Managing Drought Conditions

International Facility Management Association
September 2, 2015

Jeff Stephenson

(AP Photo/Rich Pedroncelli)
San Diego County Water Authority

- Wholesale water agency created by Legislature in 1944
  - 24 member agencies
  - 36-member board of directors
  - Serves 3.1 million people and region’s $206 billion economy
- Service area
  - 950,000 acres
  - 97% of county’s population
- Imports ~80% of water used in San Diego County
- Largest member agency of MWD of Southern California
Sources of San Diego County’s Water Supply
(2010-2014 five-year average)

19% State Water Project
(MWD supplies)

64% Colorado River
(Long-term Transfers and MWD supplies)

17% Local Supplies
Increasing San Diego Region's Water Supply Reliability through Supply Diversification

**1991**
- Metropolitan Water District: 552 TAF (95%)
- Imperial Irrigation District Transfer: 100 TAF (15%)

**Total = 578 TAF**

**2014**
- Metropolitan Water District: 326 TAF (49%)
- Imperial Irrigation District Transfer: 80 TAF (12%)
- All American & Coachella Canal Lining: 19 TAF (3%)
- Local Surface Water: 73 TAF (11%)
- Recycled Water: 29 TAF (4%)
- Seawater Desalination: 26 TAF (5%)

**Total = 667 TAF**

**2020**
- Metropolitan Water District: 231 TAF (30%)
- Imperial Irrigation District Transfer: 80 TAF (10%)
- All American & Coachella Canal Lining: 44 TAF (6%)
- Local Surface Water: 56 TAF (7%)
- Recycled Water: 103 TAF (13%)
- Seawater Desalination: 48 TAF (6%)
- Groundwater: 27 TAF (4%)

**Total = 779 TAF**
All Dry on the Western Front
Comparison of Snowpack in the Sierra Nevada

January 2013

January 2014

January 2015

DRY
CRITICAL
CRITICAL

○ = Lake Tahoe

NASA Satellite Images
Northern Sierra Snowpack

Water Content (in)

1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep

Normal 2014-2015

San Diego County Water Authority
Prolonged Colorado River Drought

Colorado River Inflow into Lake Powell Below Normal 12 of 16 Years

Lake Mead Elevation Lowest Since Filling in 1930

*Bureau of Reclamation April 2, 2015 Forecast for Water Year
San Diego Region: 19 of Past 20 Months Hotter than Normal Weather

Average daily maximum temperatures at Lindbergh Field: Departure from Normal
Governor Brown
Executive Order - April 1, 2015

- Water supplies continue to be severely depleted
- Record low snowpack in Sierra Nevada (lowest since 1950)
- Possibility current drought could extend into 2016 and beyond
- Order included a number of directives for state agencies
  - Save water
  - Increase enforcement against waste
  - Invest in new technologies
  - Streamline government response
Executive Order
Sample of Department of Water Resources Directives

- DWR updated model landscape ordinance through expedited regulation
- Increased water efficiency standards for new and existing landscapes
  - More efficient irrigation systems
  - Greywater usage
  - Onsite storm water capture
  - Limited amount of turf
- DWR report on implementation and enforcement due by December 31, 2015
Executive Order
Sample of State Water Board Directives

- Require commercial, industrial and institutional users to implement water efficiency measures
- Prohibit irrigation of ornamental turf on public street medians with potable water
- Prohibit irrigation with potable water in new construction that is not delivered by drip or microspray systems
- Adopt restrictions requiring 25% reduction in potable urban water usage through February 2016
State Water Board Emergency Regulation
25% Reduction in Potable Urban Water Usage

• Each agency is required to:
  • Report monthly total potable production compared to same month in 2013
  • Reduce total potable production by its conservation standard by February 2016

• Compliance measured monthly beginning June 2015, but assessed on cumulative basis
  • If not in compliance, SWRCB may issue conservation order

• Urban water suppliers can exempt commercial agricultural deliveries
  • Subject to locally determined reductions and other reporting requirements
<table>
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<th>R-GPCD Range</th>
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<tr>
<td>1</td>
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</tr>
<tr>
<td>9</td>
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Urban water suppliers assigned conservation standard (percent reduction) based on July – Sept 2014 residential per capita use.
State Water Board Emergency Regulation
Member Agency Conservation Standards*

*Based on R-GPCD data current as of 4/23/15. Certain data may be under review.

~20% Region
SWRCB Emergency Regulation
Member Agency Conservation – June 2015

Source: SWRCB Conservation Reporting Data
Mandatory Water-Use Restrictions Have Been Ordered

A record low snowpack in the Sierra Nevada at the start of April and an executive order by the governor to reduce water use statewide show just how urgent water conservation is for San Diego County and the rest of California. Do your part to “go low.”

