



# Farmer Perspectives on Water Management and the Sustainable Groundwater Management Act (SGMA)

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Survey Results from Fresno, Madera, San Luis Obispo, and Yolo Counties

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## Background

California is currently implementing the Sustainable Groundwater Management Act (SGMA), which became law in 2014. SGMA requires local groundwater sustainability agencies (GSAs) to develop sustainable water management plans and implement them to achieve groundwater sustainability (defined by the avoidance of six undesirable results) by 2040. Agriculture is the largest human user of water in California; therefore farmers are an important stakeholder for SGMA implementation and achieving water sustainability. This research surveyed farmers in Fresno (F), Madera (M), San Luis Obispo (S), and Yolo (Y) counties

perspectives on SGMA, water management practices, and policy preferences. This brief compares the results of this survey between the four counties, including a total of 690 farmer responses (F: 359, M: 101, S: 93, Y: 137). The Yolo County survey was collected in 2017 and the remaining counties were collected in 2019, all in collaboration with the respective county Farm Bureaus.

## Farm and Farmer Characteristics

On average, farmer respondents across all counties were 89% male (F: 92%, M: 86%, S: 84%, Y: 87%), 63 years old (F: 64, M: 59, S: 63, Y: 64), had farmed for 31 years (F: 34, M: 31, S: 24, Y: 29), and 69% were full-time farmers (F: 64%, M: 87%, S: 70%, Y: 68%). Farm size varied between counties: Fresno averaged 554 acres with 80% farmer-owned, Madera averaged 1,832 acres with 74% farmer-owned, San Luis Obispo averaged 318 acres with 79% farmer-owned, and Yolo averaged 1,343 acres with 80% farmer-owned. Table 1 displays the most common crop types for each county. Across all four counties, the respondents manage 162,254 acres of nut trees, 71,345 acres of grapes, 53,244 acres of row crops, 43,645 acres of fruit crops, and 65,927 head of cattle. Based on the 2017 Census of Agriculture, the acreage reported in this survey represents

## Key Findings

1. Despite agricultural and sociocultural differences, survey results were overwhelmingly similar between counties.
2. A majority of farmers are likely to adopt water management practices in the future, including drip irrigation, water monitoring technology, and soil moisture sensors.
3. 76% of farmers were at least somewhat concerned about all five SGMA undesirable results.
4. 90% of farmers support farmer adoption of water management practices, conjunctive use infrastructure, and incentives for saving water.
5. 71% of farmers agreed that the SGMA process is being managed locally and 68% agreed that it has involved farmers.
6. A majority of farmers believe that SGMA is necessary. However, they don't believe that other farmers think it is necessary.

Fresno	Madera	SLO	Yolo
Nut trees 45%	Nut trees 68%	Grapes 47%	Nut trees 53%
Grapes 43%	Grapes 35%	Fruit crops 34%	Hay/alfalfa 23%
Fruit crops 30%	Hay/alfalfa 12%	Cattle 20%	Row crops 18%

Table 1. Top three crops farmers indicated growing in each county (percent of respondents who indicated growing that

## Current and Future Water Management Practices

The most common water source in a “normal year” for the average respondent was irrigation through groundwater only (44%), followed by a mixture of ground and surface water (41%). However, in a “dry year,” 57% irrigate with groundwater only while 29% use a mixture of ground and surface water.

Farmers have already adopted many water management practices, most commonly drip irrigation (59% of respondents), water monitoring technology (40%), and soil moisture sensors (40%). Farmers who had not adopted certain practices indicated that they were at least somewhat likely (“somewhat likely,” “likely,” or “very likely”) to use these same three techniques in the future, at 74% (drip irrigation), 68% (water monitoring technology), and 66% (soil moisture sensors). Figure 1 displays the likelihood of farmers’ adoption of different management practices in

