

California Water 2015: *The drought of the century and beyond*

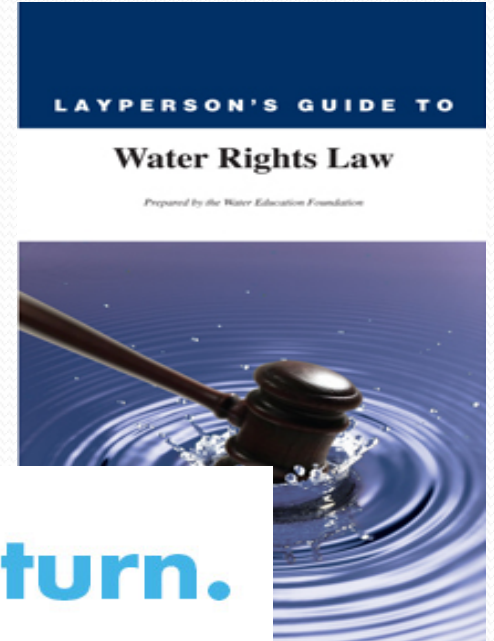
Felicia Marcus
Chair, State Water Resources Control Board
CalTech Resilience and Sustainability
Pasadena, September 21, 2015



Overview



- Overview
- Drought update
- Where do we go from here?

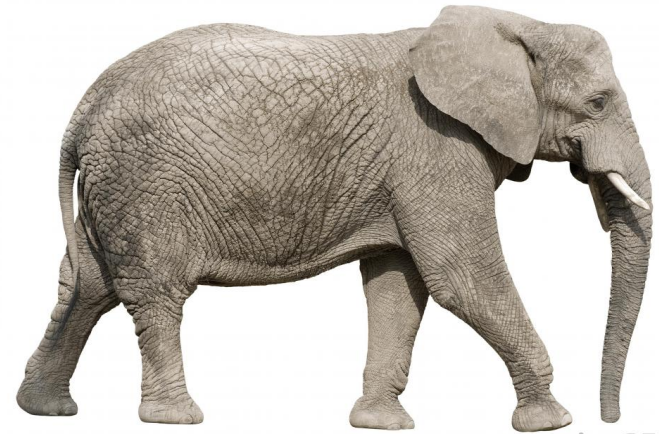


It's everyone's turn.



Setting—the whole elephant

- **Most Variable hydrology**
 - Year to year
 - Location to Location
 - Time of year
- **Mix of sources**
 - Surface Water local or imported (storage/conveyance)
 - Groundwater (intensely local)
 - Every locale different mix
 - Mix of water rights varies greatly
 - Impact of drought varies greatly
- **Climate change and other drivers as game-Changers**
 - **Requires multi-decade view**
- **Mix of solutions**
 - Conservation/Recycling/Stormwater/Desal
 - Integrated Water Management in regions and statewide
 - Storage, storage, storage, storage and other infrastructure improvements
- **Drought**
 - Worst in impact in modern history
 - 3rd re precip
 - More pop; more irrigated ag; more endangered and threatened species make impact greater than '24 & '77
 - 2015 far worse despite December/February rains because of temperature=dismal snowpack



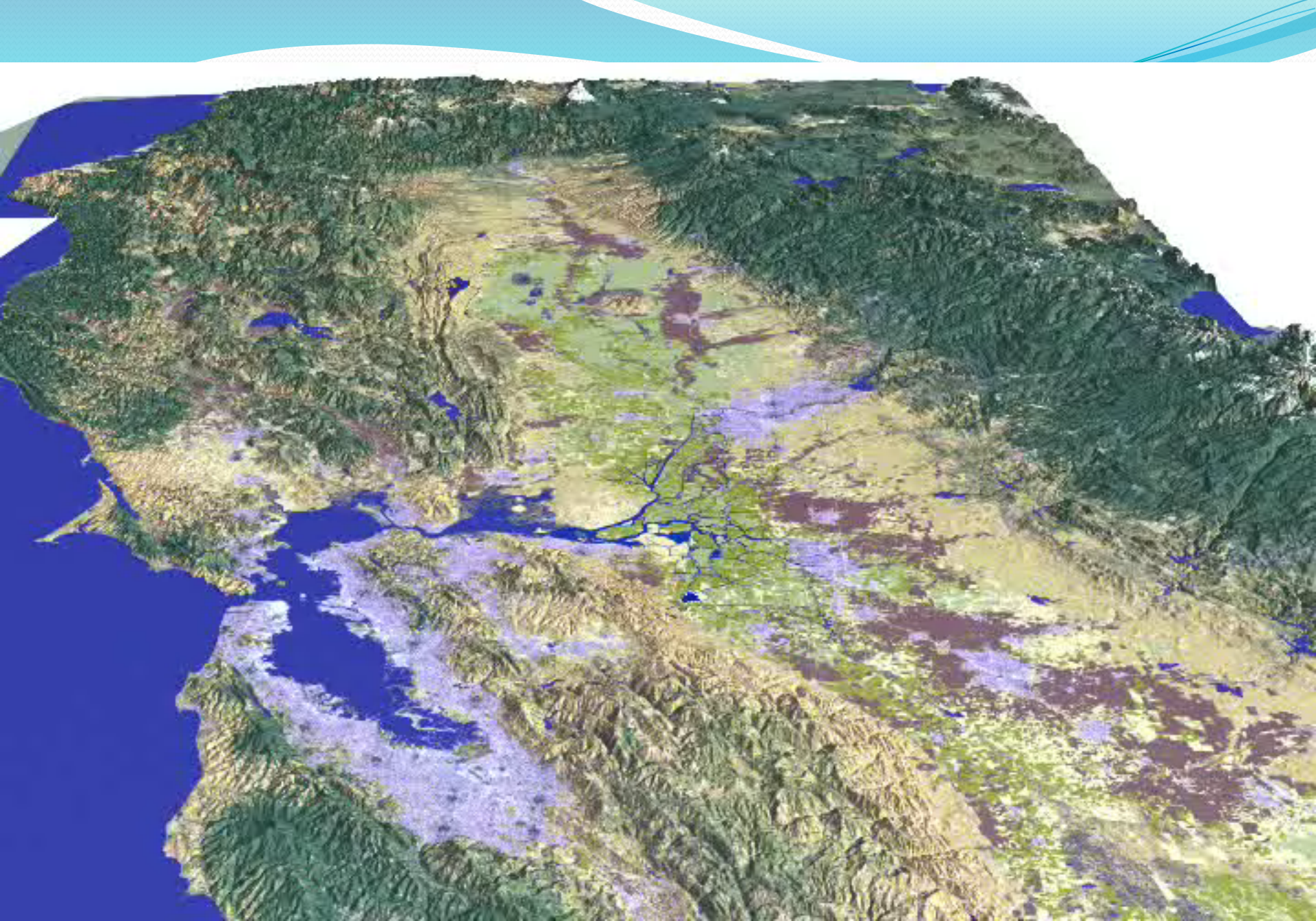
wiseGEEK

Major Water Projects

- 💧 Federal – Central Valley Project (CVP)
- 💧 State – State Water Project (SWP)
- 💧 Local – Many other projects throughout state, including Colorado River system, Hetch Hetchy, EBMUD, Owens Valley

Source: Water Environment Foundation





California Drought 2014

“Beer is proof
that God loves us
and wants us to
be happy.”

