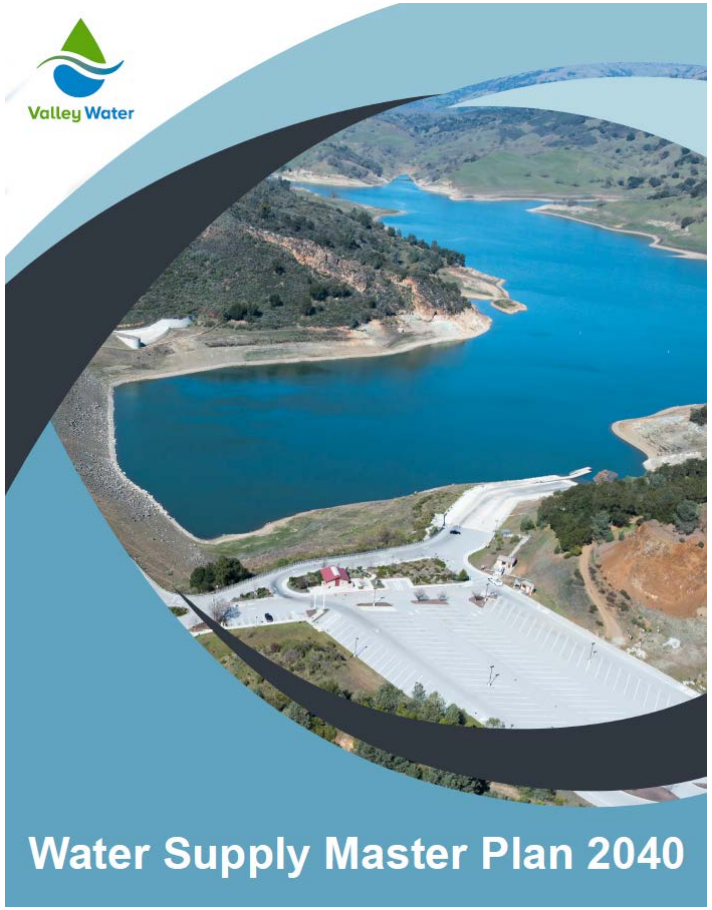
Valley Water

Clean Water • Healthy Environment • Flood Protection



Water Supply Master Plan 2040

Presented by: **Metra Richert**, Unit Manager
Water Supply Planning & Conservation

Overview

- Master Plan Purpose
- Water Supply Strategy
- Water Supply Reliability
- Master Plan Projects
- Monitoring and Assessment Approach
- Next Steps

Master Plan Purpose

Articulate Valley Water's:

- Water supply level of service goal
- "Ensure Sustainability" investment strategy
- Comprehensive evaluation of supplies, demands, project and program costs, benefits, and risks through 2040.
- Portfolio of projects to ensure water reliability
- Monitor and assess plan to avoid over or under investments

Water Supply Reliability

Level of Service Goal

Develop water supplies designed to meet 100 percent of demands identified in the Water Supply Master Plan in non-drought years and at least 80 percent of average annual water demand in drought years.

(BAO Strategy 2.4)

Water Supply Strategy

- Protects existing assets
- Leverages past investments
- Meets new demands with drought-resilient supplies
- Develops local and regional supplies to reduce reliance on the Delta
- Increases flexibility
- Increases resiliency to climate change

"Ensure Sustainability" Strategy[1]

1. Secure existing supplies and infrastructure

2. Expand conservation and reuse

3. Optimize the system

[1] Ensure Sustainability strategy reaffirmed by the Board on 01/14/19

Master Plan Evaluation of Projects









Sustainability


Operational Flexibility

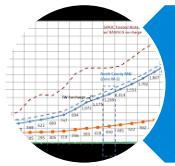

Yield


Local vs. Regional Supply


Environmental Impacts


Climate Change


Cost


Rate Impacts


Regulatory Restrictions


And more…

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Valley Water

Master Plan Projects

- **Baseline Projects[1]**
- **Delta Conveyance Project**
- **Additional Conservation & Stormwater Projects**
- **Potable Reuse (Phase 1- 24,000 AF by FY28)**
- **Pacheco Reservoir Expansion**
- **Transfer-Bethany Pipeline**
- **South County Recharge**

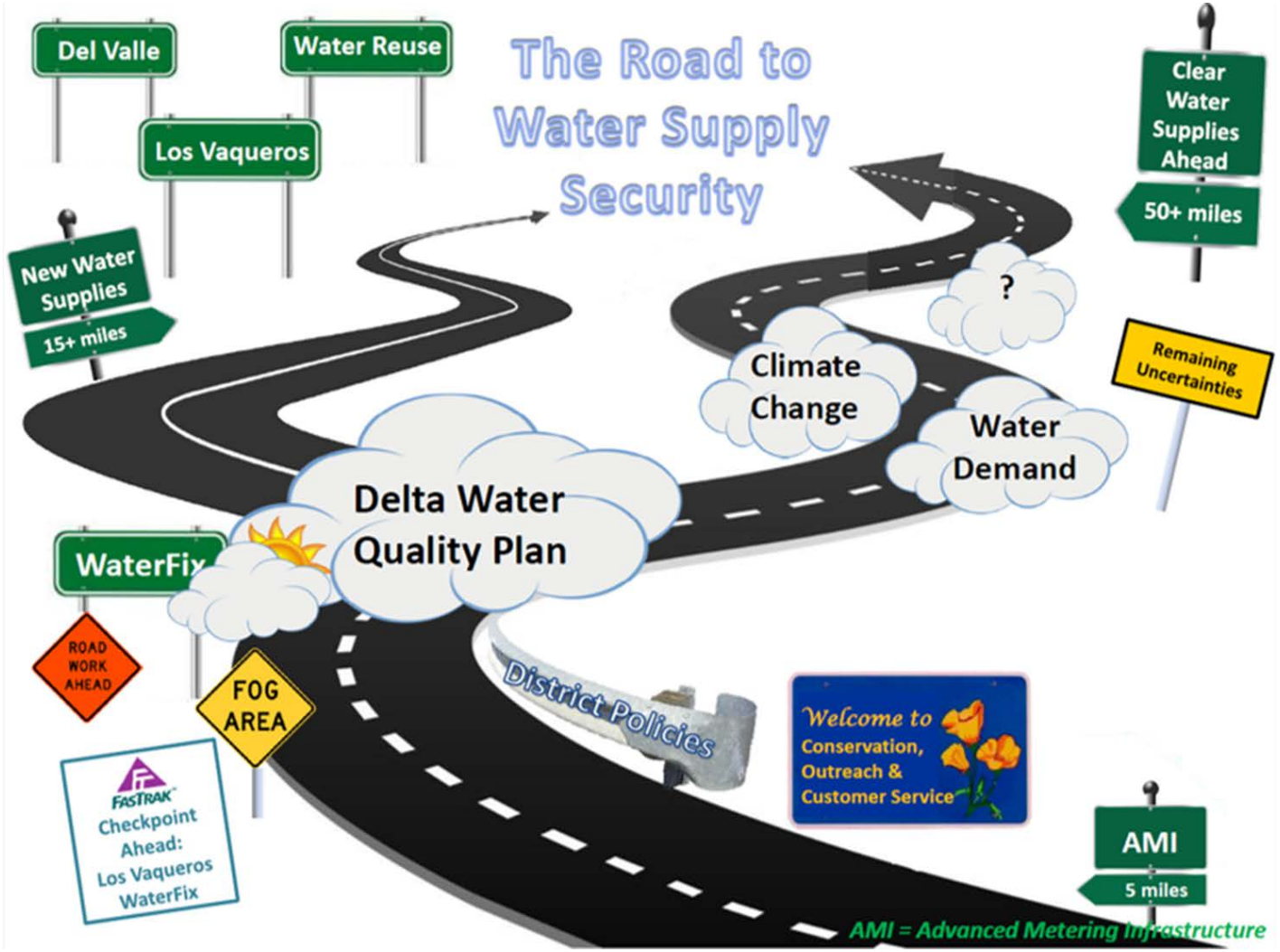
Project	Average Annual Yield (AFY)	Valley Water Lifecycle Cost[3]	Unit Cost (AF)	Risk
Delta Conveyance Project	41,000	$630 million	$600	High/ Extreme
Additional Conservation & Stormwater Projects	11,000	$100 million	$400	Medium
Potable Reuse	19,000	$1.2 billion	$2,000	Medium
Pacheco Reservoir Expansion[1]	6,000[2]	$340 million[4]	$2,000	Medium
Transfer-Bethany Pipeline[2]	3,500	$78 million	$700	Medium
South County Recharge	2,000	$20 million	$400	Medium

[1] Dam seismic retrofits, Rinconada Water Treatment Plan reliability improvement project, 10-year pipeline rehabilitation program, Vasona pumping plan upgrade, 100,000 AFY water conservation savings, and assumes 33,000 AFY of countywide non-potable recycled water.

Ultimately the amount of project yield and benefit that is usable by Valley Water depends on the portfolio of water supply projects that Valley Water ultimately implements and the outcome of ongoing regulatory processes.
[1] Assumes Prop. 1 Water Storage Investment Program funding. Costs would roughly double without funding.
[2] Based on Prop. 1 Water Storage Investment Program (WISP) application.
[3] Valley Water lifecycle (100 year) costs are presented in 2018 present value dollars.
[4] Assumes Prop. 1 and WIIN funding, WIFIA loan, and partner agencies pay 20% of the project.

Valley Water

Monitoring and Assessment Plan (MAP)



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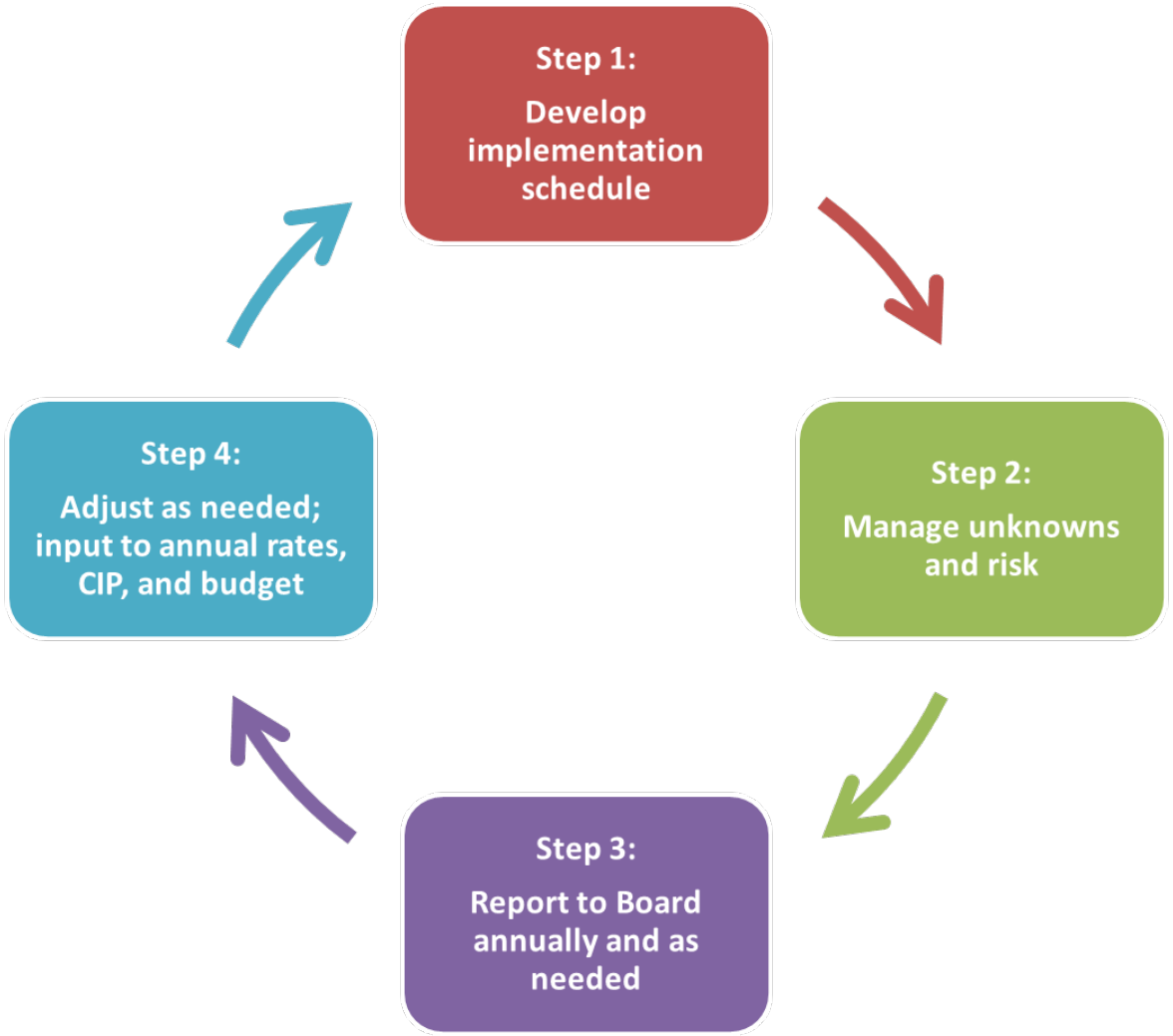
Monitoring and Assessment Plan (MAP)



