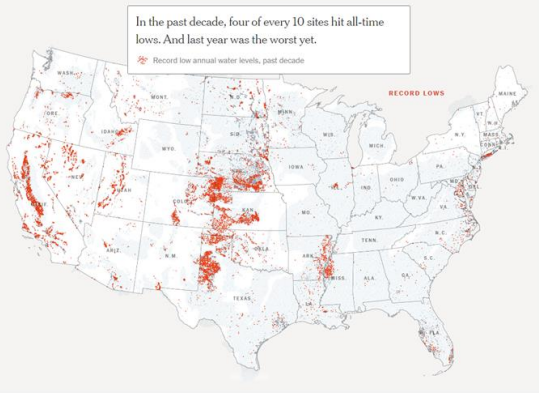




Surface Stormwater Infiltration Basin
Stockton, California

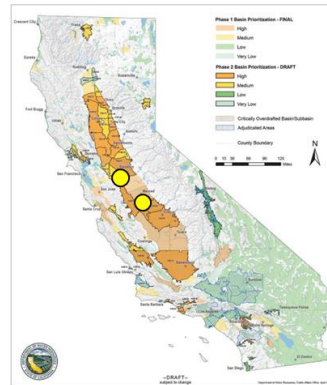
Introduction

Groundwater Crisis
Customer Opportunity
P4 Solution



<https://www.nytimes.com/interactive/2023/08/28/climate/groundwater-drying-climate-change.html?smid=em-share>

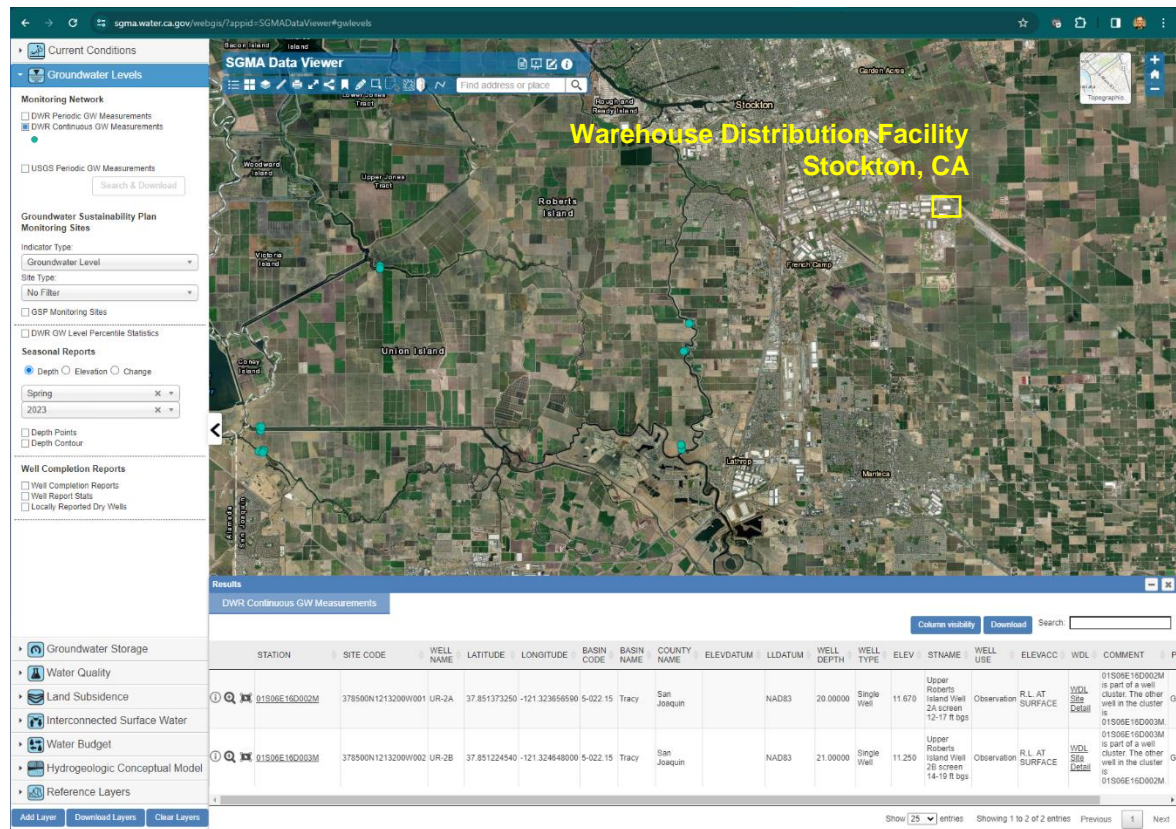
Sustainable Groundwater Management Act (SGMA)