Benjamin Franklin

Poor Richard's Almanac



California Drought 2014



When the well is dry, we know the worth of water.

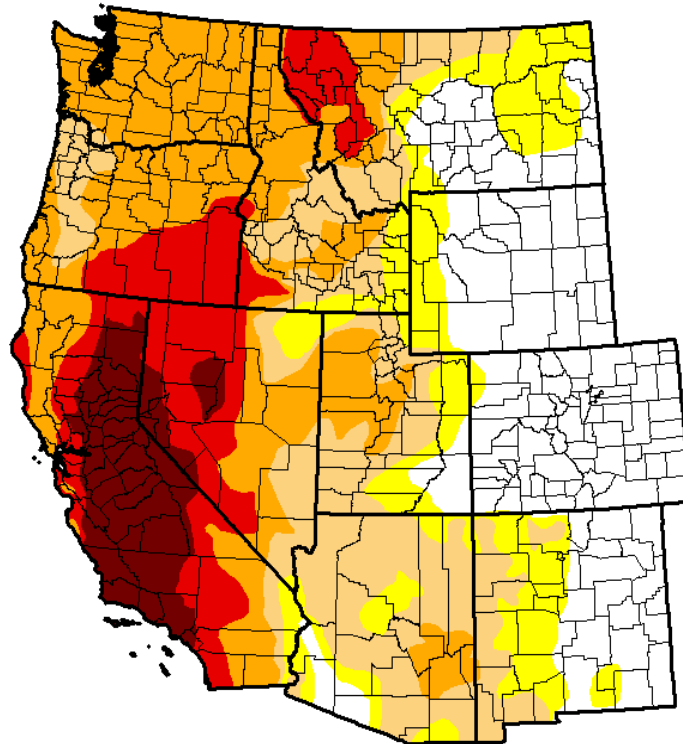
~ Benjamin Franklin

Current crisis: Worst drought in modern times

- 2013 “driest” year on record; January 2014 driest January; 2014 record heat with less precip some places; a bit more others
- Snowpack fraction of average or non-existent
- Reservoirs low—some slightly better, some much worse
- December and February rains welcome, but not enough, and snowpack abysmal so no recovery in sight
- Third worst on record, with far greater impact than the 1920s or 1970s
- Beyond anything we’ve dealt with, but not what others have
- **Harbinger of things to come—think Australia or Climate Change**

U.S. Drought Monitor West

July 21, 2015
(Released Thursday, Jul. 23, 2015)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	25.49	74.51	61.04	41.92	18.87	7.17
Last Week <i>7/14/2015</i>	25.49	74.51	61.37	43.76	18.87	7.17
3 Months Ago <i>4/21/2015</i>	28.21	71.79	61.51	37.95	17.19	7.95
Start of Calendar Year <i>12/02/2014</i>	34.76	65.24	54.48	33.50	18.68	5.40
Start of Water Year <i>9/09/2014</i>	31.48	68.52	55.57	35.65	19.95	8.90
One Year Ago <i>7/22/2014</i>	27.30	72.70	60.66	47.17	23.19	6.02

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
David Simeral
Western Regional Climate Center



<http://droughtmonitor.unl.edu/>



Jan. 18,
2013

Jan 18, 2013



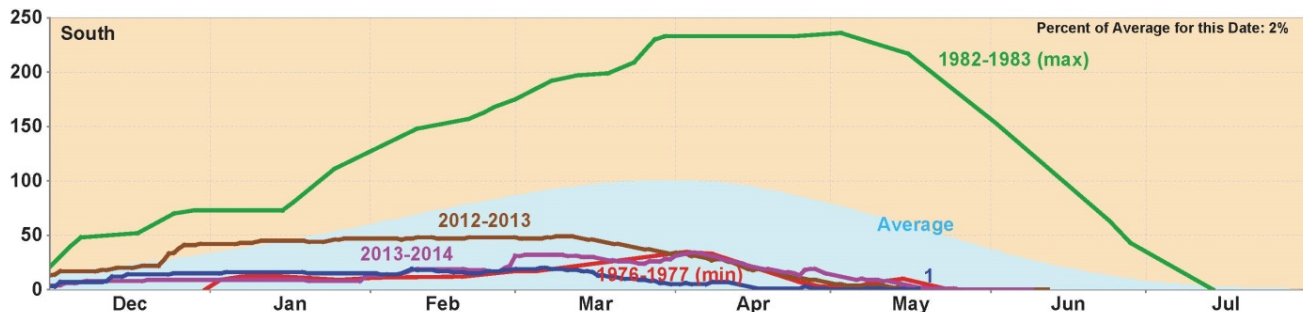
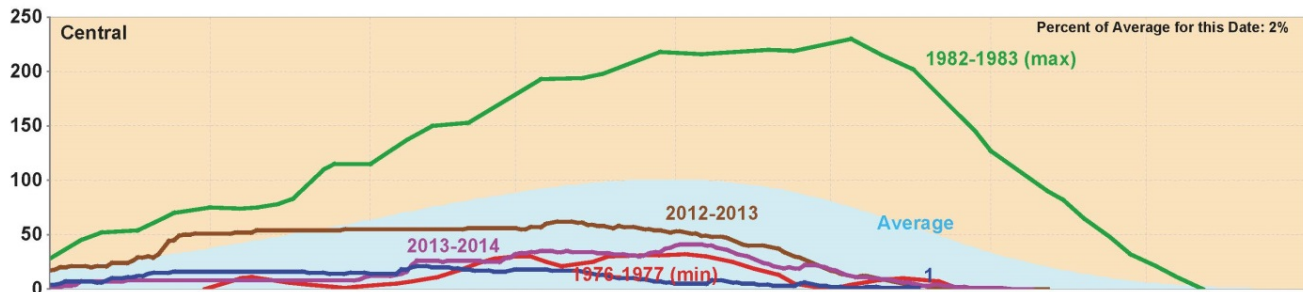
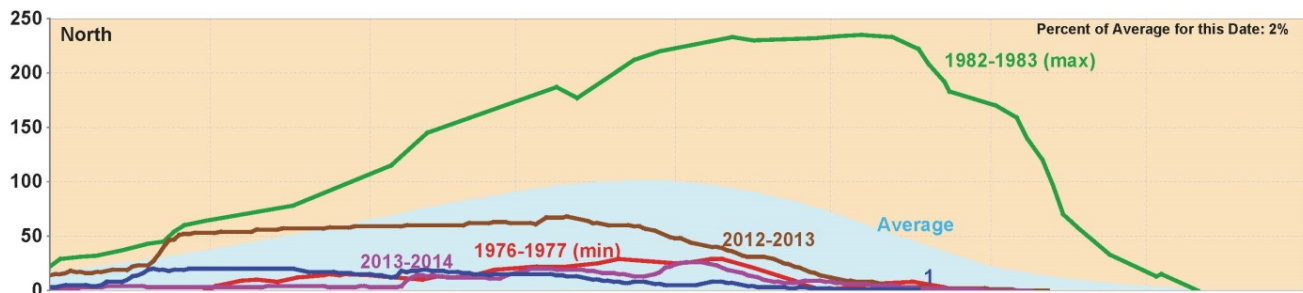
Jan. 18,
2014

