additional governance approaches to support implementation of SGMA. Following are types of committees observed supporting Boards of Directors of critically overdrafted subbasins. Additional information on GSA committees is provided through the links in the searchable spreadsheet in Appendix A.

### Oversight Committees

Most of the GSAs in critically overdrafted basins created standing or ad hoc support committees. Standing committees typically advise a Board of Directors on matters of governance. Most GSAs have at least one official committee (an Executive or Budget Committee) which may advise the Board on management, policy, rules and regulations, administration, and financial matters.

### Advisory Committees

SGMA advises GSAs that they may create advisory committees, appoint their members, and consult with them while developing and implementing their GSPs. Since the implementation of a GSP is a multi-year endeavor, an advisory committee should be considered a standing committee. SGMA encourages GSAs to engage with diverse social, cultural, and economic interests within the GSA to assist in developing their GSP. Advisory committee members should reflect the characteristics of their constituents. While not directly part of the governance of a GSA, advisory committees can connect the GSAs to the needs of their communities and may advise the governing Board regarding the impact of proposed actions on their communities.

### Ad-Hoc Committees

Ad-hoc committees are temporary committees the Board forms to address a special or temporary issue. They typically deal with technical assistance or specific needs of the standing committees and the Board. These combinations were all found in the GSAs included in this report. Because the ad-hoc committees are temporary, they were challenging to find and summarize. (Even permanent committees vary in their responsibilities and are not easily categorized.)

# CHAPTER 5: DEVELOPMENT OF GSPS

The decision-making process used by the GSAs to develop and implement GSPs was articulated in several of the reviewed plans. The expected considerations (cost, location, trust) that would logically influence the process used by the GSAs to develop their GSPs were not always the driving consideration. The one consideration that appears to have influenced the process is how the public agency that formed the GSA operated in the past. Organizations with a history of running alone, with minimal interaction with other agencies, appeared to gravitate towards developing their own GSPs. Agencies with experience working with others gravitated towards those same partnerships. Whether they developed their own GSP or collaborated to develop a GSP, all GSAs had to eventually coordinate their GSPs using the required coordination agreement.[22] Coordination agreements require all the GSAs to work together for the benefit of groundwater resources within the basin by forcing conformance among GSPs. In fact, the coordination agreement requirement is one of the recommended first considerations by GSAs when developing a new GSP or updating one. Using the agreement requirements as a guide will make coordination of basin or subbasin GSPs much easier in the future.

One consideration that appears to have influenced the process is how the public agency that formed the GSA operated in the past. Organizations with a history of running alone, with minimal interaction with other agencies, appeared to gravitate towards developing their own GSPs. Agencies with experience working with others gravitated towards those same partnerships.

More information about the formation choices is provided in Appendix A. A representative sample of the various organizational alternatives the GSAs utilized when preparing their GSPs include the following.

## Individual GSAs with their own GSP

### Cities

There was only one City GSA with its own GSP, the City of Marina.

### Counties

The only County GSA with a separate GSP was Fresno County Management Area's A and B GSP in the Delta-Mendota Subbasin. Management area A is located in the North and Central Delta-Mendota Subgroup area. Management Area B is located in the San Joaquin River Exchange Contractors area.

### Irrigation and Water Districts

There were numerous irrigation districts (ID) and water district GSAs that elected to develop their own GSPs. Some created partnerships within their boundaries; others did not. Examples include the following.

- Delano-Earlimart ID: Located in the Tule Subbasin, this ID is the exclusive agency for the area of its jurisdiction. It includes severely disadvantaged communities that participate with an MOU.

[22] CWC § 10727 (a)(3)

- Gravelly Ford Water District: Located in the Madera Subbasin, this water district represents one of the few small districts developing their own GSP. It is part of the subbasin coordination agreement.
- Westlands Water District: Westlands covers almost the entire Westside Subbasin except for some small areas on its western boundary that are represented by Fresno County (County of Fresno Westside GSA), which has an MOU with Westlands for the GSP.

#### Individual JPAs with a single GSP

The Cuyama Basin GSA JPA covers a single basin with a GSP.

#### Special Act Districts

The Pajaro Valley Water Management Agency is one of a small group of pre-existing groundwater management agencies that utilized SGMA's Alternative Submittal Process allowed in CWC 10733.6 to obtain DWR's approval of their existing groundwater management plan.

Borrego GSA is a particular case of an agency that started with a GSA and one GSP but ended up in adjudication. The adjudication has not been completed at the time of this report, but the "draft stipulated agreement" is linked in Appendix A.

#### Multiple Agency GSAs with One GSP for a Subbasin

The following are examples of the GSAs that joined together to create one GSP for a subbasin.

**Counties:** Numerous counties developed GSA areas that were part of a coordinated GSP. An example is the Chowchilla Subbasin. The Counties of Madera and Merced joined with Chowchilla Water District GSA and the Triangle T Water District GSA under one GSP.

**Multiple Joint Power Agencies with one GSP:** The Tulare Lake Subbasin has five JPA GSAs and a combined GSP.

**Combination agencies with one GSP:** Some basins or subbasins are a combination of cities, counties, and irrigation/water districts that use coordination agreement agencies or MOA-MOU GSAs to develop a single GSP. Examples of these arrangements include the Merced subbasin and the Paso Robles subbasin. Merced used a coordination agreement. Paso Robles used an MOA-MOU.

## Governance Options for Combination Agencies with Multiple GSPs Within or Across Subbasin Boundaries

GSAs, in all of their forms, must manage their groundwater. To do that effectively, GSAs have to address the groundwater throughout the basins and, at times, between basins. Coordination agreements allow GSAs within a basin to coordinate their management activities. Interbasin coordination agreements allow GSAs from one basin to coordinate their management efforts with those in another basin. Coordination agreements are discussed in SGMA and the California CCRs. [23] Interbasin agreements are not mentioned in SGMA but are fully discussed in the CCRs.[24]

[23] CCR Title 23, Div. 2, Subchapter 2, Art 8 § 357.4
[24] CCR Title 23, Div. 2, Subchapter 2, Art 8 § 357.4

### Coordination Agreements

Where there are multiple GSAs in a basin or subbasin, SGMA requires GSAs to develop a coordination agreement. The coordination agreement guides their participation in the shared responsibilities of meeting groundwater management requirements and in particular coordination of the implementation of the Groundwater Sustainability Plans (GSPs) for the entire basin.

The coordination agreement must ensure the measurement and consistent data management of the following as required by the SGMA.

1. Groundwater elevation
2. Groundwater extraction
3. Change in groundwater storage
4. Surface water supply
5. Total water use
6. Water budget
7. Sustainable yield

The California Code of Regulations (CCRs) specify the content of a coordination agreement, which includes:

- Delineation of the responsibilities each GSA has relative to meeting the terms of the agreement
- The process for submitting GSPs and their amendments to DWR
- The process for identifying areas within the basin that are adjudicated or under an Alternative Management Plan
- Additional detail regarding the coordinated implementation of the GSPs
- A point of contact for the GSAs
- How GSAs will implement common data management and reporting systems to provide information required by SGMA (data identified in the previous paragraph)
- How the GSAs will exchange information in a timely manner

DWR is responsible for reviewing the coordination agreement for compliance with the CCRs. If approved, the coordination agreement becomes part of the GSP for each GSA.[25]

Neither SGMA nor the CCRs require coordination agreements to be approved by each of the GSAs within the basin. On advice of counsel, GSAs formally adopted resolutions approving the coordination agreement and were signatories to the agreement.