Next Steps

- Post final report on website
- Complete new demand model – spring 2020
- Develop first WSMP annual MAP report and present to the board – fall 2020

Recommendations

A. Adopt the Water Supply Master Plan (WSMP), and

B. Direct staff to return with the WSMP first annual Monitoring and Assessment Plan (MAP) report in fall 2020.

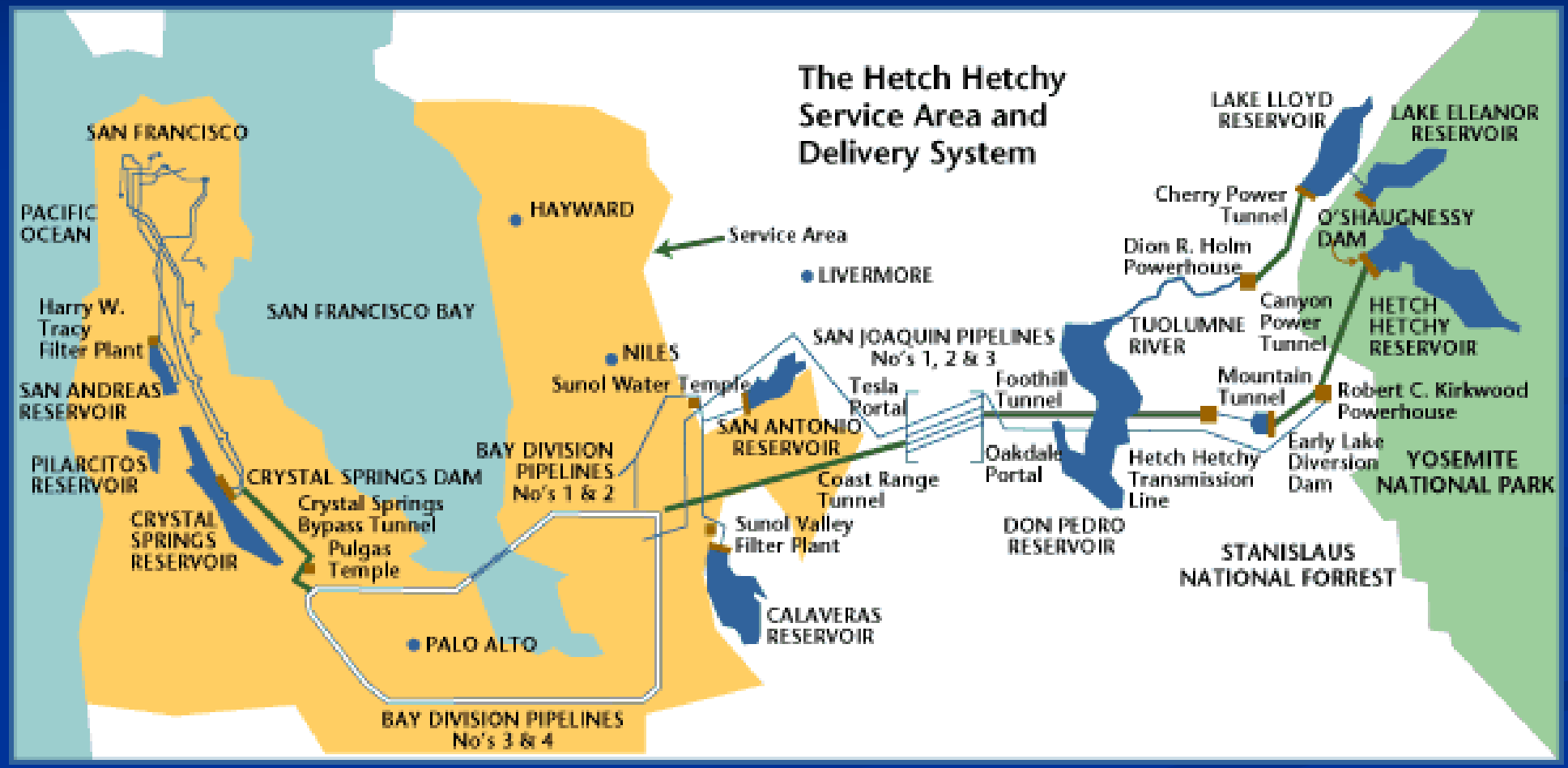
Valley Water

Clean Water • Healthy Environment • Flood Protection

SFPUC Water Supply
(A few things you might not have known)

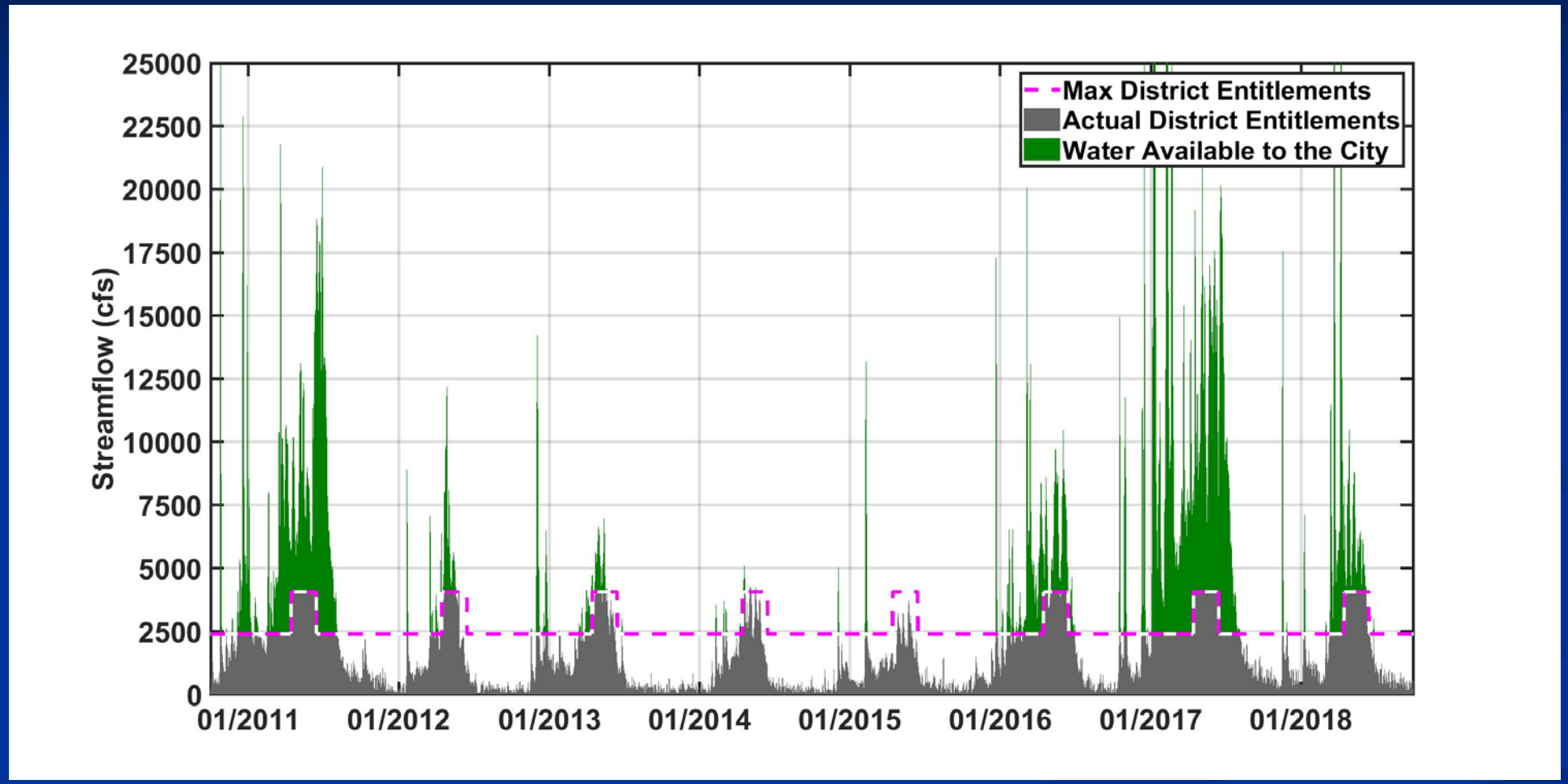
Peter Drekmeier
Tuolumne River Trust
November 20, 2019

SFPUC Water Entitlements, Demand and Storage



Tuolumne River = 85% Bay Area Watersheds = 15%

Tuolumne River Water Entitlements



The SFPUC's water rights are poor in dry years, but exceptional in normal and wet years.

SFPUC Water Supply & Demand

"The 1922-2003 average calculated volume of water potentially available to CCSF under the Raker Act was about 750 TAF/y [thousand acre-feet per year]"

"According to a SFPUC planning document, an average of 244 TAF/y is diverted from the Tuolumne River… based on data from 1989-2005"

Source: Bay Delta Plan SED

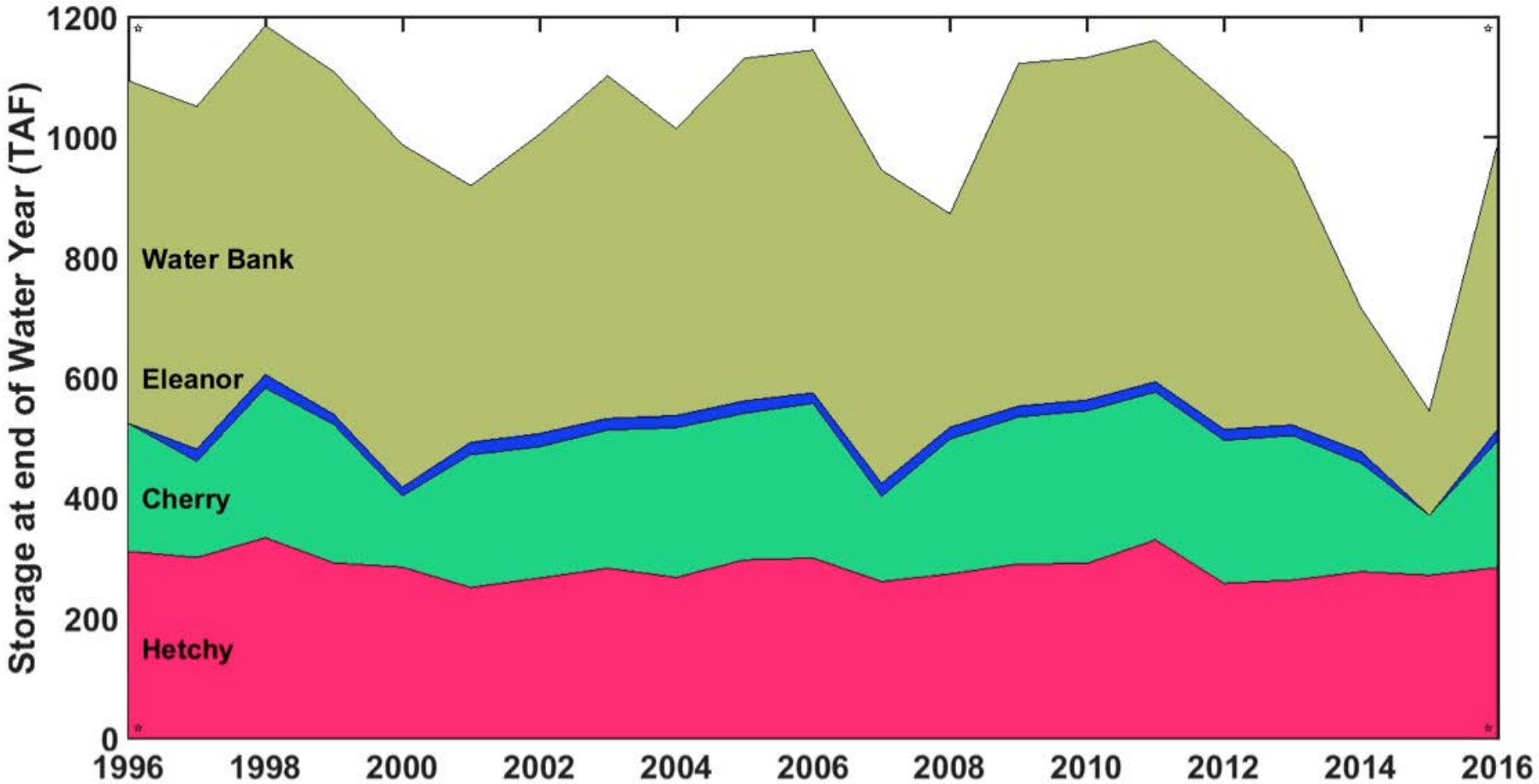
Figures do not include Bay Area water supplies.

