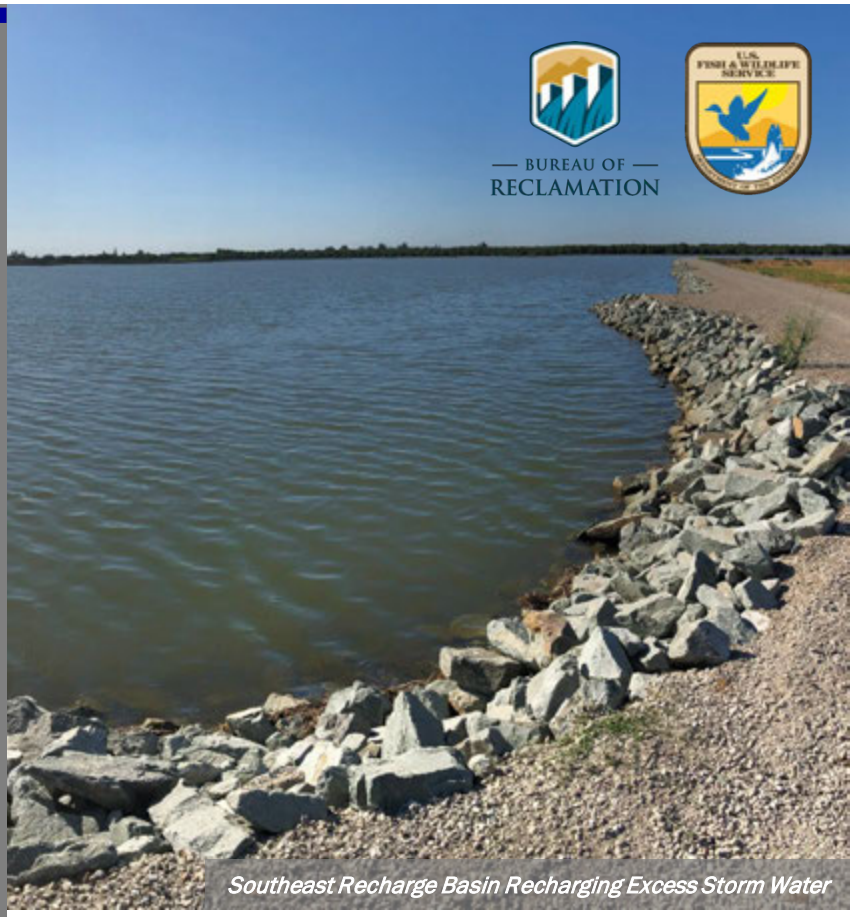
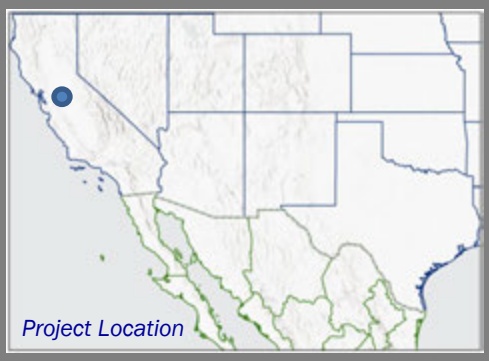
Water Conservation and Re-Use

Protecting Future Water Supply Through the Southeast Recharge Basin Project



Southeast Recharge Basin Recharging Excess Storm Water

The Stockton East Water District (SEWD), located in San Joaquin County, California, provides water for agricultural, municipal, and industrial purposes. San Joaquin County relies on groundwater to meet demand, particularly for agriculture, the dominant land use. Due to historical heavy reliance on groundwater, there has been a steady decline in the aquifer level since the 1970s. To further increase water supplies through groundwater recharge and increase management flexibility, SEWD expanded the 1997 Farmington Groundwater Recharge Program (Farmington Program) to the new Southeast Recharge Basin site.



KEY ISSUES ADDRESSED

Historic reliance on groundwater, compounded by climate change induced drought, are depleting the aquifer in San Joaquin County and threatening future water sustainability. Decreasing groundwater levels also increases the risk of saltwater intrusion, which would lower water quality. Additionally, SEWD needed to treat potentially polluted runoff during storms at the municipal water treatment plant. Thus, there was little management flexibility for SEWD in deciding when water was treated and how reservoirs were maintained because of the lack of surface water and groundwater storage.

PROJECT GOALS

- Improve drought resiliency by increasing groundwater supplies for use in years of limited surface water
- Recharge water into the aquifer to protect against potential saltwater intrusion
- Increase raw water storage to match production capacity of the expanded water treatment plant
- Expand management flexibility of water sources through the addition of groundwater recharge basins

HABITAT BONUS

In addition to providing groundwater recharge, the Southeast Recharge Basin creates seasonal wetland habitat for a multitude of birds, insects, and other animals.

Construction of the Southeast Recharge Basin

PROJECT HIGHLIGHTS

Zero-Waste Spreading Basins: The spreading basin is a shallow pond less than five feet deep that receives peak flows during storm events and increases infiltration to the aquifer. The soil excavated to construct the spreading basin was reused to create the concave shape of the basin, effectively preventing waste of this soil.

Increased Water Storage and Quality: The addition of the Southeast Recharge Basin increased water storage and improved water quality. They increased recharge from 4,400 to 16,000 acre feet of water per year. The addition improved water quality by providing more time for solids to settle before water reached the treatment plant intake.

Reduced Risk from Runoff: Runoff can be received by the spreading basin and filtered through the soil, reducing the likelihood of excess nutrients causing concern for humans and wildlife.

Flexible Operations: The addition of the Southeast Recharge Basin has increased water management flexibility for SEWD. Water operators can now take basins out of service when they require maintenance, while other basins can continue recharging groundwater. Further, SEWD can treat more high-quality water by taking basins out of service when they have lower quality water.

LESSONS LEARNED

Stakeholders surveyed potential basin sites prior to basin construction. Gaining improved understanding of the soil and hydrology of potential sites increased investment security for constructing and maintaining the recharge basins.

Planners also considered multiple alternatives for recharging groundwater in order to develop the most efficient use of resources in San Joaquin County where land-use pressures are high.

Furthermore, SEWD implemented a “Design Build" construction plan for the Southeast Recharge Basin, which reduced costs by adapting the design as construction occurred and fostered collaboration between SEWD, contractors, and designers.

Although the “Design Build” was largely successful, attempting to reduce costs on the finer details of the project resulted in use of water meters that were eventually deemed insufficient for SEWD’s needs. Improving the success of future projects requires carefully balancing the benefits of investing in high-quality equipment with consequences that can come when reducing costs.

NEXT STEPS

- Implement new groundwater recharge methods to further maximize land uses in San Joaquin County
- Replace current water meters with higher quality meters when funds are available
- Work with local and federal agencies to improve water management endeavors such as flood control improvements

Collaborators

- Stockton East Water District
- U.S. Bureau of Reclamation WaterSMART Drought Resiliency Program

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Photos courtesy of SEWD
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Bird Perched Along Southeast Recharge Basin Bank