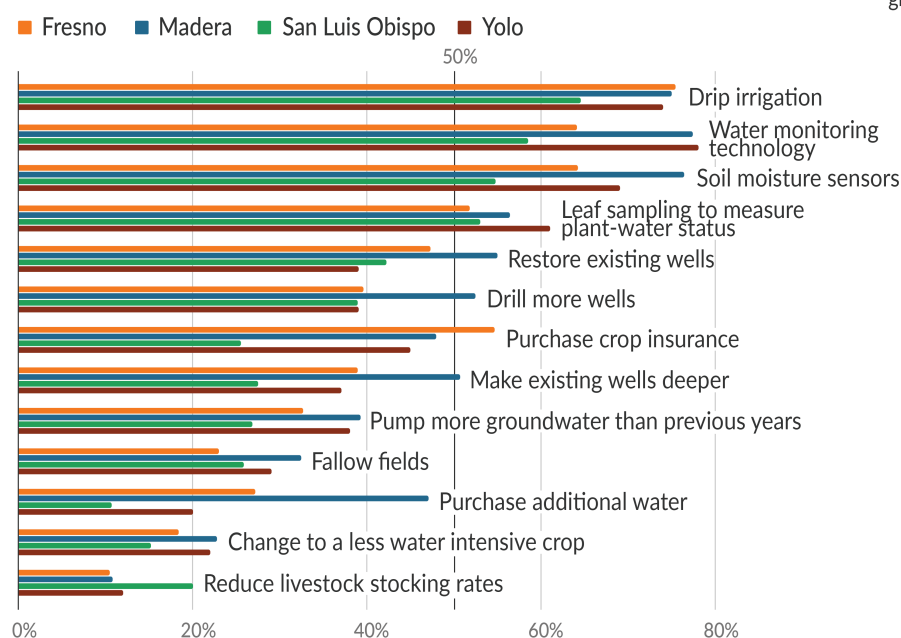


Figure 1. Percent of farmers who are at least somewhat likely to adopt water scarcity management practices in the future, by county.

## Concern for Groundwater Issues

Seventy-six percent of all respondents expressed some level of concern (“somewhat concerned,” “concerned,” or “deeply concerned”) with the SGMA undesirable results (Figure 2). Concern about saltwater intrusion

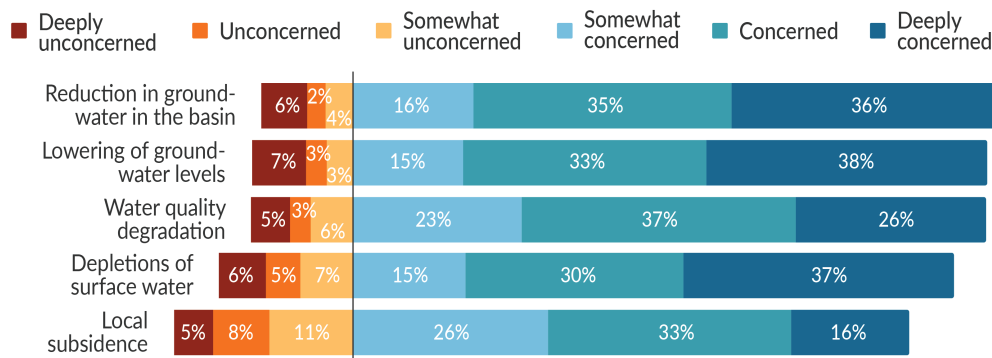


Figure 2. Aggregated farmer concern for groundwater management conditions (i.e. SGMA “undesirable results”) across all four counties.

