Developing A Water Blueprint for the San Joaquin Valley

Scott Hamilton,
3/4/2020

Critically Overdrafted Basins

PPIC PUBLIC POLICY INSTITUTE OF CALIFORNIA

25 YEARS

FEBRUARY 2019

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Brian Gray,
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Jelena Jezdimirovic,
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Peter Moyle,
Nathaniel Seavy

Supported with funding from the S. D. Bechtel, Jr. Foundation, the TomKat Foundation, the US Department of Agriculture, the US Environmental Protection Agency, and the Water Foundation

Water and the Future of the San Joaquin Valley

PPIC average overdraft 2003-2017: 2.43 maf

Outline

- Understanding the problem – how big and where?
- A three-part solution:
  1. Finding water for the Valley
  2. Conveyance
  3. Beneficial use - changing the groundwater balance; enhancing ecosystems; helping people

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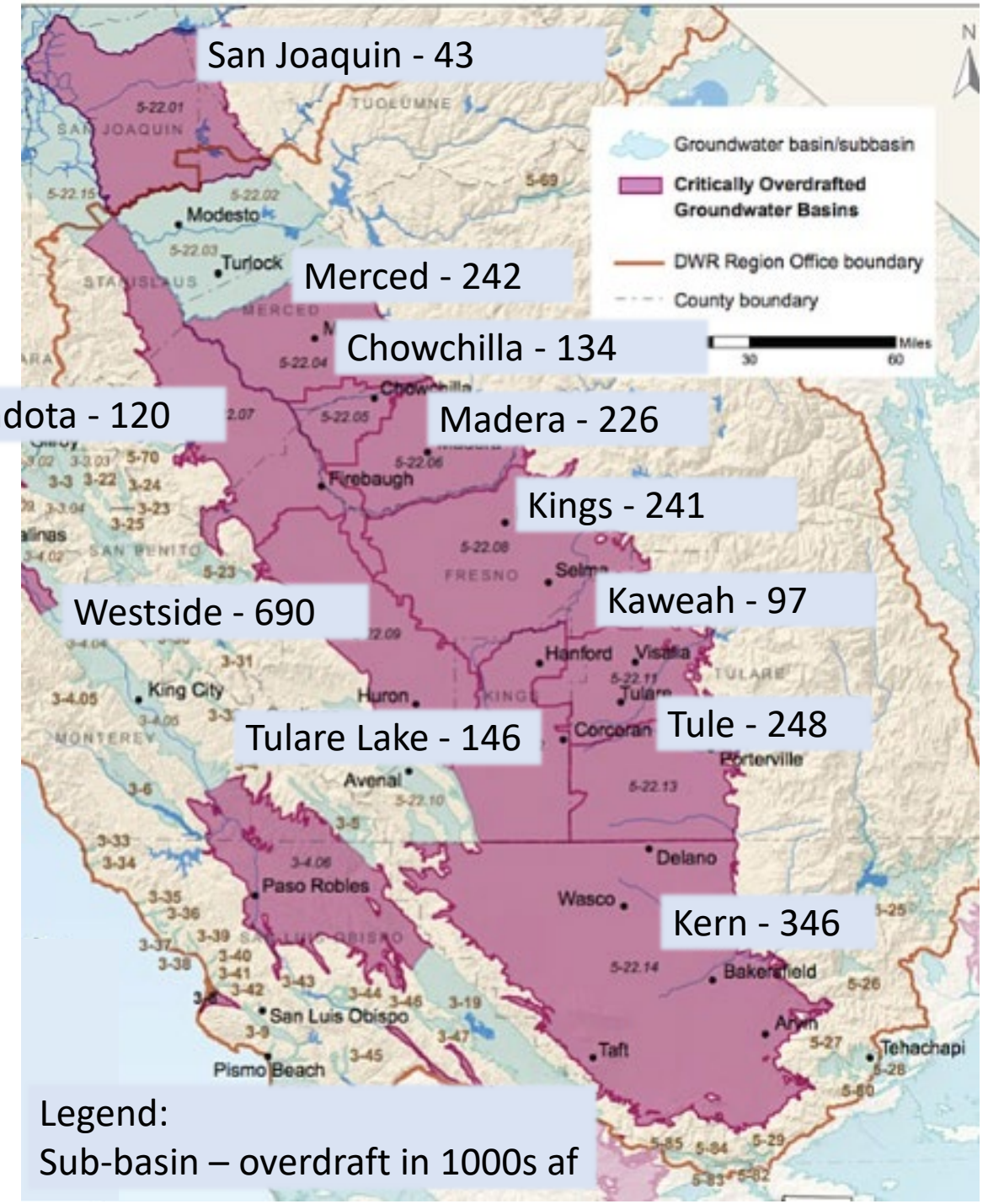
Water and the Future of the San Joaquin Valley

