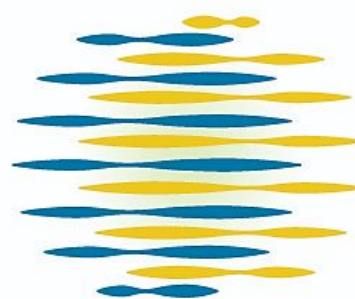
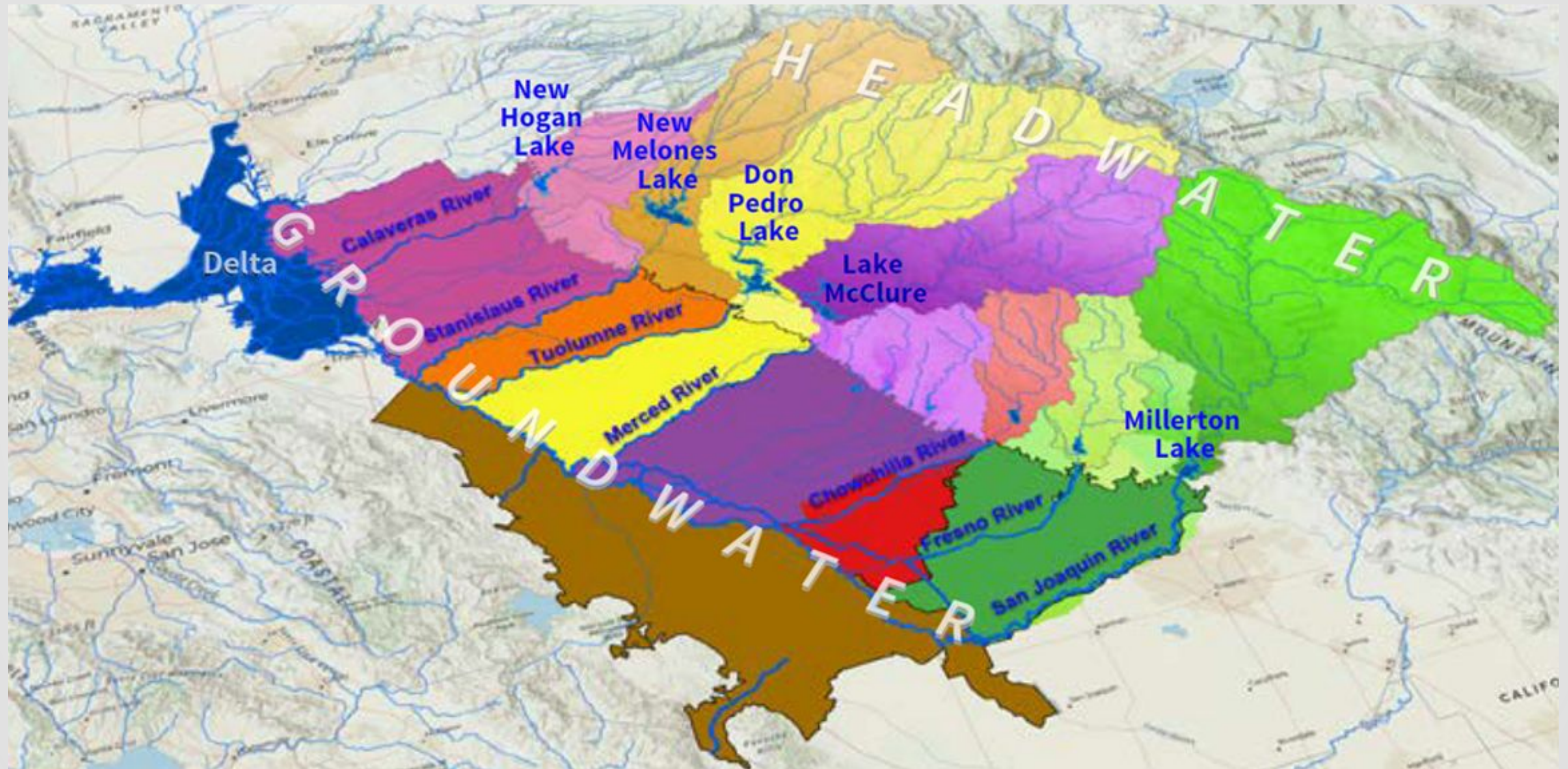