SFPUC Storage Capacity

Reservoirs	Capacity (Acre-Feet)
Tuolumne Reservoirs	660,973
Don Pedro Water Bank	570,000
Bay Area Reservoirs	227,711
Total Storage	**1,458,684**

The SFPUC has enough storage capacity to last six years.
It can count on storage to manage multiple dry years.

SFPUC Tuolumne Storage



Source: SFPUC

At the height of the recent drought, the SFPUC had enough water in storage to last three years. (Bay Area storage not included.)

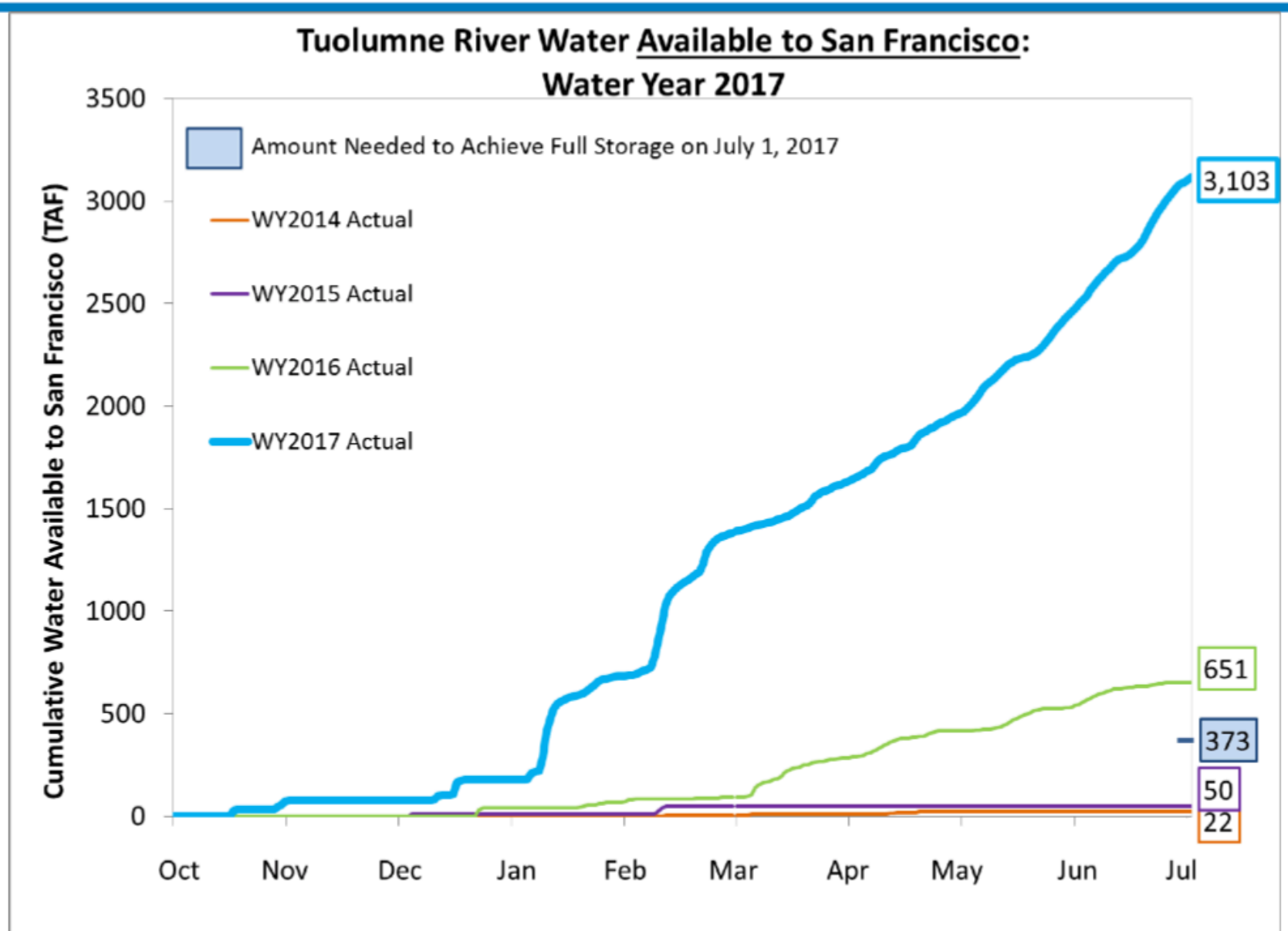
Hetch Hetchy Regional Water System

July 31, 2016 Reservoir Storage Levels

Reservoir	Current Storage[1,2,3] (AF)	Maximum Storage[3,4] (AF)	Available Capacity (AF)	Percent of Maximum Storage	Normal Percent of Maximum Storage[5]
Tuolumne System					
Hetch Hetchy	347,560	360,360	12,800	96.4%	**95.3%**
Cherry	256,170	273,500	17,330	93.7%	-
Eleanor	22,800	27,113	4,313	84.1%	-
Water Bank	421,410	570,000	148,590	73.9%	**96.0%**
Total Tuolumne Storage	**1,047,940**	**1,230,973**	**183,033**	**85.1%**	-
Local System					
Calaveras	35,419	96,670	61,251	36.6%	-
San Antonio	43,522	50,637	7,115	85.9%	-
Crystal Springs	53,386	58,309	4,923	91.6%	-
San Andreas	17,960	19,027	1,067	94.4%	-
Pilarcitos	2,504	3,069	565	81.6%	-
Total Local Storage	**152,790**	**227,711**	**74,921**	**67.1%**	-
Total System Storage	1,200,730	1,458,684	257,954	**82.3%**	**90.0%**
Total without water bank	779,320	888,684	109,364	**87.7%**	-