PPIC average overdraft 2003-2017: 2.43 maf

Future is worse:
BiOps
River Restoration
SWRCB Flow reqr.
More orchard land

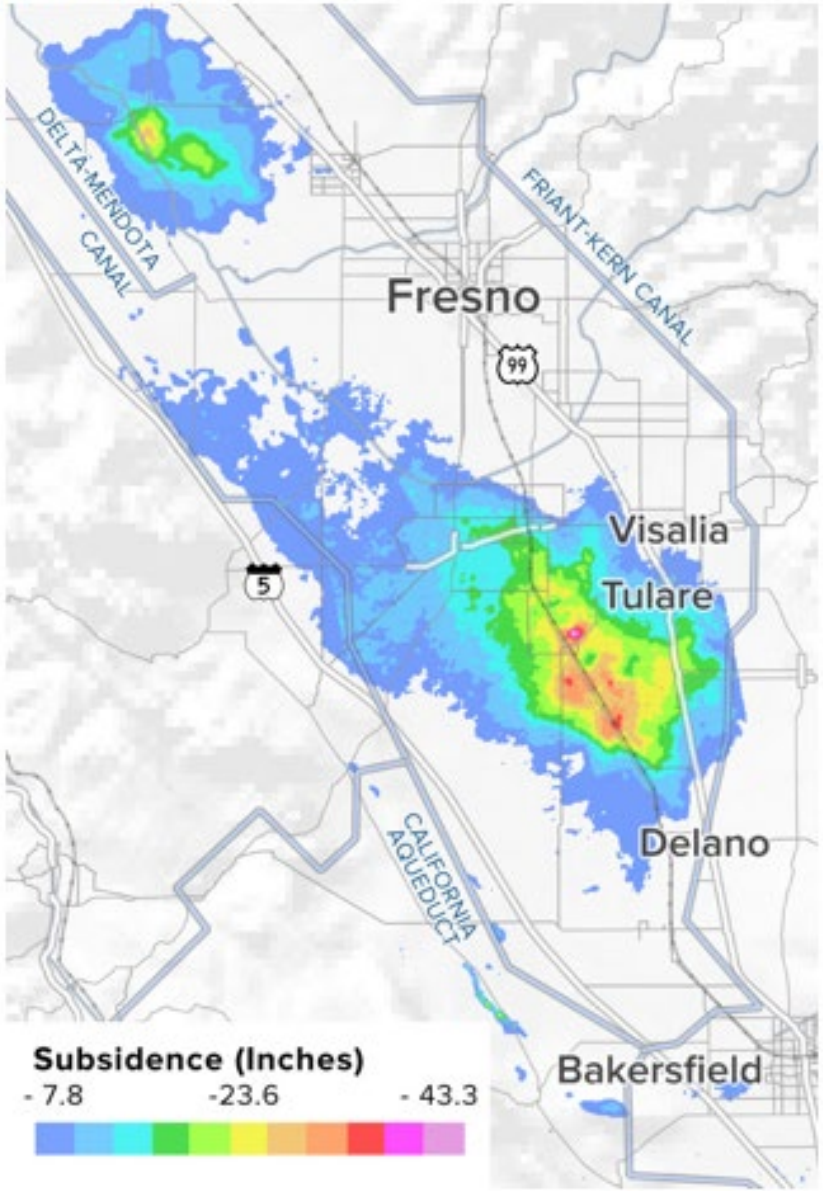
Estimated Overdraft: 2.5 maf



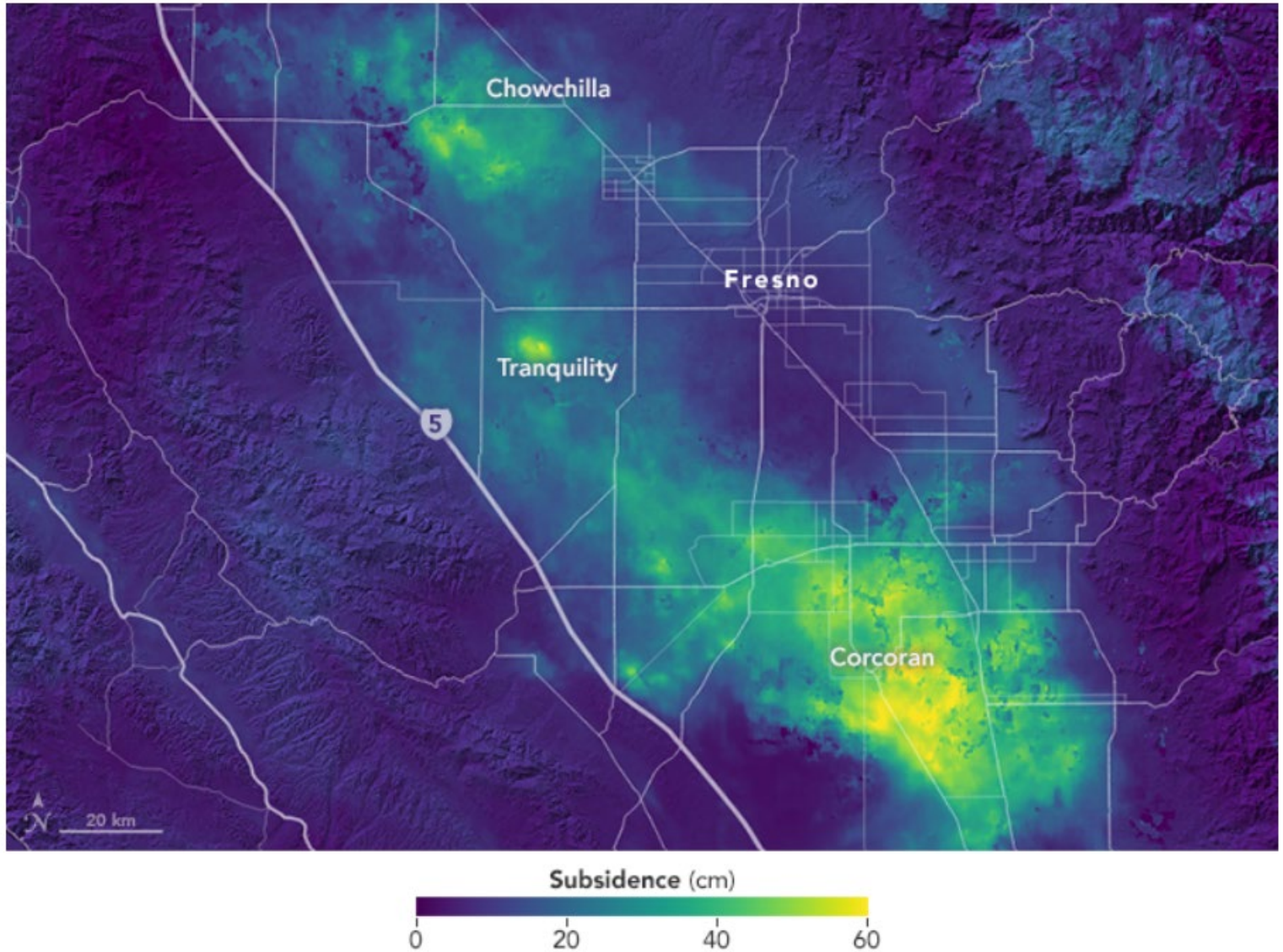
Consequences of Inaction

- Lost farm revenue: $7.2 billion per year – 1 mill ac fallowed
- Lost income to farmers: $1.9 billion per year
- Lost jobs in agriculture: 42,000
- Lost jobs in the valley: 65,000
- Lost property tax revenue
- Human and social cost

