Briefing: The Untapped Potential of California's Urban Water Supply
April 12 9-10AM PT

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Registration Link | pacinst.org/webinars

Briefing will begin shortly.
The Untapped Potential of California’s Urban Water Supply

Water Efficiency
Water Reuse
Stormwater Capture

April 12, 2022
Dr. Amanda Bielawski
Director of Communications & Outreach
Moderator
Full report available: https://pacinst.org
The Pacific Institute is an independent, non-partisan global water think tank, founded in 1987 and based in Oakland, California, with staff around the world.

Mission: to create and advance solutions to the world’s most pressing water challenges.

2030 organizational goal: to catalyze the transformation to water resilience in the face of climate change.

Water Resilience: "The ability of water systems to function so that nature and people, including those on the frontlines and disproportionately impacted, thrive under shocks, stresses, and change."

Water Resilience Issue Brief available: https://pacinst.org
Presenters

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Director of Research

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Senior Fellow
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Dr. Sonali Abraham
Research Associate

Dr. Anne Thebo
Senior Researcher

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Moderator
Agenda

• **Overview of key findings and report relevance:** Heather Cooley

• **Climate change context:** Dr. Peter Gleick

• **Potential for:**
  
  o **Water efficiency:** Dr. Sonali Abraham
  
  o **Water reuse:** Dr. Anne Thebo

  o **Stormwater capture:** Dr. Anne Thebo

• **Best practice examples:** Heather Cooley

• **Key findings and recommendations:** Heather Cooley

• **Audience Q&A:** Moderated by Dr. Amanda Bielawski
• The session is being **recorded**.

• **All participants** (except for panelists) are **automatically muted**.

• Please use the **Q&A function** to submit questions for the speakers. The moderator will ask submitted questions in the second half of the webinar. If you have a technical issue, you may also post it in the Q&A function.

• **Slides** and **recording** will be made available following the briefing.

• **Journalists**: Please reach out to us at [media@pacinst.org](mailto:media@pacinst.org) if you would like to arrange an interview after the briefing. Also available: data sets and details about relevant efficiency, reuse, and stormwater capture projects in specific regions.

• **Join us on Twitter**: Live tweeting underway
Report Findings & Relevance

Heather Cooley
Director of Research
• California has made laudable progress in recent years to reduce water use and develop local supplies, but more is needed in the face of intensifying drought and climate change.

• Efficient technologies and practices could reduce California’s urban water use by 2.0 million to 3.1 million AFY, or by 30% to 48%.

• Reuse of municipal wastewater could boost local water supplies by 1.8 million to 2.1 million AFY.

• Urban stormwater capture in areas overlying public supply aquifers could boost water supplies by 580,000 AF in a dry year to 3.0 million AF in a wet year.

• These strategies are proven and cost effective – and can provide water reliability and other co-benefits for California.

• These findings can inform policy and decision making in California and beyond.
California Drought Realities & Climate Change

Dr. Peter Gleick
Senior Fellow
Co-Founder
California Drought Realities

Water in Major California Reservoirs, April 4, 2022
Shasta, Oroville, New Melones, Shasta East Branch, Lake McClure, San Luis, Trinity,

Statewide Snowpack Chart

- Average - Current Year
- Percent of normal to date: 27%
- Percent of April 1st average: 27%

Empty: 10.3 million acre-feet
In Storage: 7.7 million acre-feet

U.S. Drought Monitor
West

April 5, 2022
(Released Thursday, April 7, 2022)
Valid 8 a.m. EDT

Intensity:
- None
- D1 Abnormally Dry
- D2 Moderate Drought
- D3 Severe Drought
- D4 Extreme Drought
- D5 Exceptional Drought

The Drought Monitor uses an interagency assessment approach to provide information on the drought's extent, impacts and causes. For more information visit https://droughtmonitor.unl.edu

Author:
Deborah Halvorson
National Drought Mitigation Center
droughtmonitor.unl.edu
Climate change has **worsened** severe drought in California.

- Our water systems and planning do not yet account for this.
- The strategies assessed in the new report help build climate resilience.

The past 22 years in the Southwestern US have been the driest in 1200 years.

*Williams, Cook, Smerdon 2022 Nature Climate Change*
Urban Water Efficiency Potential

Dr. Sonali Abraham
Research Associate
Urban water use has declined dramatically since peaking in 2007. Between 2017 and 2019, urban water use averaged 6.6 million AFY.
Estimating Water Efficiency Potential

- The **current water use baseline** was developed from the *Electronic Annual Reports (EARs)* submitted by water agencies for 2017 to 2019.

