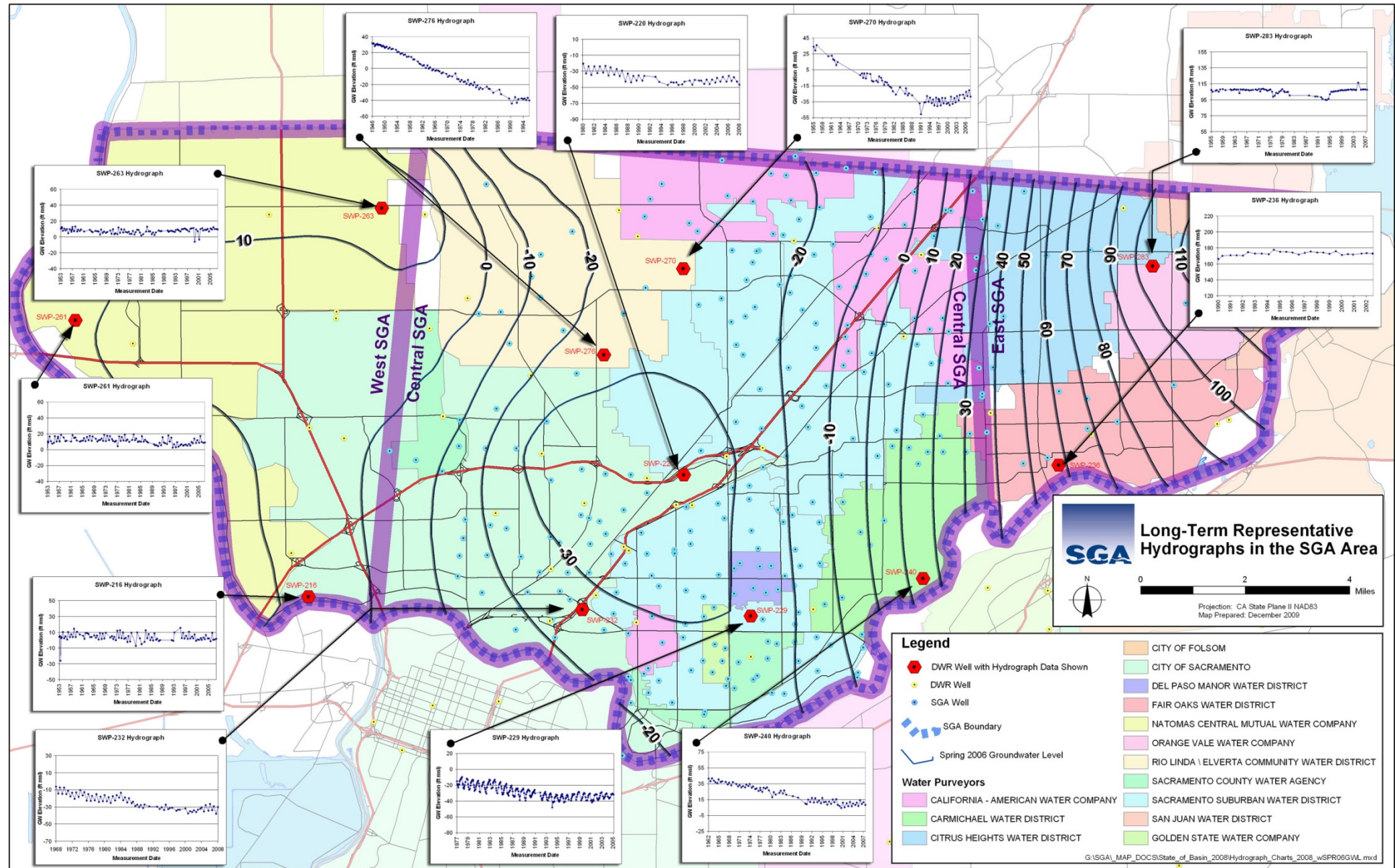


Water Accounting Framework - Background

- SGA formed:
 - To maintain the long-term sustainable yield of the North Area Basin.
 - To facilitate implementation of an appropriate conjunctive use program by water purveyors.

