SLIDES: Water Use Efficiency: An Under-Tapped Resource

Bart Miller

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WATER USE EFFICIENCY:
An Under-tapped Resource

Bart Miller

NRLC water conference, June 10, 2005

WESTERN RESOURCE ADVOCATES
Our Region

The Southwest
# Population Growth in the Southwest

## Top 12 States by Percent Population Growth, 1990-2000

<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Nevada</td>
<td>1,998,257</td>
<td>1,201,833</td>
<td>796,424</td>
<td>66.3</td>
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<td>2</td>
<td>Arizona</td>
<td>5,130,632</td>
<td>3,665,228</td>
<td>1,465,404</td>
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<td>3</td>
<td>Colorado</td>
<td>4,301,261</td>
<td>3,294,394</td>
<td>1,006,867</td>
<td>30.6</td>
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<td>4</td>
<td>Utah</td>
<td>2,233,169</td>
<td>1,722,850</td>
<td>510,319</td>
<td>29.6</td>
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<td>5</td>
<td>Idaho</td>
<td>1,293,953</td>
<td>1,006,749</td>
<td>287,204</td>
<td>28.5</td>
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<td>6</td>
<td>Georgia</td>
<td>8,186,453</td>
<td>6,478,216</td>
<td>1,708,237</td>
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<td>7</td>
<td>Florida</td>
<td>15,982,378</td>
<td>12,937,926</td>
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<td>23.5</td>
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<td>8</td>
<td>Texas</td>
<td>20,851,820</td>
<td>16,986,510</td>
<td>3,865,310</td>
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<td>North Carolina</td>
<td>8,049,313</td>
<td>6,628,637</td>
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<td>Washington</td>
<td>5,894,121</td>
<td>4,866,692</td>
<td>1,027,429</td>
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<td>11</td>
<td>Oregon</td>
<td>3,421,399</td>
<td>2,842,321</td>
<td>579,078</td>
<td>20.4</td>
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<td>12</td>
<td>New Mexico</td>
<td>1,819,046</td>
<td>1,515,069</td>
<td>303,977</td>
<td>20.1</td>
</tr>
</tbody>
</table>

Resulting Urban / Suburban Expansion

Photos by K.C. Becker
The Historic Water Solution...
Critical Ecological Values

Photos by U.S. Fish and Wildlife Service
Human & Economic Values

Photos by Jeff Widen and Brian Holmes
Examples of Rivers at Risk

• Bear River (UT)
• San Pedro (AZ)
• Gunnison (CO)
• Colorado (Regional)
• Rio Grande (CO, NM, TX)
• Salt and Verde (AZ)

Photo by Jeff Widen
SMART WATER

• Yardstick of current levels of urban water use across the region

• Roadmap for the future---policies and programs
Single-Family Residential Use

2001 Single-Family Residential Daily per capita Water Consumption

Gallons per capita per Day (gpcd)

- Albuquerque: 135
- Boulder: 140
- Denver: 159
- El Paso: 122
- Grand Junction: 182
- Highlands Ranch: 140
- Las Vegas: 230
- Mesa: 123
- Phoenix: 144
- Scottsdale: 203
- Taylorsville: 193
- Tempe: 211
- Tucson: 107
Outdoor Water Use

2001 Estimated Single-Family Residential Outdoor Use, Represented as a Daily per capita Use

<table>
<thead>
<tr>
<th>City</th>
<th>Gallons per capita per Day (gpcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque</td>
<td>65</td>
</tr>
<tr>
<td>Boulder</td>
<td>70</td>
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<tr>
<td>Denver</td>
<td>90</td>
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<tr>
<td>El Paso</td>
<td>53</td>
</tr>
<tr>
<td>Grand Junction</td>
<td>113</td>
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<tr>
<td>Highlands Ranch</td>
<td>71</td>
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<tr>
<td>Las Vegas</td>
<td>161</td>
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<tr>
<td>Mesa</td>
<td>54</td>
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<tr>
<td>Phoenix</td>
<td>75</td>
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<tr>
<td>Scottsdale</td>
<td>134</td>
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<tr>
<td>Taylorsville</td>
<td>124</td>
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<tr>
<td>Tempe</td>
<td>142</td>
</tr>
<tr>
<td>Tucson</td>
<td>38</td>
</tr>
</tbody>
</table>
Unaccounted For Water (UFW)