### Combinations of GSAs (JPAs and other types)

Most of the critically overdrafted basins and subbasins are now managed by combinations of GSAs that include cities, counties, irrigation and water districts, and joint powers agencies with multiple GSPs. These GSAs used SGMA's mandated basin or subbasin "coordination agreements" to understand conditions in and needs of the basin or subbasin to develop their GSPs.

[25] CCR Title 23, Div. 2, Subchapter 2, Art 8 § 357.4(C)(g-h)

Implementation of the GSPs will likely influence and instigate the need for changes in governance elements of GSAs. For example, lists of projects that will obtain the SGMA goal of sustainability are required as part of the GSP related regulations.[26] It follows then that a GSA itself will need to establish rules and regulations for defining, prioritizing, financing, and developing projects to achieve sustainability.

As an example, groundwater banking is a crucial strategy for many GSAs to prevent or reduce the undesirable results SGMA intends to address. It also offers a prime example of a governance implementation strategy. In their GSP, the North Fork Kings River GSA proposed and adopted policies for groundwater banking projects suggested by landowners, especially those that offer to transfer groundwater credits to others.[27] SGMA requires GSP updates at five-year intervals, but, in this case, the agency may make changes on a more frequent basis. The CCRs require that the GSAs report changes in GSPs to DWR. In turn, changes to GSPs may trigger the need to makes changes to GSA governance rules and regulations and the cooperative agreement.

### Interbasin agreements

Interbasin agreements are not mentioned in SGMA but rather are discussed in the CCRs. This type of agreement is used to identify the common elements and assessments between GSAs to meet the necessary finding that a GSP will not adversely impact an adjacent basin.

The CCRs state that an interbasin agreement should:

- Identify the GSAs participating in the agreement and the basins they represent
- Identify the GSPs, Alternatives, and adjudicated areas within each basin
- Include a common description of the geology and hydrology of the basins and how they influence cross basin groundwater flow
- Provide technical information regarding groundwater flow across basin boundaries
- Describe the assumptions used in each GSP and how the GSAs from each basin reconciled any differences between assumptions
- State the criteria that will be used to determine that no adverse impacts are occurring
- Describe the monitoring network established to confirm that no adverse impacts are occurring
- Assess differences between the minimum thresholds for measurable objectives set forth in each GSP and determine how these differences will be reconciled. Then, the GSA will identify how it plans to manage the basins to avoid adverse impacts.
- Where differences between the minimum thresholds of measurable objectives between basins are significant, identify those differences and include a plan and schedule to collectively reduce the uncertainties in the data and reduce the differences to less than significant
- Facilitate the exchange of data between the GSAs.
- Include a dispute resolution process

[26] CCR Title 23 Div. 2, Subchapter 2, Art 8 § 354.44

[27] North Fork Kings - groundwater banking rules

DWR reviews interbasin agreements and posts them on their website. As of this report, there are no formal interbasin agreements. There are two informal agreements. One is a voluntary, unsigned agreement between the GSAs in the Chowchilla Subbasin and the Merced Basin. The second is an agreement between the Westside Subbasin GSA and the North and Central Delta-Mendota Authority GSA. These agreements only pertain to sharing groundwater monitoring data.

## Final Configurations of GSAs and GSP Choices

**Appendix A** provides an overview of all the critically overdrafted basins and their final governance and GSP choices. The goal of the lists was to consolidate the information from the DWR SGMA portal on the 21 basins. The GSAs and the GSPs have web links to them. They are either directly linked to the GSAs or linked to the DWR SGMA Portal. Various other links include special documents that may be of value to future GSA development such as governance strategies, financing mechanisms or rules and regulations adopted by the GSAs.

**On-line Matrix**: More detailed information is provided in an on-line matrix[28] that encapsulates certain key SGMA GSA organizational information found in the California Department of Water Resources SGMA portal into a single location. The information is limited to the information in the hydrologic basin or subbasin areas designated as in a condition of "critical overdraft." The goal is to offer the governance information for use in future GSA and GSP development where the experiences and ideas may have value to inform any future ongoing efforts. This matrix is linked overall in a report prepared by the California Water Institute at Fresno State. The matrix is a living document and will be maintained to the best ability of the staff of the California Water Institute until the last round of required groundwater sustainability plans have been submitted to the California Department of Water Resources. Maintenance will include frequent corrections and repairs as well as additions that add value or any changes requested by email from informed users. Requested changes should be emailed to: <cwi@mail.fresnostate.edu>

The "read me" section identifies the information provided in the matrix columns and where appropriate adds the context to the potential value of the information.

[28] https://docs.google.com/spreadsheets/d/1hnERb-cXtwf4mgsCXkbbNXR4bdmv60pV/edit#gid=412692653

# CHAPTER 6: STAKEHOLDER PERSPECTIVES

Given the unprecedented magnitude of policy change catalyzed by SGMA, many practitioners, researchers, community groups, and institutions in California and elsewhere are interested in investigating GSA and GSP processes. As a result, external observers and organizations have analyzed, informed and continue to shape SGMA processes. Similarly, a broad cross-section of internal practitioners and policy representatives has guided the new agencies implementing SGMA. The valuable views and experiences of these experts were shared with the interviewers. Interviewees represented six categories of stakeholders: technical experts, disadvantaged community advocates, elected officials, environmental advocates, GSA managers, and researchers. Following is a summary of input shared by these groups.

## Technical Experts

The consulted technical experts worked directly with GSAs, especially on the GSPs. These individuals were instrumental in gathering the background and data necessary to inform the process of attaining sustainability. The technical experts had views very similar to the academic group (discussed later). The technical work they performed for the agencies and their policy-adopting representatives, the Boards of Directors, required a substantial educational effort. In order to assist decision makers in making informed decisions, education was needed on topics ranging from groundwater science to technology and management. In addition to informing the policy-adopters requiring this information, there was a need to provide public presentations on the agencies' efforts. All those audiences needed a simplified, fundamental understanding of what was happening to groundwater systems followed by what is needed to attain sustainability. These investments in time and effort complicated the process for these experts. These experts also believed leadership, education and communication plans needed more careful effort and time in order to increase the common understanding of issues and needs. Enhanced communication and education would, they believe, optimize the potential for success by the organizations implementing SGMA.

## Elected Official Representation

This group of interviewees were composed of Board of Supervisor representatives who were actively engaged in SGMA both as partners in GSAs and/or part of larger group planning organizations such as JPAs and Board of Directors of GSAs in which the County was the main implementing agency. Not surprisingly, these interviewees were very cognizant of the financial and policy challenges the new agencies will be facing. Subjects such as the challenges of implementing taxes in the face of State constitutional tax amendments that require certain types of elections or approvals to enact such funding mechanisms was a concern of theirs. They were also concerned about reduced land values and the subsequently reduced tax base for counties. They constructively offered that there are models available to develop more area-wide funding as has been done for other county-focused issues. For example, transportation and road improvements have been funded by passing sales tax additions.

They also were very supportive and pleased that their own staff had become very engaged and were providing support and leadership for many of the groundwater management efforts in their counties.

Historically, most counties relied solely on water agency professionals. They believe these new partnerships will be valuable in the future.

## Ecosystem and Environmental Justice Representatives

The representatives from the ecosystem and environmental justice organizations had similar approaches in their analyses of the current efforts. They understood there were complexities in the process of implementation of SGMA by the new agencies, but they believed there were numerous geographic areas where substantial gaps in addressing their interests exist, either in ecosystem impacts in the management plans or in water elevation objectives, which could have adverse impacts on uses of groundwater by disadvantaged communities or citizens. The comments they submitted to the various agencies were intended to be constructive so that improvements in the management plans could be made as soon as possible. The environmental organizations who commented were particularly focused on surface water that could be influenced by groundwater additions and groundwater dependent ecosystems. They referenced the co-signed letters that they had sent to the various GSAs that summarized their concerns and pointed out the specific areas of impacts they believed needed addressing.