Land Subsidence in the San Joaquin Valley, 2007 - 2011



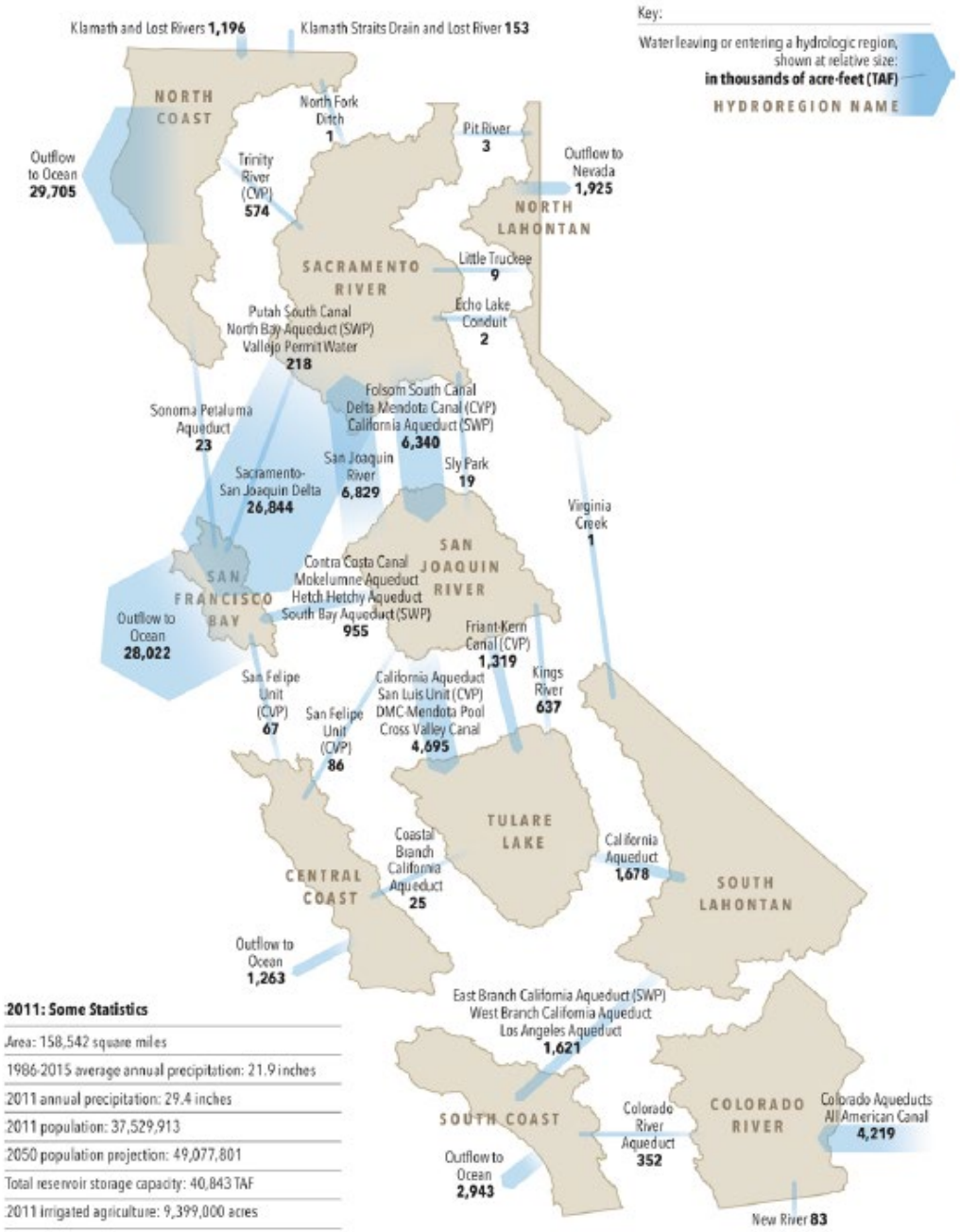
Source: Tom Farr, NASA Jet Propulsion Laboratory



