SAN JOAQUIN VALLEY Greenprint

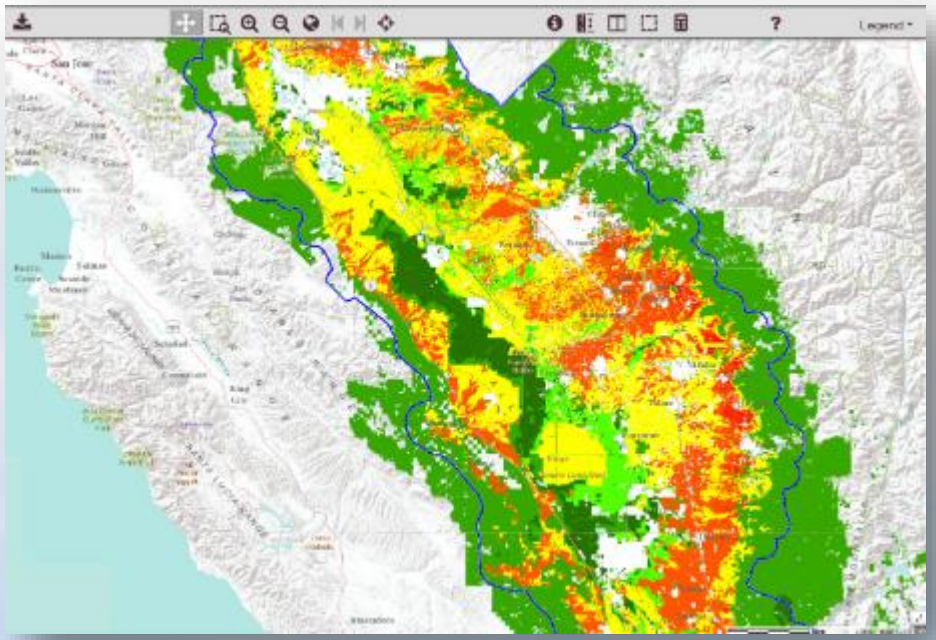
# San Joaquin Valley Greenprint

*A voluntary, stakeholder-driven project that provides agricultural, water, and environmental leaders with improved planning data and fosters regional collaboration on strategies that prioritize resource sustainability while enhancing economic prosperity.*

San Joaquin Valley Greenprint Advisory Committee | August 29, 2017

# What is the Greenprint?

- Interactive mapping platform for comprehensive consideration of resource planning in the Valley
- Purpose is to expand capacity of planners, decision-makers, and stakeholders through access to data

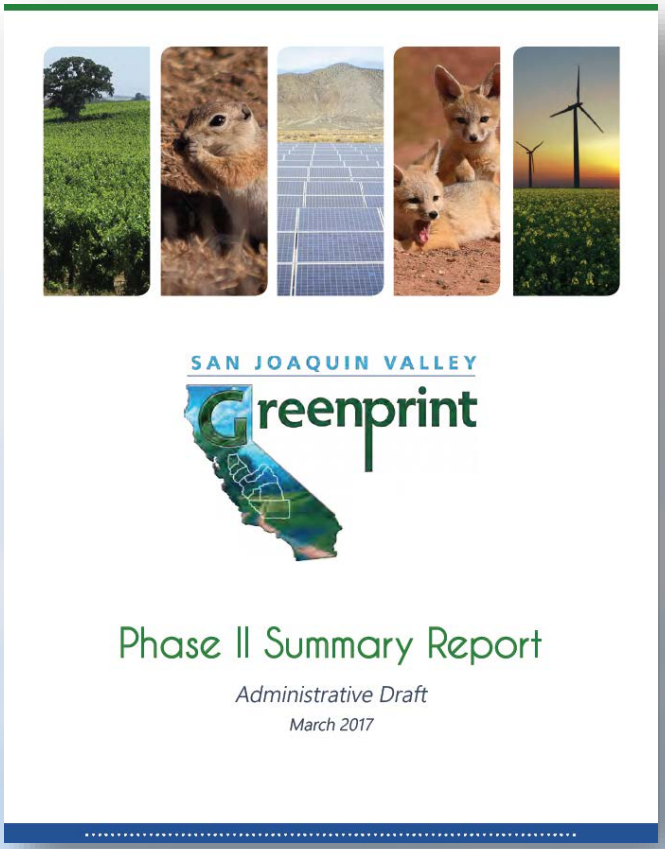


http://sjvp.databasin.org

# Session Agenda

- Final SJV Greenprint Phase II Summary Report
- CBI Demonstration of the SJV Gateway
- Demonstration Projects:
  - *American Farmlands Trust:* Land-Water Resources Intersection Report
  - *Sequoia Riverlands:* Watershed Enhancement Strategies for Groundwater Sustainability
  - *Sustainable Conservation:* Groundwater Rechage Assessment Tool (GRAT)
- Discussion and Q&A

# Final SJV Greenprint Phase II Summary Report




- Project Overview
- SJV Gateway
- Demonstration Projects
- Conclusions and Recommendations
- SJV Gateway User Guide

# SJV Greenprint Phase II Report

- Stakeholder Outreach
  - Expert Panelists
  - Planning Director Survey
  - Interviews

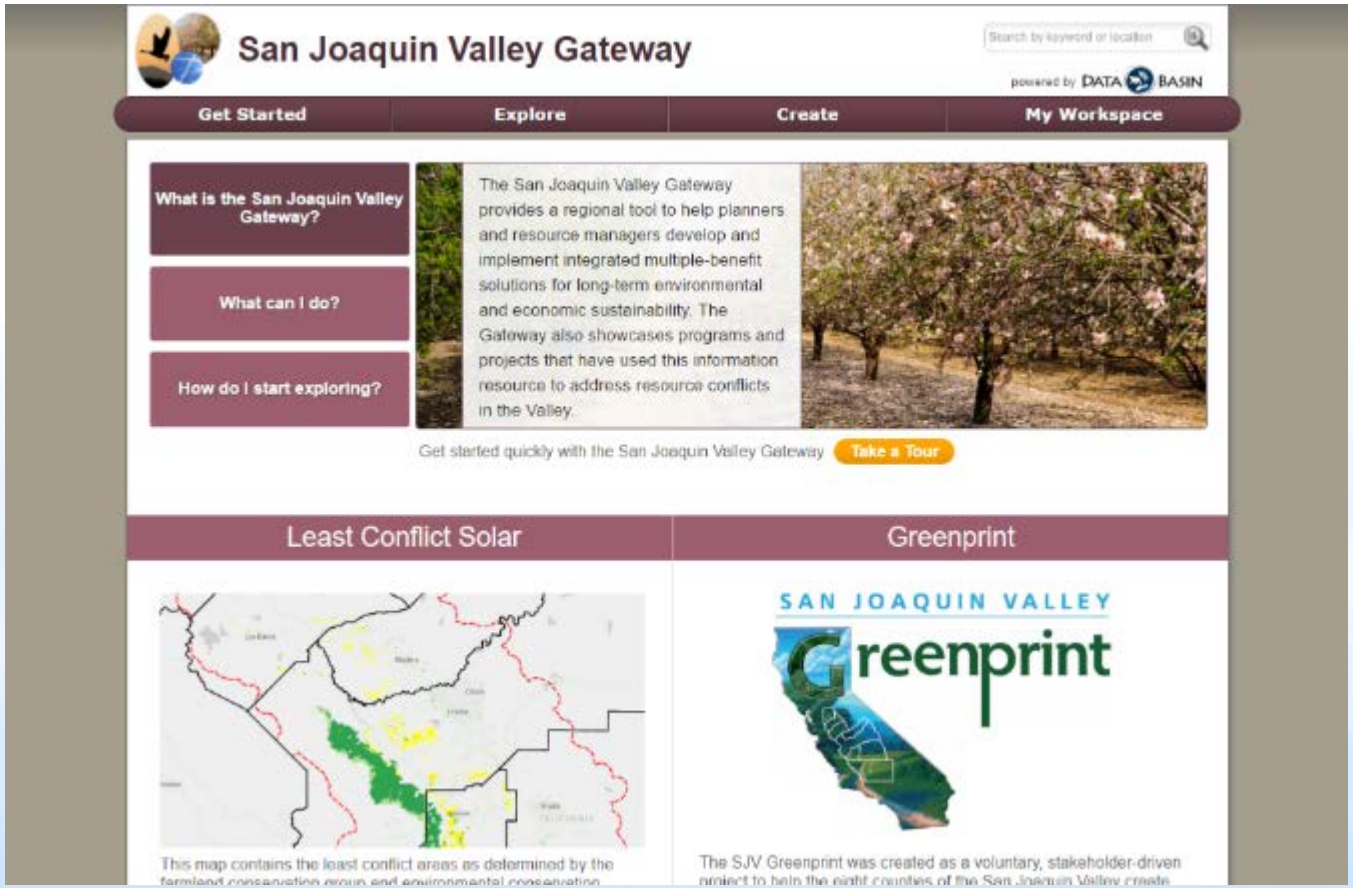
# SJV Greenprint Phase II Report

- Resource Challenges
  - Water
  - Agriculture
  - Biodiversity
  - Energy

# Next Steps

1. Outreach to Publicize the SJV Gateway
2. Maintain the SJV Gateway
3. Secure Long-term Funding
4. Identify additional demonstration projects
5. Explore opportunities for coordinated policy discussions (Greenprint Summit)