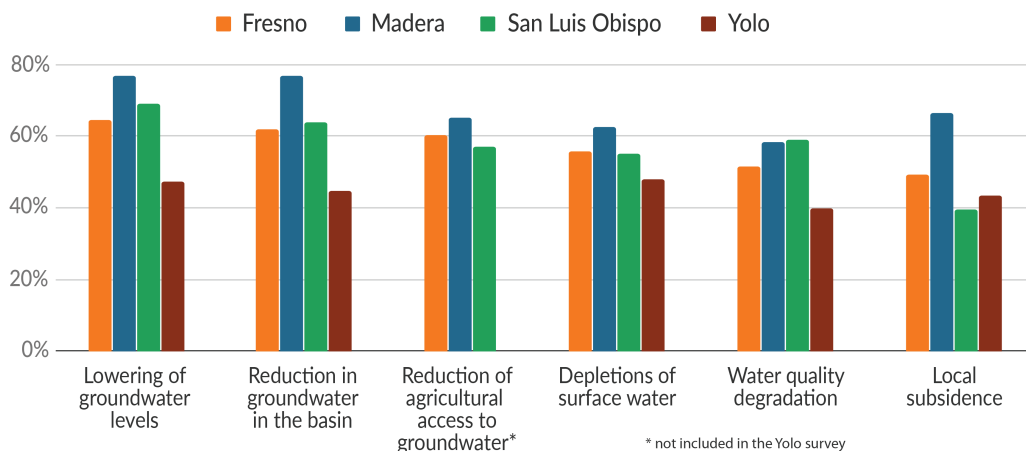


Figure 3. Percent of farmers who believe these groundwater management conditions are happening now or will occur in the next five years.

not included in the survey because three of the four counties are landlocked. Averaged across all undesirable results, concern was highest in Madera and Yolo counties at 86%, and lowest in San Luis Obispo at 75%. Fresno County was most concerned about reduction in groundwater in the basin (86%), while groundwater reduction and depletions of surface water (90%) had the highest concern in Madera County. San Luis Obispo County was most concerned about lowering of groundwater levels (87%), and Yolo County was most concerned about water quality degradation (91%).

All counties were least concerned about local subsid-  
ence. Additionally, the majority of farmers believe that  
the undesirable results are already happening or will  
occur in five years (with the exception of local subsid-  
ence, at 49%). Figure 3 compares these perceptions  
across the four counties.

## Farmer Preferences for Groundwater Sustainability and SGMA

Seventy-one percent of farmers at least somewhat  
agree (“somewhat agree,” “agree,” or “strongly agree”) that the SGMA process is being managed locally, 68% agree that it has involved farmers, and 55% think it is fair. More than half also have personally participated in SGMA events (59%), know how to participate in the process (51%), and clearly understand SGMA policy (50%). Perceptions and engagement varies across the four counties (Figure 4). Farmers have mostly received information about SGMA from their local irrigation district (30%), GSA eligible entities (20%), and commodity organizations/grower cooperatives (16%). They indicated that they would trust information from their local irrigation district (37%), their county agricultural commissioner (36%), and commodity organizations/grower cooperatives (32%). Finally, farmers would like to receive information in the future from their local irrigation district (31%), the county agricultural commissioner (27%), and the University of California Cooperative Extension (24%).

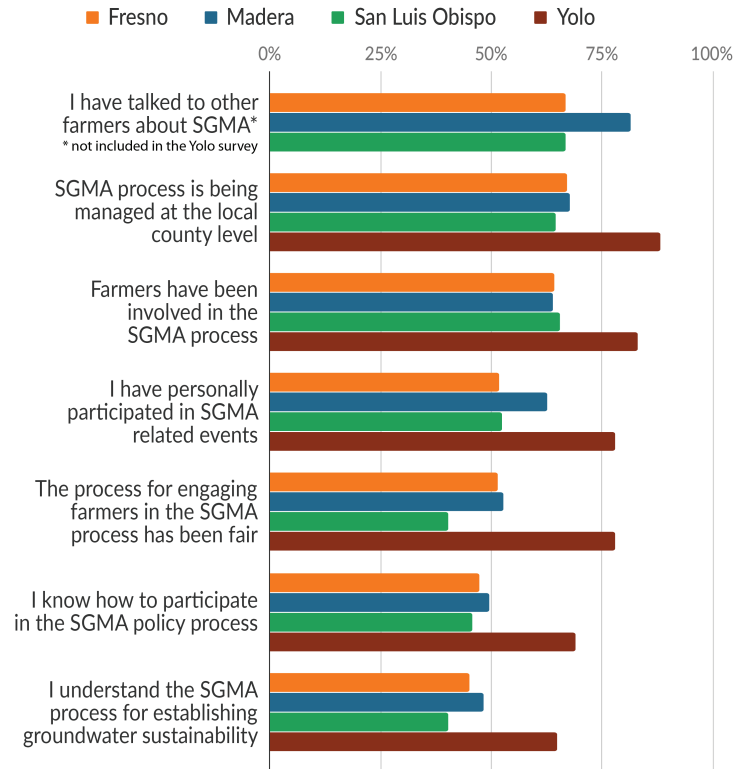


Figure 4. Percent of farmers that at least somewhat agree with these statements regarding participation in and perceptions of the SGMA policy process, compared between counties.

