California’s Drought: Gone or Here to Stay?

Los Angeles Area Chamber of Commerce
August 19, 2016

Deven E. Upadhyay
Metropolitan Water District of Southern California
Metropolitan Water District

Water Wholesaler
26 Members Agencies
19 Million People
5,200 Square Miles
~4 MAF Annual Demand
- ½ Imported Supplies
- ½ Local Supplies

MWD Service Area

Imported Supplies
Local Supplies
Metropolitan's Imported Water Supply

Sacramento & Feather Rivers

Lake Oroville

Northern Sierra

Bay-Delta

San Luis Reservoir

Lake Mead

Colorado River Aqueduct

MWD Service Area

Lake Powell

Upper Colorado River Basin

Wyoming (WY)

Utah (UT)

Colorado (CO)

New Mexico (NM)

Arizona (AZ)
Metropolitan’s Planning Calls for Higher Conservation and Local Supply Development

1990 – 41% Local
Heavy dependence on imported supply and SWP Diversions

2040 – 65% Local
Emphasis on Conservation and Local Supplies
We've Been Executing this Plan for Years with Continued Success

Gallons Per Capita Per Day

Potable GPCD (20x2020) vs Baseline: 1996-2005 Average

20% Reduction from Baseline

1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019

130 131 145
Allowing the Region to Grow While Holding Demands Flat

- Metropolitan Service Area Population
- Retail Demands
Investigating the Largest Regional Recycled Water Project in the Western Hemisphere
However, this planning strategy recognizes that imported supplies will always be an important base for reliability.
This Strategy Includes Investments in Storage Surface and Groundwater

13x Increase in Capacity
Storage Reserves Lessen Drought Impacts to Member Agencies

End of Year Balances

Million Acre-Feet

2006: 2.2
2007: 1.8
2008: 1.1
2009: 1.0
2010: 1.7
2011: 2.4
2012: 2.7
2013: 2.3
2014: 1.2
2015: 0.9

Emergency Storage
Dry-Year Storage

Metropolitan’s Storage Investments at Work
Metropolitan Provides Supplemental Water When Local Supplies are Deficient

- Total Imported Supply
- Total Local Supply

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Imported Supply</th>
<th>Total Local Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>55%</td>
<td>45%</td>
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<tr>
<td>2007</td>
<td>57%</td>
<td>43%</td>
</tr>
<tr>
<td>2008</td>
<td>53%</td>
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<td>2009</td>
<td>51%</td>
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<td>2010</td>
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<tr>
<td>2013</td>
<td>53%</td>
<td>47%</td>
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<tr>
<td>2014</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>2015</td>
<td>58%</td>
<td>42%</td>
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</table>
Is drought the only factor impacting shortages?
Northern California Runoff Since 1995

WET  NORMAL  DRY

Northern California Runoff (MAF)

Ranked Runoff (1995-2016)

SWP Allocation
Dry Periods Do Reduce SWP Allocations

Northern California Runoff (MAF)

Ranked Runoff (1995-2016)

WET | NORMAL | DRY

SWP Allocation

0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100%
DWR’s SWP Projections Show Another Factor: Regulatory Constraints

- **Wet Year**: 97%
- **Normal Year**: 89%
- **Dry Year**: 54%

*SWP Supplies (MAF)*
*Pre Biological Opinions*
*% SWP Allocation*
DWR’s SWP Projections Show Another Factor: Regulatory Constraints

![Bar chart showing SWP Supplies (MAF) for Wet Year, Normal Year, and Dry Year, with Pre Biological Opinions and Post Biological Opinions, and % SWP Allocation.]

- Wet Year: Pre Biological Opinions (97%), Post Biological Opinions (82%)
- Normal Year: Pre Biological Opinions (89%), Post Biological Opinions (66%)
- Dry Year: Pre Biological Opinions (54%), Post Biological Opinions (42%)
Actual Observations Support DWR’s Projections

Northern California Runoff (MAF)

Pre Biological Opinions

SWP Allocation

WET
NORMAL
DRY

Ranked Runoff (1995-2016)

SWP Allocation

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Actual Observations Support DWR’s Projections

WET  NORMAL  DRY

Pre Biological Opinions  Post Biological Opinions  SWP Allocation

Ranked Runoff (1995-2016)

Northern California Runoff (MAF)

SWP Allocation
Further Reductions in Supplies due to BiOps

Northern California Runoff (MAF)

Pre Biological Opinions
Post Biological Opinions
SWP Allocation

Ranked Runoff (1995-2016)

WET
NORMAL
DRY
What Storage Reserves Might Have Looked Like if Imported Supplies Were Stabilized

End of Year Balances

Million Acre-Feet

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<tr>
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<th>Dry-Year Storage</th>
<th>Additional Storage with Cal Fix</th>
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<tbody>
<tr>
<td>2006</td>
<td>2.2</td>
<td>0.9</td>
<td>1.3</td>
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<tr>
<td>2007</td>
<td>1.8</td>
<td>0.7</td>
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<td>2008</td>
<td>1.1</td>
<td>0.6</td>
<td>0.5</td>
</tr>
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<td>1.0</td>
<td>0.5</td>
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Future Reliability is a Multi-Pronged Approach

- Increase Conservation Efforts
- Increase Local Supply Development
- Stabilize Imported Supplies
  - Helps mitigate future regulatory impacts
“We need to plan to replace half our supplies every generation”

- Langdon ‘Don’ Owen
  MWD Board Director (1996-2003)
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