

Water Systems and Institutions in California



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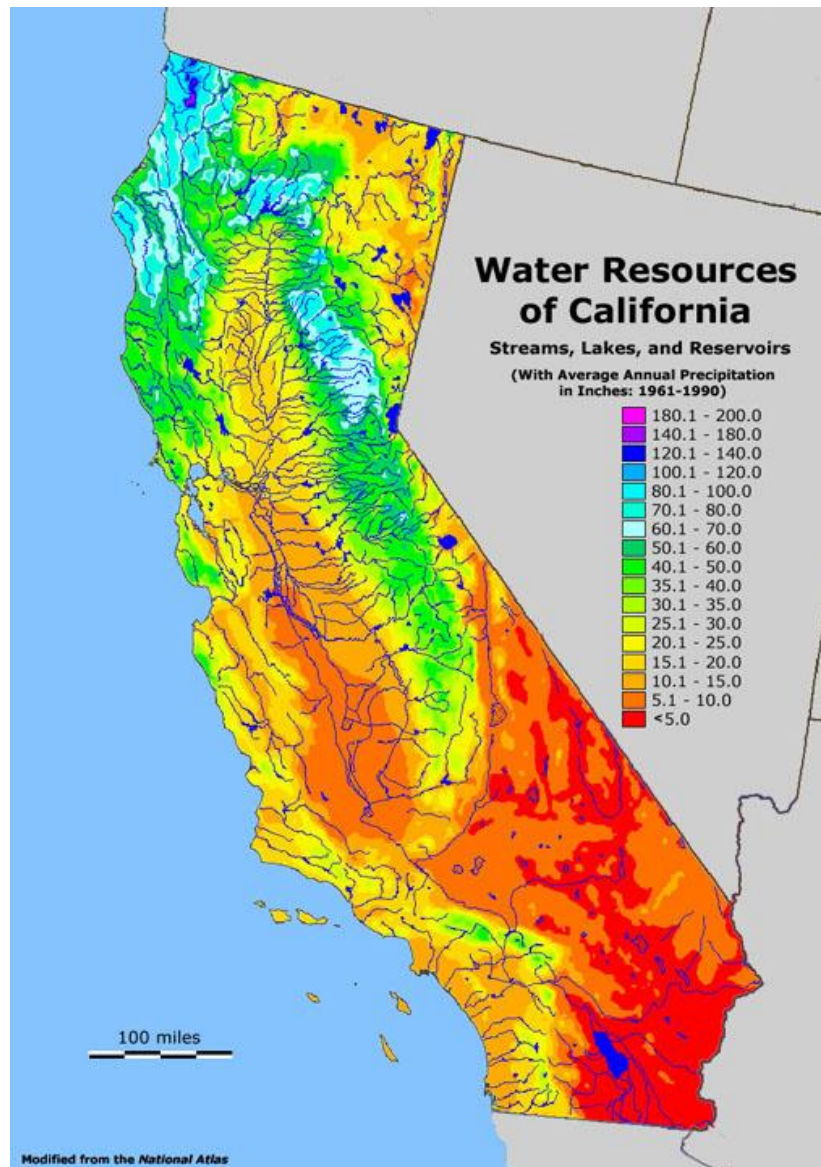
Outline

- California Climate and Hydrology
- California Water Supply
- California Water Use
- California Water Challenges



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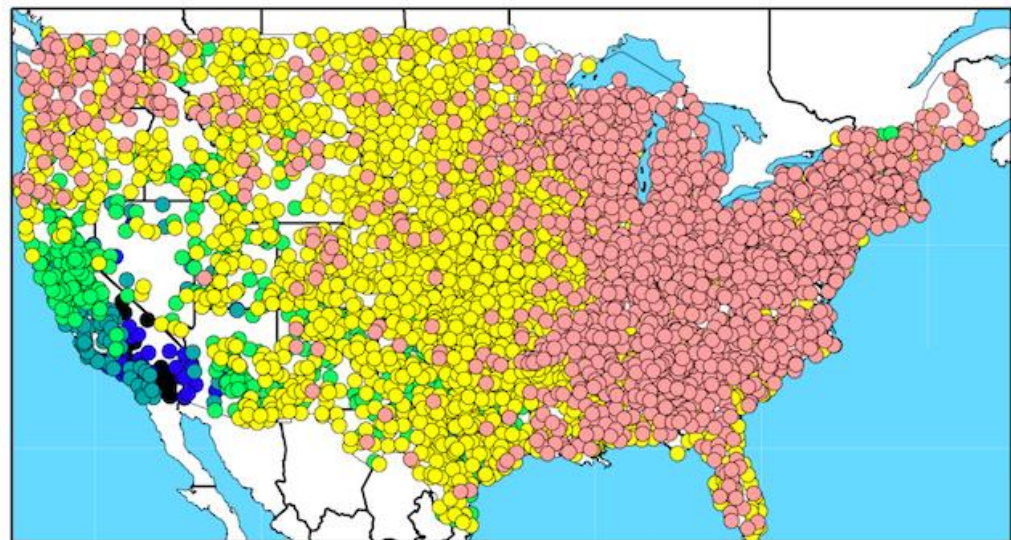
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Variation in Annual Precipitation

