

# This presentation premiered at WaterSmart Innovations

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# Does turf removal save water?

Metropolitan Water District of  
Southern California

Kathy Ramos

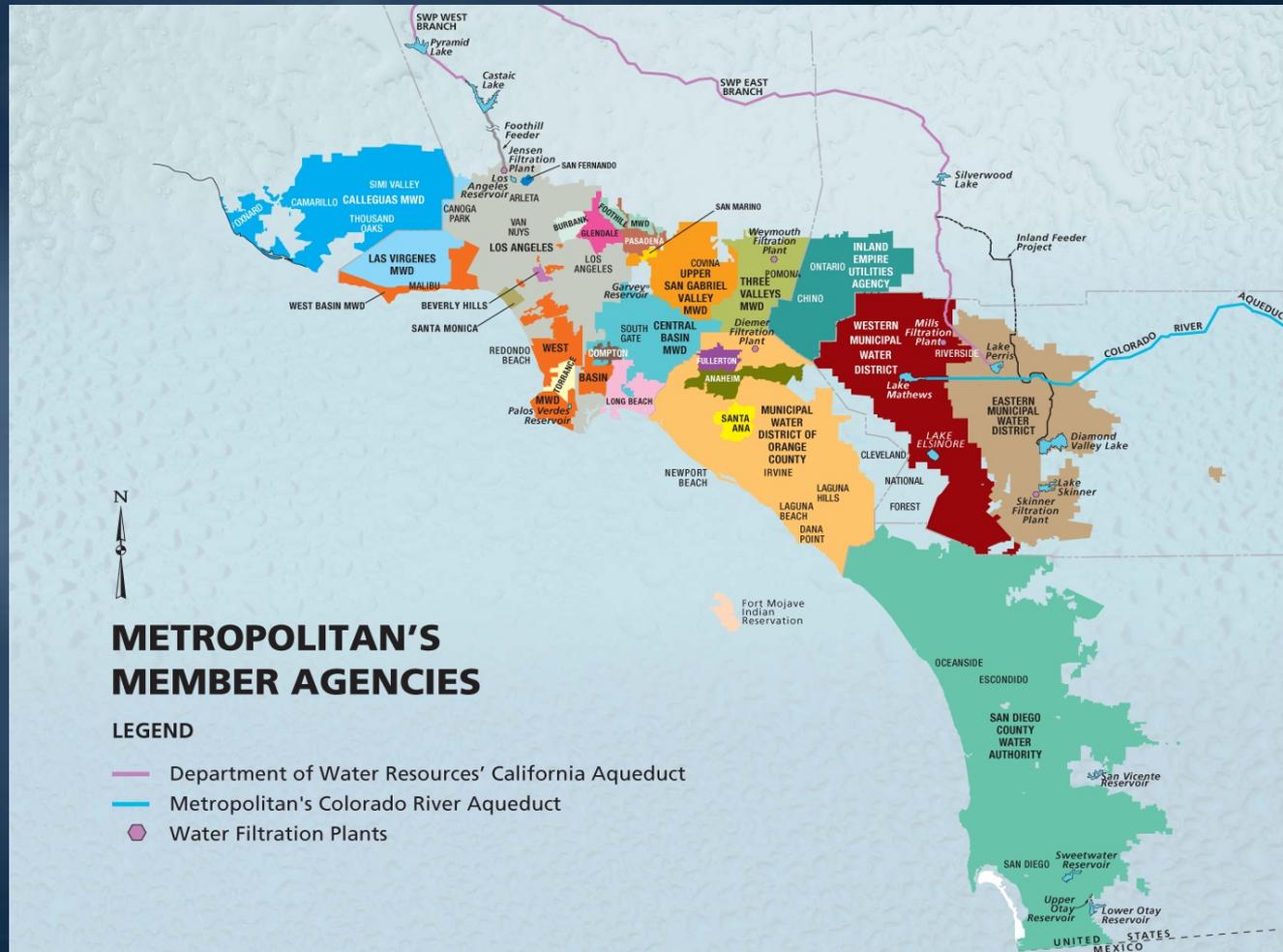
# Metropolitan Water District of Southern California



- Regional water wholesaler
  - Serves 6 counties, 19 million people
  - 5,200 square mile service area
  - \$1 trillion regional economy
  - 50%+ of region's water supply
  - Population increasing ~170,000 per year