Merced Watershed Study Pilot to San Joaquin Basin Watershed Studies



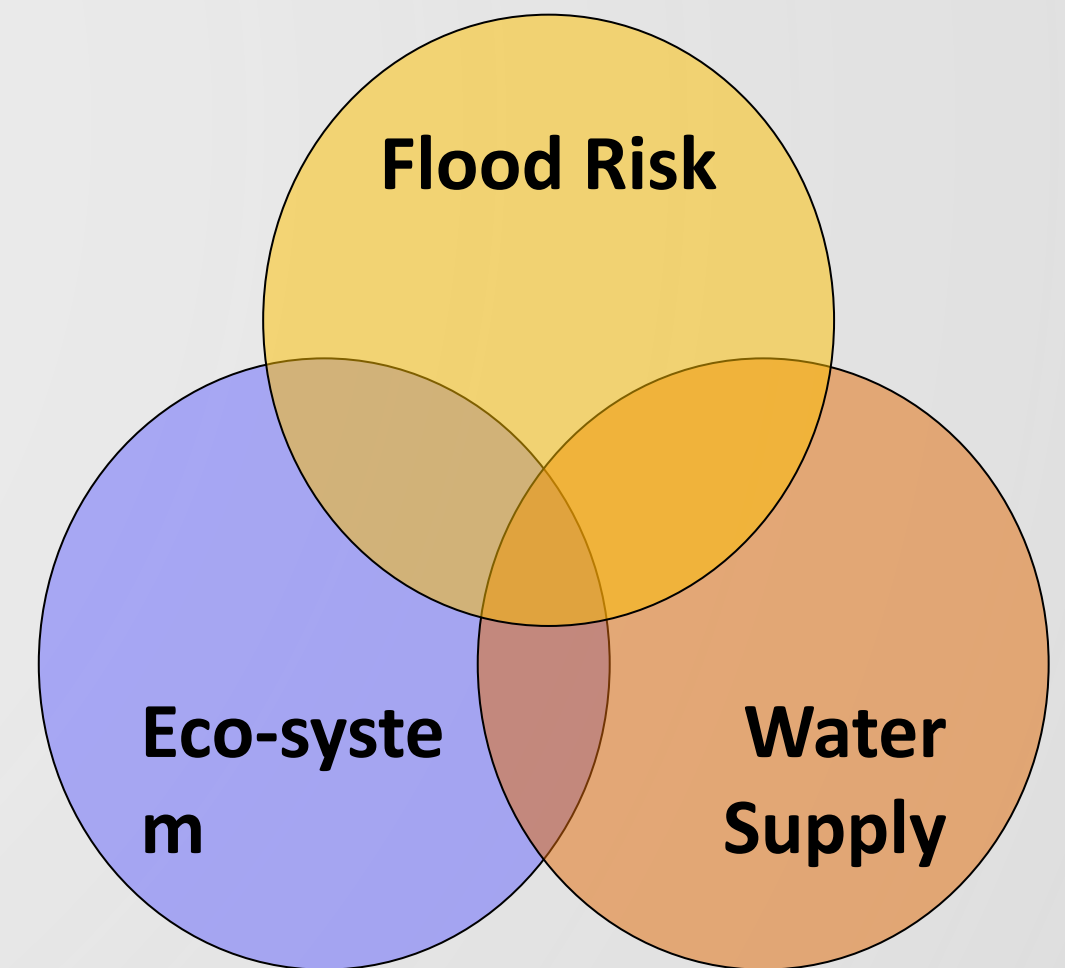
One Became Five

San Joaquin Basin Watershed Studies



