Data for Water Use Efficiency and Water Management

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Agenda

• Introduction
• Customer Specific Data and Water Use Efficiency
• Data Uses in Water Supply Planning
• Challenges and Opportunities
EMWD’s Service Area

- Established in 1950
- Unique agency, serving:
  - Water/wastewater/recycled
  - Wholesale and retail
- 555 square miles
- Population: 825,000
- Moreno Valley to Temecula
- Seven cities and the unincorporated areas
- One of 26 member agencies of The Metropolitan Water District of Southern California (MWD)

High-growth area that is 38% built-out
EMWD Services

• **Potable Water:** Approx. 144,000 accounts
  – Imported water from the State Water Project and Colorado River
  – Directed treated deliveries from MWD
  – Two Ultra-filtration plants
  – Groundwater wells (adjudicated - managed basin)
  – Brackish desalination

• **Wastewater:** Approx. 239,000 accounts
  – Four regional water reclamation facilities

• **Recycled Water:** Approx. 300 accounts
  – 35,617 acre feet sold in FY 2014/2015
  – Approximately 10,800 acres of agriculture irrigated by recycled water
Customer Specific Data and Water Use Efficiency
Allocation Based Tiered Rate Structure

• Creates a “Allocation” or “Water Budget” for each customer account based upon reasonable indoor and outdoor needs and efficient use

• Focuses on Equity: Those who need more have a higher budget, those who need less cannot waste

• Uses Economic Incentives: Water is priced to customer lower for use within budget and much higher for use over budget
  – Rewards efficiency
  – Communicates cost of water over-use

• Identifies Over-use customers: water bill functions as “report card” – focus staff resources

• Tied to the EMWD’s Water Shortage Contingency Plan
Outdoor Irrigation Budget

Outdoor Budget = (Annual Evapotranspiration - Eto) x (Landscape Area) x (Evapotranspiration Adjustment Factor)

• Evapotranspiration or Eto
  – A measured weather factor of solar radiation, temperature, humidity, wind - plant transpiration

• Evapotranspiration Adjustment Factor or “ETAF”
  – Level of water use applied based upon landscape type
  – Based on the Model Water Efficient Landscape Ordinance (MWELO) in place at the time
EMWD Billing System

• Each account is geolocated
  – Latitudinal/Longitudinal coordinates
  – Complete service addresses
  – Comments describing exact locations

• Historical data is recorded per account
  – Activation and Inactivation dates
  – Complete consumption and billing history
  – Meter sizes and replacements
  – Historical variance requests
  – Bill payment history

• 1 meter is assigned per account
  – Each meter is assigned a unique serial number

• Residential Dwelling Units (RDU) are recorded for all residential accounts

• Every Customer Service interaction is commented and noted
Weather Data

• California Irrigation Management Information System (CIMIS)
  – A program unit managed by the California Department of Water Resources (DWR)
  – Over 145 automated weather stations in California

• Evapotranspiration (ET) Microzones
  – Evapotranspiration data is collected for microzones across the District using spatial CIMIS information and other weather factors
Landscape Measurements

- Conservation Staff measure and track landscapes on residential and commercial properties
  - More accurate outdoor budgets
  - Track progress of installing drought tolerant landscaping
  - Information is used for targeted rebate programs
Rebate Programs

• Rebates are available for Commercial, Multi-Family, and Residential Customers
  – 17 unique rebate programs are currently monitored
  – Participants’ water budgets and usage are compared to a control group’s to estimate savings and program effectiveness

### Residential Water Survey

Program Active Since:  Aug 2013
Program Participants:  1009
Program Type(s):  Residential

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<th>Predicted Usage</th>
<th>Actual Usage</th>
<th>Savings</th>
<th>% Savings</th>
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<td><strong>11.9%</strong></td>
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<tr>
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<th>Predicted Usage</th>
<th>Actual Usage</th>
<th>Savings</th>
<th>% Savings</th>
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<tbody>
<tr>
<td>Participants</td>
<td>14,320</td>
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<td><strong>12.5%</strong></td>
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Automated Meter Infrastructure (AMI)