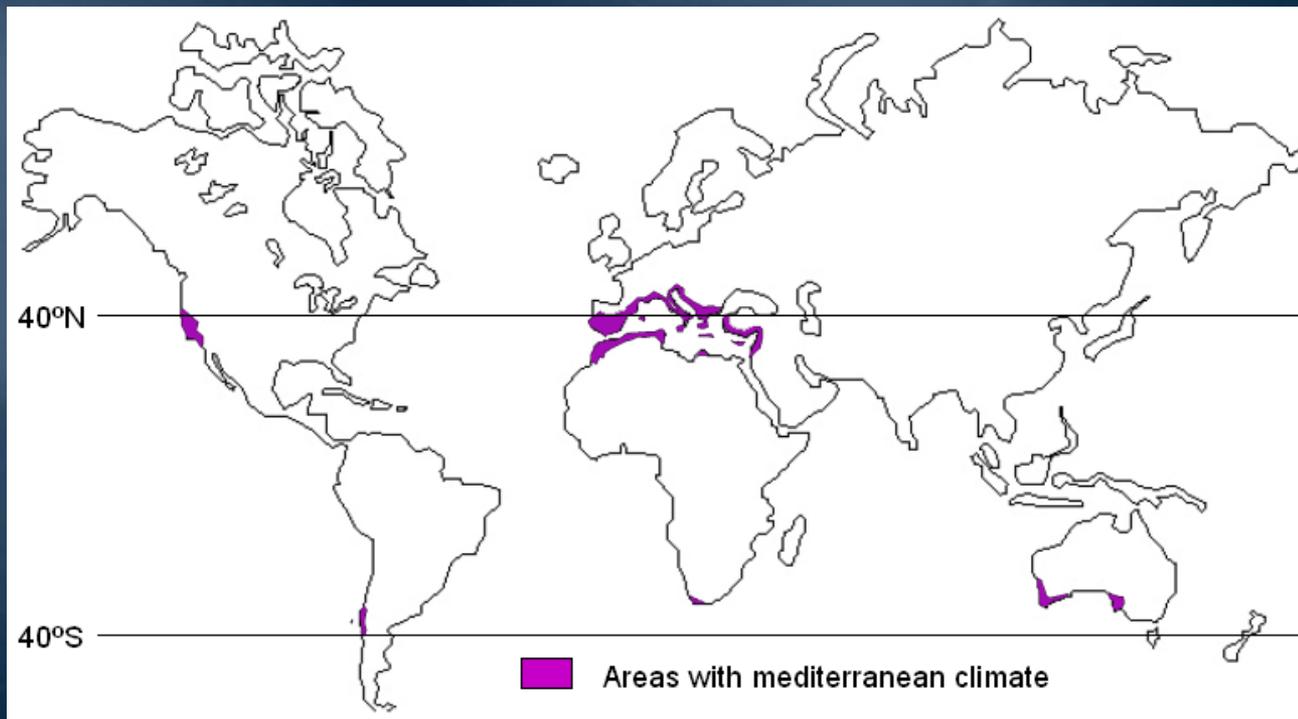
# Member and Retail Agencies

- 26 Member agencies and ~275 retail agencies



# Metropolitan: Climate

- Southern California is a Mediterranean climate
  - Hot dry summers and cool wet winters
  - Holds 16% of the earth's plant species.



# Metropolitan: Diverse landscapes



# Metropolitan Turf Removal Program

- Rebate program for customers who remove turf and replace it with a California Friendly Landscape



Before



After

# Metropolitan Turf Removal Program

- Base incentive and requirements for eligible completed projects.
- Local water Agencies can add additional funding and requirements for eligible completed projects



# Metropolitan Turf Removal Program

- Time Period: 2011-2013
- Commercial and Residential properties
- Program Funding:
  - Metropolitan Water District - \$4.4 million
  - Department of Water Resources - \$2 million
  - Bureau of Reclamation- \$1 million



**RECLAMATION**  
*Managing Water in the West*

# What is California Friendly?

- Cannot include live turf or turf-looking grasses
- Exposed soil must be covered with 2" of mulch
- Must be permeable to air and water