- Two water-savings scenarios were developed:
  - **Moderate efficiency** based on full compliance with current standards for appliances and fixtures (SB 407), landscapes (MWELO), and distribution leaks (SB 555).
  - **High efficiency** based on *available* leading-edge technologies and practices that use less water than current standards.
Water Efficiency Potential by Sector

Statewide potential: 2.0 million to 3.1 million acre-feet per year
Water Efficiency Potential by Region

- **Tulare Lake**
  - High: 0.25
  - Moderate: 0.16

- **South Lahontan**
  - High: 0.08
  - Moderate: 0.05

- **South Coast**
  - High: 1.05
  - Moderate: 1.67

- **San Joaquin River**
  - High: 0.32
  - Moderate: 0.20

- **San Francisco Bay**
  - High: 0.39
  - Moderate: 0.13

- **Sacramento River**
  - High: 0.32
  - Moderate: 0.20

- **North Lahontan**
  - High: 0.009
  - Moderate: 0.006

- **North Coast**
  - High: 0.03
  - Moderate: 0.02

- **Colorado River**
  - High: 0.09
  - Moderate: 0.06

- **Central Coast**
  - High: 0.10
  - Moderate: 0.05

**Water Potential**
(Million Acre-Feet per Year)

**Legend**
- **INDOOR**
- **OUTDOOR**
- **NON-REVENUE WATER**
Water Reuse Potential

Dr. Anne Thebo
Senior Researcher
Estimating Water Reuse Potential

Key Dataset: California State Water Resources Control Board Volumetric Annual Reporting Data (2020)
## Water Reuse Potential by Region

Statewide potential: 1.8 million to 2.1 million acre-feet per year

<table>
<thead>
<tr>
<th>Hydrologic Region</th>
<th>Currently Reused (AFY)</th>
<th>Effluent Reserved for Instream Flows or Natural Systems (AFY)</th>
<th>Potentially Available for Reuse (AFY)</th>
<th>TOTAL Effluent (AFY)</th>
<th>Currently Reused (%)</th>
<th>Potentially Available for Reuse (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Coast</td>
<td>26,000</td>
<td>4,000</td>
<td>84,000</td>
<td>115,000</td>
<td>23</td>
<td>73</td>
</tr>
<tr>
<td>Colorado River</td>
<td>15,000</td>
<td>0</td>
<td>30,000</td>
<td>45,000</td>
<td>33</td>
<td>66</td>
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<tr>
<td>North Coast</td>
<td>21,000</td>
<td>1,000</td>
<td>18,000</td>
<td>41,000</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>North Lahontan</td>
<td>4,000</td>
<td>0</td>
<td>4,000</td>
<td>8,000</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Sacramento River</td>
<td>11,000</td>
<td>168,000</td>
<td>78,000</td>
<td>256,000</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>San Francisco Bay</td>
<td>49,000</td>
<td>3,000</td>
<td>497,000</td>
<td>549,000</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>San Joaquin River</td>
<td>47,000</td>
<td>4,000</td>
<td>123,000</td>
<td>173,000</td>
<td>27</td>
<td>71</td>
</tr>
<tr>
<td>South Coast</td>
<td>473,000</td>
<td>101,000</td>
<td>1,067,000</td>
<td>1,641,000</td>
<td>29</td>
<td>65</td>
</tr>
<tr>
<td>South Lahontan</td>
<td>24,000</td>
<td>4,000</td>
<td>27,000</td>
<td>55,000</td>
<td>43</td>
<td>49</td>
</tr>
<tr>
<td>Tulare Lake</td>
<td>58,000</td>
<td>0</td>
<td>129,000</td>
<td>187,000</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>729,000</td>
<td>285,000</td>
<td>2,057,000</td>
<td>3,071,000</td>
<td>24</td>
<td>67</td>
</tr>
</tbody>
</table>

Notes: Not available for reuse is defined as water allocated to instream flows or natural systems. Value of total effluent in this table differs from Figure 12 because of reporting discrepancies between water supplied to recycled water producers and the quantity of water recycled water producers reported reusing.

[Image: pacinst.org | @PacificInstitut]
Estimating stormwater capture potential

• No comprehensive estimate of existing stormwater capture volume.

• For our study, we developed statewide estimates:
  • Impervious surface cover in urban areas across the state and in areas overlying public supply aquifers
  • High, medium, and low historical precipitation
### Stormwater Capture Potential by Region

<table>
<thead>
<tr>
<th>Hydrologic Region</th>
<th>Urban Stormwater Capture Potential (AFY)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Precipitation</td>
</tr>
<tr>
<td>Central Coast</td>
<td>20,000</td>
</tr>
<tr>
<td>Colorado River</td>
<td>11,000</td>
</tr>
<tr>
<td>North Coast</td>
<td>31,000</td>
</tr>
<tr>
<td>North Lahontan</td>
<td>3,000</td>
</tr>
<tr>
<td>Sacramento River</td>
<td>84,000</td>
</tr>
<tr>
<td>San Francisco Bay</td>
<td>85,000</td>
</tr>
<tr>
<td>San Joaquin River</td>
<td>40,000</td>
</tr>
<tr>
<td>South Coast</td>
<td>260,000</td>
</tr>
<tr>
<td>South Lahontan</td>
<td>12,000</td>
</tr>
<tr>
<td>Tulare Lake</td>
<td>34,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>580,000</strong></td>
</tr>
</tbody>
</table>

