Groundwater Storage and Conjunctive Water Management in the Kings Basin

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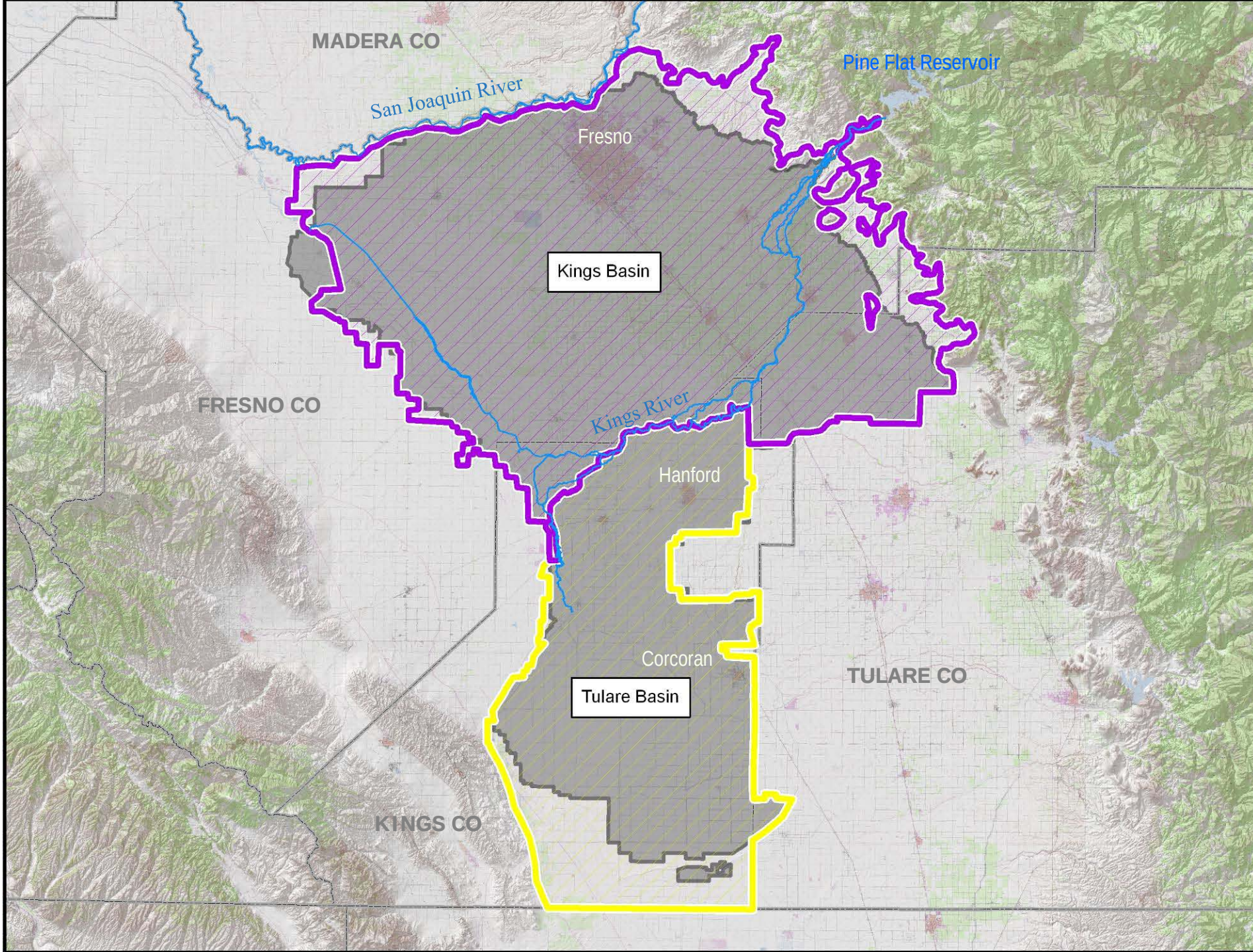
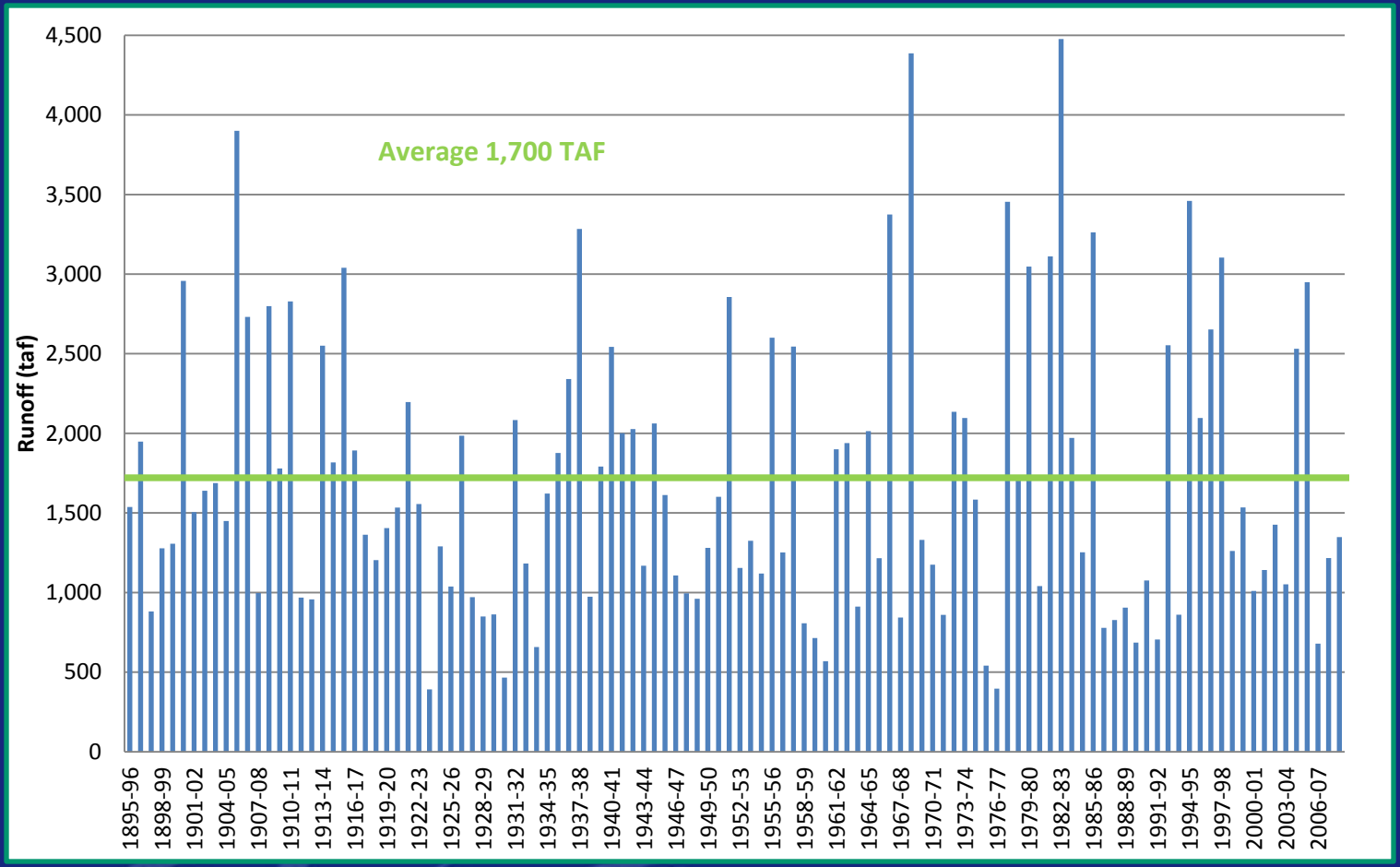
Kings River Conservation District
10/25/11


