Drought –It is not just Hydrology

Impacts of Changing Delta Regulatory Requirements on CVP and SWP Delivery Capability

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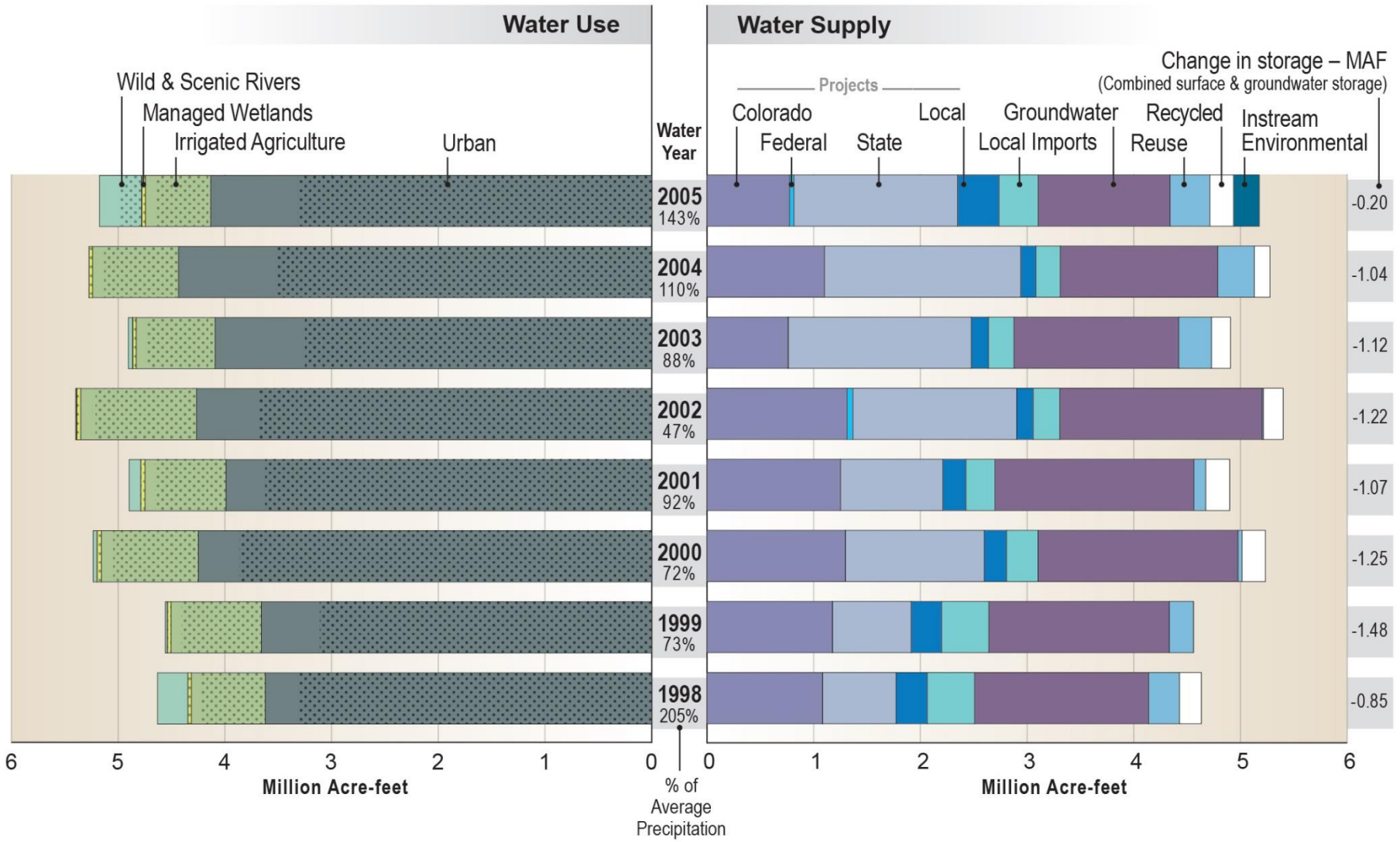
Outline

- Drought?
- Central Valley Hydrology
- CVP-SWP Water Resources System
- Delta Regulatory Requirements
- Modeling Results

Drought?

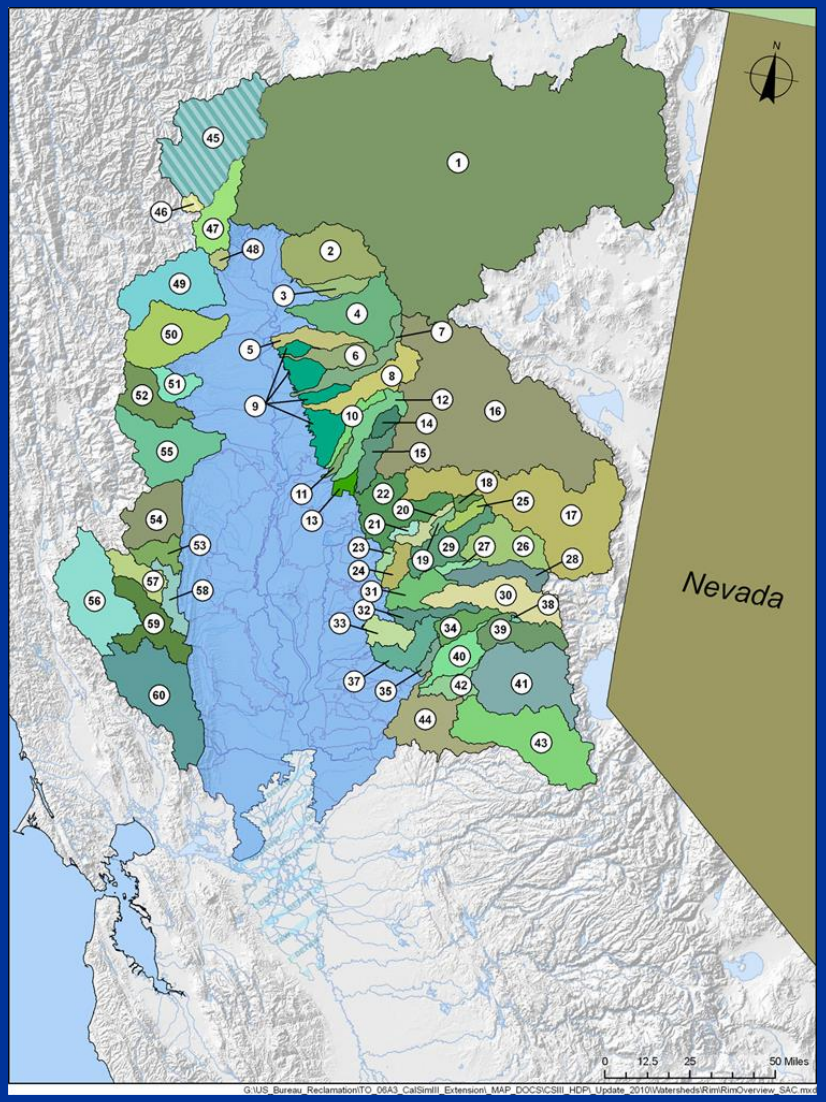
- **Hydrologic Drought** : Precipitation and Runoff less than Average
- **Drought For Water Users :** Shortage in water supply to meet demands
  - Annual Rainfall/Runoff
  - Surface and Groundwater Storage ; Conveyance
  - Water Rights priorities
  - Regulatory Requirements
  - Water Supply Portfolio