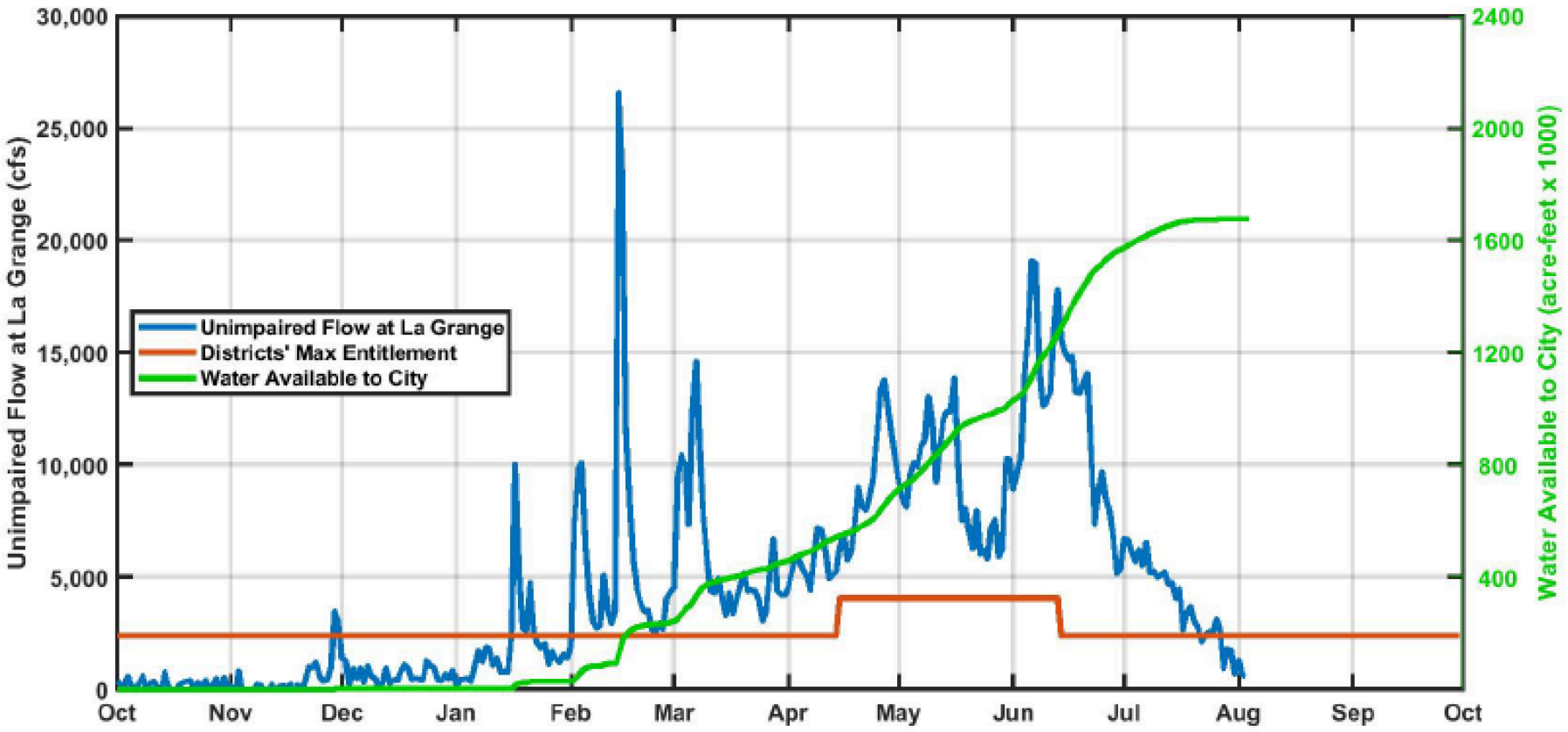
Hetch Hetchy Regional Water System

Tuolumne River Water Available to the City



Hetch Hetchy Regional Water System

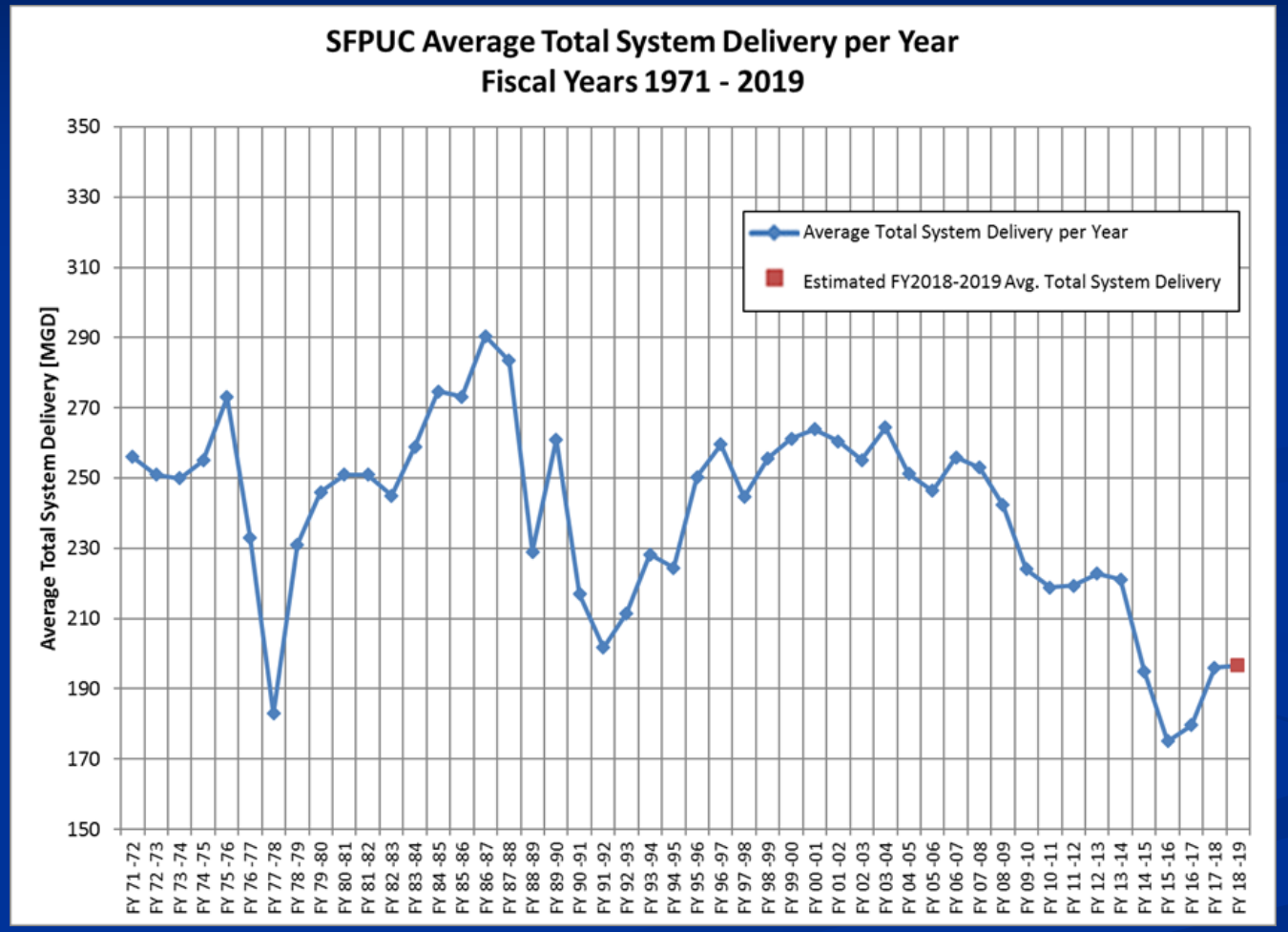
Water Available to the City



Water Year 2018/19

Source: SFPUC

The Hetch Hetchy service area has demonstrated conservation potential



30% reduction in water demand: 2006-2016

Water Demand in the SFPUC Service Area

2018 Demand Projections = 285 mgd
(from 2007 WSIP EIR)

2008 Sales Cap = 265 mgd

2013 (pre-drought) = 223 mgd

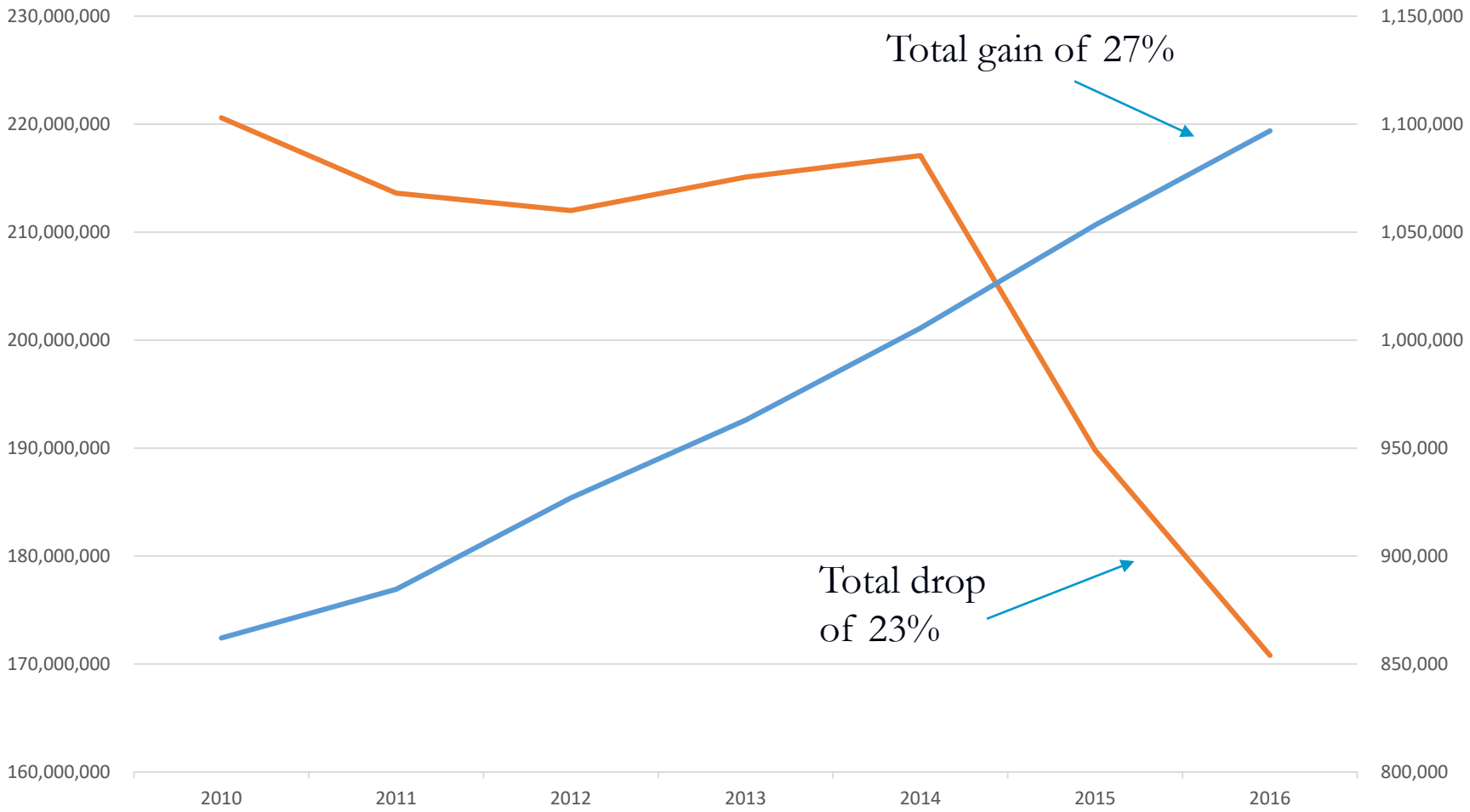
2016 = 175 mgd

2017 = 180 mgd

2018 = 196 mgd

Water demand in 2018 was 31% lower than projected.

SFPUC Water Deliveries and Employment, 2010-2016
San Francisco and San Mateo Counties

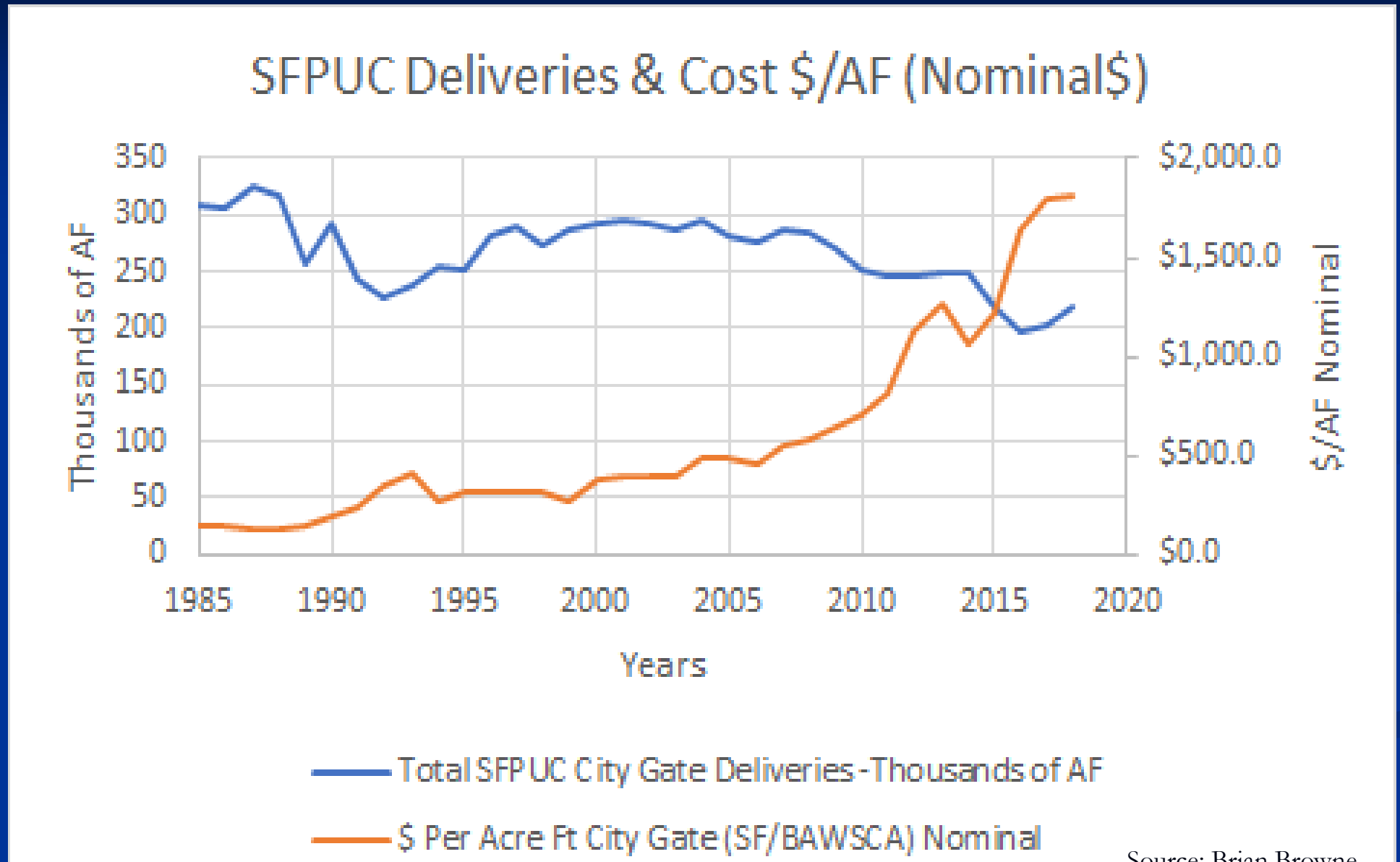


Orange Line = SFPUC water sales

Blue Line = Total employment for San Francisco and San Mateo Counties

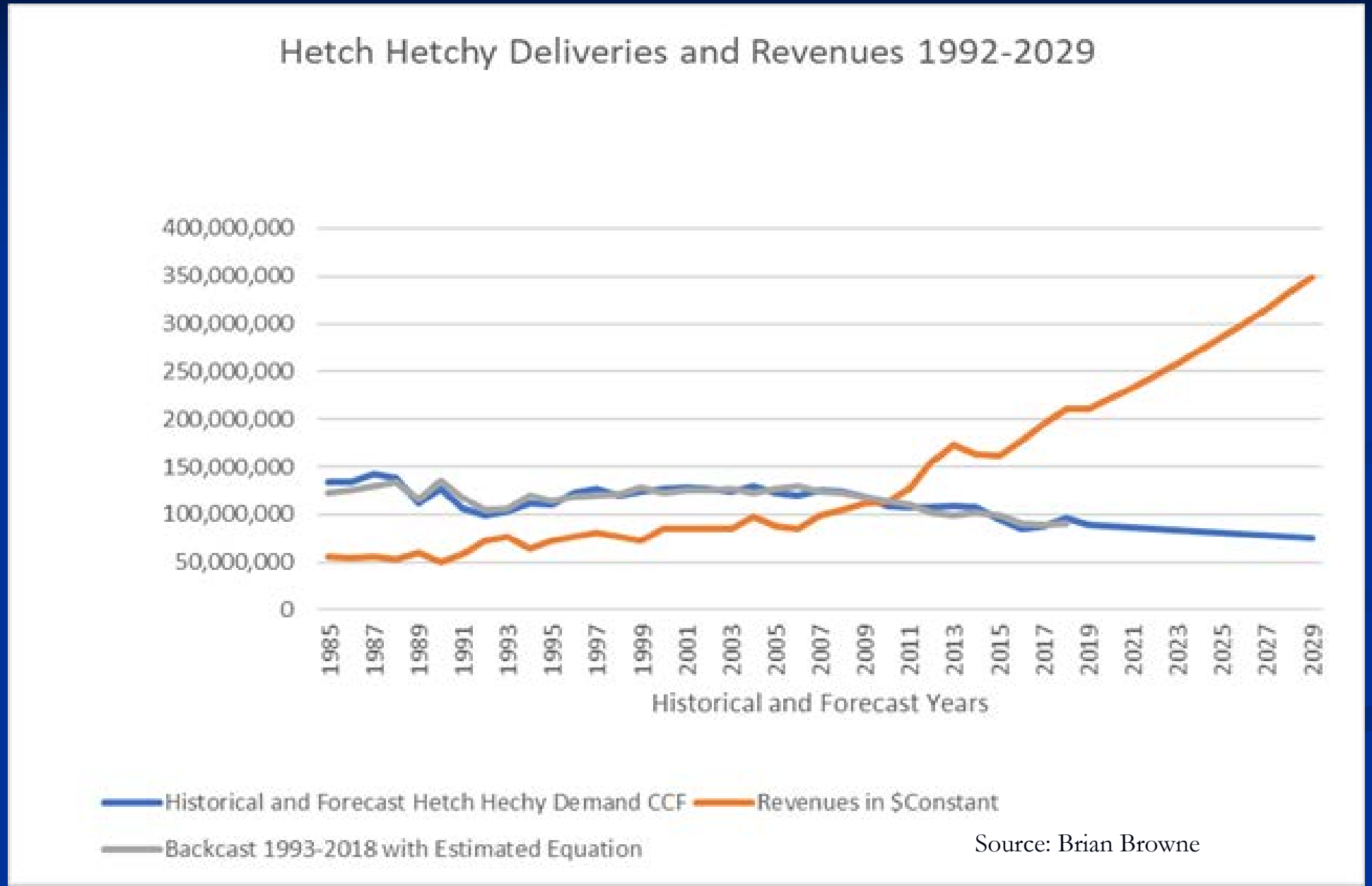
Source: Bill Martin, Sierra Club

Water Rates Have Depressed Demand



Source: Brian Browne

And Will Continue to Do So



Source: Brian Browne

TRT 6-Year Drought Model

(223 mgd baseline, 40% unimpaired flow Feb-June)