MADERA CO
San Joaquin River
Pine Flat Reservoir
Fresno
Kings Basin
FRESNO CO
Kings River
Hanford
Corcoran
Tulare Basin
TULARE CO
KINGS CO

Basin Characteristics

- Part of the Tulare Lake Hydrologic Region
  - 10.9 million acres
  - 12 distinct Basins/7 sub-basins
- Kings Groundwater Basin
  - 976,000 acres
  - 93 MAF of storage to 1,000 ft (2003 Bulletin 118)
- Conjunctive Use
  - Highly variable surface supplies from Kings River
  - Certain areas in Kings Basin are CVP – Friant contractors

Historical Water Years

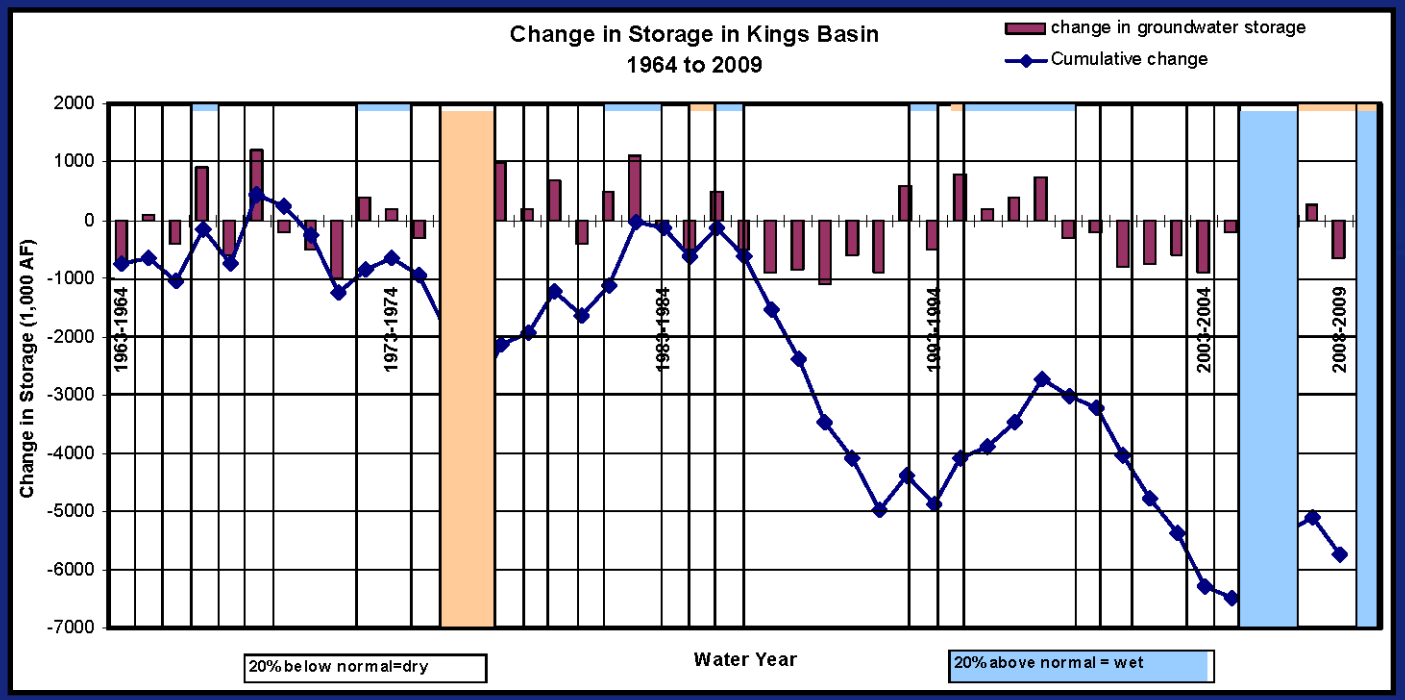


Basin Infrastructure

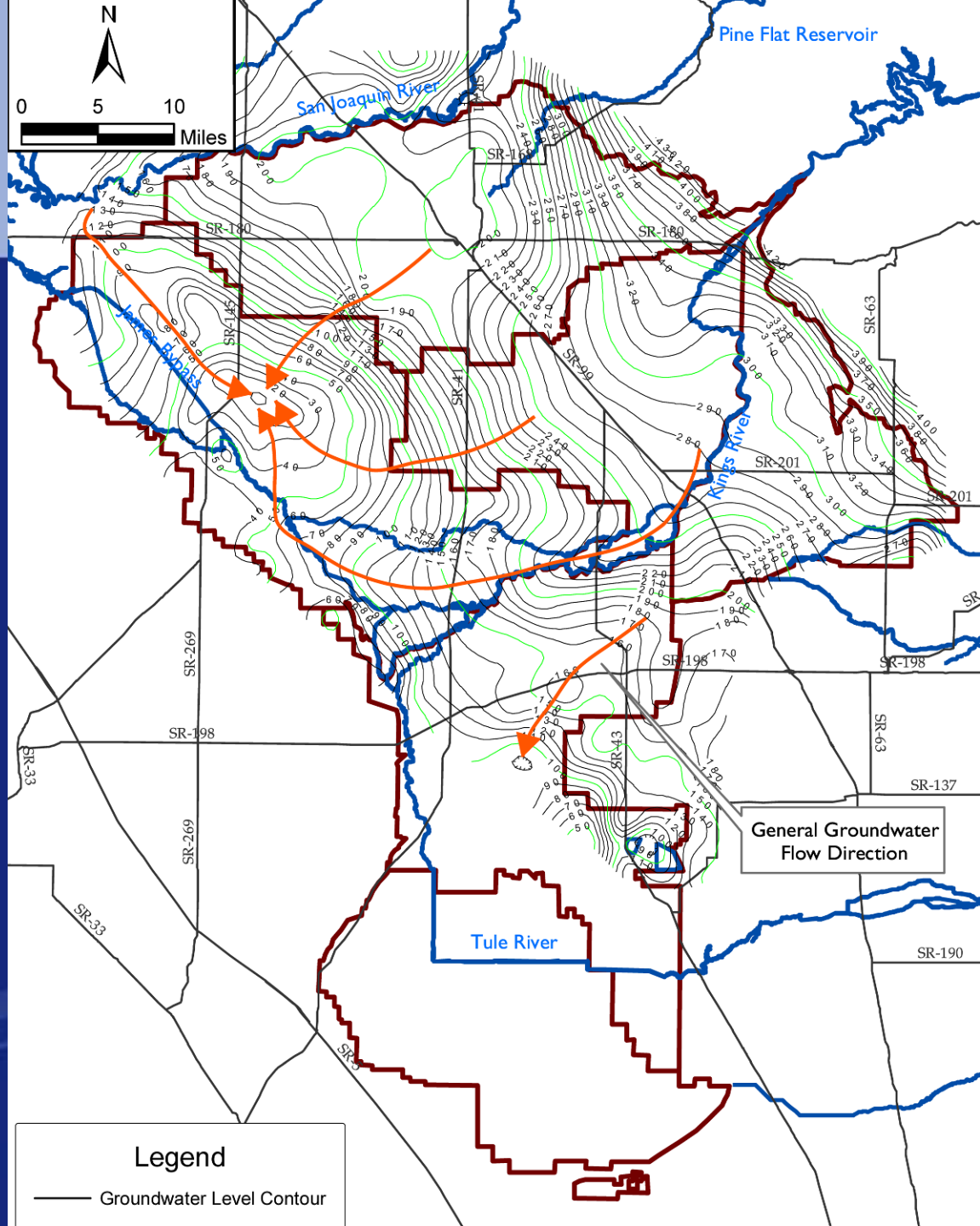
- Pine Flat Reservoir – 1 MAF
- Groundwater Recharge Basins
  - 3,800 acres capable of recharging 87,000 AF/yr
- On-Farm Groundwater Recharge
  - Conjunctive use of surface and groundwater
  - Surplus irrigation
  - On-farm flood capture and recharge
- River serves as primary conveyance
- Several thousand miles of unlined canals & ditches

