

Recharging Groundwater Basins: Facts, Myths, Projects and Possibilities

Special Meeting of the Boards and Advisory Committees of the
Petaluma Valley, Santa Rosa Plain and Sonoma Valley Groundwater Sustainability Agencies

Date: December 11, 2019

Time: 4:30 p.m.

Location: Friedman Center, 4676 Mayette Avenue, Santa Rosa 95405

Agenda

1. **Call to Order, Welcome and Introduction of Groundwater Sustainability Agencies' Boards and Advisory Committees**

Valerie Quinto, Workshop Moderator, introduced the three Sonoma County Groundwater Basin Chairs: Susan Gorin, Sonoma Valley; Lynda Hopkins, Santa Rosa Plain; and Bruce Abelli-Amen (Vice-Chair), Petaluma Valley. The Chairs, in turn, each welcomed and thanked meeting attendees from their basin. Quinto asked the approximately 85 meeting participants if there were any public comments.

2. **Public comment on matters not listed on the agenda but within the subject matter jurisdiction of the Board**

None.

3. **Recharge: What is it? What is it not? Different types of recharge; recharge in the context of SGMA**

To kick off the meeting, Marcus Trotta, Sonoma Water Principal Hydrogeologist and GSA Technical Staff, provided an overview of recharge and why it matters. Trotta provided the science behind recharge and covered how people can preserve and enhance recharge. He mentioned the importance of groundwater, which is the only water supply for the City of Sebastopol and often the only supply for agriculture and rural residential users, in addition to being, an important supplemental or backup supply for other cities. Groundwater can also be an important source of water for streams and wetlands.

Trotta covered the recharge processes, the hydrologic cycle and the difference between infiltration and recharge. He then gave an overview of the different mechanisms of recharge: 1) Distributed recharge on valley floors; 2) Streambed recharge; and 3) mountain-

front recharge. After being recharged, groundwater travels through the groundwater system. The Sonoma County basins have a lot of geologic complexities and lots of clay, which can limit recharge in some areas.

Trotta recapped the SGMA requirements for groundwater sustainability: 1) Form Groundwater Sustainability Agencies (completed June 2017); 2) Develop Groundwater Sustainability Plans by January 2022; and 3) Achieve sustainability by 2042. Trotta covered the sequence for implementation of the Groundwater Sustainability Plans from 2018 to 2042:

- Describe Basin condition (2018-2019);
- Define Sustainability for the basin (2020);
- Develop Plan and Projects (2021);
- Adopt Groundwater Sustainability Plan (2022); and
- 5) Implement Plan to achieve sustainability by 2042 (2022-2024).

Sustainable Management Criteria are defined locally and based on basin conditions to avoid significant undesirable results for SGMA's six Sustainability Indicators:

- 1) lowering groundwater level;
- 2) land subsidence;
- 3) seawater intrusion;
- 4) degraded water quality;
- 5) reduction of storage; and
- 6) surface water depletion.

Trotta provided large-scale examples of recharge including intentional flooding of farmland, preservation of natural recharge areas, percolation/recharge ponds, and aquifer storage and recovery. Small-scale examples can include water-wise demonstration gardens, rainwater capture, and rock-lined swales.

We know the locations where recharge happens by using mapping and modeling techniques and investigation techniques that include seepage runs, site-specific assessments and geophysical techniques. Information and data are also collected from the community. The level and degree of existing data/information varies by basin.

4. Flood-MAR: Using Floodwater for **Managed Aquifer Recharge**. What is it? Where is it happening? How does it work?

Kamyar Guivetchi, Manager, Division of Planning, California Department of Water Resources covered the topic of flood managed aquifer recharge. To set the context he explained California water is a tale of extremes with either high or low water conditions. There are rarely average water conditions. Climate change is making the extremes more frequent and pronounced and there are big changes in snow pack levels. We expect to see a dramatic shift in runoff of major rivers in California. More precipitation falls as rain and snow now, and consequentially there is less runoff in summer and the early fall months.

To successfully implement projects, we need much better data. Funding is always a challenge, so demonstrating our return-on-investment is important to the public. Sustainability requires collaboration, agency alignment, and sector co-management. Moving forward, it is important that agencies better align the work that they do.

Flood-MAR is an integrated strategy to manage water resources for sustainability and climate resiliency. It must be done in public/private partnerships and be voluntary. Flood-MAR is an untapped part of California's water portfolio. It can be done on a single farm or an entire watershed. To move forward toward a more sustainable way of managing our water resources, the water sectors will have to co-manage our water from headwaters to groundwater.

There are many public benefits of Flood-MAR: flood risk reduction, drought preparedness, ecosystem enhancement, groundwater remediation, and recreation and aesthetics. For aquifer replenishment to be recognized as a public benefit, it must first be recognized as a natural infrastructure. There are a number of potential barriers to Flood-MAR implementation including cooperation, legal issues around water rights, regulations, and permitting, etc. The State of California recognizes Flood-MAR as an important strategy. Guivetchi provided the audience with example components of various Flood-MAR projects.

