



California Department of Water Resources

Sustainable Groundwater Management Program

Draft Strategic Plan



March 9, 2015

DWR Mission

To manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

Sustainable Groundwater Management Program *Strategic Plan*

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Acronyms

SGMA	Sustainable Groundwater Management Act
SGWM	Sustainable Groundwater Water Management
BMPs	Best Management Practices
CASGEM	California Statewide Groundwater Elevation Monitoring
DWR	California Department of Water Resources
SWRCB	State Water Resources Control Board
CWC	California Water Code
GSA(s)	Groundwater Sustainability Agency or Agencies
GSP(s)	Groundwater Sustainability Plan or Plans



After decades of debate, California lawmakers adopted far-reaching new laws to bring the State's critically important groundwater basins into a sustainable regime of pumping and recharge. This change in water management – the most important in several generations – promises profound payoff. Groundwater on average makes up over a third of California's water supply, and it serves as a critically important savings account in dry years.

We have formally managed surface water supplies for a century. However, unrestrained groundwater use has been the rule except in areas where the courts have intervened. In some parts of California, groundwater has been pumped destructively at high levels for decades. California endured a third year of drought in 2014, and groundwater levels reached all time historic lows in most areas of the State.

While local leadership has had good success in a number of areas, on the whole, our collective management of groundwater resources is simply not working.

Governor Brown worked with the California Legislature and other stakeholders to craft the Sustainable Groundwater Management Act (SGMA). The SGMA establishes a new structure for managing California's groundwater. Developing the SGMA was not without controversy, with some interests concerned about creation of a new regulatory bureaucracy and a fear that the State would be eager to exert control over local groundwater basins. The SGMA essentially says our best chance of achieving sustainable, dependable groundwater supplies is for each basin to be managed at the local level. Local leaders will decide how best to organize and take charge through the establishment of Groundwater Sustainability Agencies. The Department of Water Resources' (DWR) primary role will be to provide guidance and technical support to local agencies. The State Water Resources Control Board will only step in on an interim basis when, but only when, local agencies fail to exercise their responsibilities set forth in the legislation. DWR recognizes that every groundwater basin is different and that solutions must be tailored by region. DWR and other State agencies are ready to provide assistance, and the water bond passed in November 2014 includes \$100 million for local and regional groundwater planning and projects.

As we consider what it will take to manage our groundwater sustainably, we need to acknowledge all water resources are interconnected. The Governor's five-year *California Water Action Plan*, released in January 2014, describes this broader view of what we need to meet the demands of the future. It spells out the challenges and the decisive actions needed now to put California on the path to more sustainable water resources: make conservation a way of life, ensure that each region does all it can to put its own water resources to efficient use, protect and restore important ecosystems, and expand water storage capacity. Sustainable groundwater management is an essential pillar of the plan.

Getting to sustainable water management will take decades, and we need to start now. This will not be easy, but many local leaders have told me they are ready to step up. We need to begin managing our groundwater so it is available for future generations while we balance the immediate needs of our economy.

Mark W. Cowin

Director

California Department of Water Resources

Navigating the Strategic Plan

Groundwater in California

Groundwater is a critical and integral component of California's overall water supply, serving residents, businesses, farms, industries, and the environment. Unlike surface water, groundwater has not been regulated on a statewide basis. Except in specific adjudicated basins, a landowner may extract an unlimited amount of groundwater if put to a reasonable and beneficial use without seeking permission to use the water. In certain parts of the state, long-term groundwater use has had serious impacts including:

- Alarming declines in groundwater levels and storage
- Degradation in water quality
- Irreversible land subsidence
- Ecosystem impacts associated with streamflow depletion and the reduced connection between groundwater and surface water systems.

The current drought has increased Californians' awareness of groundwater management issues. Approximately thirty million Californians (about 75 percent) depend on groundwater for a portion of their water supply. On average, groundwater provides about 40 percent of total annual agricultural and urban water uses. Some areas are 100 percent dependent on groundwater for their supply.

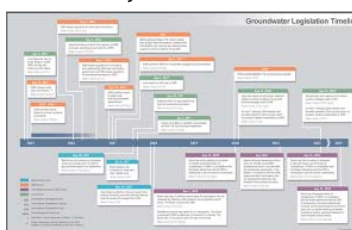
The **Sustainable Groundwater Management Program Strategic Plan** (*Strategic Plan*) describes the Department of Water Resources' roles and responsibilities under the Sustainable Groundwater Management Act (SGMA) and outlines related actions from the *California Water Action Plan* (CWAP).

This *Strategic Plan* aims to document the California Department of Water Resources' (DWR) strategy in helping to implement groundwater sustainability; share information with those who have interests in or management responsibilities for groundwater; and describe the structure through which DWR implements specific actions in coordination with stakeholders and partners.

DWR and the State Water Resources Control Board (SWRCB) are the two State agencies charged with helping to implement recent groundwater legislation. DWR's principal role is to provide guidance and support to local agencies across California to help them achieve a more sustainable future in water management. Several actions must be completed by specific dates set forth in the SGMA to accomplish this. This *Strategic Plan* does the following:

- Describes **current groundwater conditions** in the state, demonstrating the unsustainable nature of current management practices and framing the critical need for action
- Identifies **legislation and other drivers of policy**, including the SGMA, the *California Water Action Plan* and Proposition 1 (Water Bond)
- Identifies **success factors** in addressing the key challenges facing groundwater management in California
- Describes the **goals and objectives** that guide strategic concepts necessary for program implementation and the DWR actions to address the goals and objectives
- Presents an initial plan for DWR **communication and outreach** with partnering agencies, regional and local agencies, stakeholders, and the public.

Goals, Objectives, and Actions



Current GW
Conditions

Legislation &
Other Drivers

Success
Factors

Communication
& Outreach

Current Groundwater Conditions

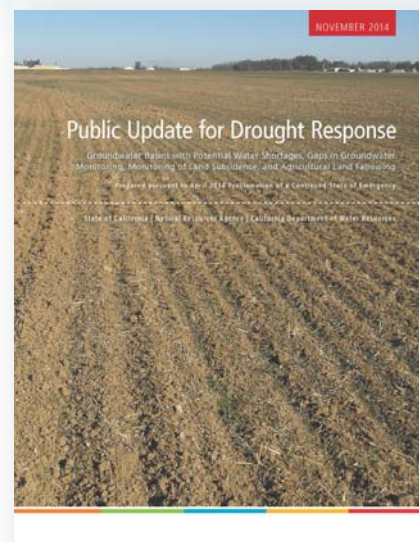
In November 2014, DWR published *Public Update for Drought Response; Groundwater Basins with Potential Water Shortages, Gaps in Groundwater Monitoring, Monitoring of Land Subsidence, and Agricultural Land Fallowing*. As part of the *Water Plan Update 2013*, DWR released *California's Groundwater Update 2013*.

These reports outline the decline of groundwater levels in some areas and the resulting issues and impacts. **Figure 1** illustrates the changes in groundwater levels from Spring 2010 to 2014 by showing numerous wells throughout California that have experienced declines in excess of 10 feet during this four-year period. The collective view of this information identifies areas that are experiencing local and regional declines in groundwater levels. Recent increases in groundwater pumping have resulted in renewed land subsidence in some areas and initiated new areas of land subsidence in others. **Figure 2** summarizes recent, historical, and the estimated potential for future land subsidence in California.

Severe drought in 2014 resulted in a lack of adequate surface water supplies, forcing many water users to increase groundwater pumping. This has resulted in further decline in groundwater levels and storage in the Central Valley from the 2010 levels shown in **Figure 3**.

Factors in recent groundwater level declines in many basins include:

- Chronic long-term pumping of groundwater in excess of the **safe yield** of the groundwater basin. Population growth, expansion of agricultural practices, allocation of water to environmental resources and restrictions to protect threatened species all have contributed to either increased water demand or decreased availability of surface water supplies in California. In response, many water users pump groundwater to offset the reduction in surface water supply.
- Short-term increase in groundwater pumping in drought years. Drought conditions in the last three years have exacerbated the groundwater conditions in many basins as more people use groundwater to meet their needs.
- Changes in irrigated land use. During the last two decades, more agricultural lands have been converted from annual crops to permanent crops, such as vine, nuts, and fruit trees, resulting in water demand hardening. Permanent crops require irrigation during the drought, while in the past many acres of annual crops were left idle through drought years.
- Climate change, resulting in reduced snowpack, will exacerbate the water supply and demand imbalance.