Water Use and Supply Balances for Calif. South Coastal Region

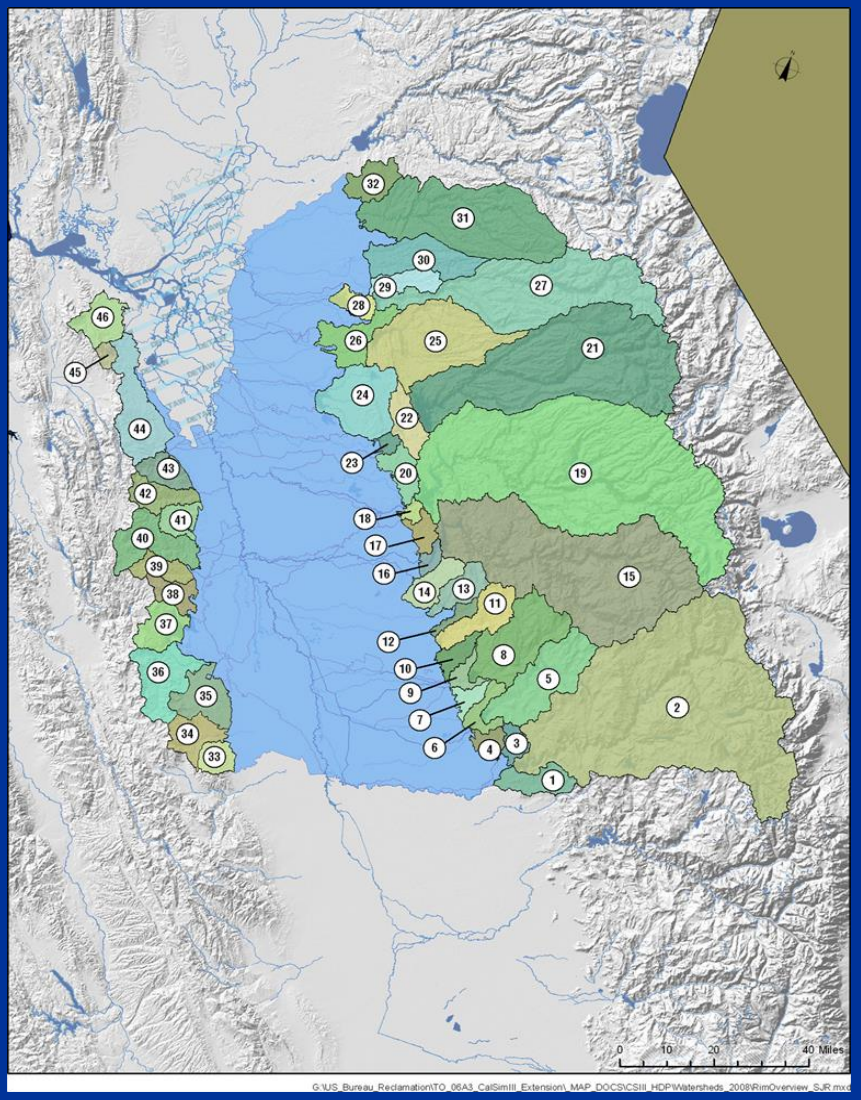


Rim watershed

Sacramento River Rim Watershed

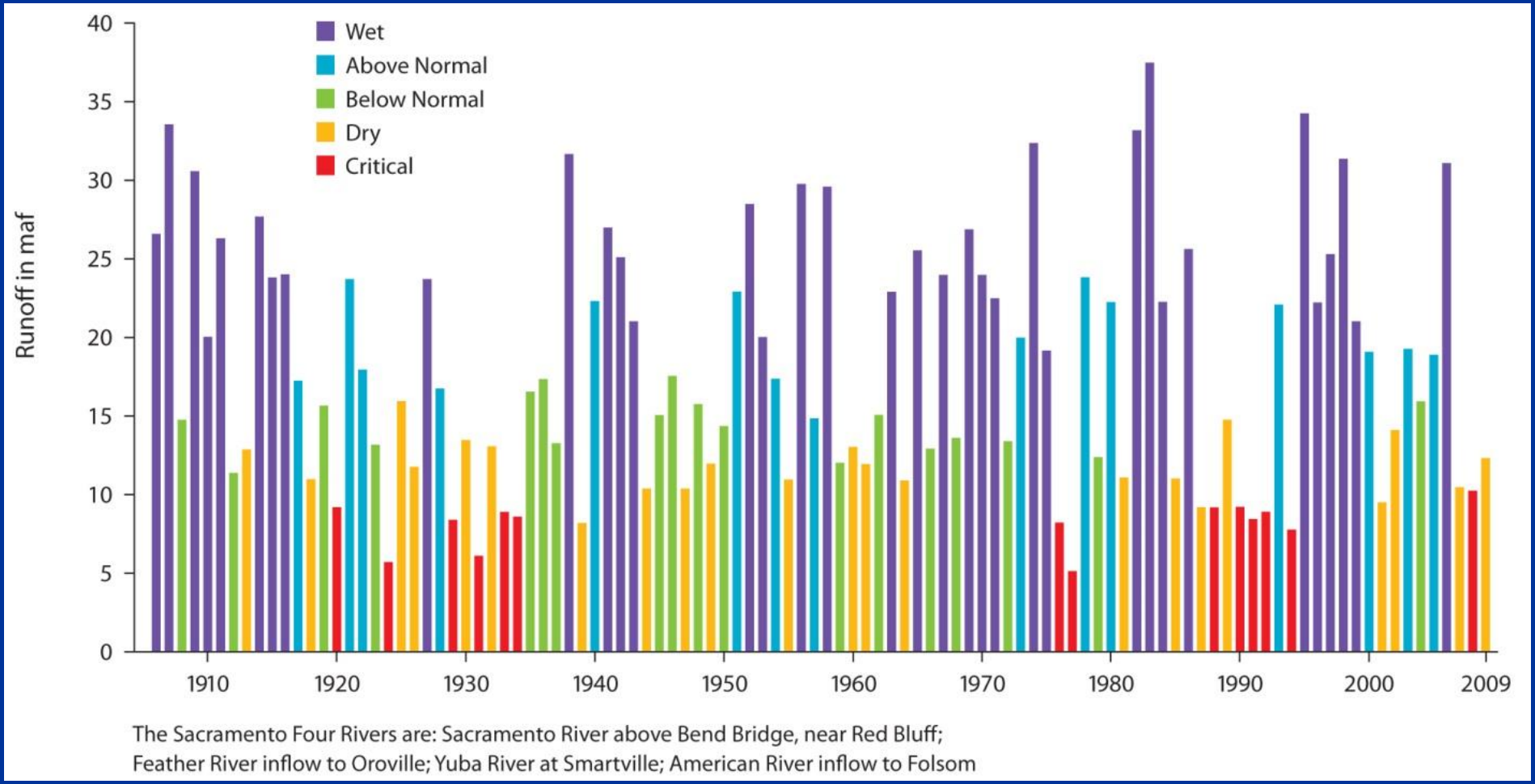


San Joaquin River Rim Watershed



Natural Hydrology Variations

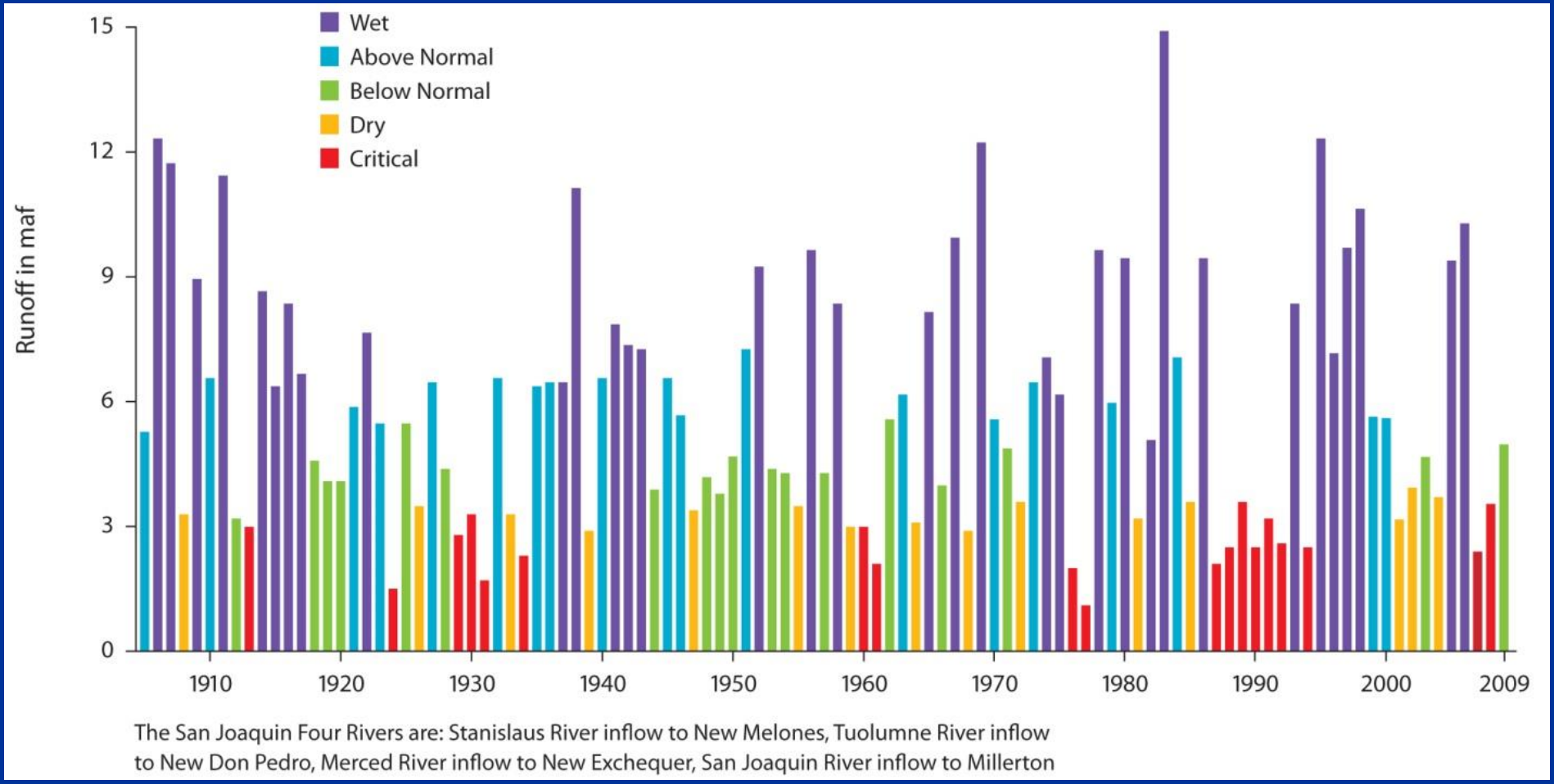
Sacramento River



The Sacramento Four Rivers are: Sacramento River above Bend Bridge, near Red Bluff; Feather River inflow to Oroville; Yuba River at Smartville; American River inflow to Folsom

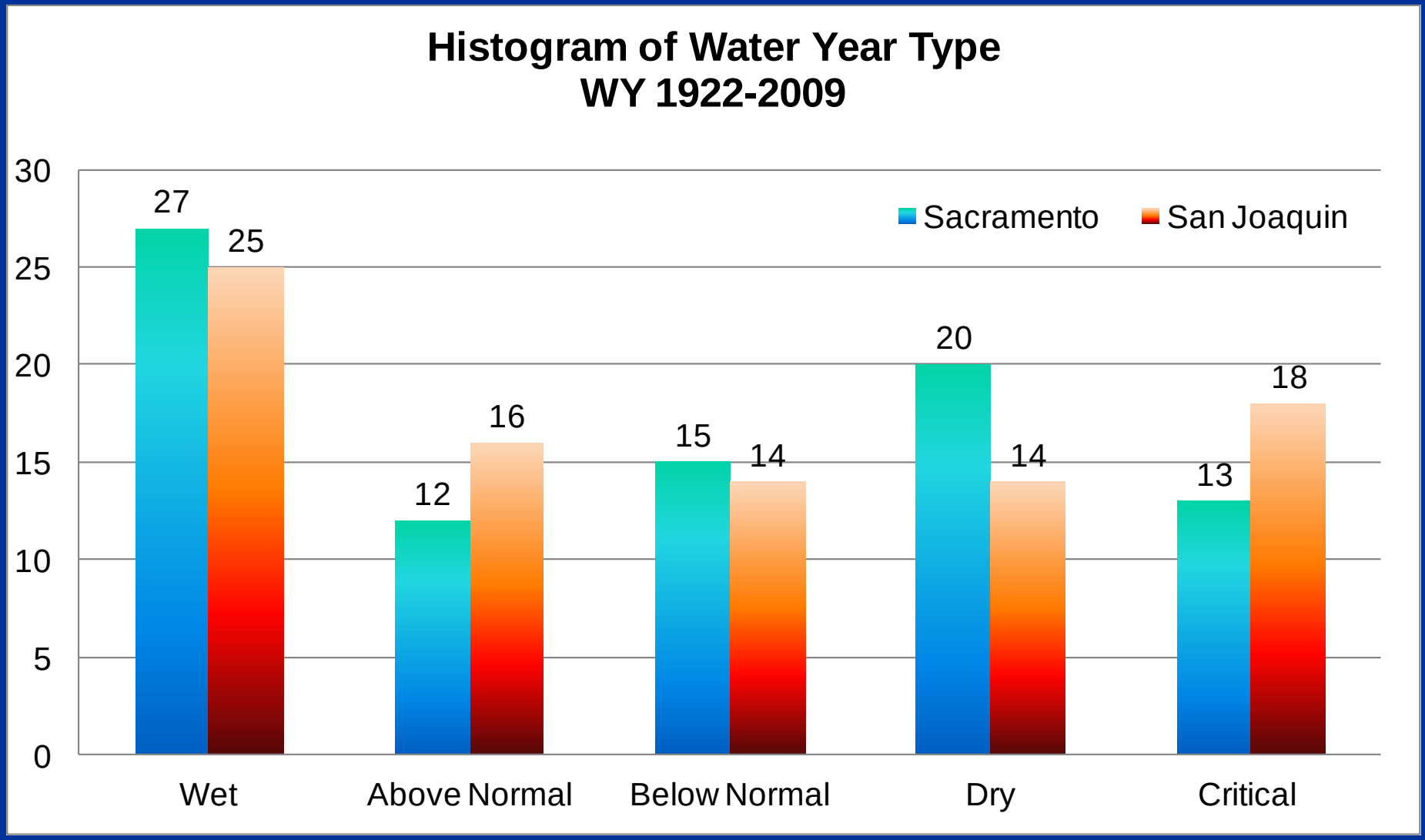
Natural Hydrology Variations

San Joaquin River

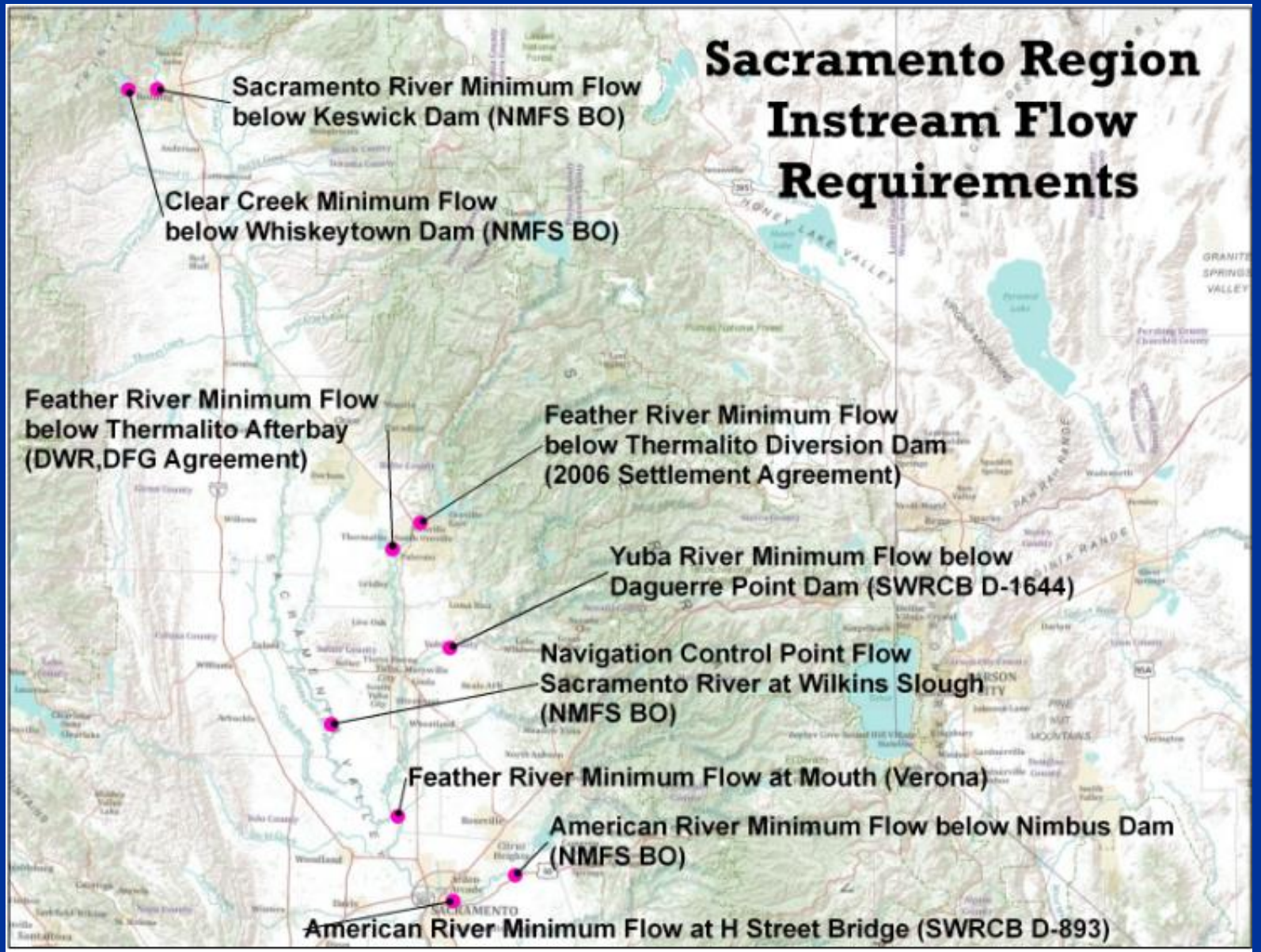


The San Joaquin Four Rivers are: Stanislaus River inflow to New Melones, Tuolumne River inflow to New Don Pedro, Merced River inflow to New Exchequer, San Joaquin River inflow to Millerton