**Notes:** Numbers are rounded to two significant figures. Totals may not equal column sums due to rounding.
Examples, Conclusions, Recommendations

Heather Cooley
Director of Research
Water Efficiency, Water Reuse, and Stormwater Capture Potential by Region

- Tulare Lake
- South Lahontan
- South Coast
- San Joaquin River
- San Francisco Bay
- Sacramento River
- North Lahontan
- North Coast
- Colorado River
- Central Coast

WATER SAVINGS/SUPPLY POTENTIAL

- Water Reuse Potential
- Stormwater Potential (Low)
- Stormwater Potential (Medium)
- Stormwater Potential (High)
- Efficiency Potential (Moderate)
- Efficiency Potential (High)
Key Points

• The potentials quantified are **NOT** additive across the three strategies but they are complementary.

• This is a **snapshot of current opportunities** – we did not evaluate new technologies, changes in population or economic activities, or any new development.

• We did **NOT** quantify opportunities for agriculture – but recognize they are significant.
These strategies are technically feasible and cost effective.

Source: Cooley and Phurisamban 2016
These strategies also provide co-benefits, making them more economically viable.
Best Practice Examples

Retrofit-on-Resale Ordinance, San Francisco
Lead: San Francisco Public Utilities Commission

- Adopted in 2009, requires high-efficiency plumbing fixtures in single- and multi-family homes upon sale.
- Projected to save over 2.5 billion gallons by 2045.

Direct Install Gardens (DIG), Long Beach
Lead: Long Beach Water

- Pilot program provides single-family homeowners in low-income neighborhoods with a free sustainable landscape.
- Replaced over 17,000 ft² of turf and saved over 250,000 gallons of water.

Source: Long Beach Water
Best Practice Examples

Pure Water Monterey, Monterey
Lead: Monterey One Water

- Treats municipal wastewater, industrial process water, irrigation drainage, and urban stormwater for groundwater recharge.
- Produces 1.2 billion gallons per year of purified water to support the area’s potable supply.

Regional Recycled Water Program, Southern CA
Lead: Metropolitan Water District of Southern California

- Proposed facility would produce up to 150 million gallons per day of purified water.
- Could lead to a long-term agreement with partner agencies, including in Nevada and Arizona, to co-fund construction and operation in exchange for Colorado River water.
Best Practice Examples

Stormwater Retention Basins, Fresno
Lead: Fresno Metropolitan Flood Control District

• More than **150 stormwater retention basins** in the Fresno-Clovis area that reduce flooding, improve water quality, and replenish groundwater.

• Recharge groundwater **by 16 billion gallons per year**.

Moscone Center Expansion Project, San Francisco
Lead: San Francisco Public Utilities Commission

• **District-scale onsite water system** treats and reuses rainwater, condensate from the building’s cooling system, and foundation drainage.

• **Offsets about 15 million gallons per year of potable water** for use in toilets and urinals, landscape irrigation, and to refill street-cleaning trucks.
Key Findings

- California has made laudable progress in recent years to reduce water use and develop local supplies, but more is needed in the face of intensifying drought and climate change.

- Efficient technologies and practices could reduce California’s urban water use by 2.0 million to 3.1 million AFY, or by 30% to 48%.

- Reuse of municipal wastewater could boost local water supplies by 1.8 million to 2.1 million AFY.

- Urban stormwater capture in areas overlying public supply aquifers could boost water supplies by 580,000 AF in a dry year to 3.0 million AF in a wet year.

- These strategies are proven and cost effective – and can provide water reliability and other co-benefits for California.
Recommendations

Expand Efforts to Improve Water Use Efficiency and Water Loss Control.

• Increase funding for water-efficiency and water-loss control programs to levels consistent with other water-supply investments.

• Ban non-functional grass at businesses and institutions and in large housing developments.

• Adopt retrofit-on-resale ordinances for residential and non-residential properties.

• Make efficiency programs accessible to low-income and multi-family households.
Recommendations

Expand the Supply and Use of Recycled Water.

- Leverage state and federal funding for recycled water, prioritizing multi-benefit projects.
- Continue progress on regulations for direct potable reuse and onsite non-potable water systems, and revise regulatory frameworks, as appropriate.
- Incorporate efficiency and changes in population, economic activity, and land use in local and regional assessments of supply and demand for recycled water.
Recommendations

Increase Efforts to Capture and Use Stormwater.

• Reduce barriers to funding for ongoing operation and maintenance costs.

• Create partnerships to provide stacked incentives for multi-benefit stormwater projects on residential and other properties.

• Develop stormwater capture goals based on a quantitative assessment of its potential and track progress toward those goals.
Q & A Session

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- **Questions or comments?** info@pacinst.org

- **Journalists:** media@pacinst.org:
  - arrange an interview
  - data sets and details about relevant regional projects

- **Continue the conversation and follow us on Twitter:** @pacificinstitut
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