May 7, 2015 - September 10, 2016

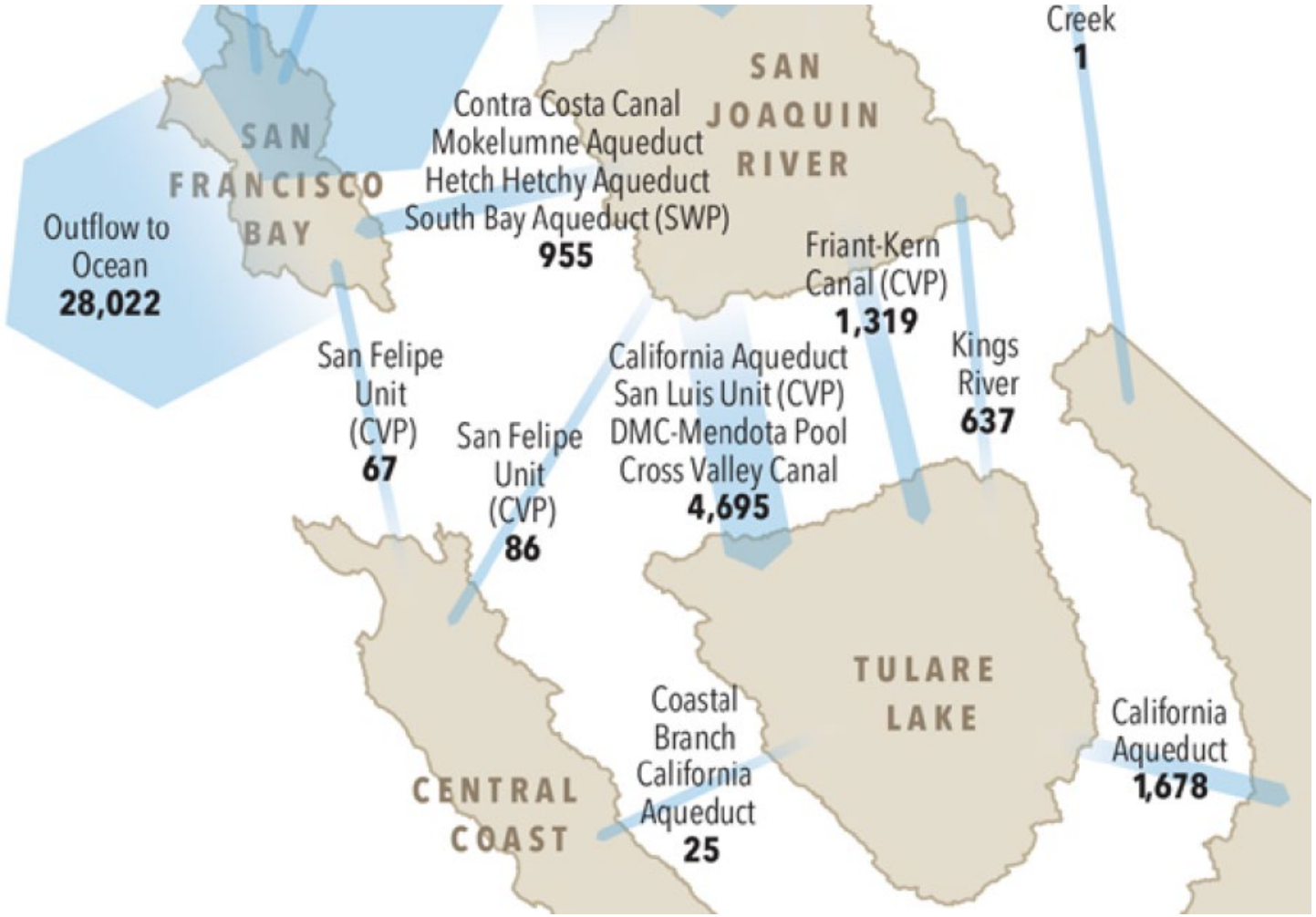
PNG

Figure 17 Regional Inflows and Outflows, Water Year 2011



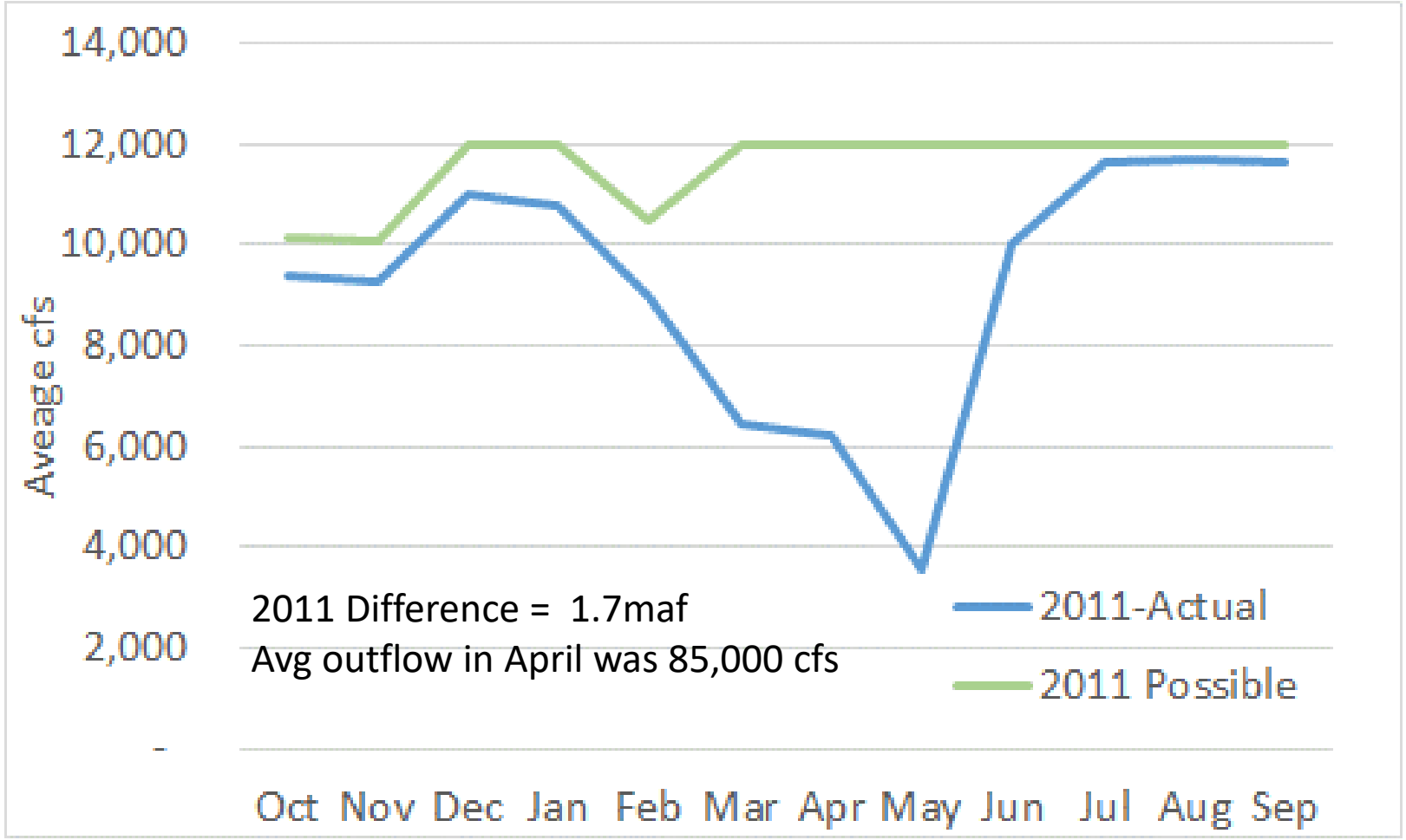
2011: Some Statistics