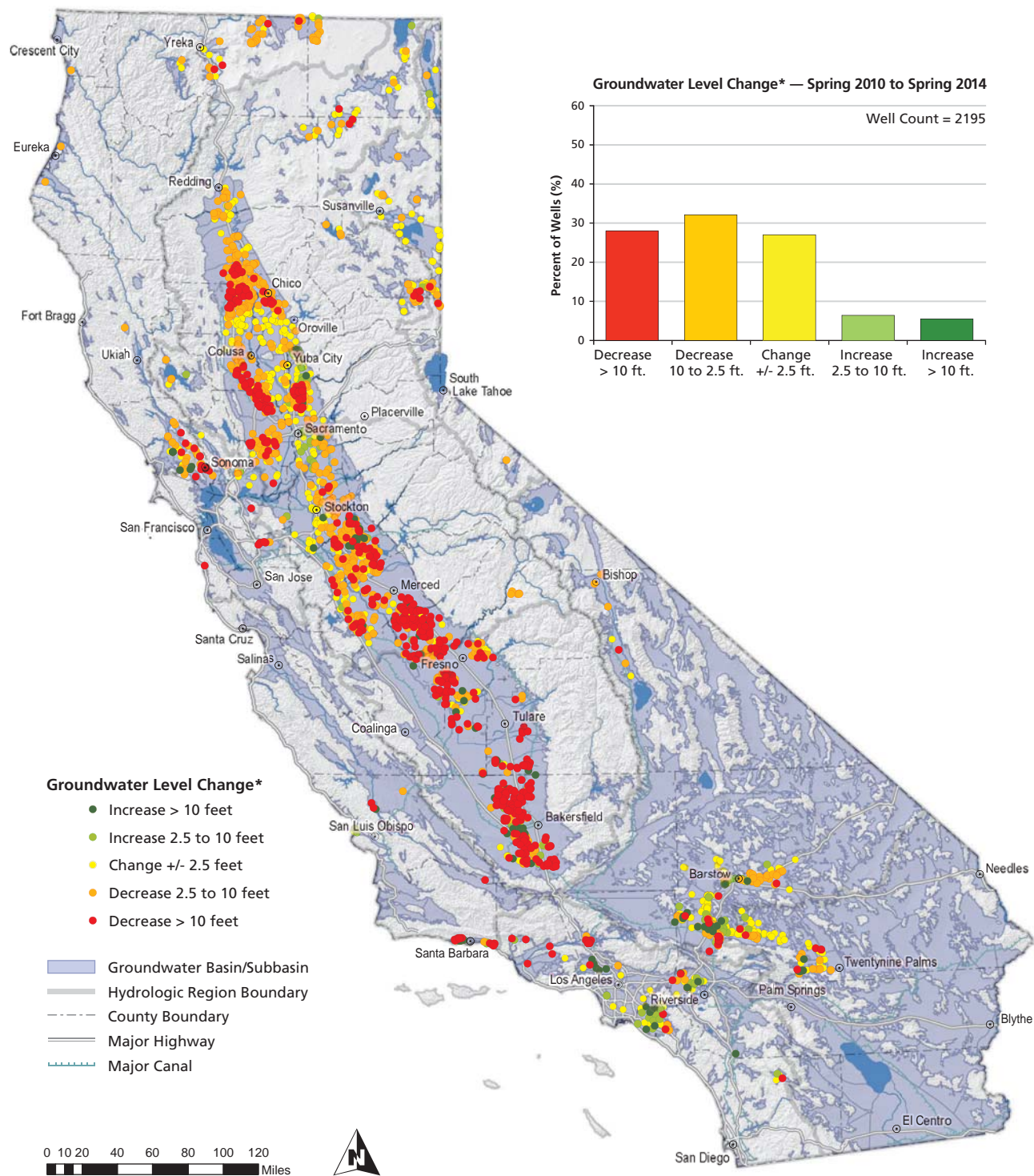


Public Update for Drought Response: *Groundwater Basins with Potential Water Shortages, Gaps in Groundwater Monitoring, Monitoring of Land Subsidence, and Agricultural Land Fallowing*

Key Definition

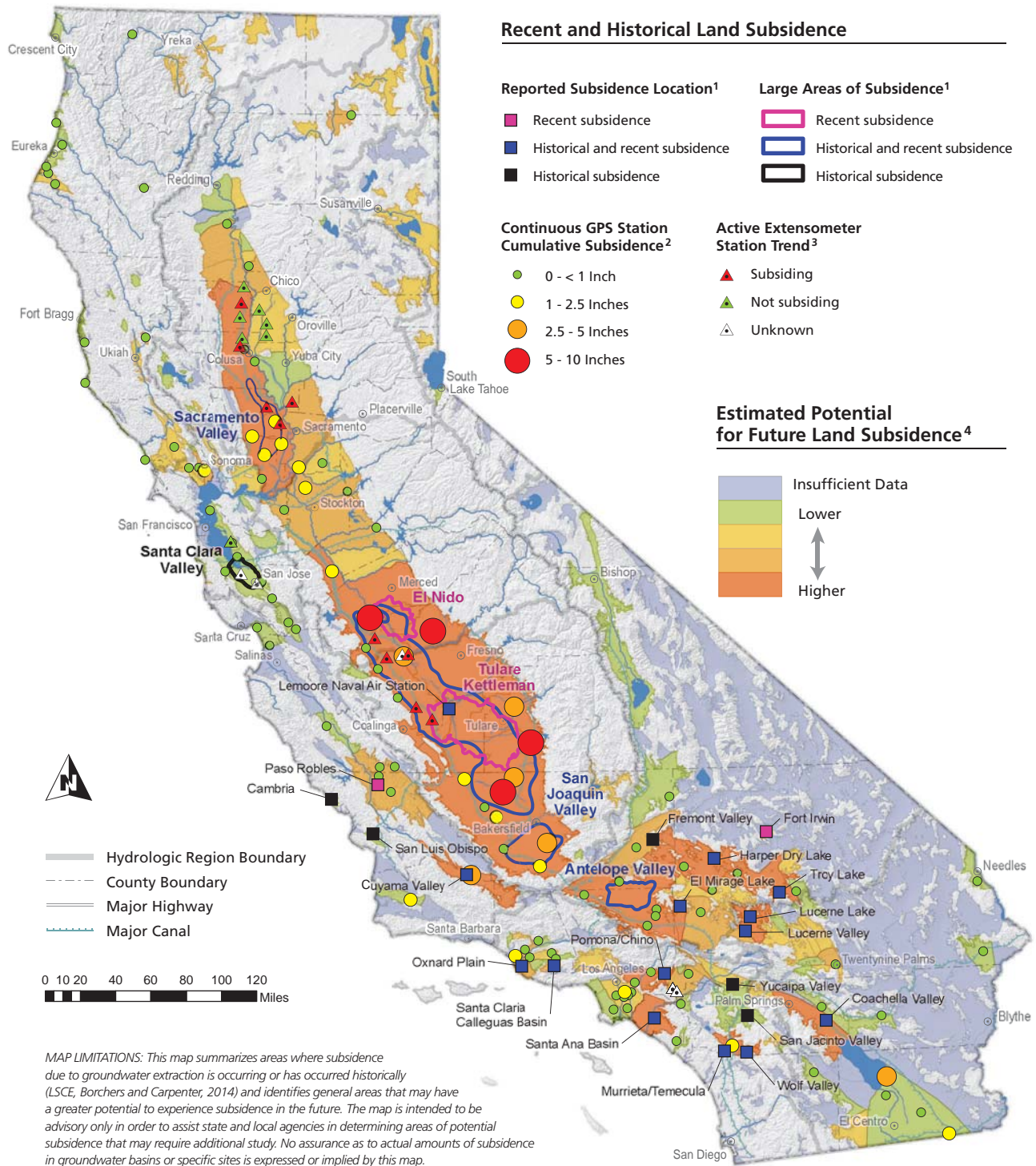
Safe Yield

The maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect.



*Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Water Data Library as of 11/08/2014. Data subject to change without notice.

Figure 1. Change in Groundwater Levels Spring 2010 to Spring 2014



¹ Land subsidence data modified from LSCE, Borchers and Carpenter, 2014. ² Continuous GPS data from UNAVCO.org.

³ Extensometer data from DWR (<http://www.water.ca.gov/waterdatalibrary>) and LSCE, Borchers and Carpenter, 2014

⁴ For more information on how the estimated potential for land subsidence was calculated see:

http://www.water.ca.gov/groundwater/docs/Summary_of_Recent_Historical_Potential_Subsidence_in_CA_Final_with_Appendix.pdf

Data current as of May 2014.

Figure 2. Summary of Recent, Historical, and Estimated Potential for Land Subsidence

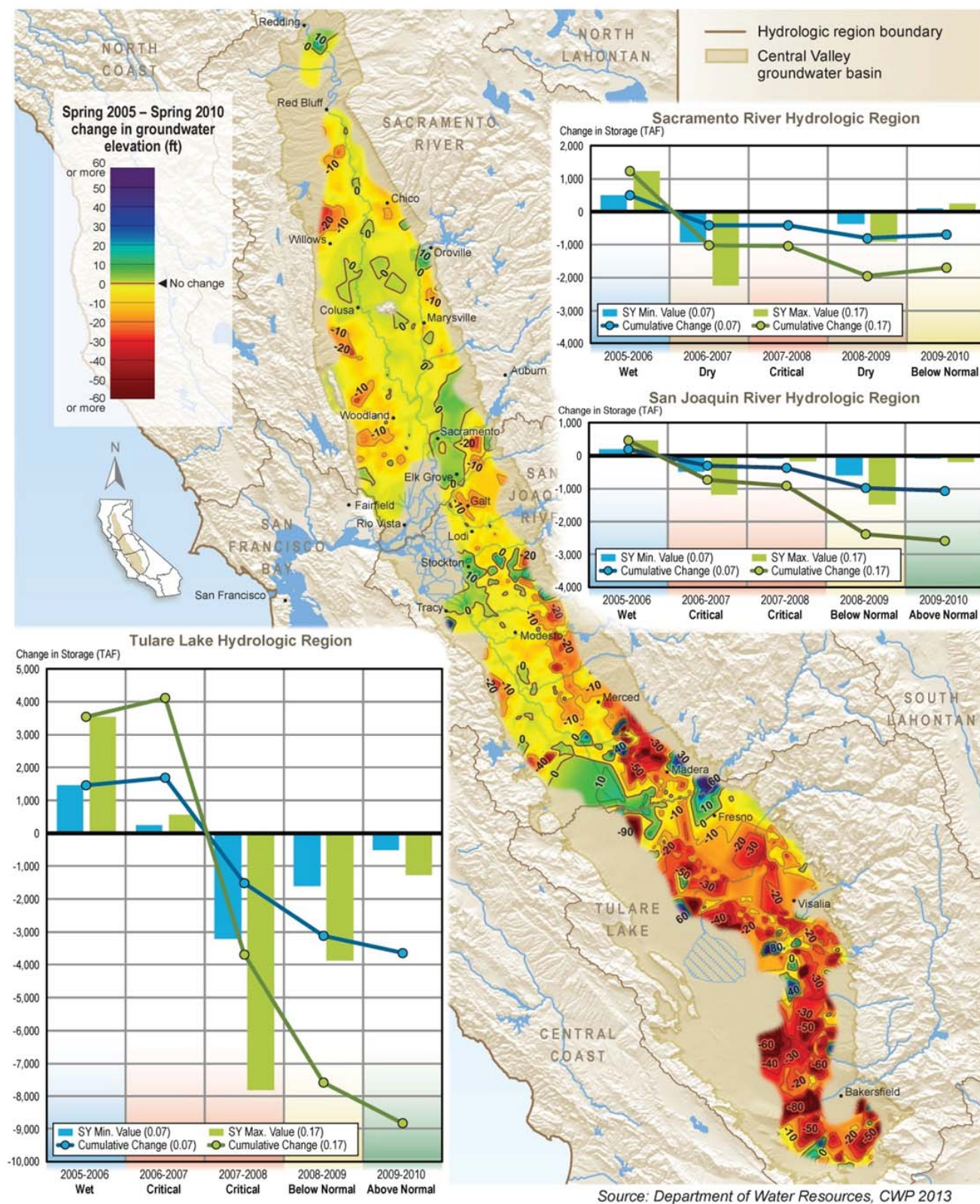


Figure 3. Change in Groundwater Storage in the Central Valley, Spring 2005–Spring 2010

Groundwater Basins

The SGMA addresses alluvial basins identified by DWR's *Bulletin 118*, with specific required actions for those basins that have been categorized as high or medium priority by the California Statewide Groundwater Elevation Monitoring (CASGEM) Program (described below). Groundwater within fractured rock is not addressed by the SGMA. In addition, low and very low priority basins are not subject to the requirements outlined in the SGMA, but local managers are encouraged to manage sustainably and can form Groundwater Sustainability Agencies and develop Groundwater Sustainability Plans.