COEFFICIENTS OF VARIATION OF
TOTAL PRECIPITATION, WY 1951-2008



fraction



Source: Dettinger et al (2011)

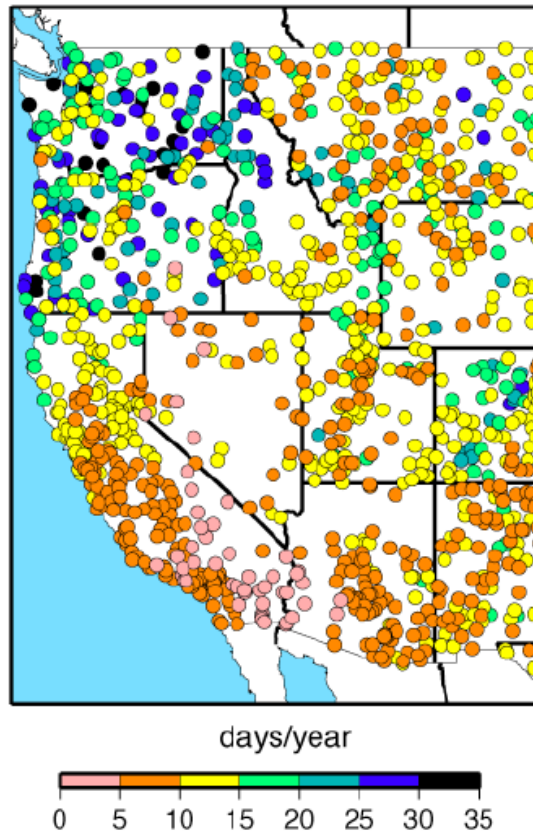


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The Importance of Large Storm Events

c) AVERAGE NUMBER OF DAYS/YR TO OBTAIN HALF OF TOTAL PRECIPITATION, WY 1951-2008



Dettinger et al, Water, 2011

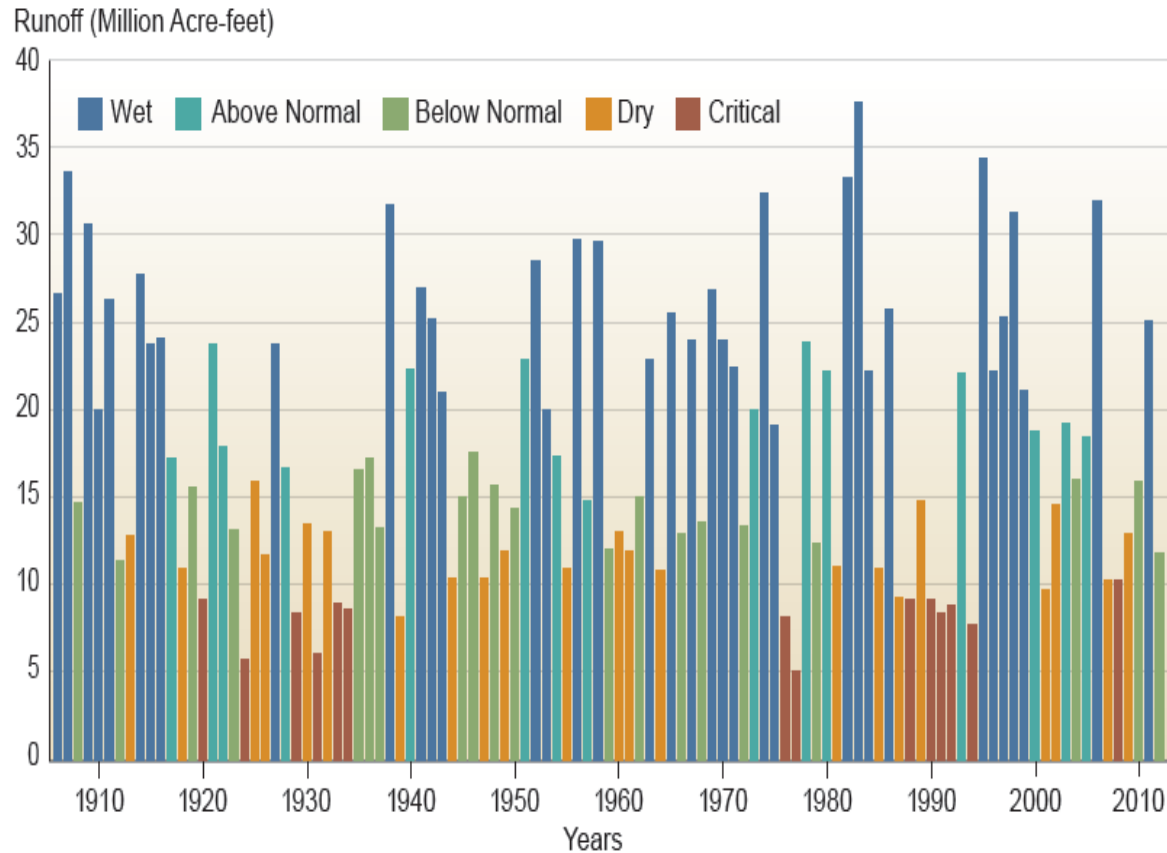


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Figure 3-7 Sacramento Four Rivers Unimpaired Runoff, 1906-2012