2001 Unaccounted For Water (UFW) as Percentage of Total Raw Water Extracted

- Albuquerque: 12.3%
- Boulder: 8.7%
- Denver: 4.4%
- El Paso: 10.3%
- Grand Junction: 10.3%
- Highlands Ranch: 4.5%
- Las Vegas: 4.6%
- Mesa: 1.3%
- Phoenix: 9.8%
- Scottsdale: 11.8%
- Taylorsville: 3.5%
- Tempe: 4.5%
- Tucson: 12.0%
Urban Water Use Efficiency

• Demand-side solutions and recent trends

• Supply-side solutions and look to the future

Photo by Jeff Widen
Demand-side: Outdoor Conservation

In most Southwestern cities, 50-70 percent of all water use is outside the home or office.

Much landscape irrigation is inefficient – even modest conservation efforts can yield significant water savings:

> Xeriscape

> Efficient Landscape Design

> Efficient Watering

Photo by Dave Shows and Assoc., Inc.
Demand-side: Indoor Conservation

Typical, Conserving, and State-of-the-Art Indoor Water Use (daily per capita)

- Gallons per capita per Day

- Graph showing water usage for Typical Home, Conserving Home, and State-of-the-Art Home.
- Water usage categories include Toilets, Showers, Baths, Faucets, Dishwashers, Clothes Washers, Other Domestic, and Leaks.
Demand-side Efficiency Programs and Policies

• Water Rate/Pricing Structures
• Rebate and Retrofit Programs
• Education
• Regulations, e.g.:
  – Landscape and irrigation guidelines
  – Plumbing codes
  – Subdivision covenants
Rate Structures: Average Prices

Derived from 2001 water rate data
Rebate and Retrofit Programs

- Turf replacement (with Xeriscape requirements)
- Landscape irrigation controllers
- Ultra low flow toilets
- High-efficiency clothes washers
- Showerheads and faucet aerators

Photos by American Water Works Assoc. and David Winger, Denver Water
Education Programs

- Public relations
- Information clearinghouse
- Outreach and instruction
- Indoor/Outdoor water use audits for all customer sectors

Photo by American Water Works Association
Smart Development via Zoning and Development Standards

- Higher land use densities

- Minimize coverage of water-loving landscaping (e.g., bluegrass)

- Maximize use of Xeriscape

- Use reclaimed water for landscape irrigation

- Limit turfgrass on medians, slopes, and narrow parkways

Photos by Al Nichols
Average Single-Family Lot Sizes in 2001, by Individual Year and Overall --- Clark County, Nevada
Average Daily Water Use in Gallons in 2001, Single-Family Homes by Year of Construction --- Clark County, Nevada
Supply-side Efficiency Alternatives

Water Loss Reduction       Water Reuse

Photos by American Water Works Association
Supply-side Efficiency Alternatives

Aquifer Storage & Recovery

Water Transfers: including Dry-Year Leasing and Fallowing

Photos by American Water Works Association
South Platte basin: Urban population and water demand 2000 & 2030
[Source: Statewide Water Supply Initiative (Nov. 2004)]

2000 Conditions
- 3 million people
- 770,000 AFA

2030 Projections
- 4.9 million people
- 1,180,000 AFA

Photo by K.C. Becker
South Platte potential savings by 2030

[Sources: Metropolitan Water Supply Investigation and research by Western Resource Advocates]

• Supply side:
  – Conjunctive Use 40,000 AFA
  – Re-use 120,000 AFA
  – Water Transfers 190,000 AFA

• Demand Side:
  – Outdoor Savings 100,000 AFA
  – Indoor Savings 50,000 AFA

• Total: 500,000 AFA
Recommendations

• Adopt effective *increasing block rate* pricing structures

• Offer permanent *indoor appliance, Xeriscape, and irrigation controller* rebate programs

• Enact ordinances to encourage *efficient water use*

• Increase *water conservation education*
Recommendations

• Implement loss reduction programs (e.g., detect/repair system leaks, home and business audits)

• Implement re-use and water recycling systems

• Use aquifer storage and recovery (coordinated surface and groundwater) where appropriate

• Pursue agriculture-to-urban water transfers that protect agricultural uses