The California Drought: Companies Take Action to Foster Sustainable Water Solutions

April 19, 2015

In Conversation With:

Ceres

US Water Alliance
Jennifer Gerholdt, Director, Environment Program, U.S. Chamber of Commerce Foundation @JGerholdt @USCCFBiz4Good

Radhika Fox CEO, U.S. Water Alliance @radhikafox @WaterAlliance

Kirsten James Senior Manager for California Policy and Partnerships, Ceres @kirstenjames_CA @CeresNews

Abigail Antolovich North America Reuse Business Development Manager Xylem, Inc. @XylemInc
Housekeeping

• All Participants are muted; please submit your questions through the question box

• The webinar is being recorded; instructions for downloading it will be sent shortly after the webinar
The California Drought: Living in a New Normal

Radhika Fox
CEO, US Water Alliance

www.uswateralliance.org
Global Water Risk
Water Challenges in the US

Flooding

Drought

Water Quality

Aging Infrastructure
A Record-Breaking Drought

41% of the state is facing “exceptional drought” (the most severe kind).

Abnormally dry
Moderate drought
Severe drought
Extreme drought
Exceptional drought

2011
2012
2013
2014
2015

SOURCE: U.S. Drought Monitor

VISUAL NEWS

www.uswateralliance.org
U.S. Drought Monitor
California

April 12, 2016
(Released Thursday, Apr. 14, 2016)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>3.55</td>
<td>96.45</td>
<td>90.58</td>
<td>74.37</td>
<td>55.25</td>
<td>31.60</td>
</tr>
<tr>
<td>Last Week</td>
<td>49/2016</td>
<td>3.55</td>
<td>96.45</td>
<td>90.58</td>
<td>74.37</td>
<td>55.25</td>
</tr>
<tr>
<td>3 Months Ago</td>
<td>12/2016</td>
<td>0.00</td>
<td>100.00</td>
<td>97.33</td>
<td>87.55</td>
<td>69.07</td>
</tr>
<tr>
<td>Start of Year</td>
<td>12/2015</td>
<td>0.00</td>
<td>100.00</td>
<td>97.33</td>
<td>87.55</td>
<td>69.07</td>
</tr>
<tr>
<td>Start of Year</td>
<td>8/29/2015</td>
<td>0.14</td>
<td>99.86</td>
<td>97.33</td>
<td>92.36</td>
<td>71.08</td>
</tr>
<tr>
<td>One Year Ago</td>
<td>4/6/2015</td>
<td>0.14</td>
<td>99.86</td>
<td>98.11</td>
<td>93.44</td>
<td>66.60</td>
</tr>
</tbody>
</table>

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:
Richard Tinker
CPC/NOAA/NWS/NCEP

http://droughtmonitor.unl.edu/
# California Drought Timeline 2012-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td><strong>Feb.</strong> Snowpack below avg. for 2nd year</td>
</tr>
<tr>
<td></td>
<td><strong>Nov.</strong> Governor releases 5-year Water Plan &amp; Assembles Task Force</td>
</tr>
<tr>
<td>2014</td>
<td><strong>Jan.</strong> Governor declares State of Emergency</td>
</tr>
<tr>
<td></td>
<td><strong>Summer.</strong> Snowpack &amp; groundwater at record lows</td>
</tr>
<tr>
<td></td>
<td><strong>Nov.</strong> Voters approve $7.5 B Water Bond</td>
</tr>
<tr>
<td></td>
<td><strong>Dec.</strong> Report shows drought is worse dry spell in last 1,200 years</td>
</tr>
<tr>
<td>2015</td>
<td><strong>Apr.</strong> Governor announces first mandatory water cutbacks in CA history</td>
</tr>
<tr>
<td></td>
<td><strong>May.</strong> Groundwater depletion intensifies. 2,000 wells dry.</td>
</tr>
<tr>
<td></td>
<td><strong>Winter.</strong> El Nino storms raise snowpack and reservoir levels</td>
</tr>
<tr>
<td>2016</td>
<td><strong>Apr.</strong> Expected relief from El Nino storms come up short</td>
</tr>
</tbody>
</table>
What about El Nino?
Field Poll: The drought

Opinions on the seriousness of California’s drought have receded among voters in all regions of the state after a more normal winter.

Proportion of Californians who consider the state’s current water shortage to be “extremely serious”

<table>
<thead>
<tr>
<th></th>
<th>Statewide</th>
<th>South*</th>
<th>Central Valley</th>
<th>North*</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2016</td>
<td>62%</td>
<td>60%</td>
<td>58%</td>
<td>68%</td>
</tr>
<tr>
<td>October 2015</td>
<td>76%</td>
<td>74%</td>
<td>79%</td>
<td>79%</td>
</tr>
<tr>
<td>May 2015</td>
<td>66%</td>
<td>62%</td>
<td>70%</td>
<td>71%</td>
</tr>
<tr>
<td>February 2015</td>
<td>68%</td>
<td>64%</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>April 2014</td>
<td>60%</td>
<td>55%</td>
<td>71%</td>
<td>64%</td>
</tr>
</tbody>
</table>
Opportunity: Long Term Behavior Change
San Francisco Public Utilities Commission

