The Sustainable Groundwater Management Act: An Overview

California wouldn't be the economic powerhouse it is today without groundwater. The semi-arid, Mediterranean climate only brings so much rain, meaning that for more than 100 years, the ground has been drilled to pump the precious groundwater resource that has helped fuel the state's agricultural industry and establish the development of cities and industries.

The numbers bear this out: on average, groundwater accounts for about 40 percent of the state's annual water supply. That number grows to 60 percent or more in dry years, when creeks, rivers and reservoirs are strapped by drought. But some communities are totally reliant on groundwater, whether it is a drought or not.

Yet, the overreliance on groundwater in some areas has come at a steep price. The advent of bigger and better pumping technology meant more water could be reached from even deeper in the Earth. Pulling out so much water so fast caused the ground to sink or subside, in parts of the San Joaquin Valley, along the coast and in Southern California while creating a crisis of shared supply.

What is Groundwater?

Water gets into the ground mostly through snowmelt and rain seeping into the soil and broken rocks underneath the ground, and through overland flow in channels, such as creeks, streams, rivers and ponds.

The water infiltrating the underground basin moves gradually, pulled by gravity, into the saturated zone of the subsurface. From here, groundwater will flow toward points of discharge such as rivers, lakes or the ocean to begin the cycle anew. Groundwater is collected with wells and pumps, or it can flow naturally to the surface via seepage or springs.

Groundwater can be thousands of years old, although typically it is extracted within years or decades after it originally moves underground through small openings within porous material, called aquifers.

Aquifers can be several feet thick or several thousand feet thick. California's alluvial aquifers are composed of gravel, sand, silt and clay that have been eroded from surrounding rocks and then are deposited by running water and sometimes wind. Aquifers in the Central Valley and in the Los Angeles area can hold large quantities of water. California's largest and most heavily used groundwater basins are in the Central Valley.

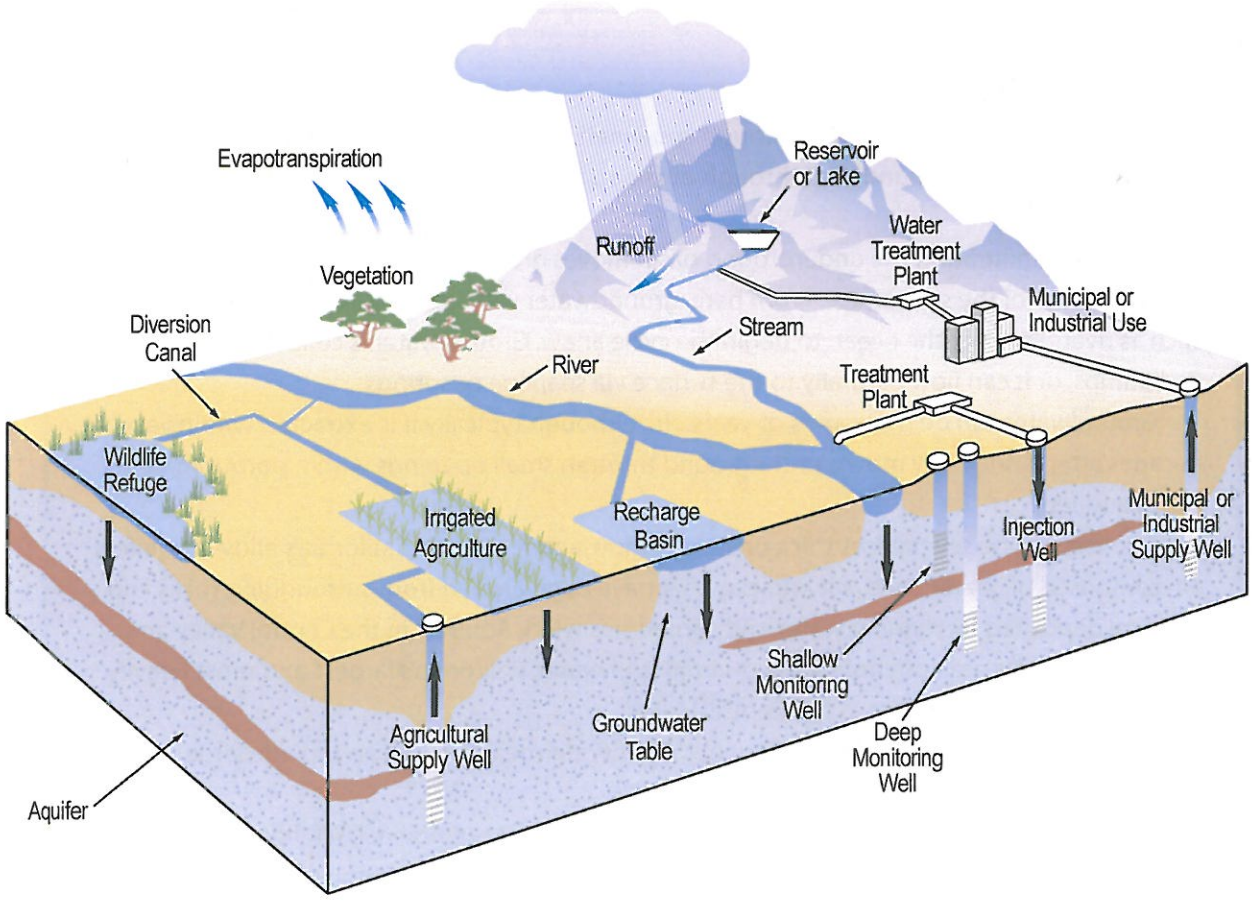
Because these alluvial aquifers are generally very permeable they can provide large quantities of water to wells.