As part of California's 2009 Comprehensive Water Package legislation (SBx7-6), DWR implemented the CASGEM Program. The SBx7-6 Groundwater Monitoring legislation added Part 2.11 to Division 6 of the California Water Code (§10920 et seq.), which established provisions and requirements for local agencies to develop and conduct groundwater level monitoring programs. The legislation required DWR to identify the extent of groundwater elevation monitoring within each of the alluvial groundwater basins defined in *Bulletin 118-2003*, and to prioritize those basins to help identify, evaluate, and determine the need for additional groundwater level monitoring. The legislation directed DWR to consider, to the extent available, all of the data components listed below as the basis for prioritizing the basins:

1. Population overlying the basin
2. Rate of current and projected growth of the population overlying the basin
3. Number of public supply wells that draw from the basin
4. Total number of wells that draw from the basin
5. Irrigated acreage overlying the basin
6. The degree to which persons overlying the basin rely on groundwater as their primary source of water
7. Any documented impacts on the groundwater within the basin, including **overdraft**, subsidence, saline intrusion, and other water quality degradation
8. Any other information determined to be relevant by DWR.

DWR evaluated California's 515 groundwater basins identified in *Bulletin 118-2003* and categorized them into four priorities:

- High Priority
- Medium Priority
- Low Priority
- Very Low Priority

The CASGEM basin prioritization identified 43 groundwater basins as High Priority, 84 basins as Medium Priority, 27 basins as Low Priority, and the remaining 361 groundwater basins or subbasins as Very Low Priority. The 127 groundwater basins designated as High or Medium Priority include 96 percent of the annual groundwater use and 88 percent of the 2010 population overlying the groundwater basin area. DWR recently determined that the basin prioritization completed in June 2014 for the CASGEM program and shown in **Figure 4** is the initial prioritization required by the SGMA.

Key Definition

Groundwater Basins

DWR's Bulletin 118 identifies 515 groundwater basins in California. The Act recognized these basins as the initial boundaries for groundwater management and permits revision of basin boundaries at the request of a local agency.

Key Definition

Overdraft

The condition of a groundwater basin where the amount of water withdrawn exceeds the amount of water replenishing the basin over a period of time.

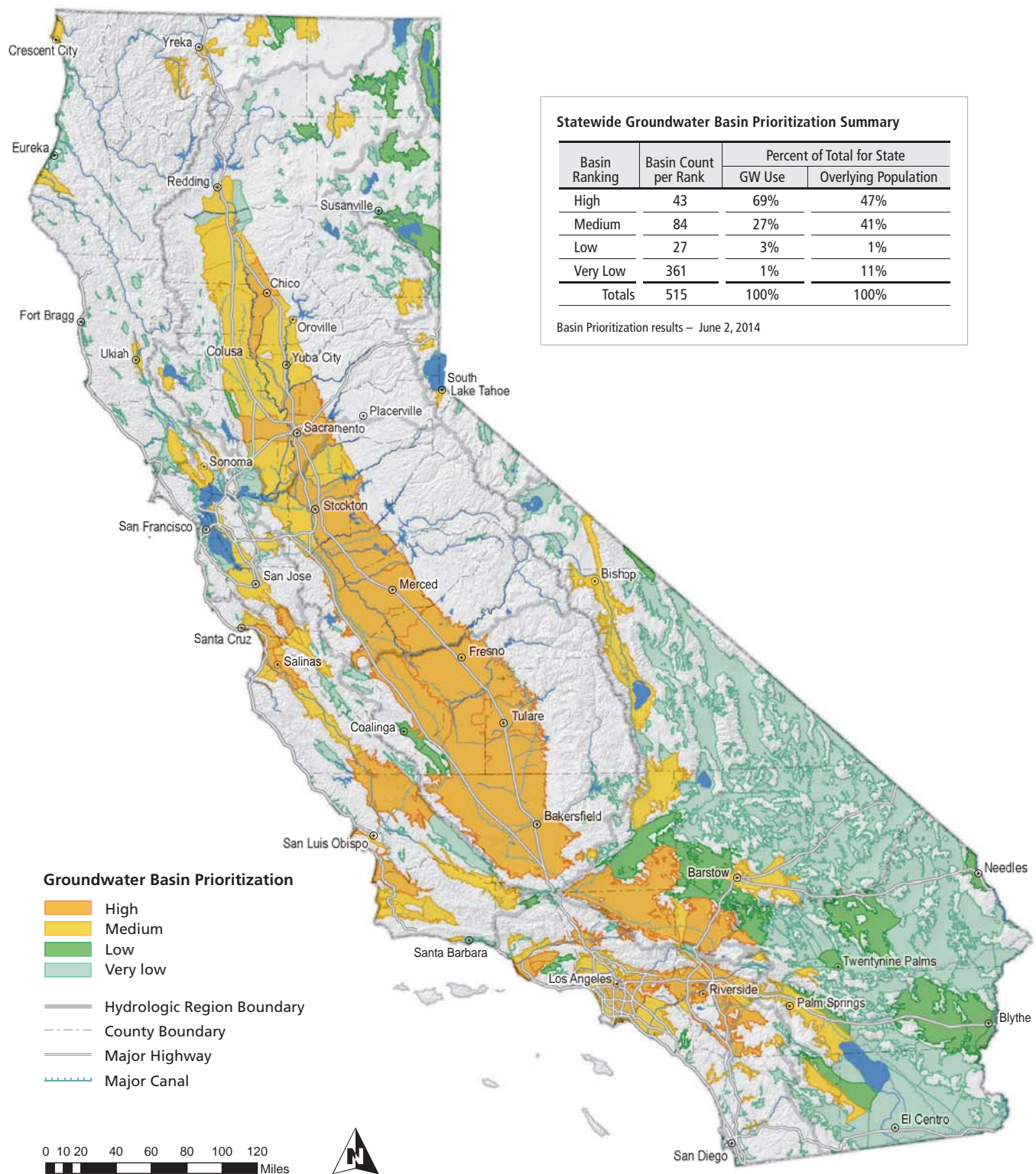


Figure 4. CASGEM Groundwater Basin Prioritization

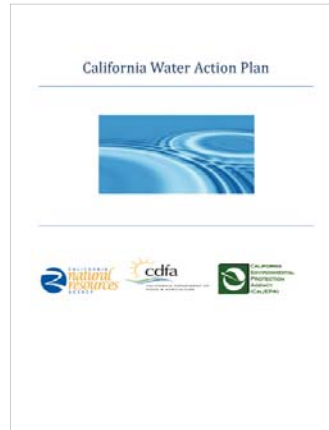
Legislation and Other Drivers of Policy

In January 2014, the Governor's Office released the **California Water Action Plan** (CWAP). The CWAP formulated actions that focus on sustainable water resource management for California's people, environment, industry, and agriculture, with the overarching goals to improve reliability, restore key ecosystem functions, and establish resilient resources that can be relied upon for future generations. Ten key actions identified in the CWAP:

1. Make conservation a California way of life
2. Increase regional self-reliance and integrated water management across all levels of government
3. Achieve the co-equal goals for the Delta
4. Protect and restore important ecosystems
5. Manage and prepare for dry periods
6. Expand water storage capacity and **improve groundwater management**
7. Provide safe water for all communities
8. Increase flood protection
9. Increase operational and regulatory efficiency
10. Identify sustainable and integrated financing opportunities

The CWAP acknowledges that there is broad agreement that the State's water management system is currently unable to satisfactorily meet all ecological and human needs, is too vulnerable to wet and dry climate cycles and natural disasters, and is inadequate to handle the additional pressures of future population growth and climate change. Water sustainability solutions are complex and expensive, and require the cooperation and ongoing commitment of all Californians working together. To be sustainable, solutions must consider the need to provide for public health and safety (e.g., safe drinking water, clean rivers and beaches, flood protection), to protect the environment, and to support a stable California economy.

CWAP recognizes the importance of increased water supply reliability, improved restoration of important species and habitat, and the develop-



An excerpt from the *California Water Action Plan* about the need for better groundwater management:

"The bottom line is that we need to expand our State's storage capacity, whether surface or groundwater, whether big or small. Today, we need more storage to deal with the effects of drought and climate change on water supplies for both human and ecosystem needs.... Moreover, we must better manage our groundwater basins to reverse alarming declines in groundwater levels. Continued declines in groundwater levels could lead to irreversible land subsidence, poor water quality, reduced surface flows, ecosystem impacts, and the permanent loss of capacity to store water as groundwater."

CWAP Action 6: Expand water storage capacity and improve groundwater management

- Provide Essential Data to Enable Sustainable Groundwater Management
- Support Funding Partnerships for Storage Projects
- Update Bulletin 118, California's Groundwater Plan
- Improve Sustainable Groundwater Management
- Support Distributed Groundwater Storage
- Increase Statewide Groundwater Recharge
- Accelerate Clean-up of Contaminated Groundwater and Prevent Future Contamination

Key Definition**Water Budget**

“Water budget” means an accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water stored. {Water Code § 10721 (x)}

ment of a more resilient and sustainably managed water resources system. The *CWAP* also outlines the importance of groundwater in achieving water management sustainability, a linkage between surface water and groundwater, and increasing the State’s groundwater and surface water storage capacity. Achieving groundwater sustainability will be dependent on implementing sustainable and balanced **water budgets** throughout California, and addressing most of the key actions identified in the *CWAP*.