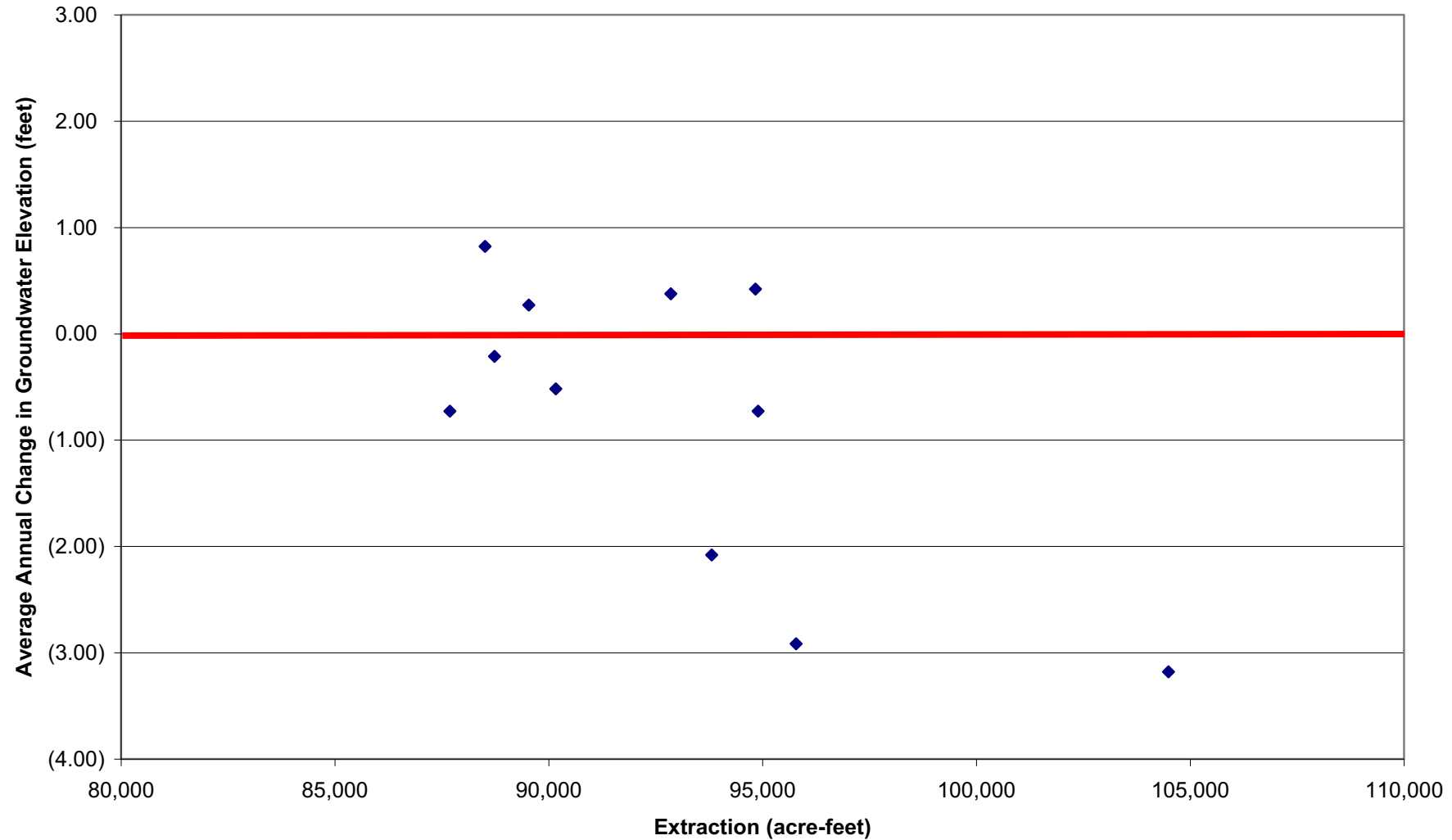


WAF Approach – Focus on Problem Area



Level Analysis ('95 - '05 data)

Change in Elevation vs. Groundwater Extraction
(head measured following Spring)



Sustainability Goal

Agency	Pumping Prior to SGA (ac-ft)	Sustainability Reduction (ac-ft)	Sustainable Target (ac-ft)
Carmichael WD	7,516	870	6,646
City of Sacramento	23,287	2,696	20,591
California American Water	20,351	2,356	17,995
Del Paso Manor WD	1,657	192	1,465
Golden State WC	1,242	144	1,098
Rio Linda/Elverta Community WD	3,259	377	2,882
Sacramento County WA	4,850	562	4,288
Sacramento Suburban WD	39,622	4,587	35,035
Total	101,784	11,784	90,000

WAF Status at beginning of 2020

Status through 2019	Basin Sustainability Balance
Carmichael WD	34,098
City of Sacramento	29,383
California American	57,259
Del Paso Manor WD	1,601
Golden State WC	1,484
Rio Linda/Elverta CWD	2,950
Sacramento County WA	-2,888
Sacramento Suburban WD	83,182
Central Area Total	207,069

Regional Water Reliability Plan

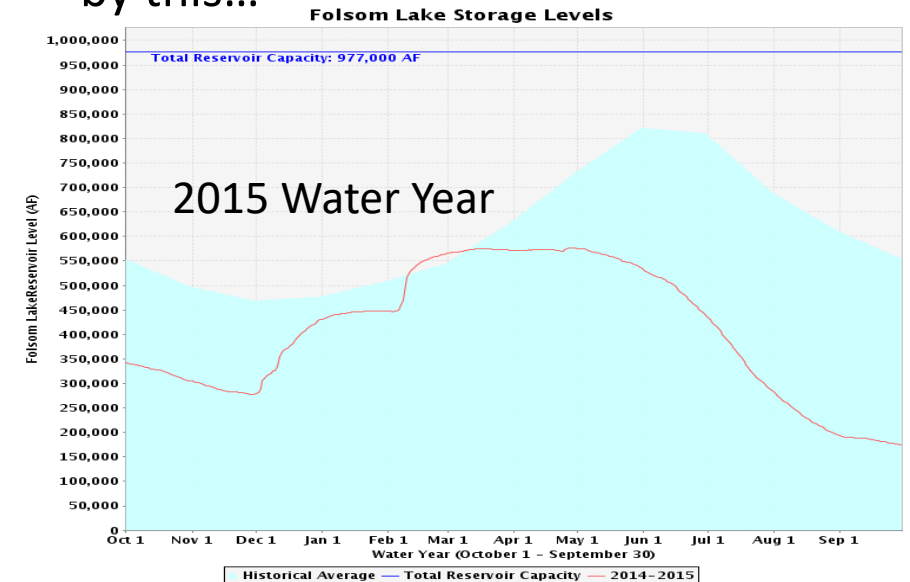
- 2013 RWA Strategic Plan called for development of Plan
- Approach was to identify:
 - Vulnerabilities to water supply of each agency
 - Mitigation measures to help overcome the vulnerabilities
- Objective was to help ensure a “basic level of service” for each public water supplier under all conditions within the region
- Considered both current and long-term (20 years) demands
- Plan completed in 2019
- Identified >100 mitigation actions

The idea came from this...