# San Joaquin Valley Gateway



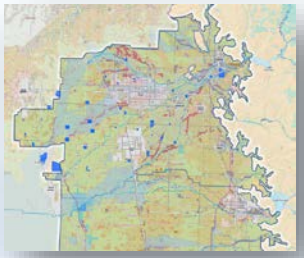

https://sjvp.databasin.org

# Demonstration Projects

- Showcase the power of the SJV Greenprint data in addressing resource issues, conflicts, or opportunities
- Use data available on or contribute data to the SJV Gateway
- Result in implementation tools and/or mechanisms for use by local governments
- Engage a range of stakeholders
- Applicable to the San Joaquin Valley as a whole or to sub-regions within the Valley

# Demonstration Projects

- Exploring the Land-Water Intersection in the San Joaquin Valley
  *American Farmland Trust*



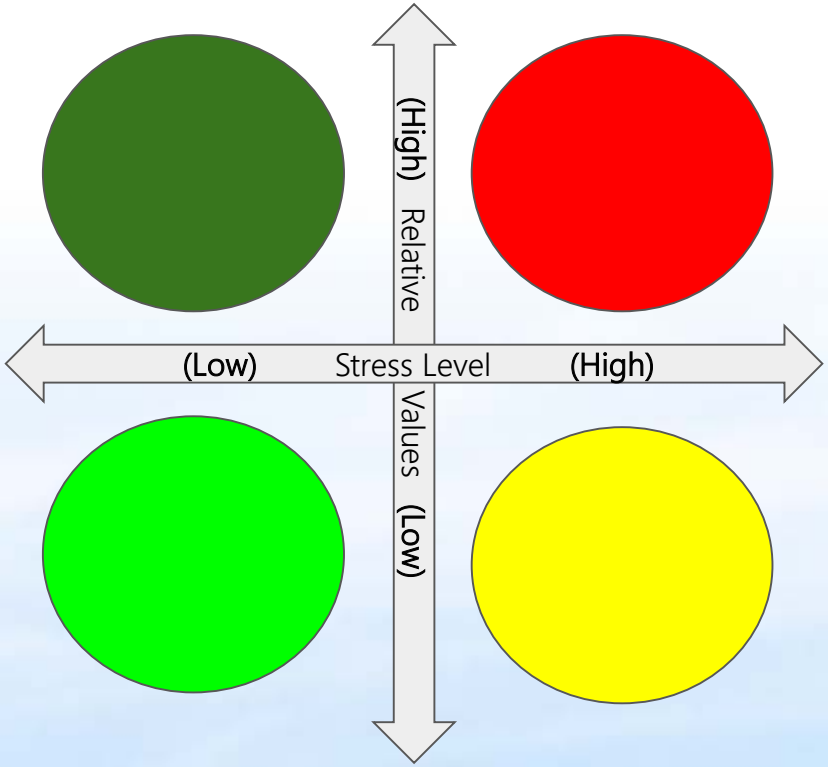
- Watershed Enhancement Strategies for Groundwater Sustainability
  *Sequoia Riverlands Trust*

- Groundwater Recharge Assessment Tool
  *Sustainable Conservation*

# Exploring the Land-Water Intersection in the San Joaquin Valley

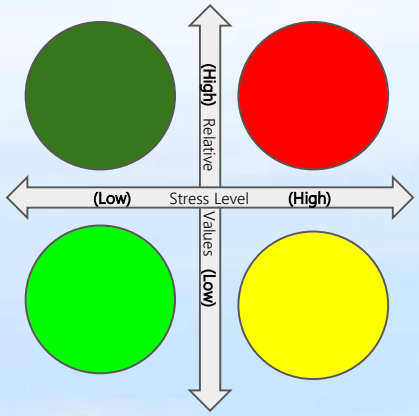
# Exploring the Land-Water Intersection in the San Joaquin Valley

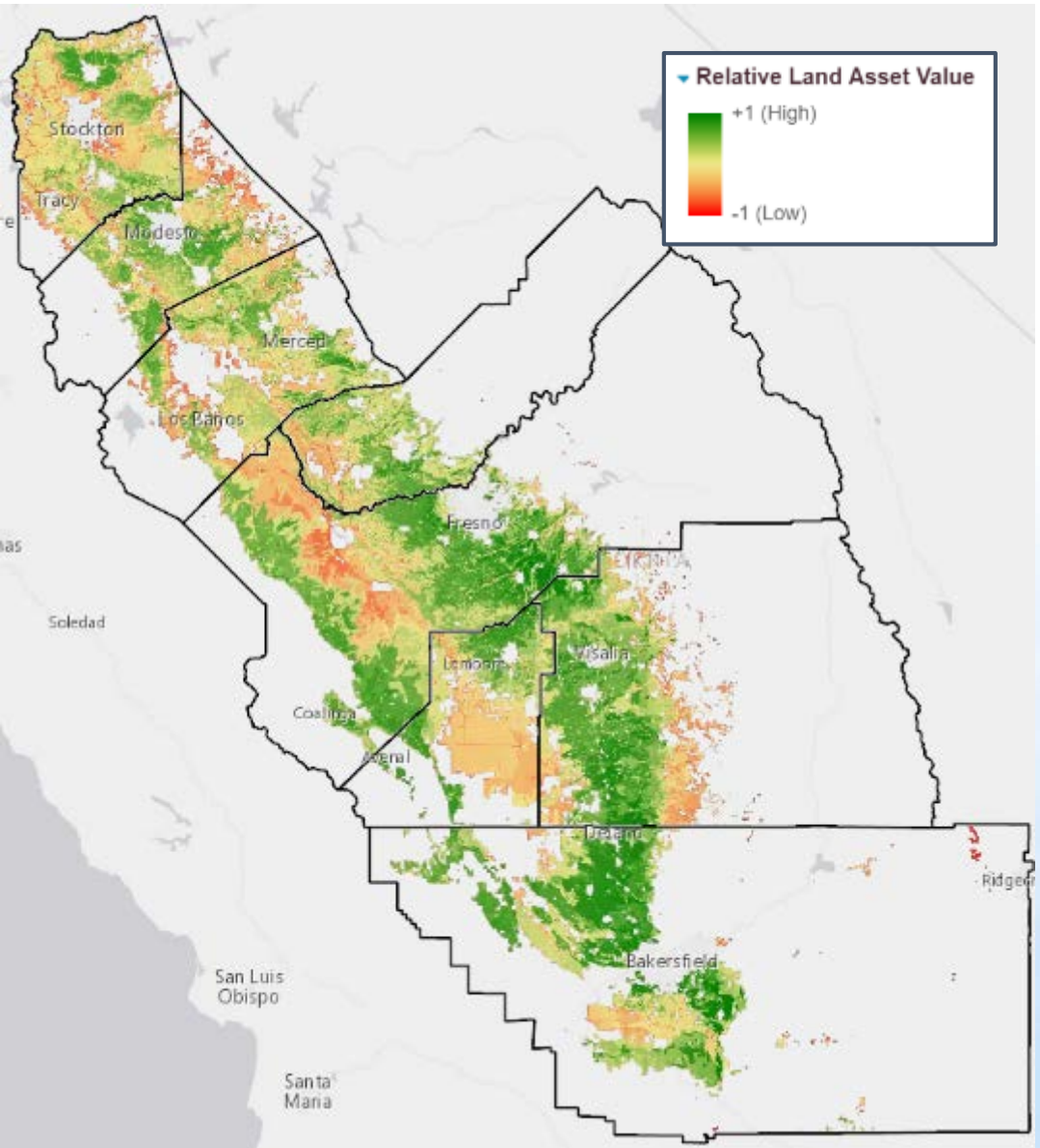
- Developed as part of the SJV Greenprint Demonstration Projects
  - Project Lead: American Farmland Trust
  - Technical support by the Conservation Biology Institute
- Project Goal: Identify relative agricultural values of, and stresses on the land and water resources in the San Joaquin Valley as a guide to conservation and resource management strategies.
- The intersection concept recognizes that both land and water resources are critical to agriculture.