Area: 158,542 square miles	
1986-2015 average annual precipitation: 21.9 inches	
2011 annual precipitation: 29.4 inches	
2011 population: 37,529,913	
2050 population projection: 49,077,801	
Total reservoir storage capacity: 40,843 TAF	
2011 irrigated agriculture: 9,399,000 acres	



2011 Exports

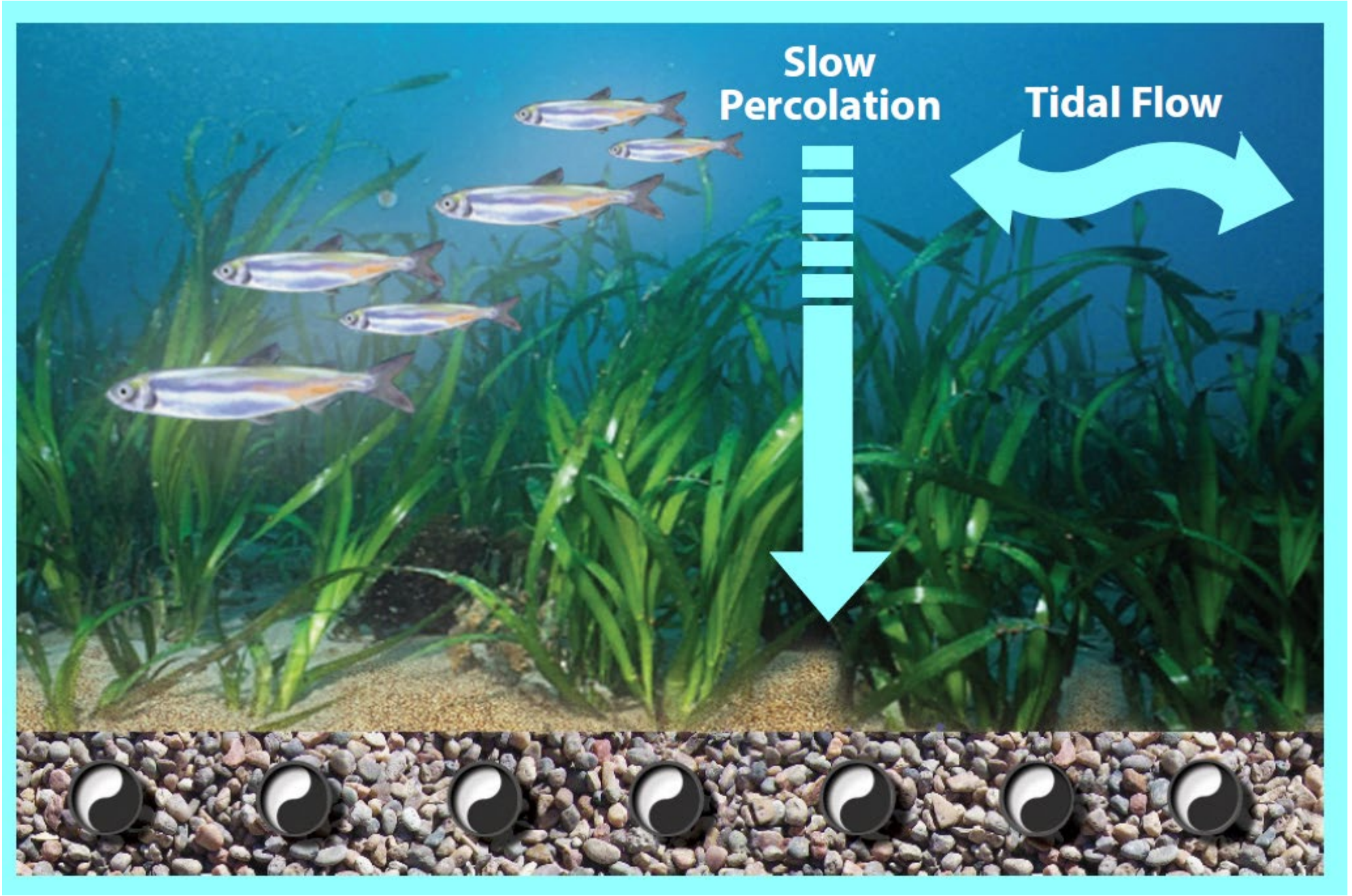
1. Water for the Valley
   – surplus delta outflows