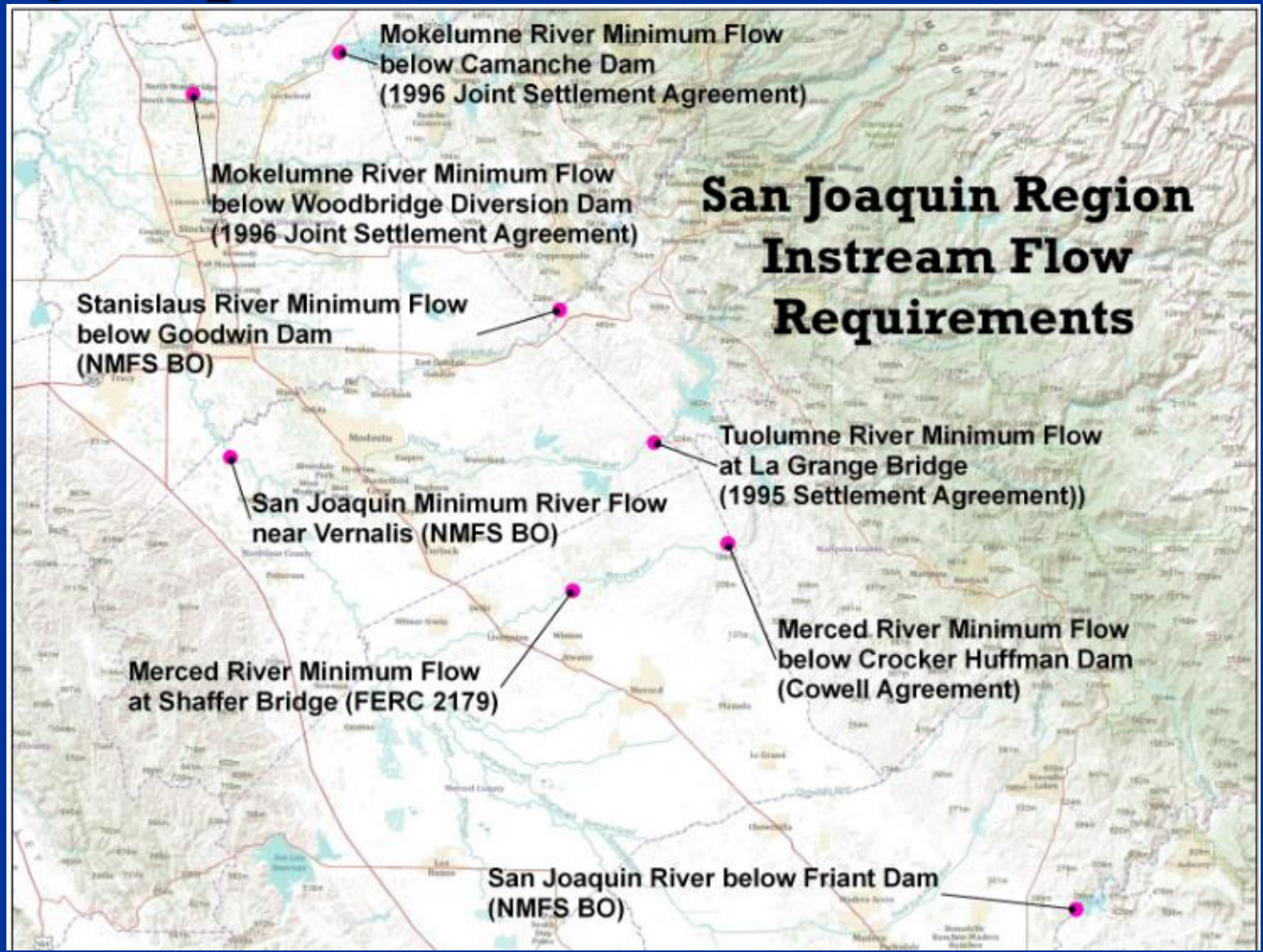
Water Year Type Frequency



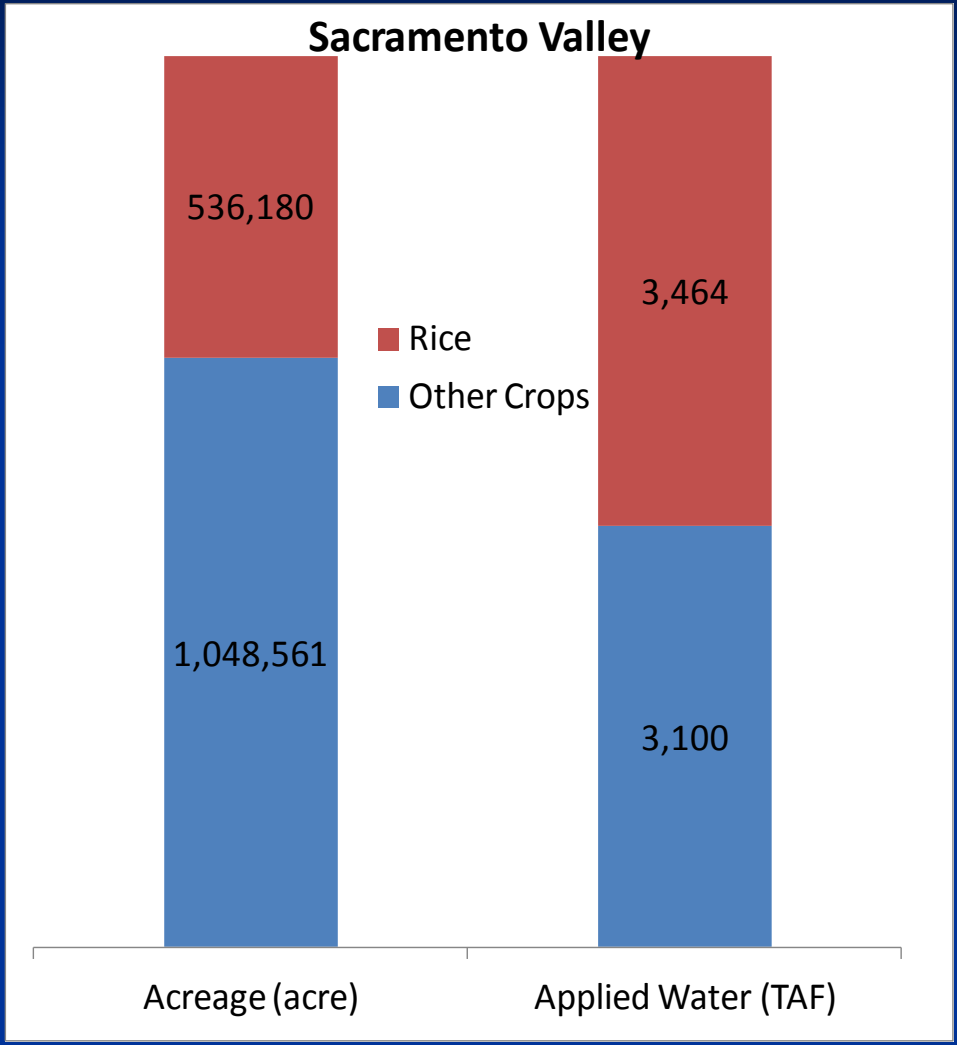
Regulatory Requirements – Sacramento Basin