# Modeling Approach

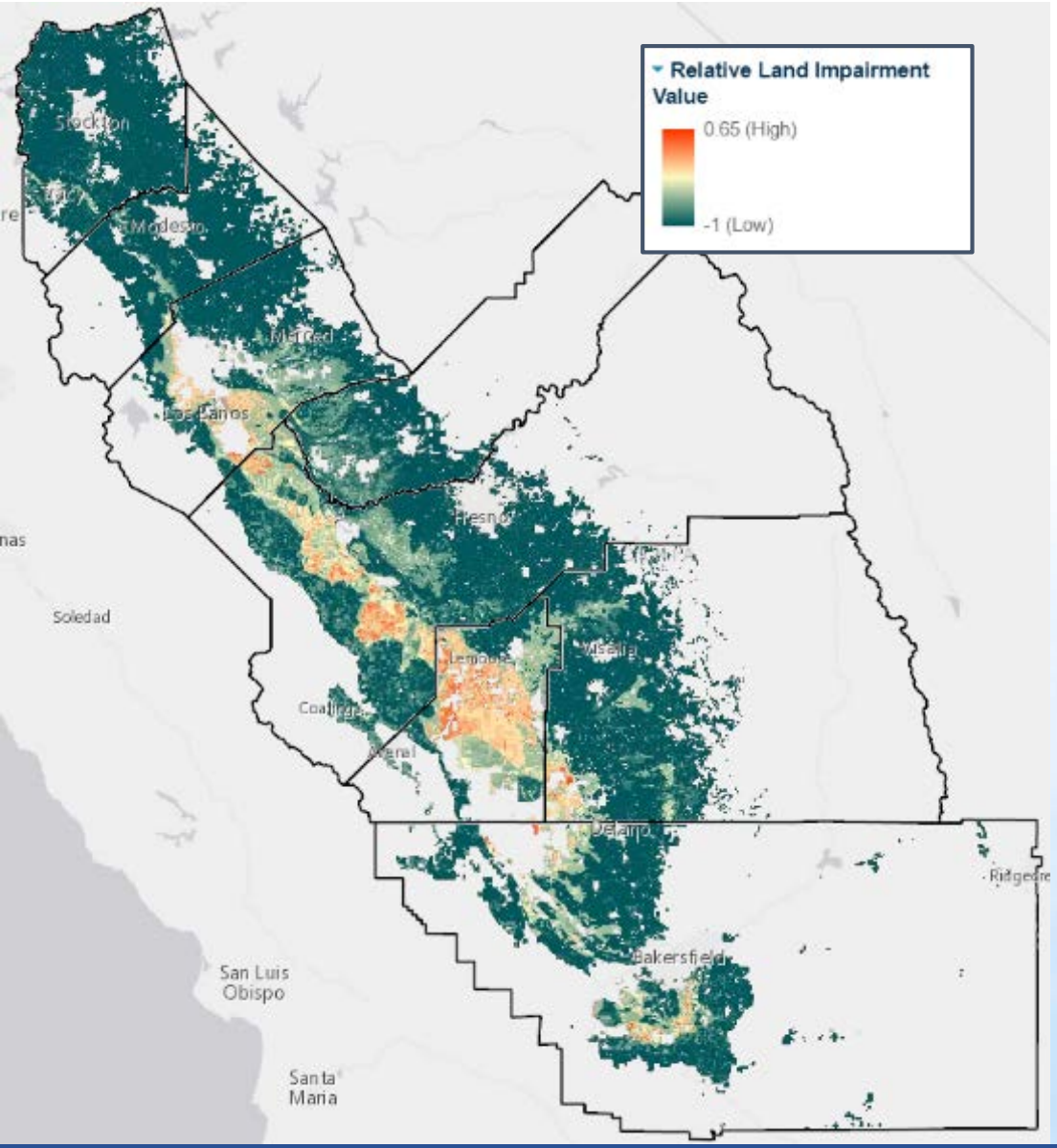
- Develop separate modules to easily identify relative land agricultural value and stressors
  - 4 Modules currently
    - Land Assets
    - Land Impairments
    - Water Availability
    - Urban Development
- Model development is happening within an interactive transparent framework
  - Environmental Evaluation Modeling System
  - Allows us to model inputs using shades of grey vs. a binary assessment
  - Allows for a easily updated platform that is useful for iterative development
  - 270m reporting unit cell





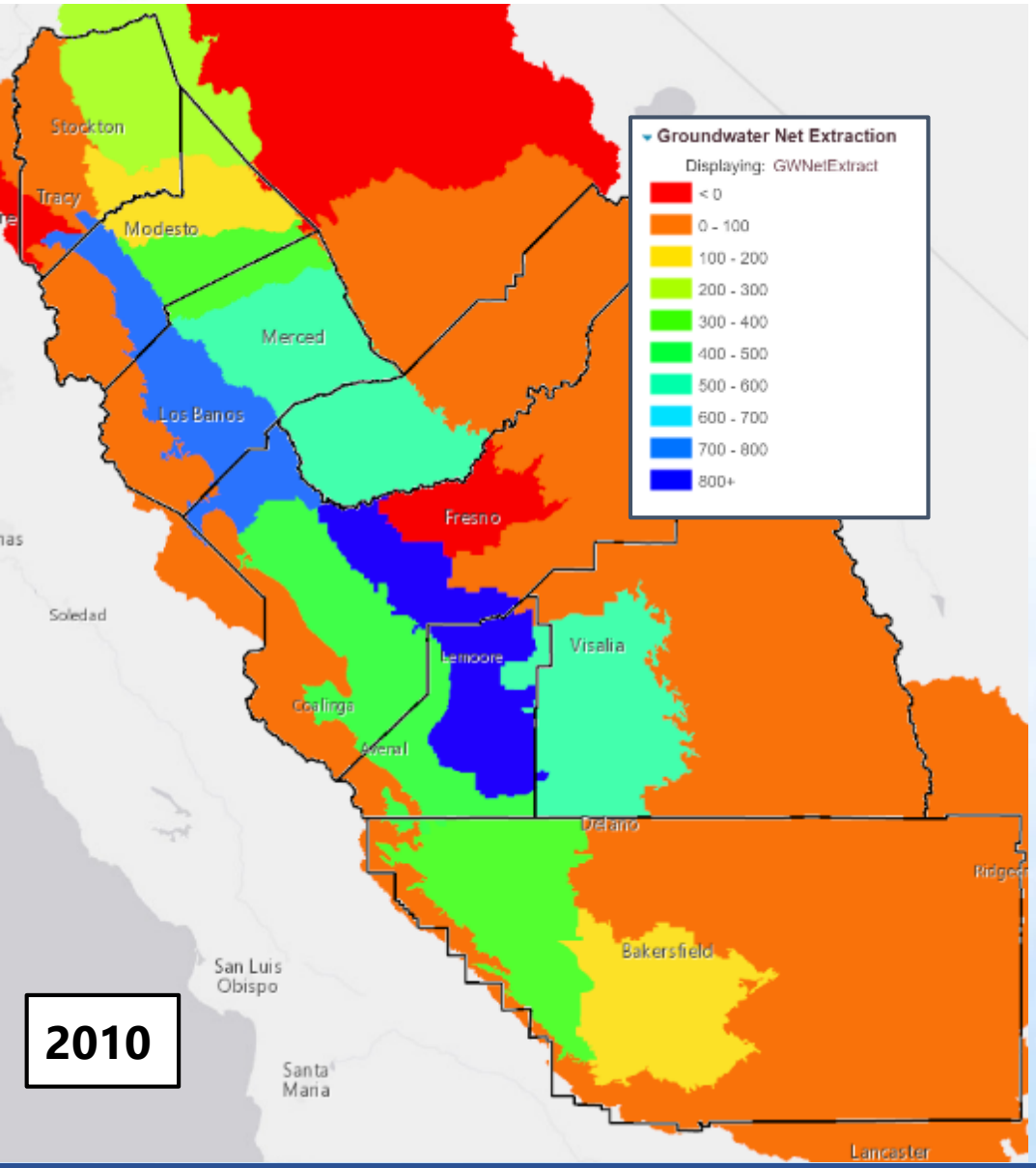

# Land Assets

- Current Land Classification
  - Farmland Mapping and Monitoring Program
- Soil Capability
  - California Storie Index
- Citrus Microclimate
  - Historical Predicted Suitability
- Groundwater Recharge Index
  - Soil Agricultural Groundwater Banking Index



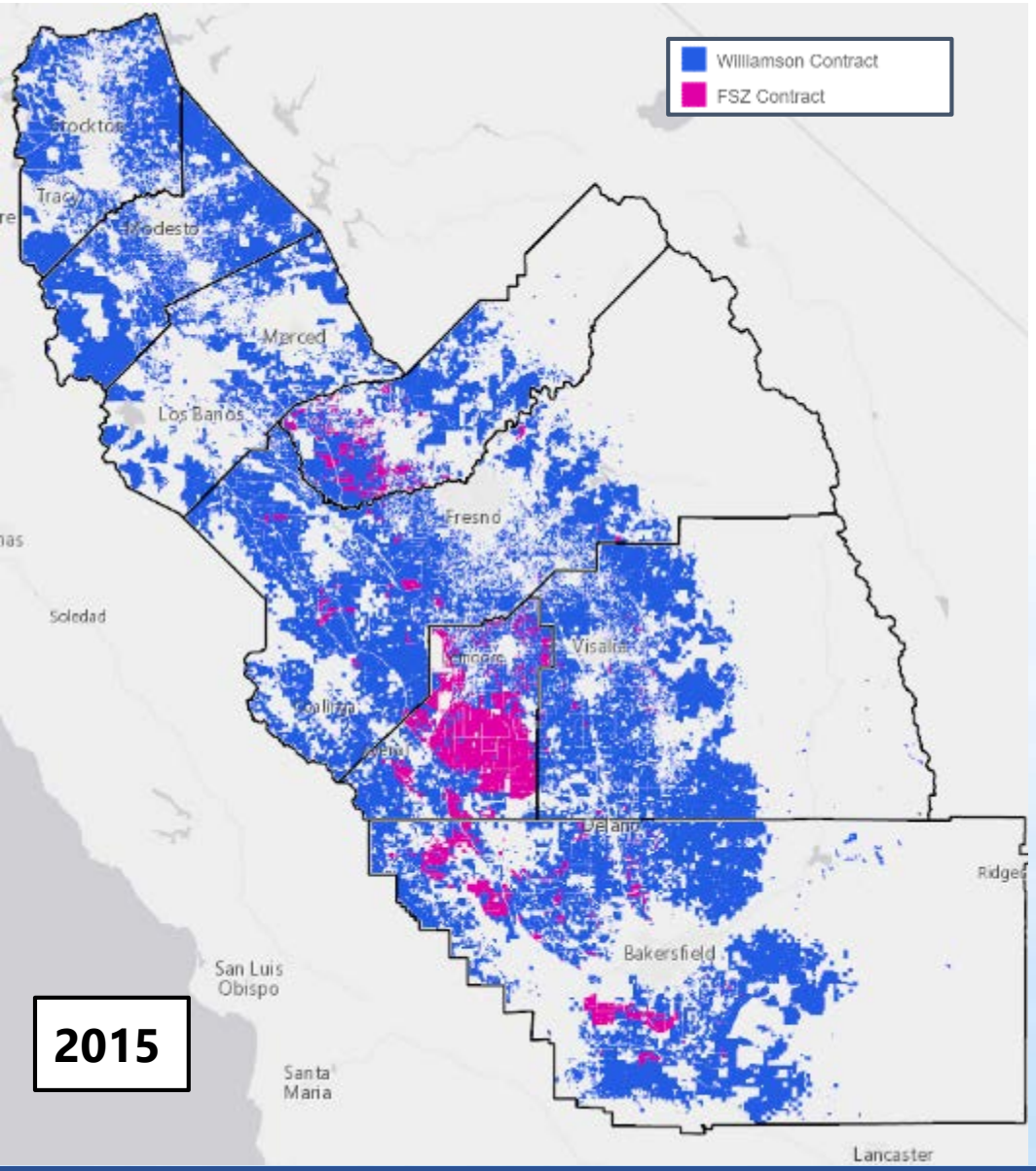

# Land Impairments

- Soil Impairments
  - Sodicity
  - Salinity
- Observed Idling/Fallowing
  - NASA/USDA Cropland Data Layer
  - 2011-2016
- Root Zone Impairment
  - DWR Shallow Groundwater