Basin GW Conditions

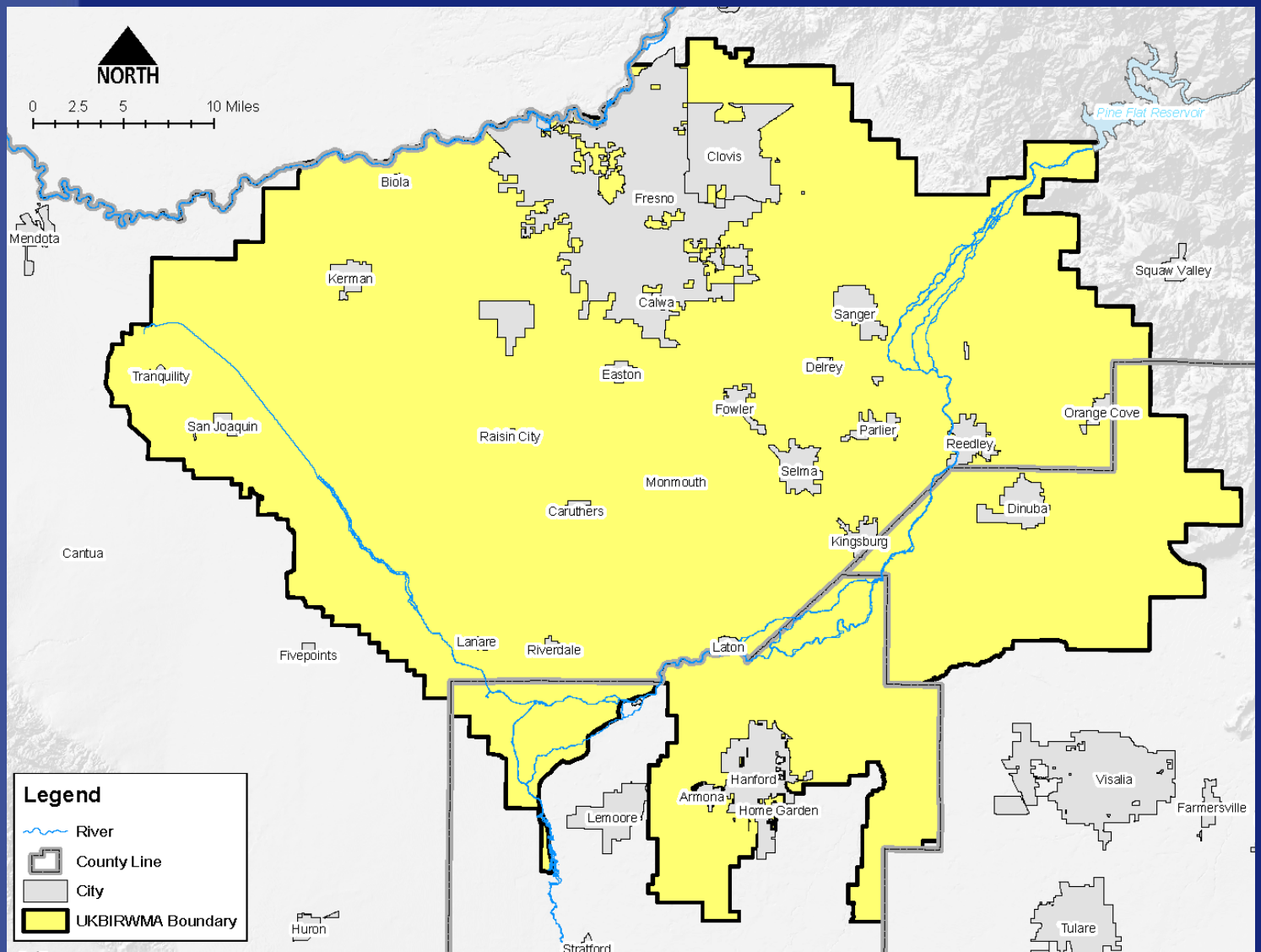
- Kings Basin Overdraft
  - Regional Supply Characteristics: closed system, conjunctive use basin.
  - Average annual overdraft (1963 to 2009) approx. 120 TAF.
  - Largest GW depression located near Raisin City, beyond the Kings River place of use.