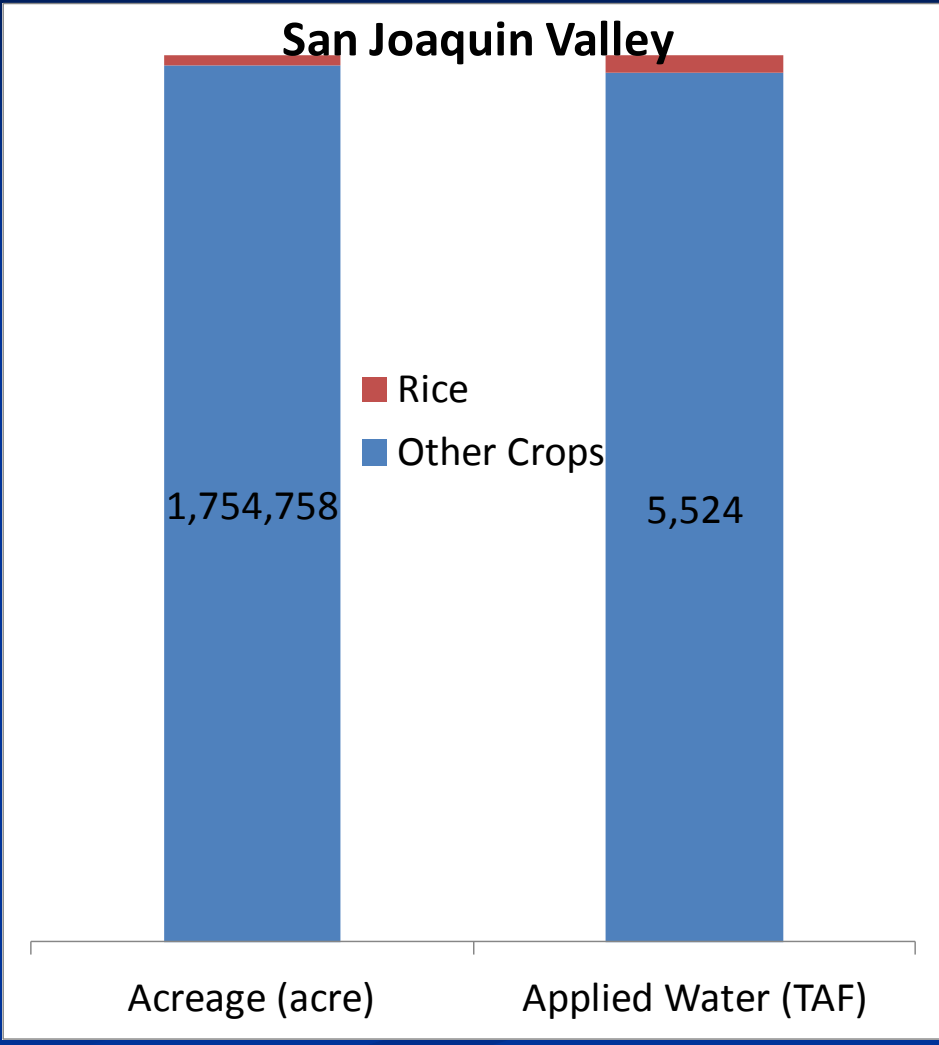


Regulatory Requirements – San Joaquin Basin

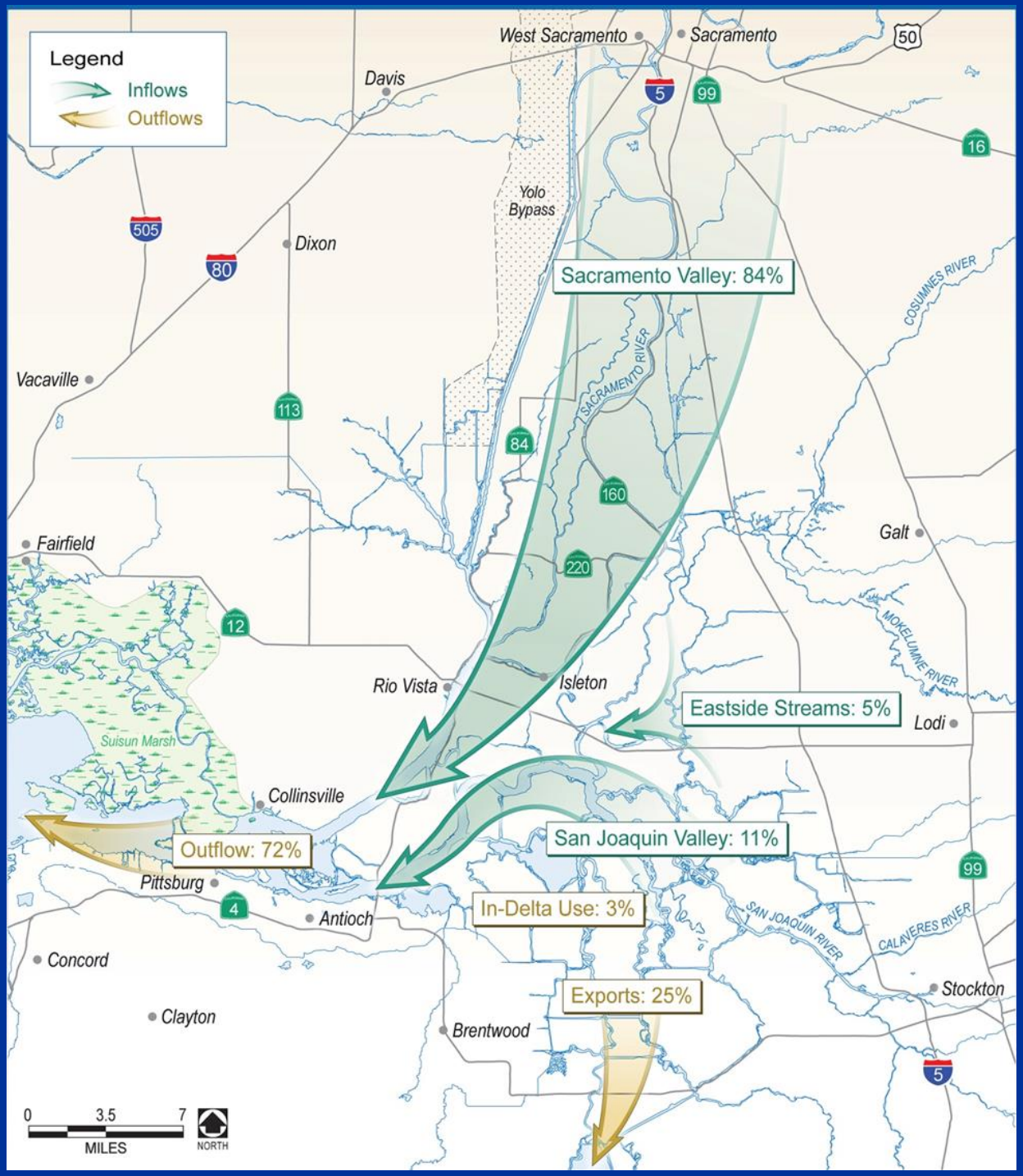


Ag. Water Demands

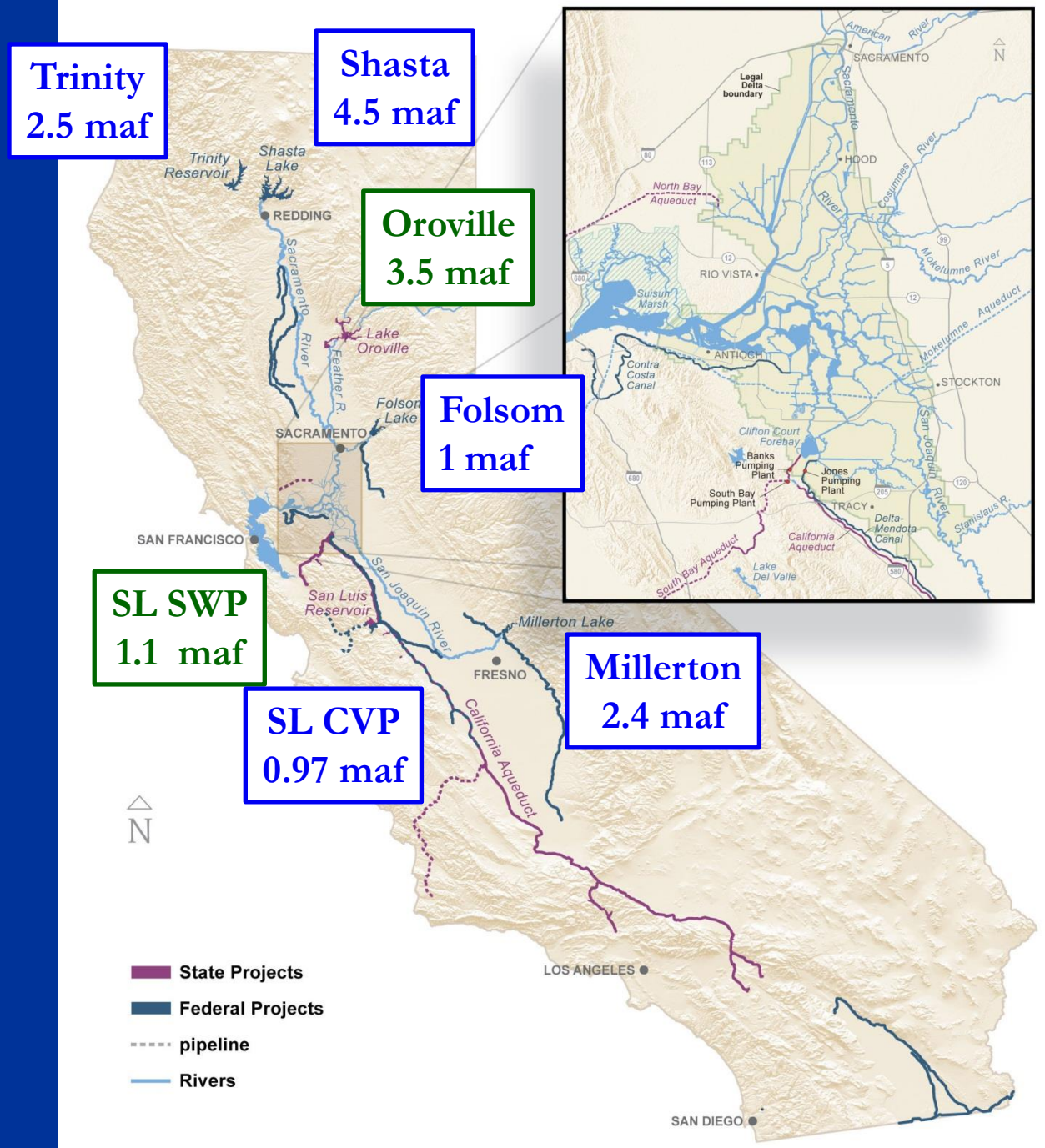




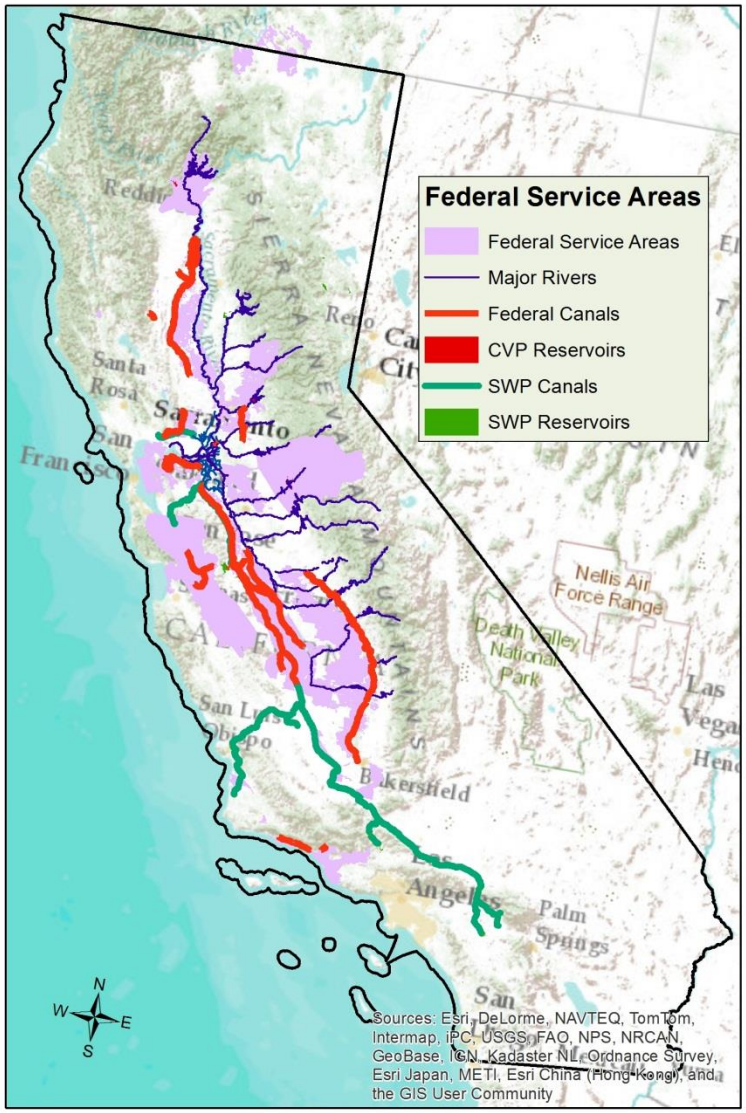
WY 2000 (AN) Delta Water Balance

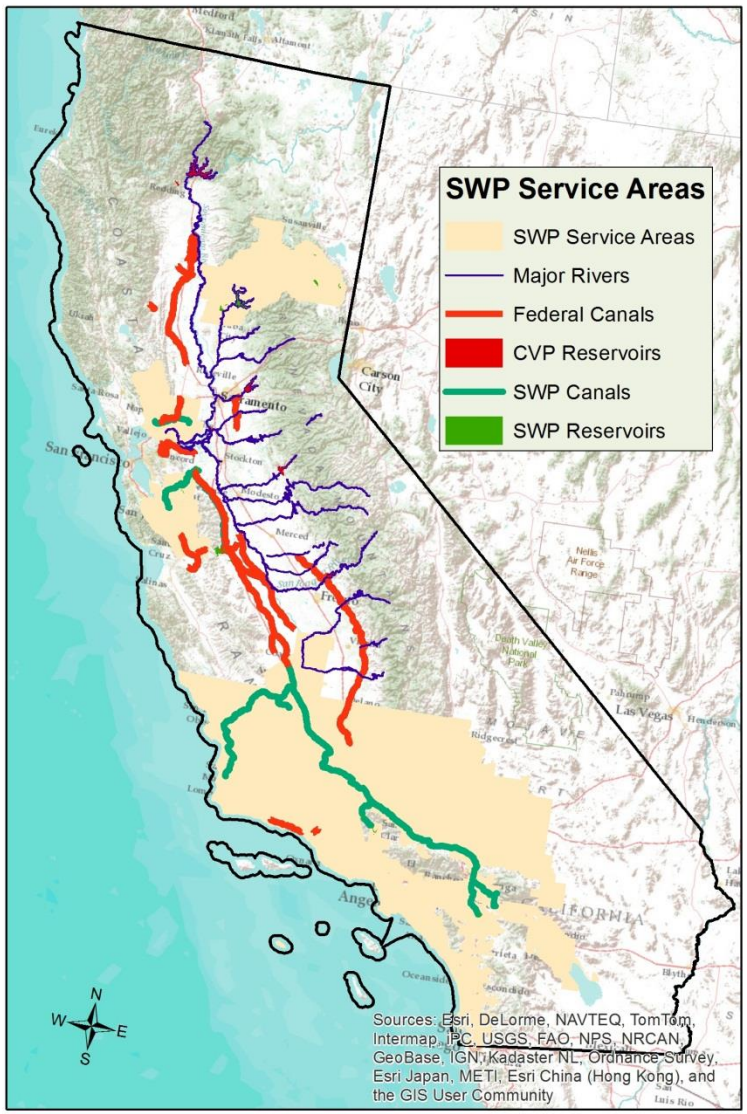


CVP -SWP Water Resources System



CVP and SWP service areas





SWP and CVP Water Demands (Contracts)

SWP Demands (TAF/yr)	Table A - Ag	Table A - M&I	Non-SWP/WR Demand	Total
NOD Demands	-	37	1081	1118
SOD Demands	1017	3113	32	4162

CVP Demands (TAF/yr)	Agriculture	Municipal & Industrial	Exchange or Settlement	Refuge	Total
NOD Demands	480	541	2195	207	3423
SOD Demands	1963	148	875	305	3290