The environmental justice groups were concerned about depth to water and quality management efforts to protect the interests of disadvantaged communities or individuals and their access to safe water. The principle these groups communicated is to make sure the leadership of the management agencies continually re-evaluate their implementation plans and develop the necessary remedies to address the needs they outlined or specified.

### GSA Staff and Management Representatives

The staff and management representatives from the GSAs themselves had comments about the need to be more inclusive in water management planning and the desire for more support, including technical and financial support. They provided information about what they thought was missing, including a key concern that there is a need for more integration with other agencies and programs involved in managing water. After substantial SGMA efforts were already under way, they realized it would have been valuable to involve other federal, State and regional water management or planning efforts that influence the success of groundwater management. They offered that State and federal water supply organizations, flood control agencies, water quality management agencies and regional water management planning efforts should have been better engaged in the process. They recognize that it may have been partly their responsibility to start that engagement, but the tight timelines for their information gathering and plan development efforts overwhelmed their capacity to engage these other agencies.

The principle involved in this advice is the concept of integration. Their finding is that integrating multiple water management efforts could assist with better management of groundwater. They also mentioned the need for more State guidance on aspects of plan management actions and funding of SGMA implementation. An example of plan guidance they believed would have had value was to receive information about the environmental issue of connected surface water or groundwater dependent ecosystems. These representatives also have the daunting responsibility for implementing the numerous

projects and actions of their plans and are very concerned about funding groundwater sustainability projects as well as causing real economic damage as control actions are implemented.

### Academics, Researchers and Policy Experts

The academics, researchers and water policy experts in academic institutions were consistent in their analyses of the progress and implementation efforts of the entities required to develop and implement all the necessary elements of SGMA (form agencies, gather the necessary technical information and develop management plans). This group found there was an unevenness in the products of the process, with some agencies performing better than others. Larger organizations generally performed better in all aspects compared to smaller entities. However, they believed that all the agencies had the capacity to meet the intent of the law. This positive assessment is highly encouraging. Their findings were that many of the new agencies did a fairly good job of creating the potential for success. They offered that, in their view, the difference in success was likely due to leadership issues and time. They found that ongoing leadership training that included groundwater science, law, and management would be needed for future success. They also recognized that time would be a factor in correcting deficiencies of underperforming organizations.

# CHAPTER 7: FINDINGS AND OBSERVATIONS

In terms of compliance with SGMA, GSAs in critically overdrafted subbasins have been successful in organizing efforts to meet governance requirements. Further, all reviewed information indicates they have the capacity to be successful in achieving groundwater sustainability. Each has:

- Publicly elected or appointed members who have the responsibility to represent all the groundwater users and beneficial uses of groundwater.
- Achieved 100% subbasin coverage.
- Submitted the required GSPs on time.

The development of each jurisdiction's governance structure was affected by a series of factors. The following considers these factors in more detail and, where applicable, includes considerations for future actions and policy.

## Leadership

Interviewees unanimously selected leadership as the most important attribute needed for successful SGMA governance. Leadership in this instance included directors (or board members) and staff executives and managers. To be successful, these individuals must have the capability to understand and explain groundwater management responsibilities and formulate recommendations that guide the organization to act in the best interests of all groundwater users and uses. The interviewees believed the most successful GSAs and GSPs had one or both of their leadership groups with these capabilities.

### Future Implications

Because managers and directors come and go, ongoing leadership training is a must.

## Trust

Not all of the policy or technical issues were completely addressed in the GSA formation or GSP preparation process. Still, the capacity to address those issues and improve governance and GSPs was apparent where leadership created an atmosphere of "trust" in both the technical and institutional decisions. For many external observers, trust was considered the most important indicator of continued success in the crucible of governance.

### Future Implications

By definition, equitable management of a shared resource requires collaboration and collaboration requires trust. Future researchers and policy makers may wish to explore options for facilitating on-going trust building.

## Data Availability

One shortcoming was that a significant portion of data, such as water well information, was privately held in many basins and subbasins. These data required some effort to obtain and depended on the willingness of the private parties to share the information. Data gaps resulted, particularly in the newer GSA areas. Many GSAs are actively working to fill in those gaps. Data gaps required assumptions based on best available information in order to develop GSPs. Therefore, management actions based on those

assumptions will need to be reviewed as actual data replaces the assumptions. The governing bodies are aware of the data gaps and the need for subsequent evaluation of management actions once the data gaps are filled.

#### Future Implications

Many GSAs are seeking assistance in developing better data, as it is as an ongoing priority action item for their agencies. However, the impact of data gaps may cause some GSPs to be deemed incomplete per DWR's regulatory guidelines.

### Costs of Governance

Individual City, County or ID/Water District GSAs often had the easiest path to starting a GSA. They used their existing Boards, Councils and Supervisors to form the agency and generally had the ability to use general funds to cover initiation costs. However, cities and counties may have experienced financial strain as general fund use diverted money from other priority uses. IDs were able to charge their customers for the costs by including them as part of their water charges or as part of their administrative costs.

Governance for GSP development that required coordination agreement activities and new management actions had different implications. Due to the geographic scope of basins and subbasins and the cost of staff, consultants, and studies to prepare a GSP, many agencies joined with other GSAs to cost share. Those who developed their own GSPs likely had higher unit costs than those who shared them.

#### Future Implications

GSAs will need a clearer process for developing funding for on-going SGMA implementation.

### Previous Partnering Arrangements

Agencies with existing relationships that allowed formation of an MOA-MOU or JPA GSAs generally were able to proceed fairly easily. The complexity, if any, experienced by these entities revolved around the lack of understanding by some new partners about groundwater itself and the need to assume responsibility for its management.

The advantage the JPA GSAs experienced was the ability to use the existing powers of all the partner agencies as well as the ability to borrow funds or sue (and be sued) as a separate organization (without legally binding the individual members for such legal matters).

### Existing Groundwater Jurisdictions

Unlike other general-purpose agencies, existing special districts were already designed to manage most of the issues outlined in SGMA. Some had to adjust subbasin coverage by bringing in additional partners. At the time of this review, one special district had already received approval for their management plan as an "alternate method" to an SGMA GSP (see reference 23). New special districts had the benefit of reviewing existing districts then designing their new groundwater agencies to meet the comprehensive requirements of SGMA.

## Costs of Implementation

All the GSAs have experienced substantial costs to initiate and implement the requirements of SGMA. Fortunately, the California Department of Water Resources provided grant funds for a number of the needed efforts, in particular for the very high costs of creating the GSPs. Also, their help in the form of guidance information, report requirements, and special issue information (such as monitoring well inclusion in CASGEM) has made the GSP development and implementation of resulting management actions go more smoothly and reduced GSA costs.

The financial impacts of SGMA resonated as a concern with many of the observers and were two-fold. First was the cost of the failure to stabilize groundwater levels. Second was the cost of the GSPs and the implementation of projects needed to stabilize groundwater levels.

### Future Implications

The impact of the failure of SGMA will be felt if groundwater shortages cause lands to revert to a minimal or an unused state, which has the potential to have severe negative impacts on the economies of the areas dominated by farming communities. One of the first casualties will be the reduction of property values which will affect the tax base for many local agencies, but especially counties. The rippling effect of lost economic activity could reduce the money available to locally fund the implementation of projects listed in the GSPs to create sustainability of groundwater levels. These projects are huge and complex, involving groundwater recharge and/or demand management as well as the complex storage and delivery system improvements needed to manage the recharge water.