Building up to the Sustainable Groundwater Management Act

There have been a number of previous legislative and administrative efforts that have laid the groundwork for development of the SGMA, and several of these are likely to be useful tools as implementation of the SGMA goes forward. These efforts include:

Assembly Bill 3030 (AB 3030)

The passage of AB 3030 in 1992 encouraged local agencies to prepare and adopt plans for managing their local groundwater resources, whether or not their groundwater basin exhibited overdraft conditions. This legislation was significant in that it greatly increased the number of local agencies authorized to develop a groundwater management plan and set forth a common framework for management by local agencies throughout California. AB 3030 provides a systematic procedure to develop a groundwater management plan by local agencies overlying the groundwater basins defined by *Bulletin 118-75* and updates. Upon adoption of a plan, these agencies could possess the same authority as a water replenishment district to “fix and collect fees and assessments for groundwater management” (Water Code § 10754). However, the authority to fix and collect these fees and assessments is contingent on receiving a majority of votes in favor of the proposal in a local election (Water Code § 10754.3).

Senate Bill 1938 (SB 1938)

In 2002, the Legislature passed SB 1938, which expanded groundwater management plan requirements related to groundwater levels, groundwater quality, inelastic land subsidence, and surface water-groundwater interaction, and required local agencies to develop and adopt plans so groundwater projects can be eligible for receiving public funds. The law requires any public agency seeking State funds administered through DWR for the construction of groundwater projects or groundwater quality projects to prepare and implement a groundwater management plan with certain specified components. New requirements included establishing basin management objectives, preparing a plan to involve other local agencies in a cooperative planning effort, and adopting monitoring protocols that promote efficient and effective groundwater management. **Figure 5** shows basins in California covered by some form of groundwater management plan.

Assembly Bill 359 (AB 359)

AB 359, introduced in 2011, made changes to the California Water Code that, among other things, requires local agencies to provide a copy of their groundwater management plans to DWR and requires DWR to provide public access to those plans. The bill

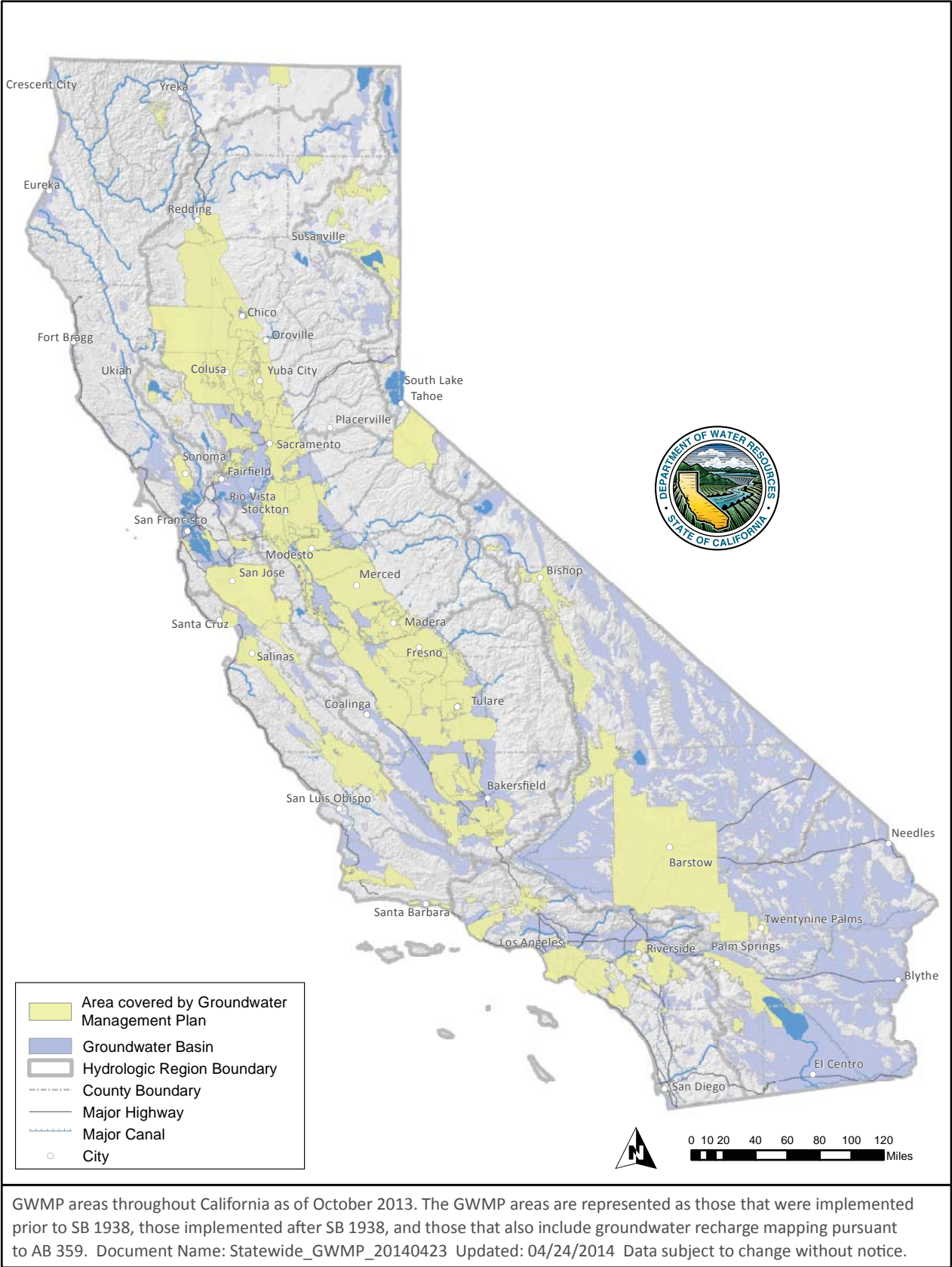


Figure 5. Location of Groundwater Management Plans in California

requires local agencies to provide a map of recharge areas to local planning agencies and notify DWR and other interested persons when a map is submitted. Prior to the passage of AB 359, which went into effect on January 1, 2013, local groundwater management planning agencies were not required to submit their groundwater management plans to DWR.

Local Groundwater Ordinances

Another method of managing groundwater is through ordinances adopted by local governments such as cities or counties. DWR's *Bulletin 118-2003* indicated that 27 counties adopted groundwater management ordinances related to the following activities: forming advisory committees; establishing basin management objectives; and controlling the export of groundwater by requiring permits for transferring groundwater out of the basin or county. The authority of counties to regulate groundwater has been challenged. An important event in 1995 was the California Supreme Court declining to review an appeal of a lower court decision, *Baldwin v. County of Tehama* (1994), that holds that State law does not occupy the field of groundwater management and does not prevent cities and counties from adopting ordinances to manage groundwater under their police powers. However, the precise nature and extent of the police power of cities and counties to regulate groundwater is uncertain. *Bulletin 118-2003* provided a model groundwater ordinance with recommended components of a groundwater management plan to guide local agencies as they develop groundwater management ordinances.

Adjudication

In some groundwater basins, as the demand for groundwater exceeded the safe yield and caused overdraft, landowners and other parties turned to the courts to determine how much groundwater can rightfully be extracted by each user. The courts study available information on groundwater use and other factors to arrive at a distribution of the groundwater that is available each year, usually based on the California law of overlying use and appropriation. This court-directed process can be lengthy and costly. Many of these cases have been resolved with a court-approved negotiated settlement, called a stipulated judgment. The court decisions guarantee to each party a proportionate share of the groundwater that is available each year. The intense technical focus on the groundwater yield and restrictions on groundwater extraction for all parties make adjudications one of the strongest forms of groundwater management in California.

The majority of adjudicated groundwater basins are located in Southern California and in the South Coast region (See **Figure 6**). For each adjudicated groundwater basin, the court usually appoints a water-master to oversee the court judgment. The majority of groundwater basin adjudications in California impose extraction limits and/or initiate management actions in the event of declining groundwater levels or water quality degradation. The primary objective of adjudication is to provide a proportionate share of available groundwater to users within the basin so it can be extracted without having adverse effects on existing groundwater supplies. Environmental concerns were not considered when most of the judgments were written.