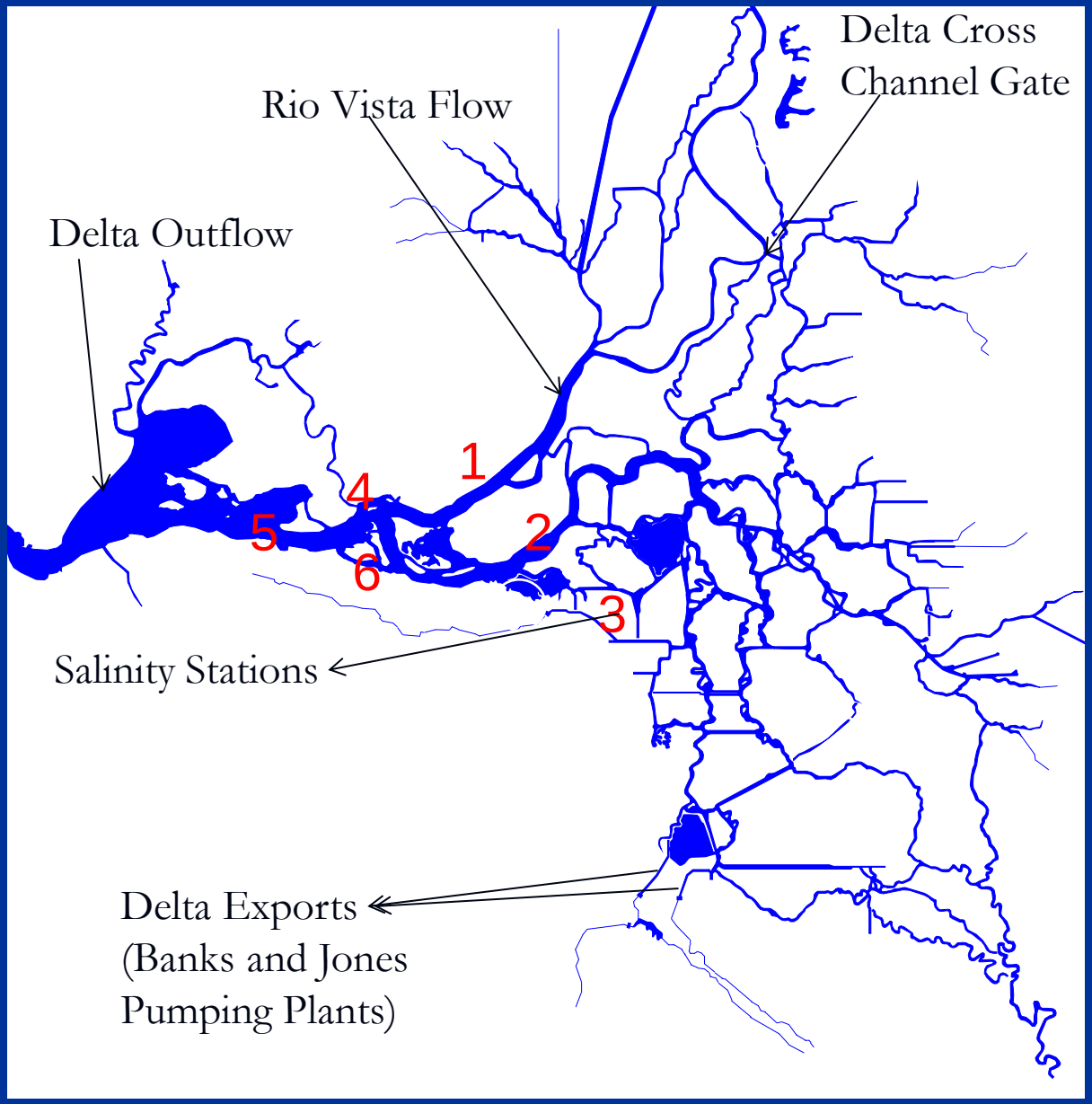
Delta Regulatory Requirements

Key Delta Regulation Points

Salinity Standards

1. Emmaton
2. Jersey Point
3. Contra Costa PP#1
4. Collinsville
5. Chipps Island*
6. Antioch*

**only used in D1485 studies*

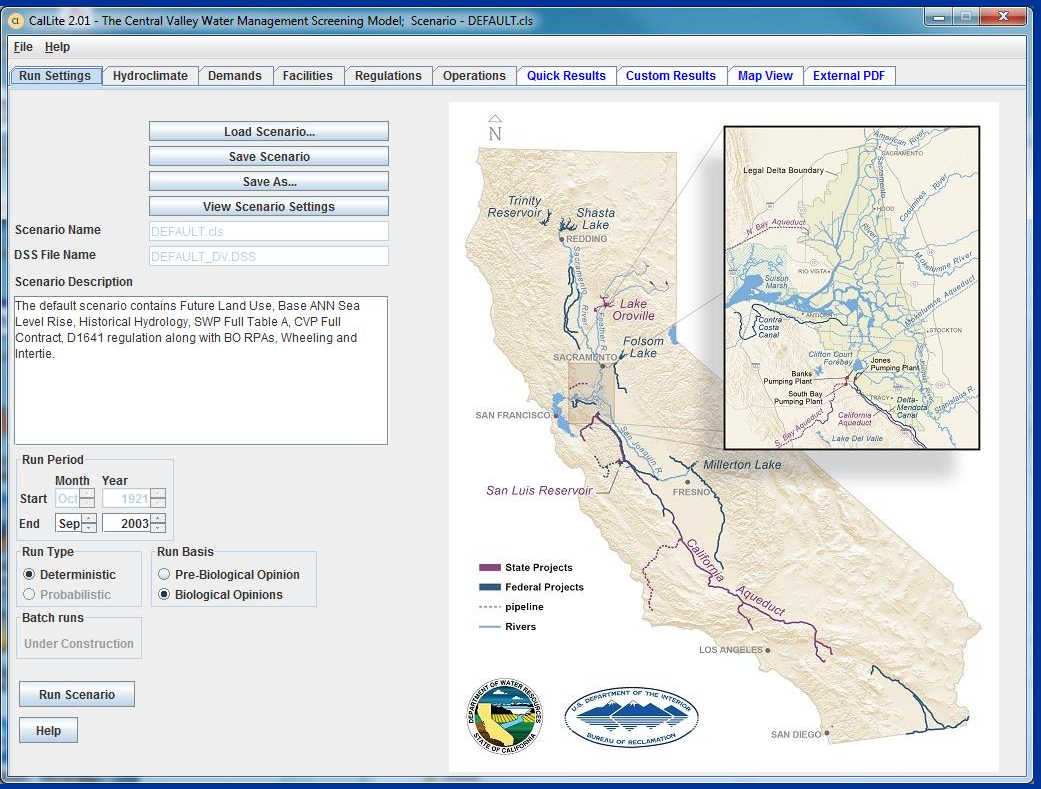


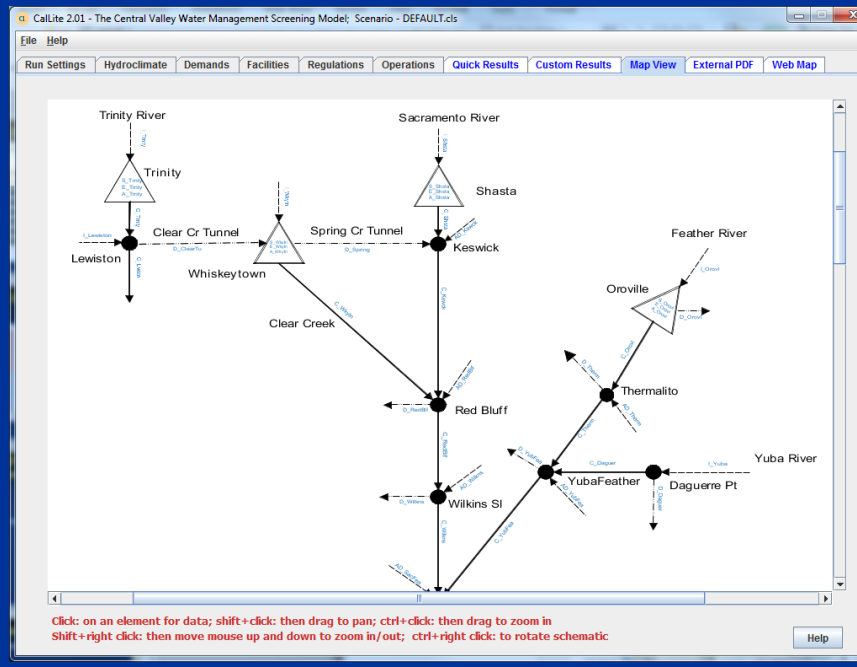
Delta Regulatory Requirements

Regulation Category	Decision 1485 (D1485)	Decision 1641 and CVPIA (b)(2) (D1641)	D 1641 with recent B0s RPAs
Chronology	August 1978	March 15, 2000	December, 2008
Rio Vista Min Flow	- Minimum flow at Rio Vista (flow varies by month)	- Minimum flow at Rio Vista (flow varies by month)	-D1641 standard
Delta Cross Channel	- # of gate days open or closed defined	- Revised Days open or closed defined	- D1641 standard - Additional gate closure
Salinity Standard	- Standard for 6 Stations (M&I, Ag, and Fish)	- Standard for 4 Stations (M&I, Ag, and Fish) - San Joaquin River Salinity	- D1641 standard
Export Constraints	- Pumping restriction May-June	- Export Inflow Ratio (35% from Feb – Jun and 65% from Jul-Jan)	- D1641 standard - Old and Middle river flow standard - Export cap based on Vernalis flow
Delta Outflow	- Minimum Delta outflow (standard varies by month)	- Revised Minimum Delta Outflow - X2 requirements (Spring)	- D1641 standard - Fall X2 requirements

Description of CalLite Model

- Central Valley Water Management Screening Model
- Simulation Period is 82 years (1922-2003)
- Flexible Graphical user interface



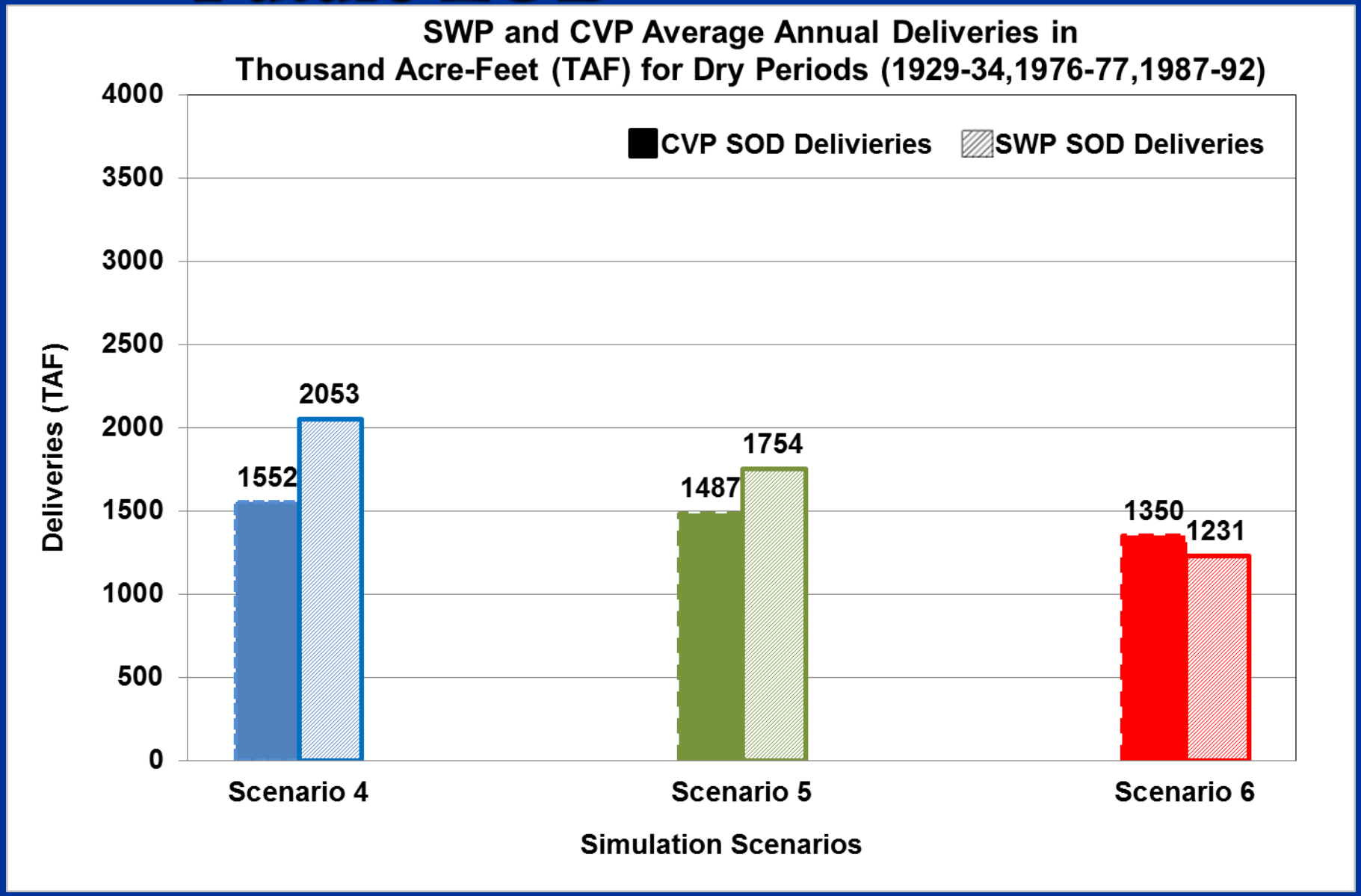


Model Studies Scenarios

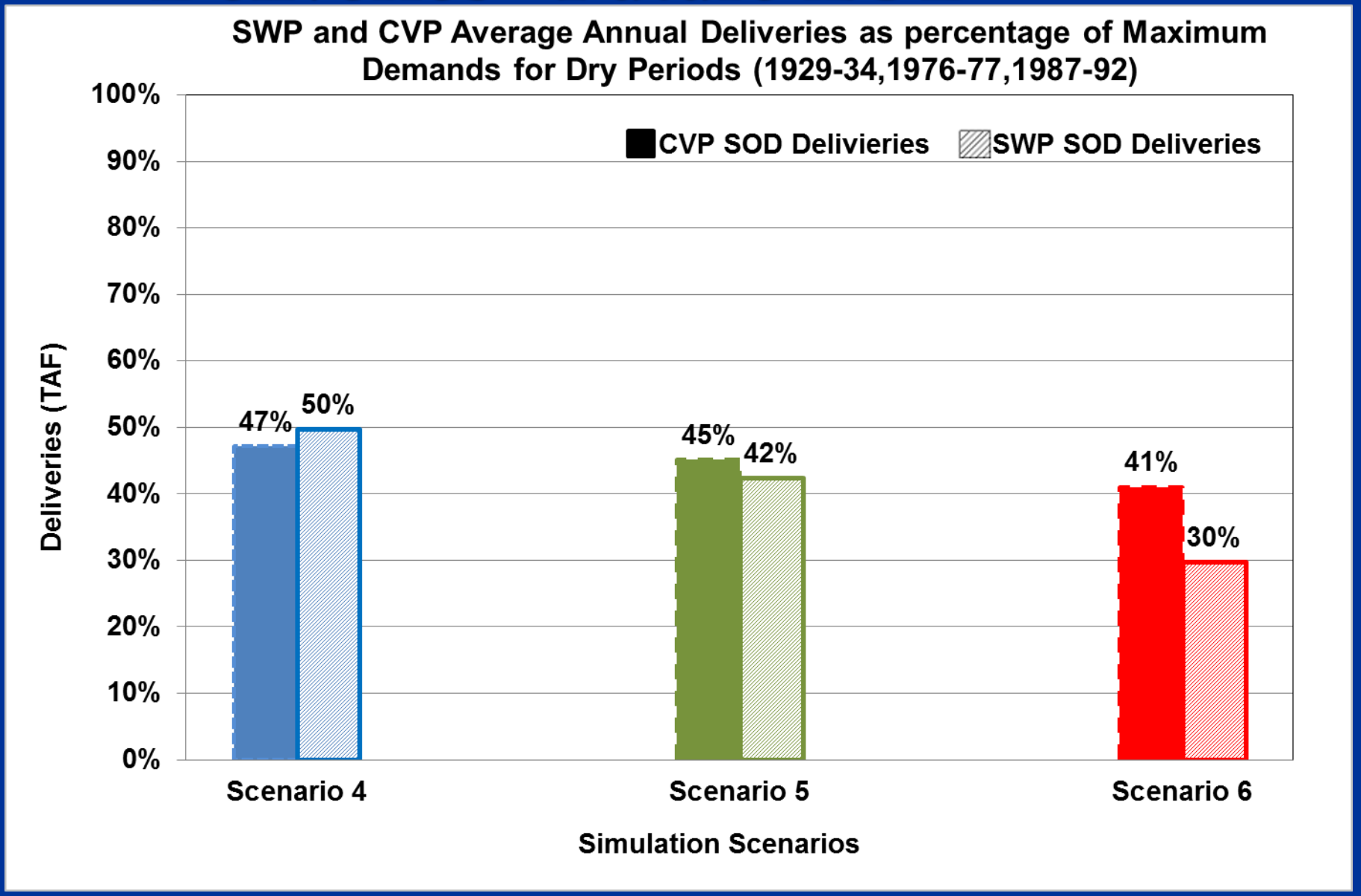
Scenario	D1485	D1641	BO RPAs	Hydrology (Level of Development)	Demand (Current or Full)
1	X	-	-	Existing	SWP – Current CVP- Full Contract
2	-	X	-	Existing	SWP – Current CVP- Full Contract
3	-	X	X	Existing	SWP – Current CVP- Full Contract
4	X	-	-	Future	SWP – Full Table A CVP- Full Contract
5	-	X	-	Future	SWP – Full Table A CVP- Full Contract
6	-	X	X	Future	SWP – Full Table A CVP- Full Contract