1. **Dirty hands.**
   - Turn off the tap when soaping your hands.
   - Don’t let the tap run – save 2 gallons per minute.
   - We’re in a drought! Hetch Hetchy water – too good to waste. sfwater.org/conservation

2. **Satisfied.**
   - Watering twice a week will keep most gardens satisfied.
   - Cut back on outdoor water use today.
   - We’re in a drought! Hetch Hetchy water – too good to waste. sfwater.org/conservation

3. **Quickie.**
   - When showering, make it a quickie.
   - Shorten showers – save 2.5 gallons per minute.
   - We’re in a drought! Hetch Hetchy water – too good to waste. sfwater.org/conservation
Opportunity: Partnerships for Progress
One Water LA
Opportunity: Investing in Innovation
Santa Clara Valley Water District

74%

Of voters supported a tax on water investment

Voters in the area have twice supported taxes for water investment. The funds support projects from a massive seismic retrofit of the water district’s largest reservoir to the installation of hydration stations in schools.
CA is Ready for Long-Term Solutions
Business Implications of the Drought

Photo: REUTERS/Lucy Nicholson
Water Risks Translate to Corporate Financials
Water Scarcity has a Current Economic Impact

> 74% of CA has been hit by drought

SE Brazil is facing its worst drought in > 80 yrs. Sao Paulo, largest city in S. America, pop of 20 million, ripple effects to the business community

“Brazil downgraded to junk rating by S&P, deepening woes”
A Projected 40% Gap in Water Supply and Demand by 2030

2005

<table>
<thead>
<tr>
<th></th>
<th>Demand</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homes</td>
<td>0.5</td>
<td>4.1</td>
</tr>
<tr>
<td>Industry</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>3.0</td>
<td></td>
</tr>
</tbody>
</table>

2030 (projected)

<table>
<thead>
<tr>
<th></th>
<th>Demand</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homes</td>
<td>0.8</td>
<td>4.2</td>
</tr>
<tr>
<td>Industry</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>

3% gap

40% gap

Improvements in technology and infrastructure could reduce the gap to 30%.

Figures do not sum to total, because of rounding.

Source: International Food Policy Research Institute (IFPRI); McKinsey analysis
Drought & California Agriculture

Crop Fallowing (thousand acres)

Crop Revenue Change ($ millions)

Employment Loss (full and part time jobs)

Relative Impact
Less More

UC Davis Center for Watershed Sciences
Water Prices are Beginning to Rise, yet not Proportional to Scarcity (Risk)

Price of Water 2015: Up 6 Percent in 30 Major U.S. Cities; 41 Percent Rise Since 2010

April 22, 2015 / in California, California Drought, Infrastructure, North America, Water News / by Brett Walton

As urban water use declines, utilities change business models.

THE PRICE OF WATER: 2015
Combined water, sewer and stormwater prices for households in 30 major U.S. cities.

Water, sewer, and stormwater prices for 30 major U.S. cities in 2015.
Key Drivers of Water Risk

1. Competition for Water
2. Weak Regulation
3. Aging / Inadequate Infrastructure
4. Water Pollution
5. Climate Change & Weather Variability

Business Impacts
- Rationing & Shortages
- Abrupt Rate Hikes for Water & Wastewater Treatment
- Water Supply & Treatment Failures
- Reputational Damage/Loss of Social License to Operate
- Stricter Regulations
- Decrease in Agricultural Productivity

Source: Ceres’ Feeding Ourselves Thirsty
Water bills will creep up next year in L.A. because we've conserved so much

The Drought Means More Pollution and Higher Bills

Nestle bottled water operations under investigation amid California drought

Sacramento City Council passes water, wastewater rate increases

Vegetable supplies, hurt by drought, now threatened by rains
Global Business Growth is Threatened by Freshwater Risks

2015 CDP Water Program FTSE Global 500 Equity Index

In total, respondents identified 3,201 substantial risks. 68% of businesses responding report exposure to water risk, with financial impacts totaling more than US$2.5 billion.

“Global water crises = the biggest threat facing the planet over the next decade.”
From Risks to Opportunities
Out of Risk, Comes Opportunity
CA Policy– Business Playing a Role

It’s time for California to Connect The Drops

Water is the lifeblood of California. It is central to our communities, our economy and our natural resources. • Our state is blessed with world-class innovation and talent, bountiful farmland, and diverse wildlife. Yet today, the water supplies that sustain these essential resources are in jeopardy. • We cannot risk our state’s economic future by relying on outdated water management practices, policies and infrastructure. Now is the time for fresh thinking, shared purpose and bold solutions to build a resilient water future for all Californians. And it is incumbent on us—the business community—to help lead the way. • It’s time to come together. To connect the drops. Between flowing rivers and economic opportunity. Between saving water and saving energy. Between clean water and healthy people. By embracing innovation and investing in smart policies and solutions that help us conserve, reuse and maximize our water supply. • California has made progress—but much more can be done. We can be more water efficient. We can do more to replenish our rivers and aquifers. And we can do it while strengthening the communities and industries that make our economy strong. • But we cannot do it alone.