A majority of farmers believe that water allocation based on standard crop water requirements (68%), correlative rights (67%), and historical average pump-  
ing (64%) are at least somewhat fair (“somewhat fair,” “fair,” or “very fair”). Seventy percent believe that allocation based on agricultural output is at least

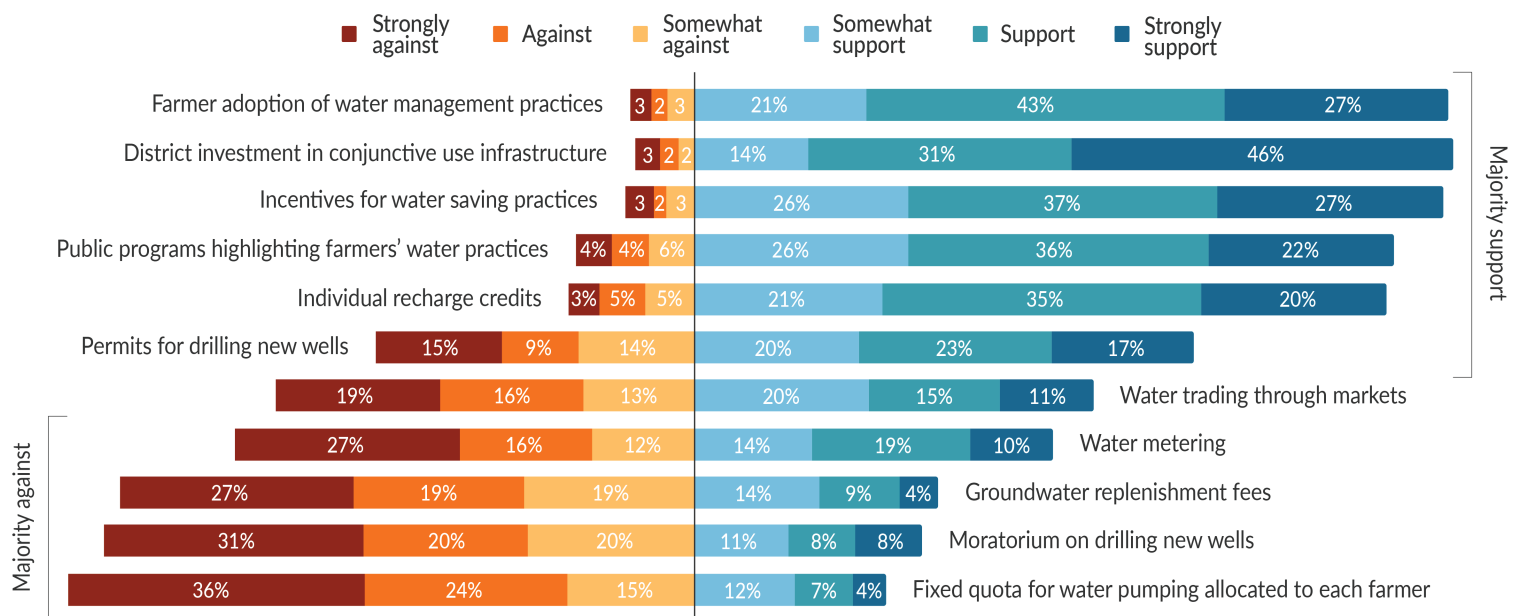


Figure 5. Farmer preferences for potential water management options.