Year	Level of Rationing	SFPUC Storage Reduction (TAF)	SFPUC Water in Storage (TAF)
=1986			1,517
=1987	0%	478	1,039
=1988	0%	347	692
=1989	10%	45	647
=1990	10%	292	355
=1991	20%	75	280
=1992	20%	220	**60**

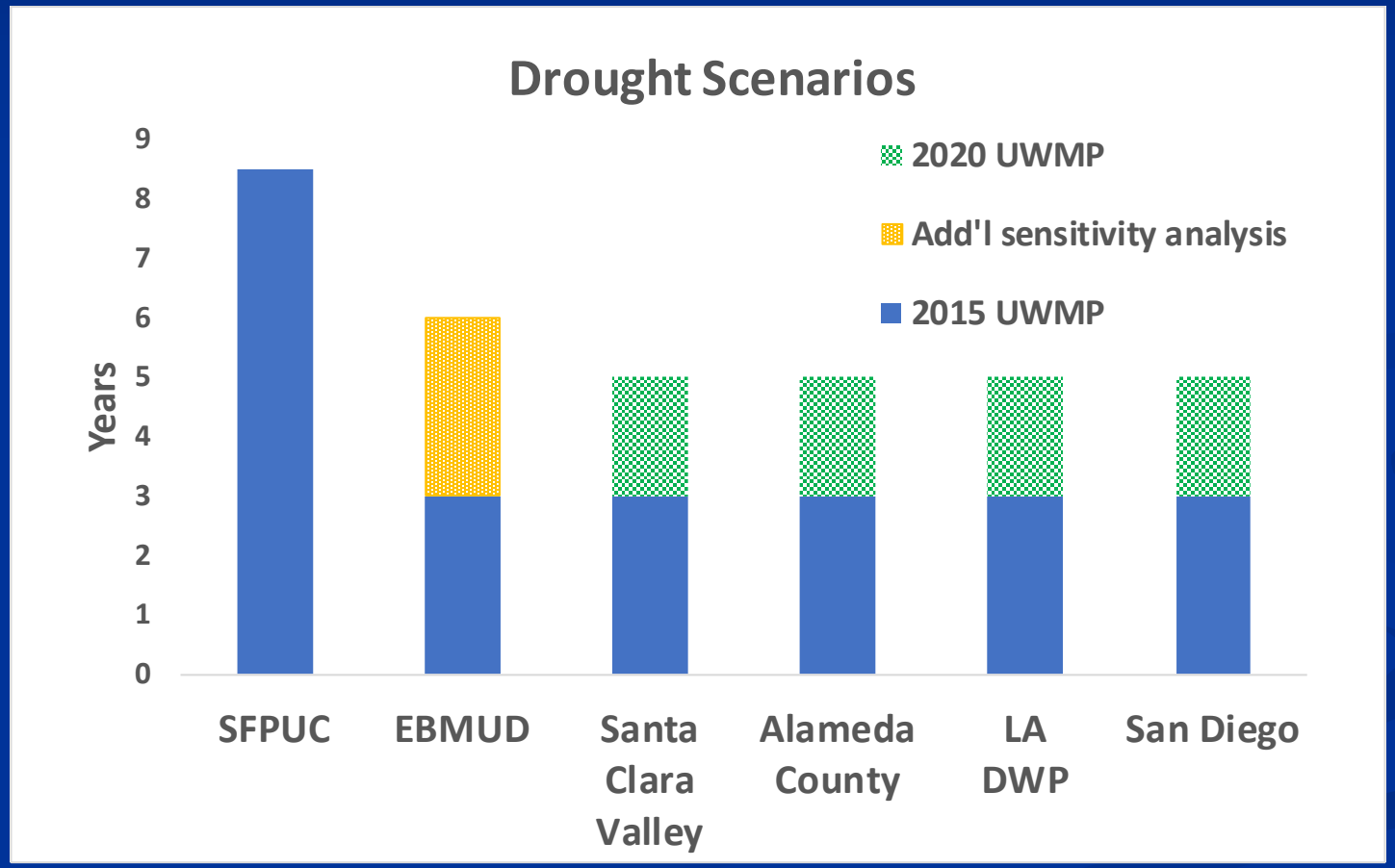
If the past 100 years of precipitation were to repeat, and the Bay Delta Plan were in place, the SFPUC would not run out of water.

The SFPUC's "Design Drought"

"Our Level of Service objective for water supply is to survive the drought planning scenario (1987-92 followed by 1976-77) with no more than 20% rationing from a total system demand of 265 MGD…We need to plan for each year as if it is the beginning of our drought planning scenario."

-SFPUC, January 10, 2017

The SFPUC has the longest drought scenario of California's major water districts



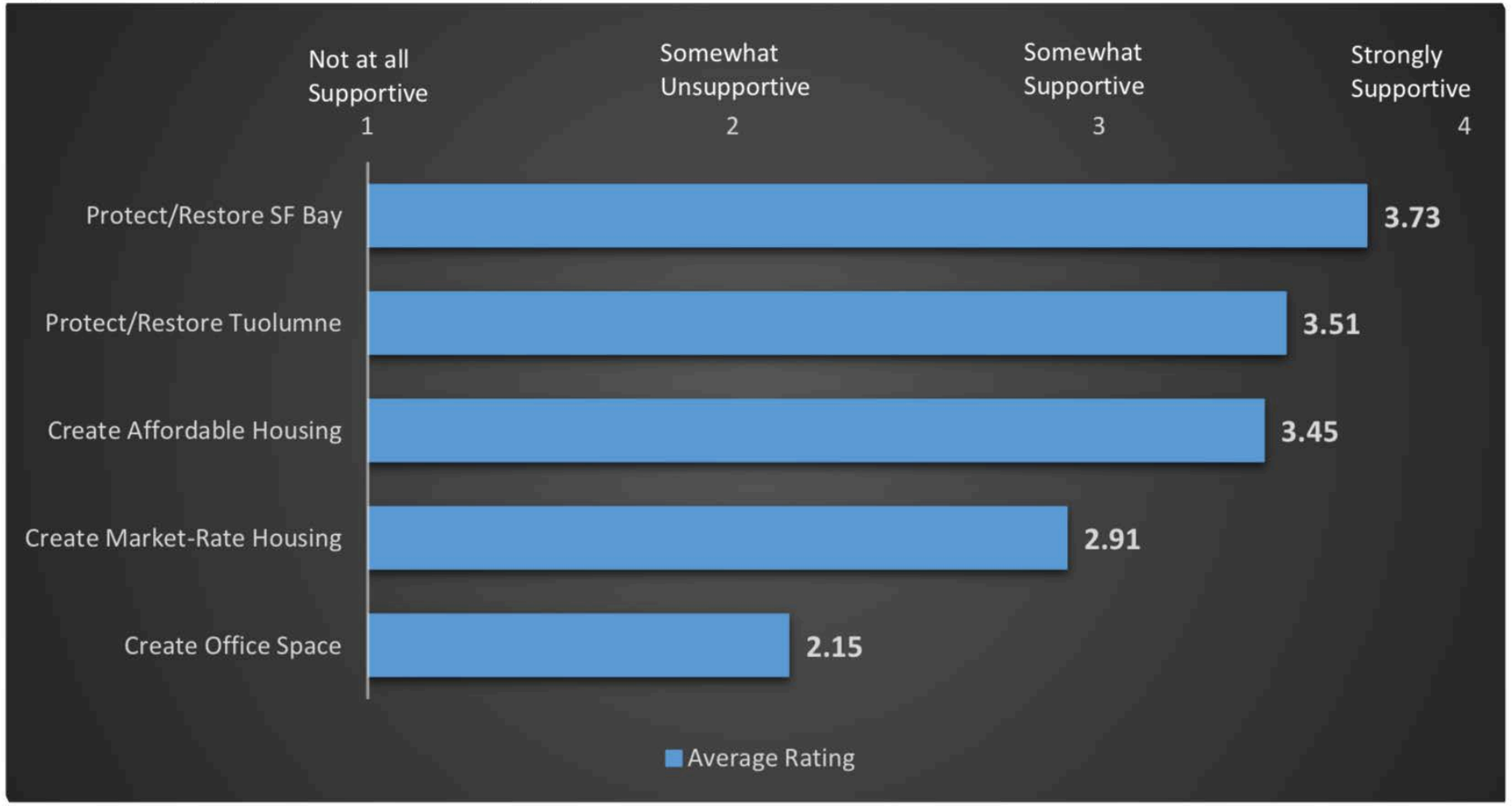
SFPUC Design Drought Rationing Scenario
(223 mgd baseline, 40% unimpaired flow Feb-June)

Year	Level of Rationing	SFPUC Storage Reduction (TAF)	SFPUC Storage (TAF)
=1986			1,517
=1987	39%	379	1,138
=1988	39%	248	890
=1989	39%	-29	919
=1990	49%	194	725
=1991	49%	2	723
=1992	49%	147	**576**

At the end of a repeat of the 6-year drought of record, the SFPUC would have enough water in storage to last more than two years.

97% support for San Francisco Bay

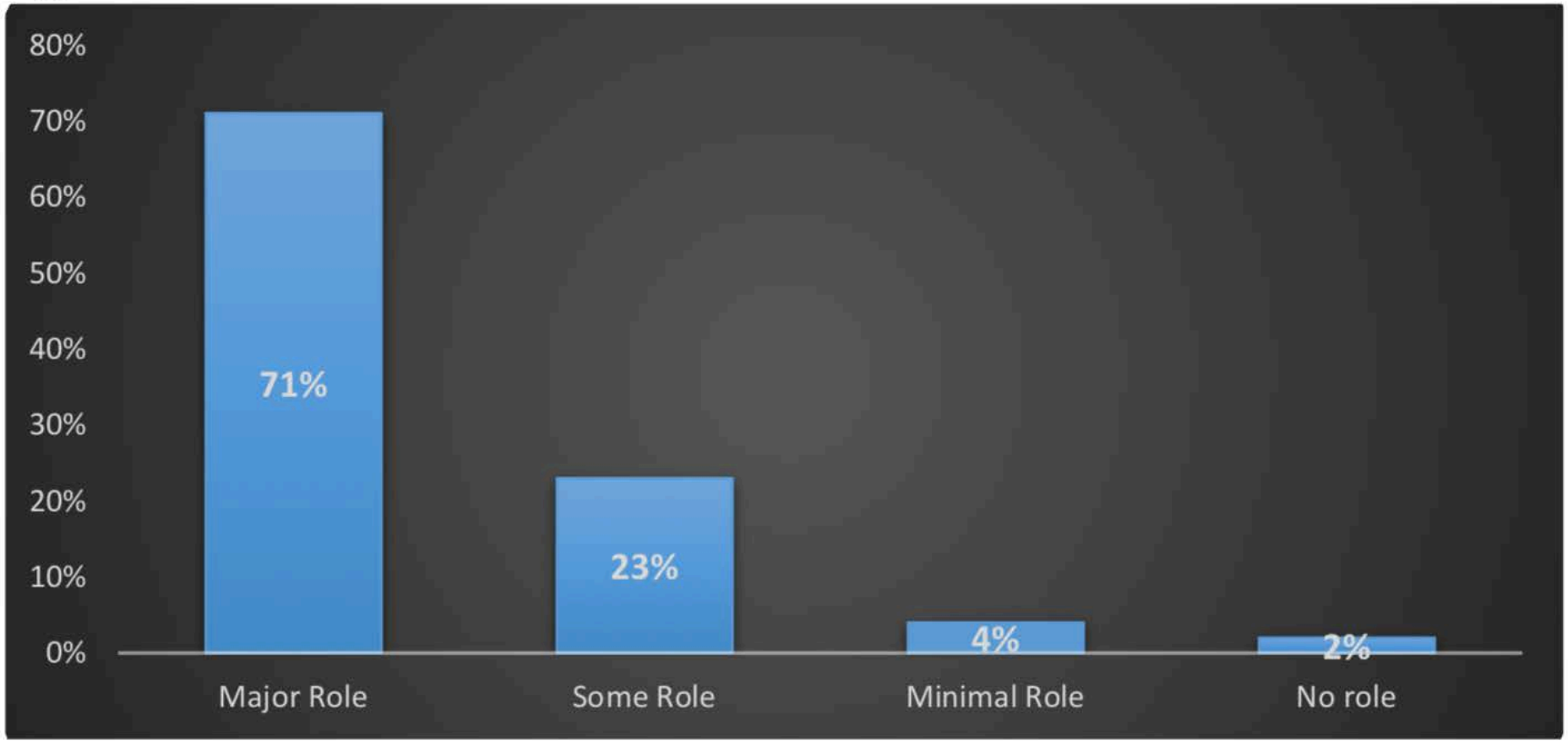
Figure 6. Support for Potential City-Wide Measures



