MANAGING CALIFORNIA GROUNDWATER FOR THE FUTURE

Recent Institutional and Technical Strategies

Sarge Green

State Board of Food and Agriculture Meeting

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The Central Valley Aquifer System

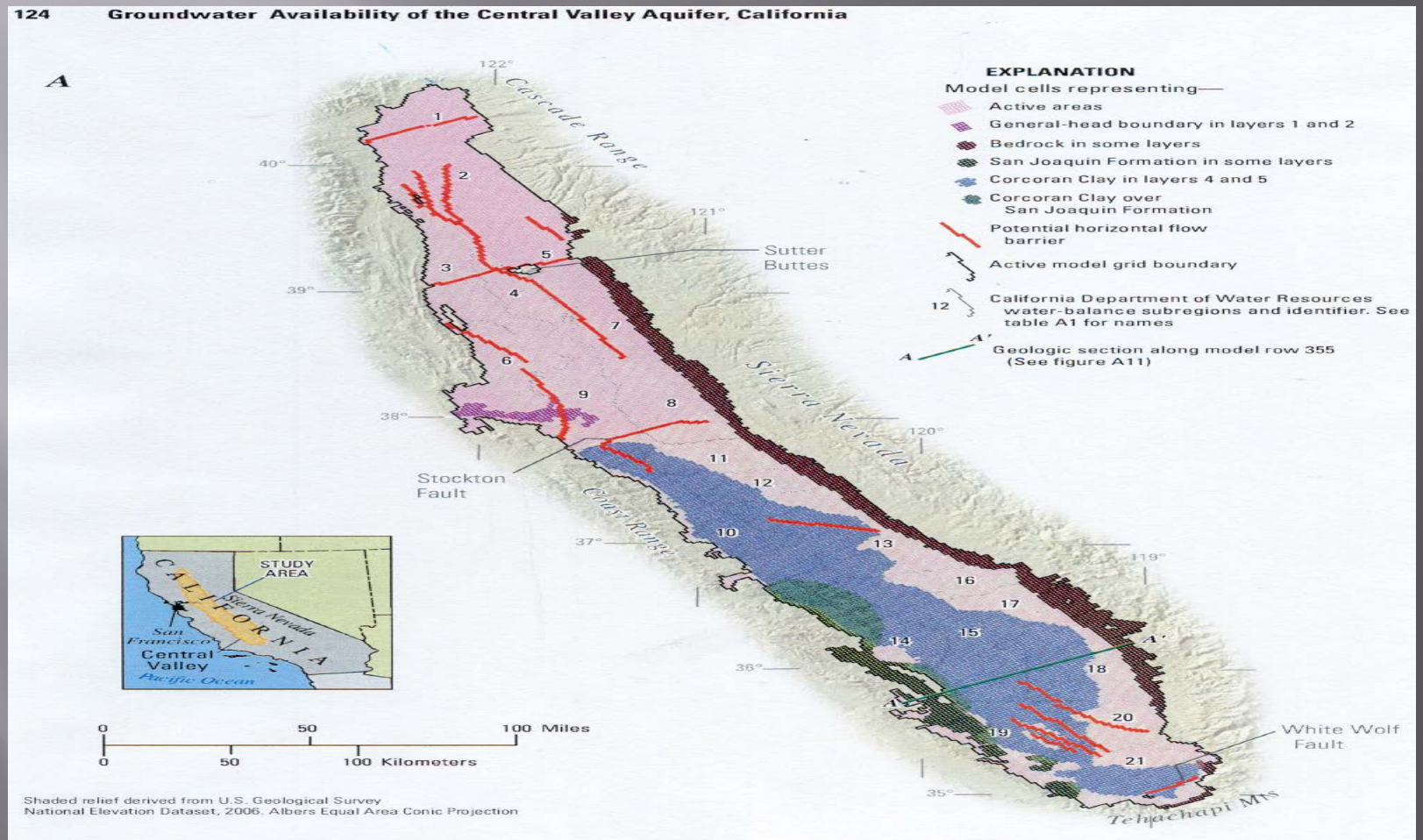


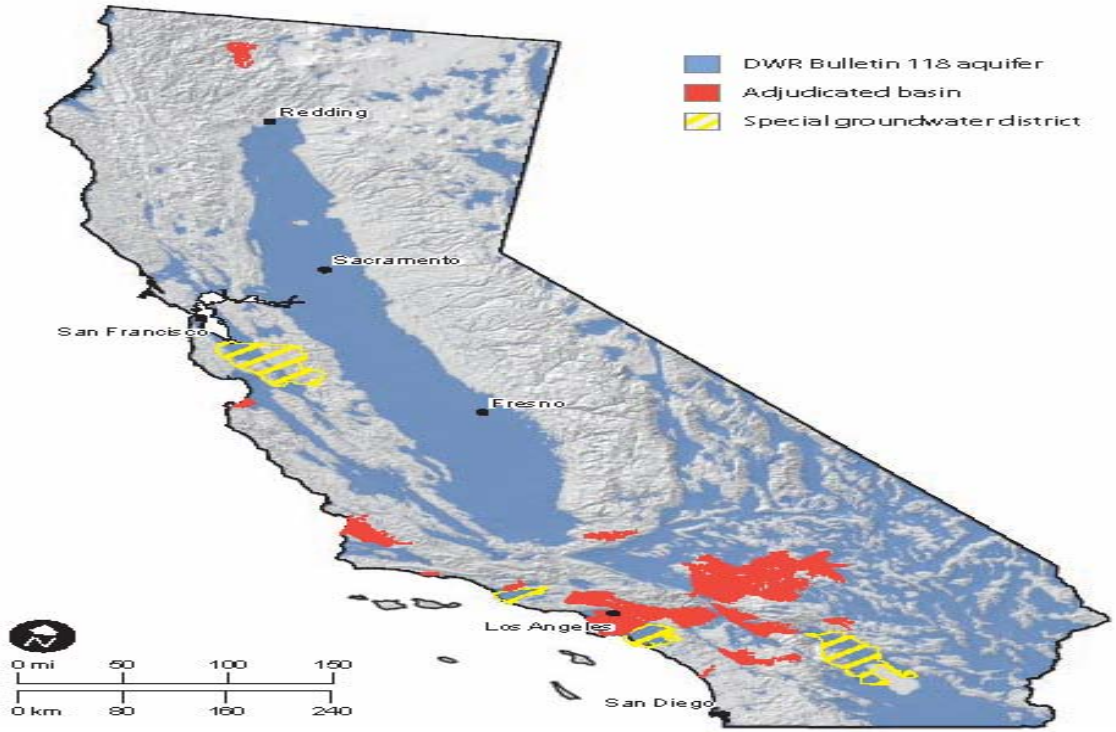
Figure C1. Central Valley Hydrologic Model grid: *A*, Extent of San Joaquin Formation, Corcoran Member of the Tulare Formation, crystalline bedrock, and horizontal flow barriers. *B*, Upper-most active layer.

Background

- Management of groundwater in California covers a range of actions from individual responsibility to controlled basins
  - Individual wells all require a drilling permit
  - Controlled basins come from adjudication
    - Adjudication includes both administrative and court-mandated
      - Administrative adjudication is for water quality threats, Section 2100 of Water Code

Map of Controlled Basins

Figure 4.1
Comprehensive groundwater schemes are concentrated in urban Southern California and Silicon Valley