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

California Water Plan Update 2013

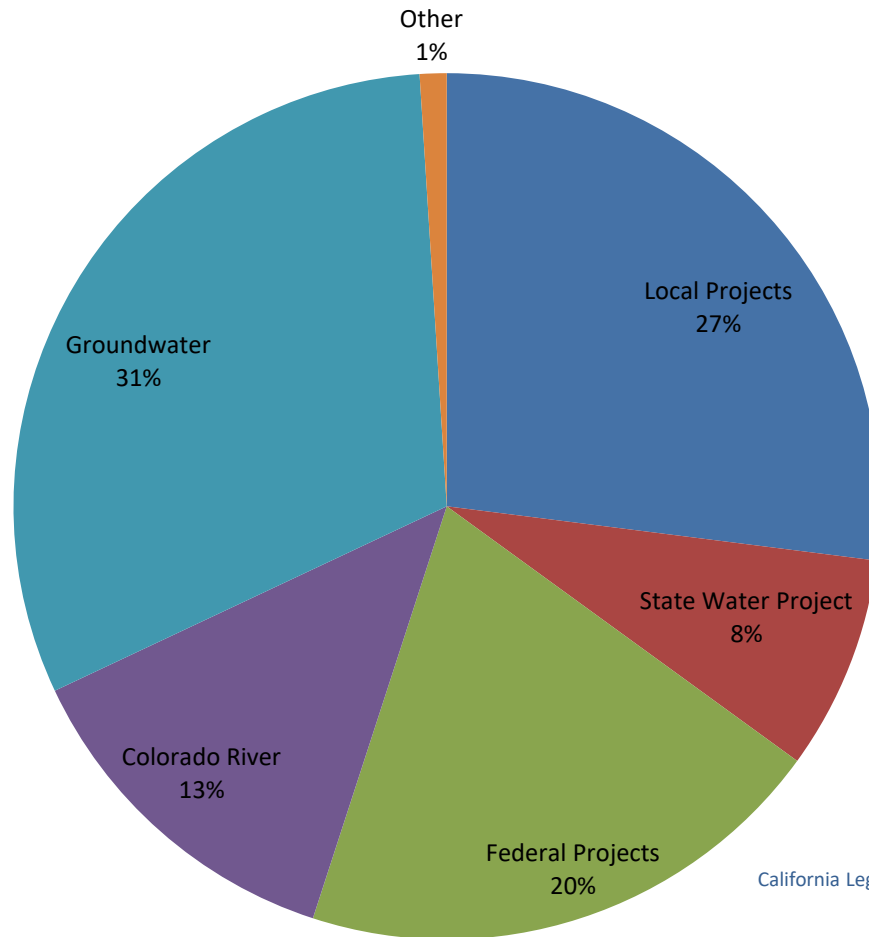


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California's Water Sources



California Legislative Analyst's Office, September 8, 1999



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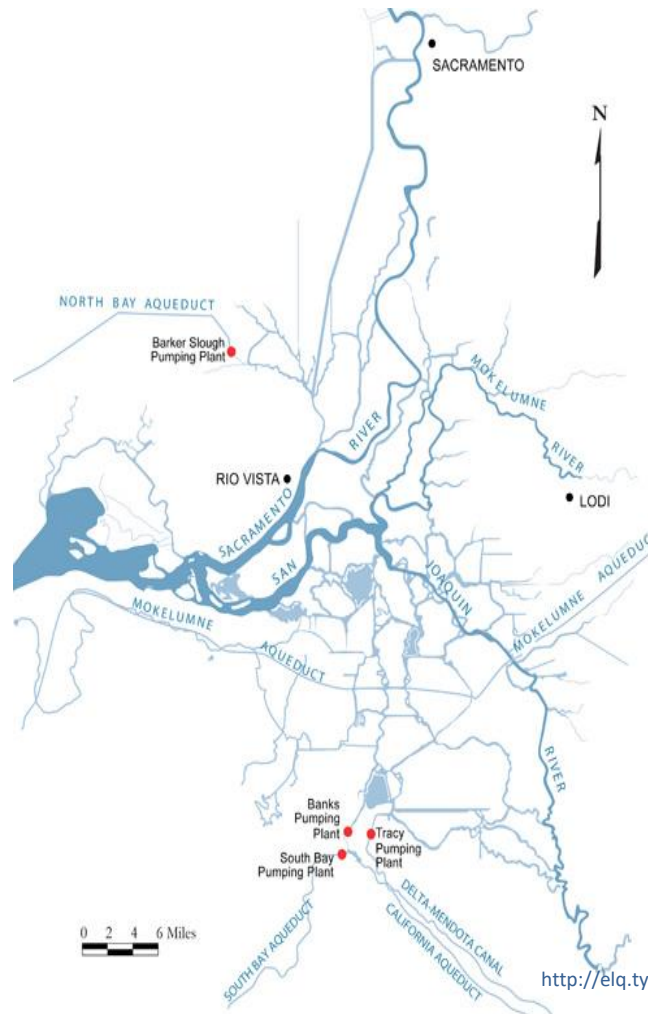


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Sacramento-San Joaquin Delta



