California’s Water Challenges: Lessons from the Current Drought

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Caitrin Chappelle, Associate Center Director

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Droughts and floods are a recurring feature of California’s variable climate.

Average annual precipitation

SOURCE: Western Regional Climate Center
California is four years into a severe drought

SOURCE: California Department of Water Resources.
California is getting warmer, increasing risks to the economy and environment

This year’s snowpack is lower than predictions for late 21st century

Governor Brown’s Executive Order
April 1, 2015

SOURCE: Cayan, Dan et al. (2009), CA Climate Adaptation Strategy

2070-2099, Medium Warming Scenario
25% remaining

April 1 snow water equivalent

~0 inches 15 30 45

SOURCE: Cayan, Dan et al. (2009), CA Climate Adaptation Strategy
What about El Niño?

- El Niño is an unreliable predictor
- Multiple wet years needed to recover
- Understanding likely impacts can help reduce harm

Droughts reveal strengths and deficiencies in water management

- **Good News:**
  - Limited urban problems (so far)
  - Better performance thanks to planning, investments

- **Bad News:**
  - Painful agricultural reductions
  - Supply emergencies in small communities
  - Environmental water crisis (fish, birds)
We are meeting conservation targets in most regions
California’s major cities have become more resilient since the last major drought

- So far...
  - Investments paid off
  - Regional cooperation
  - Conservation working
  - Cultural change

- Looking forward...
  - Supplies more constrained
  - Pricing restrictions (Prop 218) and affordability issues
  - Water quality investments needed
But smaller rural communities around the state say supply emergencies

- So far...
  - 2,000+ dry domestic wells, 100+ small systems in trouble
  - Strong emergency response
  - But time lags still too long

- Looking forward...
  - Increase in dry wells
  - Worsening air quality
  - Economic hardship
The drought motivated statewide progress on some fronts:

- Groundwater management
  - SGMA
  - Adjudication
- Measuring and reporting of water use and leakage data
- Small system consolidation
So, what’s next?
An “all of the above” approach to adapt to water scarcity

- **Diversify supplies**
  - Recycled water, stormwater capture, desal, etc.
- **Manage demand**
  - Behavior changes, efficiency advances, etc.
- **Expand water trading**
- **Enhance water storage**

Anaheim Lake, a groundwater recharge basin
Growing water quality challenges require innovative solutions

- New and growing regulatory mandate to manage pollution, not just drainage
- Costs are rising as regulations get stricter
- Smaller systems face high burdens
- Constitutional reforms make it hard to pay

The Los Angeles River watershed is expected to reach “zero-trash”
Integration is needed to improve performance of entire water system

- California’s system is decentralized and siloed
- Integration should be both geographic and functional
- Funding needed to:
  - Jump-start collaborations
  - Provide technical and scientific support
- Hard to raise funds from participants (especially local stormwater agencies)

Green Streets are one example of functional integration
Need to go beyond bonds to close critical funding gaps

- Broad and flexible mix of funding sources
- Reforms that make it easier to:
  - Fill critical gaps
  - Prepare for droughts and floods
  - Adopt conservation-oriented and life-line water rates
- ...while maintaining transparency

<table>
<thead>
<tr>
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<th>Annual gap ($ millions)</th>
<th>One-time funds from Prop 1 ($ millions)</th>
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<tbody>
<tr>
<td>Safe drinking water in small rural systems</td>
<td>$30–$160</td>
<td>$260*</td>
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<tr>
<td>Flood protection</td>
<td>$800–$1,000</td>
<td>$395</td>
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<tr>
<td>Stormwater management</td>
<td>$500–$800</td>
<td>$200</td>
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<tr>
<td>Aquatic ecosystem management</td>
<td>$400–$700</td>
<td>$2,845**</td>
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<tr>
<td>Integrated management</td>
<td>$200–$300</td>
<td>$510</td>
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SOURCE: California’s Water: Paying for Water (PPIC, 2015)
The public is paying attention: An opportunity for change?

What Californians see as the state’s top issue:

- Jobs, economy: 52% in March 2012, 20% in May 2015
- Water, drought: 1% in March 2012, 39% in May 2015

SOURCE: PPIC Statewide Survey: Californians and their Government
Interesting days lie ahead, hopefully with lots of clouds*

*And not severe floods
Notes on these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

Caitrin Chappelle, 415-291-4435 (chappelle@ppic.org)
Thank you for your interest in this work.