Jan 18, 2014



Statewide Snow Water Content

California Snow Water Content, May 18, 2015, Percent of April 1 Average



Selected impacts

- 400,000+ acres fallowed*; more this year
- Diminished yield on others
- 17,000+ out of work directly connected to agriculture
- Groundwater levels dropping precipitously
- Communities running out of drinking water
- Fish and wildlife impacts across the board
- Increased wildfires=\$\$, ecological devastation, air, land, and water impacts now and into future
- 5-10x worse without groundwater

Selected Actions—

- Drought Task Force
- Emergency Orders—Governor Brown February 2014/April 2014/Sept 2014/April 2015
- Emergency Legislation--\$680m (2014) \$2+b (2015)(includes Prop 1 acceleration)
- Disaster relief—Food and Water
- State Federal coordination:
 - Real-time operations team/Federal-State coordination calls
 - Temporary flow adjustments to water right permits and adjustments to implementation of federal biological opinions
 - Contract water allocation cutbacks by state and federal projects

Actions—con't

- Water rights implementation: “Curtailments” of junior water rights holders in favor of their seniors; even seniors junior to other seniors
- Adding supply →
 - IRWM \$\$\$
 - Recycled water advancement
 - 1% financing through SRF (\$800m/150,000 af/yr)
 - Streamlined permitting at state and regional level
 - SB322 timeline: groundwater recharge/indirect potable/direct potable feasibility report
- Fish and Wildlife rescues/voluntary agreements
- **Water Conservation—statewide regulations on urban water purveyors and SaveOurWater.com campaign**

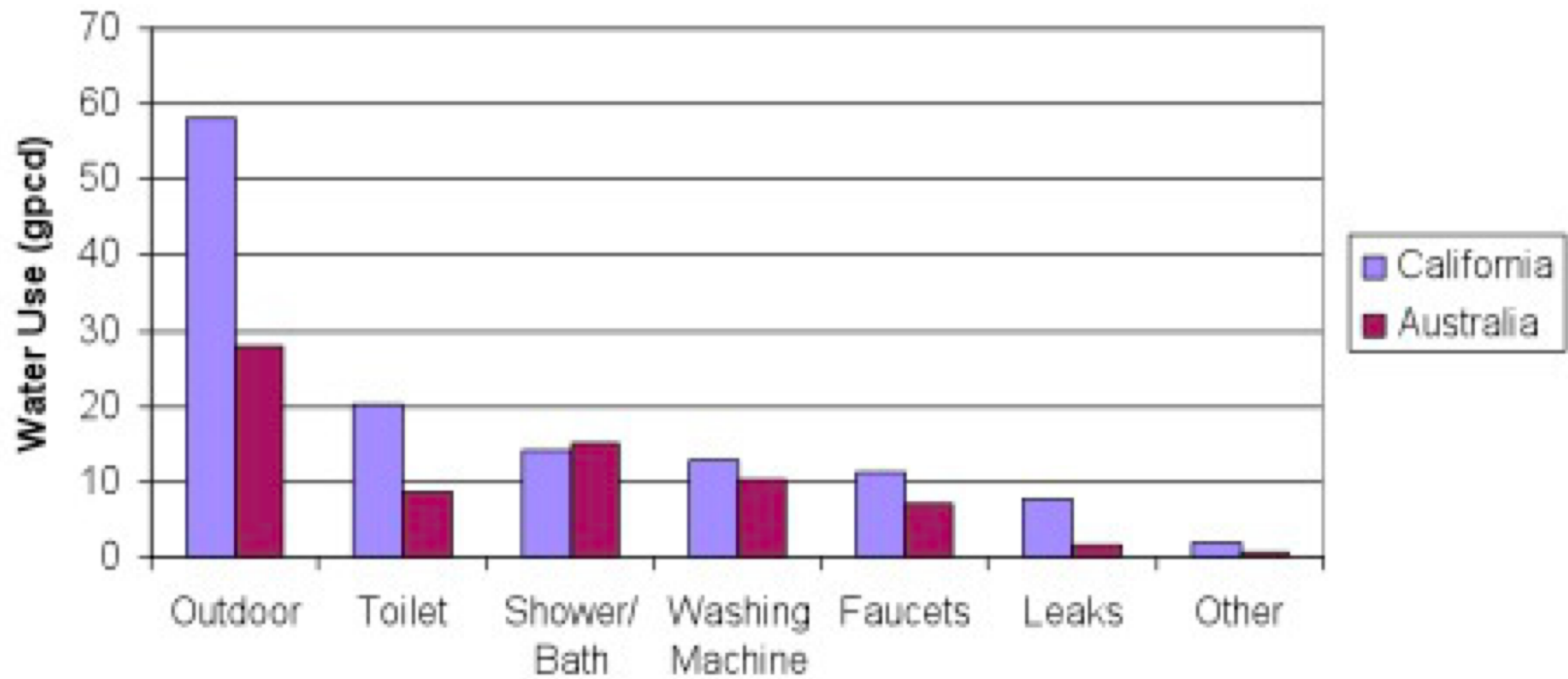


Think Australia, or Sao Paulo, or Tulare

- Have to assume it won't end in any "normal" cycle
- Australian advice
- Sao Paulo experience
- Pray for best but plan for worst



Californian and Australian End Uses of Water



How we're doing

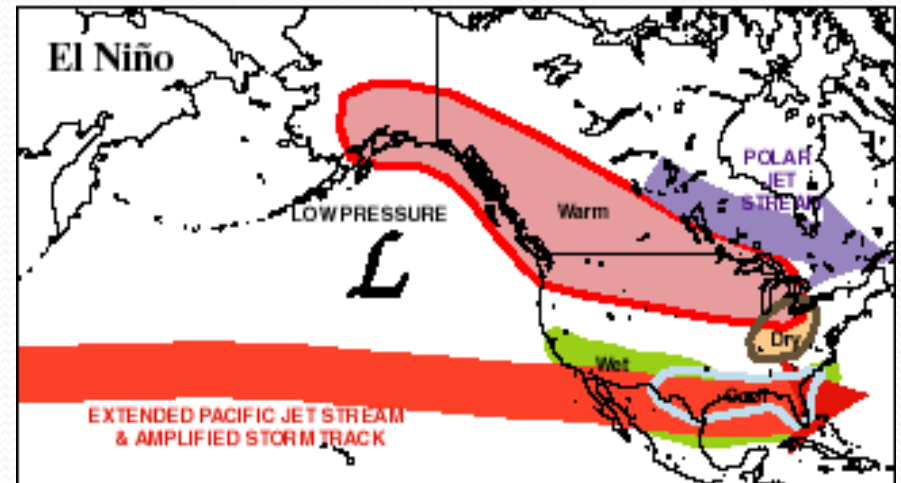
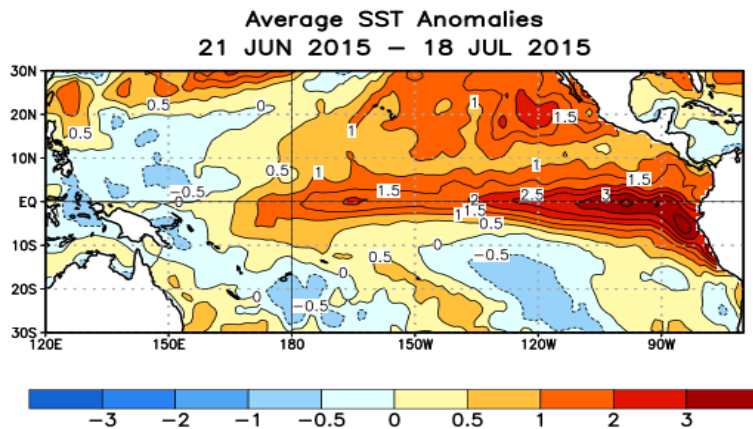
- Effective and rapid conservation—*results*
- *July Average was 31%!* But we needed it to be
- Progressive enforcement—*notices/info orders/conservation orders/fines*
- Acceleration of recycling and stormwater capture programs and integrated water management of all kinds.
- Turf replacement demand through the roof—MWD program deserve kudos.