<http://elq.typepad.com/currents/2010/03/currents37-03-frank-2010-0319.html>



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2015 Drought

SWP Allocations

- December 1 10%
- January 15 15%
- March 2 20%

CVP Allocations

Year		
2015	Contractors	Feb 27, 2015
	North of Delta	
	Agricultural Contractors (Ag)	0%
	Urban Contractors (M&I)	25%*
	Wildlife Refuges (Level 2)	75%**
	Settlement Contractors/Water Rights	75%**
	American River M&I Contractors	25%*
	In Delta - Contra Costa	25%*
	South of Delta	
	Agricultural Contractors (Ag)	0%
	Urban Contractors (M&I)	25%*
	Wildlife Refuges (Level 2)	75%**
	Settlement Contractors/Water Rights	75%**
	Eastside Division Contractors	0%
	Friant - Class 1	0%
	Friant - Class 2	0%



2019 Wet (Snowpack 161% of Normal)

Allocations

- SWP
 - March 20 70%
(Last 100% Year, 2006)
- CVP
 - North 100%
 - South 55%



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Colorado River Basin- MAP- CRBC- Chris Harris.jpg

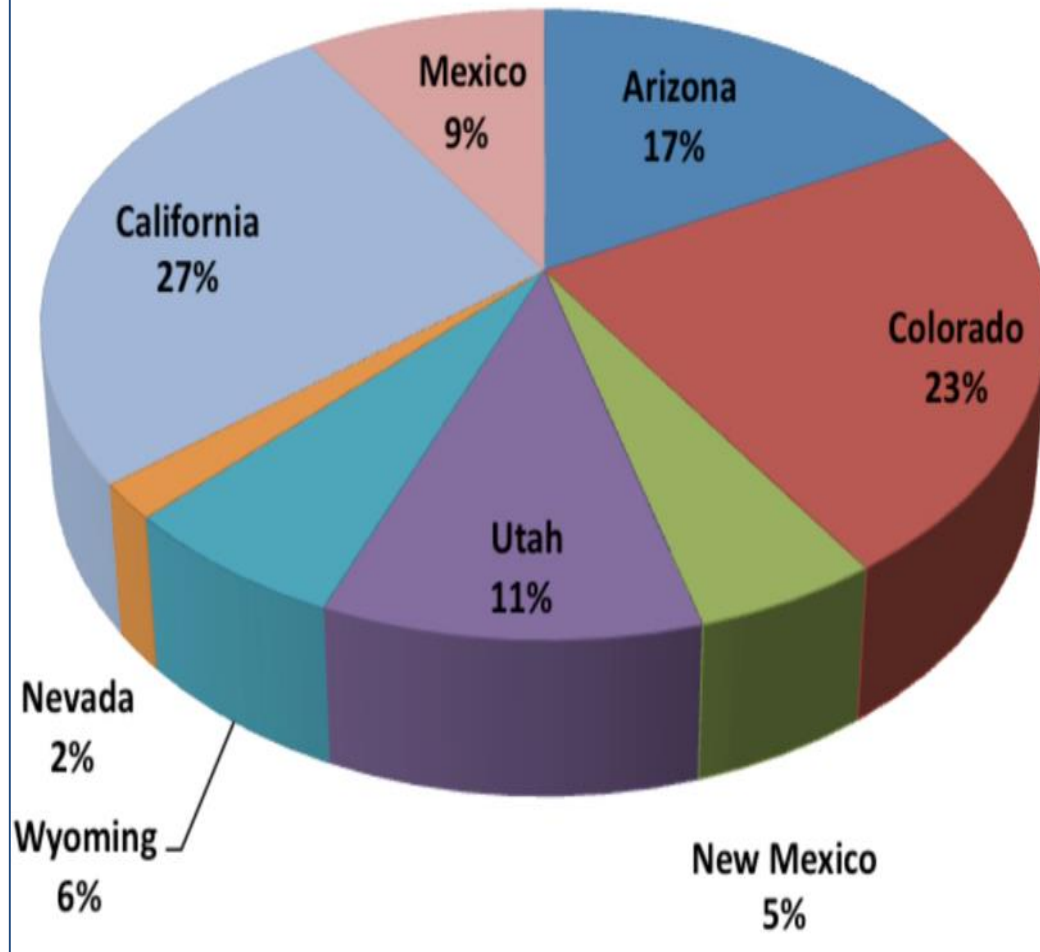


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Colorado River Apportionment