There are many ways to save water!

- Take shorter showers. Even better, use a bucket to capture water while your shower warms up and use that water on your plants.

- Promptly fix leaks inside and outside your home. Also remember to wash only full loads of laundry and dishes.

- Turning off irrigation systems for as long as possible.

Click here for more WaterSmart tips!

Find Your Local Water Agency Restrictions and Conservation Programs & Incentives

Click here for information available in your local area.
Find Local Restrictions
www.whenindrought.org
Saving Water is Good for Your Business

PRODUCT TYPES ELIGIBLE FOR REBATES

- **Plumbing Equipment:** High-efficiency toilets, ultra-low and zero water urinals
- **Landscaping Equipment:** Irrigation controllers, large high-efficiency nozzles, pop-up rotating nozzles
- **HVAC Equipment:** Cooling tower conductivity and pH controllers
- **Food Services Equipment:** Connectionless food steamers, air-cooled ice machines
- **Medical and Dental Equipment:** Dry vacuum pumps, laminar flow restrictors

socalwatersmart.com

Rebates & Incentives

Save Water, Save Money

Rebates are available!
Stay in Touch with the Water Authority

Video & Slide Sharing
- youtube.com/SDCWAvideo
- slideshare.net/waterauthority

Mobile App
- sdcwa.org/mobile-news-app

Social Media
- facebook.com/SanDiegoCountyWaterAuthority
- @sdcwa
- @mwdfacts
- sdcwa.org/rss

www.sdcwa.org
Landscape Water-Use Efficiency and California’s Drought

Rajan L. Brown
Director of Resource Management
MLA, CLIA, CWM, LEED Green Associate
9.02.2015
Today’s Agenda

- California’s Drought
- Heaviland’s Resource Management Division
- Water Savings – The Low Hanging Fruit
- Water Management
- Water Smart Landscape Renovations
California’s Drought

California is facing water shortfalls in the driest years in recorded state history.
Drought Restrictions

• Landscape water use is largest opportunity for water savings
• 45% of all urban water is dedicated to landscape irrigation
• 60% of the state’s residential water is applied to landscapes
• Landscape water usage is viewed as discretionary
Drought and the Bottom Line

- Water rates are increasing 7-15% annually
- Tiered water rates impact high water use landscapes and inefficient irrigation systems
- Each individual water district has the authority to implement their own mandatory conservation measures
- Your landscape may not be able to thrive with current restrictions
End the Drought Mindset

- Change the way we reactively respond to the drought/rain cycles
- Plant regionally appropriate drought tolerant plant materials and maintain water efficient irrigation systems that can be sustained through increasingly variable weather conditions
The Resource Management Division focuses on improving the cultivated landscape through the implementation of regionally appropriate landscape design/build projects and efficient water management practices.
Resource Management Division

Regulatory Compliance

Water Management

Planning, Design and Installation
What is Water Management?

• Effective Landscape Irrigation (the low hanging fruit)

• Irrigation controller scheduling based on plant water needs

• Soil Health Management

• Effective use of technology
Water Savings Assessment

- Check for leaks/repairs
- Stopping runoff
- Minimizing evaporation
- Hydrozoning
Checking for Leaks

Distribution Uniformity: "Distribution uniformity" means uniformity of water application by the irrigation system. - Irrigation Auditor Handbook
Eliminate Runoff

- Cycle and soak stations
- Drip Irrigation
- Rotating Nozzles
- Edgescapes
Minimize Evaporation
Minimize Evaporation

• Smarter Spray Head Nozzles
  • Greater DU Efficiency (Up to 75%)
  • More Evenly Matched Precipitation Rates
  • Can solve zone pressure and flow problems
  • Perform Best with Pressure Regulation
Minimize Evaporation

- Drip irrigation
  - Greater DU Efficiency (Up to 90%)
  - Lowest Flow Rates
  - Can solve zone pressure and flow problems
  - Perform Best with Pressure Regulation

Point source

Inline

DROUGHT RESOURCE MANAGEMENT DISCUSSION
Minimize Evaporation

ROCK MULCH

BARK MULCH

DROUGHT

RESOURCE MANAGEMENT

DISCUSSION
A Work in Progress

AUGUST 2010

SEPTEMBER 2014

DROUGHT

RESOURCE MANAGEMENT

DISCUSSION
Smart Controllers

- ET Based Scheduling Adjusts Daily the Valve Runtime and Application Interval by Calculating Local Weather Conditions and Plant Requirements
- Irrigation Controllers that use ET Rate Inputs to adjust Programs for Weather & Landscape Conditions.
- They take the guess work out of irrigation scheduling.
Cloud-Based Smart Control

- **ET WATER** Anywhere Access

Irrigation control from any Internet-connected device – computer, tablet or smart phone
Respond remotely to client special requests.
Reduce emergency site visits by shutting off any high flows remotely
Flow Management:

Cloud based flow management allows for Real Time or True Flow versus assumed or predicted flow. Automatic system shut down for leaks or other flow anomalies. Automatic alerts sent via text message and email to notify users, property owners, managers, etc. of leaks or other flow issues.