El Nino for Winter 2015/16?

Enough already.....

<http://www.wrh.noaa.gov/sto/climate/>

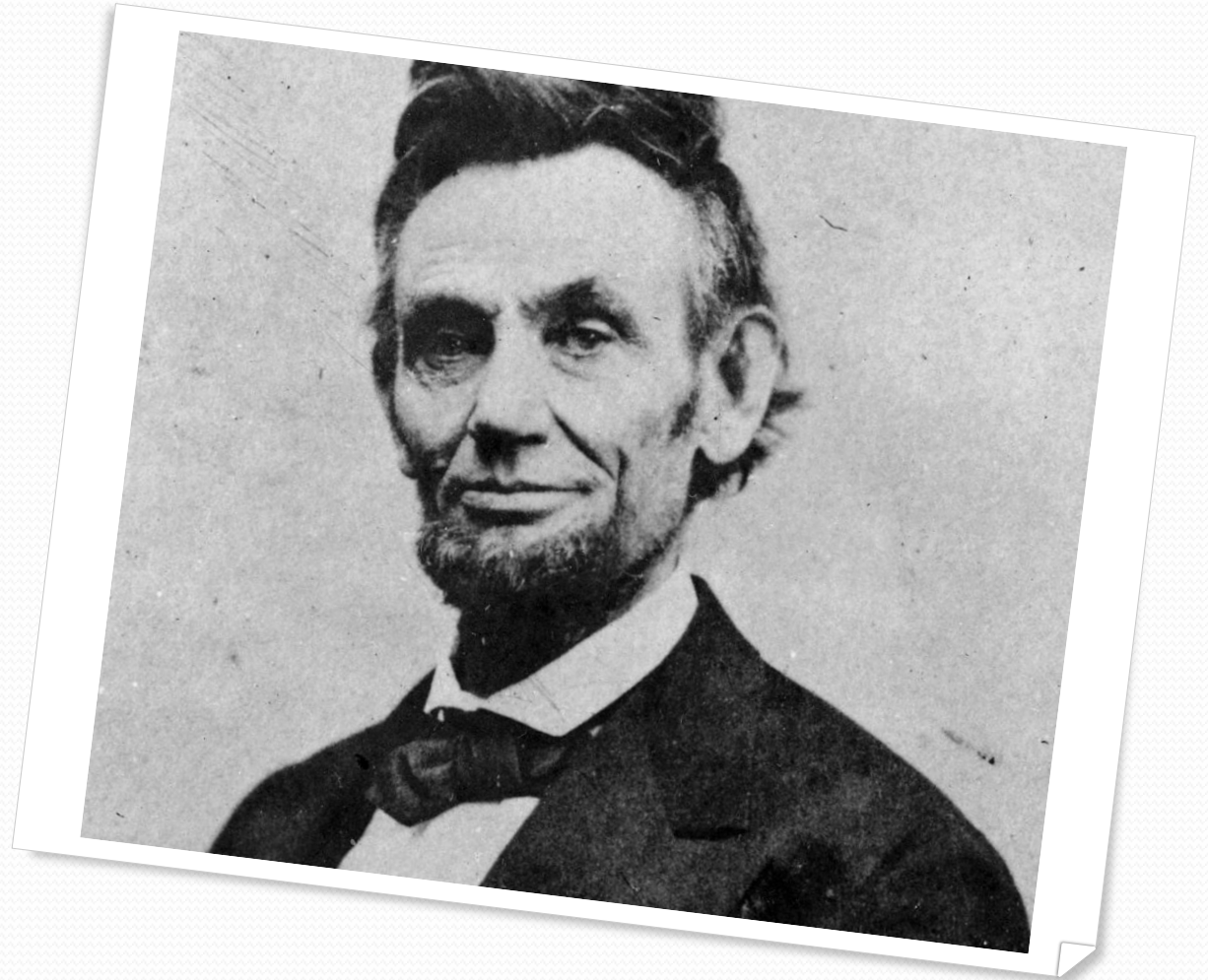


What's it gonna be?