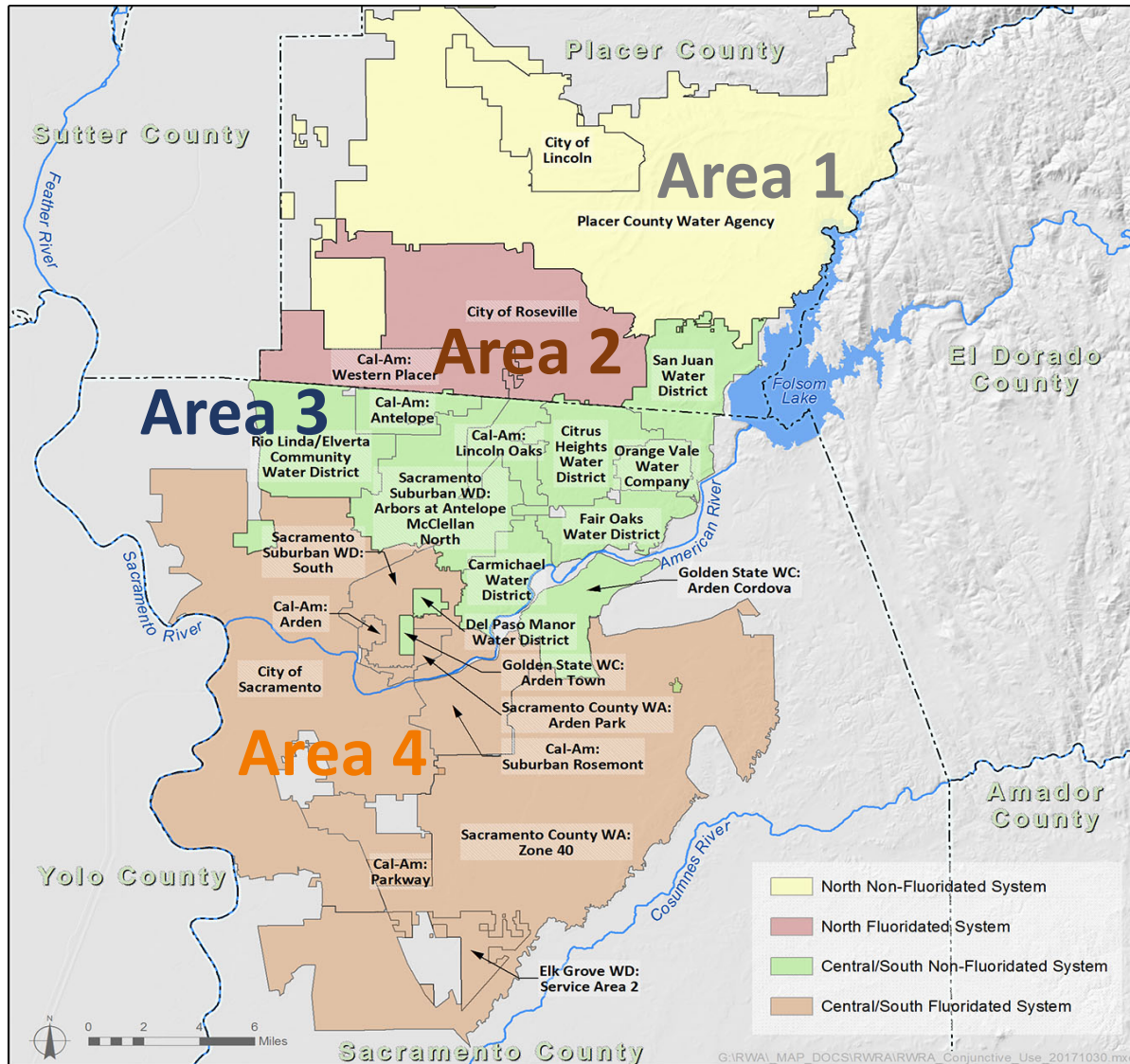


Collapsed Bear River Canal (2011)

But our work was greatly influenced by this...



Conjunctive use analysis was performed for agencies overlying the groundwater basin and contiguous with each other



Two fundamental questions

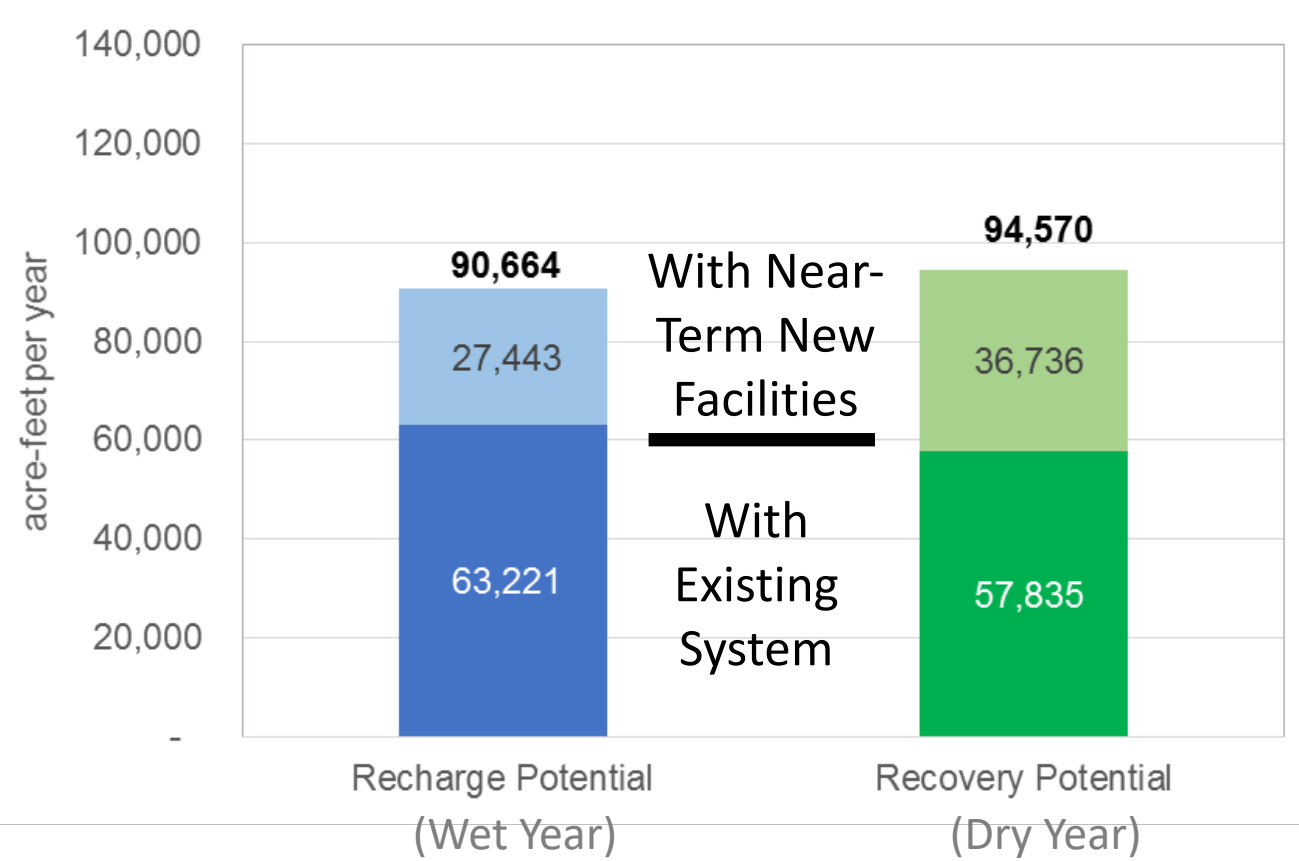
1. What we can do today by reoperating existing system?
2. What we can do over next 10 years with new facilities added to system?