GSAs must also implement funding strategies that rely on specific processes, which can be daunting. Whether GSAs choose to adopt permit and regulatory fees or propose property assessments, there are specific constitutional requirements that must be satisfied to enact such funding mechanisms. Some GSAs have already worked through the constitutional processes to create permanent funding sources. Others are still operating on conditional or temporary agreements whereby GSAs have chosen to use a proportional cost-sharing agreement. Sooner or later all GSAs musts have more permanent funding arrangements to implement their GSPs and build projects to optimize groundwater conditions.

Interviewees noted that securing permanent funding is one area where all GSAs need to collaborate to develop strategies or collective solutions to finance their operations and to implement their GSPs. Funding GSP projects could potentially come from a more uniform tax of all groundwater users, either by counties or by collaborative regions. For example, regional transportation projects are often funded through county special sales tax measures. The level at which such sources could fund groundwater improvement projects depends on the structure of the funding model. Most local transportation measures are used to match State and federal funds and to prioritize projects that are most important to the communities involved. Grant match is part of the existing process for water projects at both State and Federal level, but the scope of the needs in the case of infrastructure for sustainable groundwater is likely much higher than recent investments by any of the funding agencies. The bottom line for these interviewees was that providing adequate funding for GSAs to implement their GSPs, though difficult, must be solved.

## Education and Training

SGMA is about groundwater. Managing groundwater requires some fairly complex fundamental knowledge about groundwater science and groundwater law. The literature and interviewees resoundingly supported the ongoing need for more education and training of GSA board members and staff on both groundwater science and law. Groundwater science is difficult because unlike a reservoir, canals, or even pipes (which can be uncovered), groundwater cannot be seen. Misunderstanding the science of groundwater can lead to faulty thinking or mistrust of those who are trying to develop rational technical, institutional, and managerial processes to manage groundwater sustainably. Mistrust can also be engendered by leaders who limit the scope and access of basic information to constituents. Leaders, such as Boards of Directors, in particular, need to have some understanding of how groundwater works so they can make rational decisions on management. Staff and consultants are also needed to explain the technical issues and actions needed in clear and unambiguous terms that ultimately satisfy groundwater users and the public.

### Future Implications

There is an ongoing need to create educational materials and training programs that have universal applicability to SGMA and groundwater management. Technical information that can be consumed easily is particularly needed for policy leaders, so the best decisions can be made by Boards and managers. Good decisions will build trust with all of the stakeholders. Similarly, the public needs constant "care and feeding," especially when it comes to disseminating useful information about a common use resource like groundwater. Citizens currently receive varied pieces of water information such as reservoir conditions, snowpack levels, and precipitation as well as drinking water quality from their community system, whether it be surface or groundwater, but little else is provided. The observers hinted that developing usable information to educate everyone about the conditions and value of groundwater requires collaborative thinking about how to deliver information at the least cost. Water data transparency is now a requirement under State law but presenting that information in a useful format for everyone's consumption is an art. Groundwater needs no less attention than any other part of the water cycle since it is an important water source for many and the only source of water for some.

An example of how to visually represent groundwater conditions can be found at the Madden Library GIS Center ( Geospatial Information Services | Henry Madden Library (fresnostate.edu)[29].

[29] Madden Library Geospatial Services, "Groundwater in 3-D", CSU Fresno

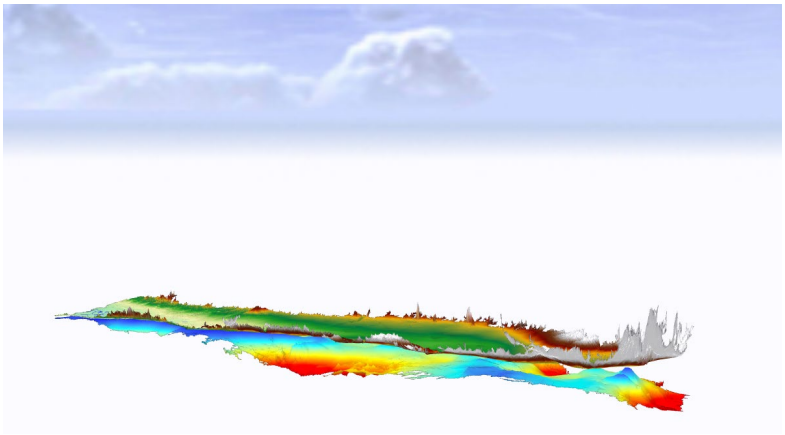

*Figure 2. Madden Library Geospatial Services, Groundwater in 3-D (Fresno State)*

Groundwater law and groundwater rights also need better and more consistent explanation so users can understand the policies and procedures that implement those rights in a fair and balanced manner. Groundwater law in California has evolved as "common law" or fundamental decisions in a court of law. There are no constitutional provisions or statutes on groundwater law, making understanding the nuances complex. Legal aspects should be in understandable, universal summaries made available through all GSAs. This is particularly important because existing conceptions of rights and conditions of use become challenged as science identifies other beneficial uses of groundwater, such as contributions to surface water and the environment.

## Integration

GSAs developed their GSPs on a very tight timeline, using data they possessed or could obtain quickly, to characterize their groundwater. They were provided guidance and help from DWR. However, developing GSPs from scratch left them with little time and energy to integrate the GSPs with other related groundwater and/or water management plans and efforts.

### Future Implications

Many of the following programs were mentioned in the plans, but many observers suggested that better coordination and integration with these agencies and programs would have greatly benefited the GSAs and the quality of their GSPs and would increase effectiveness in the future. Following is a partial list of potential agencies and programs identified in interviews that should be considered for integration efforts.

- US Bureau of Reclamation Central Valley Project (all Divisions and locations)
- Central Valley Flood Control Program (managed by DWR)
- US Army Corps of Engineers District Engineers (flood and storage management)
- San Joaquin River Restoration Program (USBR)
- Irrigated Lands Regulatory Programs of the Central Coast and Central Valley Region Water Quality Control Boards
- Salt and Nutrient Management Plan (SNMP) program of the above Water Boards, especially the nitrate control programs

- Integrated Regional Water Management Plan (IRWM) areas financed by DWR

There was specific mention of collaboration and integration for financing, implementation, and cost control of projects. Mitigation strategies were also mentioned by the external observers as areas worth the investment of time and effort by the GSAs. They suggested that the optimum areas for considering integration are with the IRWM areas and their hydrologic basin coordination committees.

## Iteration

One concept observer recognized as a key to future success is that all of the participants involved in the implementation of SGMA, from the State to the GSAs, must understand the magnitude of the efforts needed to meet the new law.

Another concept they recognized is that an iterative process is a key element in the effective implementation of SGMA. Iteration – the time to learn and the opportunity to apply lessons learned -- is essential to SGMA's ultimate success.

Time is needed to build trust, not only for issue management with special interests, but among all the government parties themselves. With water agencies being thrown together, counties and water agencies forming new relationships and of course, GSAs dealing with all the agencies and elements of State government the new partners must satisfy, parties are in a continuous learning mode. Local control did not mean local decisions that do not meet all the expectations of the law. The observers were very clear that failure is not an option. The 20-year horizon is part of SGMA to allow local agencies to learn from the implementation of their GSPs and make adjustments as they see successes and failures. In other words, iterations of effort will be needed to develop and implement groundwater management actions that result in sustainable groundwater levels as defined by SGMA.

