Outdoor Water Use Efficiency

Urban Water Demand Roundtable

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Aurora, CO
Aurora Water

- Third largest Municipal Water Provider in Colorado

- Population: 336,000
- Accounts: 78,500
- Annual Demand: 50,000 af
- Residential usage: 89gpcd
# Variable Yields

## Historical Annual Gross Yields (in acre-feet) by River Basin

<table>
<thead>
<tr>
<th>Basin</th>
<th>Average</th>
<th>Dry Year Yield</th>
<th>Wet Year Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado River Basin</td>
<td>22,779</td>
<td>6,272</td>
<td>36,399</td>
</tr>
<tr>
<td>Arkansas River Basin</td>
<td>18,821</td>
<td>9,723</td>
<td>30,912</td>
</tr>
<tr>
<td>South Platte River Basin</td>
<td>40,664</td>
<td>20,507</td>
<td>74,150</td>
</tr>
<tr>
<td><strong>System Total</strong></td>
<td>82,264</td>
<td>36,502</td>
<td>141,462</td>
</tr>
</tbody>
</table>
Aurora’s Reservoirs

Total Historical System Storage
From 1/1/1997 to Date

Month-Year

- Total System Content
- Active System Capacity
- Annual Consumption
Historic Demands

Aurora Water - Water Usage 1990 - 2012

Composite (gpcd)

Indoor  Outdoor

Historic Demands

Aurora Water - Water Usage 1990 - 2012

- Avg. Outdoor (1990 - 2001)

Composite (gpcd)

Indoor  Outdoor
Demand Questions

• Water Resources:
  – Will demands stay at current levels? Decrease? Increase?

• Conservation:
  – Can we have a more proactive approach to conservation?
Outdoor Irrigation Efficiency Study

- Develop a water-use map for visualization and planning
- Target inefficiencies
- Actively contact customers
- Rebate most inefficient uses – improve water savings and ROI

- Total Cost under $200k ($120k state grant)
What my friends think I do
What my mom thinks I do
What society thinks I do
What my clients think I do
What I think I do
What I really do
City Mapping Project

- Clip Imagery to Tiles
- Base Classification
- Compute / Render NDVI
- Vegetation Analysis
City Mapping Project

• Create a city wide map for irrigation types
  – High, Medium/Low, or Non-irrigated areas
Database – Map Link

- Link water meter data to mapped data
- Create a water use map
  - Linked with customer water meter in GIS
  - Focuses on inefficient water users
Water Use Map (Based on Pilot)

Categories:
- Very Low Water Use: <70%
- Low Water Use: 70% - 89%
- Good Water Use: 90% - 110%
- High Water Use: 111% - 130%
- Very High Water Use: >130%
What’s Next…

• Immediate Applications:
  – Add water-budget and conservation savings information directly to monthly water bill
  – City will target the top 200 residential water-wasters for detailed audits

• More informed prioritized list of actions to take.
What’s Next…

• Future Refinements / Applications:
  – Add weather data
  – Calculate city-wide efficient water use
  – Trends in future water use
  – Etc.

Weather Station
Possible Citywide Uses

- City Parks
  - What do they have? Irrigated areas?
- Storm Water
  - Potential billing based on Imp. Surface
- Development Planning
  - Lot trends (P vs. I) throughout city
  - Past vs. Present vs. Potential Trends
  - City ordinances on new development