# Water Availability

- State Water Project Deliveries
- Central Valley Project Deliveries
- Local Water Deliveries
- Groundwater Usage
- Surface Water vs. Groundwater Use
  - Dependency on SW vs. GW
- Agricultural vs. Urban Water Use
- Depth to Groundwater
- Change in Depth to Groundwater
- Potential Regulatory Decisions
- Climate Change Impacts to Water Resources
  - Increase Irrigation Demand
  - Lowered SWP/CVP/Local Deliveries




# Urban Development

- Current Fragmentation
- Parcel Size and Zoning
- Spheres of Influence
- Williamson Act Enrollment
- General Plans
- Predicted Growth out to 2050

# Next Steps

- Draft maps available for viewing on the San Joaquin Valley Gateway:
  - https://sjvp.databasin.org/
- Further developing the modules/scenarios.
- Second Webinar at the end of March.

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*Dustin Pearce - dustin.pearce@consbio.org*

# WATERSHED ENHANCEMENT STRATEGIES FOR GROUNDWATER SUSTAINABILITY

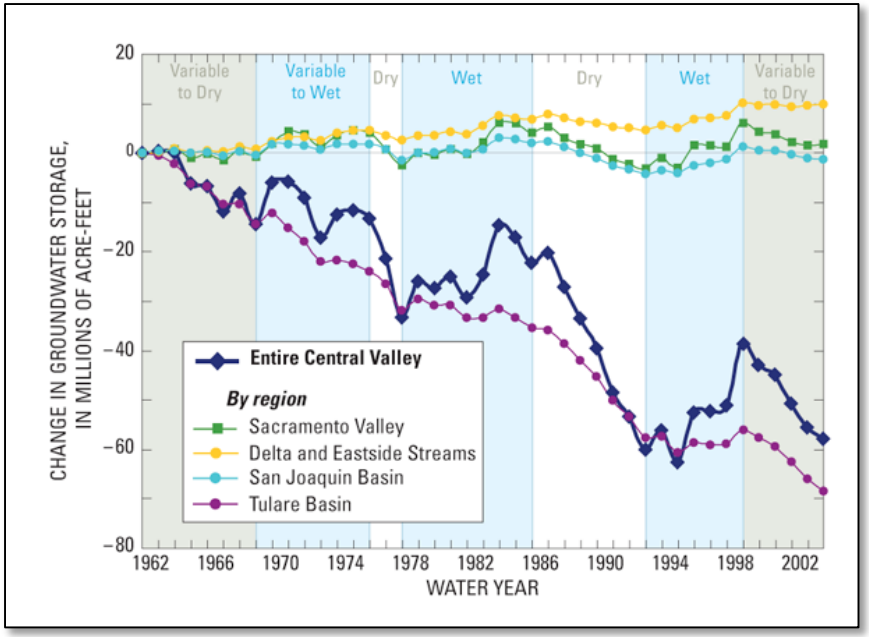
A San Joaquin Valley Greenprint Demonstration Project


Photo: John Greening, 2012.

# Background

Water Challenges

- Uneven supply from year to year
- Growing dependence on groundwater (even before drought)
- Climate change and future drought risk
- Flood control



# Background

Sustainable Groundwater Management Act

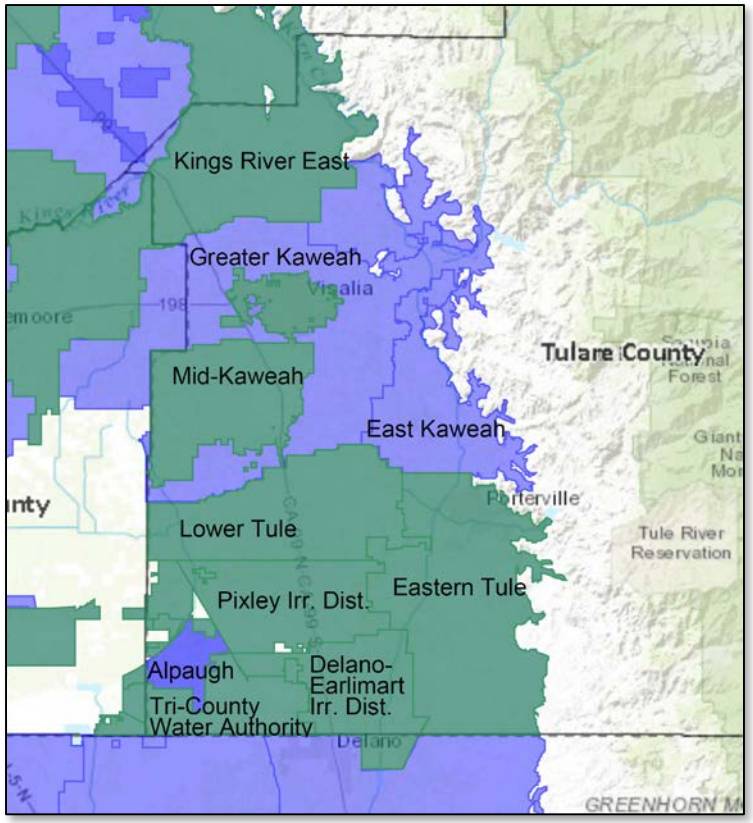
- Requires stakeholders to establish Groundwater Sustainability Agencies (GSAs) for each basin
- GSAs must develop Groundwater Sustainability Plans (GSPs) by 2020
- Time horizon for achieving sustainability:  20 years

Photo:  CA DWR, 2013

# Background

Sustainable Groundwater Management Act

- SRT involved in technical or advisory capacity with multiple GSAs:
  - **Mid-Kaweah**
  - Greater Kaweah
  - East Kaweah
  - **Lower Tule**
  - Eastern Tule



# SRT's Project

Possible Solutions

to Water Challenges

- Technological fixes
- Behavioral changes
- **Land-based strategies**

Photo: KVPR, 2017.


# SRT's Project

- Themes
  - Soil enhancement
  - Flood protection
  - Mineral resources
- Geographic Focus
  - Kaweah Watershed
  - Tule Watershed

Photo: John Greening, 2010.