Today there is a Flood-MAR Research Advisory Committee for Research and Data Development. This committee includes 100 organizations with 200 experts to cover 13 research areas. Together, the committee identified 130 information gaps and 39 priority actions. The next step is to build a Flood-MAR network to share information, coordinate, and to implement and track Research and Data Development Plan actions and Flood-MAR projects. We need to build momentum within the research community to leverage our collective efforts to secure the funding, conduct the research, collect the data, and build the tools needed to advance Flood-MAR.

The State can help expand Flood-MAR by recognizing California's aquifers as natural infrastructure as a public benefit and by making multi-benefit actions for replenishing over-drafted aquifers eligible for State grants, technical assistance, and/or regulatory alignment. Everyone can help build and participate in a Flood-MAR network.

5. **Considering Groundwater Recharge Above Annual Irrigation Use (RAU) in Sonoma County**

Dr. Phil Bachand, Bachand & Associates, gave a presentation about Recharge Above Annual groundwater Use in farm and agriculture (RAU). He explained that the main reason we are looking at water recharge is cost. Groundwater recharge is much less expensive than reservoir expansion or seawater desalination. On-farm recharge involves capturing available flood flows onto farm lands for groundwater recharge (crop irrigation) and flood management. The system is expandable, scalable, and fast in responding to the releases of surface water from climate change or normal climate conditions that occur. It is complicated to get water on fields to do what you want and to measure the effects. There are lots of complexities.

Bachand provided examples of RAU in Kings Basin in the Central Valley, and Saralee vineyards here in Sonoma County. Vineyards, pecans and other nuts are well suited for recharge projects.

The goal of monitoring at Saralee vineyard was to see effects of responses in groundwater. Some lessons learned from the Saralee vineyard studies: Implementation was successful using standard vineyard irrigation infrastructure; Recharge Above Use requires data tracking to quantify water recharge volumes and SGMA benefits/credits; increases in soil moisture can decrease irrigation demand; and Recharge Above Use did not increase soil salinity.

Specific challenges of RAU include implementing at scale, water rights, leveraging all potential waters, and suitability, among other things.

6. Questions and comments

How helpful are the California Tiger Salamander areas with groundwater sustainability?

Response Trotta – In the Santa Rosa Plain salamander habitat generally coincides with areas of vernal pools. The vernal pools typically form because there is a shallow clay or other low-permeability layer that prevent water from infiltrating below it, so generally, salamander areas are not good recharge areas.

Question – Identifying locations for recharge, you all stressed this is key to any Flood-MAR project. Since everyone is relying on large scale mapping done by the city, will the State be updating the information and supporting the basins?

Response Guivetchi – Short answer is yes. The technology is fairly recent. The State is piloting the technology on a small scale. We want to do a much broader application of the survey of groundwater basins in the State. In the near future the State will make information available to all GSAs so we can improve on aquifer characterization, which is an important factor for determining where to do managed aquifer recharge and how it relates to existing use.

Question – One of the largest contiguous areas is the Laguna de Santa Rosa – is anyone looking at it as a potential huge recharge basin?

Response Trotta - The Laguna area is generally a discharge area. Most times of the years, it is not the best area for recharge, as it is a slow-moving stream, which generally results in deposits of low permeability silts and clays. When the Russian River floods, it can provide recharge, but overall, it is not a good recharge area.

Response Bachand – When you look at areas for recharge, under SGMA a lot of farm-based recharge is about stream flows. Only a very small subset of areas has good connectivity between shallow and deep groundwater. Also, there is some opportunity in higher elevation areas to hold back water through erosion control measures, which then may be able to provide recharge into the deeper groundwater.

Response Guivetchi – As we characterize soil and geology, we could find an area that might not be prime for recharge might be good as a capture basin. Once people do the climate change vulnerability assessments, they will see lots of flood risk.

Question - Are there simple rules of thumb about the limits of wine grapes sitting in water, about the physiological state of the vines?

Response Bachand – Wine grapes have been flooded or over-irrigated for months in the

Central Valley. Soils here can only infiltrate so fast. Lots of differences in grape growing areas.

Question – Kings project – looks like a lot of land owners. How did you convince so many folks in a contiguous area to flood their fields?

Response Bachand – Started with a big ranch, with support of the NRCS, we suggested the idea of a broader flooding area – 20-30 landowners over about 70000 acres. Did outreach, did presentations, lots of people came on board relatively quickly. Then SGMA came along. Like anywhere else, if people are interested, they join.

Response Guivetchi – Landowner Don Cameron was an early adopter of Flood-MAR in the early 90's. He demonstrated it could be done. Flood-MAR can be done one farm at a time.

Question – Examples we saw are basically in flat areas. Anything happening on the slopes? Most of Sonoma County agricultural areas are hilly.

Response Bachand – It is more complicated to implement and to measure.

Question – You have done a wonderful job discussing Flood-MAR and recharge. What are the challenges we face with a direct recharge process from flood waters?

Response Trotta – It is possible to recharge the deeper aquifer but there are additional challenges to recharge through wells which are prone to clogging. We have done one recharge pilot project through a well in Sonoma Valley using treated drinking water. It was a successful program but there are additional things to consider, including costs.

The Question and Answer session was followed by basin-focused table top discussions, before concluding with a short wrap-up and closing comments.