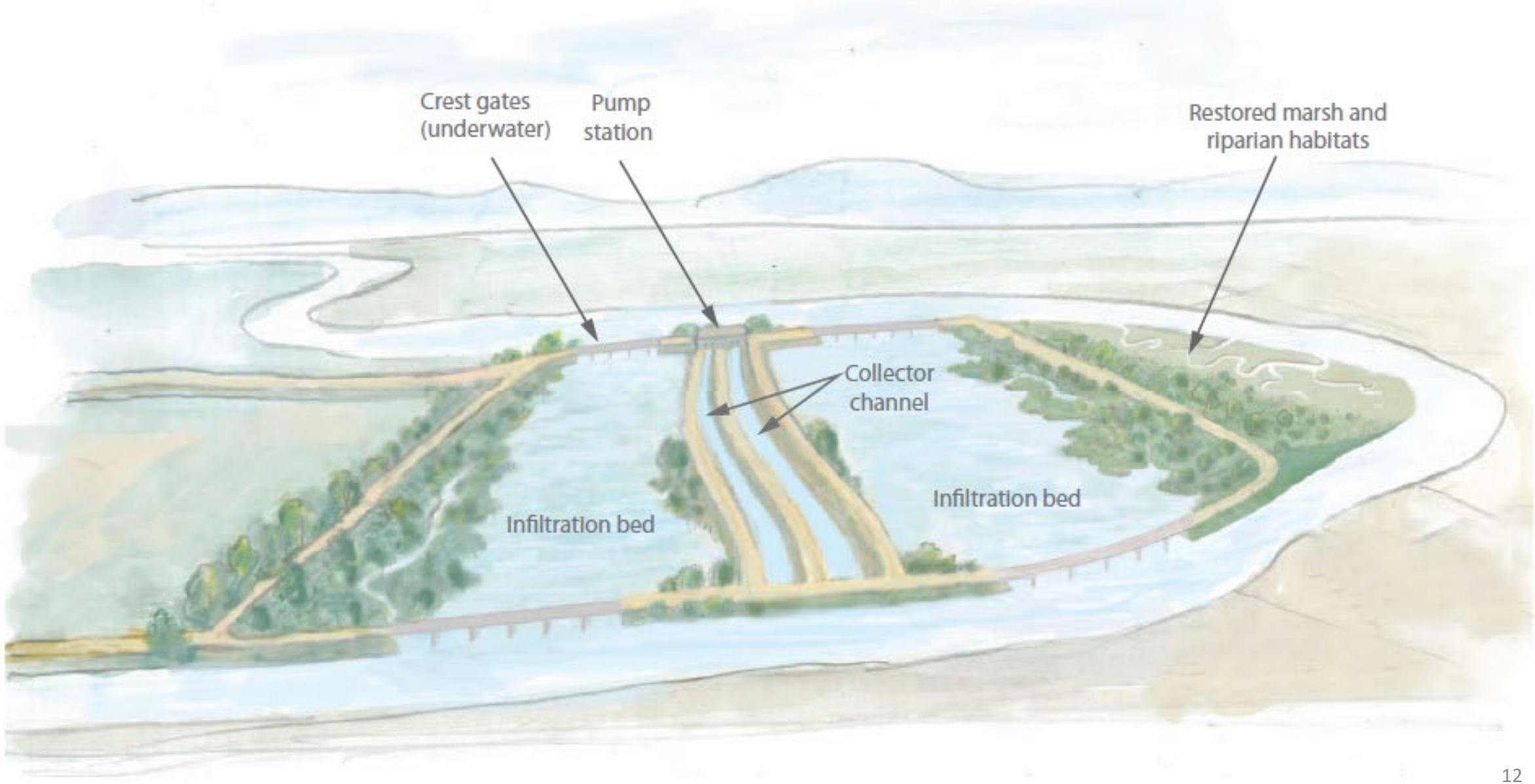
Avg exports since Biops	4.20	maf/yr
Aggressive export estimate	6.24	maf/yr
Possible increase	2.04	maf/yr