Observers also stated that a way to share information – whether it be through a dedicated websites, communications networks, NGOs or professional organizations -- is necessary for sharing successes and lessons learned among GSAs.

## Special Subjects

### Coordination Agreements

A suggestion came out of the interviews that there may be some value in initiating and developing the subbasin or basin coordination as early as possible in the stages of the development of a GSP. Early on, coordination efforts could help develop the important relationships needed for subbasin and basin collaboration sooner. Doing so may also hasten the information development process for commonly needed subbasin or basin data, data tools, or other common information needs, which could potentially reduce the efforts and costs of those activities at the GSA level.

### Issues Needing Guidance Documents

Interviewees recommended the development of guidance documents on interconnected surface waters and groundwater dependent ecosystems, domestic well programs, suggested groundwater allocation mechanisms, and GSA powers and authorities. Such guidance would improve common understanding and facilitate development processes. Whether the guidance documents are developed through collaboration of the GSAs, through NGOs or Universities, by DWR, or combinations of these entities is

inconsequential. The point is such efforts would be valuable so that future GSAs have a better understanding of these issues and can better prepare GSP implementation processes.

### Talent Pool

Observers noted that SGMA has exacerbated an existing problem of a lack of talent in various water agencies, technical consulting organizations and relevant support staff. An effort to develop a strategy among all the agencies needing such talent, including federal, State and local agencies, would be useful. The shortage includes engineers, geologists, hydrogeologists, water technicians, data management experts and communication specialists as well as financial and managerial professionals.

While drinking water and wastewater technical training is available, there is minimal training available for other water-related technicians and professionals such as hydrographers, water well construction and allied installation workers, water samplers, laboratory technicians and other water technology occupations.

## The Bottom Line

If there is one way to describe what these first GSAs have gone through during the process of implementing SGMA, it would be to say that it has been a challenging and enlightening journey, as well as a watershed event.

# APPENDIX A. GSA AND GSP CONFIGURATIONS

## GSA Configurations by GSP Submittal Type

Link to sortable document: https://docs.google.com/spreadsheets/d/1hnERb-cXtwf4mgsCXkbbNXR4bdmv60pV/edit#gid=412692653

| GSP Submittal | Subbasin | Irrigation and Water District GSAs | MOA- MOUs/JPAs/ Coordination Agreements | City GSAs | County & CSD GSAs | SB 372 Special Districts |
|---|---|---|---|---|---|---|
| Adjudication in progress | Borrego | | | | | |
| Single Plan | Chowchilla | Chowchilla WD<br>Triangle T WD | Chowchilla Subbasin JPA | | Madera<br>Merced | |
| Single Plan | Cuyama Valley | | Cuyama Basin JPA | | | |
| DM_North Central Adopted | Delta-Mendota | DM II<br>Oro Loma WD<br>Patterson ID<br>West Stanislaus ID<br>Widren WD<br>Santa Nella WD | Central Delta-Mendota JPA - | Patterson | | |
| DM_Farmers_Adopted | | Farmers WD | | | | |
| Aliso WD GSA | | Aliso WD | | | | |
| DM_Grassland_Adopted | | Grasslands WD | Grasslands MOA-MOU | | Merced | |
| DM_SJREC_Adopted | | Turner Island #2 | San Joaquin River Exchange Contractors Coordination Agreement | Dos Palos<br>Firebaugh<br>Gustine<br>Los Banos<br>Mendota<br>Newman | Merced<br>Madera | San Joaquin River Exchange Contractors GSA |

| GSP Submittal | Subbasin | Irrigation and Water District GSAs | MOA- MOUs/JPAs/ Coordination Agreements | City GSAs | County & CSD GSAs | SB 372 Special Districts |
|---|---|---|---|---|---|---|
| DM_Fresno_Adopted | | | | | Fresno – Management Area A<br>Area B | |
| Single Plan | EASTERN SAN JOAQUIN | Central Delta WA<br>Central San Joaquin WCD<br>North San Joaquin WCD<br>Oakdale ID<br>South Delta WA<br>South San Joaquin ID<br>Stockton East WD<br>Woodbridge ID | Eastern San Joaquin Groundwater Authority JPA | Lodi<br>Manteca<br>Stockton | San Joaquin – Eastern 1 & 2<br>Lockeford Community Services District | |
| Single Plan | INDIAN WELLS VALLEY | | Indian Wells Valley JPA | | | |
| East Kaweah | KAWEAH | | East Kaweah GSA JPA | | | |
| Mid-Kaweah GSA | | | Mid-Kaweah GSA JPA | | | |
| Kaweah Subbasin - Greater Kaweah GSP | | | Greater Kaweah GSA JPA | | Tulare GSA - Kaweah | |
| Henry Miller Water District GSA | KERN | Henry Miller WD | Kern Groundwater Authority Coordination Agreement | | | |
| Kern Subbasin Olcese GSP | | Olcese WD | | | | |
| BVGSA | | Buena Vista WSD | | | | |

| GSP Submittal | Subbasin | Irrigation and Water District GSAs | MOA- MOUs/JPAs/ Coordination Agreements | City GSAs | County & CSD GSAs | SB 372 Special Districts |
|---|---|---|---|---|---|---|
| Kern Subbasin -KRGSA GSP | | | Kern River MOA-MOU | | | |
| KGA GSP | | Cawelo WD<br>Pioneer<br>Semitropic WSD<br>West Kern WD | | McFarland | | |
| Kings_McMullinArea_Adopted | KINGS | | McMullin GSA JPA | | | |
| Kings - North Fork Kings - Adopted | | | North Kings River GSA JPA | | | North Fork Kings GSA** |
| Kings Central Kings Adopted | | | | | Tulare | |
| Kings South Kings Adopted | | | South Kings GSA JPA | | | |
| Kings - Kings River East Adopted | | | | | | Kings River East GSA* |
| Kings – North Kings Adopted | KINGS | | Central Kings, James, Kings River East, McMullin Are, North Fork Kings, North Kings and South Kings, GSAs | | | |
| Kings - _James Adopted | | James ID | | | | |
| Single Plan | LAS POSAS VALLEY | | | | | Fox Canyon Groundwater Management Agency |
| Madera Subbasin Joint GSP | MADERA | | Madera, Madera, Madera ID, Madera | Madera | Madera | |

| GSP Submittal | Subbasin | Irrigation and Water District GSAs | MOA- MOUs/JPAs/ Coordination Agreements | City GSAs | County & CSD GSAs | SB 372 Special Districts |
|---|---|---|---|---|---|---|
| | | | Water District GSA JPA | | | |
| Madera Basin - GFWD GSA | | Gravelly Ford | | | | |
| Madera – New Stone Adopted | | New Stone WD | | | | |
| Madera RCWD Adopted | | Root Creek WD | | | | |
| Single Plan | MERCED | Turner Island #1 | Merced Subbasin Coordination Agreement | | | |
| Single Plan | OXNARD | | | | Ventura | |
| Alternative Plan | PAJARO VALLEY | | | | | Pajaro Valley Water Management Agency |
| Single Plan | PASO ROBLES | Shandon-San Juan WD | | Paso Robles | San Luis Obispo, San Miguel Community Services District | |
| Single Plan | PLEASANT VALLEY | Camrosa WD | | | Ventura | Fox Canyon Groundwater Management Agency |
| Single Plan* | SANTA CRUZ MID-* | | Santa Cruz Mid- GSA JPA | | | |
| Single Plan | TULARE LAKE | Delano-Earlimart ID | Tulare Lake Subbasin JPA<br>Tri- Water Authority JPA | | | |
| Basin - ETGSA GSP | TULE | | Eastern Tule JPA | | | |

| GSP Submittal | Subbasin | Irrigation and Water District GSAs | MOA- MOUs/JPAs/ Coordination Agreements | City GSAs | County & CSD GSAs | SB 372 Special Districts |
|---|---|---|---|---|---|---|
| Pixley ID GSA | | | Pixley ID GSA MOA-MOU | | | |
| DEID GSA | | Delano-Earlimart ID | | | | |
| Tule Subbasin Alpaugh GSP | | | Alpaugh ID GSA JPA | | | |
| LTRID GSA | | Lower Tule River ID | | | | |
| Basin TCWA - Tule | | | Eastern Tule GSA, Tri-County Water Authority GSA, Pixley ID GSA, Lower Tule River ID GSA, Delano-Earlimart ID GSA, Alpaugh GSA, Tulare County GSA | | | |
| Single Plan | WESTSIDE | Westlands WD | | | | |
| Single Plan* | 180/400 FOOT AQUIFER* | Marina Coast WD | Salinas Valley Basin - Aquifer JPA | Marina | Monterey | |