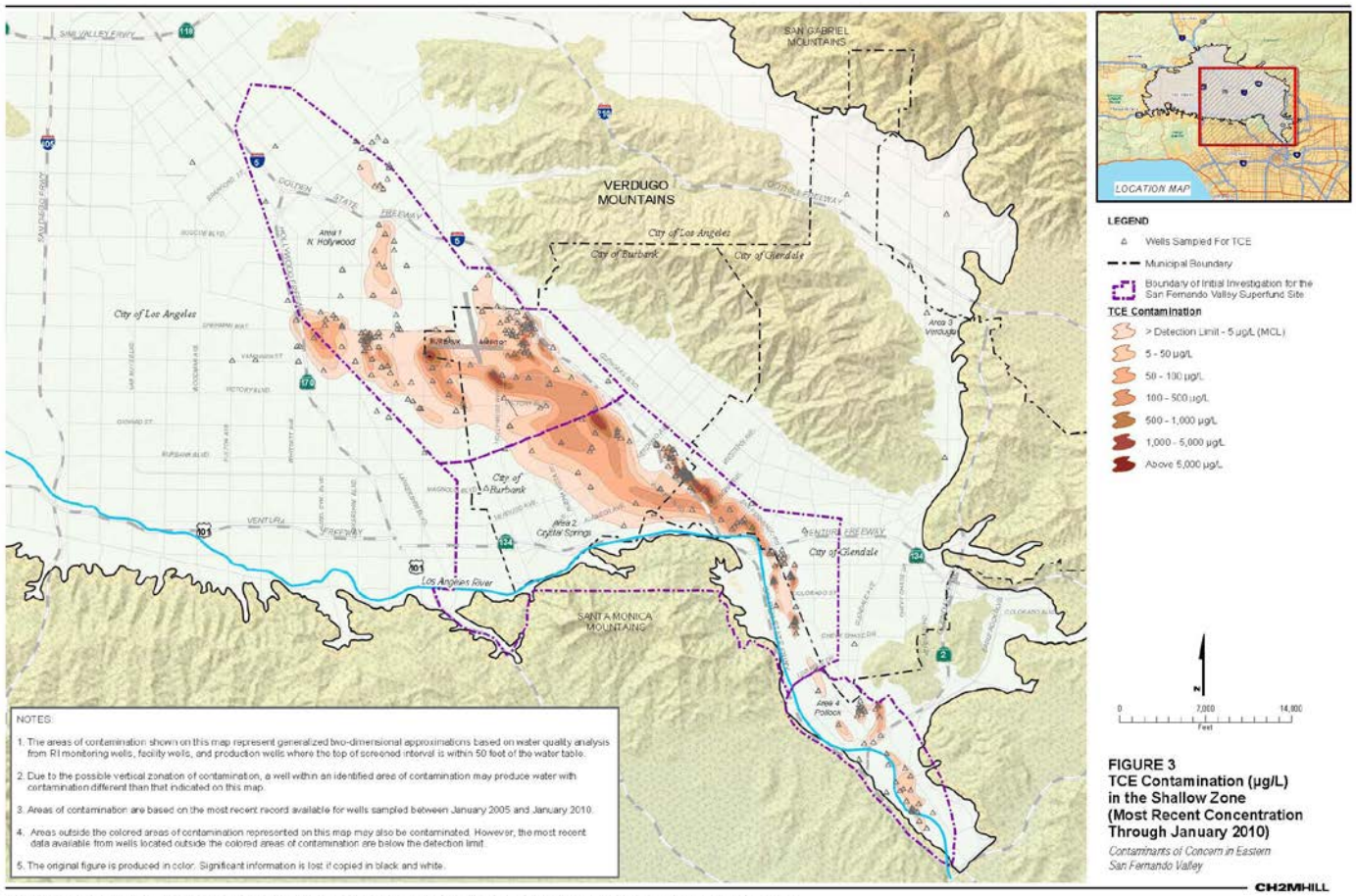
SOURCE: California Department of Water Resources (DWR).

NOTES: The map shows all groundwater basins (blue), all 22 adjudicated groundwater basins (red), and four special groundwater management districts (Coachella Valley Water District, Fox Canyon Groundwater Management Agency, Orange County Water District, and Santa Clara Valley Water District), all of which exercise authority to levy pump charges. (For a list of adjudicated basins, see www.water.ca.gov/groundwater/gwmanagement/court_adjudications.cfm.) In the Scott Valley (far north on the map), the adjudication included both ground and surface water rights.

Background, cont'd

- Controlled basins are not necessarily totally managed
  - Many of the court adjudicated basins require imported surface water to allow reduced extractions
  - Some areas may need additional external supplies or the groundwater stability will reverse again
  - A number of the controlled basins have water quality problems including NPL sites

NPL Sites in an Adjudicated Basin



Groundwater Management Plans

- AB 3030 and SB 1938 are the legal framework for groundwater management plans

- Many areas have coverage but still lack the capacity for real outcomes, e.g.:
  - Recharge areas for deep confined zones are often not within the overlying GWMP jurisdiction
  - Data gathering has not been consistent to properly inform groundwater users about supply and quality issues

Institutional Changes

- 2009 California Legislation
- Irrigated Lands Regulatory Program
- Integrated Regional Water Management Plans

2009 Legislation and Groundwater

- Delta sustainability impacts groundwater south of the Delta
- CASGEM – groundwater elevation
- Agricultural Water Use Efficiency
- UWMP 20/20