Fish Friendly Diversions
Rethinking Water Diversions
in Sensitive Ecosystems
"With the correct water engineering, entrainment effects might be eliminated, allowing maintenance of current diversion volumes, or possibly even permitting increased diversions."
– National Academy of Sciences, 2012.

Fish friendly diversions work because of natural buoyancy and slow velocities



Fish friendly diversions don’t have dead ends



2. New Conveyance

Conceptual distribution of new water – proportional to overdraft

Use of 12,000 cfs	cfs
Western Fresno	2,500
Madera	1,000
Mid-Valley	2,000
Trans-Valley	3,000
Kern	3,500
Total	12,000

Canal capacities will depend on landowners' willingness to pay

3. Beneficial use - 100,000 acres of new recharge ponds.

Recharge ponds are a cheap way to store water and create habitat

The elements are still being developed

			AVERAGE YIELD
RESTORATION OF ESSENTIAL CONVEYANCE CAPACITY			**(taf/yr)**
Friant-Kern Canal Capacity Restoration			Necessary for maintenance of exisiting spplies
Delta-Mendota Canal Capacity Restoration			
Friant-Kern Canal Reverse Flow & Recirculation	500	cfs	
Calloway Canal Improvements			
California Aqueduct Capacity Restoration			
NEW INFRASTRUCTURE			
Delta Conveyance	6,000	cfs	Up to 2,100 taf
South Delta Improvement Plan			
Fish Friendly Diversions	12,000	cfs	
Enlarge Delta-Mendota Canal			
Mid-Valley Conveyance	3,000	cfs	
Tran- Valley Conveyance	3,000	cfs	
Groundwater Recharge Facilities	12,000	cfs	
ENHANCED WATER MANAGEMENT			
Coordinated Operations between SWP, CVP and Friant			Up to 80 taf
Enhanced Water Transfers and Exchanges			
Strategic, Multi-benefit Land Conversion	100,000	ac	Up to 310 taf
Incentivised Land Retirement			
Non-Farm Conservation			Up to 10 taf
Advanced Precipitation Forecasting & Monitoring			
POLICY AND REGULATORY CHANGES TO EXPEDITE PROCESSES			
Reconsultation on Delta Operations			Included in new infrastructure estimates above
Voluntary Agreements			
Expedited Safe Harbor Permits			
Expedited Permitting for Ecosystem Restoration			
Place of use Adjustements to Maximize Recharge			
Expedited Permitting for Water Markets			
WATER QUALITY			
Safe, reliable water for Disadvantaged Communities			
TOTAL			**Up to 2.5 maf**

In conclusion

- The road ahead is difficult
- There is a lot to be done – there is much at stake
- These are just concepts
- The numbers are still rough
- The water plan must be molded to the solution that valley water users want & are willing to pay for
- Be part of a valley solution

What you can do?

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Water Blueprint for the San Joaquin Valley

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- Not in a water district? form one/join one
- Do you need more water? know how much
- Stay in touch with your GSA/district
- Support your organizations
- If you need water, be prepared to provide funding

Blueprint Technical Process

Phase 1. Understand the problem and the consequences.

a. Quantify the magnitude and location of the overdraft
b. Quantify the economic and social impacts.
c. Articulate the objectives of the Blueprint
d. Identify solutions.

Phase 2. Assess the benefits and costs of alternatives.

a. Develop a complete range of alternatives.
b. Understand the benefits, costs, permitting requirements, political considerations, uncertainties and public perception concerns for each project.

Phase 3. Select a suite of cost effective and implementable projects that meet objectives.

Phase 4. For each project, identify governance, size, location, necessary resources.

Phase 5. Design, permit, fund and construct projects.

Phase 6. Develop organizational structures to operate and maintain projects.