Groundwater Credit Trading



You CANNOT Buy/Sell what you do not MEASURE



Customer Opportunity:

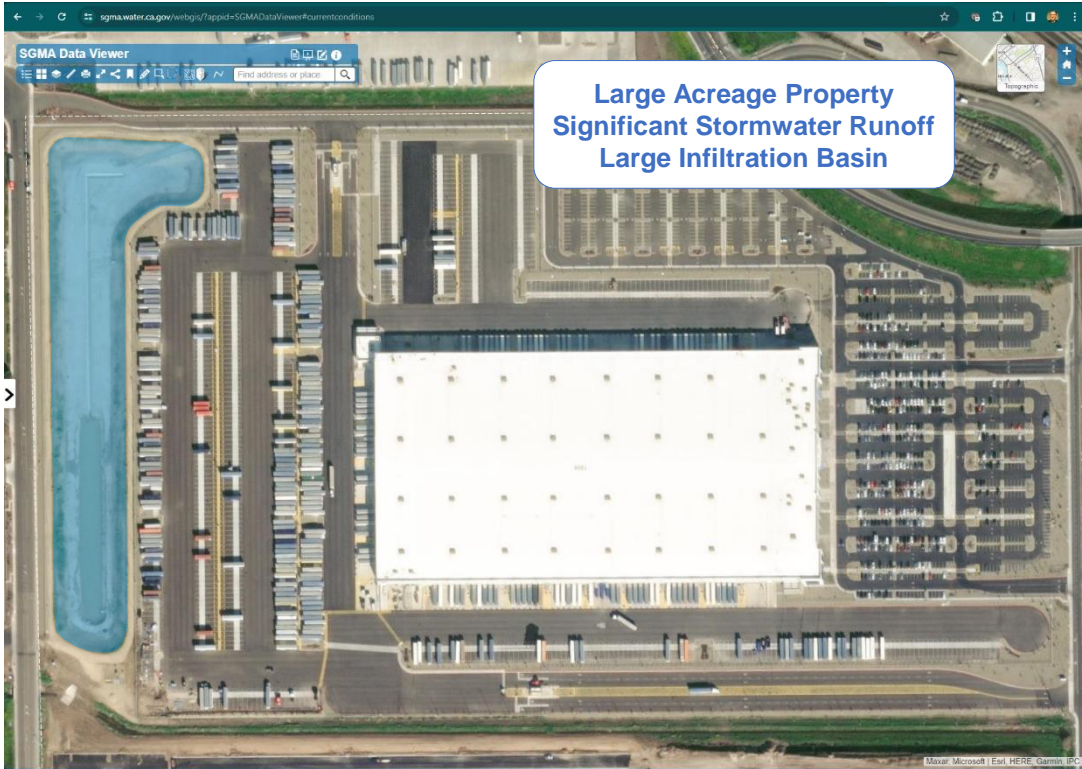
- Capture Large Runoff Volume
- Facilitate Groundwater Recharge
- Recharge Rebates and Groundwater Credit Trading:
\$375 - \$1,100 /acre-ft value⁽¹⁾

(1) TETRATECH (2016). "Establishing Monetized Benefits of Groundwater Recharge from Stormwater Retention Practices", United States Environmental Protection Agency, April, Contract No. EP-C-11-009, Washington DC, 68 pages.

LIQUA-Level EPC & Rain-mX



Large Acreage Property
Significant Stormwater Runoff
Large Infiltration Basin



Measured Data

Cost-Effective, Reliable & Robust P4 System

Continuous Monitoring of Environmental Conditions

Continuous Documentation of Basin Performance

Documented Infiltration Volume:

- Groundwater Rebates
- Groundwater Credit Trading

Empty Conditions June to October

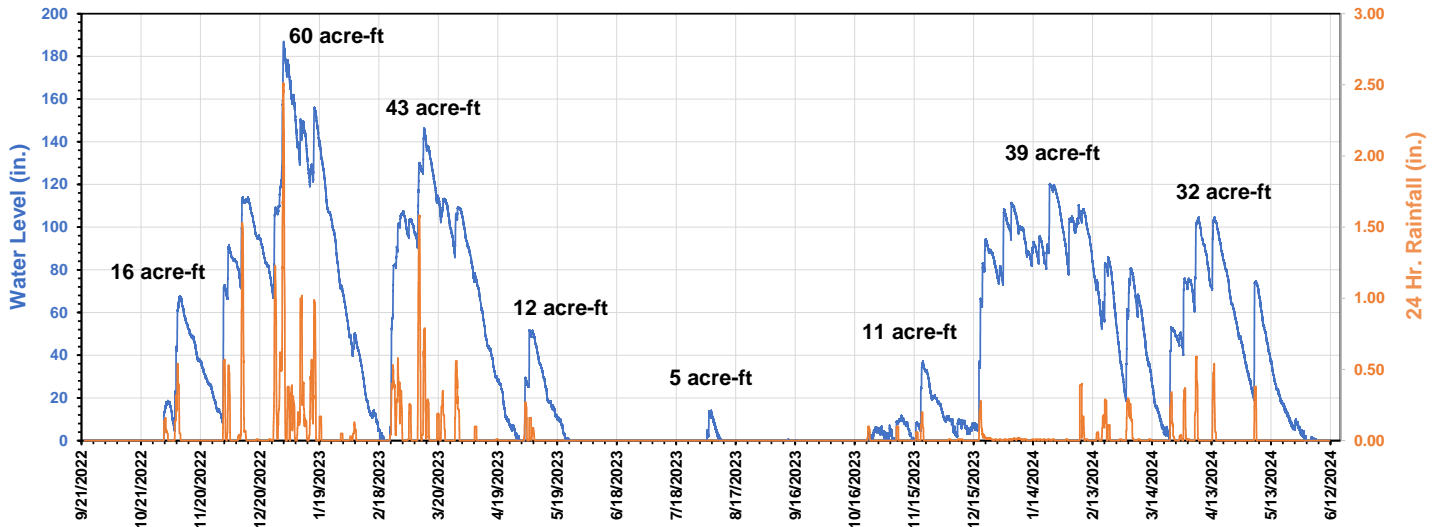


Repeated Rainfall Events October to June



Basin dimensions are too large for ultrasonic sensors.
Extreme and long-duration exposure to ultraviolet radiation.
Windy conditions present.
Water level measurement needed from ZERO to 22+ feet.

Simplified Model for Evaporation Included



LIQUA-Level EPC measures water levels from ZERO to 22 feet.

Water level measurements taken at 10-minute intervals without maintenance.

Rain-mX measures: temperature, barometric pressure, relative humidity, and rainfall at 10-minute intervals.

Minimal maintenance of tipping bucket rain gauge.

Environmental data perfectly suited for evaporation models.

218 acre-ft infiltrated

\$81,000 to \$239,000 in rebate or trading credit

OUTLOOK

The first SGMA groundwater market is trading: The importance of good design and the risks of getting it wrong

Groundwater markets are a promising tool for basins implementing SGMA, but they are complex, and good design is essential.

Sarah Heard, Director, MarketLab, The Nature Conservancy
Matthew Remps, Executive Director, Center for Economic Research and Forecasting, and Assistant Professor, California Lutheran University
E. J. Remson, Senior Project Director, California Water Program, The Nature Conservancy
Online: <https://doi.org/10.3733/ca.2021w0010>

A groundwater market, which caps total pumping within one or more basins, allocates portions of the total to individual users and allows users to buy and sell groundwater under the total cap, is a promising tool for basins implementing California's Sustainable Groundwater Management Act (SGMA). While the benefits of a cap-and-trade system for both groundwater users and regulators are potentially very large, so too are the risks. An electronic bulletin board that introduces buyers and sellers, like craightat.org, is not a market. Nor is a sophisticated financial application that matches participants and executes financial transactions. A water market is a complex interaction of individuals and institutions, the product of a large number of people, structural operational mechanisms and rules. Without careful design, a water market can do harm.

Creating a functioning market is not easy. There is no off-the-shelf solution, and there is a lot to get right. The most important — and difficult — elements to get right are the rules and structure, which must be tailored to local conditions. Capping and monitoring pumping, generating buy-in from diverse stakeholders and guarding against cheating and adverse impacts, such as the drying of shallow drinking water wells or of groundwater-dependent ecosystems (GDEs), are also essential. Even with careful design, markets can fall short or cause adverse impacts.

Accurate water monitoring is a first-order concern to ensure functioning groundwater markets. Meters, in place on Fox Canyon groundwater wells since the 1980s, track water use, left. To prevent cheating and ensure accurate data collection, Fox Canyon growers opted for universal telemetric sensors that attach to meters and stream pumping data real-time, funded by a grant from the Natural Resources Conservation Service, right.

The Fox Canyon groundwater market operates in a large area of Ventura County that includes over 55,000 acres of high-value agricultural land and 500 active agricultural wells. A primary driver of the market is the scarcity of water.

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The End

Let P4 show you how digitalization of
stormwater infrastructure can change
the game.



P4 INFRASTRUCTURE