Building Urban Drought Resilience: Lessons from California

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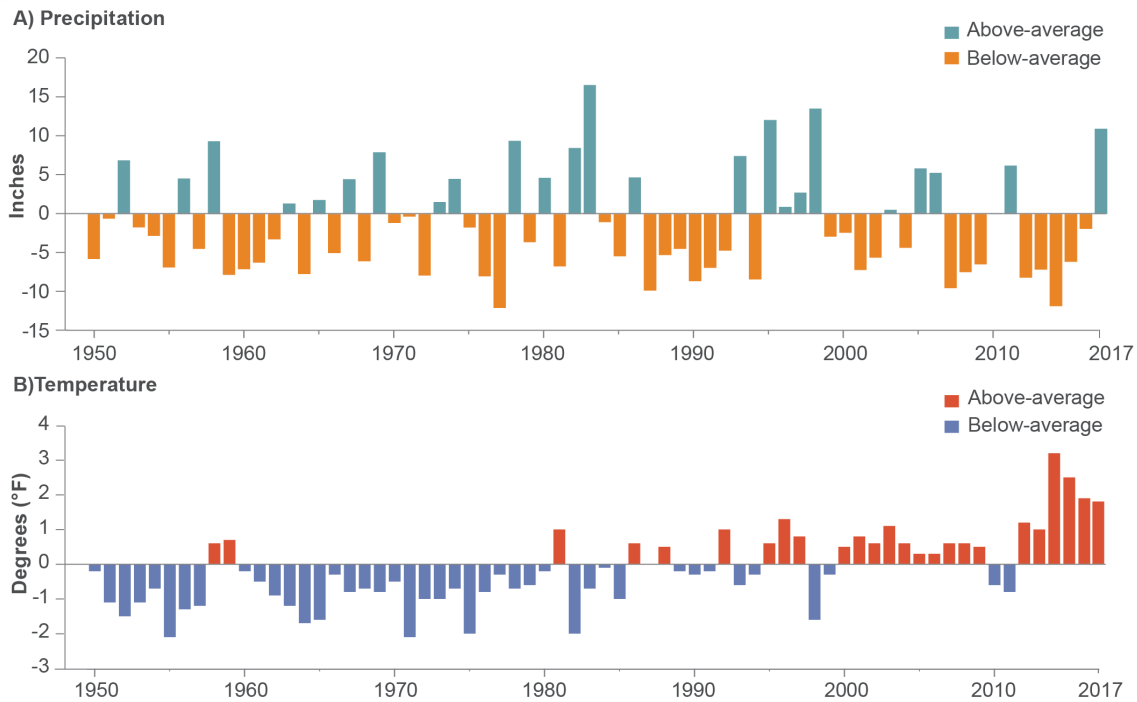
“California drought lessons” study: sectoral adaptations and responses to the 2012-16 drought



What is urban drought resilience?

- Ability to weather droughts without significant social and economic disruptions
- Two components:
  - **Supply investments** that reduce risk of extreme shortages
  - Short-term **demand management**

Key takeaways

- Urban suppliers were generally well prepared, and economy remained robust
- State conservation mandate showed Californians can respond quickly to call for rationing
- But mandate disrupted local programs, created uncertainties about future state and local roles
- State, locals need to align policies and expectations to build resilience for future droughts

Many lessons learned from past droughts

Supply emergencies were wake-up call for urban suppliers. Their response:

- Invested heavily in drought preparation (e.g., storage, interties)
- Launched long-term conservation programs

Emergency pipeline, San Rafael Bridge (1977 drought)

State actions supported local drought resilience

State responded by:

- Standardizing urban water planning
- Adopting efficiency standards
- Facilitating water trading
- Supporting local investments
- But left rationing decisions to local utilities

Orange County recharge basin

Early local and state actions in the 2012-16 drought

- Some regions faced early supply challenges, cut use
- In Jan. 2014 state called for:
  - 20% voluntary conservation
  - Implementation of local water shortage contingency plans
- Savings varied regionally, averaged 10%