92% support for the Tuolumne River

Environmental protection is an extremely strong motivator to conserve water

Figure 3. Role of Environmental Concerns in Water Conservation Efforts

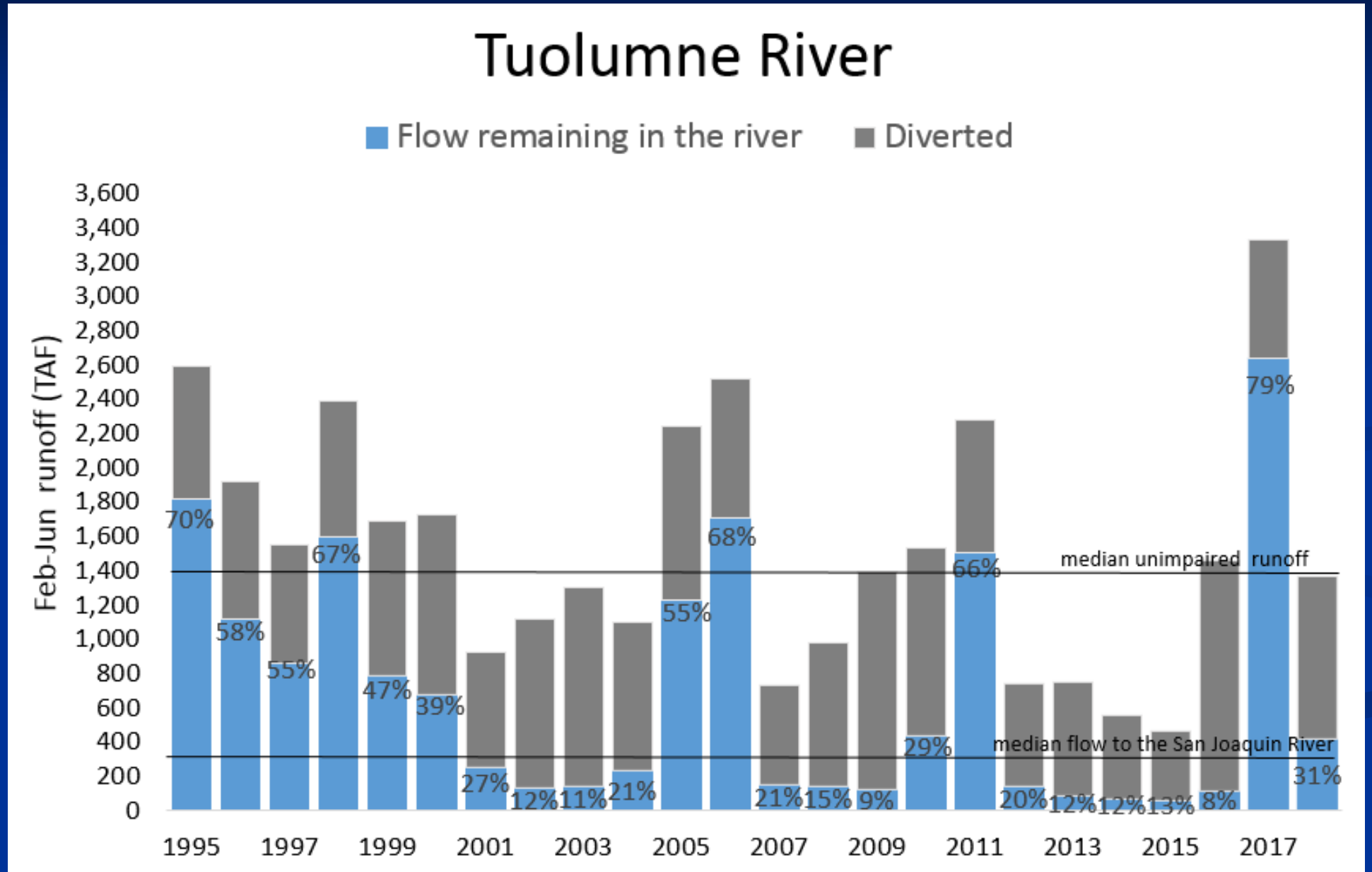


Conserved water was just impounded

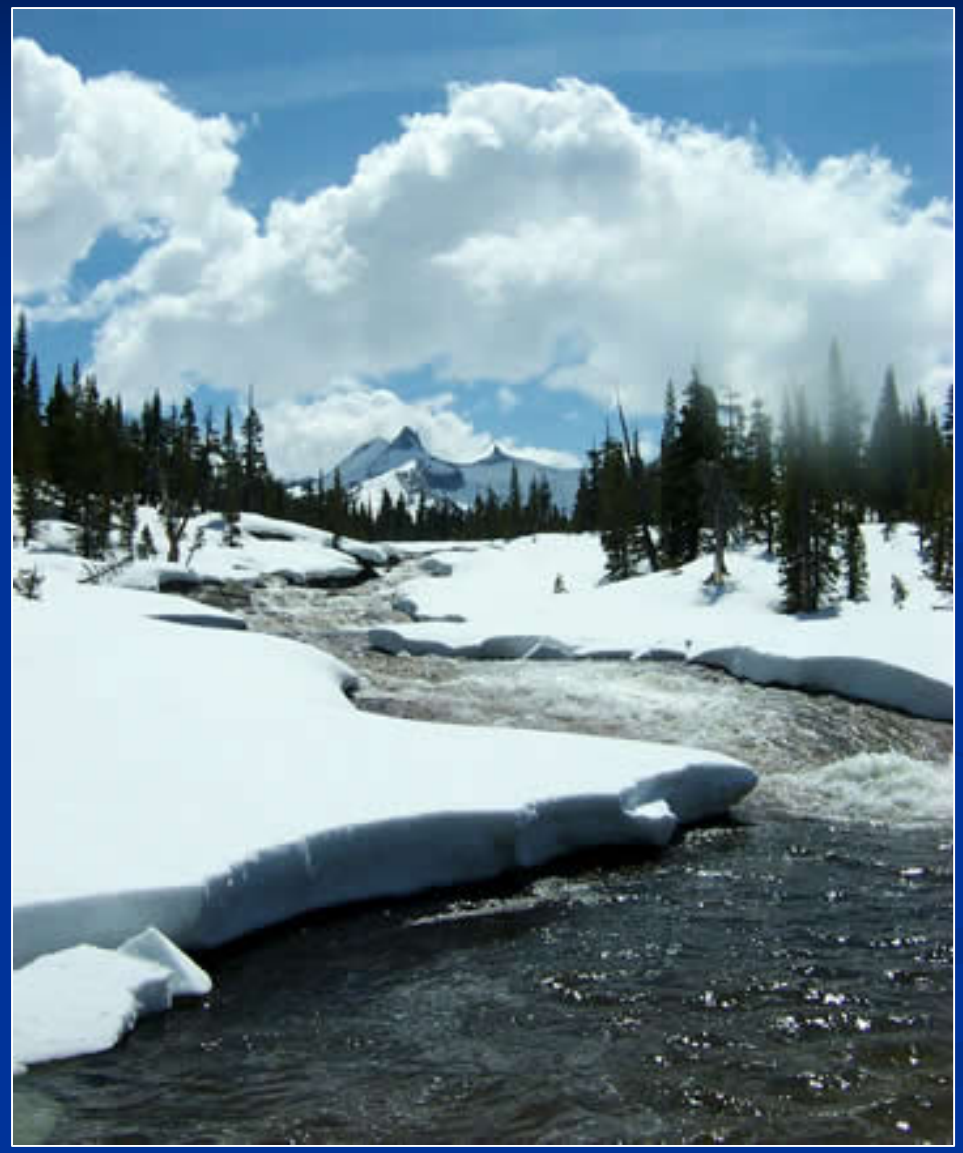
Current FERC Flow Schedule

Season	Dry Year	Normal Year	Wet Year
Oct. 1-15	100 cfs	200 cfs	300 cfs
Oct. 16 – May 31	150 cfs	175 cfs	300 cfs
June 1 – Sep. 30	50 cfs	75 cfs	250 cfs

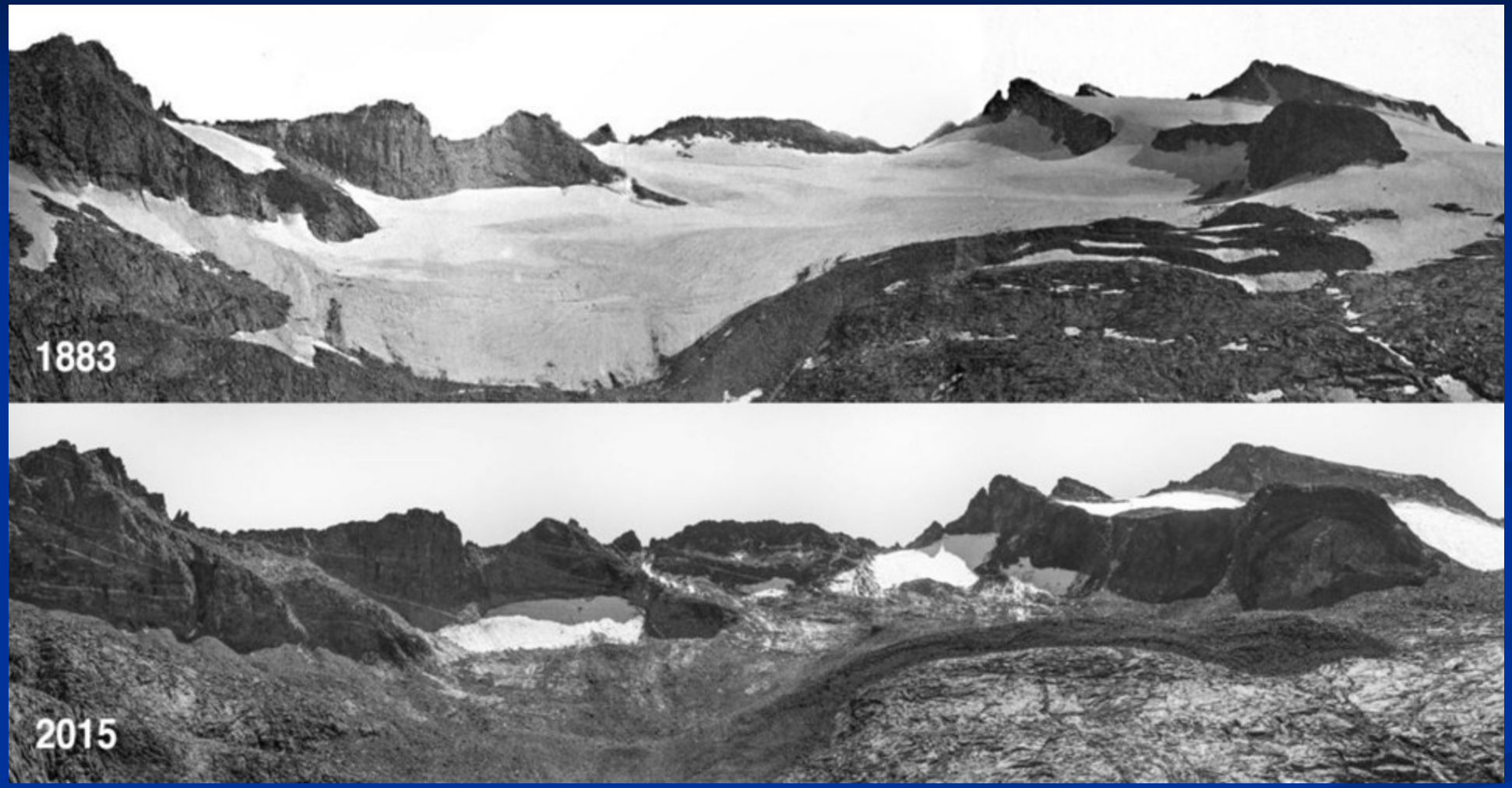
Current policy devastates the River in dry years