Constraints Considered:

- Whether or not systems fluoridate
- Water rights/contracts
- Surface water treatment plant capacity
- Conveyance/intertie capacity
- Groundwater production capacity
- Operational issues identified by purveyors

We have significant conjunctive use potential, but we lack incentive to do more

Opportunities



Barriers

- Our system is already seen as largely reliable today
- For existing system, reoperations cost differential has typically been around \$300 per acre-foot
- For new facilities, capital costs estimated at about \$288 million

A Regional Water Bank can help overcome barriers

- Generate revenue needed to offset expense of expanding conjunctive use by
 - Storing and recovering water from internal and external partners
 - Continue to allow groundwater substitution transfers post-SGMA
- Improve water supply reliability by this expanded conjunctive use
 - Near-term – mitigate against return to drought
 - Long-term – adapt to shifting of reservoir systems resulting from climate change

Most rules for a Water Bank already exist



— BUREAU OF —
RECLAMATION

Groundwater Banking Guidelines for Central Valley Project Water

Effective Date: November 12, 2014
Updated October 4, 2019

- Multi-year storage
- Storage before recovery
- Loss factor over length of storage
- Monitoring and mitigation

DRAFT Technical Information for Preparing Water Transfer Proposals

(Water Transfer White Paper)

Information for Parties Preparing Proposals
for Water Transfers
Requiring Department of Water Resources or
Bureau of Reclamation Approval

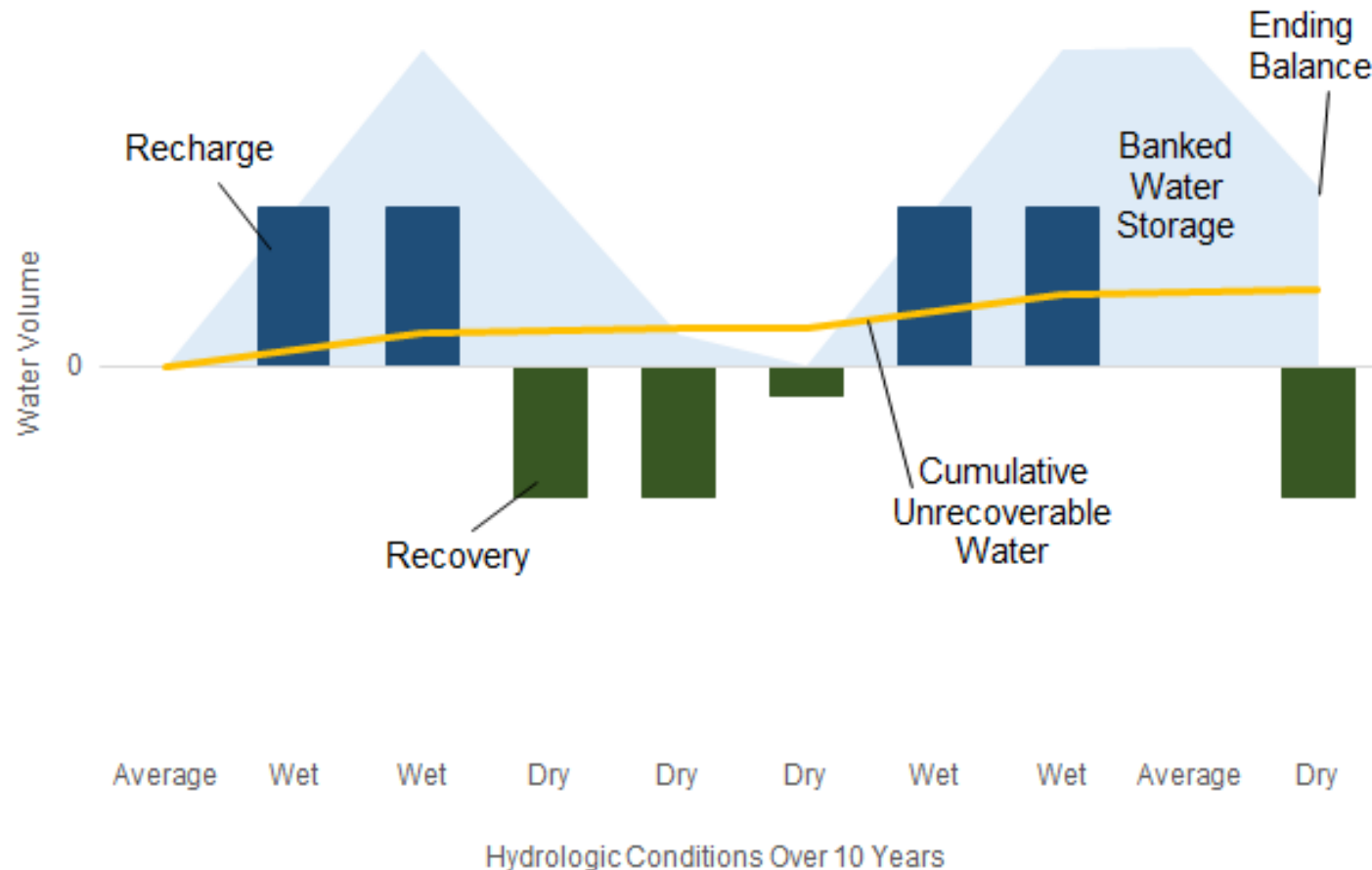
December 2019

Prepared By:
CALIFORNIA DEPARTMENT OF WATER RESOURCES
AND
BUREAU OF RECLAMATION, MID-PACIFIC REGION



- Single year transfers
- Storage is not required
- One-time loss factor
- Monitoring and mitigation

Precise operations are to be determined through modeling, but principals will help basin sustainability