Kings Basin Groundwater Flow Patterns



Upper Kings Basin IRWM Boundary



Diversity of Water Authority Planning Participation

MEMBERS (18)

Alta Irrigation District
City of Clovis
City of Dinuba
City of Fresno
City of Kerman
City of Kingsburg
City of Parlier
City of Reedley
City of Sanger
City of Selma
County of Fresno
County of Tulare
Consolidated Irrigation District
Fresno Irrigation District
Kings County Water District
Kings River Conservation District
Raisin City Water District
Fresno Met Flood Control

INTERESTED PARTIES (32)

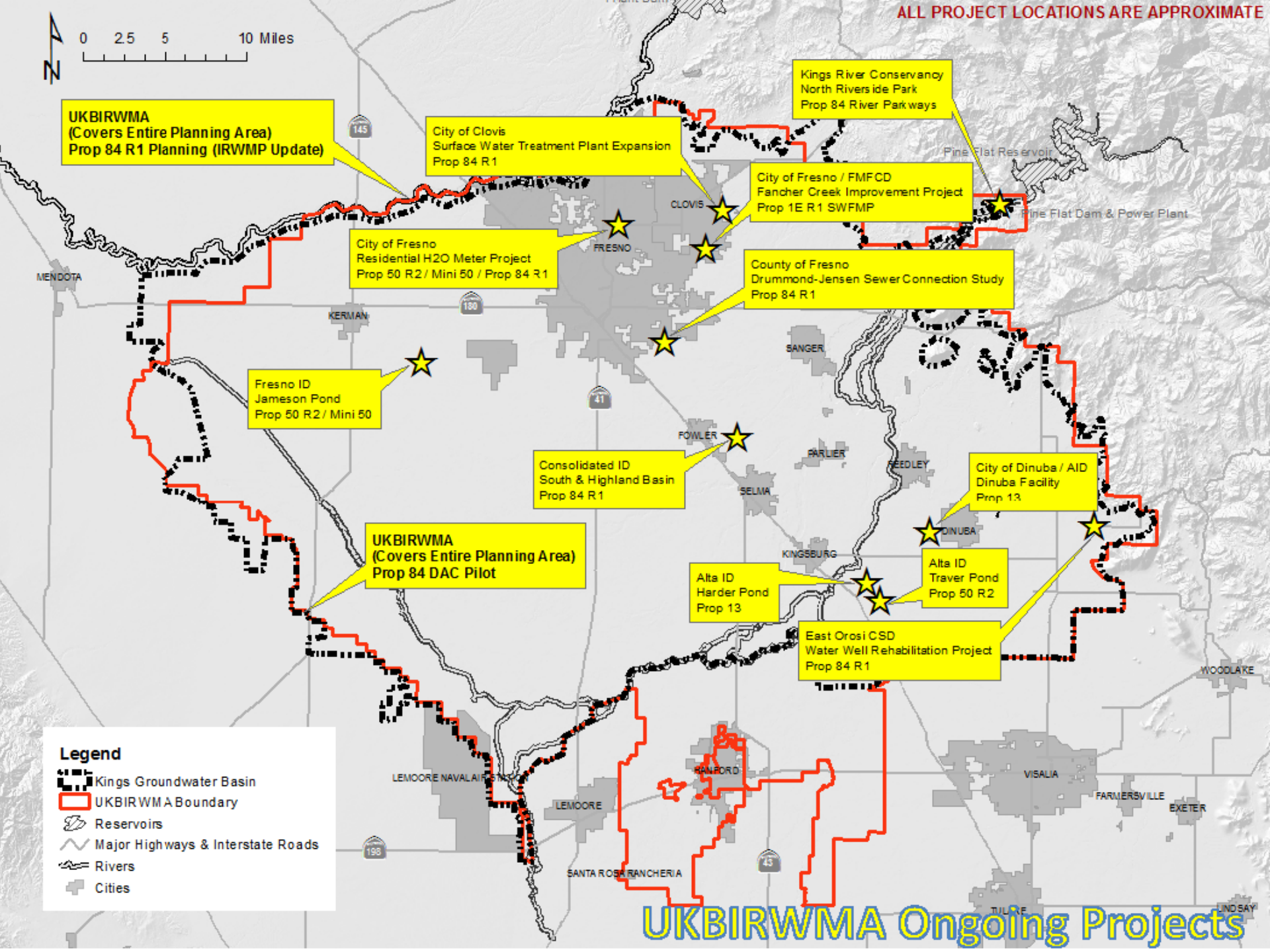
Bakman Water Company
Biola Community Services District
California Native Plant Society, Sequoia Chapter
City of San Joaquin
Community Water Center
County of Kings
Crescent Canal Company
Cutler Public Utilities District
East Orosi Community Services District
El Rio Reyes Conservation Trust
Hardwick Water Company
James Irrigation District
Kings River Conservancy
Kings River Water Association
Laguna Irrigation District
Laton Community Service District
Liberty Canal Company
Liberty Water District
London Community Services District
Mid-Valley Water District
Orange Cove Irrigation District
Orosi Public Utilities District
Reed Ditch Company
Riverdale Irrigation District
Riverdale Public Utility District
Self-Help Enterprises
Sierra Club, Tehipite Chapter
Sierra Resource Conservation District
Sultana Community Services District
Terranova Ranch, Inc.
Tulare Basin Wildlife Partners

