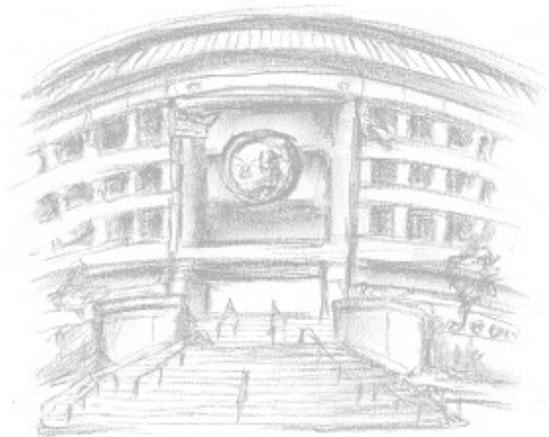




# The Western Drought



## California Public Utilities Commission

**Rami Kahlon, Director**

**Water Division**

**July 13, 2015**





# The Drought in California

- Topics
  - Drought Overview
  - Government Agency Actions
  - Commission Actions
  - Outlook
    - Short Term
    - Long Term





# California's drought; How bad is it?

- It's bad.
  - Fourth, or eighth, year of drought
  - **January 2014** – Drought State of Emergency declared by Governor Brown
    - 20% voluntary conservation
      - » Governor Schwarzenegger first proclaimed a drought on June 12, 2008
      - » Governor Brown declared the drought over on March 30, 2011
        - » 2011 was a wet year
        - » Four dry years followed



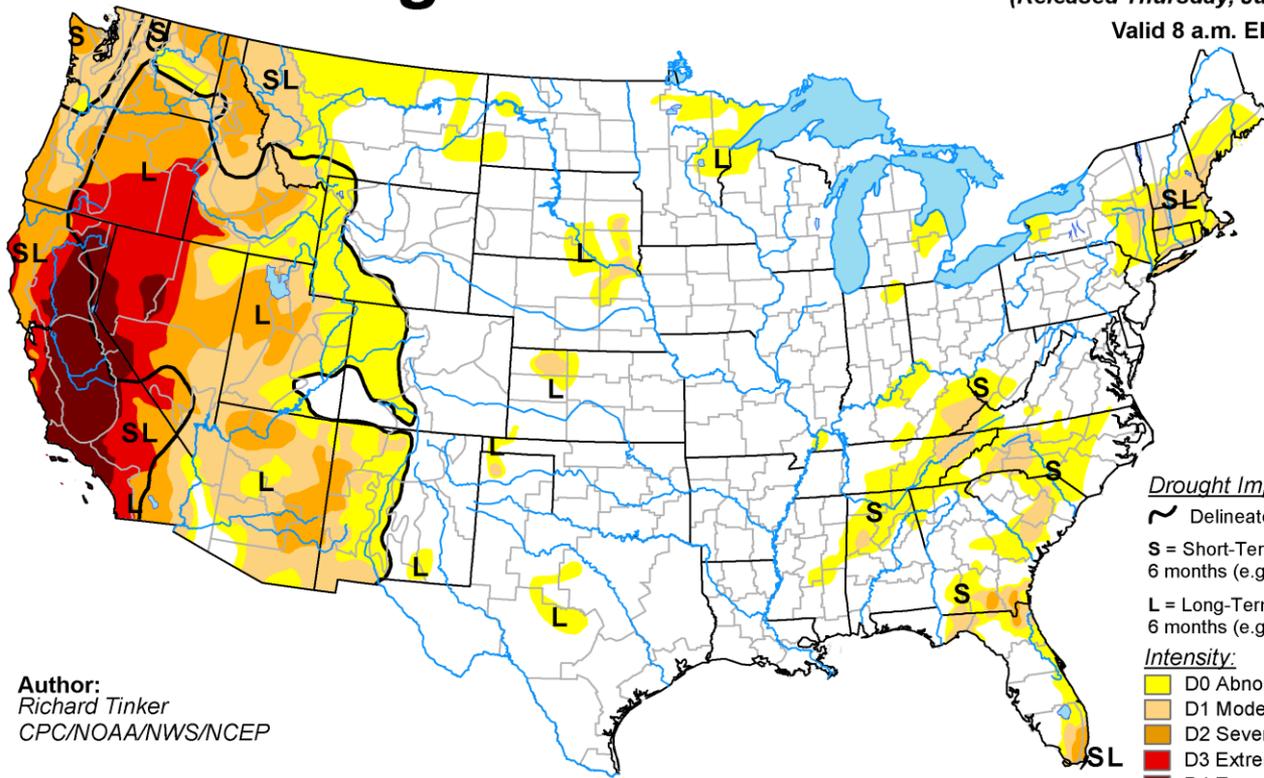
The drought is taking a toll on California





