Sustainable Conservation

theEARTH GENOME
REVEALING THE POSSIBLE

GRAT™ Support for GSP Development

> *"GRAT is an optimization tool that we will use to identify the low hanging fruit related to basic recharge practices --dedicated basins, fallowed ground, production farmland and in-lieu. It will help identify the most cost-effective actions to improve our recharge opportunities".*
>
> Eric Averett, General Manager
> Rosedale-Rio Bravo Water Storage District

Managed Aquifer Recharge (MAR) of flood waters is likely to be an important management practice for Groundwater Sustainability Agencies (GSAs) to consider for inclusion in their Groundwater Sustainability Plan (GSP) prepared pursuant to the Sustainable Groundwater Management Act (SGMA). Selecting the appropriate mix of MAR implementation project actions will likely be a central component of the GSP deliberation process. GSA participants will need to decide whether spreading floodwaters on fallow and production agricultural land or building new recharge basins offers a practical and cost effective opportunity. Especially when compared to demand reduction programs or projects to develop additional surface water supplies which typically involve greater economic impacts and regulatory, political and environmental constraints.

The Groundwater Recharge Assessment Tool (GRAT) helps water district managers and consultants support the GSA throughout development of the GSP project and management actions. It will help bring growers into the planning and project development process because agronomic concerns are incorporated into the GRAT system design, which also considers site suitability and crop compatibility, source water available for recharge, conveyance capacity, and recharge methods and costs.

Most importantly, the tool will help define least cost, feasible solutions for meeting local GSA's sustainability goals and maintaining local control; while also ensuring the GSA prepares and adopts a GSP that meets the State's regulatory requirements.

- **Identify** GSP elements for replenishment of groundwater, conjunctive use and underground storage opportunities, and quickly evaluate managed aquifer recharge (MAR) opportunities (Reg. § 354.8 9(g)).
- **Design** MAR and management actions (projects and programs) to be included in the GSP implementation plan (Reg. § 354.44), including estimating implementation costs and benefits (Reg. § 354.6(e)).
- **Develop** the criteria for projects and management actions to be included in the GSP (Reg. § 354.42).
- **Establish** and meet local sustainability goals, milestones, and MAR measures that will be implemented over the planning horizon to ensure that the basin will be operated within its sustainable yield (Reg. § 354.24, 354.30).
- **Manage** and apply the data and maps collected to describe the plan area (Reg. § 354.8); and provide a mechanism for using common methods, data and assumptions within a basin or management areas, and across basin boundaries. GRAT may also support negotiation of cooperative and inter-basin agreements.
- **Support** communications and outreach to explain MAR concepts, costs and benefits (Reg. § 354.10)

- **Engage, involve and inform** the stakeholders and public during definition of the local MAR implementation program (Reg. § 354.10); gain acceptance and support for the projects.
- **Evaluate** the water budget benefits of MAR, including quantifying and projected water budget and describing the surface water supply used or available for use for groundwater recharge or in-lieu use (Reg. § 354.18).

GRAT can be integrated into the GSP development process in several ways:

- Incorporate water budget information compiled for the basin into GRAT to develop Water Available For Recharge (WAFR) scenarios
- Evaluate recharge potential using alternative water sources and quantities.
- Identify and spatially rank cost-effective recharge projects and alternatives
- Estimate groundwater supply improvements for different water year types projected over the next 20 years
- Assist in achieving sustainability objectives in key management areas by targeting recharge benefits to those areas where feasible
- Offer flexibility for GSAs to alter the site selection process given 4 adjustable site ranking factors: extent of current conveyance, crop compatibility, deep percolation, and recharge retention
- Estimate annual and cumulative costs for recharge project budgeting and incentive development
- Run unlimited scenarios to compare costs of recharge project water supply enhancement compared to equivalent amounts of demand reduction.
- Support stakeholder engagement and facilitate discussion of project options
- If multiple districts in a sub-basin are running GRAT, compare relative cost effectiveness of capturing limited surface water supply in different locations and estimate intra-district cost allocation for greatest aquifer benefit
- Provide ongoing operational support to water managers during implementation of the GSP when deciding where to allocate water during seasonal flood releases, recruit targeted landowners, and estimate short-term implementation costs.

GRAT is a cloud-based mapping tool, accessed via any Internet browser, that uses public data sets combined with local district and GSA information to create an indexed ranking of available recharge sites. The optimization routine of the tool allocates available water on a weekly basis (across 52 weeks a year, over a 20 year time horizon) to find the most suitable and cost effective sites across user-defined water-year types. Multiple report templates portray the results of each scenario to summarize selected recharge methods, quantities, and costs.

Sustainable Conservation and Earth Genome can assist water districts, GSAs, or consultants with language to describe the inclusion of GRAT in GSP scope of work proposals for planning grant funding to the California Department of Water Resources or other potential funding sources.

Get Started Now: Contacts

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