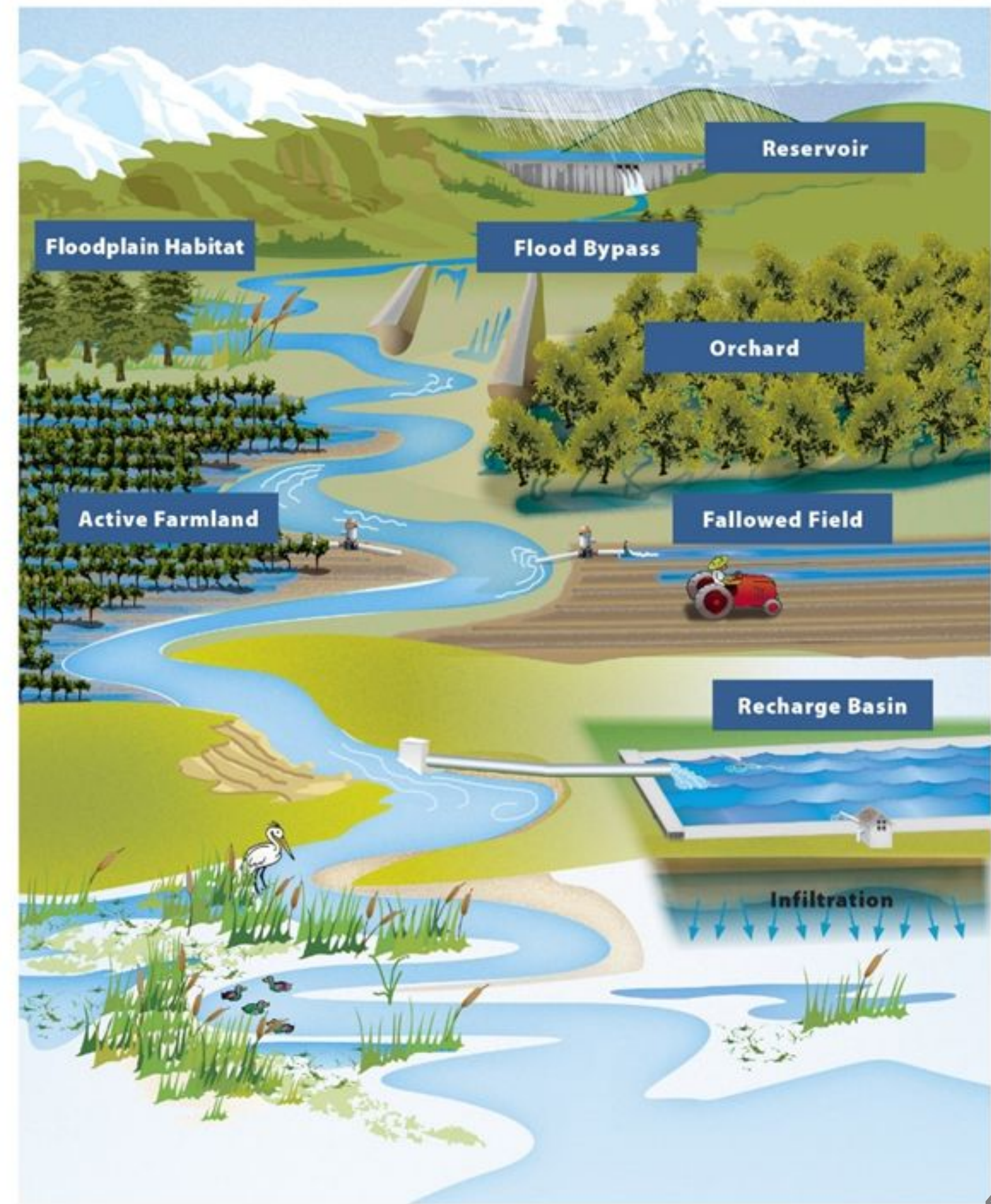
Study Design

- Watershed Scale
- Assess Climate Change Vulnerability
- Assess Flood-MAR Adaptation Performance
- Multiple water management sectors