# U.S. Drought Monitor

**June 23, 2015**  
 (Released Thursday, Jun. 25, 2015)  
 Valid 8 a.m. EDT



**Author:**  
 Richard Tinker  
 CPC/NOAA/NWS/NCEP

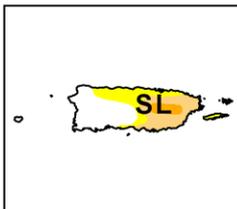
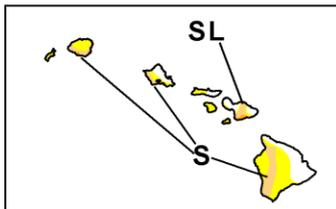
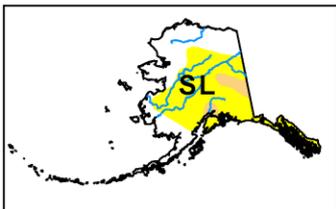
Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

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.*



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





# April 1, 2015 Snow Pack



“Today we are standing on dry grass where there should be five feet of snow. This historic drought demands unprecedented action,” said Governor Brown. “Therefore, I’m issuing an executive order mandating substantial water reductions across our state. As Californians, we must pull together and save water in every way possible.”

April 1 at “Phillips Snow Course”  
Avg. 66.5 inches of snow  
**1983:** 151 inches of snow (**high**)  
**1988:** 1 inch of snow (**low**)  
**2015:** 3 inches of snow



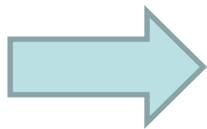
Snowpack accounts  
for 30% of  
California’s water  
supply





# CPUC Jurisdiction

- The Commission is responsible for ensuring that investor-owned water utilities deliver clean, safe, and reliable water to their customers at reasonable rates.
- 114 investor-owned water utilities and 13 investor owned sewer utilities under Commission jurisdiction,
- Provide water service to approximately 6 Million California residents, 16 percent of the population.
- \$1.3 Billion in revenues, 1.4 Million service connections



As the CPUC is the only state agency with retail water providers under its jurisdiction, the Governor looks to the CPUC to lead the way.





## ■ California's Water Supply

- Sierra Mountain Range
- Delta
- Colorado River
- Ground Water
- Storage Reservoirs



In 2015, California received 76% of normal rainfall, but only 5% of normal snowfall.





# 2015 Statewide Drought Analysis

- Study conducted by the University of California – Davis and ERA Economics – May 2015

## Findings

- Water Availability
  - 8.8 maf short – surface water
  - 6.2 maf additional groundwater pumping
  - 2.6 maf net short
    - 1.6 maf short in 2014
- Agriculture Economic Impacts
  - 564,000 acres fallowed
  - \$2.7B in total economic costs
    - \$558M in additional groundwater pumping costs



Groundwater sustains California in dry and wet years alike





## Where we are today

- **April 1, 2015** – Governor Brown Executive Order
  - Calling for a 25% reduction in potable urban water use
  
- **May 5, 2015** - State Water Resources Control Board
  - Emergency Regulation adopted
    - Targeted reductions for the top 410 water agencies
      - » Serving 85% of California's population
    - Water Use Restrictions
    - 4% to 36% system-wide water usage reductions
      - » Based on July – Sep 2014 reported figures
      - » Base year 2013
  - Monthly Water Use Reduction Monitoring Reports



Goal is to save 1.5 million acre feet of water in 2015.