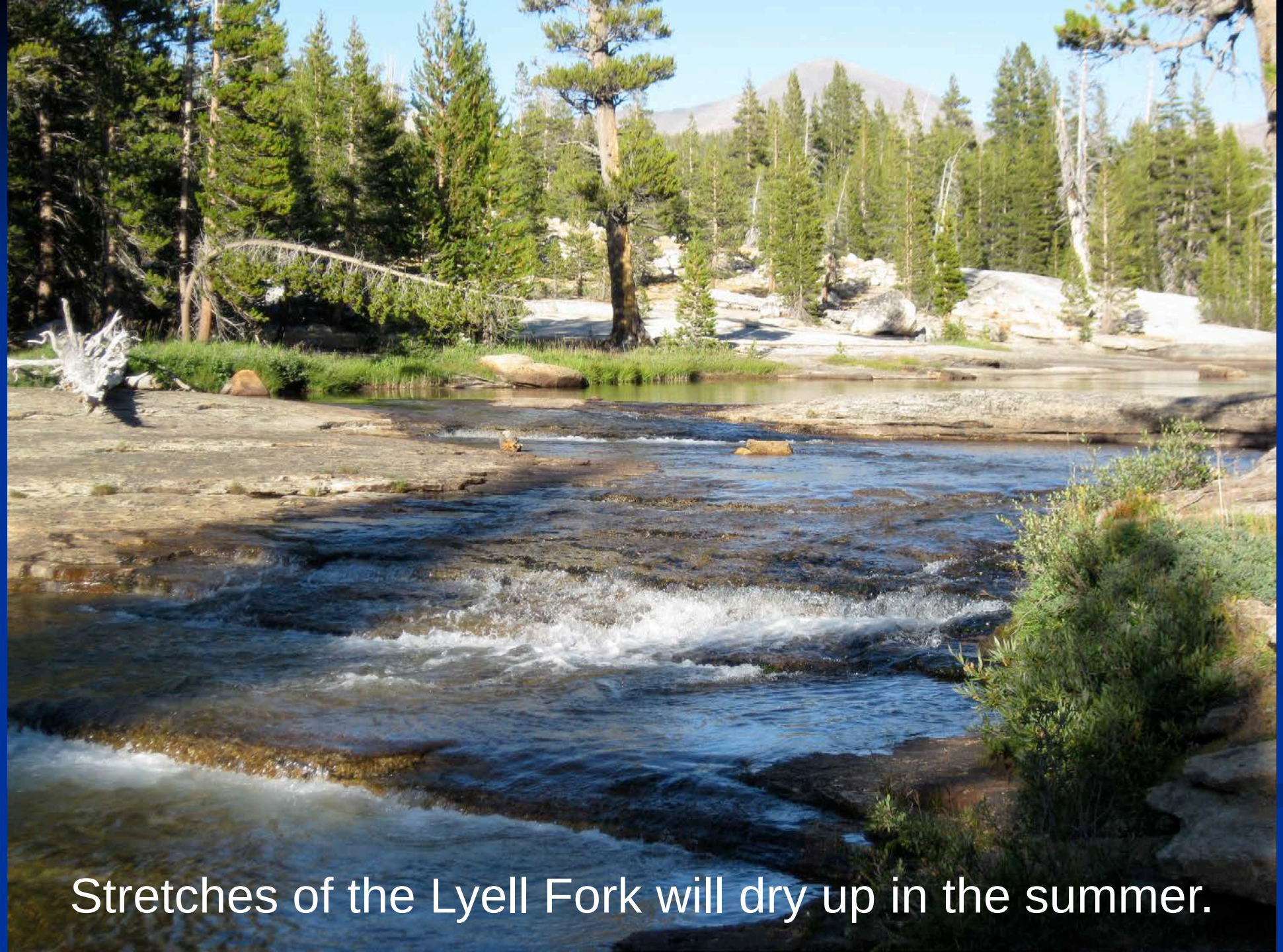
How might climate change affect us?



The Mount Lyell Glacier is disappearing

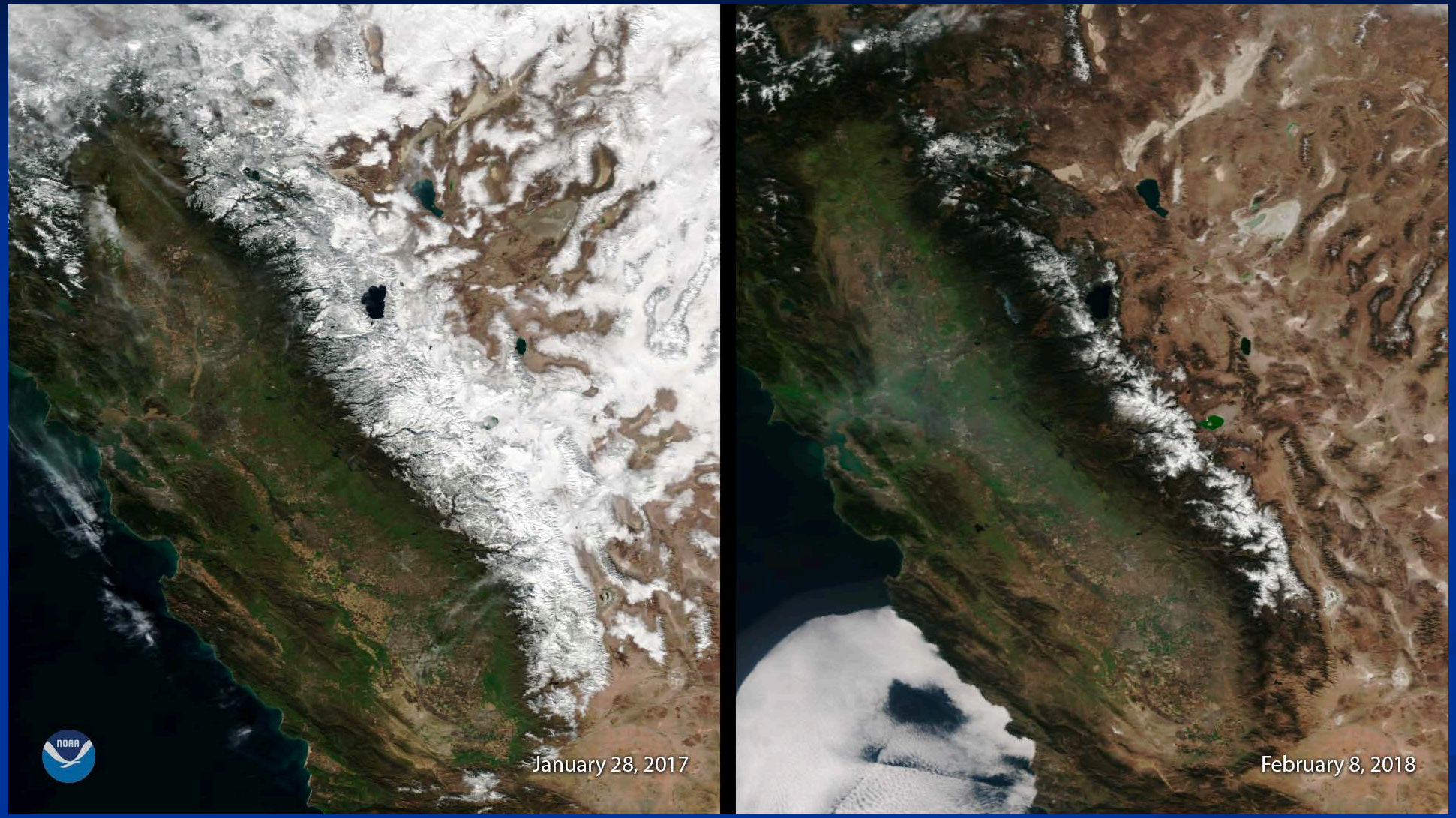


But provides just 0.2% of our water supply.



Stretches of the Lyell Fork will dry up in the summer.

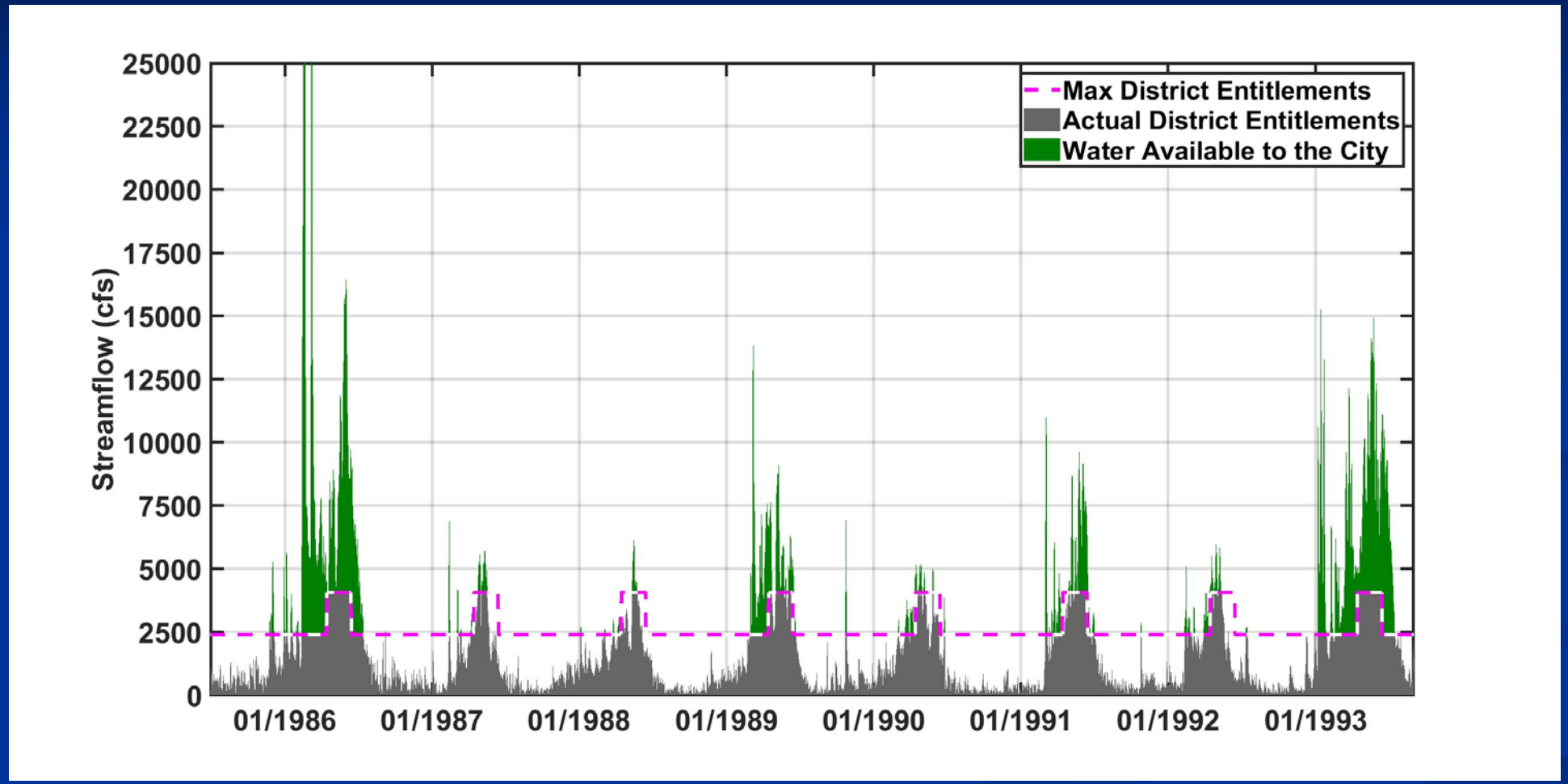
We will experience greater swings in water year types



Being storage rich, the SFPUC is well-positioned.