Irrigated Lands Regulatory Program

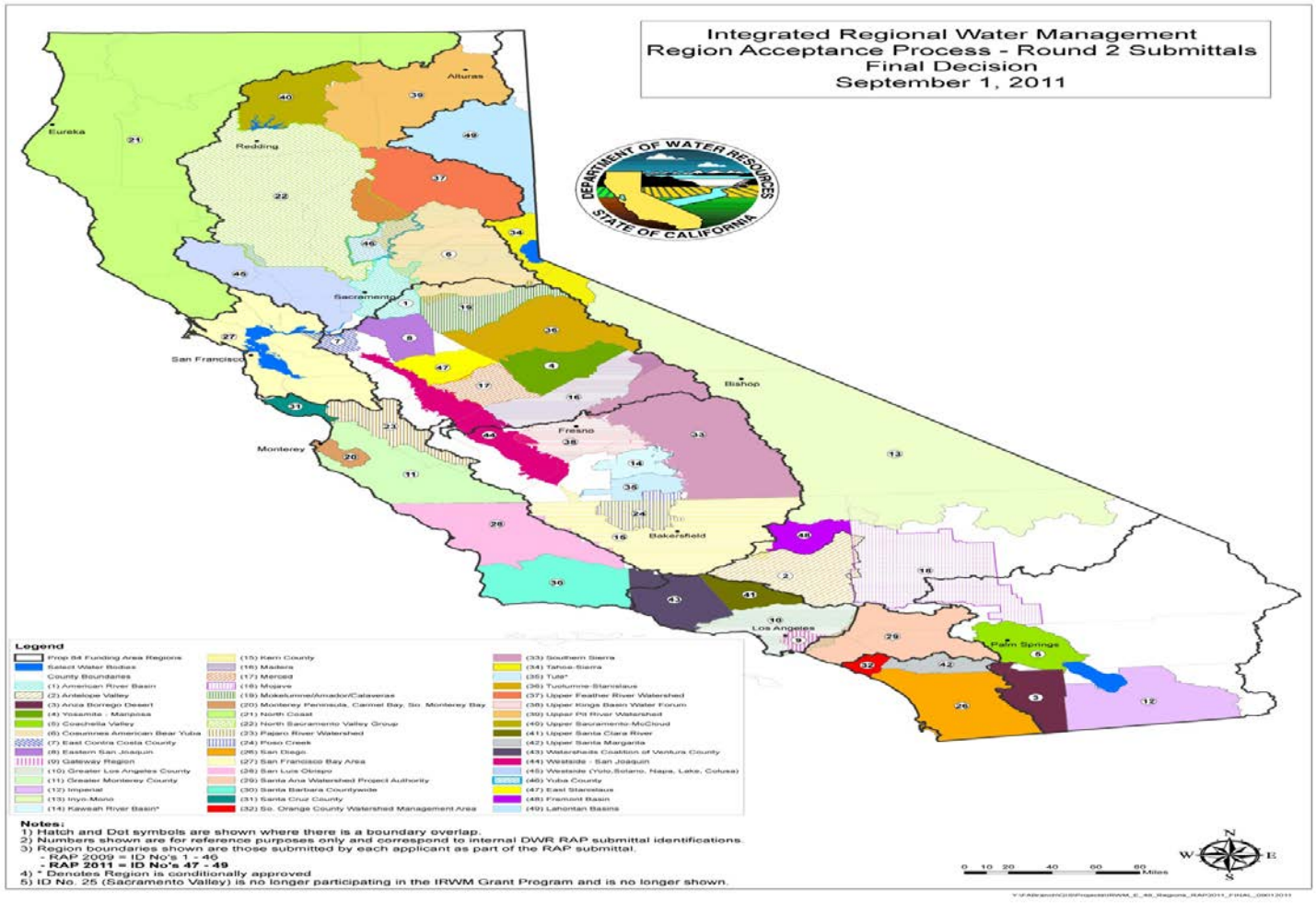
- Two Regional Water Quality Control Boards propose groundwater quality monitoring in their irrigated lands program – 'first' water will be the target

- Undoubtedly the same areas where nitrates have been mapped recently will be some of the first to have more permanent networks developed

Integrated Regional Water Management Planning

- Fills an institutional gap between State/federal and local water management activities
- Bond funds have started the activities for both planning and initial projects
- Plan requirements cover groundwater as part of the integrated water system

IRWMP's (48 plans)



Technical Strategies

- CASGEM – AWUE – Urban 20/20
- Recharge area mapping
- Alternate supplies used for drinking water driven by water quality
- Planned Recharge
- Flood water use on agricultural land

CASGEM*

- Mandated groundwater elevation measurement
  - If you don't do it, it will be done for you
  - Similar to IRWMP and ILRP, regional groups have stepped up to operate the data collection effort
  - Some concerns remain about data collection (location and timing)