OTHER PARTICIPATION

CA Department of Fish & Game
CA Department of Water Resources
California Water Institute (CSUF)
Center for Collaborative Policy
Fresno Audubon Society
Fresno Met. Flood Control District
Kings River Fisheries Program
Regional Water Quality Control Board
Sierra Nevada Research Institute (UCM)
State Water Resources Control Board

IRWM Plan Priorities

- Projects to increase water supply reliability & preserve quality
  - Groundwater recharge, conveyance
  - Recycling
  - Metering
- Protect and enhance aquatic ecosystems and wildlife habitat, and riparian recreation areas
- Public Awareness
- Coordinated Basin-level Monitoring
  - Groundwater elevations, quality, subsidence


ALL PROJECT LOCATIONS ARE APPROXIMATE
0 2.5 5 10 Miles
N
UKBIRWMA
(Covers Entire Planning Area)
Prop 84 R1 Planning (IRWMP Update)
City of Clovis
Surface Water Treatment Plant Expansion
Prop 84 R1
Kings River Conservancy
North Riverside Park
Prop 84 River Parkways
City of Fresno / FMFCD
Fancher Creek Improvement Project
Prop 1E R1 SWFMP
City of Fresno
Residential H2O Meter Project
Prop 50 R2 / Mini 50 / Prop 84 R1
County of Fresno
Drummond-Jensen Sewer Connection Study
Prop 84 R1
Fresno ID
Jameson Pond
Prop 50 R2 / Mini 50
Consolidated ID
South & Highland Basin
Prop 84 R1
City of Dinuba / AID
Dinuba Facility
Prop 13
UKBIRWMA
(Covers Entire Planning Area)
Prop 84 DAC Pilot
Alta ID
Harder Pond
Prop 13
Alta ID
Traver Pond
Prop 50 R2
East Orosi CSD
Water Well Rehabilitation Project
Prop 84 R1
Pine Flat Reservoir
Pine Flat Dam & Power Plant
CLOVIS
FRESNO
MENDOTA
KERMAN
SANGER
FOWLER
PARLIER
REEDLEY
SELMA
DINUBA
KINGSBURG
WOODLAKE
LEMOORE NAVAL AIR STATION
LEMOORE
HANFORD
VISALIA
FARMERSVILLE
EXETER
SANTA ROSA RANCHERIA
TULARE
LINDSAY
Legend
Kings Groundwater Basin
UKBIRWMA Boundary
Reservoirs
Major Highways & Interstate Roads
Rivers
Cities
UKBIRWMA Ongoing Projects

IRWM Successes

- 20,000 AF of additional annual recharge capacity
- Water metering - reduced per capita consumption
- Over 100 planned projects with more than 100,000 AF of recharge and conservation benefits

Summary

- Surface Storage needed to conjunctively manage groundwater
- Surface Storage far more effective at capturing peak flows
- Integrated Planning allows for broader allocation of storage benefits to supply, quality, ecosystem

Questions?