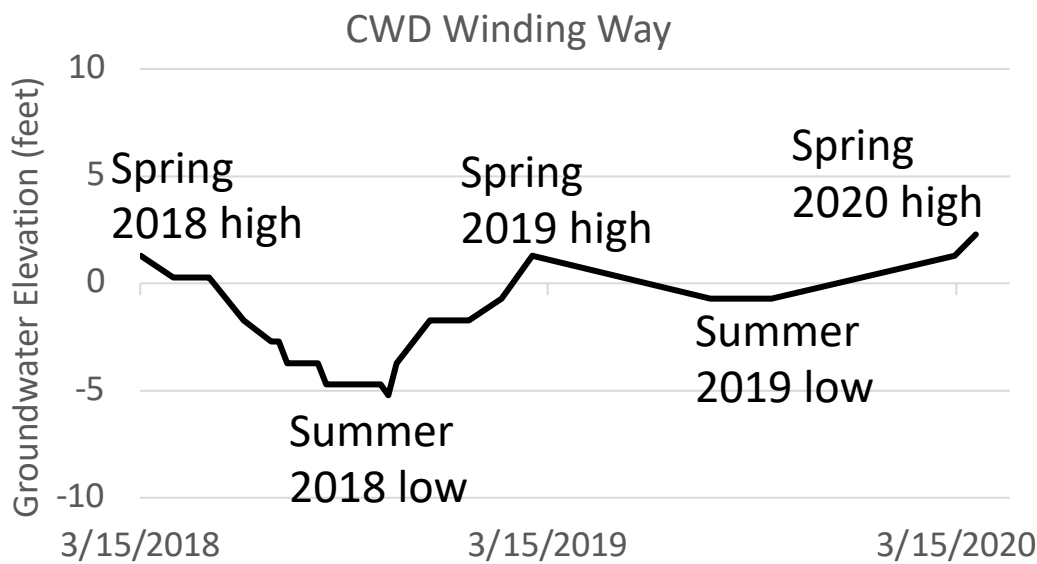
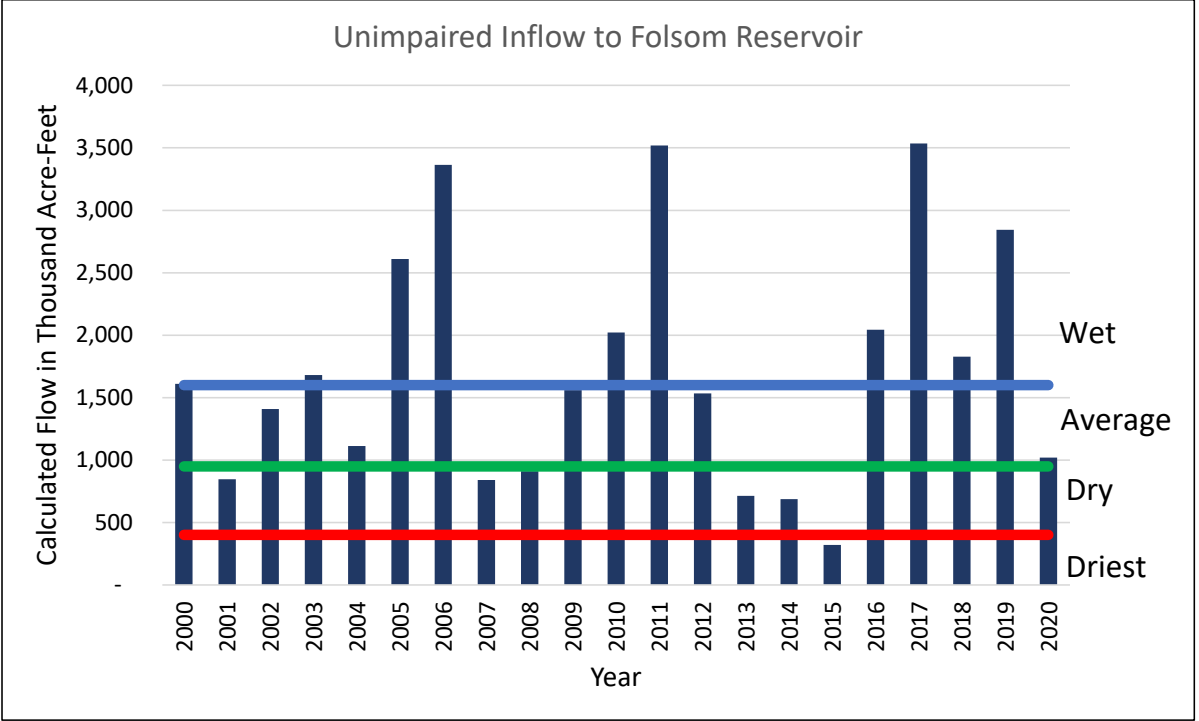
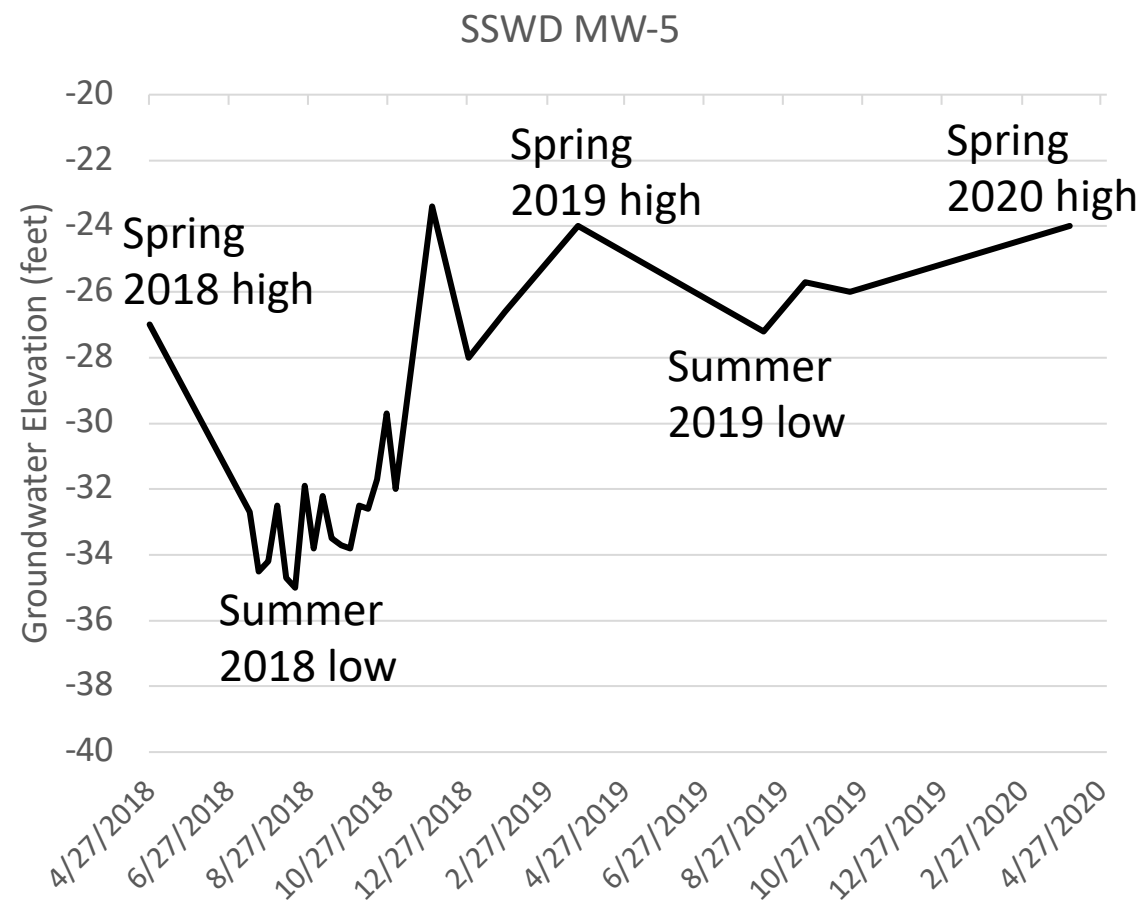