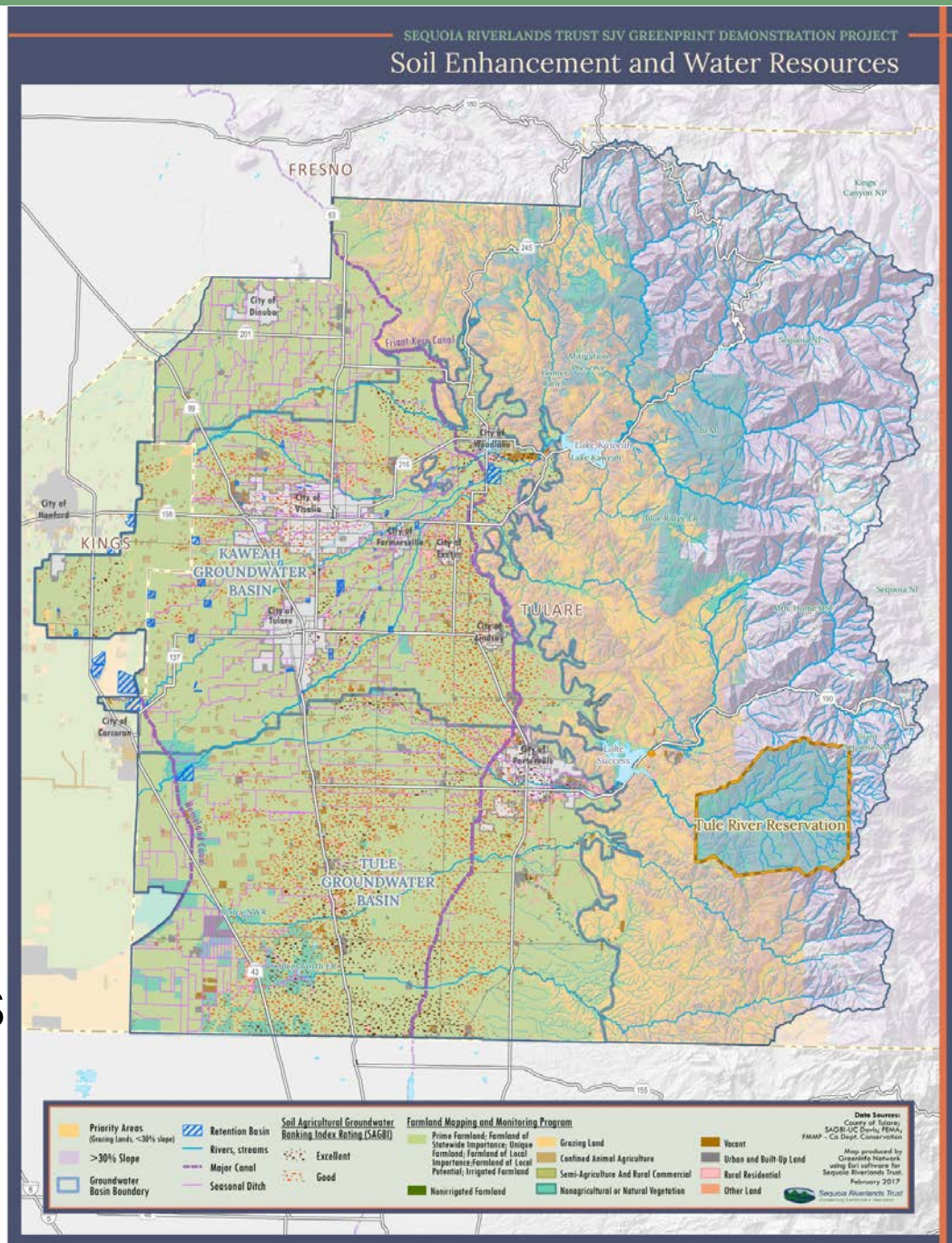
# SRT's Project

- Mapping and Planning Component
  - Analyzing Greenprint datasets for three themes
  - Groundwater recharge project
  - Web-based tool
- Groundwater Policy Component
  - Management practices for region's first GSPs
  - Ongoing outreach to GSAs

Photo: John Greening, 2012

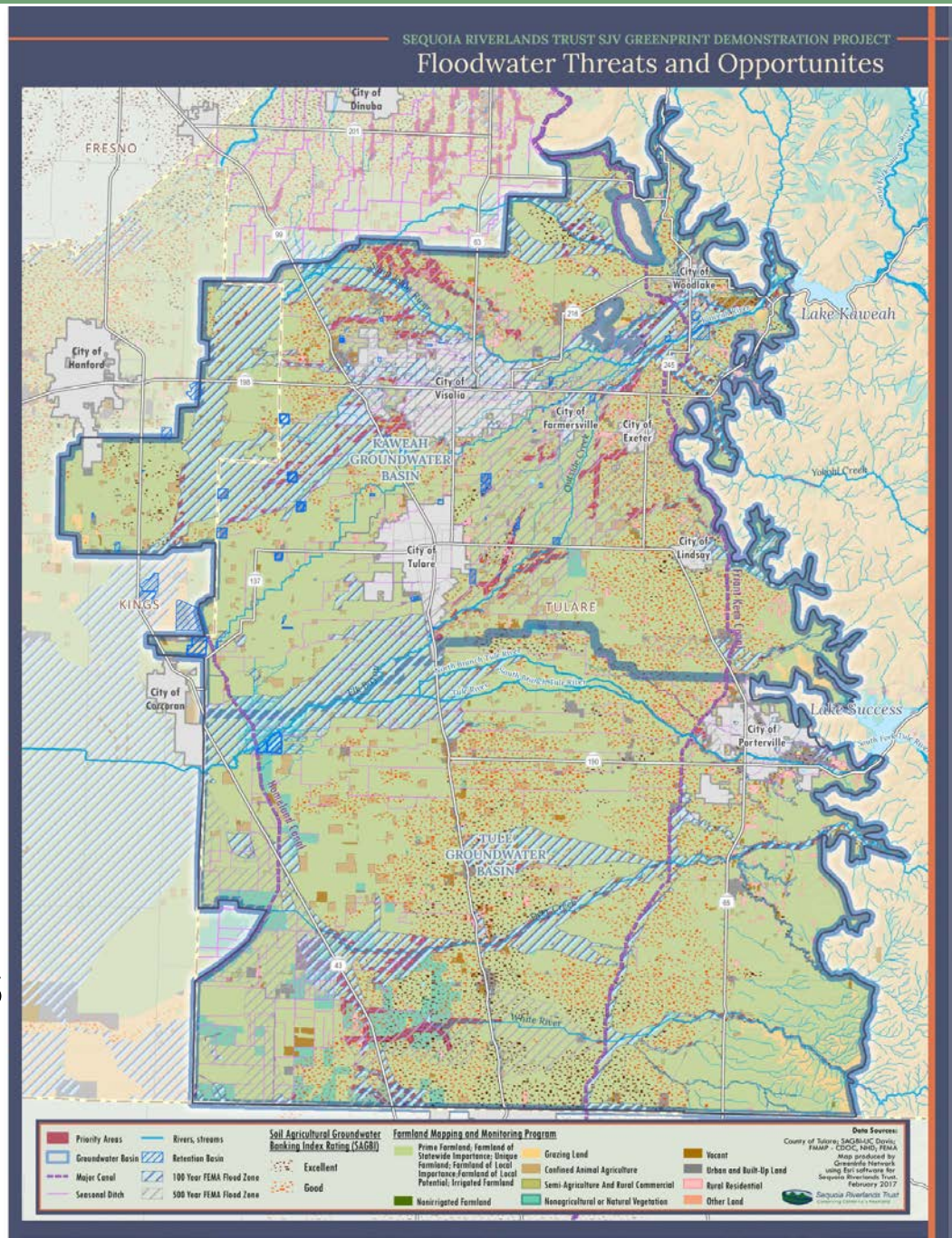
# Mapping and Planning

- **Soil Enhancement**
  - Opportunities to retain water, sequester carbon and provide other benefits
  - Could capture up to 14,500 additional acre-feet from precipitation (~19% of annual groundwater deficit in KDWCD)
- Flood Protection
- Mineral Resources



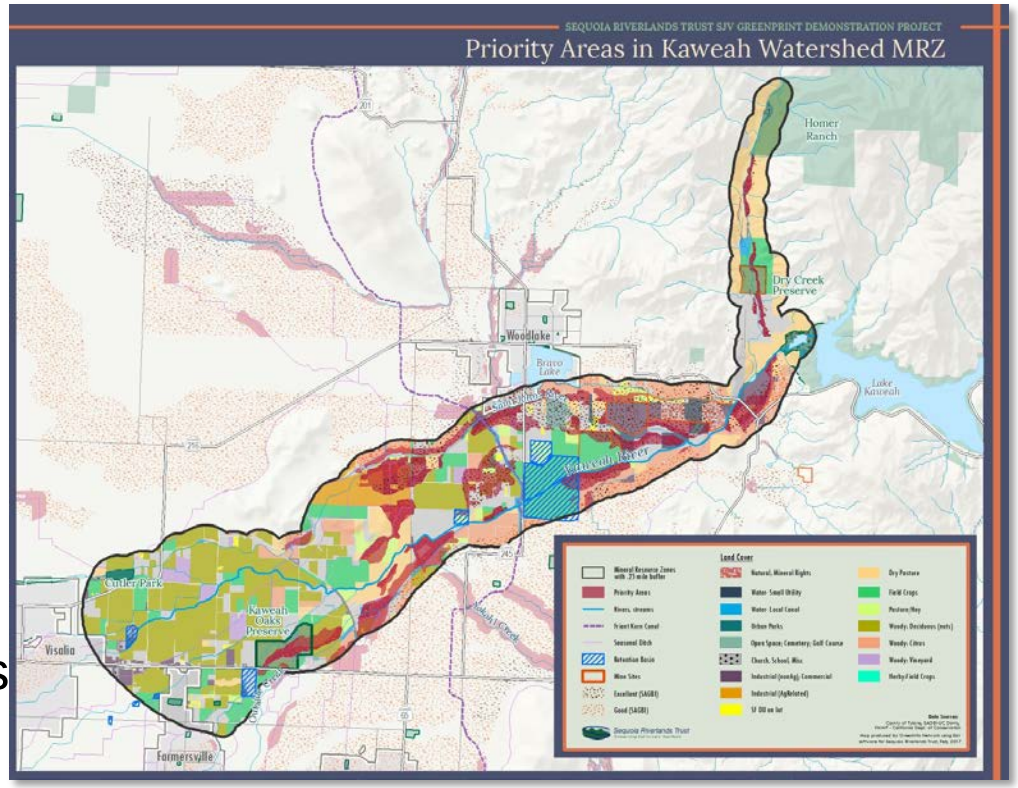
# Mapping and Planning

- Soil Enhancement
- **Flood Protection**
  - Opportunities for on-farm flooding and recharge
  - Could reduce annual GW overdrafts by up to 20% based on studies in other parts of SJV
  - On-the-ground project
- Mineral Resources



# Mapping and Planning

- Soil Enhancement
- Flood Protection
- **Mineral Resources**
  - Mineral Resource Zones
  - Mine reclamation
  - Restoring natural function in modified floodplains could make further contributions to groundwater recharge