# Emergency Regulation



## Prohibited for Everyone

- Using potable water to wash sidewalks & driveways
- Runoff when irrigating with potable water
- Using hoses with no shutoff nozzles to wash cars
- Using potable water in decorative water features that do not recirculate the water
- Using outdoor irrigation during & 48 hours following measurable precipitation
- Using potable water to irrigate ornamental turf on public street medians
- Using potable water to irrigate landscapes of new homes & buildings inconsistent with CBSC & DHCD requirements

## Required for Water Suppliers

- Achieve designated conservation standard (4%-36%)
- Notify customers about leaks that are within the customer's control
- Report on water use, compliance & enforcement

## Required for Business

- Restaurants & other food service establishments can only serve water to customers on request
- Hotels & motels must provide guests with the option of not having towels & linens laundered daily





# How about Agriculture?

- State Water Project
  - 20% of requested deliveries in 2015
  - 5% in 2014
- Central Valley Project
  - Zero water deliveries.
  - Two years in a row
- Surface Water – streams and rivers
  - Mostly curtailed now across the state
- Groundwater



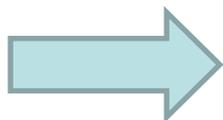
Agriculture is also impacted.





# Commission Actions

- May 7, 2015 - California Public Utilities Commission
  - Adopted Resolution W-5041
  - Orders compliance with State Board EO
  - Must file Schedule 14.1 to implement Mandatory Rationing
    - Penalty rates
    - Drought Surcharges
    - Limits based on consumption
    - Fines
  - Go beyond the State Board's requirements in some cases



CPUC regulated water utilities are responding –  
Expectation is that they meet / exceed water use  
reduction goals.





## How are we doing?

- **May 2015**
  - 29% overall water use reduction compared to May 2013
    - Up from 13.6% reduction in April
  - Statewide R-GPCD is 87.5 gallons
  - From June 2014 to May 2015 – Over 728,000 acre feet of water were saved.
- **Caveats for May 2015**
  - Lower temperatures
  - Some rainfall
- **Mandatory reductions became effective June 1, 2015**
  - Monthly reporting and monitoring will continue.



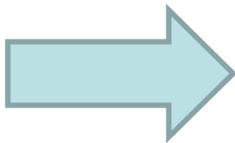
Californians are responding to the conservation call – so far.





## Outlook: 2015

- Expected El Nino – warming of the water temperatures
  - No guarantee of above average rainfall
- 150% of normal winter to get us out of the drought
- Rainy months; November through March
- Colder Temperatures needed
  - For snow



Another dry winter will compel even greater conservation efforts, fallowing of farm fields, reduction in water intensive activities, possible extinction of fish species.





# Outlook: A Prolonged Drought

- What if this time is different?
- “Economic Consequences of Optimized Water Management for a Prolonged, Severe Drought in California” – Harou et al. (2010)
- Geologic evidence suggests that California has experienced two prolonged droughts lasting 120 – 200 years.
- Study
  - Synthesized a 72 year drought
    - Using recorded dry year records
  - 53% of historical hydrological inflows (1922 – 1993)
  - Exceptional wet years were excluded from the model
  - Economic effects / potential adaptation in year 2020





# Outlook: A Prolonged Drought

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# Outlook: A Prolonged Drought

- Hydroeconomic Model – accounts for;
  - California's entire intertied water supply system including reservoirs, conveyance infrastructure, wastewater reuse and potential desalination facilities.
- Three scenarios;
  - **Base** (current hydrological conditions) – Operations / allocations are constrained
  - **Historical** (current hydrological conditions) – Institutional flexibility / economically driven
  - **Drought** (extreme drought) – Institutional flexibility / economically driven





# Outlook: A Prolonged Drought

- **Results**
  - Current water system/infrastructure is adaptable for a severe prolonged drought.
  - Water markets will enable water supply system – no significant catastrophic disruption.
  - Agriculture and the environment will suffer.
  - Requires institutional flexibility and use of water markets / other allocation methods.





# The Western Drought

*Thank you!*

**California Public Utilities Commission**

