Water Research Foundation

- **Sponsor research**
  - Research cooperative funded primarily by drinking water utilities
  - ~940 utility subscribers

- **Promote collaboration**
  - Agenda is planned and guided by drinking water utilities

- **Produce knowledge**
  - World’s most extensive drinking water knowledge source
Focus Areas 2015

1. Water Utility Infrastructure
2. Water Utility Finance
4. Water Demand Forecasts & Management
5. NDMA and Nitrosamines
6. CECs & Risk Communication
7. Biofiltration
8. Integrated Water Management - Supply diversification
9. Intelligent Distribution Systems
10. Emerging Waterborne Pathogens

Closed 2014
1. Carcinogenic VOCs
2. Hexavalent Chromium
3. Contaminants of Emerging Concern
Water Demand: Improving the Effectiveness of Forecasts and Management

1. Effectiveness of past and current water demand forecasting activities

2. Uncertainty within forecasting methods and how to make utility plans

3. Current and future structure of:
   – factors affecting water demand
   – all sectors
## Projects started before Focus Area

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td></td>
<td>Smart irrigation controller demo in FL (4227)</td>
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<td>Analysis of water use under regional climate change scenarios (4263)</td>
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<td>Update &amp; expand residential end uses of water (4309)</td>
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<td>Methodology for determining baseline commercial, institutional &amp; industrial end uses of water (4375)</td>
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</tbody>
</table>
Smart irrigation controller demo in FL (4227)

Less irrigation
- ET or soil moisture sensor controllers
- Education (proper setup of controller)

More irrigation
- Automatic timers
- Quicker draining soils
Residential end uses of water (4309)

Indoor Water use, gpcd

- 1999: 64 gpcd
- 2014: 51 gpcd
- Future: 36 gpcd
Framework for estimating CII water use (4375)

- **Aggregate by class**
  - Customer billing records, property databases, 3rd party data on businesses
    - Class characterization, forecasting factors & rate design

- **Sample by class**
  - Survey & audit customers
    - Benchmarking, program design, water budget analysis, stat. modeling

- **Customer classification categories**
- Publish in Aug 2015
Water Demand Forecasting in Uncertain Times: Isolating the Effects of the Great Recession (4458)

• How did the recent recession influence water consumption?
• Can it be measured and distinguished from other factors?
• What can we learn?

Interim results - survey & white paper on WRF website
Majority of survey sample experienced declines in water use

Did total water use in your water utility service area decrease during the recent U.S. recession? (% of 123 respondents)

- Yes: 72%
- No: 24%
- Not Sure: 4%

Magnitude of water demand decline during recent recession from pre-recession levels (% of 87 respondents who answered question - 88 reported water use decline)

- <5% decrease: 26%
- 5% - 10% decrease: 41%
- 11% - 20% decrease: 24%
- >20% decrease: 8%
Modeling and economic indicators - prelim results

SDCWA

• Using The Conference Board Leading Index to measure “economy”
  – Estimate ~13% decrease in per capita trend cycle from peak to trough of “official” Great Recession period
  – Estimate ~5% decrease from peak to trough of early 1990s recession
Effectiveness of short term demand forecasting (4501)

- Document short-term forecasting processes in the water industry.
- Analysis of strengths and weaknesses.

Interim results - survey & white paper on WRF website
4501 survey results

– Goal: to anticipate future revenues and expenditures

– 37% of utilities have conducted quantitative assessments of forecast accuracy.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Expert judgment</td>
<td>76%</td>
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<tr>
<td>Per customer use coefficient</td>
<td>72%</td>
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<tr>
<td>Demographic</td>
<td>55%</td>
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<tr>
<td>Weather</td>
<td>53%</td>
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<td>Water rates</td>
<td>36%</td>
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<tr>
<td>Economic</td>
<td>34%</td>
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RFP for 2015

CII water use

- RFP posted end of March 2015
- Use framework from 4375
- Proposals will be due in late summer/early fall
Thank You

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