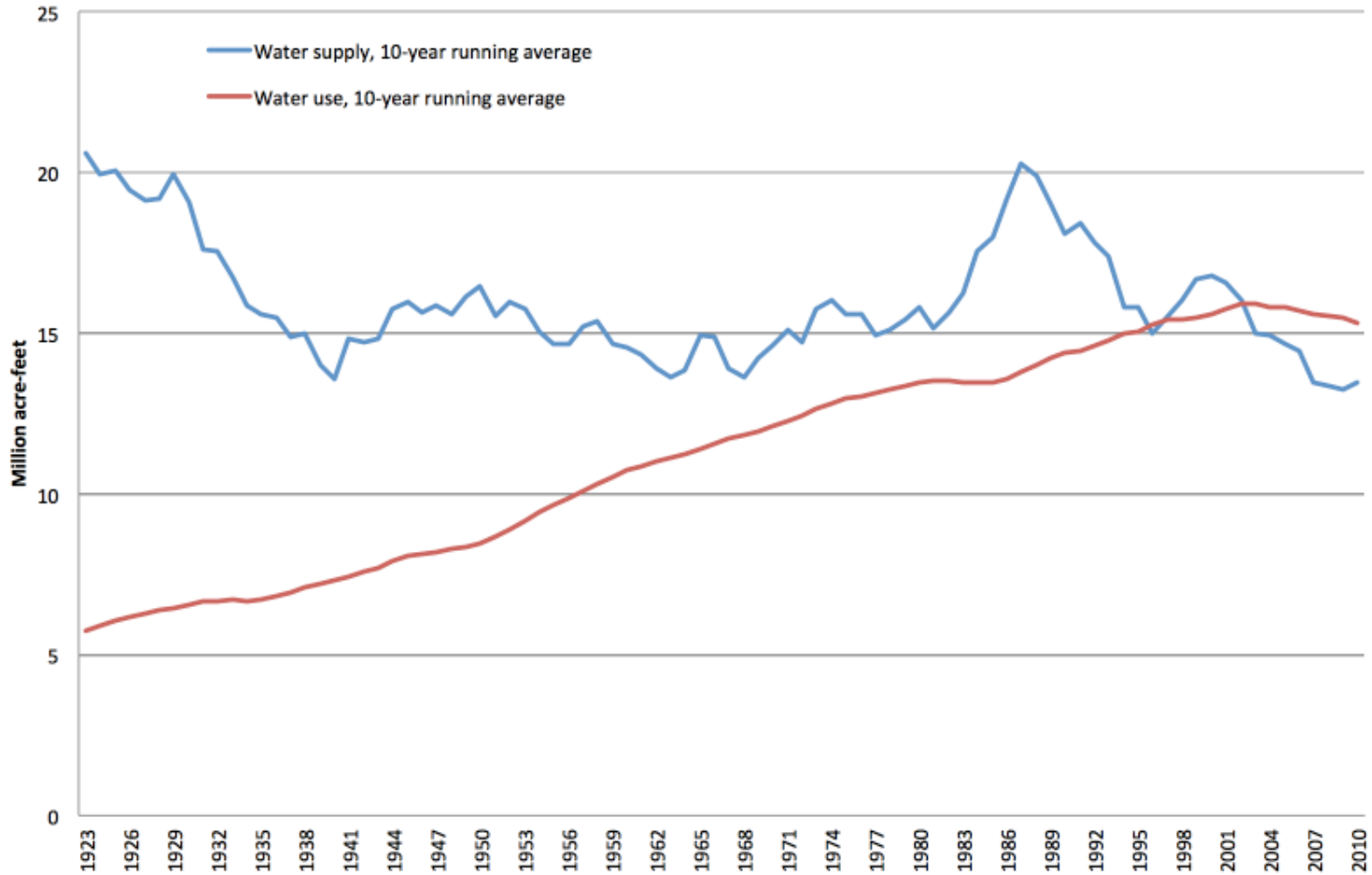
US Department of the Interior Reclamation Bureau, 1971 - 2005



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Water supply and water use in the Colorado River Basin



<http://palm.mydesert.com/2014Projects/2014ClimateChange/WaterSupplyUse800.png>



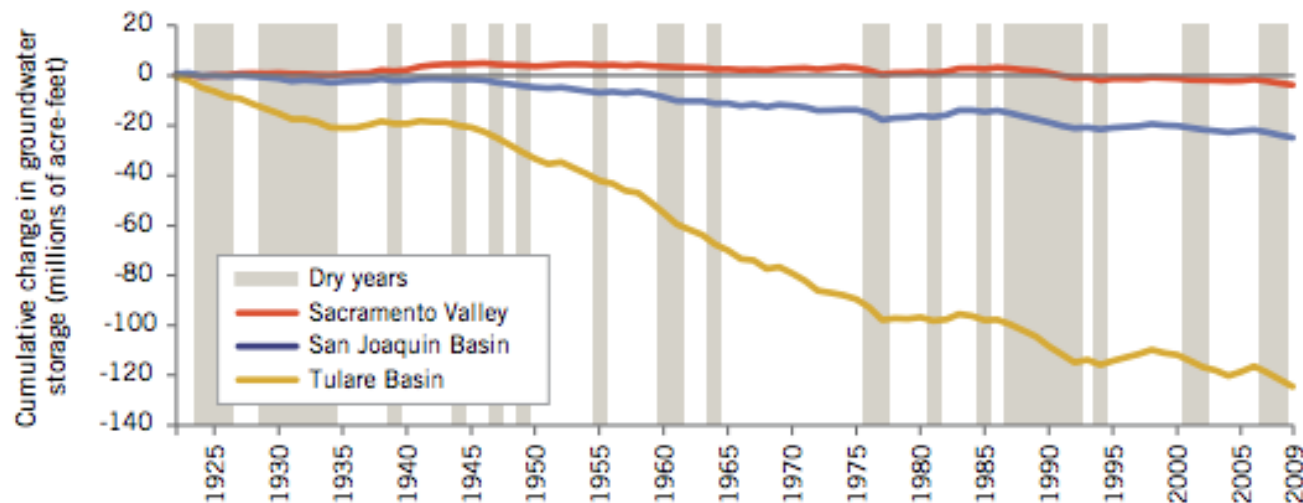
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Groundwater Levels

UNSUSTAINABLE GROUNDWATER PUMPING IS DEPLETING RESERVES IN THE CENTRAL VALLEY



SOURCE: The Nature Conservancy, using California Department of Water Resources data and models.