CoSANA Model

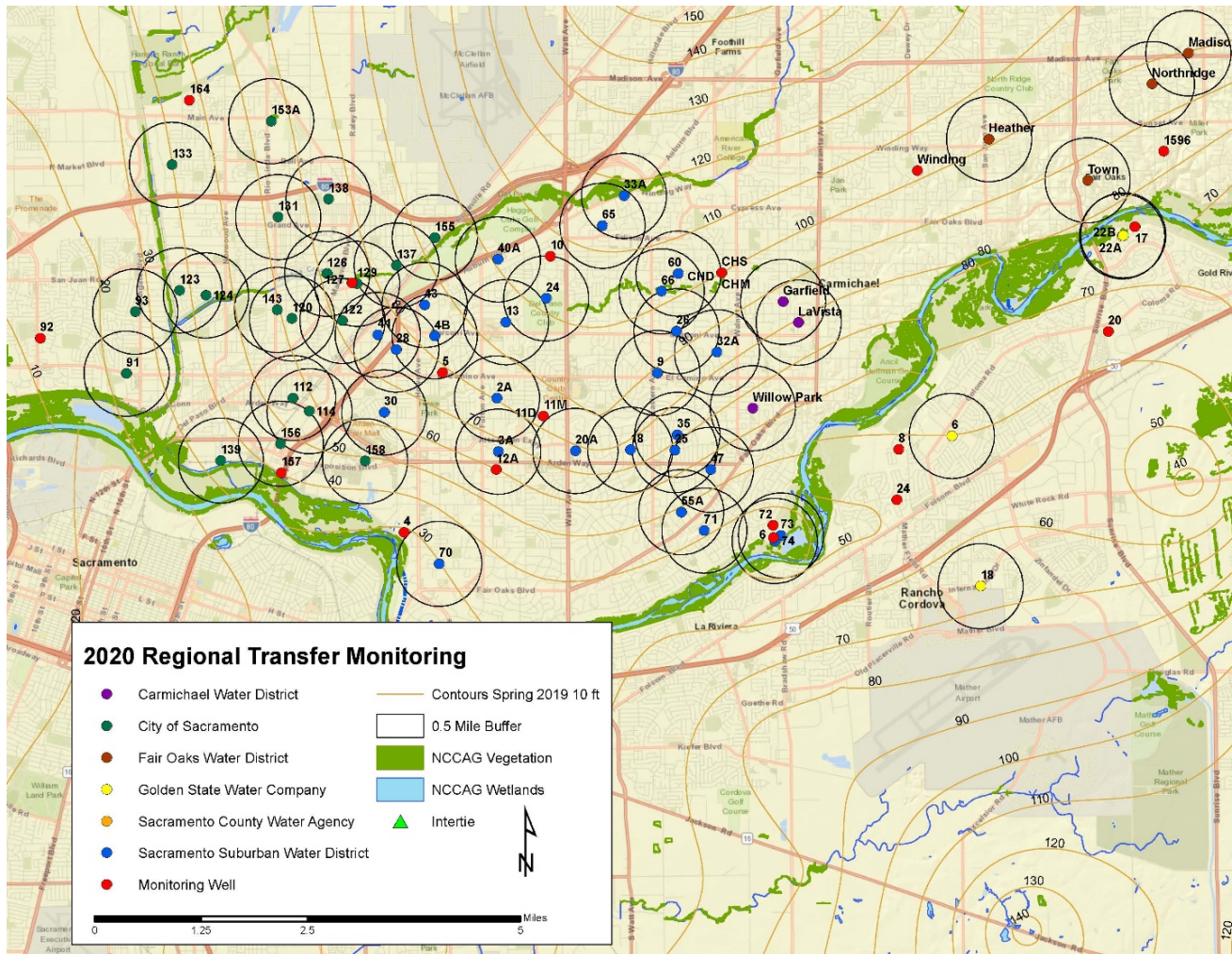
CalSIM3 Model

Temperature Model

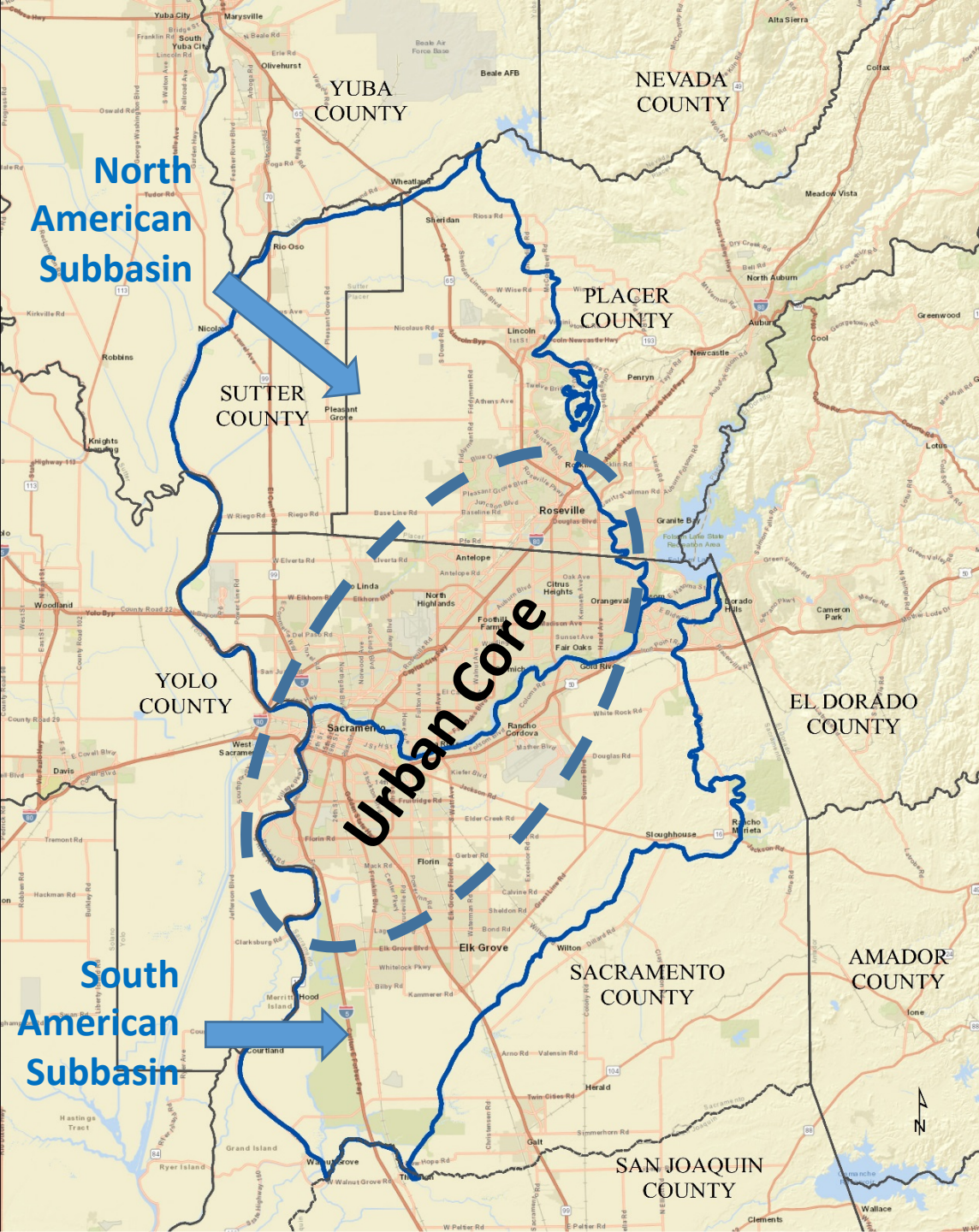
Example of positive results from these operations



