Catawba/Wateree Bi-State Commission Meeting
December 2, 2011
ATLANTA

November 2007

September 2009
Oconee River, GA

Photo credit: Steve Dorsch, Ben Emanuel
WATER SHORTAGES?

![Map showing water shortages in the United States](image)

- **Statewide (2)**
- **Local (18)**
- **Regional (16)**
- **None (9)**
- **No response or uncertain (5)**

Number in parenthesis ( ) indicates the number of states in each category.

Source: GAO analysis of state water managers' responses to GAO survey.
Why efficiency?
WATER INFRASTRUCTURE IS EXPENSIVE

20 Year Drinking Water and Clean Water Infrastructure Needs by EPA Region
### Assessing Southern California Water Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>2025 Regional Potential (TAF)</th>
<th>Timeframe (years)</th>
<th>Drought-Proof Reliability</th>
<th>Risk (Project Aborted)</th>
<th>Enviro Opinion</th>
<th>GHG</th>
<th>Initial Cap. Cost ($millions)</th>
<th>Annual Oper. Cost ($millions)</th>
<th>30-yr cost Treated ($/AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategies to Replace or Augment Imported Water</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Urban Water Conservation</td>
<td>1,100+</td>
<td>0-2</td>
<td>![Green]</td>
<td>![Green]</td>
<td>![Green]</td>
<td>![Green]</td>
<td>$0</td>
<td>$0.5</td>
<td>$210</td>
</tr>
<tr>
<td>Local Stormwater Capture</td>
<td>150+</td>
<td>3-5</td>
<td>![Red]</td>
<td>![Green]</td>
<td>![Green]</td>
<td>![Green]</td>
<td>$40-$63</td>
<td>$1-$3.5</td>
<td>$350+</td>
</tr>
<tr>
<td>Recycling</td>
<td>450+</td>
<td>6-10</td>
<td>![Green]</td>
<td>![Yellow]</td>
<td>![Green]</td>
<td>![Yellow]</td>
<td>$480</td>
<td>$30</td>
<td>$1,000</td>
</tr>
<tr>
<td>Ocean Desalination</td>
<td>150+</td>
<td>6-10</td>
<td>![Green]</td>
<td>![Red]</td>
<td>![Red]</td>
<td>![Red]</td>
<td>$300</td>
<td>$37</td>
<td>$1,000+</td>
</tr>
<tr>
<td>Groundwater Desalination</td>
<td>TBD</td>
<td>6-10</td>
<td>![Green]</td>
<td>![Yellow]</td>
<td>![Yellow]</td>
<td>![Yellow]</td>
<td>$24</td>
<td>$0.7</td>
<td>$750-$1,200</td>
</tr>
<tr>
<td><strong>Strategies to Increase Imported Water</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Transfers-Ag to Urban</td>
<td>200+</td>
<td>1-5</td>
<td>![Yellow]</td>
<td>![Red]</td>
<td>![Yellow]</td>
<td>![Green]</td>
<td>n/a</td>
<td>n/a</td>
<td>$700+</td>
</tr>
<tr>
<td><strong>Strategies to Increase Reliability</strong></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Inter-agency Cooperation</td>
<td>![**]</td>
<td>0-5</td>
<td>![Green]</td>
<td>![Yellow]</td>
<td>![Yellow]</td>
<td>![Green]</td>
<td>low</td>
<td>low</td>
<td>n/a</td>
</tr>
<tr>
<td>Groundwater Storage</td>
<td>1,500+</td>
<td>3-5</td>
<td>![Yellow]</td>
<td>![Yellow]</td>
<td>![Green]</td>
<td>![Yellow]</td>
<td>$68-$135</td>
<td>$13</td>
<td>$580</td>
</tr>
<tr>
<td>Surface Storage</td>
<td>0</td>
<td>10+</td>
<td>![Red]</td>
<td>![Red]</td>
<td>![Red]</td>
<td>![Yellow]</td>
<td>$2,500+</td>
<td>$7.5-$15.5</td>
<td>$760-$1,400</td>
</tr>
</tbody>
</table>
EPA R4 Guidelines on Water Efficiency Measures for Water Supply Projects in the Southeast

• Guidance informs local governments and water utilities of the water efficiency actions required in order to “eliminate or minimize the need for additional capacity before consideration of a water supply reservoir project on a stream or river”