SWP and CVP Dry Period Deliveries – Future LOD

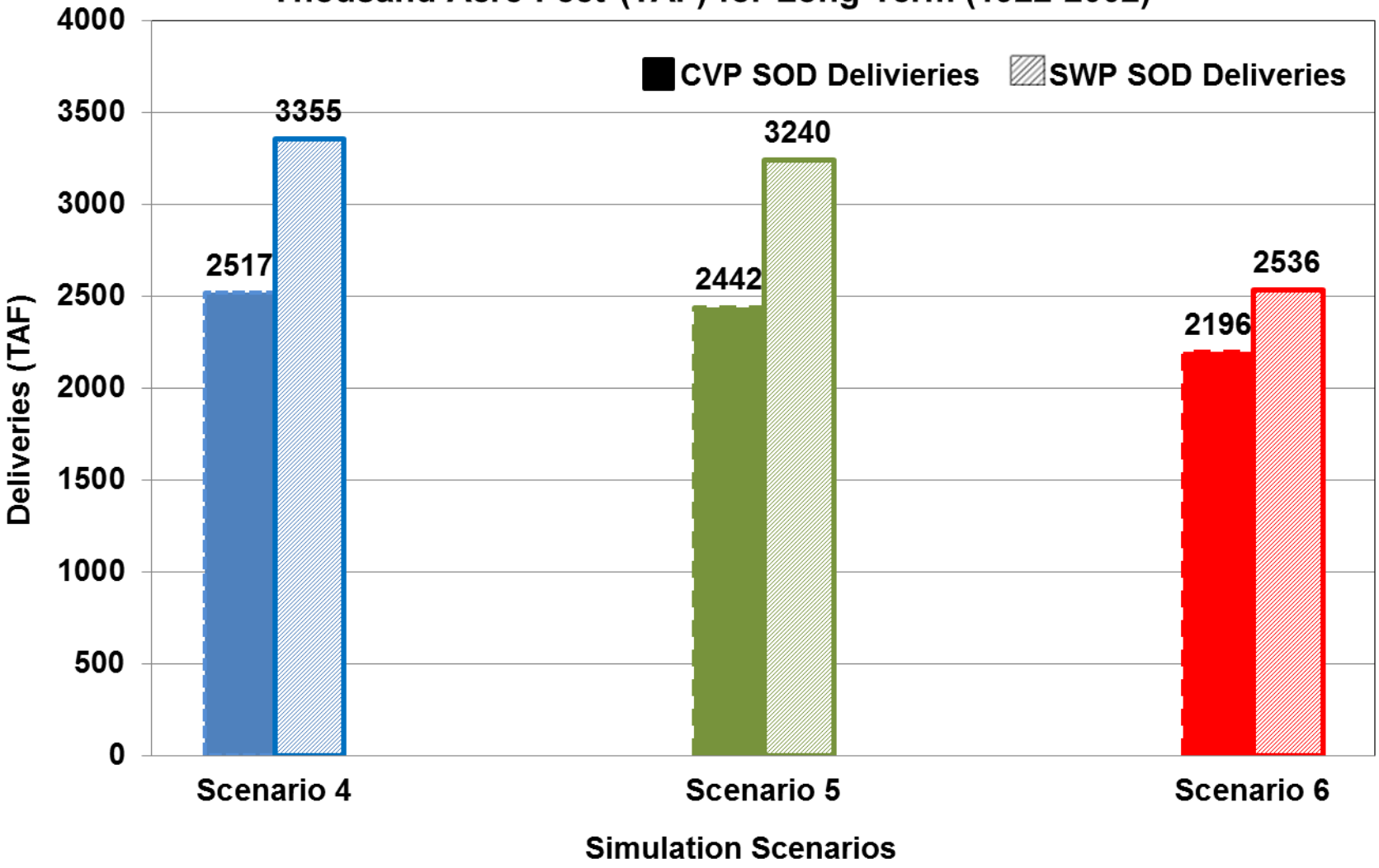
Dry Periods: (1929-34,76-77,87-92)



SWP and CVP Dry Period Percent Deliveries– Future LOD (1929-34,76-77,87-92)



SWP and CVP Long Term Deliveries – Future LOD



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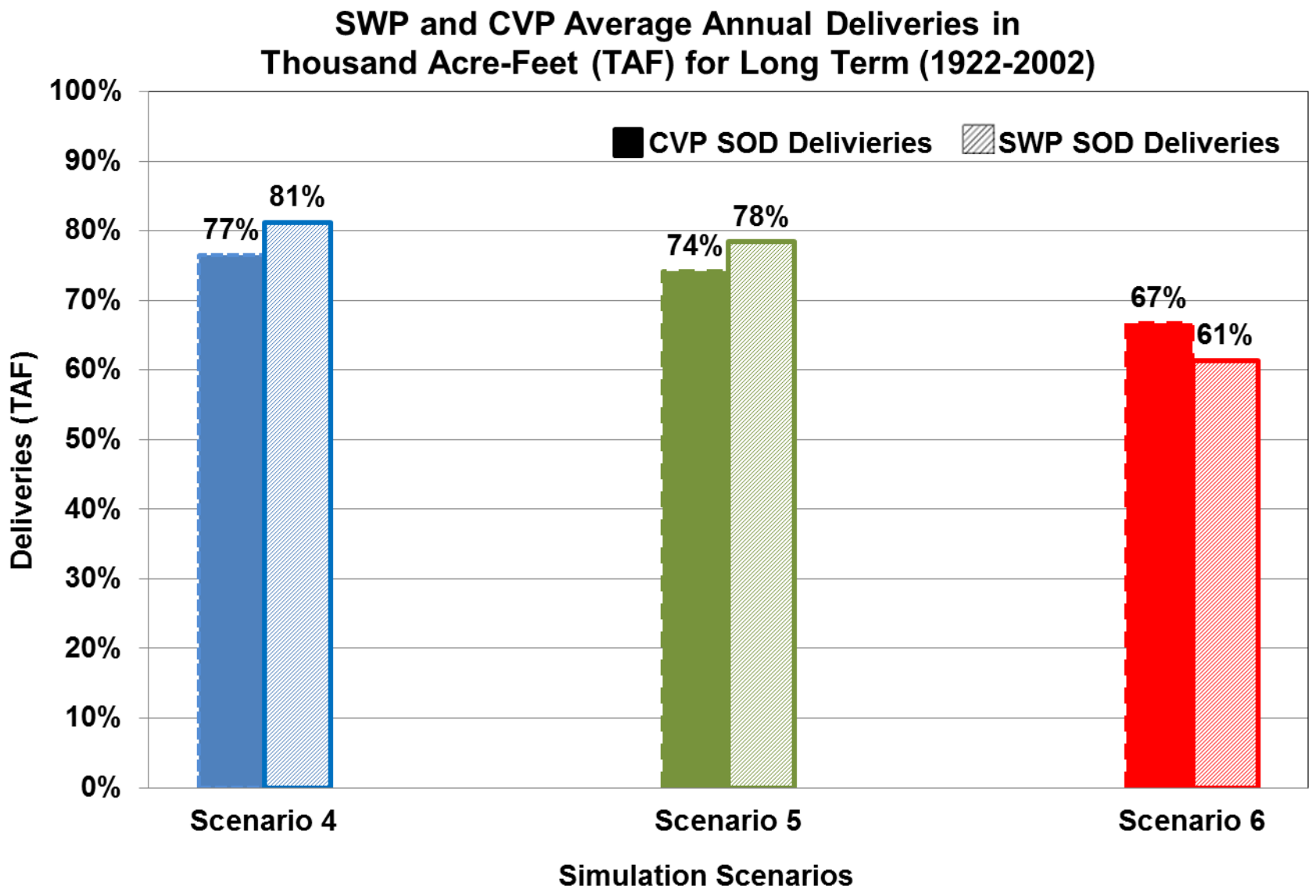
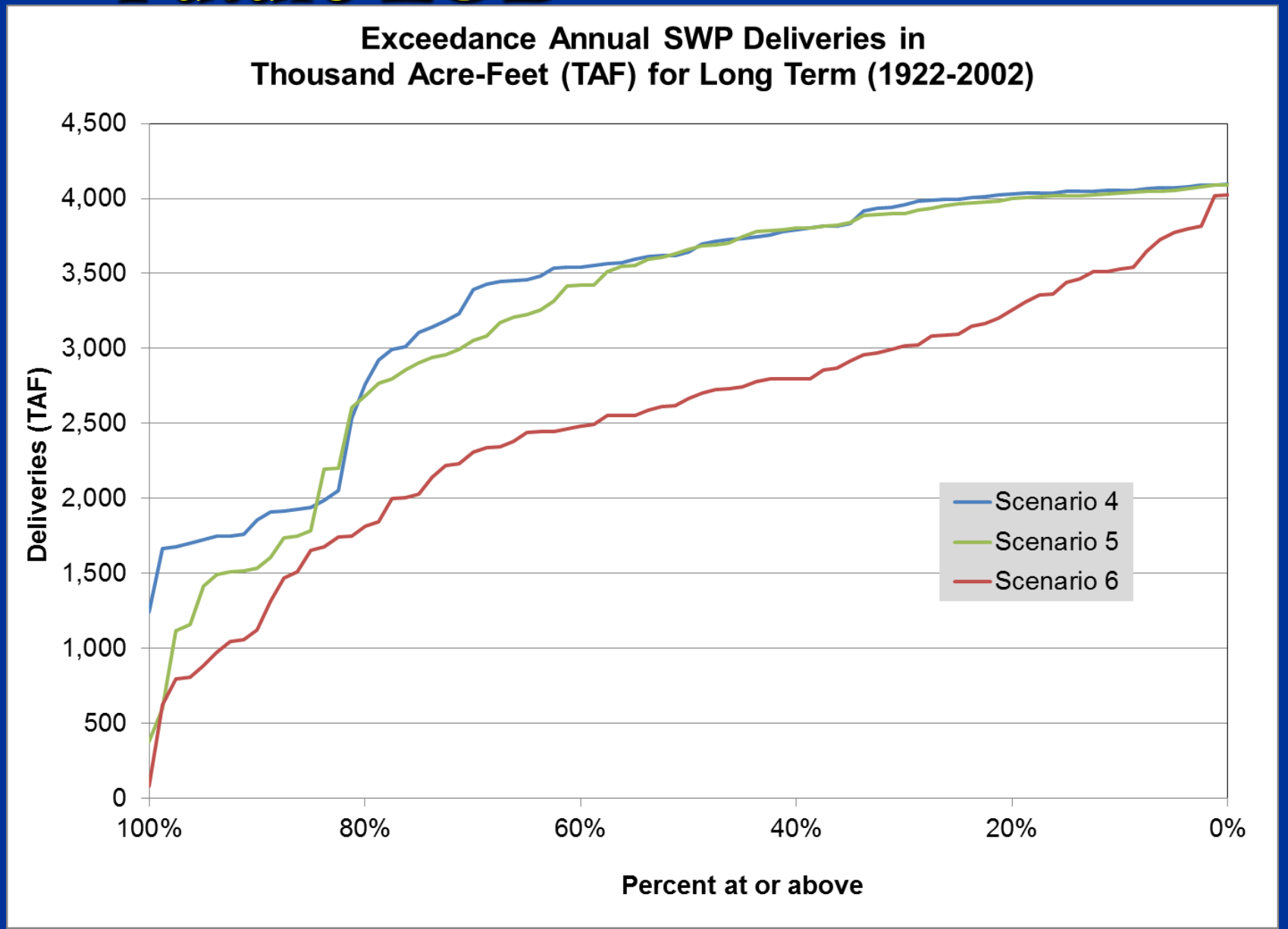
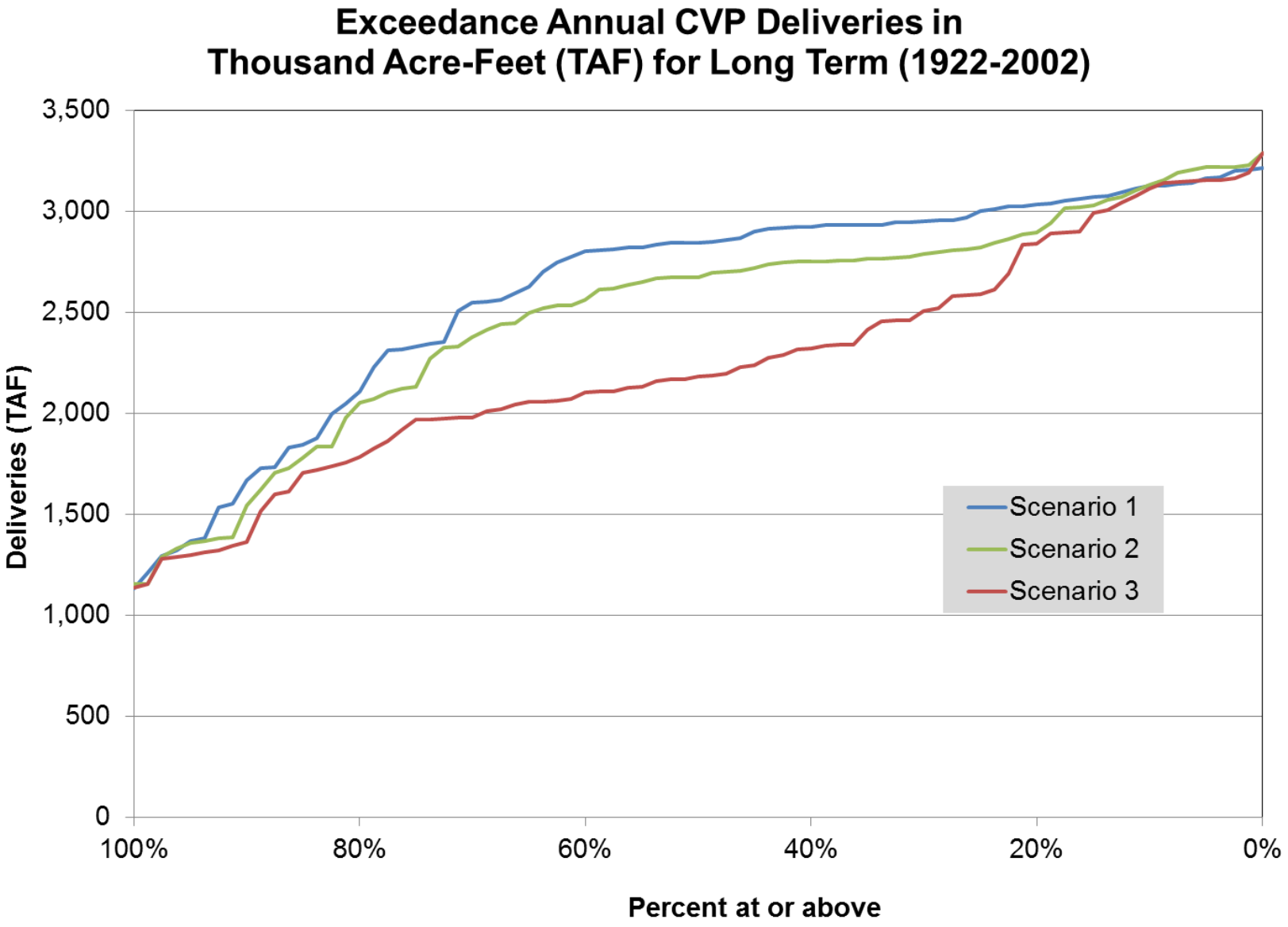