* California Statewide Groundwater Elevation Monitoring

AWUE and UWMP

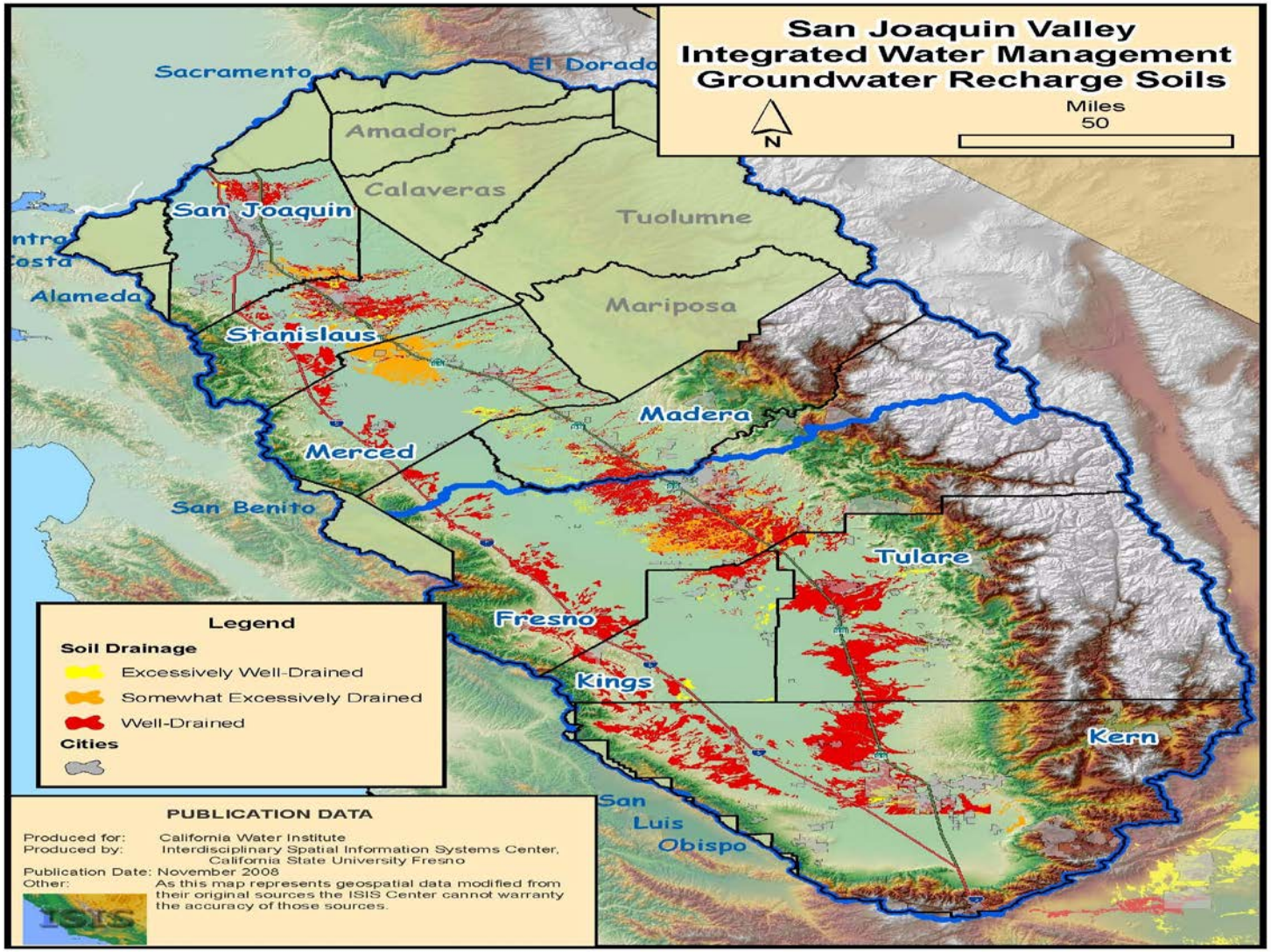
- Agricultural Water Use Efficiency requirements include mandatory point of use measurement
  - Does not include direct measurement of well discharges

- Urban Water Management Plans will need to show a 20% reduction in use by 2020
  - Most urban systems in California use both surface and groundwater, hence more active management of groundwater will occur