(Data Industrial Flow Sensors)
Site Mapping

Site measurement and scaled mapping helps accurately forecast site water budgets, fertilizer needs and efficient paths of motion.

Site Mapping Tools:
AutoCAD
Google Earth Pro
Gollawn.com
Measuring Wheels
Inclinometer
### Monthly Water Budget

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**TOTAL:** 69

**Projected Annual Savings in MCF:** 52

**Projected Annual Savings in Gallons:** 38,524

**REBATE ESTIMATE:** $5,000.00

*NOTE: ESTIMATES ARE BASED ON CALIFORNIA'S ESTIMATED WATER USE CALCULATION THAT IS USED IN AB 1891. EVAPOTRANSPIRATION DATA IS FROM THE CITY OF OCEANSIDE. WATER SAVINGS ESTIMATES ARE BASED ON PLANT WATER NEEDS AND IRRIGATION SYSTEM UNIFORMITY. ESTIMATES ARE PROJECTIONS. ACTUAL CONSUMPTION WILL VARY BASED ON WEATHER CONDITIONS AND WATER MANAGEMENT.*
Water Management and Soils

Program Aspects

- Nutrient Management
- Microbial Life
- Bio Reserves
- Organic Fertilizer Program
- Eco-Efficient Landscape Specifications
Best ways to achieve an irrigation efficient landscape:

- Maintain a level high distribution uniformity
- Update irrigation schedules frequently using Cloud-Based ET Controllers, and Flow Management whenever possible.
- Measure what you manage
- Improve your soil. Routinely cultivate your soil, incorporating organic matter such as compost. Doing so improves the soil’s ability to resist evaporation and retain moisture.
- Mulch. A two- to four-inch layer of mulch evens out temperature extremes, keep soil cool on hot days and warm on cool days.
Turf Removal Design/Build Process

• Planning and Design:
  – Measure meter specific turf areas w/ AutoCAD
  – Obtain water bills and apply for rebate reservation
  – Obtain rebate reservation from SoCal WaterSmart
  – Create conceptual design packet and plant list
  – Create scaled planting plans
  – Create project estimate and submit to client for approval
Conceptual Design

Collaborative process focusing on our client’s aesthetic, economic, and environmental needs
Design + Planning with AutoCAD
Turf Removal Renovation Process

• Eradicate turf grass
• Rototill project area to remove turf grass
• Renovate irrigation system to be water efficient
• Install drought-tolerant plant materials
• Install 2”-4” of mulch throughout planted areas
• Create new irrigation site map
• Finalize rebate completion paperwork
• Turnover project to maintenance
We specialize in California Friendly and California Native Landscape Design & Installation
Design + Installation

Water Savings: 50+%  
• In-line drip irrigation  
• Low-water plant material  
• Mulch  
• Eliminated irrigated turf area  
• Weather-based irrigation controller  
• Water budgeting
Questions?
Thank you!

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San Diego Watersheds
Drought or not: Eliminate runoff!
Reduce or Eliminate Discharges
Illicit Discharges if identified as a source of pollutants

- Discharges from potable water sources. Must be controlled

  a. Air conditioning condensation – should be directed to landscaped areas or other pervious surfaces or to the sanitary sewer, where feasible.

  b. Individual residential vehicle washing (usually frowned upon at multi-family or commercial facilities not intended for vehicle washing)

  c. Dechlororinated swimming pool discharges
Firefighting discharges to the MS4

a. Non-emergency firefighting discharges – building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

b. Emergency firefighting discharges – develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction.*
Routinely check irrigation systems
Routine checks landscapers?
It will rain again, someday, so be ready!
San Diego Zoo & Rincon Water District
Example: City Residential Rain Barrel Installation

Installed two - 204 gallon tanks
Cost: $254 each x 2 = $508

Rebate from City of San Diego = $1 per gallon x 408 = $408 ($400)

Rebate from MWD ($75x2) = $150

Total rebated $550

*Calculation only includes rain barrel costs. Base, rain gutters, first flush device and PVC pipe would be additional cost.
Thank you!

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