

Around the world, groundwater mismanagement is a major driver of water crises. An emerging method for addressing such mismanagement, called managed aquifer recharge, has generated excitement among scholars and water managers. In a [newly published article \(Owen et al. 2025\)](#), we argue that this excitement, while often justified, should also be tempered by acknowledgment of MAR's limitations. We also identify policy changes that can help MAR succeed.

MAR's potential has multiple dimensions. Where climate change is making water availability more erratic and where years of groundwater pumping have



Water is being diverted for the first time onto land that was converted to a groundwater recharge basin in Fresno County, California in May, 2024. Source: Xavier Mascareñas / California Department of Water Resources

emptied out huge volumes of subsurface space—a description that applies, unfortunately, to many places around the world—MAR can be a valuable water-storage technique. The environmental consequences of MAR will typically be lower than the consequences of building new dams. And, done well, MAR can provide multiple benefits, including slowing subsidence and seawater intrusion and enhancing environmental flows.

That's the exciting part of the story. But reasons for concern exist and have not received the attention they deserve.

MAR projects may be needed most in areas where the water to supply those MAR projects is scarce, and finding physically suitable locations for MAR projects is sometimes a challenge. Other difficulties are economic: because MAR projects are relatively novel and tend to be bespoke, rigorously assessing their benefits and costs can be a challenge. Other challenges are legal. In many places, for example, water-right systems do not involve careful monitoring and regulation of groundwater pumping, and it can be difficult for MAR-project operators to protect their investment from competing pumpers—or all too easy for MAR project operators to pump out more than they put in. Some challenges will involve wishful thinking: water managers may be tempted to use the prospect of MAR as a reason to delay hard but badly needed decisions about groundwater-use regulation. MAR also can exacerbate inequities. In theory, MAR could be a way to shore up supplies for economically vulnerable communities. In practice, instead of benefiting the have-nots, it threatens to be another way for the traditional haves of water management to just have more.

Fortunately, there are potential responses to many of these challenges. Our paper provides a menu of options. For example, by plugging gaps in the regulation of groundwater extractions, lawmakers and regulators can create more favorable settings for MAR. Providing clearer permitting frameworks can bring efficiency and clarity to approvals of MAR projects. And placing greater emphasis on public benefits—either through regulatory requirements or through publicly sponsored MAR projects—can bring MAR's benefits to natural ecosystems and to a broader range of human users.

Underlying all those options is an important point: the future of MAR is malleable. That malleability creates important opportunities for practitioners, for policymakers, and for researchers across a range of disciplines. Collectively, their actions will help determine whether and how MAR achieves its promise.

*For more, please see:*

Dave Owen, Helen E. Dahlke, Andrew T. Fisher, Ellen Bruno, and Michael Kiparsky. "Navigating the Growing Prospects and Growing Pains of Managed Aquifer Recharge." *Groundwater* (2025), available at <https://doi.org/10.1111/gwat.70029>