As noted throughout, a number of entities may exercise jurisdiction as a GSA. Following is discussion of the types of GSAs set up in the critically overdrafted subbasins and the approaches they utilized.

## Jurisdictions in Critically Overdrafted Subbasins by Governance Type.

**CITIES**

| GSA/GSP Type | Name | Status<br>Decision Drivers: Why pick this governance route?<br>SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *A city that is a single GSA with a GSP* | City of Marina | Marina has its own GSP and is also part of a subbasin GSP coordinated with the larger Salinas Valley Basin 180-400 Foot Aquifer Subbasin GSP, with elements that are specific to the city.<br>The principal GSP project objective is to limit seawater intrusion. The City of Marina is located on Monterey Bay and will derive significant benefits from implementing GSP projects that push the salt front away from their groundwater sources. | City Council members are the Board members of the GSA. Voting powers are the same as the City Council unless altered by the GSA. Meetings are separate from Council business. Brown Act regulations apply. The city engineer/public works director is the current staff charged with administering the GSA. | The City has the responsibility of securing the funds needed to administer the GSA and the GSP and the coordination agreement for the subbasin. |
| *A city that is a GSA and a member of an MOA-MOU organization* | City of Paso Robles | The primary groundwater issue in the subbasin is "chronic lowering of the groundwater levels." This is a major concern as local viticulture is a significant contributor to the local economy. Even so, the groundwater elevations in and near the city have been stable between the monitoring period of 1997 to 2017[30]. | The City Council is the governing body for the GSA. The Public Works Director is the staff named to administer the GSA. Brown Act regulations apply to the meetings of the GSA Board. | The city has a 15 % share of representation on the subbasin's Managing Cooperative Committee (MCC) created by the MOA. The MCC develops the annual budget. The members share the cost of the budget based on a percentage assigned to members and other participating parties. The MOA anticipates that approval of the GSP by the State will trigger a |

[30] Paso Robles Subbasin GSP – Figure 5-8

| GSA/GSP Type | Name | Status<br>Decision Drivers: Why pick this governance route?<br>SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | | | re-visit of the governing and financial arrangements of the MOA by the members. |
| *A city that operates a GSA within a JPA* | City of Mendota.<br><br>(Note: Numerous cities chose to be GSAs in the Delta-Mendota Subbasin.) | The city GSA is relatively small in geographic extent but does operate a city water system with groundwater wells. The issue facing small cities is that other than water conservation, their ability to fund groundwater sustainability projects is limited.<br><br>Their partnership in the San Joaquin River Exchange Contractors GSP through a JPA is valuable because the Exchange Contractors have assisted the member cities and communities to improve their sustainability with surface water supplies. The Exchange Contractors have been partnering with the small, disadvantaged communities within their jurisdiction since the 1980s and 1990s[31]. | The City Council is the Board for the GSA. The City Public Works Director is the GSA staff. Brown Act regulations apply when the Council sits as the GSA Board. | The city is responsible for its meeting costs. The San Joaquin River Exchange Contractors received State grant funding to pay for the GSP, including Mendota's and other severely disadvantaged communities' proportional share of the cost of the GSP. |
| *A city that is part of a JPA GSA* | City of Visalia | Groundwater is the primary source of Visalia's drinking water, but the | As part of the Mid-Kaweah JPA, the City of Visalia has two | The JPA Board of Directors is responsible for approving |

[31] SJR Exchange Contractors GSP – Executive Summary, page ii

| GSA/GSP Type | Name | Status<br>Decision Drivers: Why pick this governance route?<br>SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | (Note: Cities that joined a GSA through a JPA are also quite numerous.) | supplier is the California Water Service Company, a California Public Utilities Commission regulated system. The California Water Service Company is eligible to be an MOA partner in the JPA GSA under SGMA. However, the relationship is complicated. | votes on a six-member Board of Directors. Certain items can be acted on by a simple majority of a quorum of the Board of Directors. Most financial items require a unanimous vote of all members. | actions and adopting budgets for implementing the GSP and operating the JPA as recommended by a management committee. The management committee and its duties are outlined in the JPA agreement. The committee consists of staff from each of the three organizations represented on the Board of Directors. |

**COUNTIES**

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *A county with a GSA and GSP* | Fresno County has a GSA with its own GSP | Called the Fresno County GSA – Management Areas A and B. Management Area A is in the North and Central Delta-Mendota sub-group. Management Area B is in the San Joaquin River Exchange Contractor sub-group.<br>The land areas are multiple properties in the vicinity of the Mendota Pool, a storage and distribution reservoir built on the San Joaquin River and operated by the San Joaquin River Exchange Contractor Water | The Board of Supervisors serves as the governing Board for this GSA. The Public Works Department is the GSA's staff. | The administrative and implementation costs to serve the area will be funded by a land assessment. |

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | Authority. The properties assigned to each GSA were the result of a strategy developed by the County and the two Delta-Mendota sub-group GSP entities, the North and Central Delta-Mendota GSP sub-group and San Joaquin River Exchange Contractors GSP sub-group. The lands around the Mendota Pool reservoir operated by the San Joaquin River Exchange Contractors Water Authority were assigned to the San Joaquin River Exchange Contractors sub-group because they use water from the Mendota Pool. Examples include the State of California Mendota Wildlife Area and the Traction Ranch. The land assigned to the North and Central Delta-Mendota includes the Meyers Farming LLC Groundwater Banking Project and other Meyer's farming lands with a close relationship with water districts in the North and Central Delta-Mendota GSP sub-group that are also predominately in Fresno County | | |
| *A county that operates as a GSA member of an MOA-MOU GSP* | Merced County | MOA partner with the Grassland GSA in central Merced County.<br>The lands are predominately wetland and upland habitat for migrating birds. The Merced County Delta-Mendota Grassland GSA covers approximately 28% of the MOA. Groundwater is used in areas that do not | The governance of the MOA area is split; the County Board of Supervisors manages their portion of the MOA area, and the Grassland Water District Board manages their portion. Both boards are five members each. | The MOA and GSP anticipate the cost of administration and implementation in the MOA area will be some combination of permit and groundwater extraction fees or fees for other regulatory activities. |