Fresno and San Luis Obispo county respondents thought that standard crop water requirements were the most fair (68% and 70% said it was at least somewhat fair, respectively), while Madera and Yolo county respondents thought that correlative rights were the most fair (76% and 75%, respectively). Over 90% of farmers at least somewhat support three management options: farmer adoption of water management practices (91%), district investment in conjunctive use infrastructure (90%), and incentives for water saving practices (90%). The support for various management options by county is displayed in Figure 5. If water monitoring were required in the future, the majority of farmers would support implementing this via standard crop water requirements (59%) and through well

## SGMA Cost and Policy Need

Sixty two percent of all farmers at least somewhat agree that SGMA is necessary in both their county and California. However, the majority of farmers don't believe that other farmers think SGMA is necessary in their county (32%) or California (35%) (Figure 6). This suggests a disconnect between farmer's individual policy preferences and the perception of their peers. Additionally, 94% feel confident in their ability to manage their own water resources, 82% of respondents believe they use less water than other farmers who produce similar products, and 58% feel confident that they can achieve groundwater sustainability under SGMA. Only 23% believe that SGMA will be

## Perceptions of Change

Farmers indicated that a number of changes in land, policy, and climate had occurred recently. A majority of farmers felt that the nut acreage (82%), number of wells (81%), urban land use (74%), and corporate-owned farms (69%) had increased in the last five years, while 62% of farmers felt that family owned farming operations had decreased in the same time period. These trends were true in each individual county, with a few exceptions. In Fresno, Madera, and Yolo counties, at least 88% of respondents felt that nut acreage had increased, the largest concern compared to the other specified land uses. However, 92% of respondents in San Luis Obispo County indicated that the amount of vineyard acreage had increased in the last five years. This land use type was not included in the Yolo survey, but a majority of farmers in Fresno and Madera indicated that vineyard acreage had decreased.

In each of the four counties, at least 85% of farmers indicated that the number of regulations for farms and the associated reporting and paperwork had increased in the last five years. Simultaneously, forty-eight percent of all farmers felt that farmer engagement in the policy process had increased (F: 48%, M: 55%, S: 50%, Y: 40%).

While the majority of all respondents agreed that the global climate is changing (58%) and global temperatures are increasing (50%), there were differences in

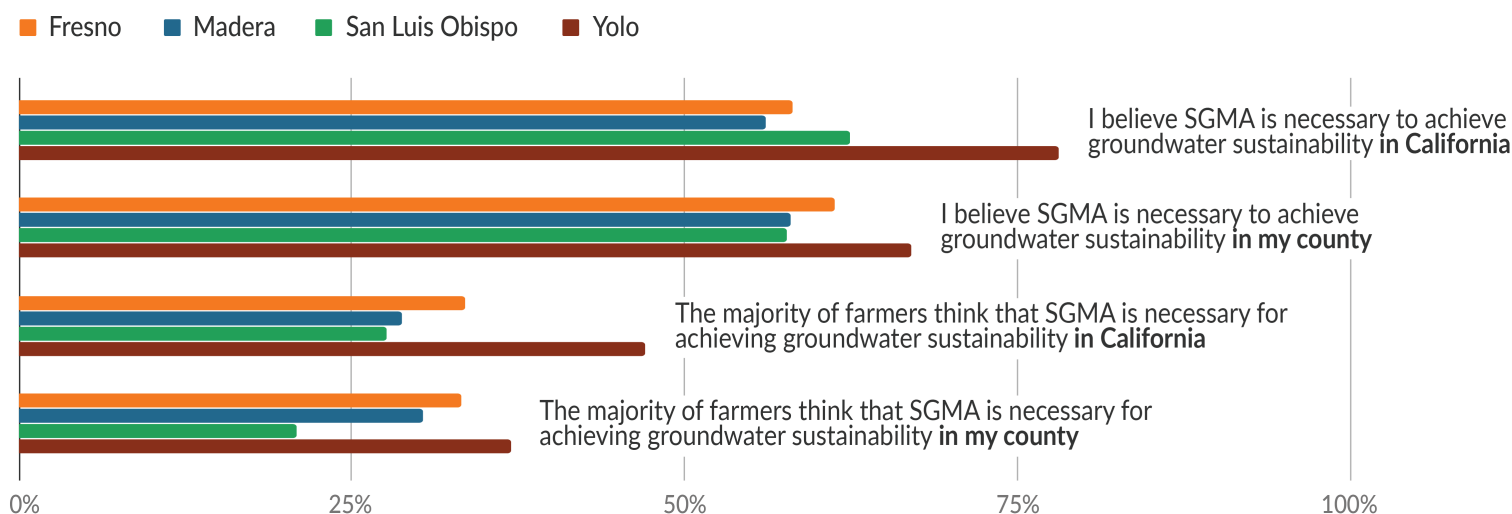


Figure 6. Percent of farmers who at least somewhat agree with the following statements regarding SGMA implementation, by county.



counties, 44% agreed that climate change presents more risks than benefits to agriculture globally, and 42% agreed that climate change presents more risks than benefits to their county in particular. Thirty-eight percent agreed that local temperatures were increasing, 36% agreed that human activities such as fossil fuel combustion were an important cause of climate change, and 32% agreed that water availability has changed because of climate change. Responses by county are displayed in Figure 7.