• Guidance ensures utilities use consistent and rigorous water efficiency approaches as they determine the projected demand based on future needs.
1. Effective Management
   – plan for efficiency
2. Pricing for Efficiency
3. Efficient Water Use
   - stop leaks
   - meter users
   - retrofit fixtures
   - landscape to minimize waste
4. Watershed Approaches
**Problem:** Water waste incentives
- Decreasing block rates
- Dependence on volumetric pricing

**Success:** Greensboro, NC:
Two part fee system
- Flat cost of service fee
- Tiered volumetric fee

**Potential Savings:** up to 22%

**Lancaster County:** Decreasing block rates incentivize water waste

**Union County:** Increasing block rates and drought pricing – residential only
STOP LEAKS

Problem:
- 6 billion gallons/day lost
- 14% total water use

Solution:
- Conduct the IWA-AWWA water audit
- Reduce leaks as close to zero as possible

Potential Savings:
Example: Clayton County, GA
- Discovered 504 significant leaks
- Non-revenue water down from 20% to 12.5
- Saved $4,252,136.78 in production costs

Example: Raleigh 4.5%; 3MGD secured

Lancaster and Union Counties:
Potential for significant ongoing water and cost savings

Photo credit: www.awwa.org
## Standard Water Balance

<table>
<thead>
<tr>
<th>Authorized Consumption</th>
<th>Billed Authorized Consumption</th>
<th>Billed Metered Consumption</th>
<th>Revenue Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unbilled Authorized Consumption</td>
<td>Unbilled Metered Consumption</td>
<td>Non Revenue Water</td>
<td></td>
</tr>
<tr>
<td>Unbilled Unmetered Consumption</td>
<td>Unbilled Unmetered Consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Losses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apparent Losses</td>
<td>Unauthorized Consumption</td>
<td>Non Revenue Water</td>
<td></td>
</tr>
<tr>
<td>Customer Meter Inaccuracies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Losses</td>
<td>Leakage on Transmission and Distribution Mains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage and Overflows at Storage Tanks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage on Service Connections up to point of Customer Meter</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Problem:** Most multi-family, commercial include water costs in monthly rent/fees eliminating market signals

**Solution:** require sub-metering

**Success:**
Lenox Woods Apartments, Atlanta, GA
Cut water use in half by both retrofitting and sub-metering. $60,000/year savings.

**Lancaster and Union Counties:**
Potential Savings: 15%
**Retrofit all buildings**

**Problem:** Outdated fixtures and appliances waste water

**Solution:**
- Voluntary incentive programs
- Required retrofit on resale/reconnect

**Success:**
- DeKalb County, GA – Retrofit on Reconnect; 9MGD
- Orme, TN; quadrupled water supply through efficiency

**Lancaster and Union Counties:**
Potential Savings: 35% on household water use
**Problem:** U.S. homes use 30% drinking water on landscape; 50% is wasted

**Solution:**
- Meter large users of irrigation water and price for efficiency
- Require moisture or rain sensors for all irrigation systems
- Promote low water landscape design

**Potential Savings:** 25%

**Success:** Cary, NC – 15%
- Rain Sensor and water waste ordinances; WaterWise landscape program; Turf buy-back program

**Lancaster County:** With restrictions - 35-40% reduction in peak

**Union County:** With restrictions - up to 50% reduction in peak
1990-2009
Total Water consumption reduced by 26%
Per capita by 33%
While population increased by 16% over the same period.

Source: Seattle Public Utilities
Actual Water Demand and Past Forecasts

- Actual Annual
- 1967 SWD Forecast
- 1973 RIBCO Forecast
- 1980 Complan Forecast Medium
- 1980 Complan Forecast Medium-Low
- 1985 Complan Forecast-Medium
- 1993 WSP Forecast
- 1997 Revised Forecast
- 2001 WSP Forecast
- 2003 Official Forecast
- 2006 Draft Forecast

Source: Seattle Public Utilities
ASSESSING WATER EFFICIENCY POTENTIAL

- Involve stakeholders in planning process
- Conduct AWWA water balance assessment
- Develop plans for cost-effective water efficiency and conservation at each utility
- Top 5 policies
  - Stop leaks
  - Price for efficiency
  - Meter all users
  - Retrofit fixtures
  - Landscape to minimize waste
Demand Projections Should...

- Include natural conservation and water efficiency/conservation in demand projections
- Include accurate population data that accounts for a range of scenarios (high, medium, low growth)
For more information, please contact:

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www.AmericanRivers.org/WaterSupply