AB 359 of 2011

- Requires recharge area mapping by agencies updating or initiating a groundwater management plan
- Maps sent to local land use planning agencies and CA DWR

SJV Soil Recharge Areas



Alternate Supplies, Planned and Farmland Recharge

- Alternate supplies usually involves cities changing to surface water to help with quality
- Planned recharge involves the use of basins or dedicated areas
- Farmland recharge of flood water

Alternate Supplies

- Cities of Fresno, Clovis and Modesto shifted to surface water fairly recently, treatment costs have dropped in comparison to groundwater pumping <u>and treatment.</u>

- Numerous other Central Valley communities proposing to do the same; Woodland-Davis

Planned Recharge

- Numerous "planned" recharge projects are coming on-line or expanding:
  - Semitropic expansion
  - Madera Ranch
  - McMullin Group in Kings River Basin
- Planned recharge requires storage and conveyance infrastructure
  - Storage allows for optimizing availability of water to match percolation rates
  - Conveyance is probably the limiting factor for more recharge

Farmland Recharge

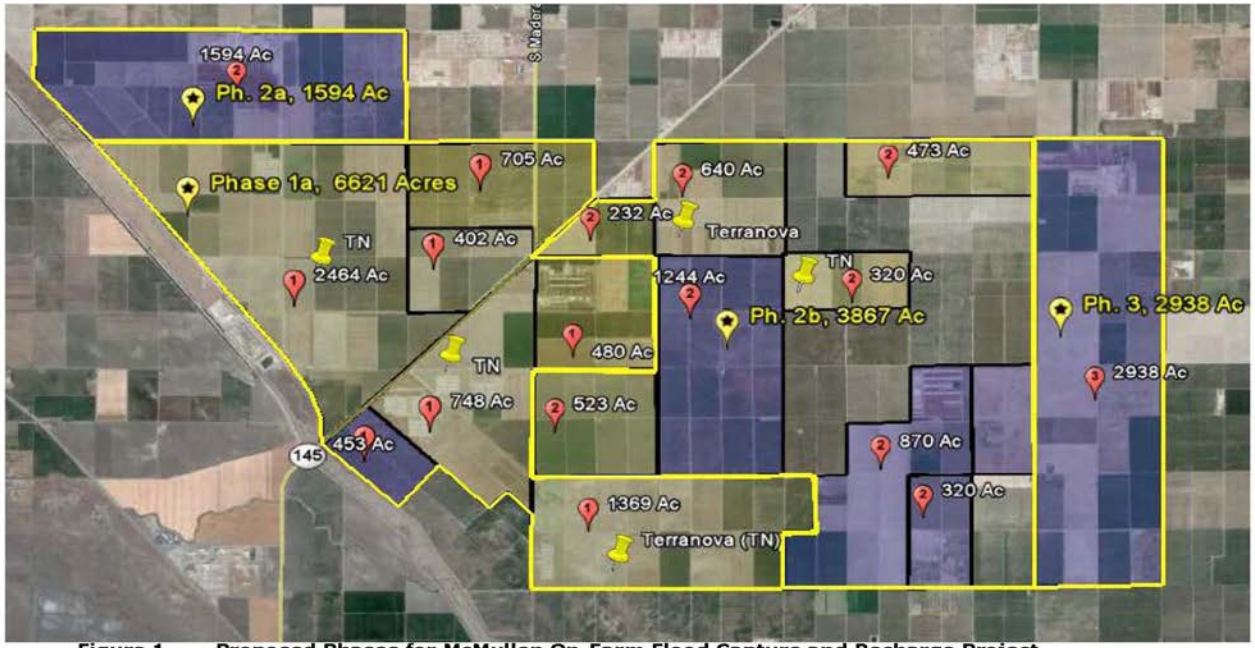


Figure 1. Proposed Phases for McMullen On-Farm Flood Capture and Recharge Project
Total proposed project area for the project is approximately 16,000 acres. Area shown represents the proposed boundaries of the McMullen Flood Flow Capture District.

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Challenges

- Data and data management challenges will rise as all the new data activities come to fruition
  - "My Water Quality" is a template for future data management
- Groundwater recharge is ***not*** a designated beneficial use of water
- Institutional arrangements still need to ripen, especially IRWM.

Conclusions

- Many of the tools for optimum management of groundwater appear to be in place
- Controls may or may not be necessary and in fact could impede integrated management
- The most critical remaining challenge is education of users and integrating all the tools with all the partners!