

February 2026:

Research Driving Smarter Water Use



by Sara Mekideche on Feb 05, 2026

At the Center for Irrigation Technology, research is where smarter water use begins. From policy-relevant groundwater management to field-scale innovations that recharge aquifers, our work, and the partners we collaborate with, helps California agriculture adapt, comply, and thrive.

This month, we're spotlighting three researchers advancing practical solutions for water use efficiency and groundwater sustainability.



Sarge Green brings more than 50 years of experience in California water management to his work with the Center for Irrigation Technology (CIT) and the California Water Institute (CWI). A former Director of CIT and Project Director for both CIT and CWI, Sarge continues to serve as a part-time water management specialist, providing research, analysis, and guidance on some of the state's most complex groundwater challenges.

Sarge's current work focuses heavily on the implementation of the Sustainable Groundwater Management Act (SGMA), particularly in the San Joaquin Valley. His research and outreach address both the technical and institutional dimensions of groundwater sustainability, from land subsidence and aquifer characteristics to governance, coordination, and financing of Groundwater Sustainability Plans (GSPs).

Key areas of focus include understanding subsidence mechanisms in the Valley (including the role of deep clay layers such as the Corcoran Clay), evaluating well spacing and extraction impacts, and exploring how tools like SAGBI and airborne geophysical data can be linked to assess groundwater recharge capacity. Sarge also examines how wet-year water can be strategically managed, stored, or transferred to maximize benefits while minimizing flood risk and conflict among water users.

Beyond the technical challenges, Sarge emphasizes the importance of regional coordination and strong institutional frameworks. His work highlights the risks of fragmented groundwater management, the need for area-wide GSPs and joint powers agreements, and the growing urgency of thoughtful land-use transitions as overdrafted basins confront land retirement and economic impacts on rural communities.

Why it matters: Sarge's work helps decision-makers move beyond compliance toward durable, coordinated groundwater solutions that protect aquifers, agricultural productivity, and communities over the long term.



CIT has a longstanding and productive partnership with the California Water Institute (CWI) and the Fresno State University Agricultural Laboratory. Cordie Qualle, Assistant Director of CWI and former lecturer in the Lyles College of Engineering, led research on the Shallow Subsurface Artificial Groundwater Recharge (SSAGR) system, an innovative approach to replenishing groundwater in agricultural fields.

SSAGR involves installing a perforated pipe network below the crop root zone to capture runoff or excess surface water and distribute it underground. This allows water to percolate directly into the aquifer while minimizing surface impacts. The research evaluated the system's economic feasibility, water use, and overall benefits under real-world field conditions.

Findings from this work help inform growers and water managers about the potential role SSAGR systems can play in advancing groundwater recharge while maintaining productive farmland.

 Read the final report:

<https://www.californiawater.org/2023/12/14/shallow-subsurface-artificial-groundwater-rechargessagr/>

CIT is pleased to support Cordie's innovative research and has featured the SSAGR project in our annual Ag Tech Day event. We look forward to further productive collaboration with CWI and all of its researchers.

Why it matters: Innovative recharge solutions like SSAGR support groundwater sustainability goals and provide new tools for managing excess water during wet years.

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This monthly update is part of CIT's ongoing effort to share our work, impact, and vision for the future.