Although the exact number of water wells in California is unknown, DWR figures and other calculations show that there are 700,000 to more than 1 million wells in the state.

Statewide, the Department of Water Resources (DWR) believes the annual rate of overdraft – taking more water from aquifers than can be replenished by rain and other means – to be 1 million to 2 million acre-feet. During the past three-year drought, there is concern that overdraft has increased, especially in the Central Valley.

The drought resulted in many new wells being drilled in Shasta, Butte, Stanislaus, Merced, Fresno, Kern, Kings, and Tulare counties, with Fresno and Tulare leading the way at more than 350 new wells, according to DWR. Because of the rate of pumping, areas with a higher potential for future subsidence are located in the southern San Joaquin, Antelope, Coachella, and western Sacramento valleys.

The issue of overdraft is one topic that led to periodic discussions about whether California needed statewide groundwater regulation even as regional management efforts in some areas proved that municipal water agencies, water replenishment districts and irrigation districts could develop methods to balance groundwater extraction and recharge and reduce groundwater overdraft.



In 2014 as the Legislature investigated the extent of the problem, members learned that data from the National Aeronautics and Space Administration (NASA)/German Aerospace Center Gravity Recovery and Climate Experiment (Grace) satellites revealed that between 2003 and 2009 the aquifers for the Central Valley and its major mountain water source, the Sierra Nevada, had lost almost 26 million acre-feet of water – which is nearly enough water combined to fill Lake Mead, America's largest reservoir. Thus, members began to deliberate on a statewide management bill.

In his 2014 California Water Action Plan, Gov. Jerry Brown noted the need to instill sustainable groundwater management:

"Groundwater is a critical buffer to the impacts of prolonged dry periods and climate change on our water system," the Plan said. "When a basin is at risk of permanent damage, and local and regional entities have not made sufficient progress to correct the problem, the state should protect the basin and its users until an adequate local program is in place."

In September Brown signed the Sustainable Groundwater Management Act (SGMA). The law's intent is for local and regional agencies to develop and implement sustainable groundwater plans with the state as the backstop – should it prove necessary – to adopt an interim groundwater management plan.

Prior to the SGMA that went into effect Jan. 1, 2015, some groundwater basins were managed under the auspices of legislatively created special districts. Some of these districts have the authority to regulate how much water is pumped and, in some cases, to levy fees to support their actions.

According to a legislative analysis, more than 20 counties adopted ordinances governing the use of groundwater, including specifically banning transfers of groundwater outside of their jurisdiction. Counties also issue drilling permits for new wells.

There are at least 22 groundwater basins, mostly in Southern California, that have been adjudicated – a process in which the court decides how much groundwater can rightfully be extracted by each landowner. The court appoints a watermaster to regulate the adjudication.