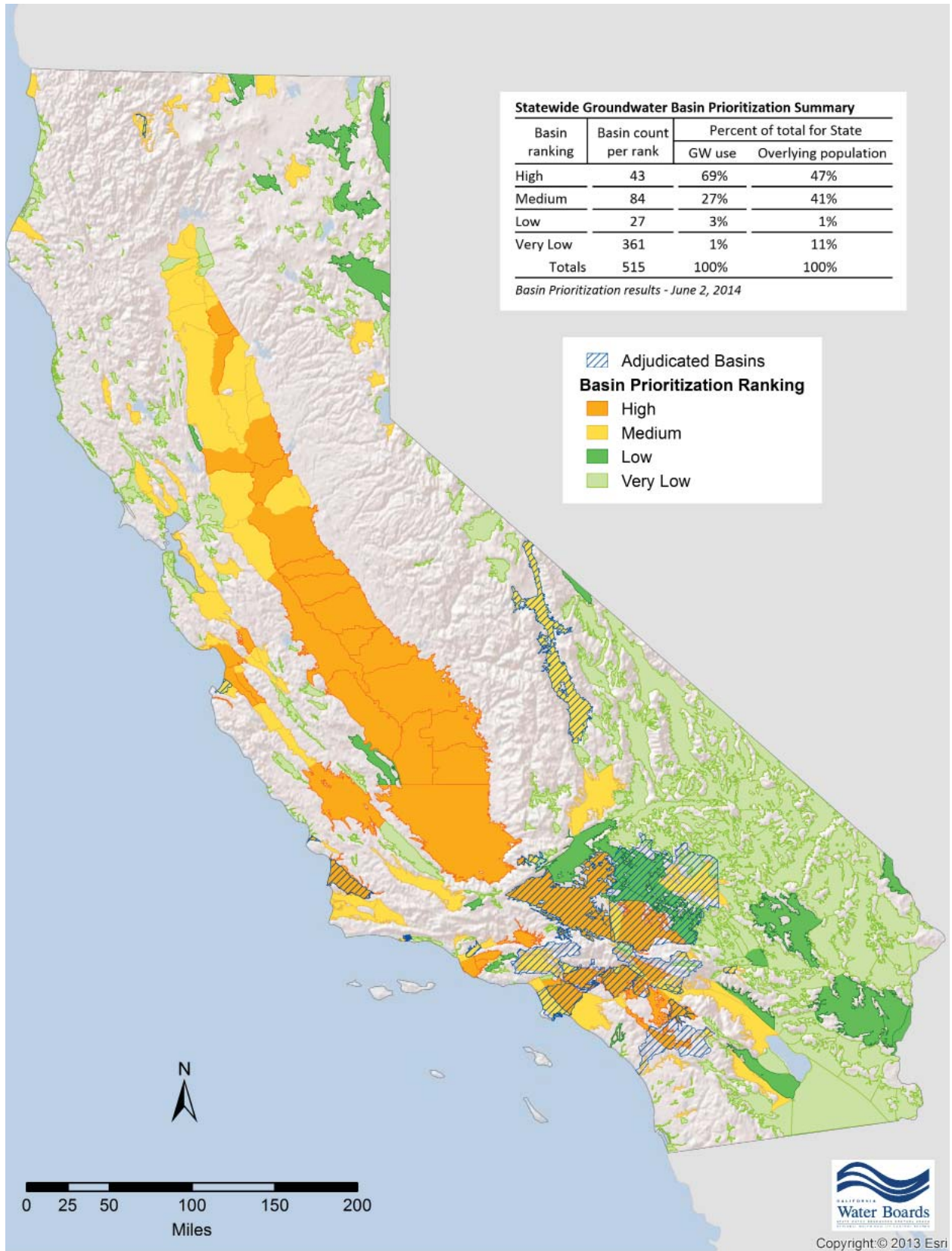


Figure 6. Adjudicated Groundwater Basins in California

Key Definition

Sustainable Groundwater Management

The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.

Key Definition

Undesirable Results

Chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence and depletions of interconnected surface waters.

Key Definition

Critical Conditions of Overdraft

A basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts (DWR Bulletin 118-80).

Key Definition

Groundwater Sustainability Agency

"Groundwater sustainability agency" means one or more local agencies that implement the provisions of this part. For purposes of imposing fees pursuant to Chapter 8 (commencing with Section 10730) or taking action to enforce a groundwater sustainability plan, "groundwater sustainability agency" also means each local agency comprising the groundwater sustainability agency if the plan authorizes separate agency action.*

**Local agency is a local public agency that has water supply, water management, or land use responsibilities within a groundwater basin.*

Sustainable Groundwater Management Act

On September 16, 2014, the Governor signed into law a three-bill legislative package: AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley). These laws are collectively known as the Sustainable Groundwater Management Act. This new legislation defines **sustainable groundwater management** as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" {Water Code § 10721(u)}. "**Undesirable results**" are defined in the legislation as any of the following effects caused by groundwater conditions occurring throughout the basin {Water Code § 10721(w) (1-6)}:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The legislation requires High and Medium Priority basins under the CASGEM program subject to **critical conditions of overdraft** to be managed under a groundwater sustainability plan by January 31, 2020 {Water Code § 10720.7(a) (1)}, and requires all other groundwater basins designated as High or Medium Priority basins to be managed under a groundwater sustainability plan by January 31, 2022 {Water Code § 10720.7 (a) (2)}. The legislation provides for financial and enforcement tools to carry out effective local sustainable groundwater management through formation of **Groundwater Sustainability Agencies (GSAs)**. The SGMA does not require adjudicated basins to develop GSPs, but they are required to report their water use. Additional work is underway to examine methods for expediting the adjudication process.

AB 1739

SB 1168

SB 1319

The Governor's signing message states,

"A central feature of these bills is the recognition that groundwater management in California is best accomplished locally."

The legislation significantly increases the role and responsibilities of DWR to support sustainable groundwater management. The legislation directs DWR to:

- Complete regulations for changing basin boundaries and establish content for and review of **Groundwater Sustainability Plans (GSPs)**
- Update basin priorities
- Conduct groundwater assessments into the next decade.

Together these new responsibilities require DWR to manage its existing resources and expand its expertise to meet the challenges and opportunities ahead.

The new legislation also expands the role of DWR to support local implementation of sustainable groundwater management, and allows for State intervention (SWRCB) at discrete points throughout the process if local agencies are not willing or able to manage groundwater sustainably.

Figure 7 (page 22) summarizes the major timelines and milestones on California's path to sustainable groundwater management.

Improving California groundwater management practices will require that local and regional agencies have the incentives, tools, authority, and guidance to develop, implement, and enforce sustainable groundwater management practices to provide the benefits of water supply reliability and resiliency, public health and safety, ecosystem services, and a stable California economy.

Key Definition

Groundwater Sustainability Plan

"Groundwater Sustainability Plan" is a plan of a Groundwater Sustainability Agency, proposed or adopted.



The severe drought in 2014 resulted in a lack of adequate surface water supply, which forced many water users to increase groundwater pumping. Above, Lake Oroville and the Enterprise Bridge looking from the South Fork on September 5, 2014.

Key Intended Outcomes and Benefits of the Sustainable Groundwater Management Act

Key intended outcomes of the SGMA include:

- Advancement in understanding and knowledge of the State's groundwater basins and their issues and challenges
- Establishment of effective local governance to protect and manage groundwater basins
- Management of regional water resources for regional self-sufficiency and drought resilience
- Sustainable management of groundwater basins through the actions of local governmental agencies, utilizing State intervention only when necessary
- All groundwater alluvial basins in California are protected and operated to maintain adequate quality to support the beneficial uses for the resource.
- Surface water and groundwater are managed as "a Single Resource" to sustain their interconnectivity, provide dry season base flow to interconnected streams, and support and promote long-term aquatic ecosystem health and vitality.
- A statewide framework for local groundwater management planning, including development of sustainable groundwater management best management practices and plans
- Development of comprehensive water budgets, groundwater models, and engineering tools for effective management of groundwater basins
- Improved coordination between land use and groundwater planning
- Enforcement actions as needed by the SWRCB to achieve region-by-region sustainable groundwater management in accordance with the 2014 legislation.

To assist in attaining the above outcomes, DWR will provide local agencies with the technical and financial assistance necessary to sustainably manage their water resources.

The benefits of these outcomes include:

- A reliable, safe and sustainable water supply to protect communities, farms, and the environment, and support a stable and growing economy
- Elimination of long-term groundwater overdraft, an increase in groundwater storage, avoidance or minimization of subsidence, enhancement of water flows in stream systems, and prevention of future groundwater quality degradation.

Success Factors

The SGMA provides a framework for best management of groundwater resources. There will be many challenges to overcome in implementing the SGMA, but addressing these will foster successful sustainable groundwater management. It is critical to identify and understand those challenges as DWR works with State, federal, and local agencies, tribes, and other stakeholders to achieve groundwater sustainability goals. Success will depend upon the following factors:

- **Balanced water supply and demand:** Current available surface water and safe yield of the groundwater basins must be balanced to support the current and future land use in the basin.
- **Coordinated water management within a basin:** Moving from disjointed basin management with sometimes conflicting interests and inconsistent objectives to a more coordinated structure will enable sustainable water management within basins.
- **Regulatory oversight and enforcement:** Managing groundwater extraction, establishing a fair allocation of groundwater resources, coordinating land use changes versus resource management, and controlling future groundwater development.
- **Regulation and criteria development:** DWR has the opportunity to promote local/regional groundwater management flexibility while ensuring that the ultimate goal of statewide sustainable groundwater management is achieved by developing appropriate and supportable criteria and regulations.
- **Basin stabilization:** Full recovery of the groundwater system may be possible in some basins. Critical issues that will need to be addressed include land subsidence and salts and nutrient concentrations. By addressing these impacts and challenges, basin managers can achieve significant improvements.
- **Improved data management:** Accurate and abundant data is necessary to assist basins in adequately developing and implementing plans to achieve the goals of the SGMA. This could include a more strategic and focused system of groundwater monitoring networks, extraction reporting, model and tool development, and a standardized process to determine water budgets for the basin.
- **Funding and resources:** Immediate, reliable, and long-term State and local funding will enable and support the achievement of the goals for sustainable groundwater management. Certain rural and disadvantaged communities will benefit from adequate funding to achieve their goals.
- **Communication and outreach:** Fostering robust communication amongst multiple entities with differing roles and responsibilities and stakeholders with differing and sometimes conflicting interests will further chances for success. Flexibility and cooperation will support consensus building amongst the various interested groups.
- **Uncertainties:** Addressing uncertainties directly will improve the likelihood for success, including those related to data, modeling and the long term effects of climate change. However, we must acknowledge we will not completely eliminate uncertainties and will therefore need to allow for adaptive management of systems as system knowledge improves.

Groundwater Sustainability Goals, Objectives, and Actions

The goals and objectives of this *Strategic Plan* are specific to DWR's role in achieving the overall goal of sustainable groundwater management, which means assisting local agencies to achieve balanced groundwater basin conditions and avoid adverse impacts such as land subsidence and long-term overdraft of the basin. Two key principles of the groundwater legislation guiding DWR include the following:

Groundwater is best managed at the local or regional level, and local agencies should have the tools they need to sustainably manage their resources. Some local and regional agencies do not currently have the necessary tools and resources to be successful. The legislation ensures that local and regional agencies will have the resources they need to sustainably manage groundwater, including the necessary authority, technical information, and financial resources.

When local or regional agencies cannot or will not manage their groundwater sustainably, the State will intervene until the local agencies develop and implement sustainable groundwater management plans. This limited State intervention would be temporary—until an adequate local program is established—to ensure the protection of the groundwater basin and its users from overdraft, subsidence, and other problems stemming from unsustainable uses of groundwater resources.

DWR's Groundwater Sustainability Goal

DWR will seek to assist local and regional GSAs to manage groundwater sustainably for long-term reliability, for economic, social, and environmental benefits, for current and future beneficial uses, and as an integral part of broader sustainable water management throughout California.