EMWD expects to have its 150,000+ water meters upgraded to AMI by spring 2019

• Cost-Efficient Technology
  – Reduces employee hours dedicated to reading meters
  – Reduces need for vehicle trips
  – Reduces EMWD’s environmental footprint

• Real-Time Data Link
  – Hourly meter reads
  – Daily meter reads
Current Uses

• Water loss tracking
  – Helps employees identify and locate leaks on mainlines and on the customer end
  – Improves water loss monitoring and reporting

• Customer Outreach
  – Notify customers about potential water leaks when continuous usage is identified at their meter
  – Develop scorecards – weekly reports comparing a customer’s weekly usage to their budget
  – Estimate indoor and outdoor use
  – Identify inefficient watering practices
Data Use in Water Supply Planning
Land Use and Water Supply Planning

Development Community
- Proposed Project Details
- Development Status

EMWD
- General Plan
- Planning Documents
- Billing Data

Land Agencies
- General Plan
- Planning Documents

Demand Projections
- Facility Master Plans
- Water Supply Master Plan
- Water Supply Assessments
- Urban Water Management Plan

Proposed Project Details
Development Status
General Plan
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Planning Documents
Billing Data
Growth Projections

Forecasts of water and wastewater connections for residential and non-residential developments is updated annually and used to project demand and plan facilities

• Projections are evaluated annually and estimate the:
  – Number of new connections
  – Water demand, wastewater flow and recycled water generation

• Annually, the following data is reviewed:
  – Number of historical connections
  – Changes in planned projects
  – Demand per unit
  – Housing development, sales, foreclosures, and market shifts
Database of Proposed Projects

- 816 Proposed residential and commercial projects
- 122,550 Proposed new homes
- Tracks from early planning stages to construction
- Input includes information from developers, local land agencies, and new business department
- Used for developing projections needed for supply and facility planning
Ultimate Land Use

• Use General Plan Updates
  – Collect and track information from seven cities and the County of Riverside
• Conservation lands
• Collected and tracked in GIS
• Integrates with DOPP
Considering Conservation

10 year average 1999-2008 = 197 GPCD

SBX7-7 2020 Target = 176 GPCD
Recycled Water

• 37% of EMWD’s Water Supply
• Offsets potable water use
• Agricultural and Urban Water Use
• Increases in urban land use result in an increase in supply of recycled water
• Decreases in available agricultural land can result in decrease in demand

Changes in land use impact both supply and demand
Projected Annual Demands – Potable/Raw Service

Annual Supply (AF)

- PROBABLE
- PESSIMISTIC
- OPTIMISTIC
- ACTUAL
Water Supply Planning
EMWD Projected Retail Supplies (2020-2040)

- Imported
- Imported, Locally Treated
- Recycled
- Desalination
- Demand

Projected Retail Supplies (AF)

2015 2020 2025 2030 2035 2040
Scenario Planning

- Evaluated the resilience of EMWD’s planned water supply portfolio.
- Design test scenarios to evaluate the reliability of EMWD’s water supply portfolio under various conditions:
  - Prolonged drought
  - Disruption of both imported and local supplies
  - A severe regulatory environment
- Use a probabilistic model to calculated an water balance annually over the next twenty years while being stressed by the identified uncertainties.
- Data is obtained from:
  - Urban Water Management Plan (UWMP)
  - Water Supply Strategic Plan
  - Recycled Water Strategic/Master Plan
  - MWD’s 2015 Integrated Water Resources Plan (IRP)
  - EMWD Billing System
  - California Irrigation Management Information System (CIMIS)
Scenario Planning

Model Inputs

Model Outputs

Presentation Summary
Challenges and Opportunities
Challenges

• Data Overload
  – Storage space
  – Data Management
  – Equipment limitations
  – Organization

• Proficiency
  – Data collection and analytical skills
  – Organization and presentation

• Security
  – Protect customer information
Opportunities

• Increased accuracy and frequency of data collection

• Better decision making:
  – Water resource managers – balancing supply and demand
  – Consumer – changing behaviors and increasing supply reliability
  – Regulators – influencing actions and responses to changing conditions

• More comprehensive understanding of behaviors and actions

• Targeted actions

• Transparency

• Safe and reliable service
Contact Information

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