NOTES: Dry years are those classified as critical or dry in the Sacramento Valley based on the California Cooperative Snow Survey.

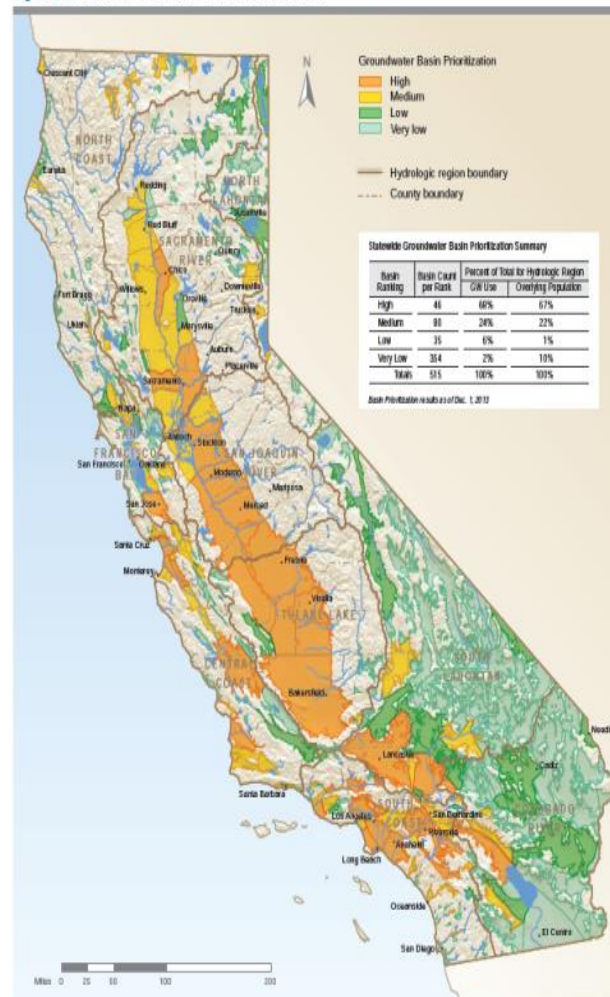


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Groundwater Basin Prioritization

Figure 3.31 CASGEM Final Basin Prioritization Results



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CA Water Facts

- 53 km³ Surface Storage
- 185+ km³ Groundwater Storage
- 19 km³ Snowpack
 - Decreasing to 12-14 km³ with Climate Change



California Water Usage

247 km³ Precipitation

20 km³ Groundwater Withdrawals

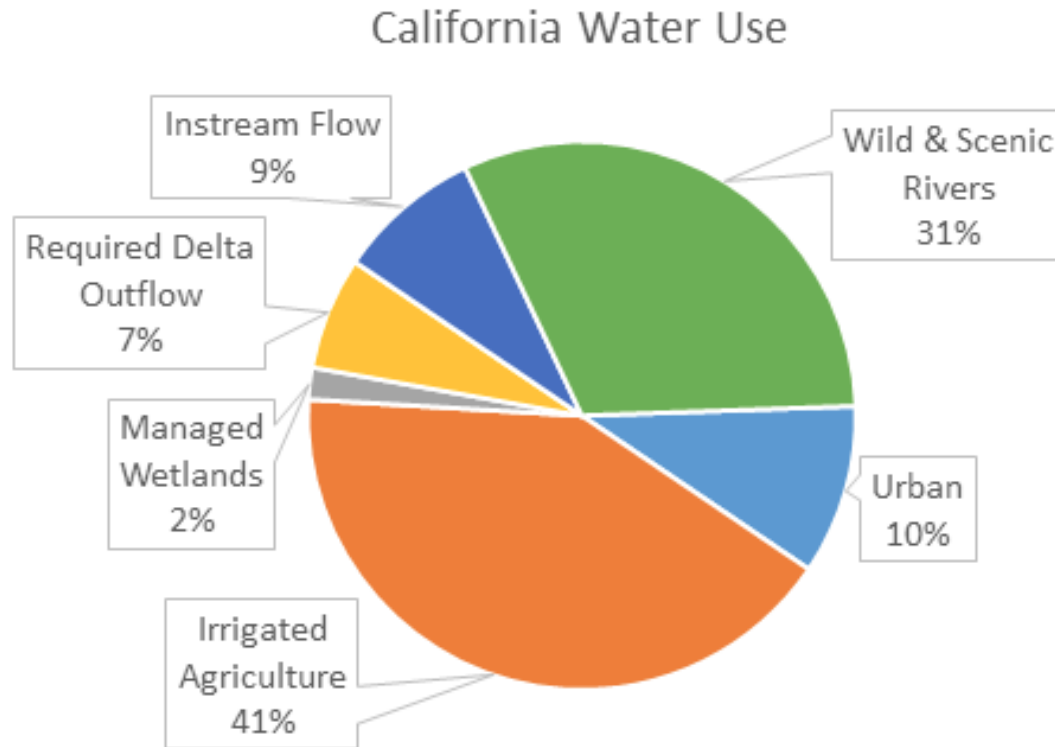
- 88 km³ Runoff
- 69 km³ Agricultural Use
- 19 km³ Urban Use
- Remainder is mostly Forest and Rangeland



