

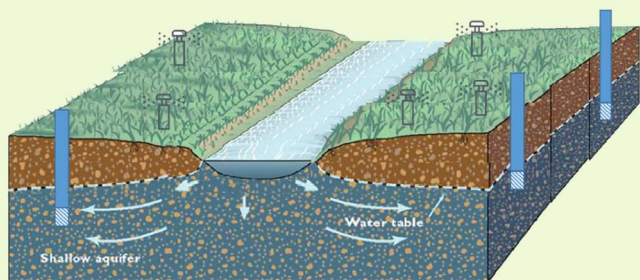
Groundwater Benefits from Recycled Water Use



Regional San is developing Harvest Water to provide a safe and reliable supply of tertiary-treated recycled water for agricultural uses. Extensive computer modeling was performed using the Sacramento Area Integrated Water Resources Model (SaciIWRM) to estimate Harvest Water benefits. SaciIWRM has supported various county-wide and localized surface water and groundwater planning efforts since the early 1990s, including evaluating land and water use plans, water supply alternatives, conjunctive use options, groundwater sustainability, and water quality conditions. The modeling simulations used a future conditions baseline that included projected 2030 land and water use under climate change to compare groundwater levels and stream flows with and without Harvest Water. Results are summarized below.

KEY GROUNDWATER BENEFITS

- Reduces groundwater pumping to restore groundwater levels and increase volume of groundwater in storage
- Improves groundwater-surface water connectivity, benefiting riparian habitats
- Improves Cosumnes River flows to support fall-run Chinook salmon
- Provides water quality and ecosystem benefits to the region
- Contributes to sustainability of groundwater basin



Current Conditions

Groundwater levels are low, and streams are losing water due to pumping.



With Harvest Water

Providing recycled water for irrigation in lieu of groundwater pumping will elevate the groundwater table to support:

- New and enhanced wetlands and riparian forests
- Increased stream flows
- Increased fall-run Chinook population

IMPROVING GROUNDWATER STORAGE AND STREAMFLOW

In-lieu groundwater recharge refers to the use of recycled water by irrigators to offset a significant portion of local groundwater use. By delivering recycled water in lieu of groundwater pumping, Harvest Water will increase groundwater storage by approximately 225,000 acre-feet within 10 years. Over the course of the Program, groundwater storage is estimated to increase by as much as 370,000 acre-feet – about one-third the size of Folsom Lake. As groundwater elevations continue to rise, the connectivity between groundwater and surface water is realized, improving the Cosumnes River’s in-stream flows.

IMPROVING GROUNDWATER LEVELS

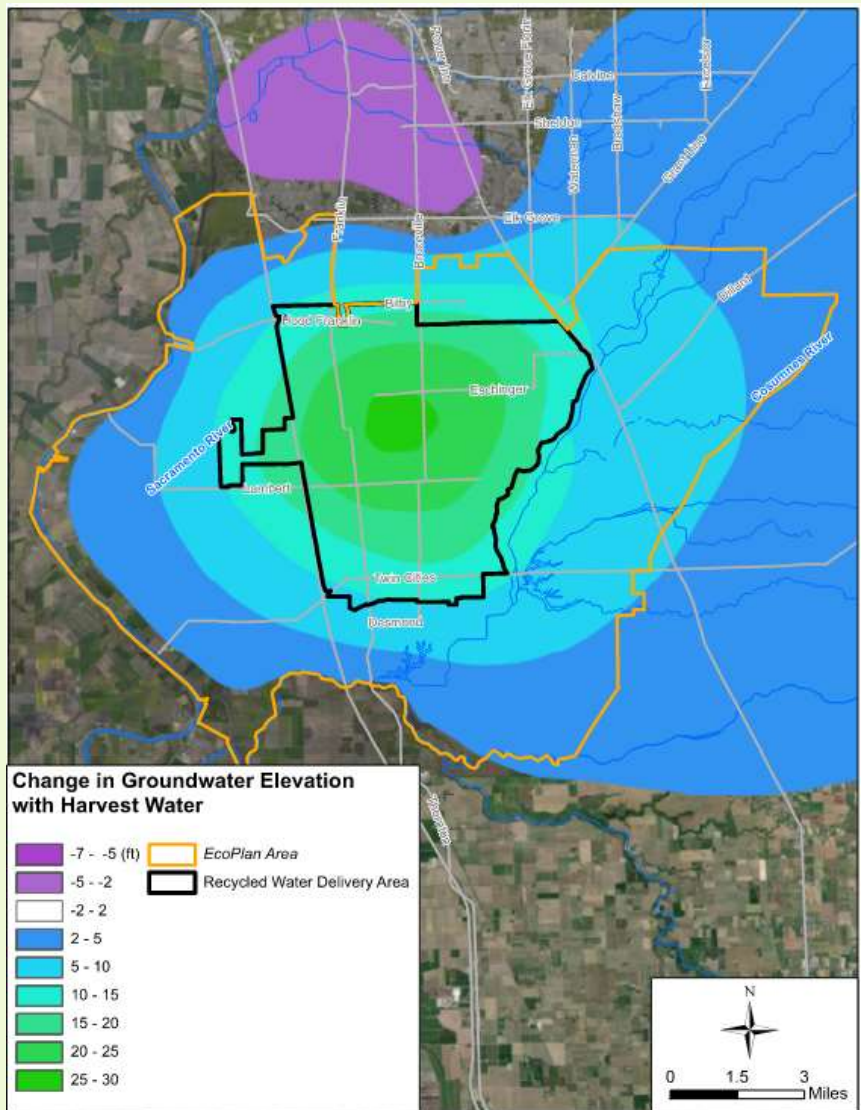
The modeling also demonstrates that Harvest Water is key to improving groundwater levels in the South American Subbasin and ensuring a sustainable groundwater supply for future generations. These benefits extend well beyond the recycled water delivery area. The *EcoPlan* area shown on the map includes the recycled water delivery area as well as the surrounding land that is expected to receive indirect ecosystem benefits. Harvest Water is expected to raise groundwater levels up to 30 feet in the center of the Harvest Water delivery area and 15 to 25 feet in other parts of the groundwater basin, helping to reverse a pumping depression that currently exists due to groundwater extraction.

