

MEETING SUMMARY

SGMA in 2023: Advancing an Agenda to Meet Emerging Needs

On June 6, 2023, a group of 60 practitioners, researchers, and stakeholders met at UC Berkeley to discuss social and economic issues of groundwater management in California. The goal of the convening was to identify how researchers, practitioners and stakeholders can work together to best support the implementation of the Sustainable Groundwater Management Act (SGMA) moving forward. What follows is a summary of key takeaways from the convening organized around gaps, priorities, and opportunities for collaboration. Given the breadth of the day's conversations, this summary is not exhaustive. Given the diversity of attendees, the summary is also not reflective of any sort of group consensus or opinion. Rather this summary is a collection of diverse viewpoints through which we aimed to 1) identify major themes; and 2) highlight diverse opportunities for future collaboration.

GAPS

Gaps across disciplines, geographies, and stakeholders hinder the success of SGMA in achieving sustainability by 2040, these include:

- **Local knowledge & community engagement by researchers:** There is value in researchers routinely engaging with community members in place. This value is twofold: helping community members build local capacity to engage in groundwater management and bringing their perspectives and concerns to the forefront of research agendas. Such engagement is also critical for uncovering the nuances in GSA organization and operation across the state; there is a limit to what can be understood from a more statewide perspective.
- **Data:** Applied researchers would benefit from granular data stretching back many years. However, much of the available groundwater data is less refined across space and time than it would need to be to enable rigorous empirical research. Stakeholders possessing potentially valuable data should not hesitate to contact researchers with any leads they may have and vice versa.
- **Redundancies and misalignment:** Within SGMA and across water management programs generally there are significant differences and redundancies in how and when information is reported. This is costly and time consuming for researchers and practitioners alike. Working across agencies to streamline and consolidate information and data would free researchers to focus on answering big questions and potentially reduce local costs and free up local capacity. Collaborations between researchers and practitioners could also help leverage existing resources more effectively.



PRIORITIES

Several areas stand out as priorities for future work:

Fostering and valuing community involvement in governance:

- Community involvement is one of the steps in successfully implementing GSPs and is necessary to ensure equitable outcomes.
- Potential initiatives to increase involvement include electing community members to boards, forming advisory groups composed of community members, offering meetings in multiple languages, reaching out to schools, and making community members feel valued, desired, and qualified to have a seat at the table. The strengths and limitations of these initiatives and others warrants further exploration.
- Adjudications are not inclusive as SGMA and involve little public input. This could hamper local capacity building, making it more difficult to achieve the aims of SGMA. How will these divergent pathways co-exist and/or intersect as lawsuits become increasingly common in SGMA basins?
- Identifying ways to sustain community involvement throughout GSP implementation.

Advancing multi-purpose, locally benefiting land retirement:

- Multibenefit land retirement programs can be used to develop renewable energy infrastructure such as wind and solar farms.
- Such programs may offset job losses created by SGMA and support affected communities. Identifying how many jobs will be created through renewable energy initiatives will help researchers and stakeholders gauge the net impact of SGMA on worker welfare.
- Identifying suitable locations for land retirement and increasing access to renewable energy among disadvantaged groups can bring opportunities to disadvantaged groups and benefit landowners and communities.
- Determining where, how, and into what retired land is transformed will have to balance many objectives and ultimately will have to be driven by local communities.

Designing effective, efficient, and equitable markets:

- Groundwater markets can reduce groundwater extraction and incentivize more efficient use of scarce resources. When implemented they must be tailored to local contexts through collaboration with stakeholders and affected groups to ensure they are fair, transparent, easy-to-use, and low-cost.
- Markets are not unique in potentially creating inequities; inequities exist under other resource management schemes and the status quo. However, without careful thought and planning, they may price out disadvantaged residents, grant historically large water users favorable initial rights, and shift production towards less labor-intensive crops.



Comparing distributional outcomes across policy approaches is essential for balancing their goals and potential adverse effects.

- Markets may be vulnerable to manipulation by powerful actors and must be safeguarded in their design and implementation. Identifying the political and economic incentives facing the agents involved is critical.

Exploring alternatives to markets:

- As an alternative to markets, alternative incentive schemes such as pricing may achieve sustainability goals while being more easily implemented. Examples include volumetric water pricing regimes that set the price of water use based on the amount of water consumed. Understanding how prices impact agricultural, water, and land use decisions in the short- and long-run is an open area of investigation.
- There is also a need to better understand the role and potential of non-incentive based management regimes.