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California Dedicated Water Uses



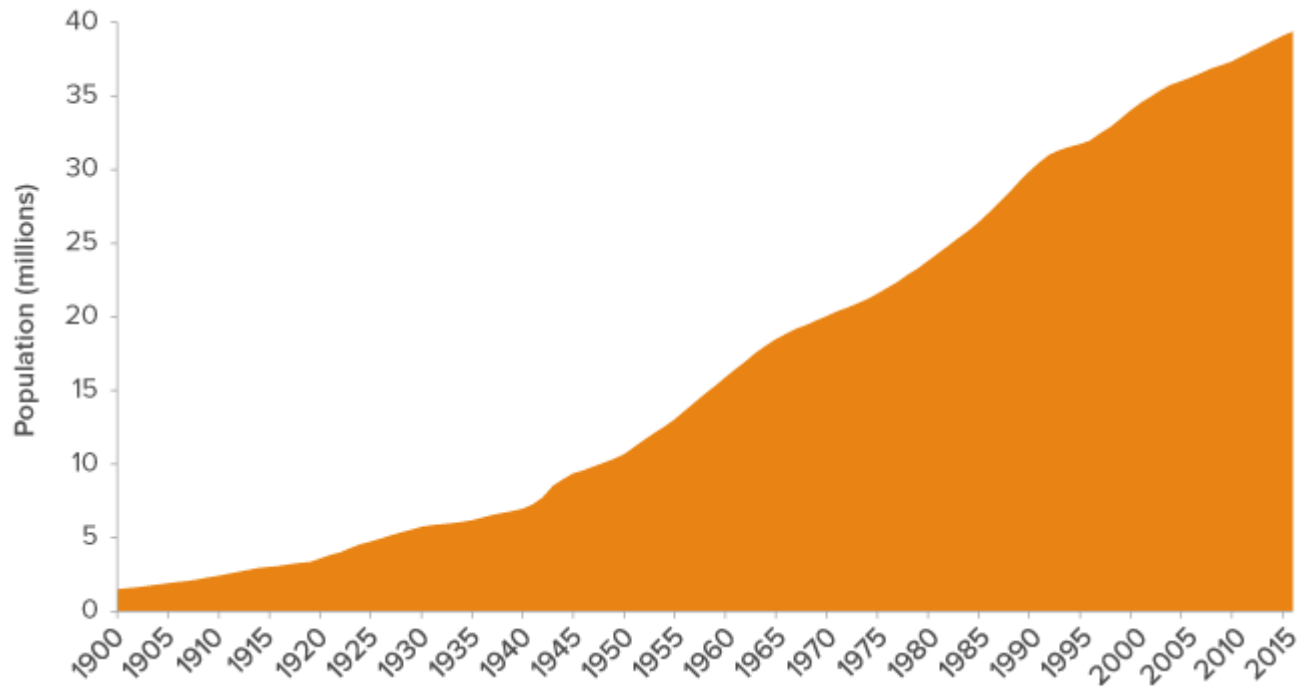
California Water Plan Update 2013



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California Population



Source: Public Policy Institute of California



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California Agriculture Facts

- 80,000 + farms
- \$46+ billion industry
- 10.5 million hectares of agricultural lands
 - 5,2 million hectares pasture and rangeland
 - 3,8 million hectares of irrigated cropland
 - 2,4 million hectares annuals
 - 1,2 million hectares orchards/vineyards



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California Agriculture

- #1 US producer of 78 commodities
- Only US producer of 14 commodities (99% or greater)



Almonds	Kiwifruit	Pomegranates
Artichokes	Olives	Rice, Sweet
Dates	Peaches, Clingstone	Seed, Ladino Clover
Figs	Pistachios	Walnuts
Grapes, Raisin	Plums, Dried	

Source: USDA, NASS, "California Agricultural Statistics, 2011 Crop Year".



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California Water Challenges

- Colorado River Drought Contingency Plan
- Sacramento-San Joaquin Delta Ecosystem and Flows
- In-Stream Fish Flows
- Drought
 - 200,000 Hectares Idled (2015)
- Groundwater (SGMA)
 - 200,000 – 300,000 Hectares Idled (2040)