Harvest Water Increases Groundwater Storage and Improves Streamflow in the Cosumnes River

Groundwater Storage Increase ¹	Average Annual Increase in Streamflow ²	Average Daily Cosumnes Streamflow Increase ³	Year 50% Benefits to Streams Achieved ⁴
370,000 af	16,800 afy	16 cfs	Year 24.5

Notes:

- (1) This represents the change in groundwater storage (acre-feet) over the 84-year simulation period relative to the baseline conditions.
- (2) This represents the average annual increase in streamflow (acre-feet per year) over the entire simulation period relative to the baseline conditions. This average includes the initial ramp up of the Program before full benefits are achieved.
- (3) This represents the change in average daily streamflows (cubic feet per second) in the Cosumnes River at Twin Cities Road over the entire simulation period relative to the baseline conditions.
- (4) This represents the simulation year where 50% benefits to streams are achieved, estimated based on the distribution of benefits between groundwater in storage and streams.



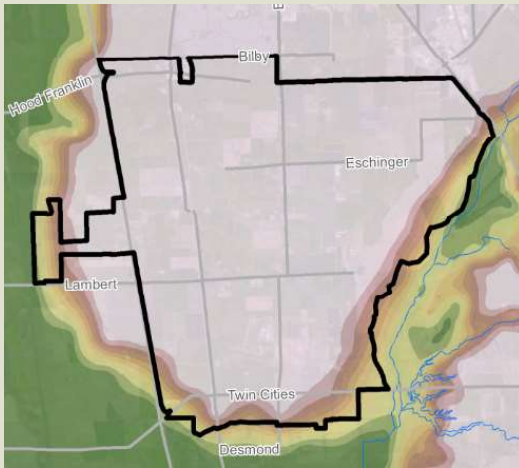
ENHANCING LOCAL ECOSYSTEMS

Riparian habitats do best when groundwater levels are within 25 feet of the surface. By raising groundwater levels, Harvest Water would significantly increase the area of the Cosumnes River corridor experiencing shallow groundwater conditions over 90% of the time. This will result in multiple benefits. Higher groundwater levels along the Cosumnes River corridor will support improved riparian vegetation due to shallow groundwater levels being reachable by the roots of trees and shrubs along the river. Increased streamflow in the Cosumnes River in dry months will support the fall-run Chinook salmon fishery. Fields voluntarily managed for Sandhill crane habitat will increase their population. Vernal pool complex habitat will be restored and managed with existing compatible grazing practices. Providing a reliable source of recycled water will help support agriculture and conservation efforts into the future.

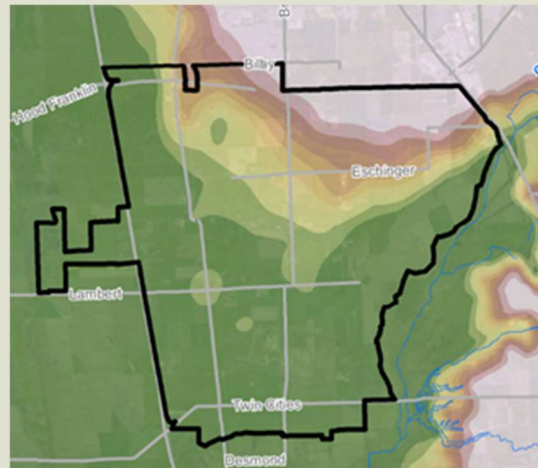
Higher Groundwater Levels Benefit Wetlands & Riparian Areas

Extent of benefits illustrated by percentage of time groundwater levels would be within 25 feet of the surface. The figure shows significant environmental benefits to almost the entire recycled water delivery area.