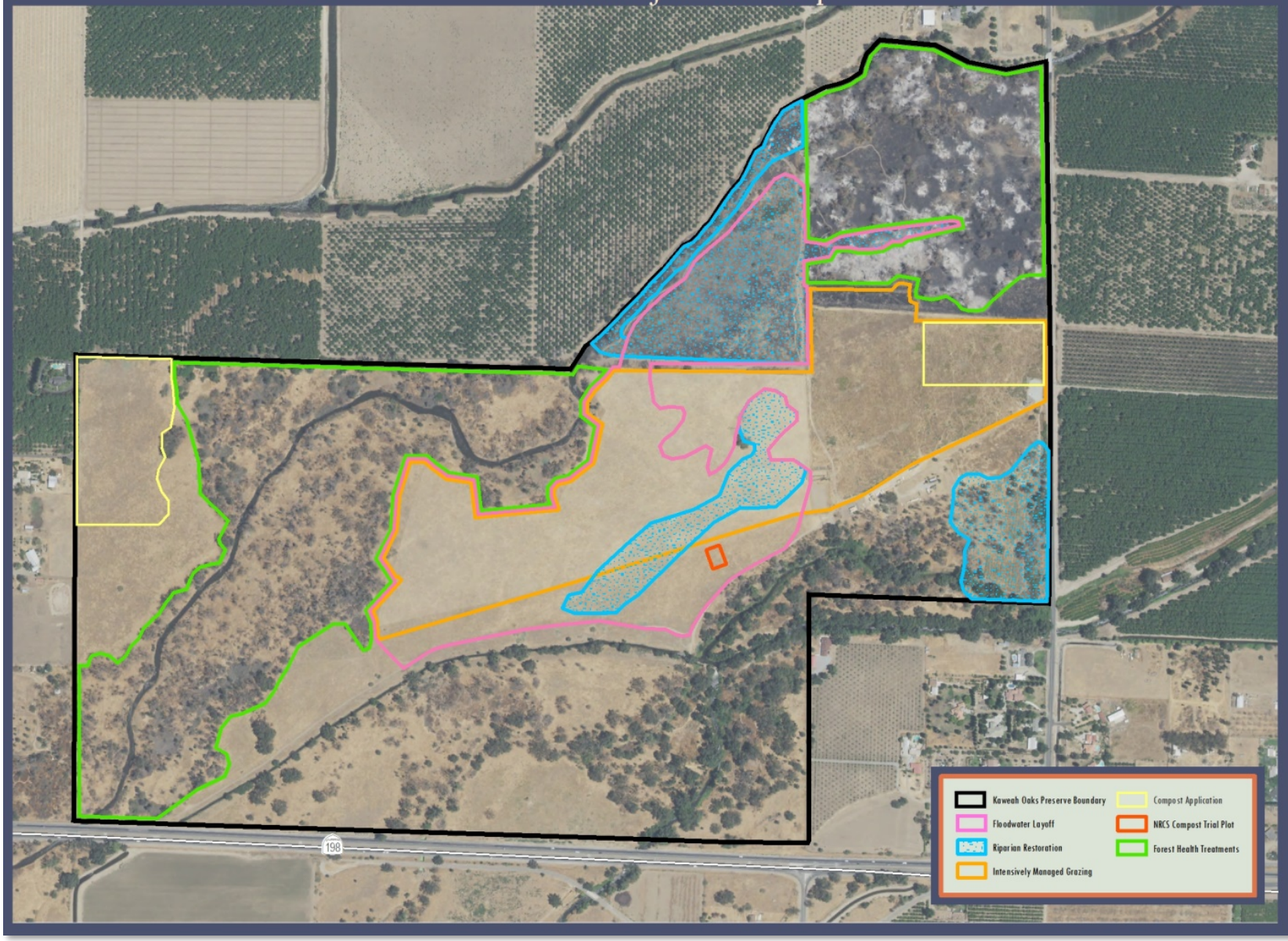


# Mapping and Planning

- KOP Groundwater Recharge Project
- Web-Based Tool

SEQUOIA RIVERLANDS TRUST SJV GREENPRINT DEMONSTRATION PROJECT

# Collaborative Project Concept for Kaweah Oaks Preserve



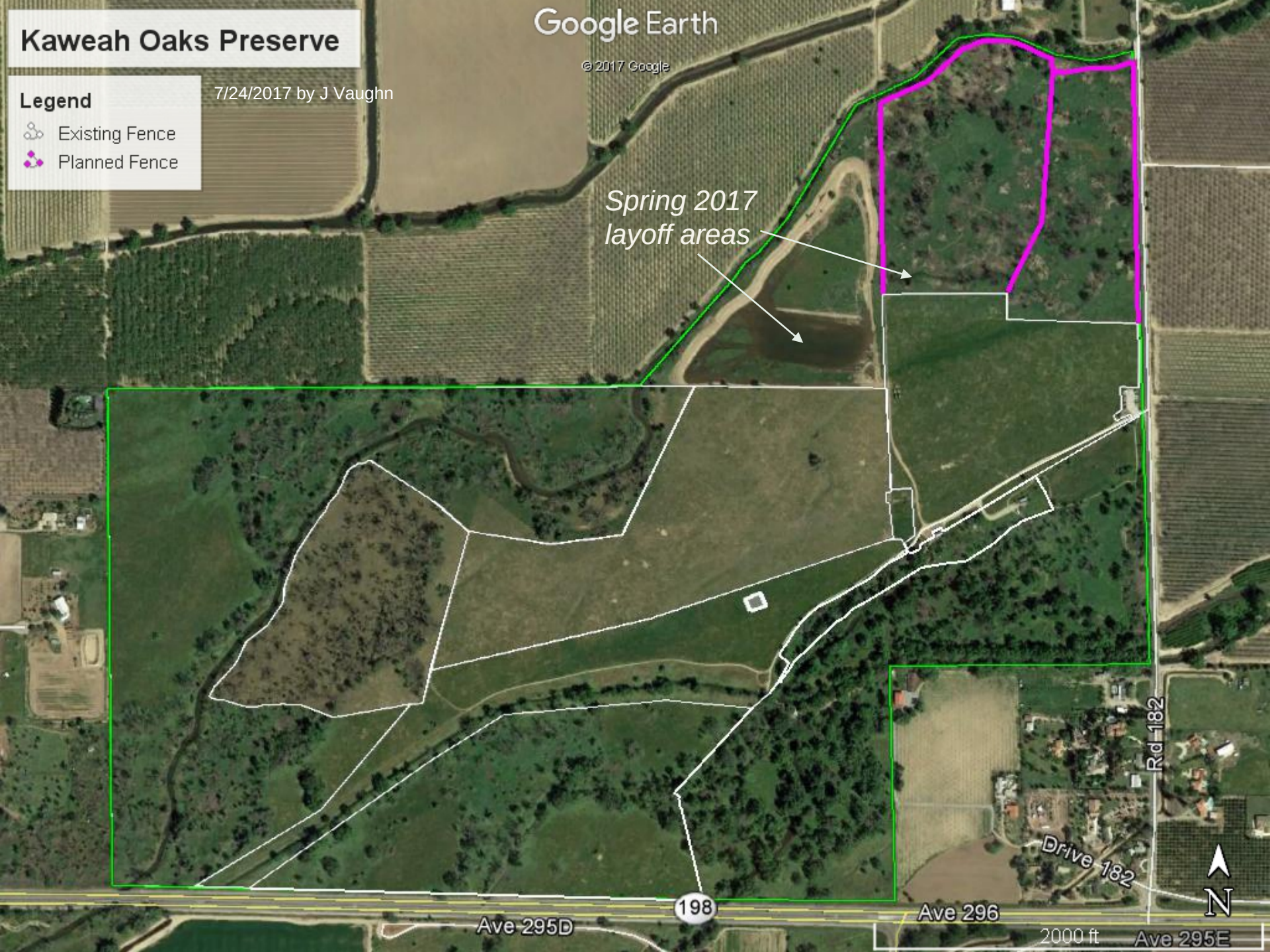

Kaweah Oaks Preserve
Legend
Existing Fence
Planned Fence
7/24/2017 by J Vaughn
Google Earth
© 2017 Google
Spring 2017
layoff areas
Rd 182
Drive 182
198
Ave 296
Ave 295D
Ave 295E
2000 ft
N

Photo:  Greening, 2017.

# KOP Results

| Month - Year | No. of Days | Monthly Recharge (Acre-Feet) |
|---|---|---|
| March - 2017 | 14 | 167 |
| April - 2017 | 2 | 24 |
| May - 2017 | 29 | 460 |
| June - 2017 | 11 | 175 |