Transfer guidelines address protection of riparian areas and GDEs



- Wells within 1 mile of river no shallower than 150 feet to first perforated interval
- Each well within ½ mile of potential GDE has to demonstrate that groundwater not supporting GDE



The Water Bank can grow substantially through time

Sources of recharge

Municipal in-lieu

Municipal
direct
through ASR

Recycled in-lieu

Flood-MAR

Agricultural in-lieu

Time

The path to Federal recognition of Water Bank and its expansion in the urban area

Planning to complete in 2022

- Technical tools/analysis
- Environmental
- Accounting/financial analysis
- Governance
- Approvals

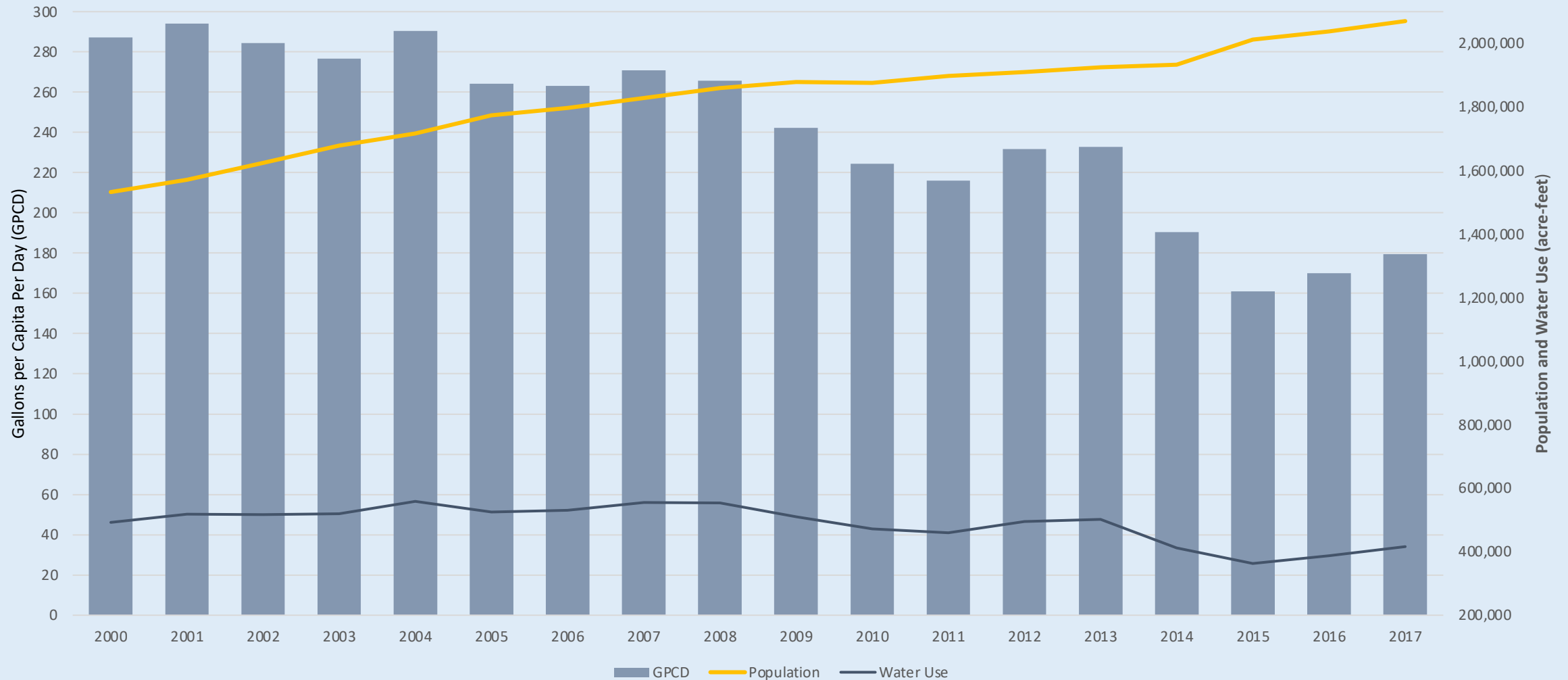
Build additional facilities to expand on operations