# What is California Friendly?



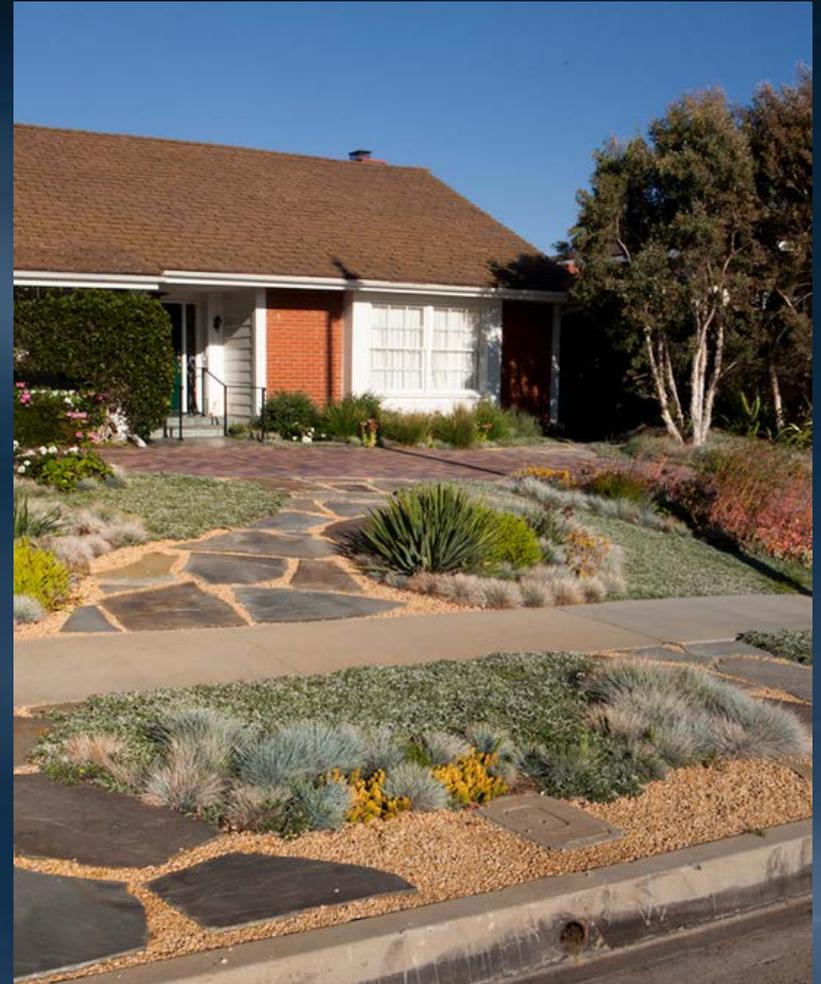
Southern California Plants

# What is California Friendly?



Succulents

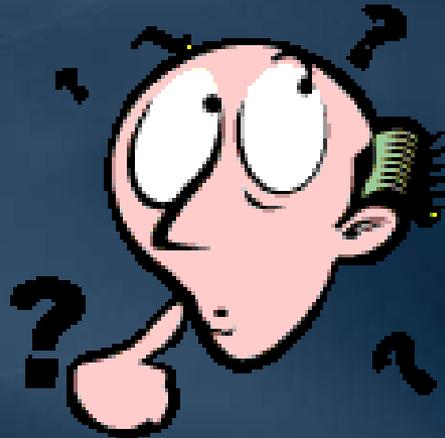
# What is California Friendly?



Water-Wise Plants

# Water Saving Analysis

- Does turf removal reduce water usage?
- Commercial sites vs. residential sites?



# Water Savings Analysis

- Develop an estimate of water savings attributed to Metropolitan's turf removal program.
  - Turf removal projects completed 2011-2013
  - Residential and Commercial properties
  - 7.4 million square feet of completed projects available for study



# Research Design

- Before and after conversion
- Utilized actual meter reads
- All agency analysis- not by individual agencies
- All service area analysis - not by climate areas



# Data Collection

- 43 water agencies with turf removal programs
- 13 programs provided data
  - Programs at least one year old
  - Programs in all weather zones
- 30 commercial sites, 287 residential sites



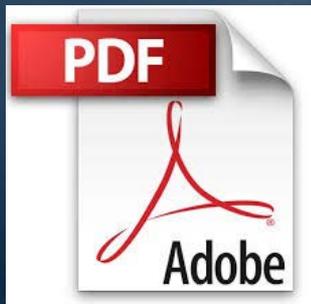
# Data Collection: Challenges

- Water usage collected directly from water provider
  - Member agency or retail agency
  - Is the agency willing to share data?
  - Does their billing system allow data sharing?
  - Was the data required actually collected?