Some 149 groundwater management plans in California were developed after the "AB 3030" law was passed almost 25 years ago. The law allowed local agencies to develop groundwater management plans to account for issues such as seawater intrusion, wellhead protection, recharge, groundwater cleanup, overdraft, conjunctive use, storage, conservation, recycling and extraction projects.

But the plans were strictly voluntary and did not allow local entities to control extractions from the groundwater basin. Thus, overdraft and land subsidence continued to be a problem in many areas.

In 2009 one component of the comprehensive water legislation in SB 6 X7, established a statewide groundwater elevation monitoring program, but not individual groundwater well extraction monitoring, to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Data from this program demonstrated the severity of the overdraft issues and generated a debate about whether a stronger groundwater management system was needed.

Lawmakers spent the better part of 2014 looking at how to deal with groundwater and came up with a series of bills that evolved into the SGMA. According to the Act, sustainable groundwater management means "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results."

The SGMA

The Sustainable Groundwater Management Act (SGMA) gives local agencies the authorities to manage groundwater in a sustainable manner and allows for limited state intervention when necessary to protect groundwater resources. The SGMA requires the creation of groundwater sustainability agencies to develop and implement local plans allowing 20 years to achieve sustainability. The SGMA provides a state framework to regulate groundwater for the first time in California history.

The SGMA specifically:

- Establishes a definition of sustainable groundwater management
- Establishes a framework for local agencies to develop plans and implement strategies to sustainably manage groundwater resources
- Prioritizes basins with the greatest problems (ranked as high- and medium-priority)
- Sets a 20-year timeline for implementation.

The SGMA includes provisions to promote engagement by interested parties in the formation of a GSA and development and implementation of a GSP. GSAs have to identify key parties and maintain records that spell out plans on how to include their interests in GSA operations and GSP development. The Act requires the GSA to provide this information to DWR.

The GSA is the primary agency responsible for achieving sustainability within the timeframe. The SGMA includes many new authorities and tools for GSAs. For example, in developing a GSP, a GSA may opt to conduct investigations, measure and limit extraction, require registration of wells or impose fees for groundwater management. Under the Act, DWR has the lead role in working with local agencies in implementing its provisions. DWR is available to provide technical assistance to GSAs.

The SGMA, a product of an exhaustive consultative process with water agencies, business interests, environmental organizations, and farmers, required DWR to identify high- and medium-priority basins that must establish Groundwater Sustainability Agencies (GSAs). In December DWR confirmed that the classifications it announced in June 2014 through the California Statewide Groundwater Elevation Monitoring (CASGEM) system would be the used in conjunction with the law.

The GSAs, made up of one or more local agencies overlying a groundwater basin, will be required to develop Groundwater Sustainability Plans (GSPs). GSAs responsible for high- and medium-priority basins must adopt GSPs within five to seven years, depending on whether the basin is in critical overdraft. Agencies may adopt a single plan covering an entire basin or combine a number of plans created by multiple agencies. Preparation of groundwater sustainability plans is exempt from the California Environmental Quality Act (CEQA).

GSPs must include a physical description of the basin, including groundwater levels, groundwater quality, subsidence, information on groundwater-surface water interaction, data on historical and

projected water demands and supplies, monitoring and management provisions, and a description of how the plan will affect other plans, including city and county general plans. GSPs can build upon existing groundwater plans.

Key Definitions in the SGMA

"Sustainable yield," according to the SGMA, means the maximum quantity of water – calculated over a base period representative of long-term conditions in the basin and including any temporary surplus – that can be withdrawn annually from a groundwater supply without causing an undesirable result.