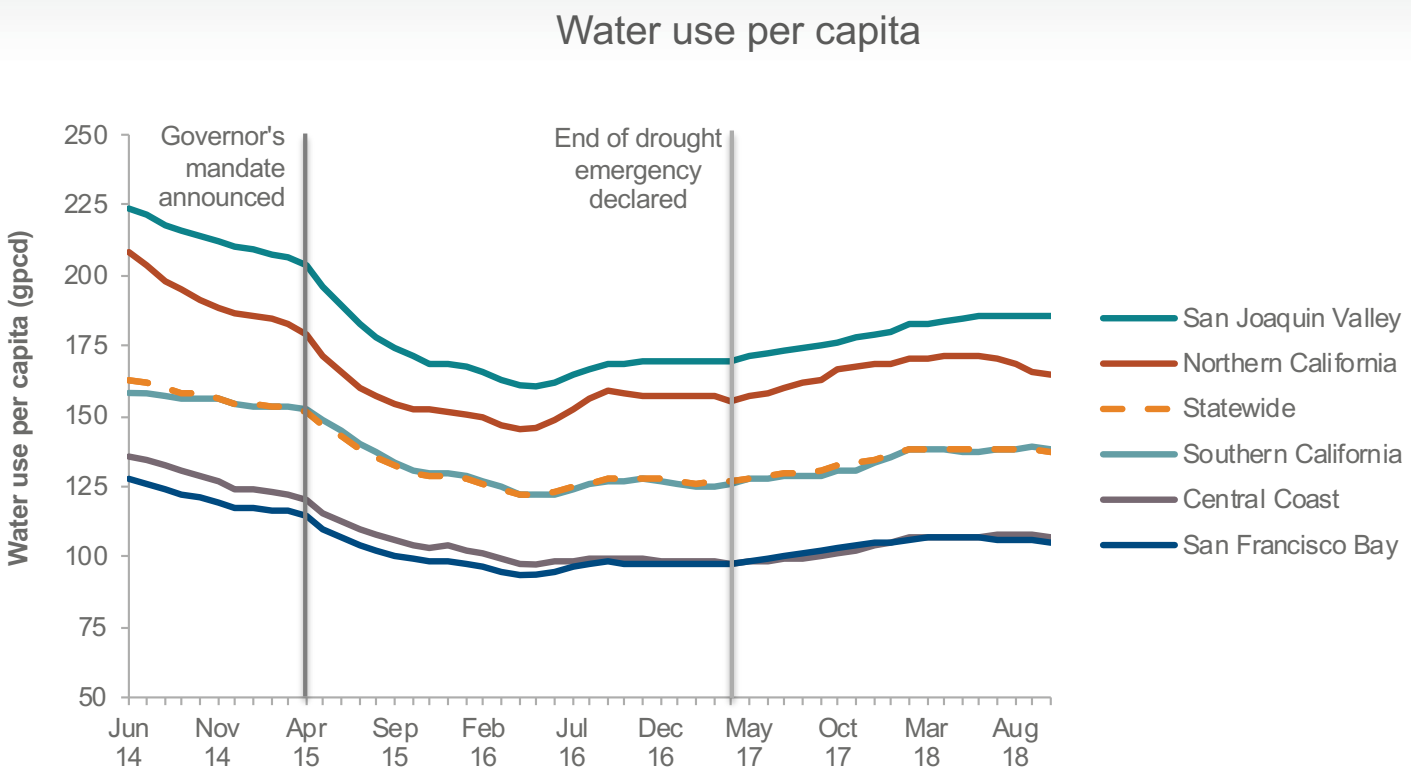
Folsom Lake, December 2013

State's concern over drought severity prompted unprecedented conservation mandate

- State assumed suppliers weren't doing enough
- Main reasons given for mandate:
  - Insuring against longer drought
  - Helping those in need
  - Changing social norms on water use

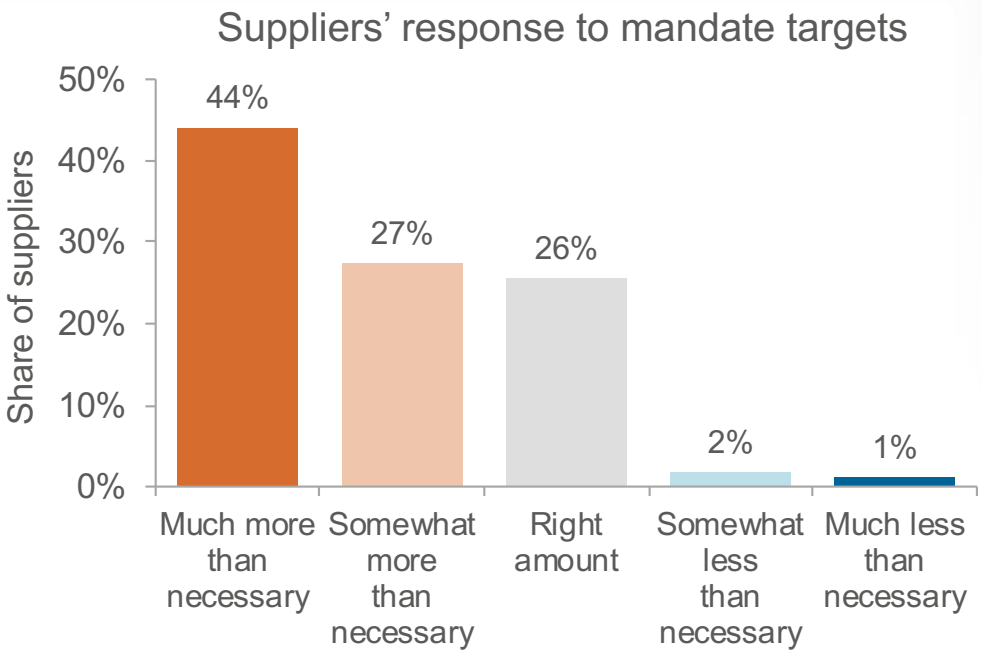
Governor Brown announces mandate
April 1, 2015