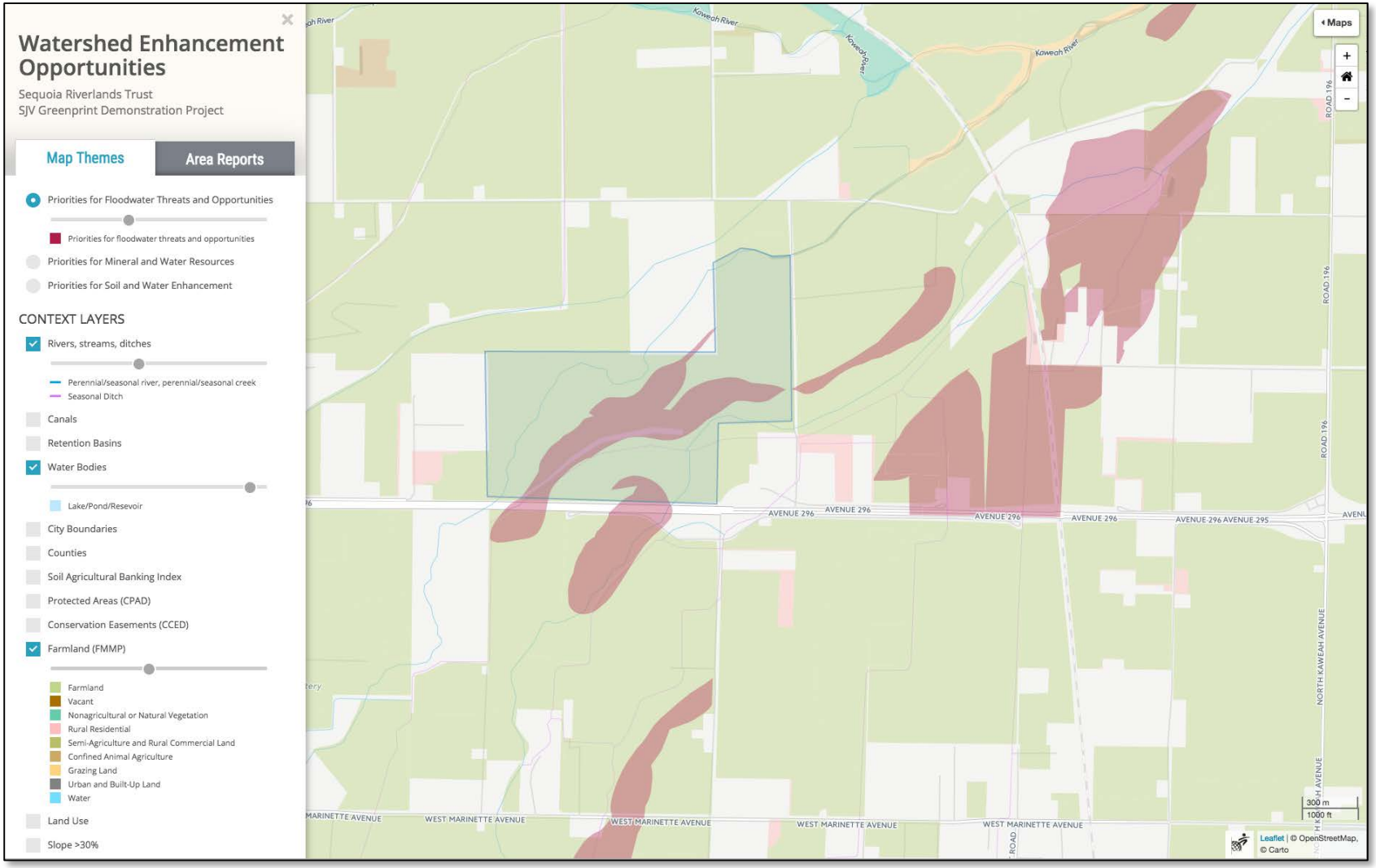
**Total:** **826 acre-feet** over four months

# Web-Based Tool

- Customized mapping
- Pin-drop reports
- Datasets available on Data Basin SJV Greenprint Gateway

Photo: Greening, 2012.

# Web-Based Tool



# Web-Based Tool

SEQUOIA RIVERLANDS TRUST SJV GREENPRINT DEMONSTRATION PROJECT

## Watershed Enhancement Opportunities

### Basic Info

| | |
|---|---|
| Search area (acres) | 325.68 |
| County | Tulare |
| Cities | |

### Priority Areas (acres)

| | |
|---|---|
| Mineral and Water Resources | 0.00 |
| Floodwater Threats and Opportunities | 76.96 |
| Soil Enhancement and Water Resources | 0 |

### Protected Lands (acres)

| | |
|---|---|
| Protected areas (CPAD) | 313.67 |
| Protected areas (CCED) | 0.00 |

### Water Features

| | |
|---|---|
| Canals (meters) | 0.00 |
| Rivers, streams, ditches (meters) | 2,644.01 |
| Water bodies (acres) | 0.00 |
| Retention basins (acres) | 0.00 |

### Slope (acres)

| | |
|---|---|
| Slope greater than 30% | 0.00 |
| Slope less than 30% | 0.00 |

### FEMA flood zones (acres)

| | |
|---|---|
| 100 year flood zone | 181.24 |
| 500 year flood zone | 144.44 |

### Soil Agricultural Banking Index [SAGBI] (acres)

| | |
|---|---|
| Excellent | 0.00 |
| Good | 115.87 |

### Mining (acres)

| | |
|---|---|
| Mineral resource zones | 272.00 |
| Mines sites | 0.00 |

### Landcover

| | |
|---|---|
| Grazing | 309.97 |
| Groundwater recharge | 0.00 |
| Agricultural uses | 3.78 |
| Natural | 0.00 |
| Semi-agricultural uses | 0.91 |


### Farmland Mapping and Monitoring Program [FMMP] (acres)

| | |
|---|---|
| Farmland | 314.60 |
| Vacant | 0.00 |
| Grazing land | 0.00 |
| Semi-agricultural and rural commercial land | 0.00 |
| Nonagricultural or natural vegetation | 0.00 |
| Confined animal agriculture | 0.00 |
| Rural residential | 0.02 |
| Urban and built-up land | 0.00 |
| Water | 0.00 |
| Not surveyed | 0.00 |

Sequoia Riverlands Trust
Conserving California's Heartland

Report created March 24, 2017

# Groundwater Policy

BMPs for Groundwater Sustainability Plans:

- Enhance water retention on farms and ranches (composting, surface cover, regenerative grazing, other practices)
- Use water-efficient landscaping techniques

Photo: Civil Eats, 2016.

# Groundwater Policy

BMPs for Groundwater Sustainability Plans:

- Explore opportunities for on-farm recharge
- Manage MRZ lands for groundwater recharge
- Use ecologically-based mine reclamation techniques

Photo: SRT, 2010.

# Groundwater Policy

BMPs for Groundwater Sustainability Plans:

- **GSAs should actively support funding for water-smart management practices**

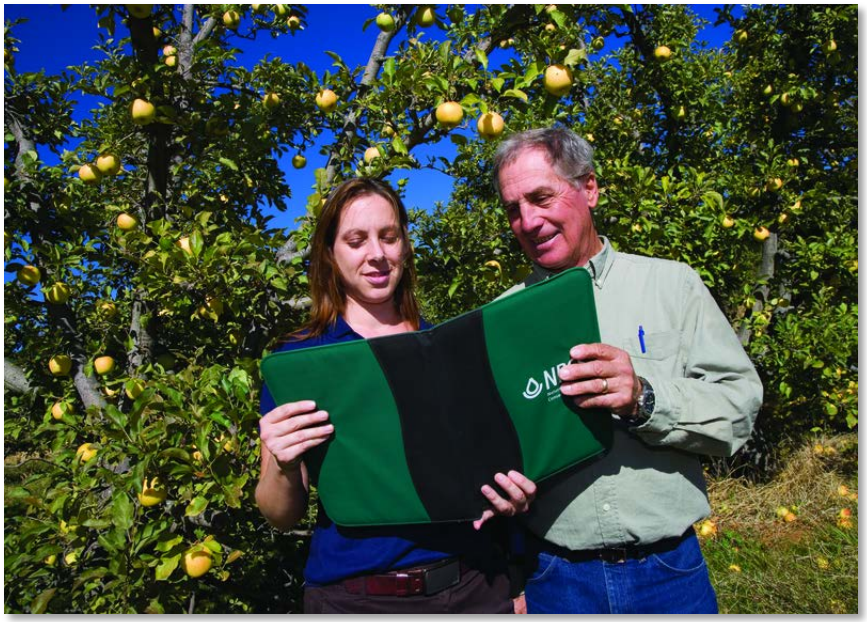


Photo: NRCS, 2011.

# Next Steps

- Continue KOP groundwater banking project
- Ongoing participation in GSAs

Photo: Greening, 2012.

# Questions?

Photo:  John Greening, 2012.

SAN JOAQUIN VALLEY Greenprint

Sustainable Conservation

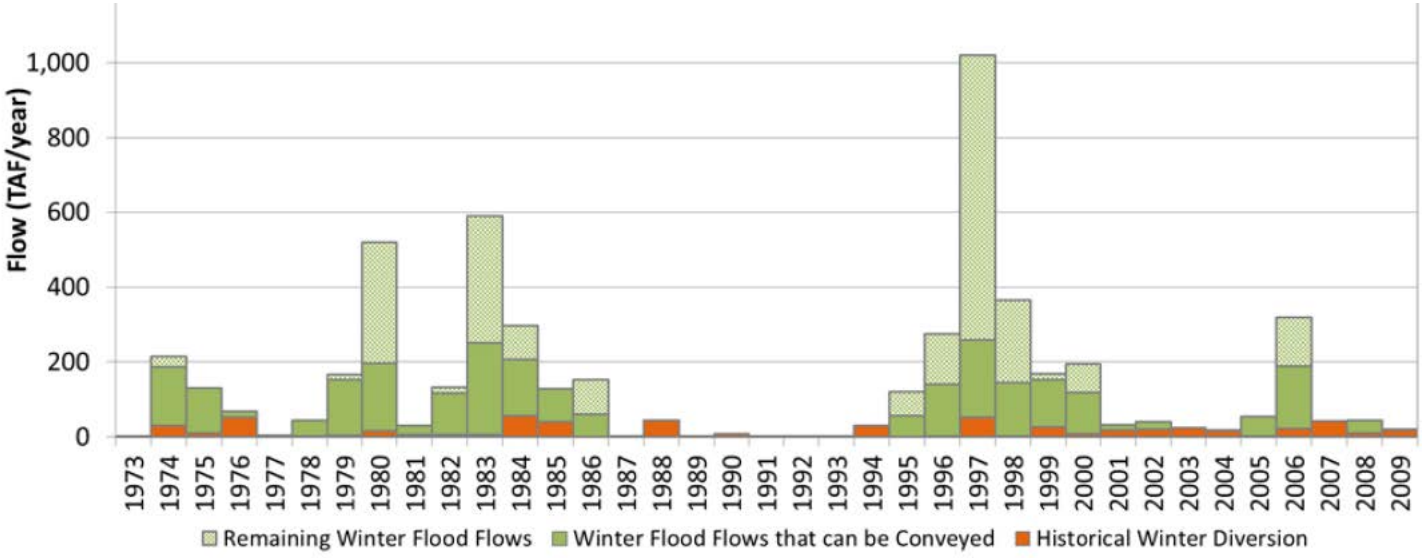
# Groundwater Recharge Assesment Tool - GRAT

theEARTH GENOME
REVEALING THE POSSIBLE

Photo: John Greening, 2012.