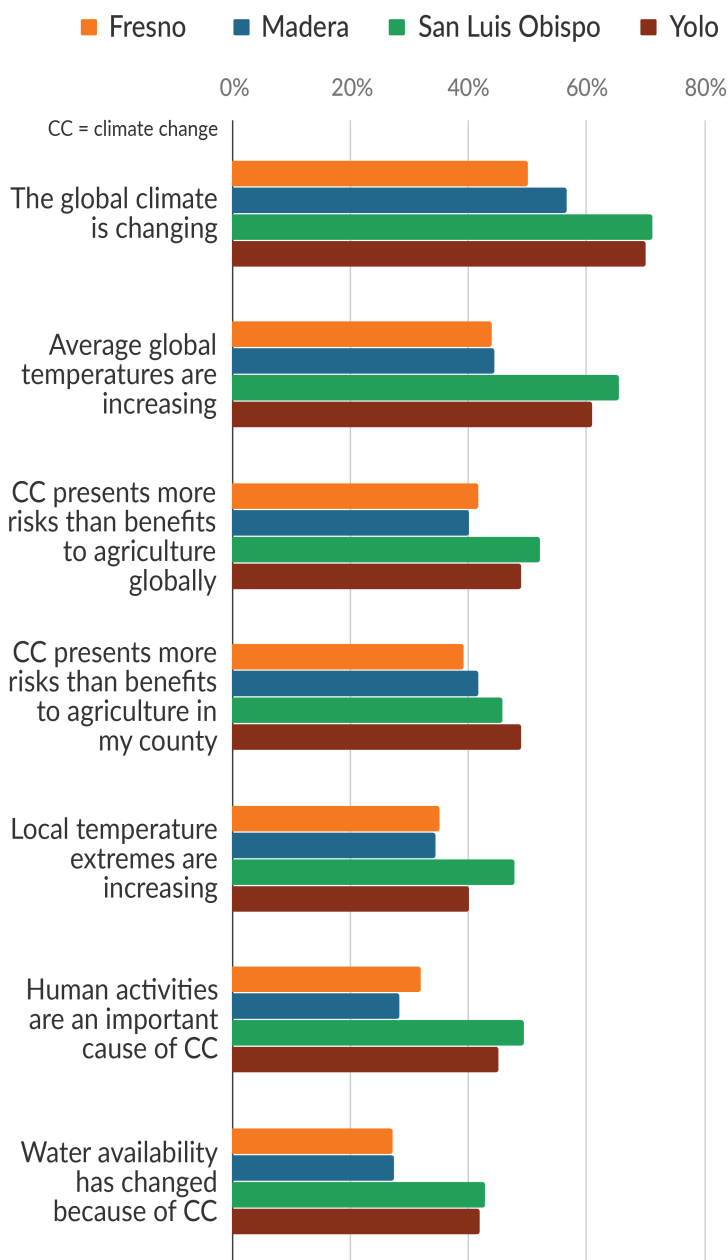


Figure 7. Percent of farmers who at least somewhat agree with statements related to changes in climate, by county.

## Future SGMA Research

Future research will utilize this dataset to explore the relationships between various trends in and between counties to better understand decision making on groundwater management amongst the agricultural community within California. This includes a study investigating the perceived fairness of potential groundwater allocation and dispute resolution options in Fresno, Madera and San Luis Obispo, building on previous research published by the research team on Yolo County. Additionally, using data from all four counties, we will explore the relationship between social capital amongst farmers, groundwater management options and farmers policy preferences. Finally we also intend to examine the relationship between farmers' environmental perceptions, risk perceptions and policy support.

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