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | have access to surface water allocated to the Grassland Water District, which operates the other GSA in the sub-group. The sub-group is part of the Delta-Mendota Coordination Agreement organized by the San Luis and Delta-Mendota Authority for the entire Delta-Mendota Subbasin. | | |
| *A county that operates as a GSA member of a JPA* | San Joaquin County | Operates two GSAs within the Eastern San Joaquin Groundwater Authority JPA jurisdiction.<br>San Joaquin County #1 and #2 GSAs include lands not covered by any other public agency. The JPA consists of 16 member agencies. The land area of the GSA is spread throughout County. San Joaquin County #1 appears to be more rural and scattered throughout the outer parts of the County. San Joaquin #2 covers lands that are around the City of Stockton. | The county staff serves as the administrator of the two GSAs. The Groundwater Authority's Board includes representatives from all the 16 member GSAs and the California Water Service Company through an agreement with San Joaquin County. The California Water Service Company is a CPUC regulated water utility that delivers drinking water to the City of Stockton. In addition, Calaveras County Water District and Stanislaus County share a seat on the Board because they cooperatively operate a member GSA, the Eastside San Joaquin GSA. The San Joaquin County Board of Supervisors retains one seat on the JPA Board and is currently the Chair of the JPA Board. A majority of the 16 | Proportional share of the GSP implementation costs were initially based on the percentage of responsibility adopted by the Board. In the future, implementation costs may be based on pumping class. Project financing within each GSA is the GSA's responsibility |

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | | members of the Board must approve administrative actions. A super-majority is required for the approval of financial matters and changes to legal documents. | |
| *A county that is part of a JPA GSA* | County of Santa Cruz | Mid-County Santa Cruz GSA JPA member GSA covers a coastal groundwater basin with a goal to manage potential seawater intrusion and overdraft conditions. The JPA is a successor to previous efforts in groundwater management and groundwater management plans lead by local water suppliers. | the JPA Board of Directors has two members each from the local agencies, including the City of Santa Cruz, the County of Santa Cruz, the Central Water District, and the Soquel Water District. The Board also includes three members of the public who represent individual private well owners. The agency uses a collaborative staffing model from the member agencies. | Until 2026, financial contributions to operate the GSA are based on a percentage assigned to the member agencies ranging from 20-percent to 70-percent. After 2026 a re-evaluation will occur by commissioning a fee and funding report written by a qualified consultant. The report will be used as a guide to develop an ongoing financial plan to support the efforts of the GSA. |

**Irrigation and Water Districts**

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *An irrigation district that is a GSA with their own GSP* | Lower Tule River ID (ID) | Co-located GSA to comply with SGMA. The GSA is in the Tule Subbasin and includes one of the areas with infrastructure damaged by subsidence, including damage to the Friant-Kern Canal. The Friant-Kern Canal delivers USBR Central Valley Project, San Joaquin River contract, and surplus | The same five-member Board of Directors serves both the ID and the GSA.<br><br>Lower Tule River ID shares management staff with a neighboring district and GSA, Pixley ID and Pixley ID GSA. | This GSA has already established a groundwater accounting process that includes the capability to charge a regulatory fee for the overuse of allocations. |

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | water from Friant Dam near Fresno to Kern County. The canal capacity was reduced by 40% due to subsidence in the Tule Subbasin near the canal. With shared management staff with Pixley ID and Pixley ID GSA. As a result of their collective understanding of the impacts groundwater pumping has had on the area, they have already adopted a very sophisticated scheme[32] for groundwater allocations, uses, and costs, including a transitional program for pumpers who exceed their allocation in a specified block of years. The Lower Tule River ID GSA is a member of the Tule Basin Coordination Agreement. | | |
| *An irrigation district that is part of an MOA-MOU organization* | Merced ID | Member of an MOU GSA that includes the City of Atwater, the City of Livingston, the City of Merced, Le Grand Community Services District, Planada Community Services District, and Winton Water and Sanitary District. The GSA is the Merced ID GSA. | The MOU's governing entity comprises representatives from participating agencies with Merced ID and the three cities each have one representative; the other agencies combined have one | Merced IU GSA completed a Proposition 26 fee study[33] and held a hearing[34] on a regulatory fee schedule. |

[32] Lower Tule and Pixley GSA Groundwater Rules
[33] Merced IU GSA fee report
[34] Merced IU GSA hearing on fees

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | | The Merced ID basically covers the Merced Subbasin.<br>The balance of the Merced Subbasin is covered by Merced County and a portion of Turner Island Water District.<br>All three agencies joined together to develop a subbasin GSP under a subbasin-wide coordination agreement | representative forming a five-person Board of Directors. | |
| *An irrigation district that operates a GSA in a JPA* | Semitropic Water Storage District | Operates a GSA in the Kern Subbasin under the auspices of the Kern Groundwater Authority<br>The Authority covers a substantial portion of the Kern Subbasin.<br>Semitropic Water Storage District has been a groundwater banking area for some time. They are a CA DWR "State Water Contractor" for importing surface water from the Sacramento-San Joaquin Delta. They also purchase other sources of northern California water as it has become available. The groundwater bank has members/partners from many areas of the State, including water purveyors in the Bay Area and Southern California. | The seven Board of Directors of Semitropic Water Storage District are also the GSA's Board. | The GSA and District use fees and assessments to finance GSA activities. Assessment changes will require a Proposition 218 election. |

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *An irrigation district that is part of a JPA GSA* | Mid-Kings River GSA is a JPA made up of Kings County Water District, the City of Hanford, and the County of Kings. | The Kings County Water District was formed to purchase stock in privately owned ditch companies that have surface water rights to local rivers, including the Kings River. The purpose of the purchase was to stop the sale of surface water to outside interests who proposed to export the water[35].<br>The district landowners mainly use groundwater. The JPA GSA is a member of the Tulare Lake Subbasin GSP through a subbasin-wide coordination agreement. | The Board of Directors of the JPA includes three representatives from Kings County Water District, one from the City of Hanford, and one representative of the stakeholder committee[36]. | The funding agreement allocates JPA costs to the members based on land area. Kings County Water District contributes 73%, the City of Hanford contributes 23%, and the County of Kings contributes 4% to fund the JPA. The agencies can raise their share of the funding through fees, land assessments, grants, and loans. |

**Special Act Districts**

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *An existing special act district groundwater management agency that has* | Fox Canyon Groundwater Management Agency | Groundwater management agency in Ventura County. Groundwater is used mainly by agricultural and municipal pumpers. The previously mentioned is the agency that had plans with basin management objectives for water | The agency has a Board of Directors made up of a Director from United Water Conservation District, a City Councilerson from an incorporated City, a | Groundwater extraction charges and surcharges for over-extraction are used to fund agency management efforts. |

[35] KCWD AB 3030/1938 Groundwater Report 2011
[36] Mid-Kings River GSA JPA agreement

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| *new GSPs for basins or subbasins in critical overdraft* | | quality that have not been met. As of the last posted annual report in 2016[37], 50% of the locations exceeded maximum contaminant levels for chlorides, nitrates, and total dissolved solids. In addition, groundwater levels were below sea level in both upper and lower aquifers near the coast. The agency prepared GSPs for the Las Posas Valley and Oxnard Subbasins and the Pleasant Valley Basin. | Supervisor from the County of Ventura, a representative from one of the small water districts, and an agricultural representative. Ventura County provides staff. | |
| *An existing special district water management agency that used the "alternate method" for SGMA GSP equivalency* | Pajaro Valley Water Management Agency | Has been managing water in the Corralitos-Pajaro Valley Basin since 1984. DWR approved their groundwater management plan submitted as an alternate method in July 2019[38] | Pajaro Valley Water Management Agency (WMA) has seven Directors, four are elected and three are appointed. The three appointed Directors serve two-year terms and must derive a majority of their income from agriculture. The elected Directors represent geographic divisions within the WMA. | WMA uses pumping charges and blended recycled water charges to fund the agency's activities. |
| *A new special district* | North Fork Kings Groundwater | Created through SB 564 (Canella). The district is located in southern Fresno | The GSA was divided into seven divisions for election | The agency conducted a Proposition 218 election for land |