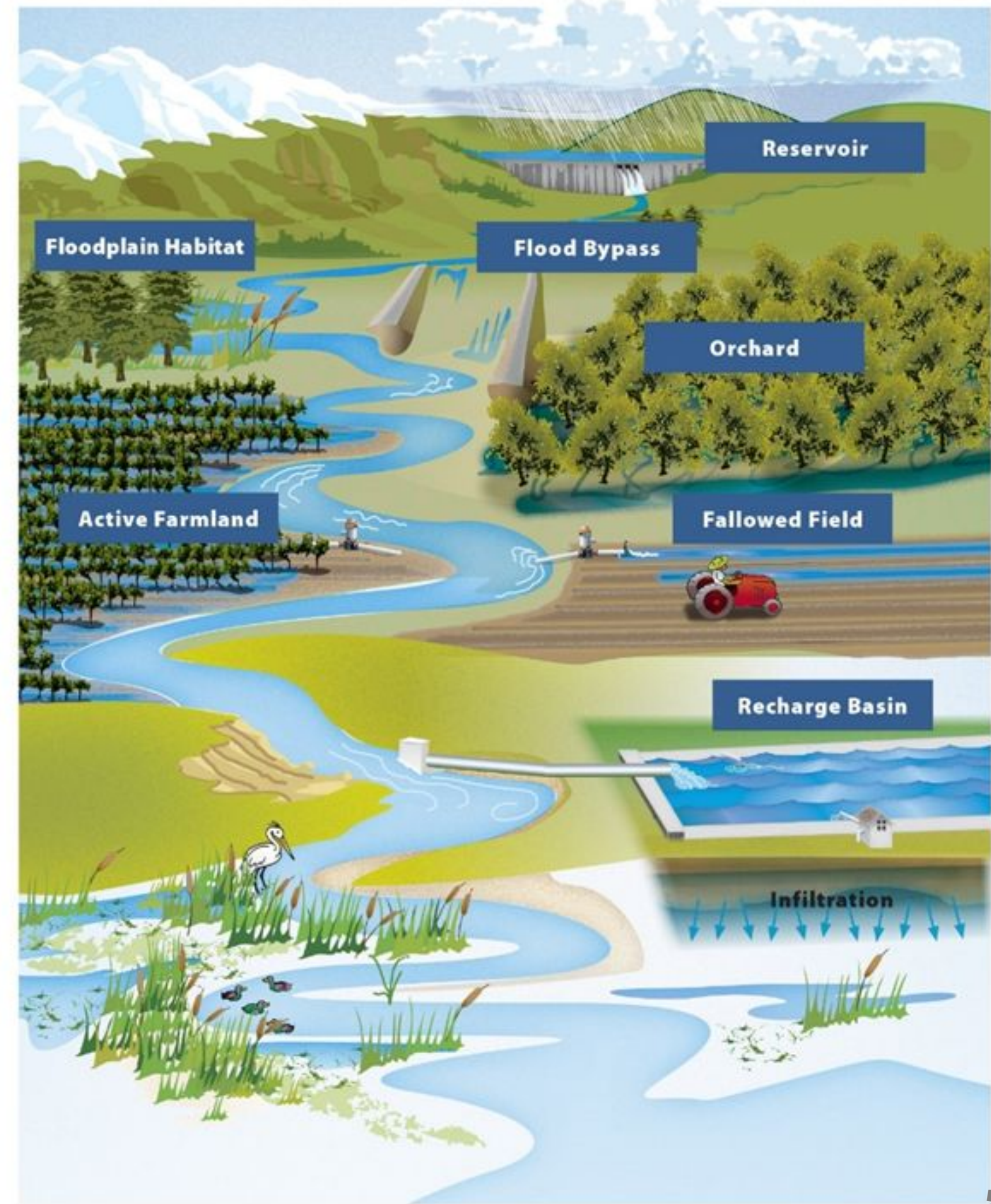
Flood-MAR

- Integrated water management strategy
- Using high flows from (or in anticipation of) rainfall or snowmelt for managed aquifer recharge
- On agricultural lands, working landscapes, and natural managed lands



Why Flood-MAR?