To achieve this goal, DWR has developed the following objectives. These objectives define DWR's approach to organizing and executing the work necessary for successful program implementation.

Objective 1: Develop a Framework for Sustainable Groundwater Management

Providing a structure which will enable GSA's to achieve success will require many factors be addressed. This objective will address basin boundaries and prioritization, GSP formulation and content, BMP's, and water budgeting. In order to address directives from the Sustainable Groundwater Management Act, DWR will develop regulations to inform and support regional efforts.

Objective 2: Provide Statewide Technical Assistance to Groundwater Sustainability Agencies

Providing technical assistance to GSA's will be crucial in enabling their success in managing their groundwater basins. GSA's will depend on easily accessible data and will be able to access this information via an online information system. Well standards and water conservation assistance will also be addressed.

Objective 3: Provide Statewide Planning Assistance to Support Groundwater Sustainability

DWR's *Bulletin-118* provides a systematic evaluation of groundwater basins in California, and will be updated to reflect critical information, including basin boundaries, groundwater quality data, yield data, and water budgets. This information will support and inform statewide water planning and assessment, including water budgeting, via DWR's *California Water Plan (Bulletin-160)*. DWR will also provide information to support local groundwater recharge projects.

Objective 4: Assist State and GSA Alignment and Provide Financial Assistance

Strong alignment and collaboration between and amongst local, regional, and State agencies will be critical to achieving sustainable groundwater management statewide. DWR will provide venues for communication and engagement, educational materials, and facilitation services, as well as financial assistance to help ensure success.

Objective 5: Provide Interregional Assistance

Achieving this objective will require DWR to support regional water managers with information on water reliability, storage and conveyance opportunities, water available for replenishment, and updated surface-groundwater interactions.

These objectives will be addressed by way of a suite of actions undertaken by DWR over the coming years to promote and support sustainable water management. These corresponding actions are defined in the following section.

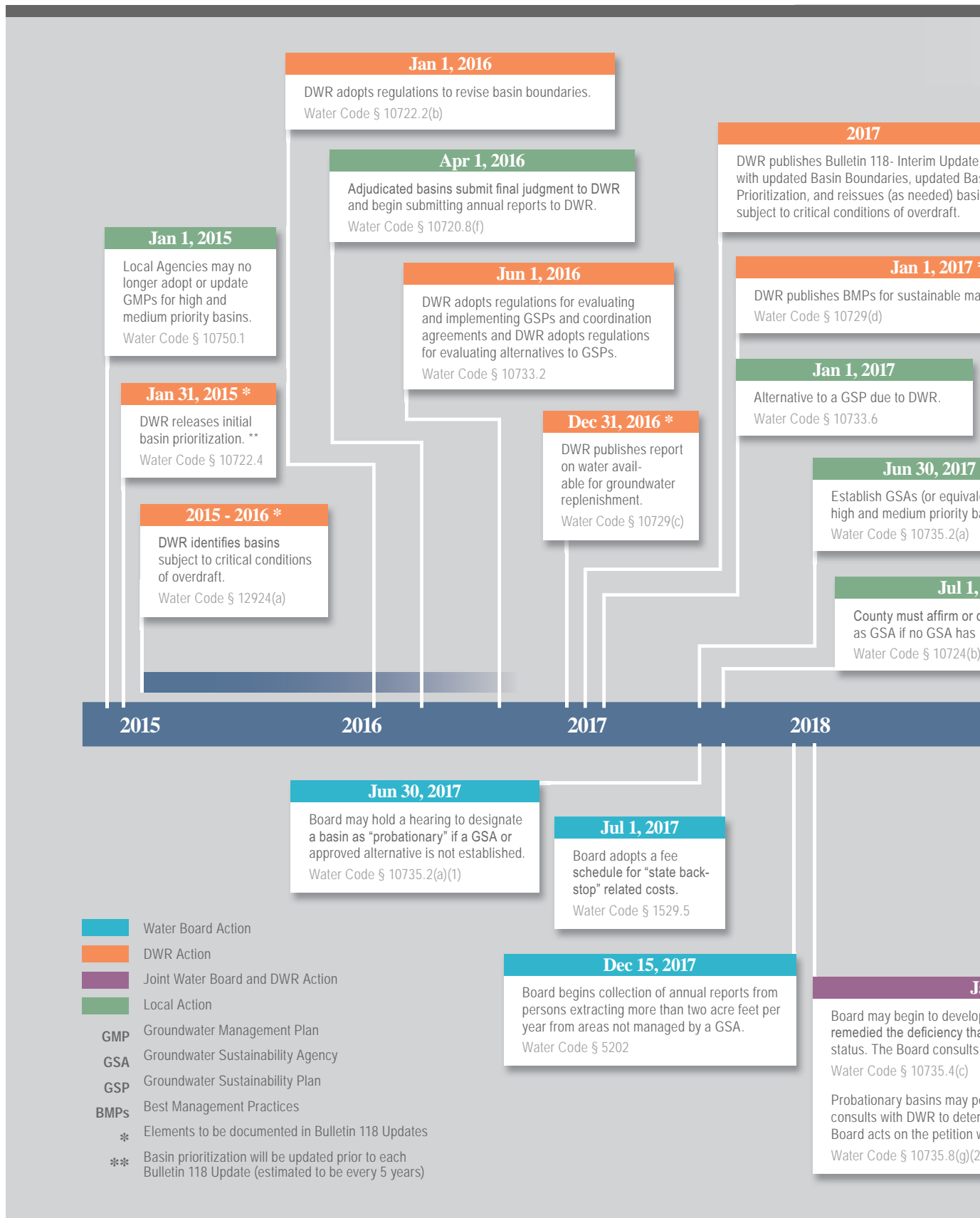
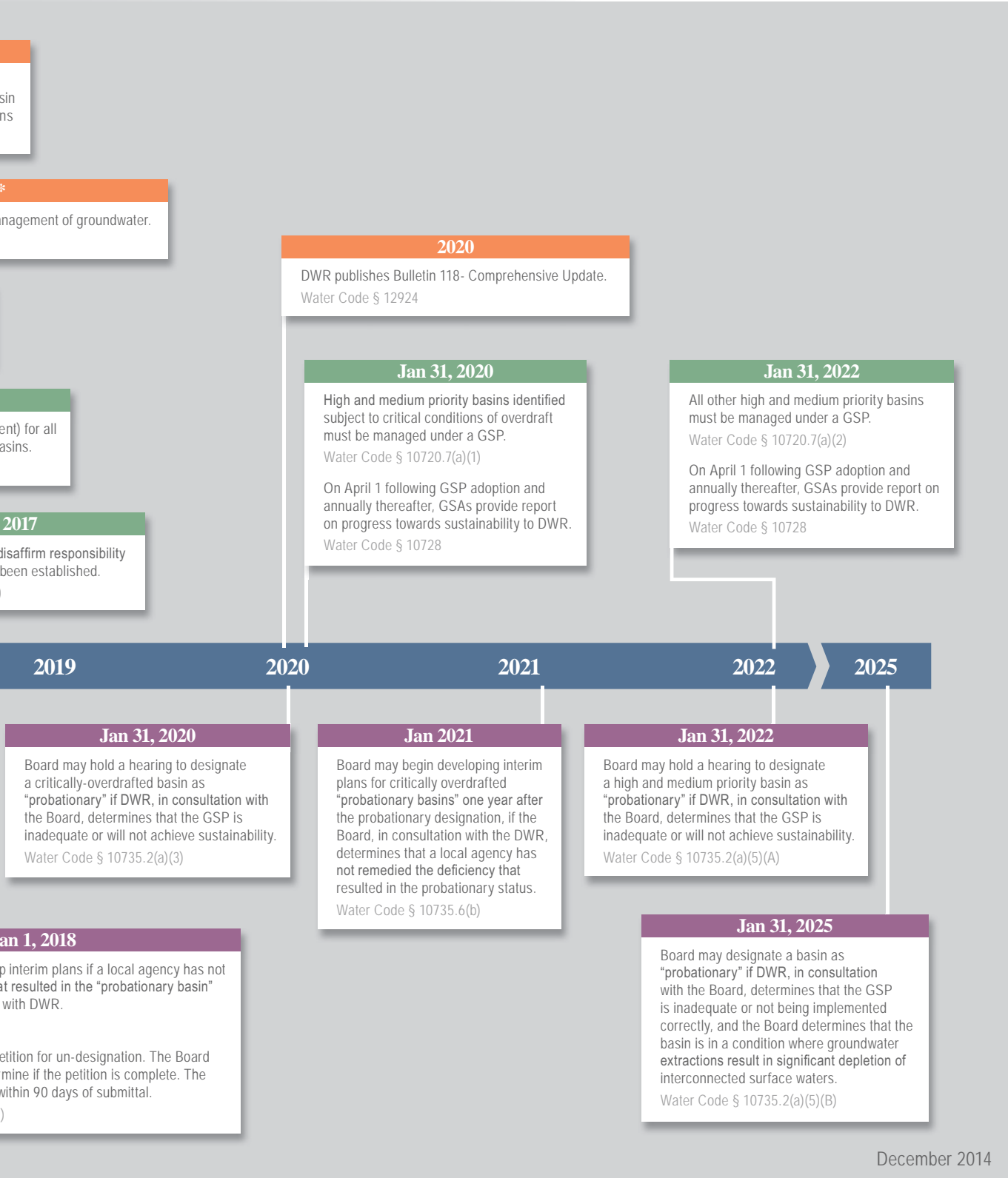


Figure 7. Major Timeline of Key SGMA Milestones

Key SGMA Milestones



DWR Objectives and Corresponding Actions

DWR's groundwater sustainability objectives and their associated actions are formulated to assist local agencies and GSAs to prepare and implement plans to achieve sustainable groundwater management in their basins. These objectives and their related actions were developed to achieve the key intended outcomes.

Objective 1: Develop a Framework for Sustainable Groundwater Management

Action 1.1 Develop Comprehensive Water Budgets for the Entire Basin

DWR will provide guidance and criteria for preparing water budgets and will review, verify, and provide comments on the water budgets prepared by the GSAs. DWR will work with local agencies to provide technical expertise to quantify comprehensive water budgets for the entire basin, including connections to upper watersheds and adjacent basins, and support making the information available to the agencies and the public through a web-based information management system.