[37] Fox Canyon GMA 2016 annual report
[38] CA DWR approval of Pajaro Valley WMA plan

| GSA/GSP Type | Name | Status<br>Decision Drivers – why pick this governance route? SGMA Considerations | Governance | Funding |
|---|---|---|---|---|
| | Sustainability Agency | County and a portion of northern Kings County and is an aggregation of both public and private water agencies. The public agencies include Fresno County, four public irrigation and water districts, three small community service and utility districts, and six mutual (shareholder) water companies. | purposes. The divisions are based on groupings of the above-described agencies. The organization also has a "policy committee" and a "rural advisory committee" appointed by the Board. The Board adopted rules and regulations[39] and a water banking policy[40]. | assessments that received 94% approval to charge $10 per acre. |

[39] North Fork Kings GSA rules and regs

[40] North Fork Kings groundwater banking policy

[41] https://docs.google.com/spreadsheets/d/1hnERb-cXtwf4mgsCXkbbNXR4bdmv60pV/edit#gid=412692653

# APPENDIX B. SELECT BIBLIOGRAPHY

The following articles represent the most relevant contemporary analyses and summaries of numerous evaluations of groundwater governance strategies. The emphasis is on the governance options and tools for agencies implementing the new Sustainable Groundwater Management Act in California. The goal of providing these links is to encourage the review of the work of external observers in order to potentially make the process of groundwater governance as efficient as possible.


"California's New Landscape for Groundwater Governance" - Conrad, E., Gordon, B., Moran, T., Blomquist, W., Martinez, J., Szeptycki, L. (2017), California's New Landscape for Groundwater Governance, Water in the West, Stanford Woods Institute for the Environment.

https://waterinthewest.stanford.edu/sites/default/files/Woods%20WITW%20Groundwater%20GSA%20Research%20Brief_Final.pdf

"Designing Effective Groundwater Sustainability Agencies: Criteria for Evaluation of Local Governance Options", - Kiparsky, M., Owen, D., Nylen, N., Christian-Smith, J., Cosens, B., Doremus, H., Fisher, A., Milman, A. (2016), Wheeler Water Institute, Center for Law, Energy & the Environment, UC Berkeley School of Law.

https://www.law.berkeley.edu/wpcontent/uploads/2016/02/CLEE_GroundwaterGovernance_2016-03-08.pdf

"Comparative analysis of institutions to govern the groundwater commons in California" - Langridge, R. and Ansell, C. (2018), Water Alternatives 11(3): 481-510.

http://www.water-alternatives.org/index.php/alldoc/articles/vol11/v11issue3/450-a11-3-3/file

"The Importance of Institutional Design for Distributed Local-level Governance of Groundwater: The Case of California's Sustainable Groundwater Management Act" - Owen, D., Kiparsky, M., Millman, A., Fisher, A (2017), 9 Water 755.

https://repository.uchastings.edu/faculty_scholarship/1652https://repository.uchastings.edu/cgi/viewcontent.cgi?article=2651&context=faculty_scholarship

"Decentralized Groundwater Governance and Water Nexus, Implications in the United States"– Megdal", S. & Petersen-Perlman, J. (2018), 59 JURIMETRICS J. 99–119.

https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/attachment/Groundwater_Nexus.pdf

"Advances in Groundwater Governance"- Megdal, S., Zuniga-Teran, A., Varady, R., Delano, N., Gerlak, A., Vimont, E. (2019), Chapter 24, CRC Press.

https://www.researchgate.net/publication/330566079_Advances_in_Groundwater_Governance/link/5c48b0e0299bf12be3ddd645/download

"Sustainable Groundwater Management Act and Local Agency Formation Commissions" (a white paper) - California Association of Local Agency Formation Commissions, (2016).

https://calafco.org/resources/reports-white-papers/calafco-white-paper-sustainable-groundwater-management-act-and-local

"Know Your Options: A Guide to Forming Groundwater Sustainability Agencies" - Kincaid, V. & Stager, R. (2015), California Water Foundation.

http://californiawaterfoundation.org/wpcontent/uploads/2015/09/CF_GSA_Guide_09.30.15_web.pdf

"Concurrent Governance Processes of California's Sustainable Groundwater Management Act", - Milman, A., & Kiparsky, M., (2020), Society & Natural Resources.

https://escholarship.org/uc/item/6x83x7p

"Dispute Resolution Processes: Thinking through SGMA Implementation" – Moran, T., Martinez, J., Blomquist, B., (2019), Stanford Water in the West.

https://waterinthewest.stanford.edu/publications/dispute-resolution-processes-thinking-through-sgma-implementation

# APPENDIX C. INTERVIEW QUESTIONS

Group interviews were conducted with people involved in forming GSAs and developing GSPs in critically overdrafted basins. The interviewees represented six categories of stakeholders: Technical Consultants, Disadvantaged Community Advocacy Representatives, Elected Officials, Environmental Advocates, GSA Managers, and Researchers. Each group was sent the following questions before the group interview.

Questions:

1. During the process of researching, developing or working with governance issues and governing bodies of the emerging GSAs and then the GSPs, what were the challenges that stood out the most in the goal of keeping all of the organizations moving forward?
    a. Were the stumbling blocks related to people issues (some who were not happy with what they had to do), was it personalities that tended to dominate the conversation, or were there other dynamics such as bureaucratic stumbling blocks that added difficulties to accomplishing the work and complying with the law? Was it all of the above?
2. What were the issues that, in your opinion, caused the most frustration or lack of understanding that instigated the need for careful examination and presentation, so everyone was able to move forward with the governance concepts and their implementation?
3. If you had the opportunity to work with the governance process over again, what would you change to make the effort more efficient and effective?

# REFERENCES


1. https://lao.ca.gov/2002/water_districts/special_water_districts.html
2. Cannon-Leahy, T. (2016) Desperate Times Call for Sensible Measures, The Making of the California Sustainable Groundwater Management Act, Golden Gate University Environmental Law Journal
3. CA DWR Adjudicated Basins map
4. CA DWR SGMA Portal
5. Kincaid, V. (2015) "Know Your Options, A Guide to Forming Groundwater Sustainability Agencies", O'Laughlin and Paris LLP and CA Water Foundation
6. California Water Code, Division 11
7. SB 372 of 2017
8. North Fork Kings - groundwater banking rules
9. Prop. 218
10. Proposition 26
11. Greater Kaweah 218 election
12. Groundwater Rights by Eastern Municipal Water District
13. Paso Robles Subbasin GSP – Figure 5-8
14. SJR Exchange Contractors GSP – Executive Summary, page ii
15. Cal Water Service rate review by City of Visalia
16. Grassland Sub-group GSP, Section 1, page 1-10
17. Lower Tule and Pixley GSA Groundwater Rules
18. Merced IU GSA fee report
19. Merced IU GSA hearing on fees
20. KCWD AB 3030/1938 Groundwater Report 2011
21. Mid-Kings River GSA JPA agreement
22. Fox Canyon GMA 2016 annual report
23. CA DWR approval of Pajaro Valley WMA plan
24. North Fork Kings GSA rules and regs
25. North Fork Kings groundwater banking policy
26. Madden Library Geospatial Services, "Groundwater in 3-D", CSU Fresno

FRESNO STATE
California Water Institute

2703 E Barstow Ave, MS JC133 • Fresno, Ca 93740
559.278.7001 • www.californiawater.org