Dealing with reality

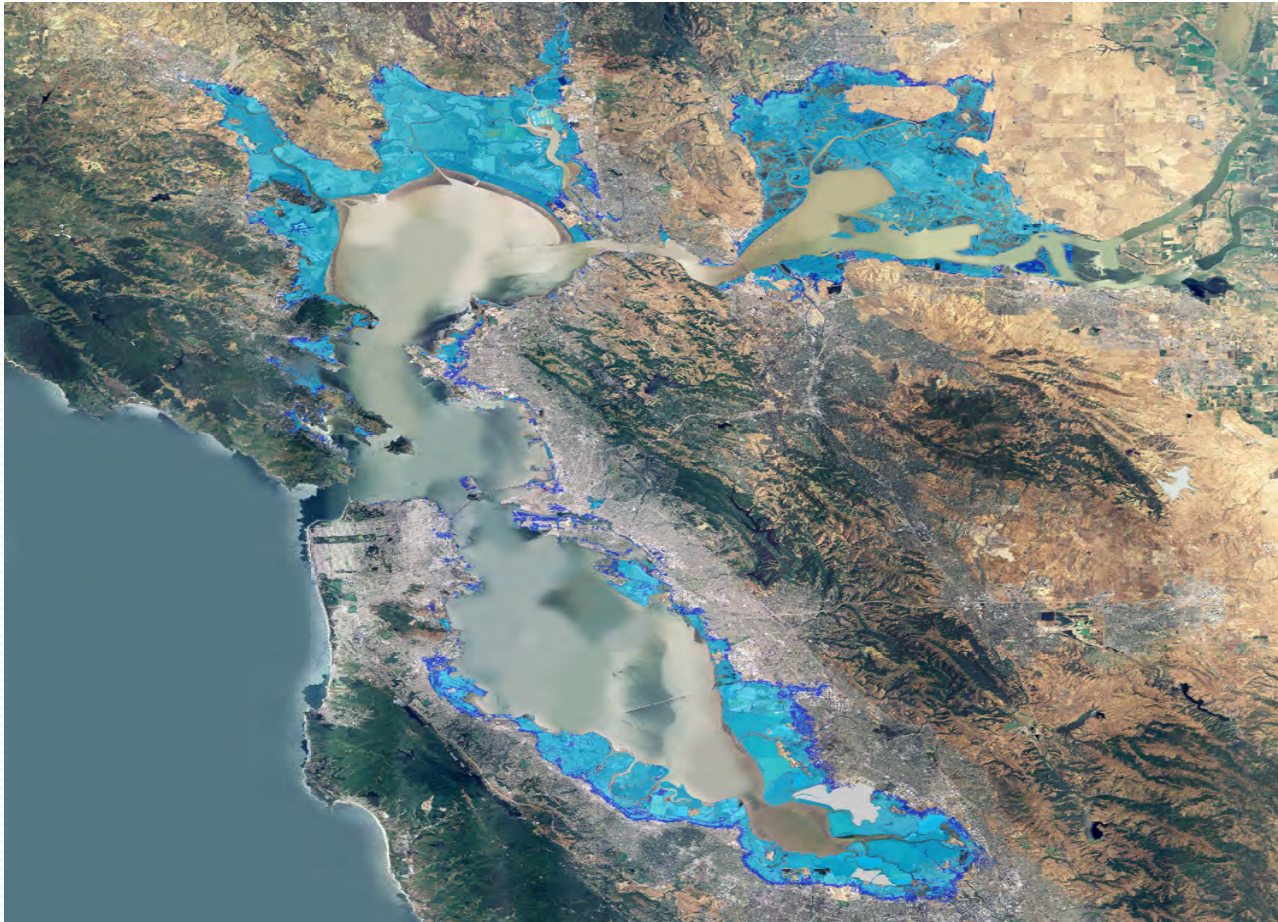
“I am a firm believer in the people. If given the truth, they can be depended upon to meet any national crisis. The great point is to bring them the real facts, and beer.”