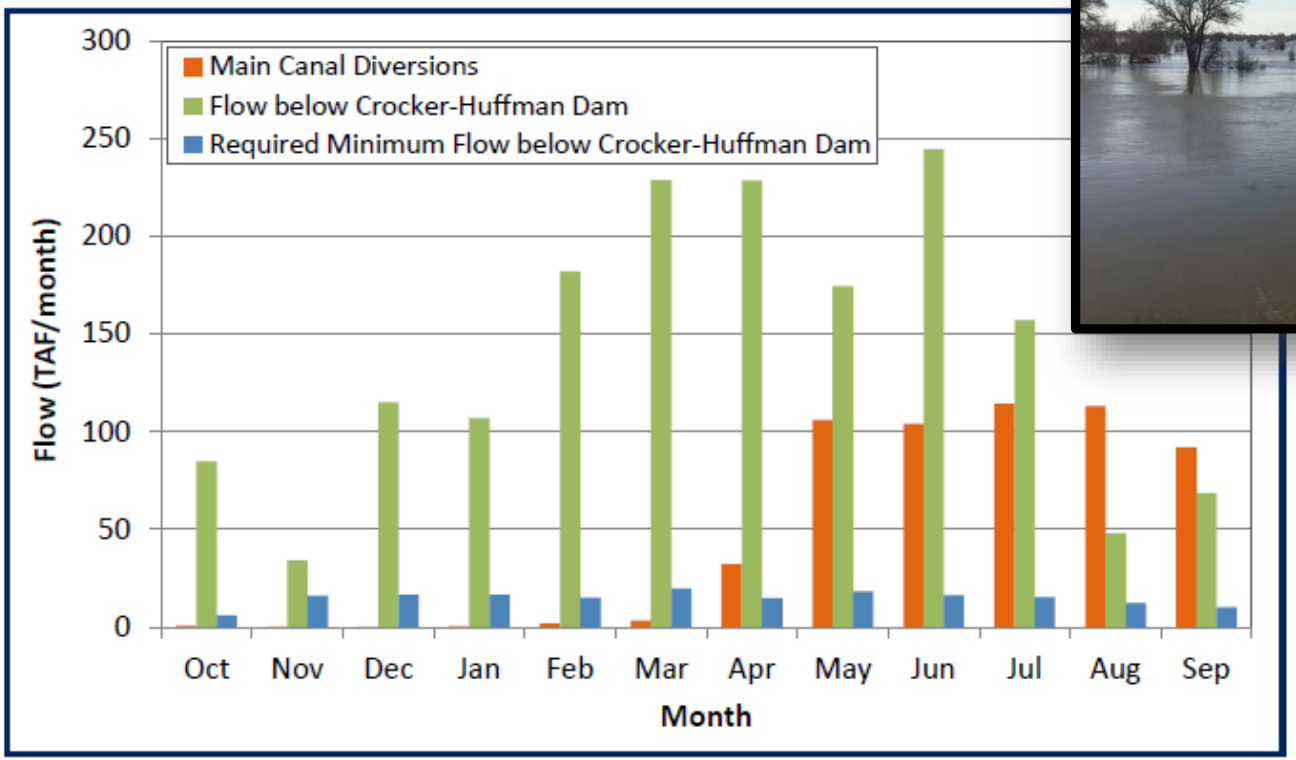
# Water Management Opportunities in the SGMA Era

Annual Merced River Flow (Nov-Mar)




# Seasonal Water Availability in Wet Years

Monthly Wet Year Merced River Flow (Nov-Mar)




San Joaquin River 2017

# Planning Needs

1. **Where** is recharge best done? **When**?
2. **How much** surface water can we capture?
3. **How much of our groundwater overdraft** can be addressed by increasing recharge?

## Source Water


- Surface water availability
- Excess flood flows

## Conveyance

- Conveyance infrastructure
- Available to direct water to fields

## Site Suitability

- Recharge suitability: slope, soil type, clay layers, underlying geology, depth to GW
- Rainfall
- Crop and land use suitability

## On-Farm and Fallow Recharge

- Infiltration potential (crop compatibility calendar)

## Dedicated Basins

- Existing dedicated recharge basins

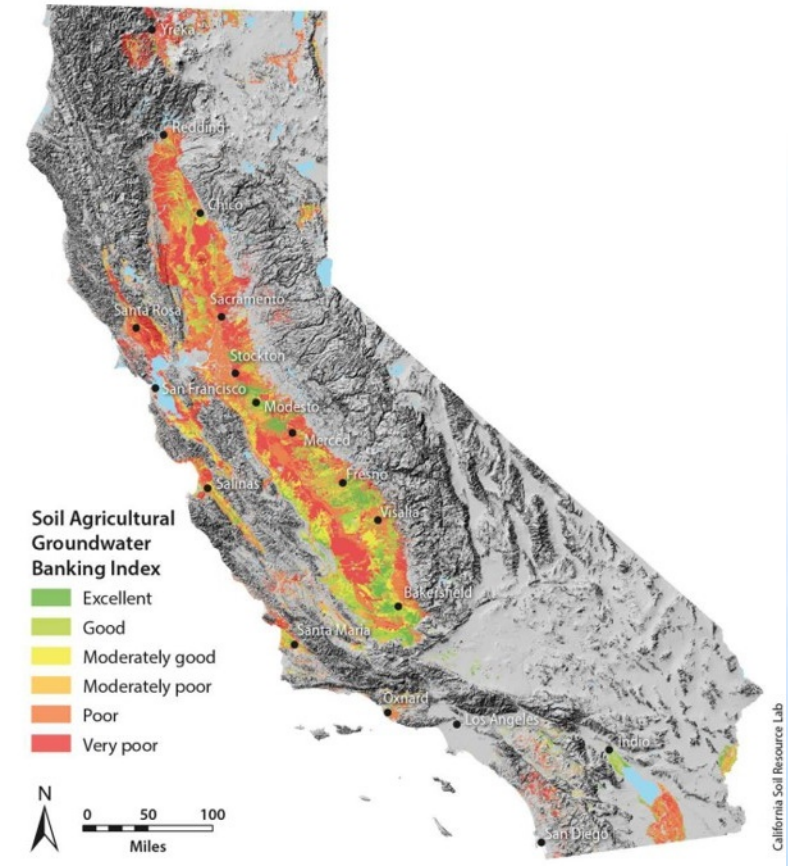
## Recharge Benefit/Cost Analysis

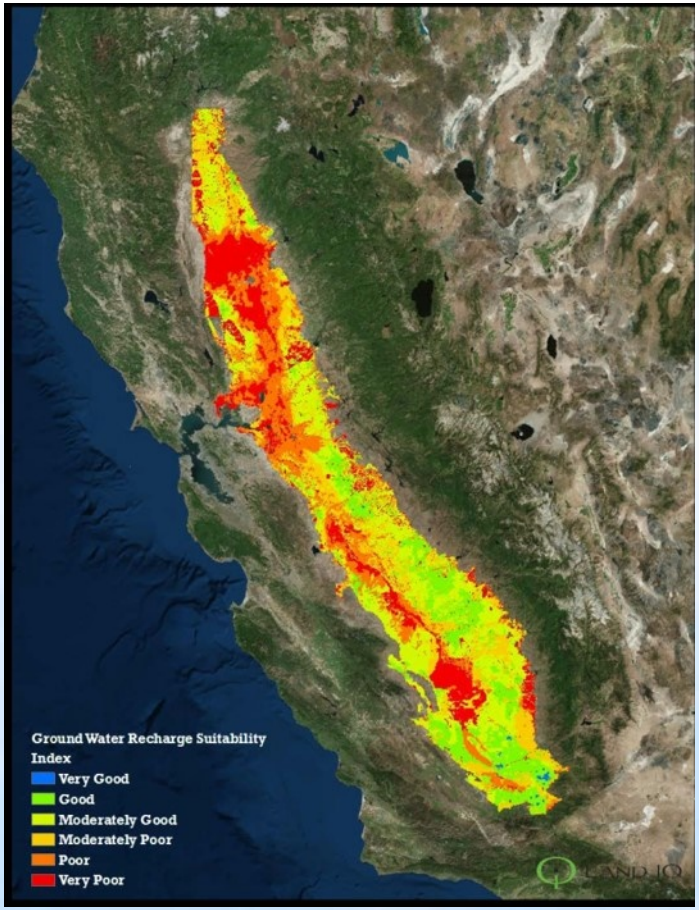
- Cost of implementing recharge
- Relative cost per acre foot ($/AF)
- Increased groundwater recharge

# Public and Private Data Integration

UCDAVIS University of California Agriculture and Natural Resources

LAND IQ



## GRAT Viewer:

http://earthgenomevm.cloudapp.net/GRATViewer/

Full GRAT Demonstration

# DISCUSSION

# Discussion Questions

- How can we best publicize and encourage the ongoing use of the SJV Gateway?
- What are potential sources for funding to maintain the SJV Gateway and continue Greenprint efforts?