- ~2030
- ~\$288 million in urban area
- Expansion scalable as funds available

Questions and Discussion

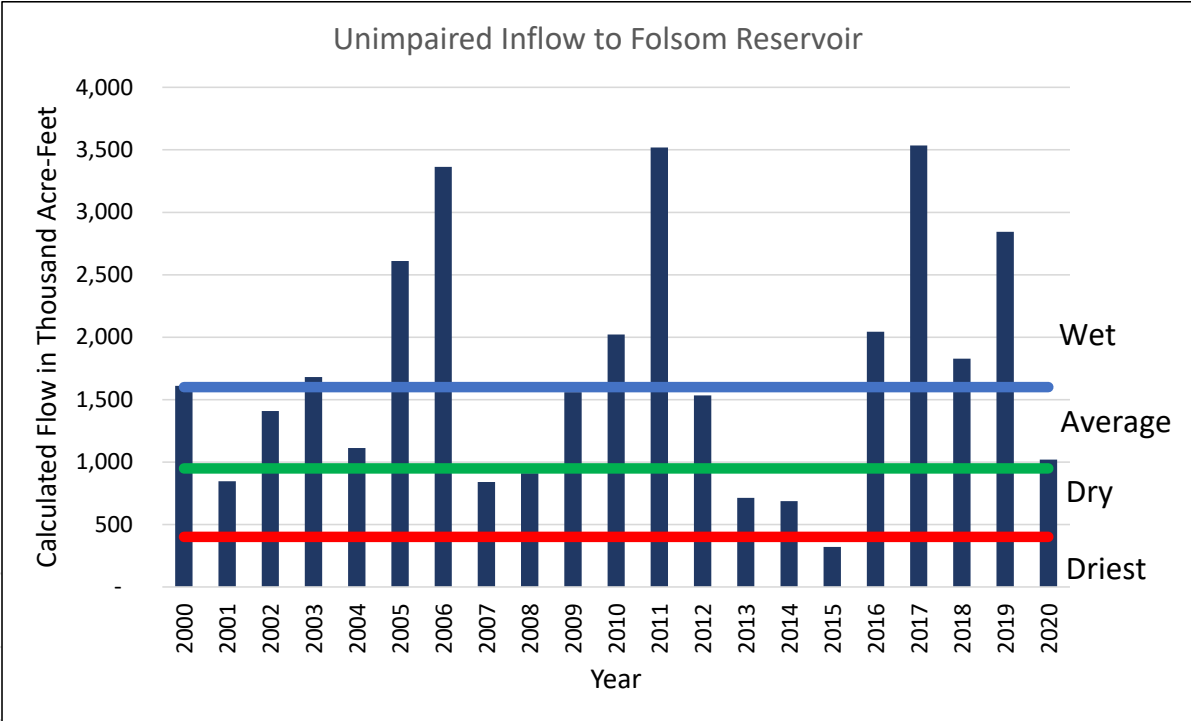
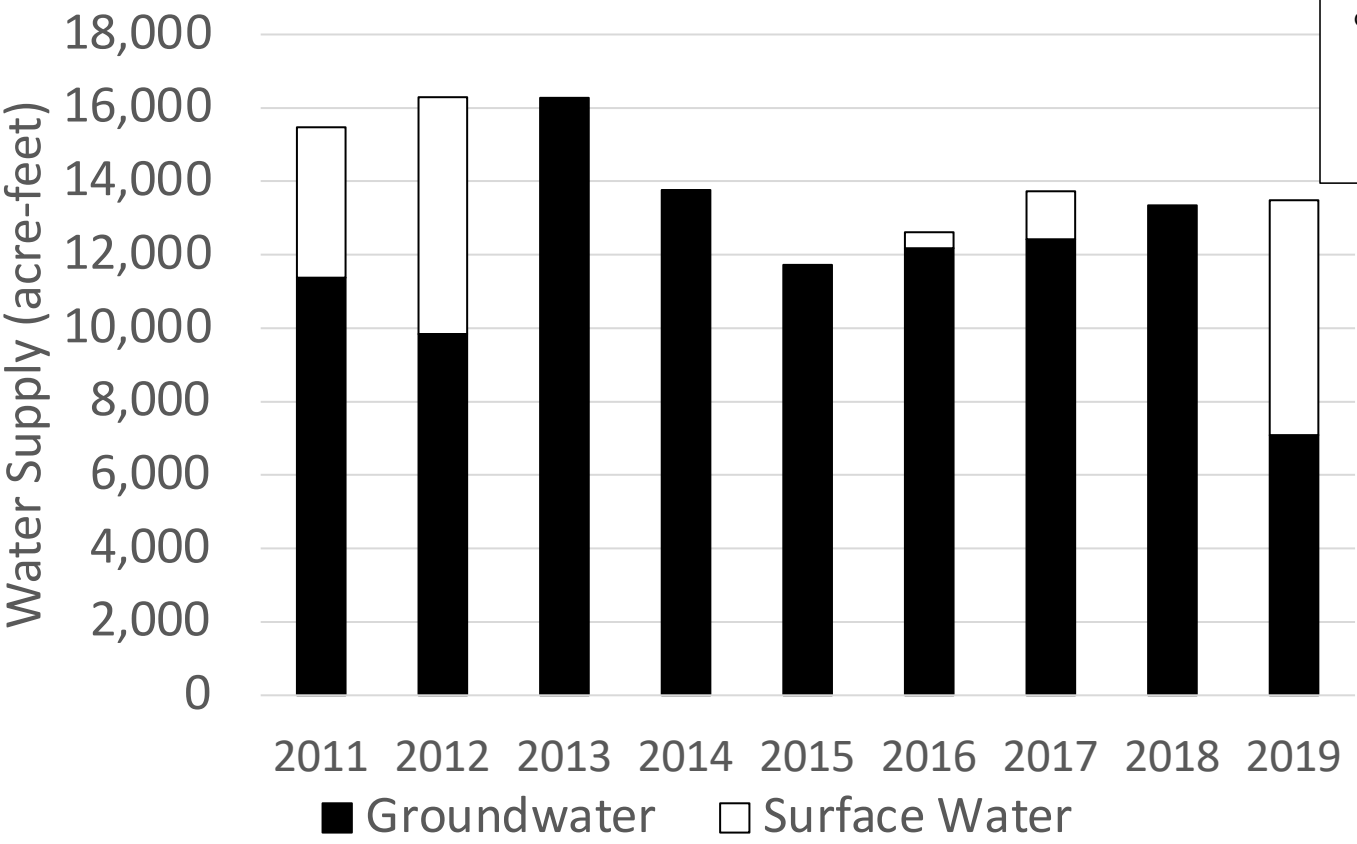
Regional Municipal & Industrial Water Trends

Population, Water Use and GPCD in the Sacramento Region



An example of the benefit of these operations

Sac Suburban South Area Water Supply in SGA Area



2020 Pilot Transfer

- Six agencies participating
- 68 production wells
- Using three interties
- 25 monitoring wells
- Weekly monitoring of elevations at all wells during transfer, monthly until March 2021
- Trigger levels established at each well
- Transfer July through September, with option for adding October and November
 - 11,700 acre-feet Jul-Sep
 - 4,400 acre-feet Oct-Nov