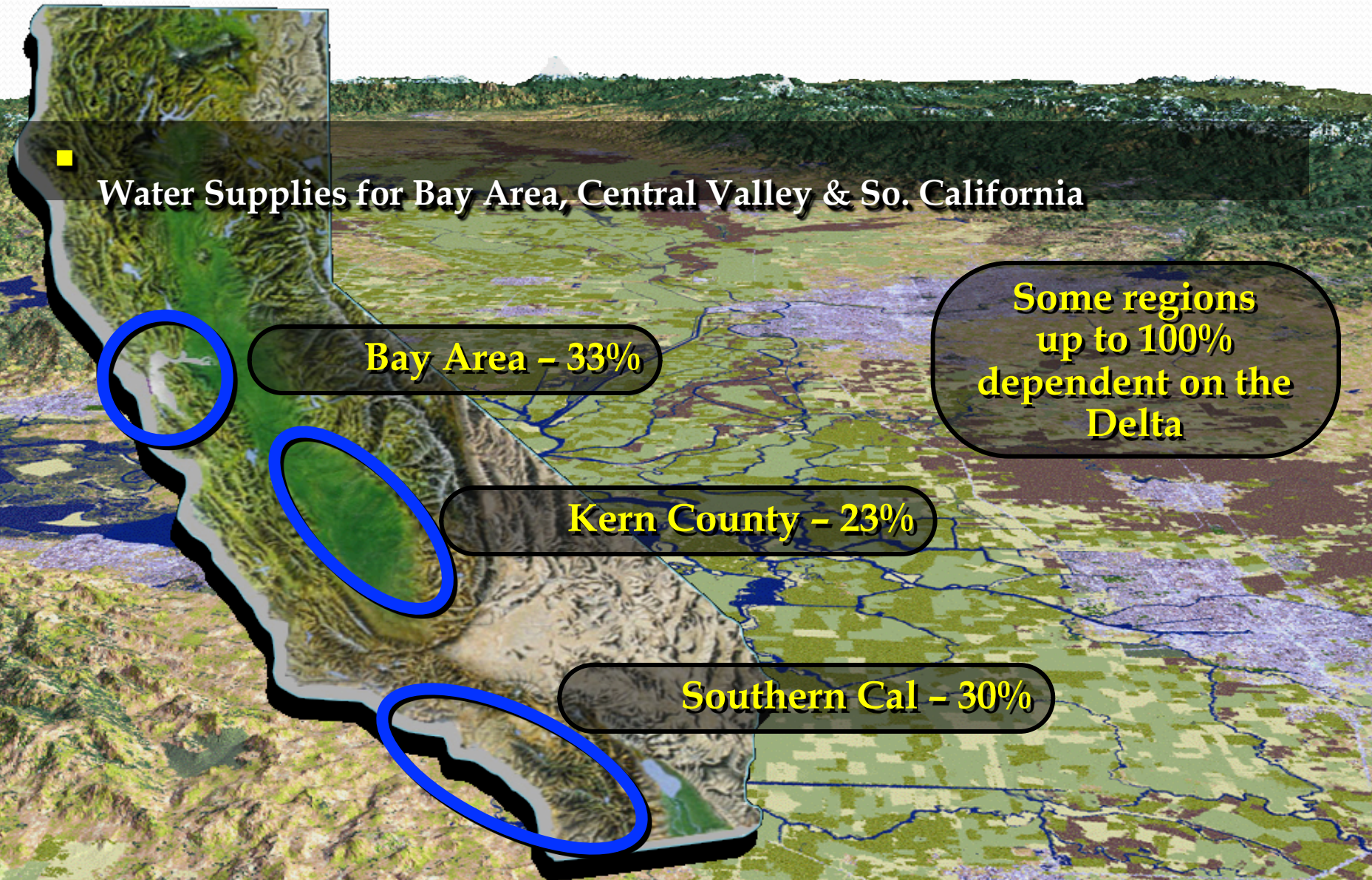
Reality: Loss of snowpack



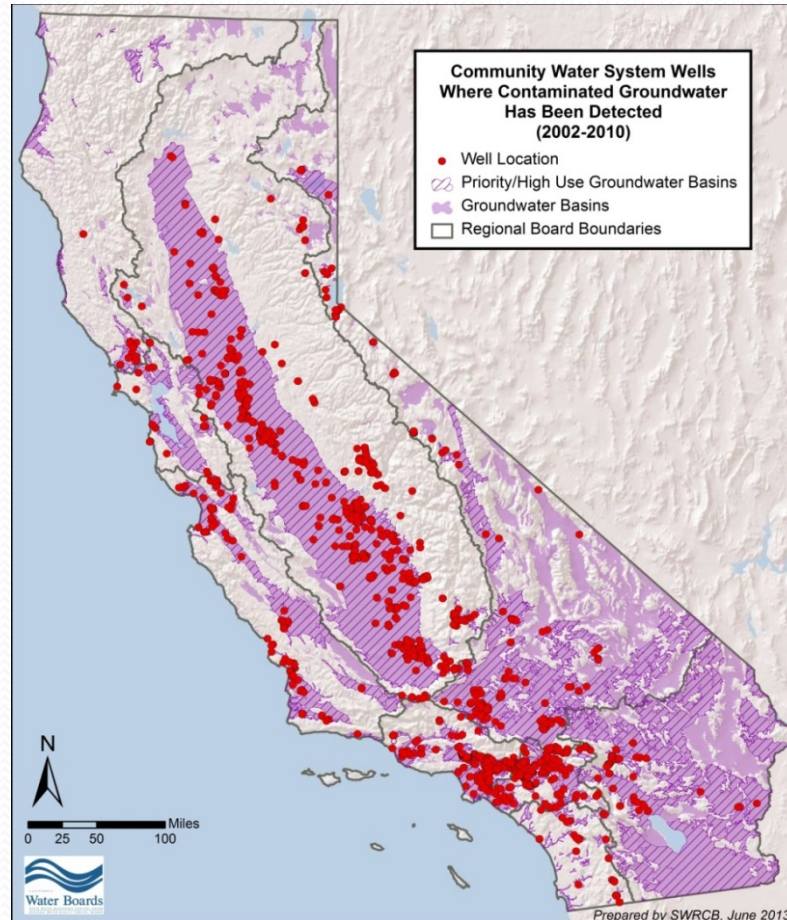
Reality: Sea Level Rise



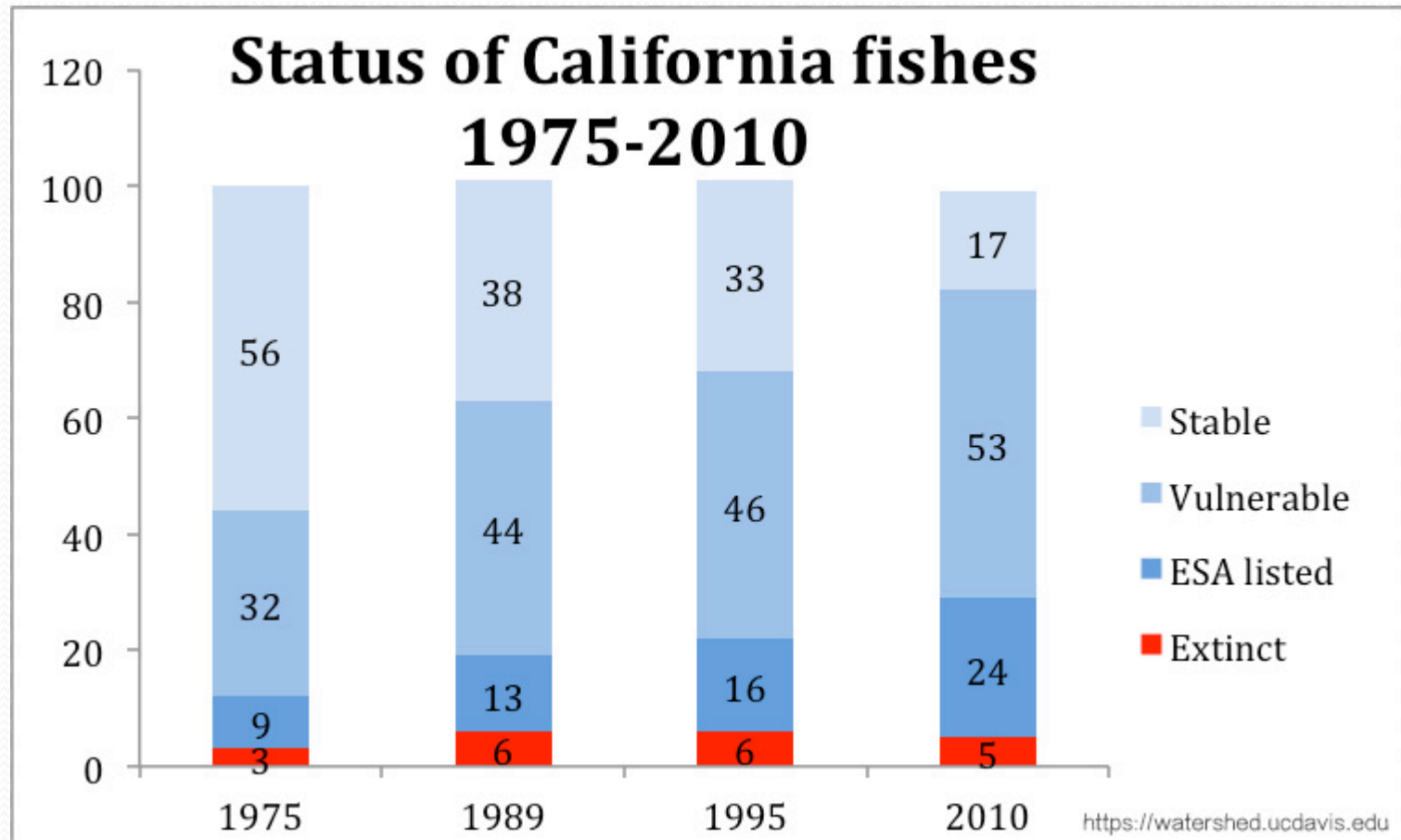
Reality: It matters



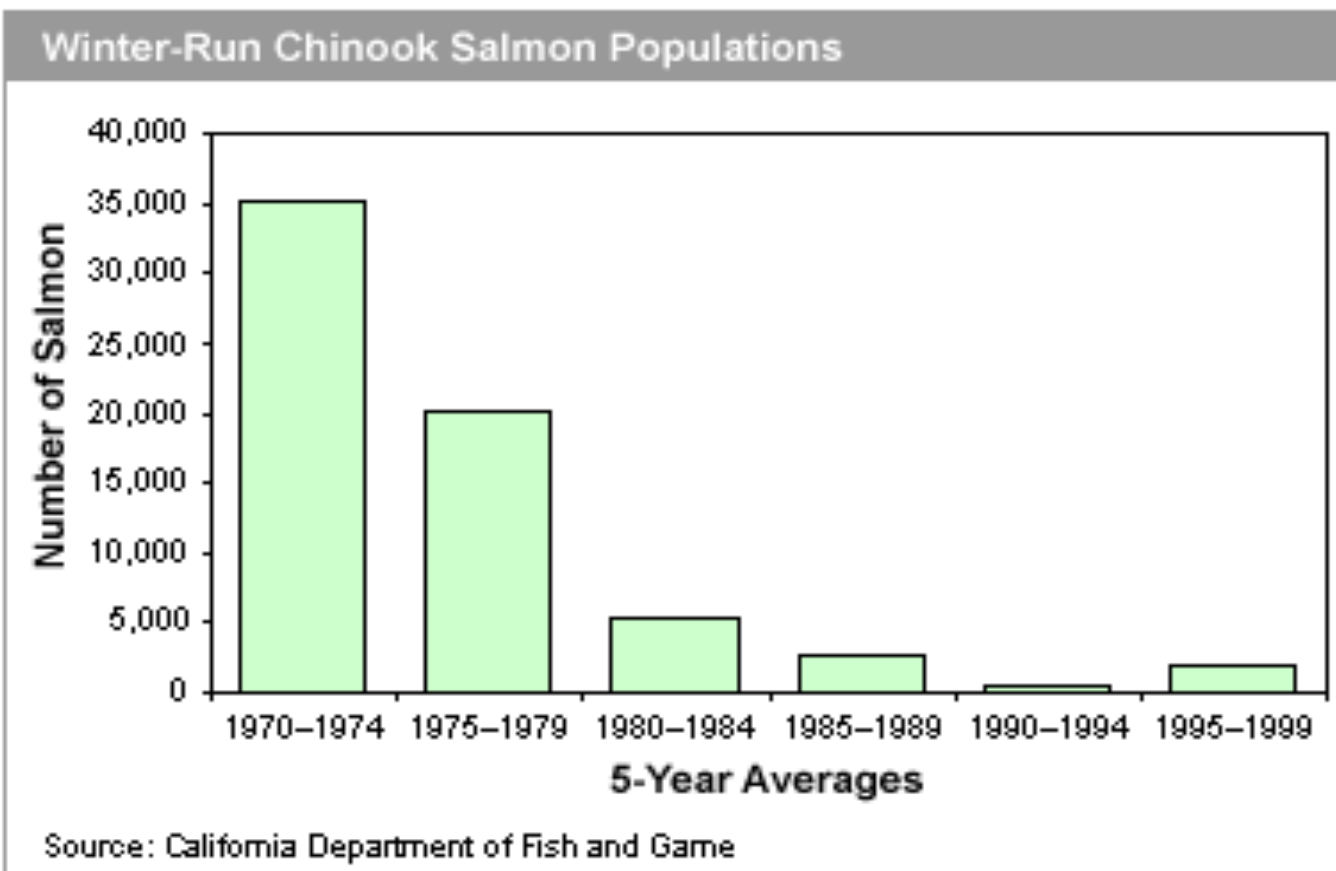
Reality: Community Well Systems Where Contamination has been Detected