# Data Collection: Logistics

- Water usage data
  - Comes from billing data
  - Many formats
  - 30-60 day range in billing cycle
  - Information can be missing or incorrect



# Data Analysis: Factors

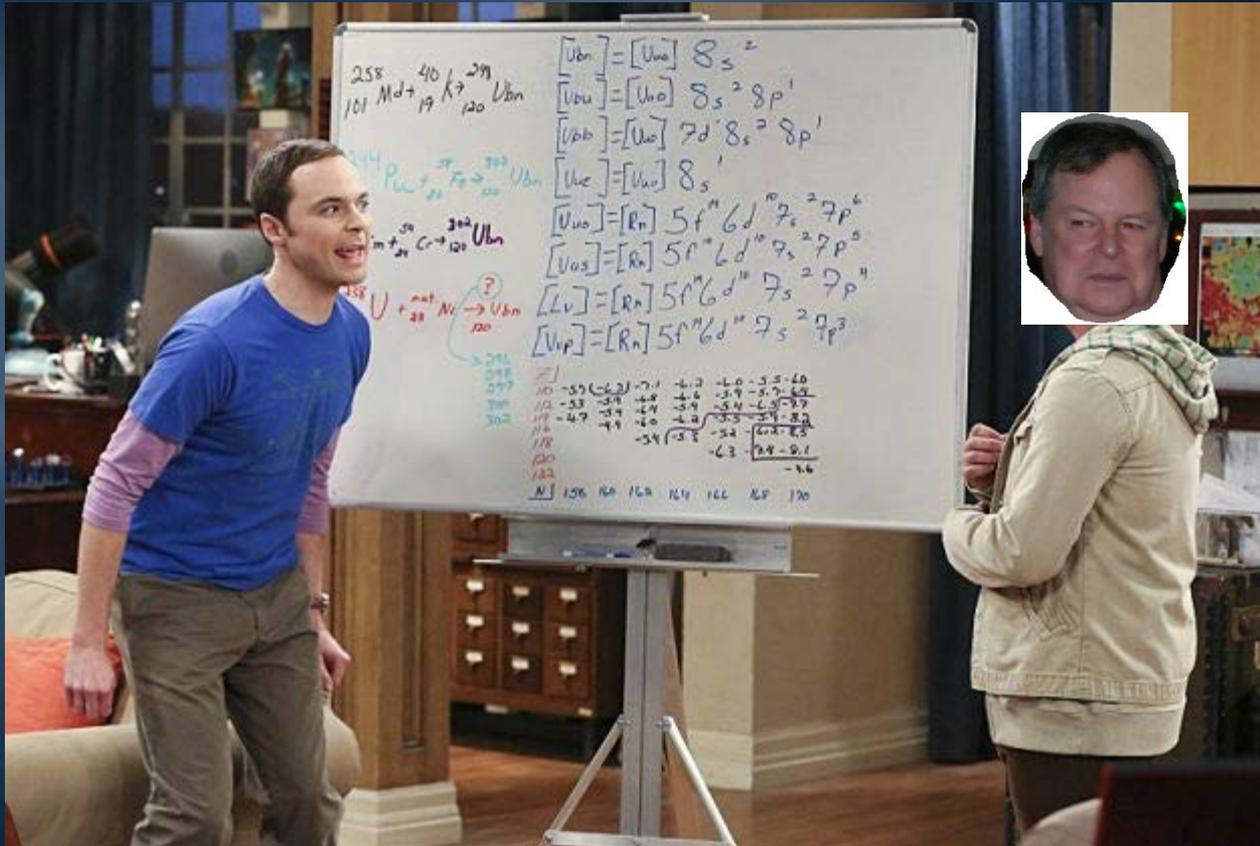
- Factors incorporated
  - Seasons
  - Temperature
  - Rainfall
- Factors not incorporated
  - Attitudes toward conservation
  - Income of participants
  - Influence of economic health
  - Behavioral factors – marketing on water conservation.

# Data Analysis: Caveats

- Sample group may not be representative of all turf removal programs
- Ideally have up to 3 years of post-conversion water usage data
- Not all factors could be incorporated

# Data Analysis: Solutions

- Very smart people
- Models, estimator effect tests, logarithmic transformations, regression, and more.



# Results: Commercial, Industrial, Institutional

- Parks, medians, city property, offices, industrial sites, homeowner associations
- Average water reduction: 23.9%



Parks



HOA Common Areas

# Results: Residential

- Single Family Homes
- Average water reduction: 18.2%



# Results: the details

- Individual customer savings varied
- Three major trends – increase, decrease, stable
  - Replacement landscape
  - Prior irrigation history
  - Time of year



# In the future: new questions

- Additional “post” installation water usage data
  - Does water savings increase, decrease or persist?
- Total irrigated landscape
  - Calculate the gallons reduced per square foot
- Larger sample size
  - Allow for analysis per climate zone or program rules
- Cost effectiveness
  - Information on cost to customer and water agency

# Before and After Photos



# Before and After Photos



# Before and After Photos



# Before and After Photos



# Contact Information



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