- Multi-sector integration and solutions
- Sustainable groundwater management
- Mitigate the effects of climate change



SJ Watershed Studies Participating Entities

Local

San Joaquin County

Stockton East Water District

Calaveras County Water District

Oakdale Irrigation District

Merced Irrigation District

Madera Irrigation District

Friant Water Authority

Pacific Gas and Electric

City of Stockton

San Joaquin Area Flood Control Agency

South San Joaquin Irrigation District

Chowchilla Water District

Kings River Water Agency

Southern California Edison

Regional

US Bureau of Reclamation

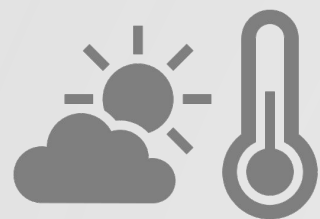
US Army Corps of Engineers

Center for Western Weather and Water Extremes

California Department of Water Resources



Results ▢ Metrics ▢ Sector Performance



**Watershed
Conditions**

Upper Watershed Runoff

Applied Demand



Flood Risk

Stream Flood Conditions



**Water Supply/
Surface Water
(SW)**

Reservoir Storage

SW Deliveries

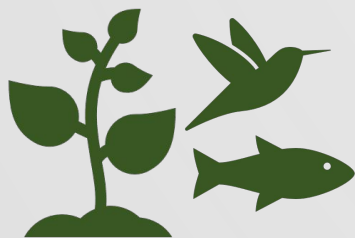


**Water Supply/
Groundwater
(GW)**

GW Pumping

Δ GW Storage

Δ GW Levels in Disadvantaged Communities



Ecosystem

GDE Habitat

River Salmonid Habitat

Shorebird Habitat



Benefits and Opportunities Explored

- Flood Risk
- Ecosystems
 - Salmonids and Shorebirds
- Water Supply (SW + GW)
 - Disadvantaged Communities
- Sustainable Groundwater
 - GDE's, Subsidence, Storage, Stream-Aquifer



The Vision and Next Steps

- 5 Vulnerability and Flood-MAR Adaptation Performance Studies
- Lower San Joaquin River Watershed Study and Basin Summary Results



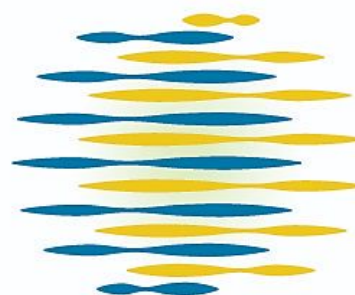
THANKS

JIM WIEKING

JAMES.WIEKING@WATER.CA.GOV



Sustainable Conservation



theEARTH
GENOME
REVEALING THE POSSIBLE



MERCED
IRRIGATION
DISTRICT

WATER & POWER

Questions

- How can we align technical capabilities with existing policy and how to advance policy to accommodate new technical capabilities?
- How can we connect forecasts at different time scales to get multiple time scales of decision support for reservoir operations and other water management planning activities?
- How can the FIRO community inform the San Joaquin Watershed Studies regarding FIRO-MAR reservoir operations?
- How can the Watershed Studies inform or contribute to the FIRO / WCMU processes?
- What are the current hindrances to achieving effective groundwater recharge with existing reservoir operations strategies in California?
- What are the benefits and challenges with having efforts by multiple agencies/entities evaluating the modification of reservoir operations in the same watershed?



Water Managers and Scientists

- Flood
- Ecosystems
- Surface Water
- Groundwater
- FIRO
- Climate Change
- Decision-makers