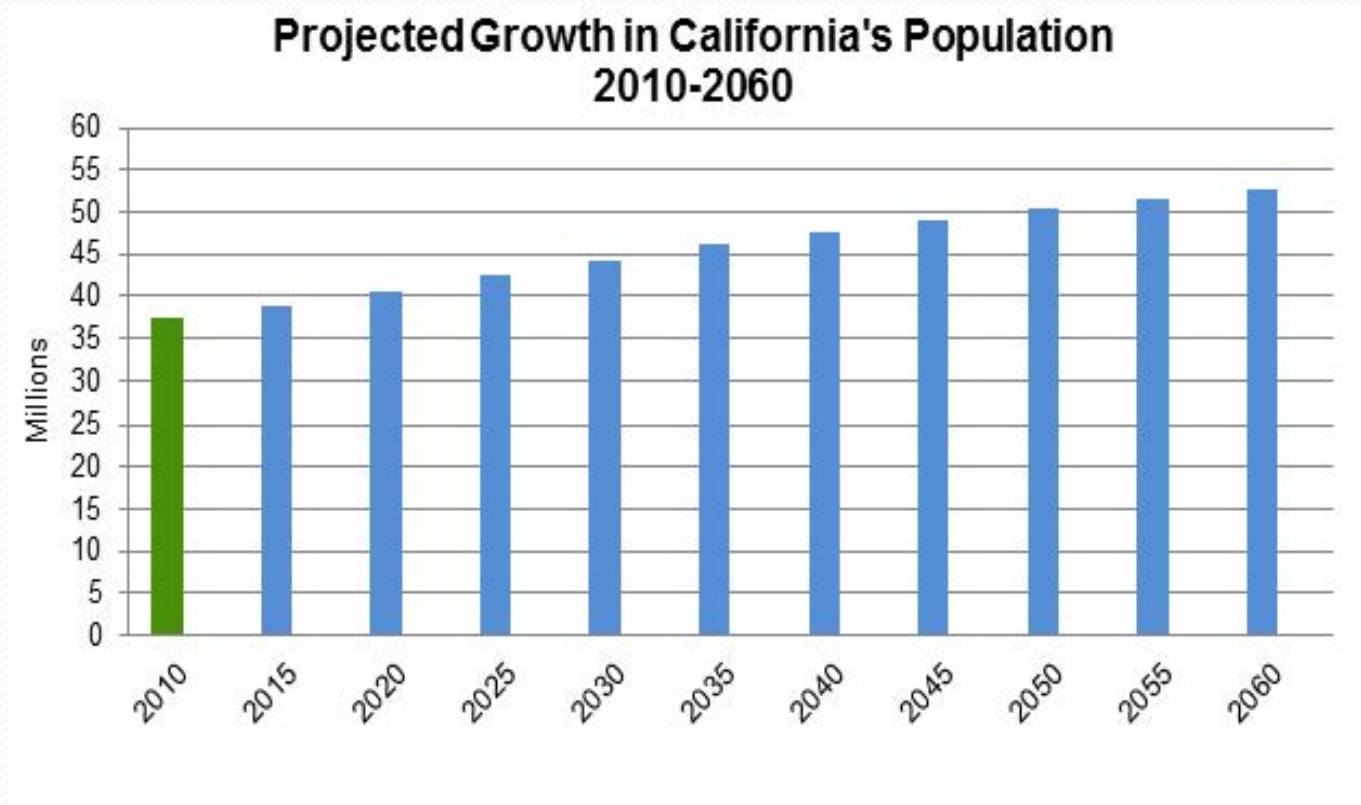
Reality: Fish and wildlife are in trouble



Reality: Fish and wildlife are imperiled



Reality: Population will rise



- Source: Department of Finance; Controller Betty Yee website

**Reality: Lack of
statewide
groundwater
management has
been a problem**



Reality: We can do something about it

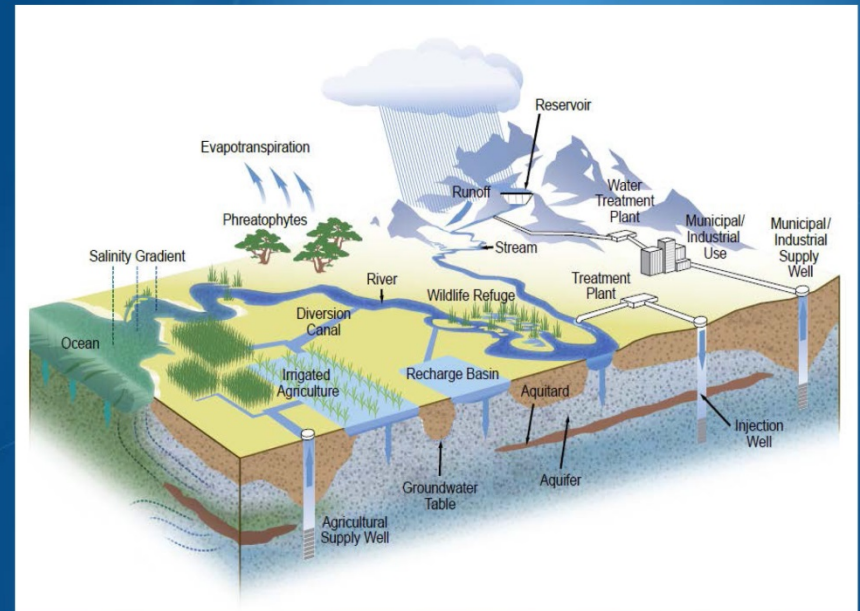


Water 4.0

The Past, Present, and Future of the World's Most Vital Resource

David Sadlo

A Call to Integrate Interconnected Systems Require Integrated Solutions



Reality: We can do something about it

Forests and Water in the Sierra Nevada: Sierra Nevada Watershed Ecosystem Enhancement Project