More precipitation will fall as rain and less as snow, leading to earlier runoff

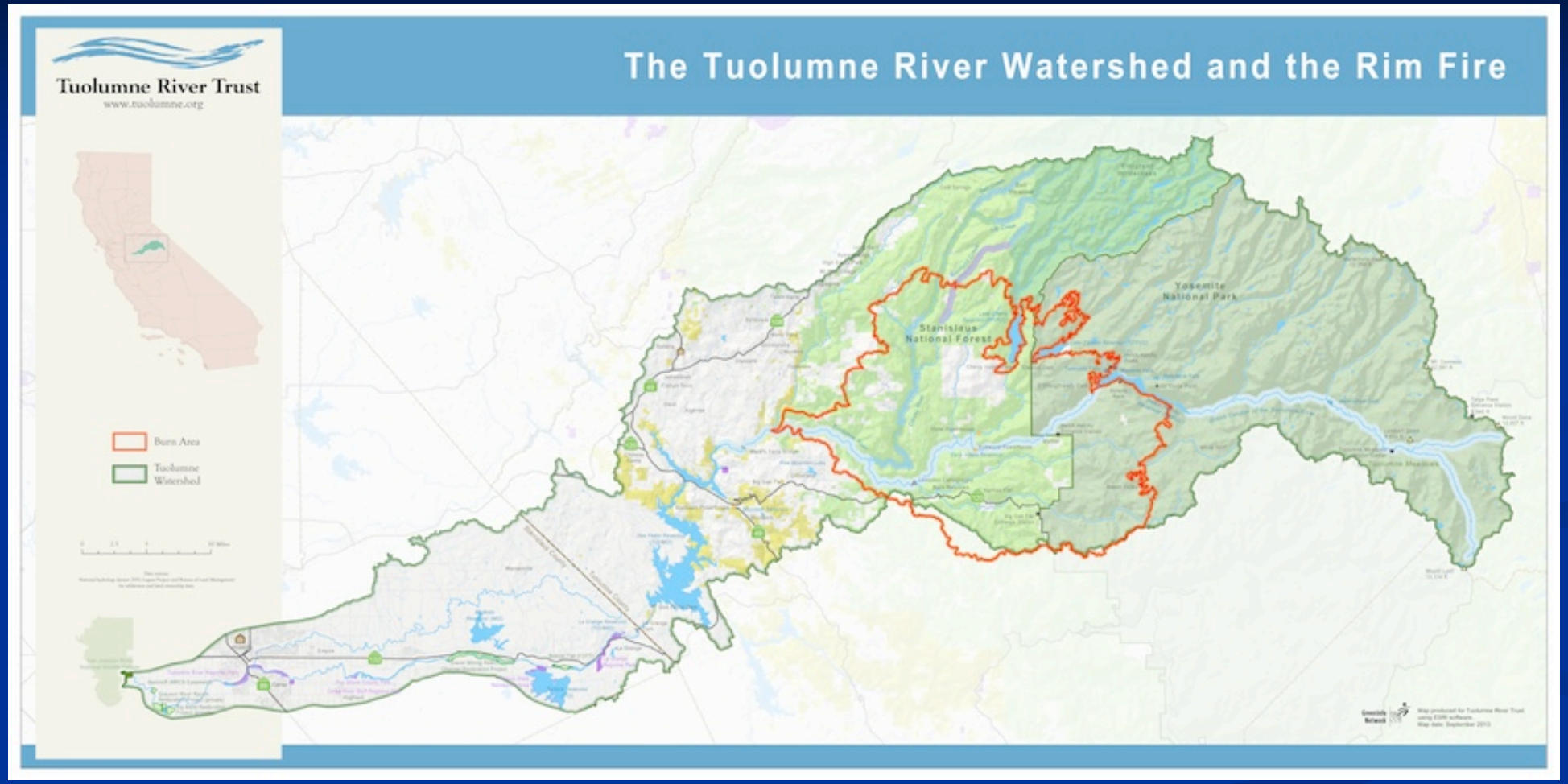
The SFPUC's water rights could improve



Three week shift in runoff = 217 TAF

Wildfires will become more common

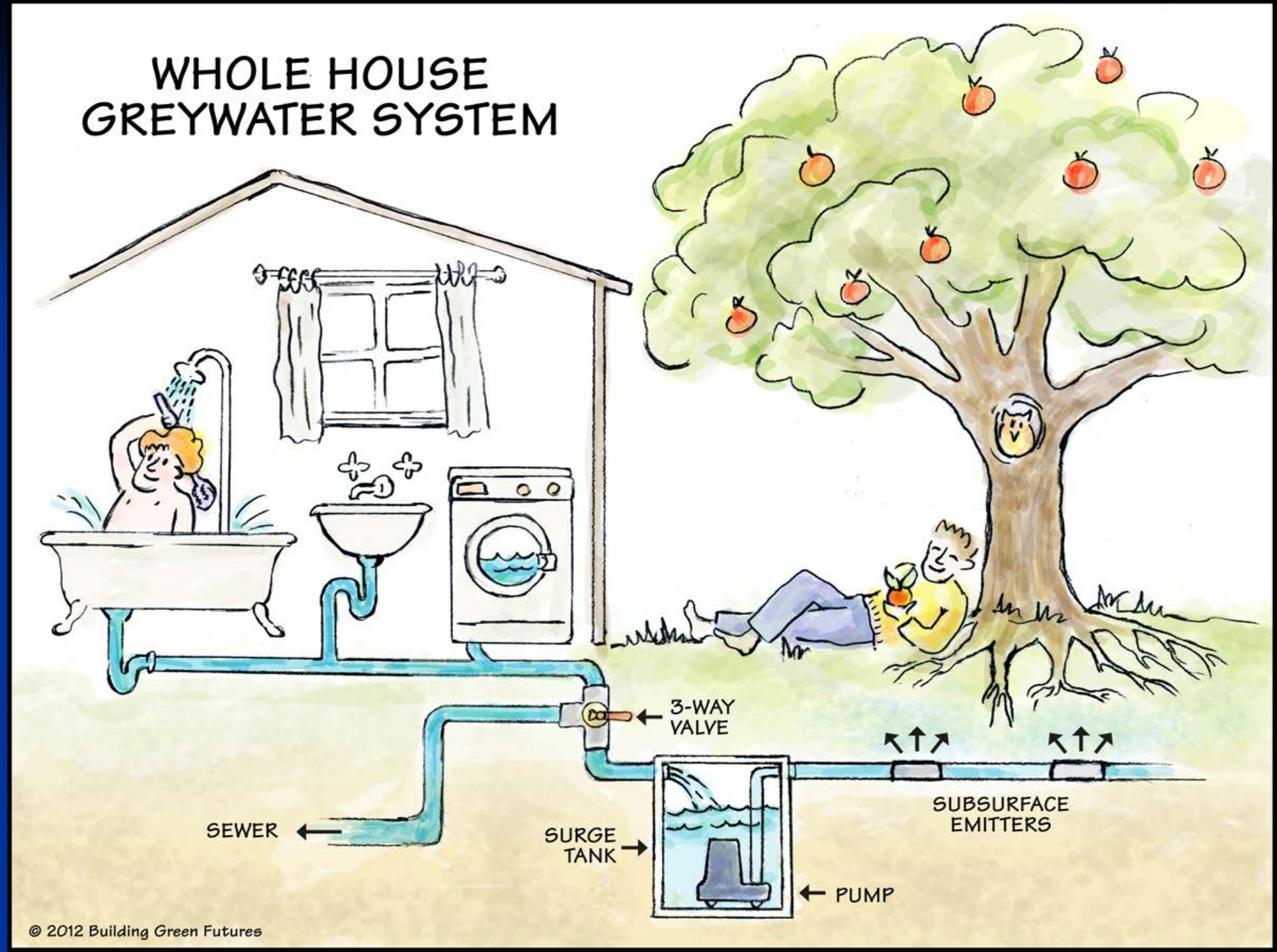
Poor forest health will lead to increased runoff



2017 was the second wettest year on record,
but produced the most runoff.

SILICON VALLEY
WATER CONSERVATION
AWARDS

Climate-appropriate landscaping


WHOLE HOUSE
GREYWATER SYSTEM
3-WAY
VALVE
SEWER
SURGE
TANK
PUMP
SUBSURFACE
EMITTERS
© 2012 Building Green Futures


RECYCLED WATER
DO NOT DRINK


Recycled
Water
is being used in this
water feature

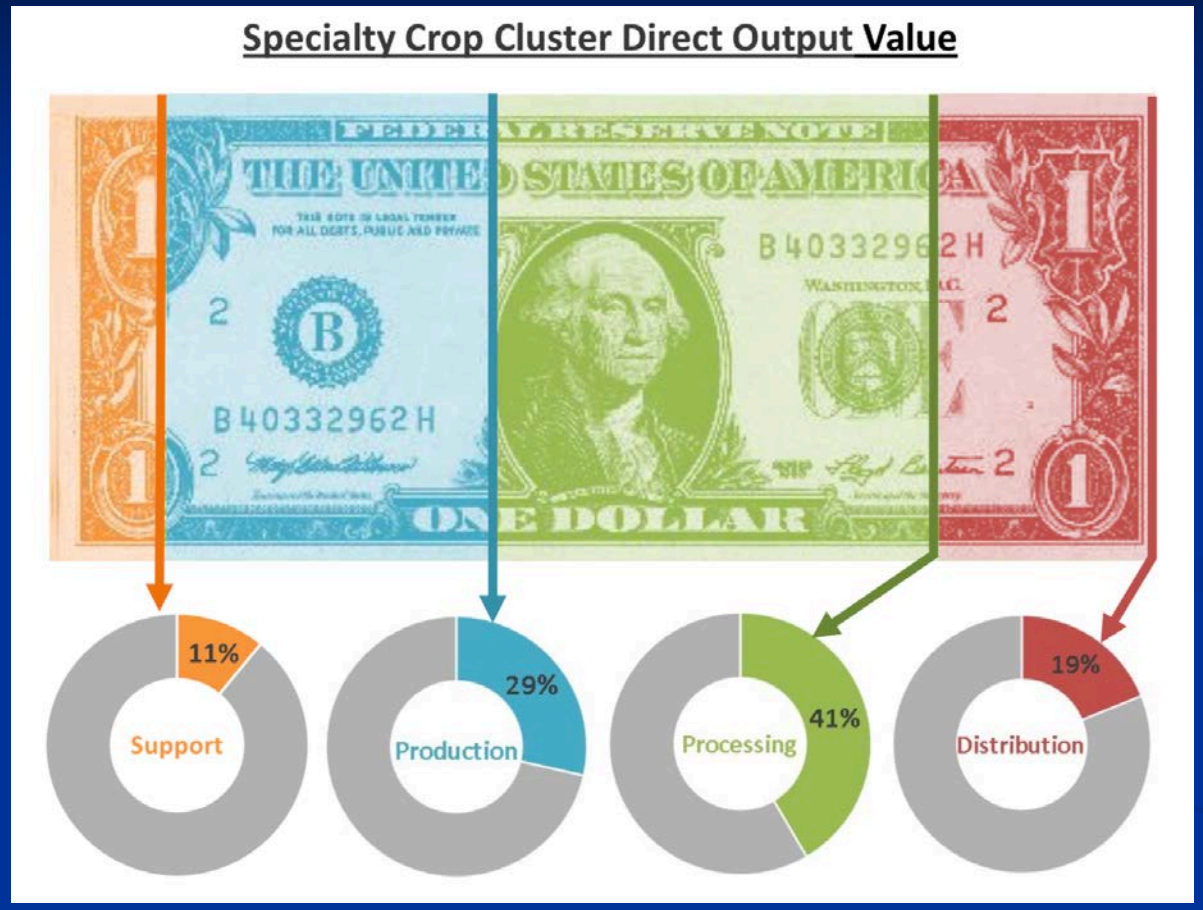

NOTICE
RECYCLED
WATER USED TO
WASH VEHICLES

Photo by C. Hearn

Water-efficient irrigation practices and crop shifting reduce water use

Water could be purchased from irrigation districts

What about the multiplier effect?



The value of water for low-value crops is $500 - $1,000 per acre-foot. BAWSCA member agencies currently pay almost $2,000 per acre-foot.

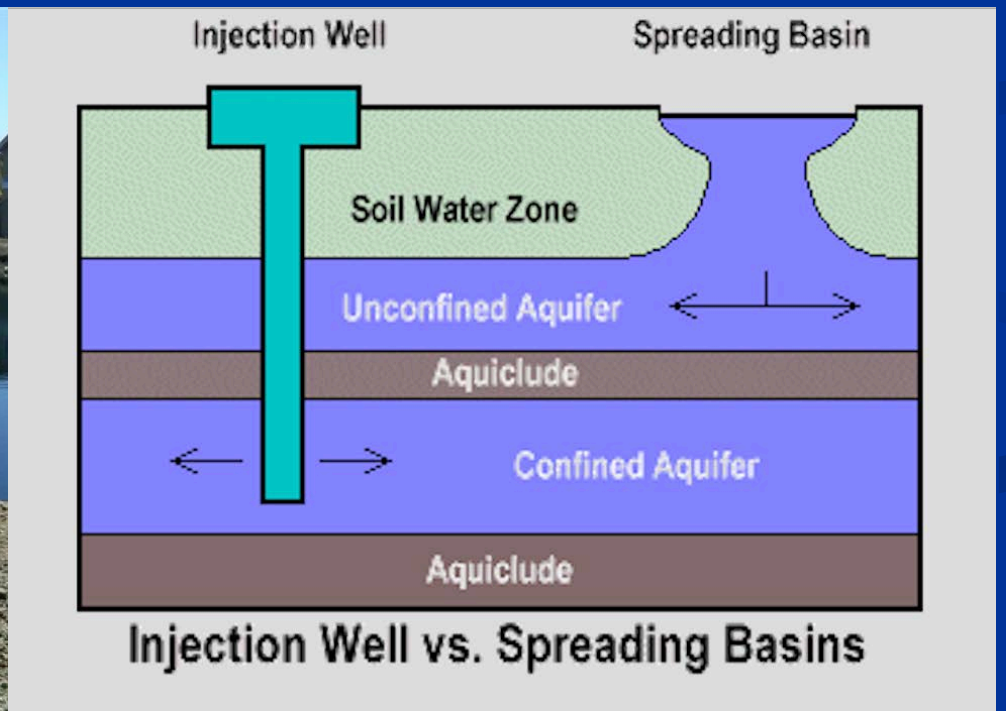
Potential Water Savings and Estimated Cost

Retained Water	Cost
The average amount of water to be retained annually will be between 25,000 and 40,000 acre feet	The total estimated cost of all anticipated improvements will be about $115 million

February 2012

Amortized over 20 years = $144-$230 per AF

The SFPUC could partner with MID/TID to recharge groundwater in wet years and establish a water bank similar to Don Pedro



Injection Well vs. Spreading Basins