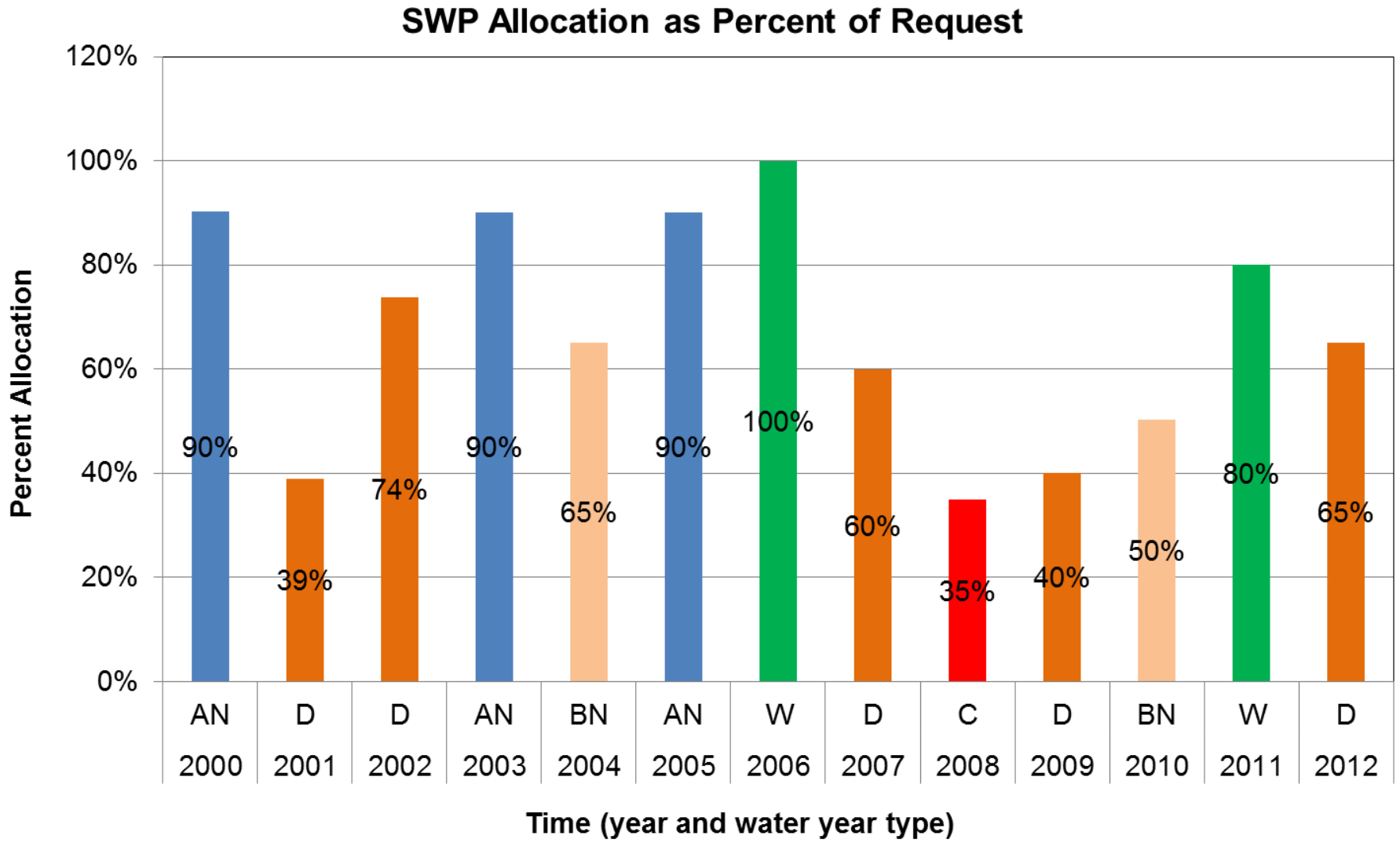
SWP Long Term Deliveries – Future LOD



CVP Long Term Deliveries – Future LOD



Historical SWP Annual Allocations Percent of Request for 2000-2012



Thank you!!

SWP and CVP Dry Period Deliveries – Current LOD

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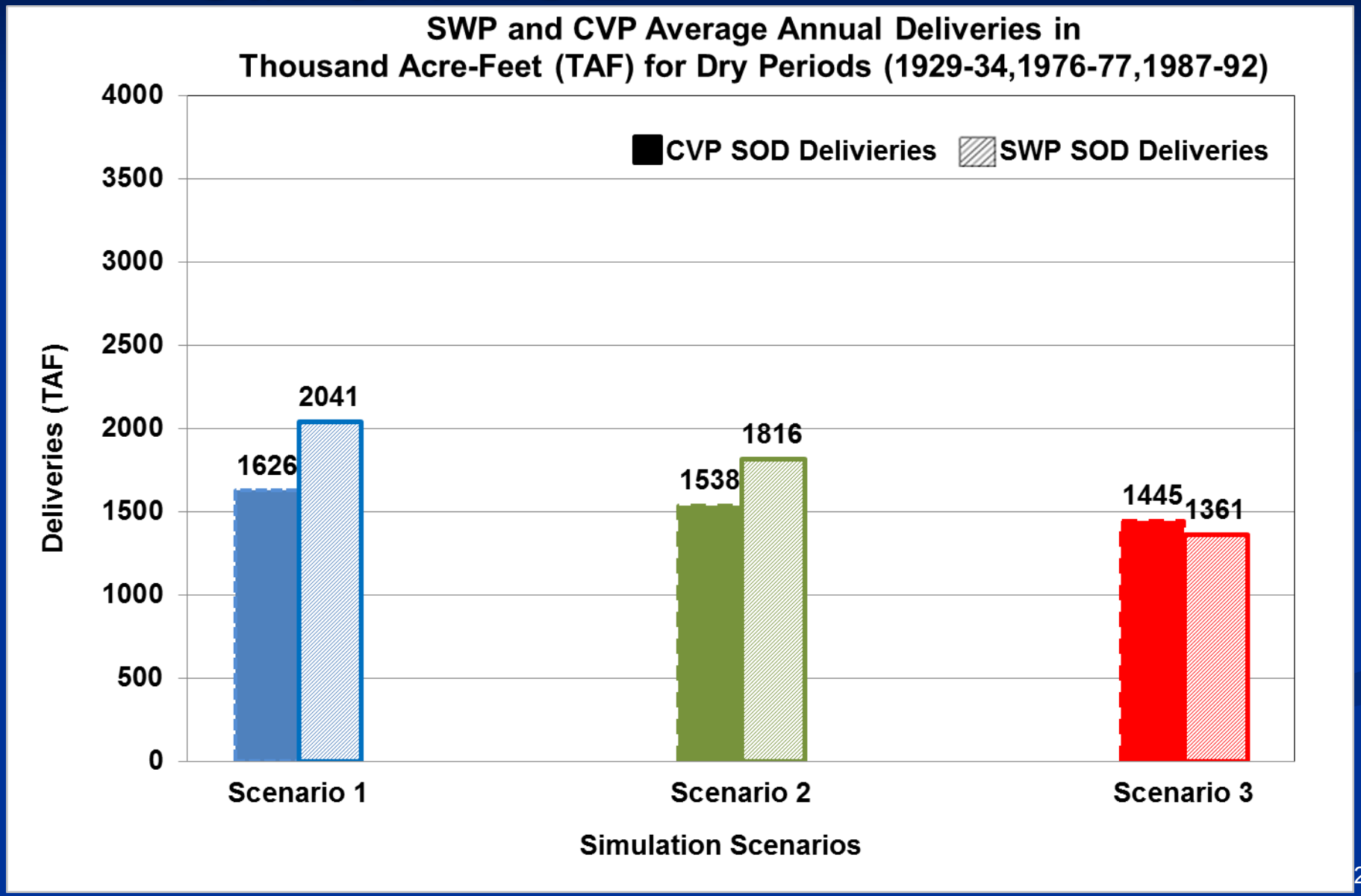
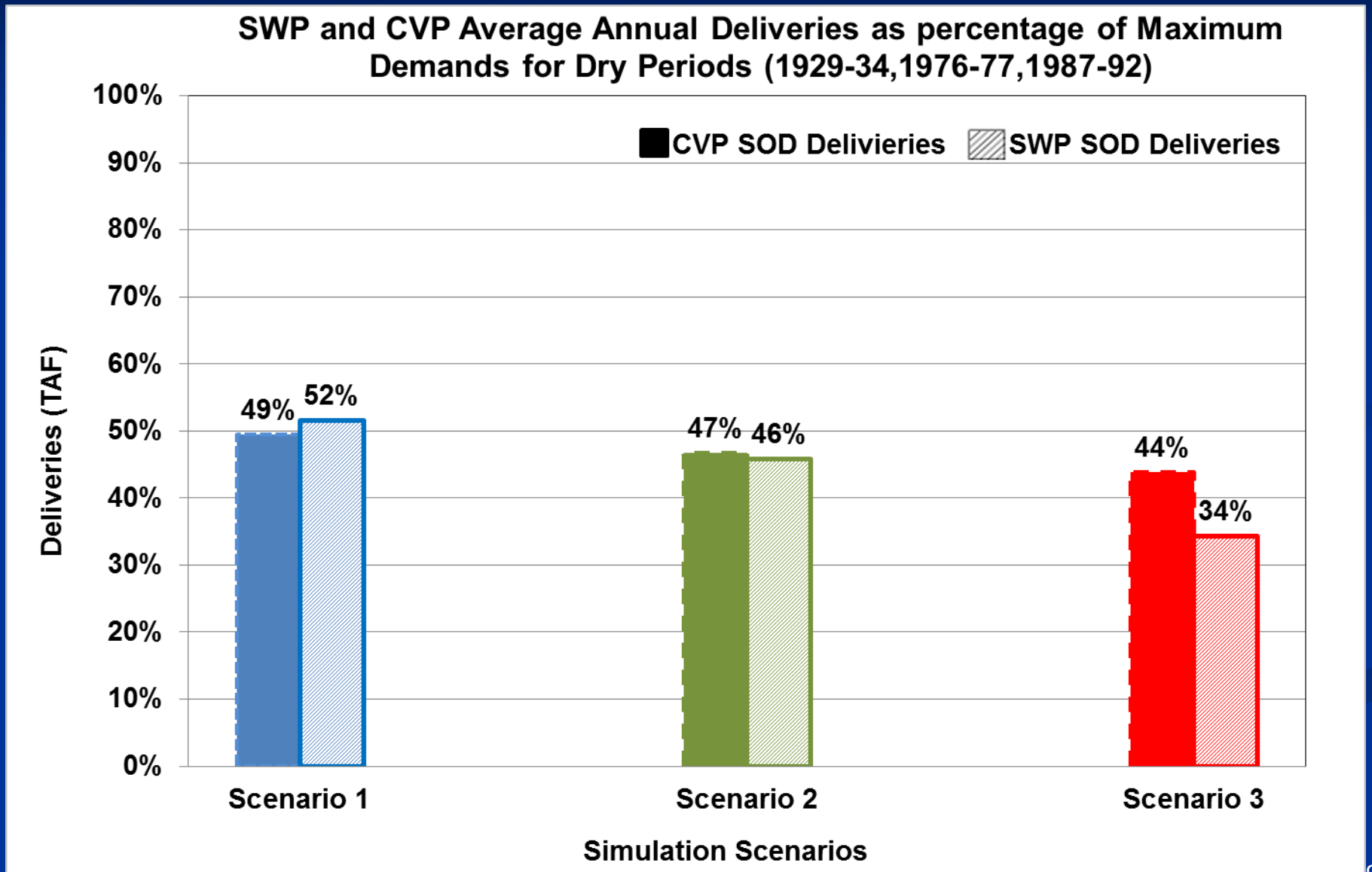


