

Locals implementing California's Sustainable Groundwater Management Act (SGMA) are rapidly turning from questions about [who](#) will manage groundwater and how they should approach [institutional design](#) to next-level questions: What does sustainability mean for a particular basin, and how will local managers achieve it?



Photo: Chris Austin.

One of many potential management tools is a local groundwater market. SGMA opens the door for local markets but does not provide guidance about when they might be appropriate.

Proponents' rhetoric can paint markets as an [unambiguously better](#), or even as the [only](#), solution to California's water challenges. However, faith in market efficiency needs to be tempered with a firm grasp of the greater physical and institutional context for water. Markets may be part of the solution, but only where implemented carefully.

A new report by Berkeley Law's [Center for Law, Energy & the Environment](#) and [UC Water](#) begins to address the guidance gap. [\*\*Trading Sustainably: Critical Considerations for Local Groundwater Markets Under the Sustainable Groundwater Management Act\*\*](#), outlines a set of considerations designed to help decision makers and stakeholders evaluate whether a local groundwater market might be a viable tool for sustainably managing a particular groundwater basin and, if so, what it would entail.

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## Foundational considerations



Measuring groundwater extractions



Setting overall pumping limits



Establishing individual groundwater extraction allocations

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## Market-specific considerations



Market goals



Groundwater rights questions

Potential impacts of trades



Spatial dimensions



Temporal dimensions



Method and purpose of use dimensions



Social dimensions



Environmental dimensions



Trading rules



Trading system and transfer approval process

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## General considerations



Monitoring



Oversight and enforcement



Evaluation



Modification



Transparency and public engagement

Resources

Human capacity



Physical and technological infrastructure



Funding



## Background

In many California groundwater basins, past levels and patterns of groundwater use are unsustainable. Decades of unfettered pumping have [depleted groundwater supplies](#), causing [dry wells](#), [deteriorating water quality](#), [stream depletion](#), and [damaged infrastructure](#).

The situation was so dire during the recent drought that the Legislature took a step widely considered unthinkable just a few years earlier — it passed SGMA, a statewide mandate for locally managing groundwater.

SGMA calls for the creation of local groundwater agencies in [medium- and high-priority](#) basins and tasks them with developing and implementing plans to achieve sustainable groundwater management. The time for planning is [relatively short](#). Over the next two-and-a-half (for critically overdrafted basins) to four-and-a-half years, each groundwater agency must develop a plan to bring basin groundwater use to sustainable levels within 20 years of the time the plan is first implemented. Groundwater agencies will employ a locally tailored mix of strategies, likely including some that limit groundwater use and some that enhance groundwater supplies.

Because SGMA allows groundwater agencies to assign individual groundwater extraction allocations to pumpers and to authorize transfers of these allocations under certain circumstances, it opens the door for the development of local groundwater markets. In a local market, a willing seller could trade a portion of their groundwater extraction allocation to a willing buyer, allowing the buyer to pump groundwater in the seller's stead. Markets could help water users adapt to new pumping restrictions needed to achieve sustainability.

### Critical considerations for local groundwater markets

Carefully designed and implemented groundwater markets could potentially contribute to sustainable management in some basins, but success is not a foregone conclusion. Whether a local groundwater market might be a viable tool will depend on a host of factors that may vary significantly from basin to basin, as well as within a single basin. Used inappropriately, markets could have negative unintended consequences, including contributing to the [undesirable results](#) SGMA seeks to avoid.

Our report can help groundwater agencies, the stakeholders they serve, and state agencies with oversight and intervention responsibilities evaluate whether and under what conditions local groundwater markets can contribute to sustainability goals. Critical considerations include (1) *foundational considerations*, shared in common with other programs that limit

groundwater pumping; (2) *market-specific considerations*; and (3) *general considerations* that are important for all groundwater sustainability programs.

One of the most basic considerations is that groundwater agencies will need to [require pumpers to measure and report](#) their groundwater extractions. That can be controversial, but it provides essential context for market trades and for establishing and enforcing the overall pumping limits and individual pumping allocations that make trading possible.

Where groundwater agencies decide to employ local groundwater markets, careful design and implementation will be critical. Groundwater agencies will need to develop clear pictures of the likely impacts of markets in their basins to convincingly demonstrate to state oversight agencies that they have charted paths to sustainability. Markets will require unambiguous trading rules, designed to prevent unacceptable trading impacts, that are backed up with effective oversight and enforcement mechanisms to ensure that rules are followed. Groundwater agencies will need to evaluate market effectiveness and address problems that arise.

The report highlights that groundwater rights law could present an obstacle for markets. As an example, the most common type of groundwater right is based on overlying land ownership, and it is not clear that pumping allocations associated with such rights could be legally traded. That may not matter if basin stakeholders are comfortable with a groundwater agency's allocation and trading systems. But it could be a serious problem where some stakeholders feel that allocations or trading rules are unfair. Transparency will be essential. Groundwater agencies should seek [meaningful stakeholder involvement](#) in allocation decisions and market design, so they can understand and address community concerns up front and potentially head off future legal challenges.

#### **The take-home message . . .**

The stakes involved in SGMA implementation are high. Groundwater management decisions made today will affect everyone in a basin, now and well into the future, the full impacts of poor decisions may not be felt until long after they are made, and some impacts may be irreversible.

Addressing the considerations raised in this report will empower groundwater agencies to make better decisions that lead to more sustainable futures for the basins they serve.

Markets are not free. As our exploration of critical considerations makes clear, local groundwater markets consistent with SGMA will take substantial effort to design and

implement. Like other management options, they have transaction costs, in this case, costs that must be incurred to make groundwater trading that furthers sustainable management possible. Groundwater agencies will need to develop and fund significant physical, technological, and managerial infrastructure to support market design and implementation.

Markets may be one of the tools that helps California blaze a path toward better groundwater management. In some contexts, markets could help achieve sustainability more efficiently than regulations alone. However, markets that lack well-defined goals, appropriate rules, or effective oversight run real risks of generating unintended consequences. Where groundwater agencies plan to rely on markets to help reach sustainability goals, foresight and diligent preparation will be essential ingredients for success.

You can access the report, co-authored with Michael Kiparsky, Kelly Archer, Kurt Schnier, and Holly Doremus, via [CLEE's website](#). See also our recent [op-ed](#) in *The Bakersfield Californian*.