Understanding the effects SGMA will have on workers and local communities:

- The full impacts of SGMA on workers and local communities are unknown and are of great concern from the local to state level.
- There can be a disconnect between employers and workers, this may be exacerbated as farmland is consolidated and financialized. How might this influence decision-making, management strategies and outcomes?
- Identifying ways to distribute the costs of SGMA more equitably will prove vital to protecting the livelihoods of workers and communities.

Improving the efficacy and safety of groundwater recharge:

- Developing effective recharge strategies will require preparing for precipitation events, such as the atmospheric rivers incurred earlier this year, and could benefit from incorporating indigenous knowledge.
- The quality and safety of recharged groundwater is of great concern to farmers and community members. More work, such as developing and distributing an aggregate risk index that incorporates various contaminants, is needed to better inform and evaluate the potential of existing and future recharge technologies.
- Groundwater is not a typical public resource: it is rivalrous and excludable. New incentive schemes are thus needed to encourage growers to increase the amount of water they recharge. Investigating examples of success in this domain, such as select water districts in the San Joaquin, could inspire researchers and stakeholders in designing such schemes.



Increasing capacity for monitoring and enforcement:

- A lack of data does not mean there is no problem. Identifying gaps in monitoring for groundwater contamination and over-pumping is the first step to addressing them. Politics and the involved parties' interests must then be considered in devising a plan to remedy these gaps.
- Spatially representative monitoring programs may be explored to reduce the administrative cost of widespread monitoring. Their effectiveness compared to well-level monitoring data needs to be better understood and should be further investigated.
- Measuring individual and cumulative threats to water quality can help protect human health. Such measurements should continue to be improved and made more readily available.
- Designing binding enforcement mechanisms is central to implementing any of the above measures. If hard decisions can continue to be postponed, there is little hope of attaining sustainability by 2040.

Addressing the distributional impacts of groundwater management and mismanagement:

- Public health impacts including groundwater contaminants are experienced cumulatively by residents, addressing cumulative impacts is often missing on the part of managers and researchers.
- Economic impacts of dry wells, sea water intrusion and other groundwater management externalities can be assessed in ways similar to impacts to agriculture.
- Data quality and data gaps often impede a clear understanding of who is impacted.

OPPORTUNITIES FOR COLLABORATION

Identifying underexplored data sources:

- GSAs have only existed for a few years and thus are limited in the amount of data they can provide to researchers. Conversely, counties (and other regional entities) may have existed for a long time and may have extensive data that can be underutilized.
- Such data may require significant processing effort, such as digitizing physical documents, but it could also be very rewarding.

Taking lessons from electric utilities:

- While water data is available in the residential and commercial sectors, it is more challenging to obtain in the agricultural sector.
- In the electric utility space, there is a process for researchers to submit requests to obtain granular data from multiple agencies.
- It could be valuable to establish a similar system for agriculture.



Increasing willingness to experiment:

- Like medical research, social science research can use randomized controlled trials (RCTs) to identify causal relationships between policies and outcomes.
- RCTs are often time and resource intensive and require a dedicated team of researchers and stakeholders to implement successfully.
- RCTs are uncommon in the agriculture water-use space, and they could be used to answer many important questions.

Anticipating and adapting to climate change as part of GSPs:

- While most agencies have recognized the importance of incorporating climate change into their plans, roughly two-thirds have yet to include extreme climate change scenarios. This creates the danger of overestimating water supplies and underestimating future water demands. It can also leave managers flat footed when unexpected wet years arrive.
- Modeling when and how frequent dry and wet periods will occur will be important in preparing for them and then policies, regulations and programs also must be designed to be flexible enough to accommodate these extremes.
- Such models may require data and information that are not readily available, and could benefit from greater collaboration among researchers and stakeholders.

Supporting comparative learning and innovation:

- Groundwater management generally, and SGMA implementation specifically, is highly diverse across the state.
- Statewide meta-analyses could help counties, GSAs, and other governing bodies identify opportunities for learning and innovation relating to policies and management approaches. For example, knowledge of the percentage of metered wells in California could spur low-monitoring regions to increase their monitoring.