WITHOUT HARVEST WATER

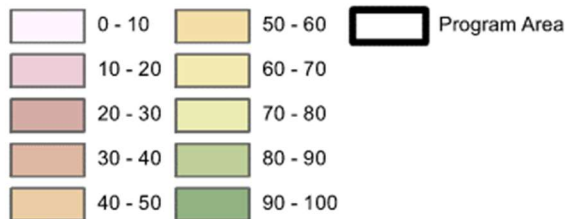


WITH HARVEST WATER



Legend

**Percent of Time that
Depth to Groundwater is Less than 25 ft.**

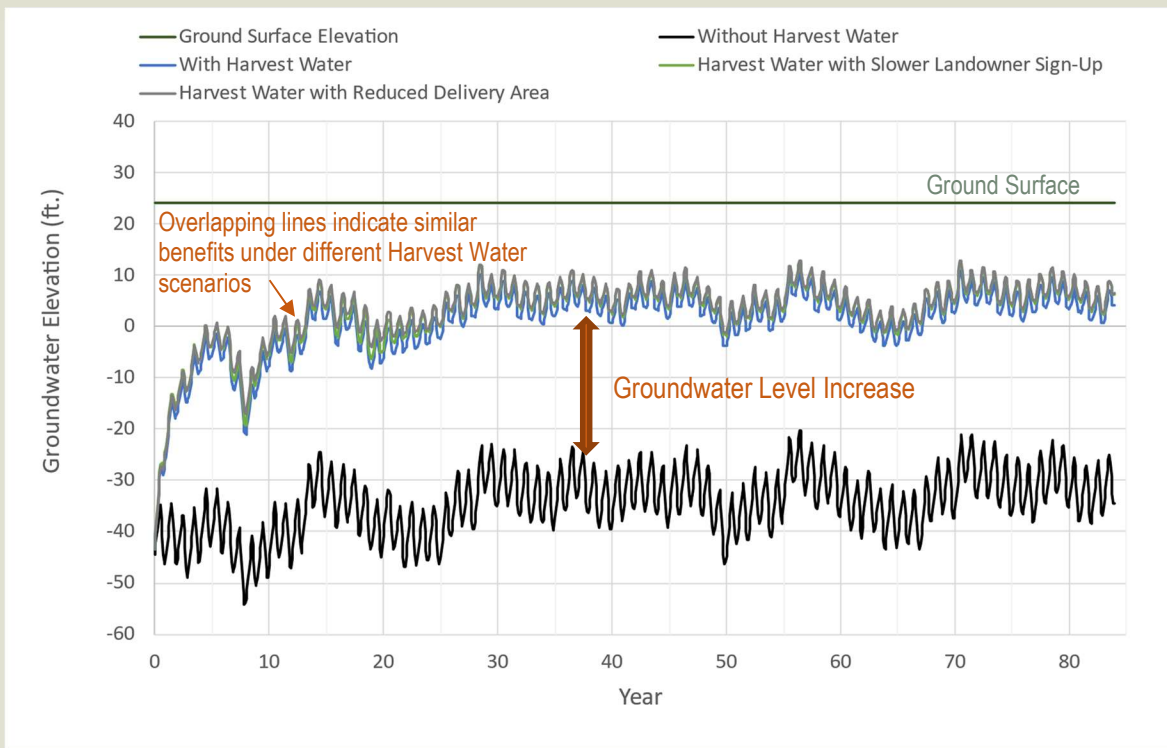


SENSITIVITY ANALYSIS

The modeling included a sensitivity analysis looking at different scenarios such as slower or more rapid Program implementation. For example, one scenario assumed slower sign-up of interested landowners, and another assumed recycled water delivery to a reduced portion of the Program Area. The modeling analysis showed significant benefits to groundwater levels in the Program Area under all scenarios.

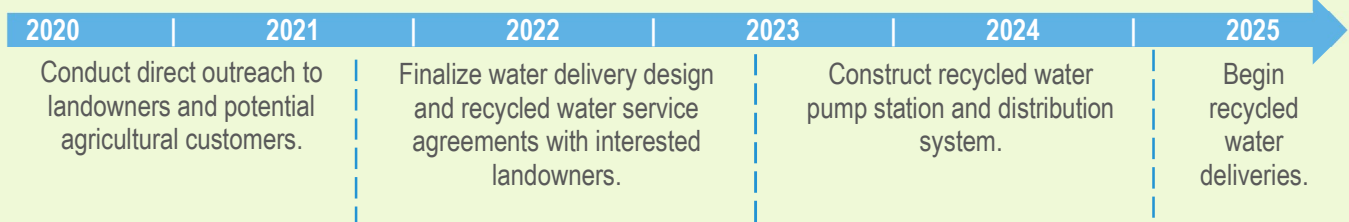
Groundwater Levels in Harvest Water Program Area

The sensitivity analysis shows significant benefits to groundwater levels under all Harvest Water scenarios.



OVERALL SCHEDULE

Next steps include continuing planning efforts with interested local farmers and landowners and developing preliminary designs for distribution systems to convey recycled water to agricultural lands.



For more information, please visit regionalsan.com/harvest-water or contact Regional San at HarvestWater@sacsewer.com or (916) 876-3322.