Urban water use declined rapidly in response to conservation mandate



But the mandate posed challenges for many utilities

- Disconnect between mandate levels and local conditions
- Compliance challenges for suppliers with high targets
- Scaled-back use of drought supplies
- Intensified financial impacts

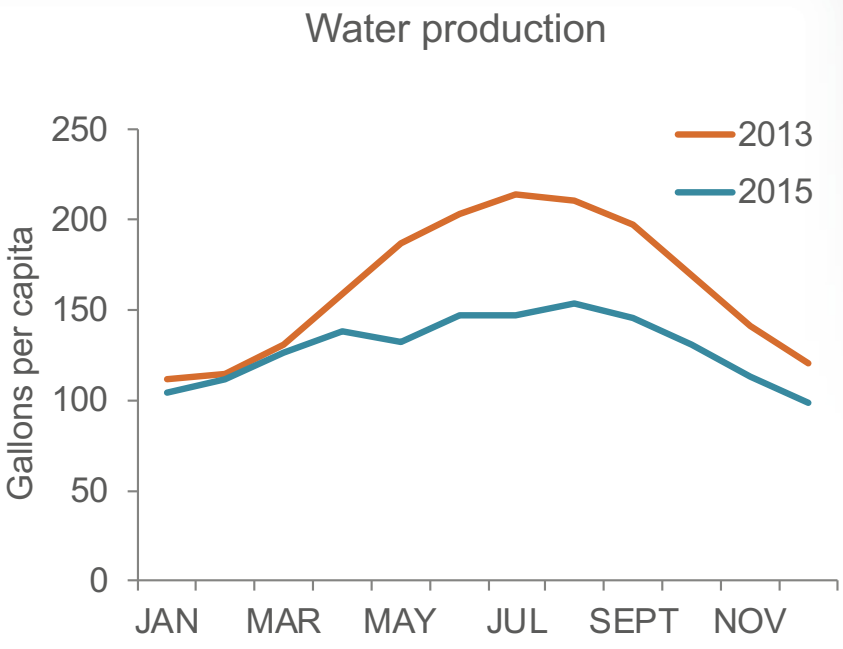


State and suppliers need to cooperate to protect economy from severe drought impacts

- Because conditions vary greatly, local suppliers are best placed to prepare for and manage droughts in their communities with:
  - Supply portfolios
  - Short-term demand management
- State should focus on areas that require state leadership:
  - Incentives, support for local action
  - Flexibility to reallocate scarce supplies
  - Protection of vulnerable communities, ecosystems

Balancing long-term water use efficiency and drought resilience is a looming issue

- **Issue**: Long-term savings have benefits, but can make it harder to cut use quickly during droughts
- **Actions**: Address the tradeoffs
  - Allocate some savings to a "reliability reserve"
  - Update water shortage contingency plan requirements
  - Incorporate reliability goals into long-range plans



Also looming: Impacts of urban demand management & increased recycled water use on wastewater sector

- Priorities:
- Drought resilience planning, including better coordination and information sharing with water suppliers
- Formalized planning for recycled water projects at the regional level
- Identifying “high-tradeoff” areas most at risk of conflict over the use of treated wastewater because of impacts on the environment and downstream water users

More information at ppic.org/water

- Mitchell et al. (2017) Building Drought Resilience in California's Cities and Suburbs. PPIC.
- Chappelle et al. (2019) Managing Wastewater in a Changing Climate. PPIC

About 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:

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Thank you for your interest in this work.