Roger C. Bales, John J. Battles, Yihsu Chen, Martha H. Conklin, Eric Holst, Kevin L. O'Hara, Philip Saksa, William Stewart

November 29, 2011



Sierra Nevada Research Institute,
UC Merced

Center for Forestry,
UC Berkeley

Environmental Defense
Fund



Reality: We are doing something about it

- Myriad Individual acts of transcending traditional silos
 - Integrated Regional Water Management
 - Drought “angels”
 - Fish/farmer win/wins
- Legislative agreements, e.g.,
 - “Human right to water”
 - 2009 legislation/“coalition of the willing“
 - Groundwater legislation
 - Water Bond
 - Move of drinking water program and creation of Office of Sustainable Solutions
 - More enforcement and information gathering authority over water rights including seniors
- Local leadership
 - Conservation heroes
 - Stormwater capture/Recycled water/Contaminated basins—and other integrated solutions
- Water Action Plan—see next slide

“Our relationship with water has to evolve.”

Los Angeles Mayor Eric Garcetti, October 14, 2014



We have to think differently....





Planning

Mid and Long Range



California Water Action Plan

California Water Action Plan



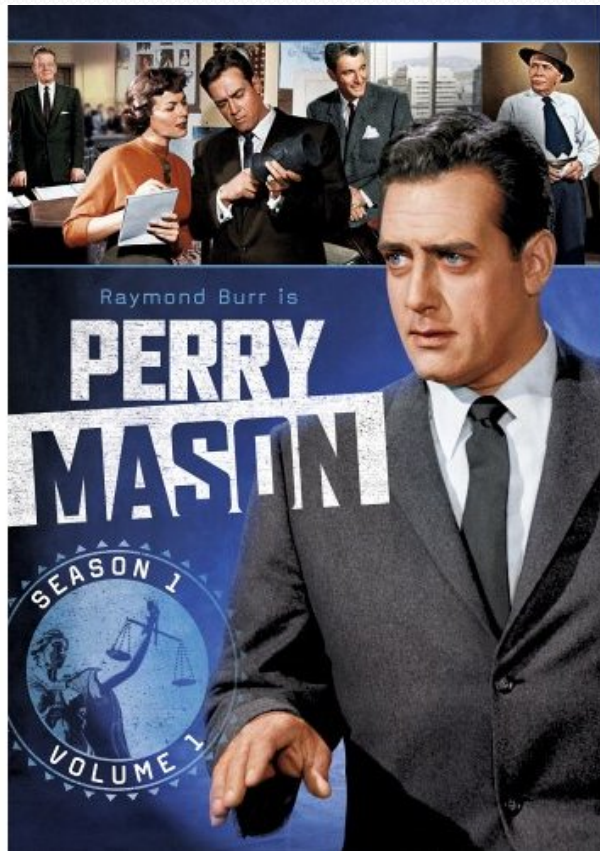
- Make Conservation a California Way of Life
- Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
- Achieve the Co-Equal Goals for the Delta
- Protect and Restore Important Ecosystems
- Manage and Prepare for Dry Periods
- Expand Water Storage Capacity and Improve Groundwater Management
- Provide Safe Water for All Communities
- Increase Flood Protection
- Increase Operational and Regulatory Efficiency
- Identify Sustainable and Integrated Financing Opportunities

Water Bond 2014



- Water Quality, Supply, and Infrastructure Improvement Act of 2014 – \$7.545B
- Hard fought, but near unanimous vote at end
- Real mix of “all of the above”
Down-payment on full needs, but a lot that is good, visible, and paves way for next round

What it will take



www.saveourwater.com





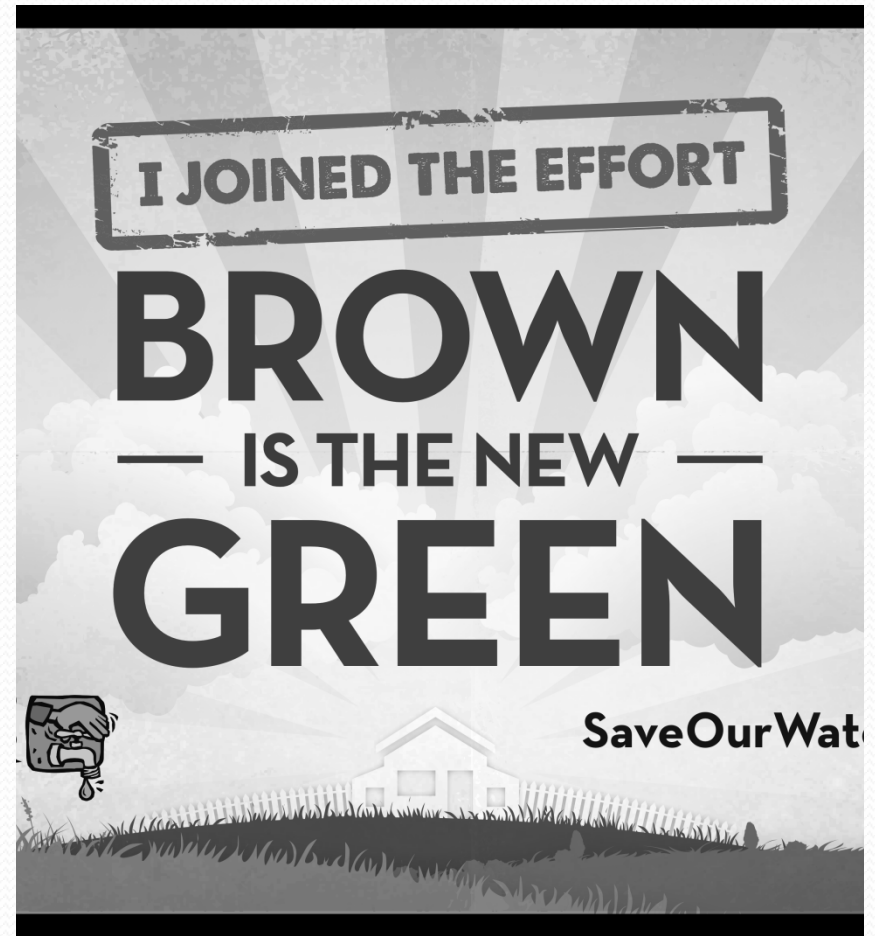
To Do List:

- Turn sprinklers off
- Mulch around trees
- Fix leaky toilet

Visit  CA, California


KEEP SAVING  **CA**
saveourwater.com

Save Our Water



I JOINED THE EFFORT

BROWN
— IS THE NEW —
GREEN

 Save Our Water

Thank you!!!