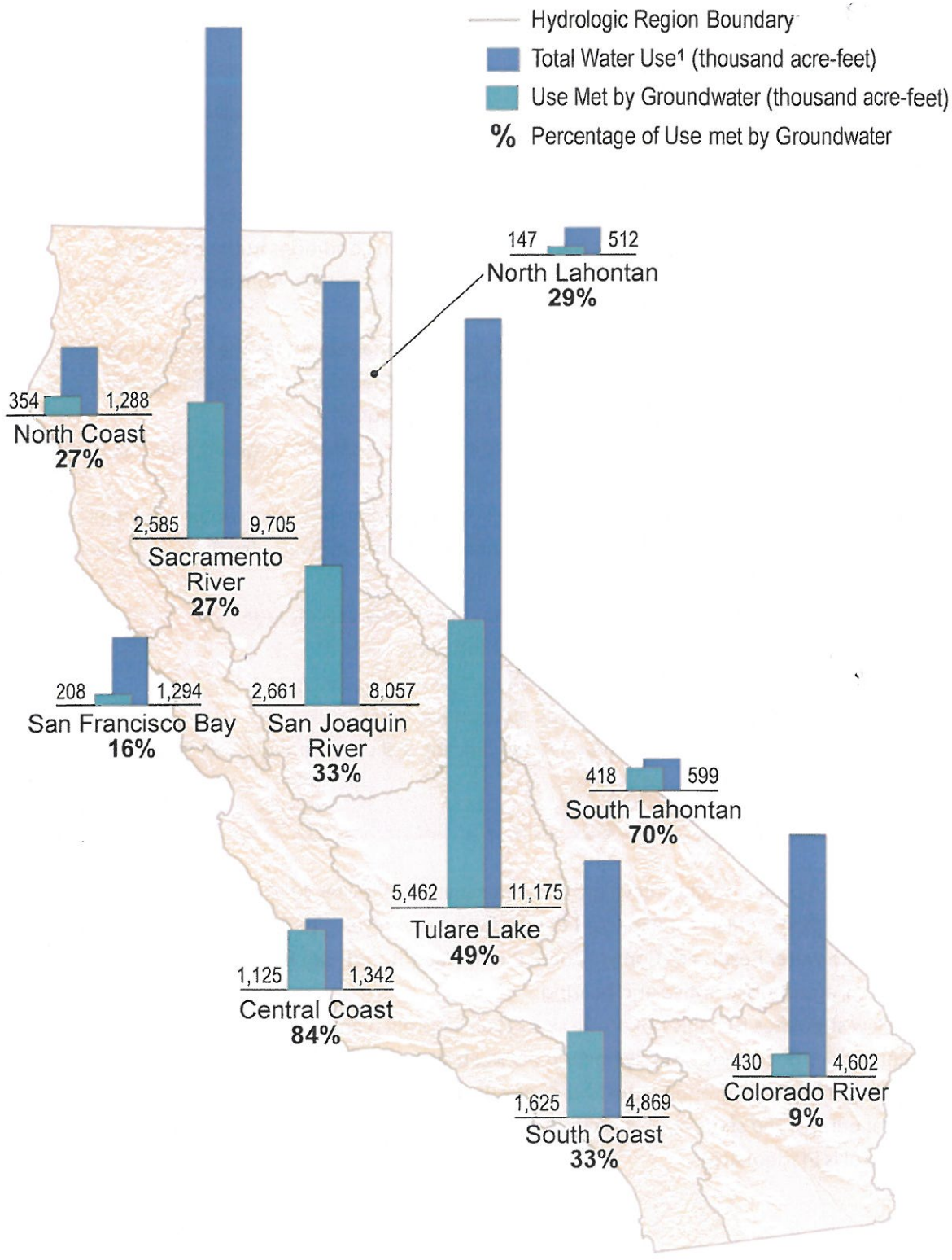
The act further defines "sustainable groundwater management" as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results."

"Undesirable result" means any of the following effects caused by groundwater conditions occurring throughout the basin:

- Chronic lowering of groundwater levels, but excluding reductions in groundwater levels during a drought if they are offset by increases in groundwater levels during other periods;
- Significant and unreasonable reductions in groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degradation of water quality;
- Significant and unreasonable land subsidence; and
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses.

Overdrafted basins must achieve groundwater sustainability by 2040 or 2042, predicated on the completion of plans, which are expected to take five to seven years to complete. If deadlines aren't met, the State Water Resources Control Board (State Water Board) can intervene and establish an interim plan, after public notice and hearing.

The law stipulates that it is not a "one size fits all" approach and that each groundwater basin is different. It does not remove the distinction between surface water rights and the personal, private property right to pump groundwater and does not allow the disclosure of how much water an individual pumps. The state, according to the SGMA, can intervene only in extreme conditions when local control is inadequate.



1. *Total Water Use is defined as the sum of water uses for agricultural, urban, and managed wetlands.*

Source: DWR