Jan 31, 2015 *

DWR releases initial basin prioritization. **
Water Code § 10722.4

Action 1.2 Update Basin Prioritizations

DWR will periodically revise and publish basin prioritization through updates of *Bulletin 118*. Groundwater basins will be categorized as High, Medium, Low, or Very Low Priority using eight criteria including basin population, irrigated acreage, and degree of reliance on groundwater. The initial basin prioritization already has been determined as that published in June 2014 pursuant to CASGEM. Future basin priority updates will include assessment of groundwater-related impacts to habitat and streamflow.

Jan 1, 2017 *

DWR publishes BMPs for sustainable management of groundwater.
Water Code § 10729(d)

Action 1.3 Develop Best Management Practices

By **January 1, 2017**, DWR will publish best management practices (BMPs) for sustainable groundwater management. These BMPs will provide descriptions of essential elements to be incorporated into a GSP, including stakeholder coordination, effective and appropriate monitoring systems for determining how well sustainability objectives are being met, essential data collection and management, and public transparency guidance. The BMPs will be incorporated into future *Bulletin 118* updates.

Jan 1, 2016

DWR adopts regulations to revise basin boundaries.
Water Code § 10722.2(b)

Action 1.4 Develop and Adopt Regulations for Basin Boundary Revisions

By **January 1, 2016**, DWR will adopt regulations, which will include the methodology and criteria to be used in evaluating and approving basin boundary adjustments. DWR will then evaluate and approve local agency requests for basin boundary changes where supporting documents meet the specified criteria. Boundary changes will be published in *Bulletin 118: California's Groundwater*.

Action 1.5 Develop and Adopt Regulations for Groundwater Sustainability Plan Assessment and GSP Alternatives

By **June 1, 2016**, DWR will develop and adopt regulations for evaluating the adequacy of GSPs, the implementation of GSPs, and the development of coordination agreements.

These regulations will identify necessary plan components and describe how DWR will determine whether sustainable management objectives and actions developed by GSAs meet the intent of the SGMA. The regulations also will identify required necessary information for coordination with adjacent GSAs.

By **June 1, 2016**, DWR also will adopt regulations for evaluating alternatives to GSPs. Local agencies that wish to manage the basin under an alternative to GSP will need to submit their alternative to DWR by January 1, 2017. Basins managed under adjudication are required to submit their final judgment to DWR by April 1, 2016, and begin submitting their annual reports to DWR.

Jun 1, 2016

DWR adopts regulations for evaluating and implementing GSPs and coordination agreements and DWR adopts regulations for evaluating alternatives to GSPs.

Water Code § 10733.2

Action 1.6 Identify Basins Subject to Critical Conditions of Overdraft

By **2016**, DWR will develop and apply criteria to identify basins subject to critical conditions of overdraft.

2015 - 2016 *

DWR identifies basins subject to critical conditions of overdraft.

Water Code § 12924(a)

Action 1.7 Evaluate Adequacy of Groundwater Sustainability Plans

Within two years of receiving a GSP, DWR will evaluate the GSP and provide the GSA with an assessment of the plan– including recommended corrective action to address plan deficiencies or adequacy to achieve sustainability.

Objective 2: Provide Statewide Technical Assistance to Groundwater Sustainability Agencies

Action 2.1. Develop a Groundwater Management Information System

DWR will develop a web-based groundwater management information system to collect, organize, store, and manage the exchange of information between DWR and GSAs.

Action 2.2. Collect Groundwater Quality Data

DWR will continue to collect and make groundwater quality data available.

Action 2.3. Collect Groundwater Elevation Data

DWR will continue to collect, assess, and make groundwater level data available and provide assistance to improve/expand statewide groundwater elevation monitoring for high and medium priority basins.

Action 2.4 Collect Subsidence Data

DWR will provide support to advance the collection and reporting of land subsidence data and opportunities to improve subsidence monitoring through remote sensing techniques.

Action 2.5 Establish Well Standards

DWR will update the California Well Standards and submit them to the SWRCB for adoption into the Model Well Ordinance. DWR will provide training to local enforcing agencies in administering the updated Standards.

Action 2.6 Implement the CASGEM Program

DWR will continue to support the CASGEM program and efforts that support local collection, analysis, and reporting of relevant data and information.

Action 2.7 Promote Water Conservation

DWR will provide assistance and water management strategies to groundwater-reliant entities to promote water conservation and protect groundwater resources

Objective 3: Provide Statewide Planning Assistance to Support Groundwater Sustainability

2017

DWR publishes Bulletin 118- Interim Update with updated Basin Boundaries, updated Basin Prioritization, and reissues (as needed) basins subject to critical conditions of overdraft.

Action 3.1 Update Bulletin 118

By 2017, DWR will complete an interim *Bulletin 118* Update, then by 2020, and every 5 years thereafter DWR will update Bulletin 118, which will include updated basin boundaries and basin prioritization and identify basins that are subject to critical conditions of overdraft.

Action 3.2 Integrate Groundwater information into Bulletin 160

DWR will incorporate basin budget information from *Bulletin 118* updates into statewide planning analysis developed as part of the Department's *Bulletin 160 California Water Plan* updates, to assess changes in aquifer storage and long-term groundwater sustainability throughout California.

Action 3.3 Local Assistance for Recharge Projects

DWR will support the development, protection, and operation of a statewide network of locally and regionally operated natural and artificial groundwater recharge and managed groundwater storage sites. This will include identifying regulatory barriers and assist in removing those barriers, and providing technical tools and assistance to promote natural and managed groundwater recharge. This action will complement Action 5.1.

Objective 4: Assist State and GSA Alignment and Provide Financial Assistance

Action 4.1. Alignment for management of groundwater programs

DWR will establish State agency steering committees, policy groups, and technical advisory groups to help strengthen and improve alignment and collaboration with the State and GSAs, and to provide guidance and support to GSAs and other stakeholders. State agency steering committees will ensure collaboration, avoid redundancy, and remain in alignment throughout the implementation process.

Action 4.2 Provide Financial Assistance

DWR will provide funding to help local agencies to develop tools and models, prepare water budgets, and provide technical assistance in helping GSAs prepare their GSPs.

"One hundred million dollars (\$100,000,000) shall be made available for competitive grants for projects that develop and implement groundwater plans and projects"

—Proposition 1

Action 4.3. Provide Education and Communication Assistance

DWR will assist in establishing effective communication pathways between GSAs and stakeholders through the implementation of a public engagement and outreach plan. DWR will provide education materials to stakeholders to assist in the development of groundwater sustainability agencies.

Action 4.4. Provide Facilitation and Engagement Assistance

DWR will provide neutral facilitation services to assist GSA development by assessing local issues, identifying common values and objectives, and establishing a framework for consensus building.

Objective 5: Provide Interregional Assistance**Action 5.1. Assist in the Implementation of Storage and Conveyance Projects**

DWR will provide assistance to local agencies to implement groundwater conjunctive use and help curb groundwater overdraft. This could include development of storage projects, conveyance, inter-regional and systemwide infrastructure improvements for basin water supply reliability and to reduce reliance on groundwater.

Action 5.2. Provide Information on Surface Water Reliability

DWR will provide systemwide water supply availability information including State Water Project and Central Valley Project water supply reliability and delivery information.

Action 5.3. Advance Studies on Surface/Groundwater Interaction

DWR will advance studies, modeling, tools and integrated water management actions that support the understanding and ability to manage water as a single resource. Independent management of surface water and groundwater resources often result in undesirable consequences to the long-term supply of one or both of these resources.

Action 5.4. Provide Information for Water availability for Replenishment

By December 31, 2016, DWR will publish a report providing a statewide estimate of water available for groundwater replenishment. This estimate will provide information to enhance supply, based on hydrology and feasible conveyance improvements. This estimate will be included in updates to *Bulletin 118*.

Dec 31, 2016 *

DWR publishes report on water available for groundwater replenishment.

Water Code § 10729(c)

Phased Implementation

It will take years to achieve the ultimate goal of local sustainable groundwater management at a statewide scale. To achieve the key outcomes, DWR, SWRCB, and other State agencies will work together to implement the many actions listed above, and assist local agencies in achieving groundwater sustainability. **Figure 8** provides an overview of the phased implementation of DWR's groundwater sustainability actions.