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Thank You



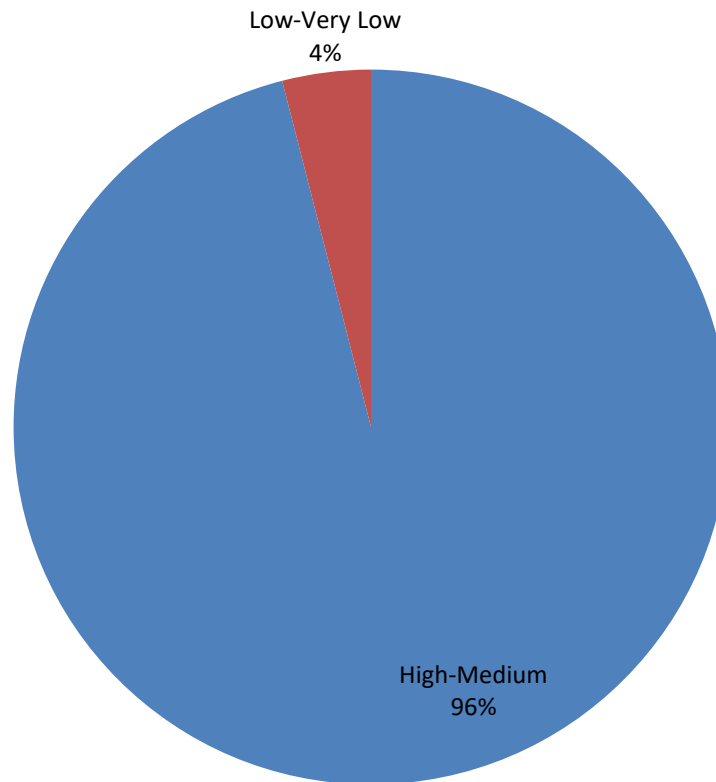
Web: ucanr.edu/drought Twitter: @ucanrwater



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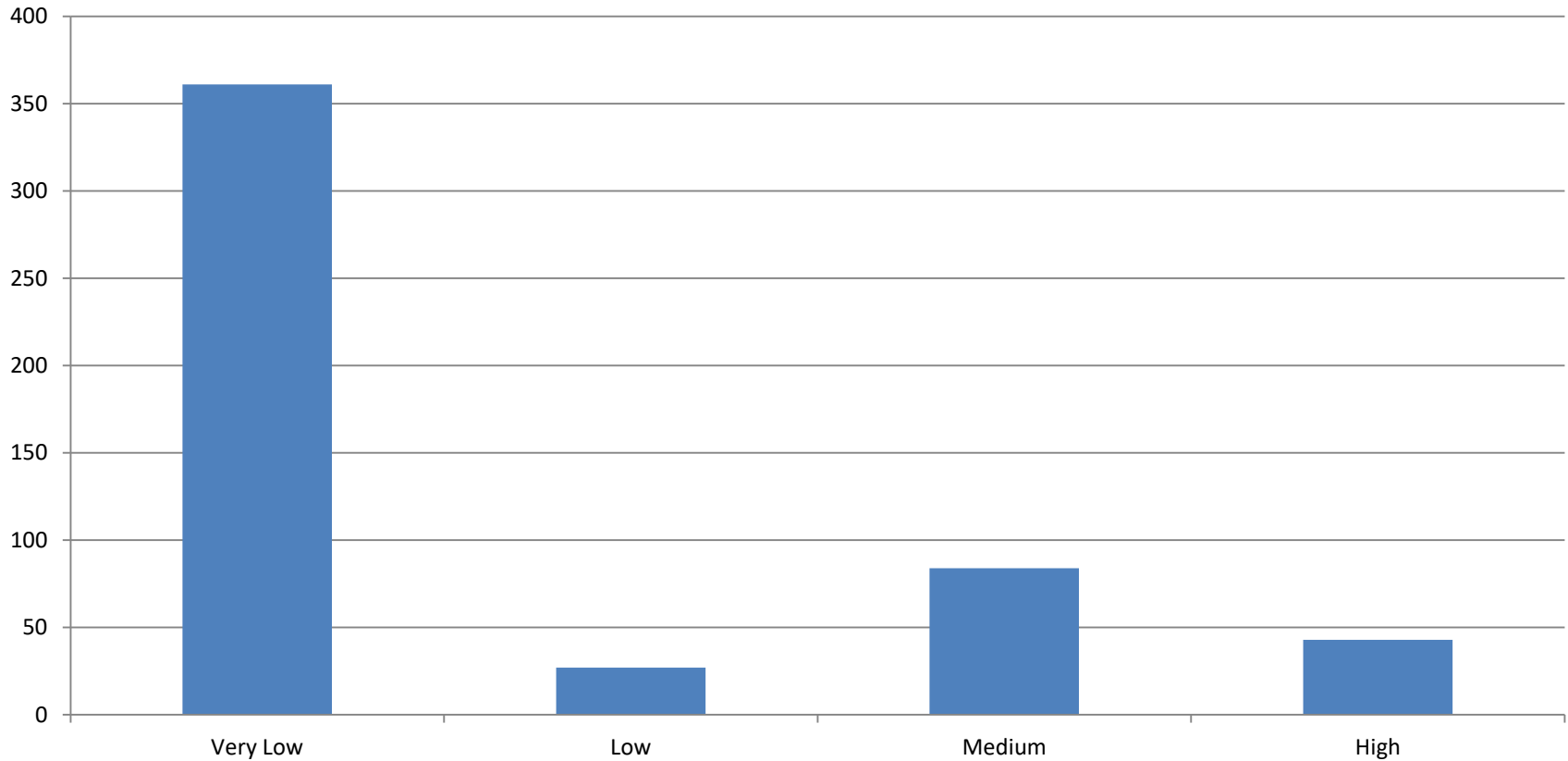
Percentage Water Use by Basin Prioritization



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Number of Basins by Prioritization Level



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California Water Rights (Groundwater)

- Adjudicated Basins
- 2014 Groundwater Law
 - Local Management with State Oversight
 - Sustainable Management Plans by 2020
 - Implemented by 2040



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