SWP and CVP Dry Period Percent Deliveries– Current LOD (1929-34,76-77,87-92)



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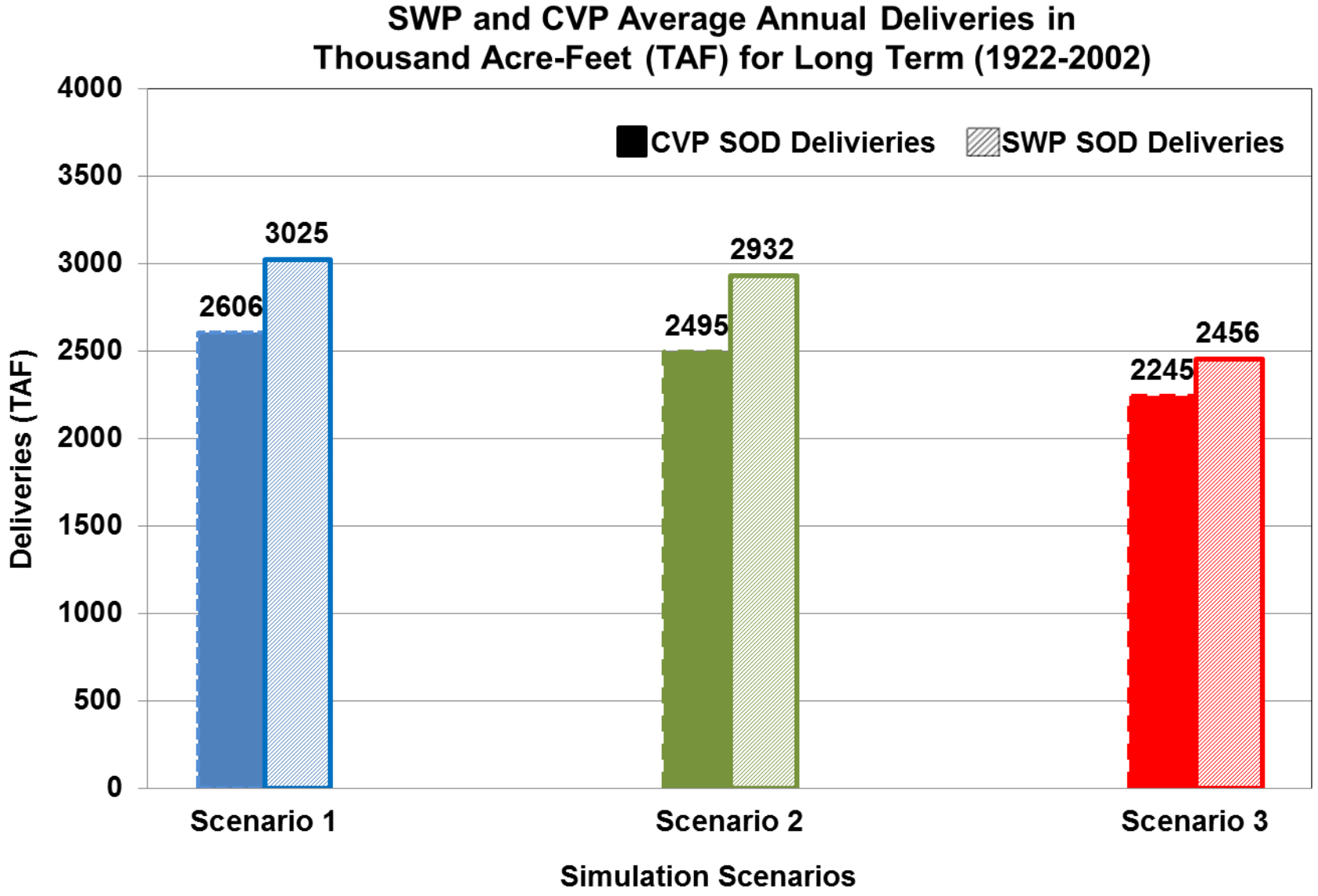

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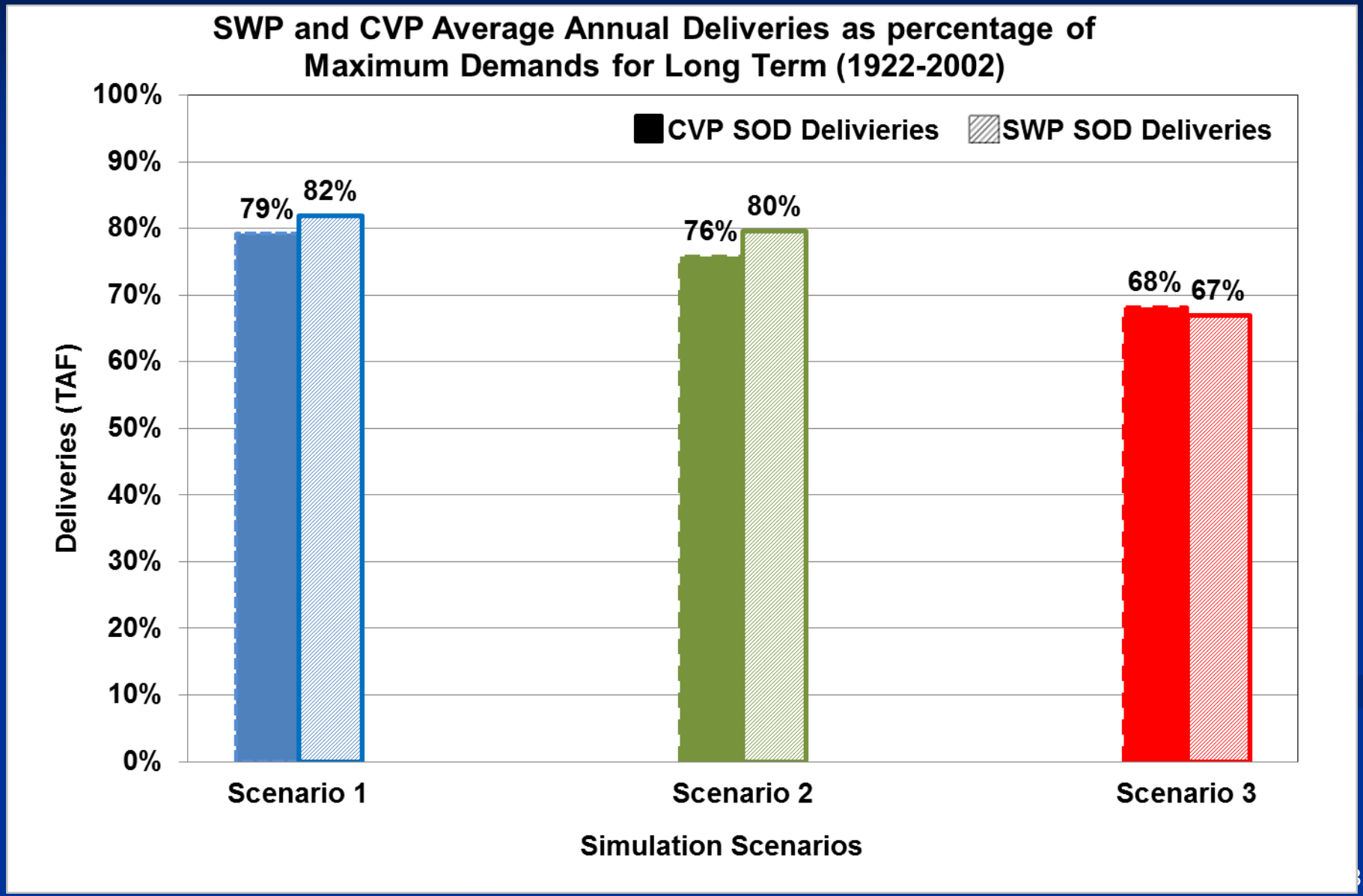

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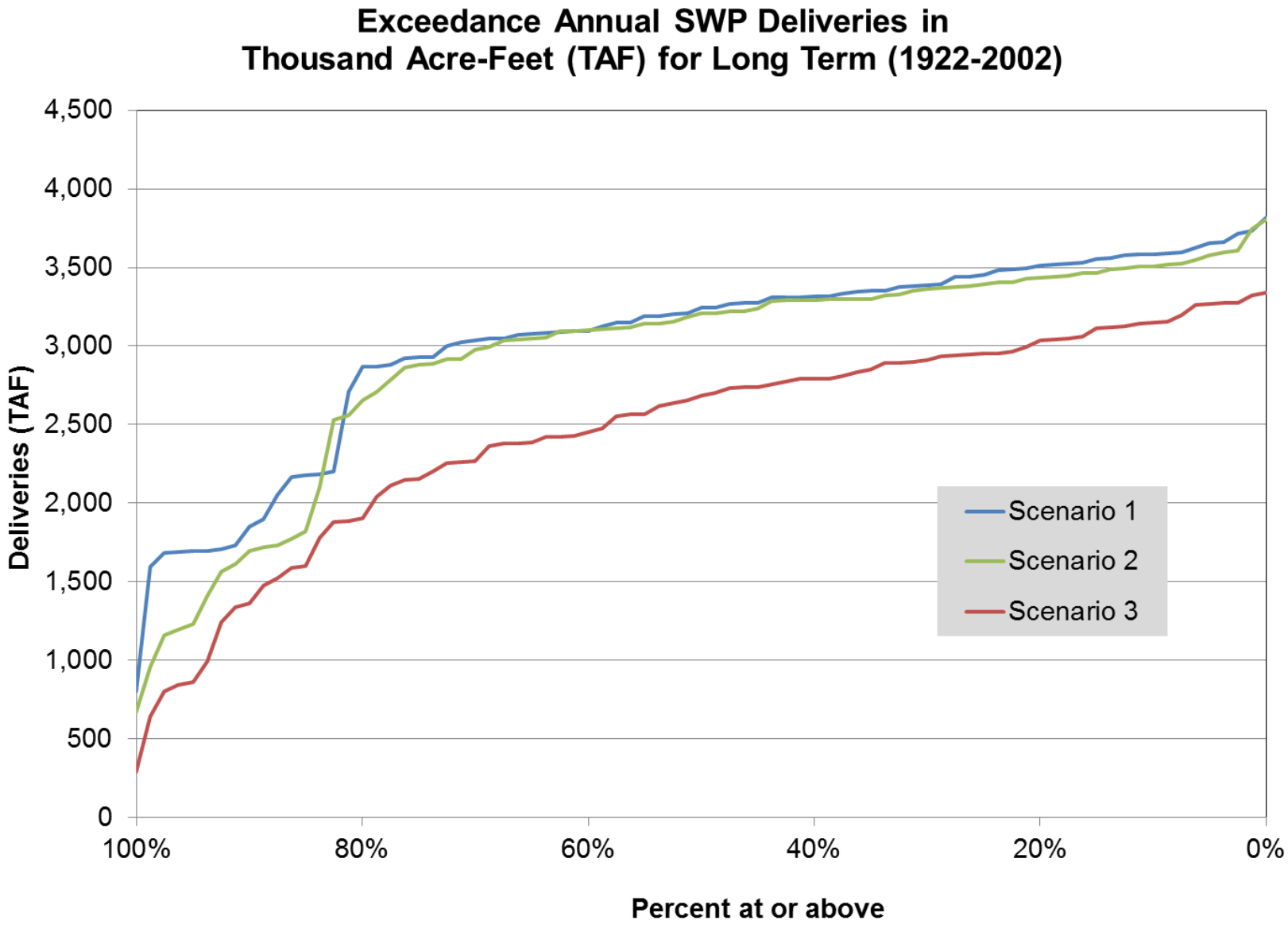

CVP Long Term Deliveries – Current LOD