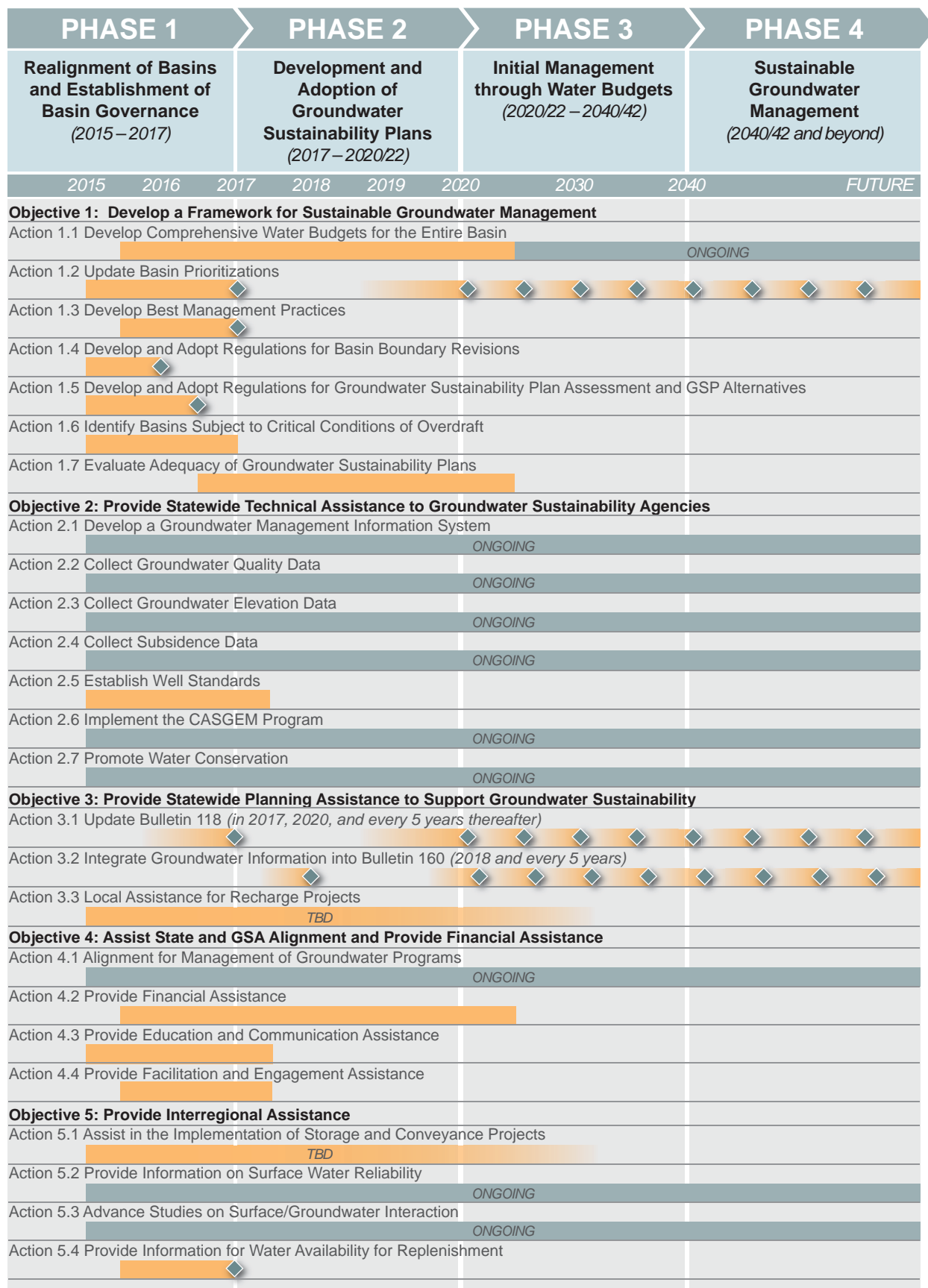


Figure 8. Phased Implementation of DWR Groundwater Sustainability Actions

Communication and Outreach

Governor Brown noted upon signing the SGMA that groundwater is best managed at the local level, and that the State's primary role is to provide guidance and support. The CWAP, SGMA, and provisions of Proposition 1 (Water Bond) direct the State to provide assistance to local agencies. Successful implementation is directly tied to effective communication and outreach, in addition to coordination at all levels of government. The SGMA requires DWR to develop regulations and tools, provide data and information, and provide support to local and regional agencies as they take on central roles in managing their groundwater basins and advancing the CWAP. California water management needs are diverse and implementation of the SGMA necessitates timely, forthright, and consistent communication among all partners and stakeholders.

In addition to communication, proactive outreach to and engagement of partners and stakeholders is essential to achieving sustainable groundwater management at the local and regional level. Local and regional agencies in turn must reach out to keep local citizens, groundwater users, and stakeholders informed. Adaptive, practical, and two-way communication is essential to establishing and maintaining the partnerships needed. This section of the *Strategic Plan* provides an overview of DWR's initial plan for communication, outreach, and coordination with partners. The key audiences for this effort include:

- **State, Federal and Tribal Governments:** Governor's Administration, Legislature and key State and federal agencies, tribes
- **Regional and local governments and agencies:** Water and groundwater management agencies and districts; land use entities such as counties and cities
- **Other stakeholders:** Non-governmental organizations including water and groundwater, environmental, environmental justice, agriculture; universities
- **The public.**

A more comprehensive communication and outreach plan is forthcoming.

Communication

Communication will provide for continuous sharing of information on all aspects of SGMA implementation, including details of DWR activities. Through proactive, regular, and timely communication, DWR seeks to accomplish the following:

- **Engagement:** Seek and maintain collaboration and cooperation with other agencies and stakeholders, and solicit and encourage public participation in SGMA implementation
- **Education:** Educate stakeholders, water users, and citizens on the requirements of the SGMA and water management sustainability objectives, and DWR's role in its implementation, relative to other State agencies
- **Accessibility:** Provide easy access to informative materials, data, reports and DWR's technical experts
- **Accountability:** Measure and report on progress and accomplishments in implementing the SGMA and provide transparency about DWR's implementation activities.

Key Definition

Communication

Ongoing sharing of information on provisions of the SGMA and its implementation.

Key Messages

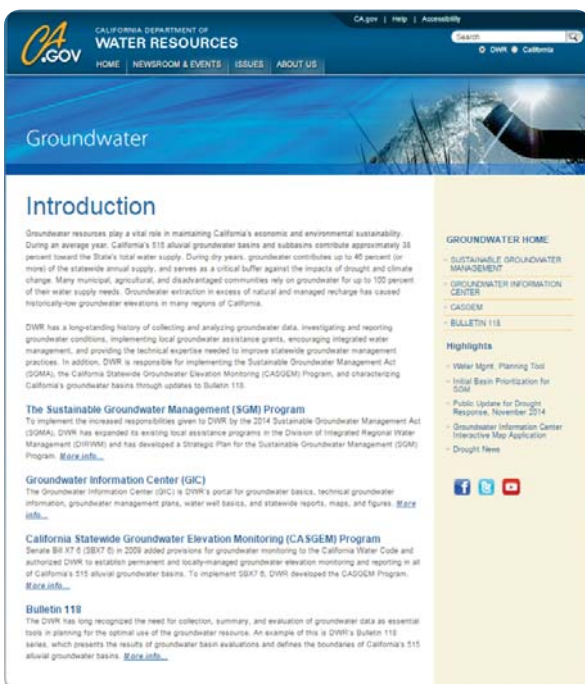
The following are some of the key messages that must be commonly understood by all stakeholders:

- Groundwater is best managed at the local or regional level, and strong local/regional governance and strategic planning are essential for success
- The State's role is to provide assistance to enable local and regional agencies to sustainably manage their water resources, and to intervene if necessary until local sustainable groundwater management plans are developed and implemented
- Strong and effective State agency alignment and coordination are required to support local/regional efforts
- Sustainable groundwater management can only be achieved in the context of regional and statewide water balance, accounting for all sources of supply as well as demands
- It will take decades to fully achieve sustainable water management and a phased approach is necessary, with accountability checks to measure progress.

Communication Tools

In collaboration with the State Water Board, DWR will create a suite of information tools and resources. These include a centralized State groundwater website managed by DWR, as well as DWR and State Water Board websites:

- <http://www.groundwater.ca.gov>
- http://www.waterboards.ca.gov/water_issues/programs/gmp/
- <http://www.water.ca.gov/groundwater>



DWR's groundwater website includes information related to subject items in this *Strategic Plan* and links to other relevant websites.

DWR's groundwater website includes many informational features related to subject items discussed in this *Strategic Plan* and links to other related websites with technical information. The website will be updated regularly.

The DWR groundwater website will outline various project-specific actions and implementation status. DWR will continue to update and maintain its groundwater website. Technical information, data, and reports on DWR's websites will complement the centralized groundwater website and provide key information specific to SGMA implementation. DWR and SWRCB encourage local and regional agencies to develop their own communications programs to keep water users, stakeholders, and the public informed on implementation of the SGMA.

Outreach

Outreach will be critical to successful implementation of the SGMA. DWR's *Strategic Plan* outlines an outreach program that will be proactive and interactive with information, ideas, and the opportunity for a two-way exchange. DWR will tailor its outreach efforts to major program functions and milestones, including governance, revisions to groundwater basin boundaries and

required regulations, local agency assistance, and information management. Outreach efforts will recognize the importance of differences from basin to basin.

DWR is committed to maintaining open and accessible pathways of information to provide as much opportunity for engagement as possible. Shared understanding of strengths and weaknesses in groundwater management will help to build a more resilient, interconnected management framework around the State—a key goal of the Administration’s CWAP.

Key Definition

Outreach

Stakeholder/public engagement and interaction in all aspects of implementation.

Outreach Tools

DWR’s outreach program will consider a range of activities, events, and venues for public and stakeholder briefings. Specific meetings organized by DWR will include State agency committees, public stakeholder meetings, one-on-one meetings with interested stakeholders, regional workshops, and topic-specific webinars. DWR also will form groundwater sustainability member advisory panels to cover focused and specific issues. DWR-sponsored public meetings will help ensure public and stakeholder input as implementation unfolds.

Partners

DWR and the SWRCB will work closely to develop clear, consistent information regarding SGMA implementation and enforcement. DWR and SWRCB steering committees have been formed to ensure collaboration, avoid redundancy, and create alignment throughout the implementation process. In addition, DWR has a long-standing direct relationship with the California Water Commission (Commission), which, pursuant to California Water Code Section 161, must approve all DWR rules and regulations. DWR will work closely with the Commission, which meets publicly, as it develops regulations pursuant to the SGMA.

DWR also recognizes the importance of keeping relevant federal agencies and tribal governments informed of its activities and exploring potential involvement in meeting statewide groundwater sustainable goals.

Practitioners Advisory Panel

DWR will establish an advisory panel consisting of practitioners who have experience in managing groundwater or technical experts to help strengthen and improve alignment and collaboration with the State and GSAs, and to provide guidance and support to GSAs and other stakeholders. The panel will be formed to ensure the understanding of complex and detailed issues, coordination, avoidance of redundancy, alignment throughout the implementation process, and successful implementation of the SGMA.

Leveraging Associations, Foundations, and Organizations

DWR will establish effective communication pathways between stakeholder organizations through the implementation of advisory groups to ensure these organizations provide the necessary input into the process, avoid redundancy, and remain in alignment throughout the implementation process.

One-on-One Meetings

DWR will occasionally meet with specific water agency and county officials to ensure specific regional issues are discussed and well understood, and to ensure communication throughout the process.

Workshops and Webinars

DWR will participate in workshops and topic-based webinars as needed.

It is important that there is a shared vision of DWR’s objectives and plans in implementing its Sustainable Groundwater Management Program. To that end, DWR invites comments to this plan. Please send any comments by June 1, 2015 to: sgmps@water.ca.gov

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