Come and join us.

ABInBev    Amgen    Dignity Health    Driscoll’s
EILEEN FISHER    FETZER VINEYARDS    Gap Inc.    Genentech
G GENERAL MILLS    KB HOME    Kellogg’s    KOHLER
LEVI STRAUSS & CO.    QUALCOMM    SYMANTEC    The Coca-Cola Company
vmware    xylem    Ceres

ceres.org/connectthedrops

March 14, 2016
Joseph Byrne, Chair
California Water Commission
Department of Water Resources
1416 Ninth St.
Sacramento, CA 95814

Re: Draft regulations for the Proposition 1 Water Storage Investment Program

Dear Chairman Byrne,

As businesses concerned with the short-term and long-term risks associated with California’s unprecedented drought and future climate projections, we, the undersigned, are writing to encourage the California Water Commission (CWC) to adopt regulations for the Proposition 1 Water Storage Investment Program (WSIP) that provide full opportunity for the funding of groundwater projects as well as surface water storage solutions.
Xylem – Leading Global Water Solutions Provider
Recent Survey – Californians Support Water Reuse

DROUGHT-WEARY CALIFORNIANS ARE READY FOR RECYCLED WATER*
Residents eager for long-term solutions to water scarcity

- 76% of survey respondents believe recycled water should be used as a long-term solution, regardless of drought.
- 87% of respondents support using recycled water as an additional source of water.
- 41% of respondents are somewhat willing to use recycled water in their everyday lives.
- 42% of respondents are very willing to use recycled water in their everyday lives.
- 83% of respondents support using recycled water in their everyday lives.

Californians believe that recycled water should be used as a LONG-TERM SOLUTION for a water-secure future – regardless of potential rainfall from El Niño.

NEARLY 90% of Californians believe the state should continue to invest in recycled water for drinking water even if El Niño brings the expected rainfall.

Only 12% will be less concerned about conserving water if El Niño brings the expected rainfall.

## Xylem’s Contributions to Water Reuse

<table>
<thead>
<tr>
<th>Project</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Valley Advanced Water Purification Center</td>
<td>8 MGD UV disinfection for non-potable reuse</td>
</tr>
<tr>
<td>City of San Diego</td>
<td>Ozone+biological filtration demonstration facility for future 40 MGD plant</td>
</tr>
<tr>
<td>Apple Valley, Hesperia, Victor Valley Reclamation Plants</td>
<td>UV disinfection for non-potable reuse</td>
</tr>
<tr>
<td>University Area Joint Authority, State College, PA</td>
<td>Ozone disinfection for non-potable reuse</td>
</tr>
<tr>
<td>Terminal Island Water Reclamation Plant, Los Angeles Sanitation</td>
<td>12 MGD UV+chlorine process for groundwater recharge</td>
</tr>
<tr>
<td>Second Changi Water Reclamation Plant, PUB, Singapore</td>
<td>50 MGD UV disinfection system for reservoir augmentation</td>
</tr>
<tr>
<td>St. Francis Wastewater Treatment Facility, St. Francis, MN</td>
<td>UV disinfection system for non-potable reuse</td>
</tr>
<tr>
<td>Donald C. Tillman Water Reclamation Plant, Los Angeles Sanitation</td>
<td>Pilot systems for technology selection of future ~40 MGD groundwater recharge facility</td>
</tr>
</tbody>
</table>

- Provided services and funding for eight major water reuse research projects
- $250K donor for research
- Member of Research Advisory Committee
- In-kind contributor on many research projects
- 2014 Equipment Manufacturer of the Year
- Co-chair on planning committee for WRA 2015 Annual Symposium
- Corporate sponsor
Potable Reuse Critical to Meeting CA Water Demands

- 200+ research projects worth > $70M to support potable reuse
- Nearly 200 reports available to facilitate implementation
- Expert panel assembled to provide guidance
Silicon Valley Advanced Water Purification Center

- Silicon Valley Advanced Water Purification Center
- 8 MGD state-of-the-art water reuse facility
- Membrane filtration plus UV disinfection
- High quality non-potable water for irrigation and industrial customers
- Tours available to public

UV Disinfection System
Terminal Island Water Reclamation Plant

- Terminal Island Water Reclamation Plant
- 12 MGD indirect potable reuse facility
- Membrane filtration plus advanced oxidation with UV and bleach
- Groundwater recharge (drinking water)
- First ever full-scale UV/chlorine advanced oxidation process
- Installation in 2016
Pure Water San Diego

- North City Water Reclamation Plant
- 1.5 MGD Demonstration Plant
- Ozone + biological filtration + membrane filtration + advanced oxidation
- Surface water augmentation (drinking water)
- First full-scale demo of ozone + biological filtration for reuse in CA
- Evaluating design for 36 MGD reuse plant to address water needs

Ozone-Enhanced Biologically Active Filter
Better Business, Better World: Mainstreaming the Circular Economy
MAY 16–17, 2016 | WASHINGTON, D.C.

https://www.uschamberfoundation.org/event/2016-sustainability-forum

JOIN20 for 20% off
Audience Q&A