



Water Research Foundation Research Area - Demand Forecasting & Management

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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
3. Energy Efficiency & Integrated Water-Energy Planning
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

2012	2013	2014	2015	2016
Smart irrigation controller demo in FL (4227)				
Analysis of water use under regional climate change scenarios (4263)				
Update & expand residential end uses of water (4309)				
Methodology for determining baseline commercial, institutional & industrial end uses of water (4375)				

Focus Area

2012	2013	2014	2015	2016	2017	2018
Water demand forecasting in uncertain times: isolating the effects of the Great Recession (4458)						
		Effectiveness of short term demand forecasting (4501)				
		Integrate high efficiency stds, codes & tech. into forecasting (4495)				
			Water use in multi-family housing sector (4554)			
		Uncertainty in long term demand forecasting (4558)				
			Water use in the CII sector			
				Analysis of the effectiveness of long term demand forecasting		
				Comparison of short vs long term forecasting		
				Methods of planning with uncertainty in demand forecasts		

Smart irrigation controller demo in FL (4227)

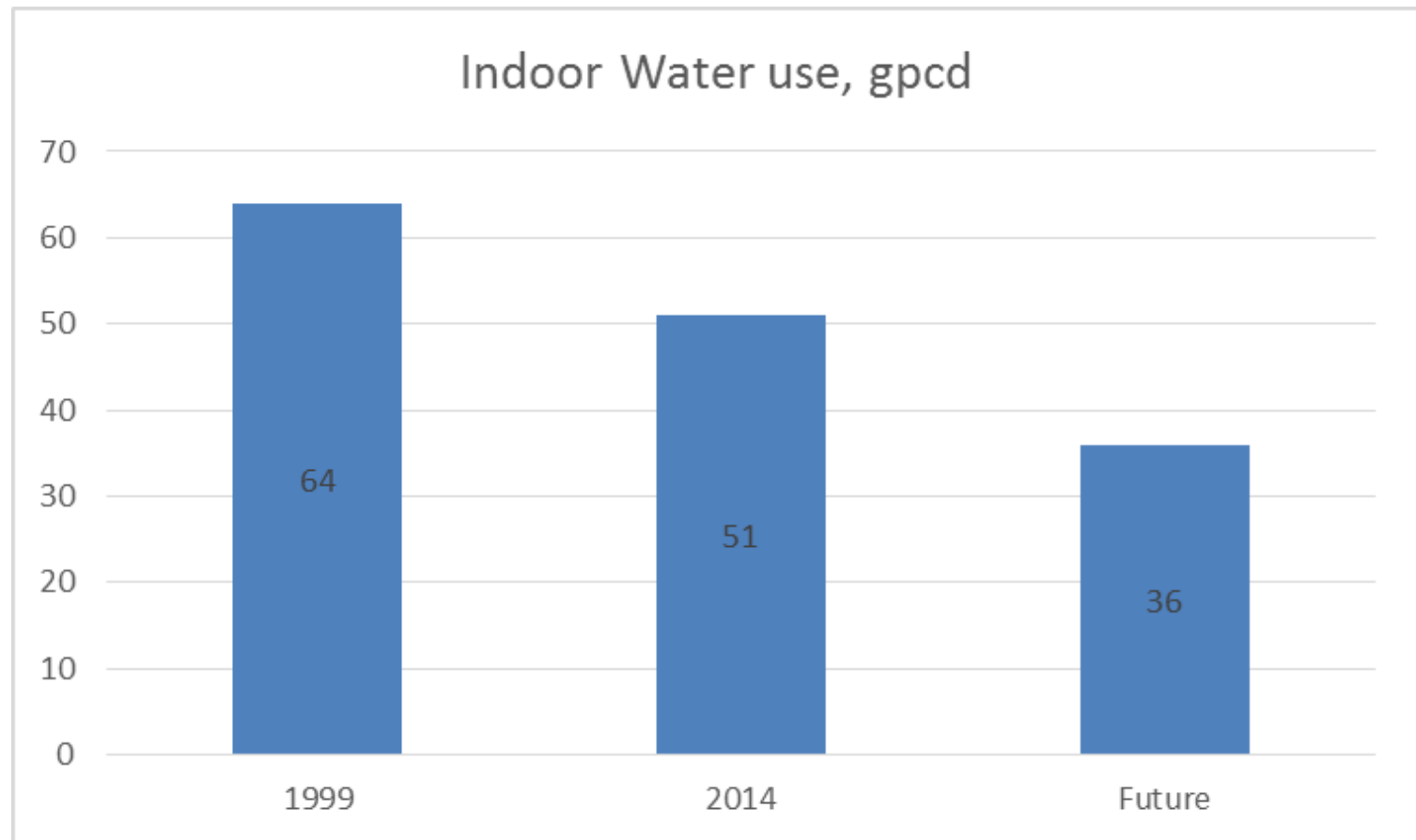
Less irrigation

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

More irrigation

- Automatic timers
- Quicker draining soils

Residential end uses of water (4309)



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

WRF 4375
Methodology for Determining
Baseline Commercial,
Institutional, and Industrial End
Uses of Water

DRAFT

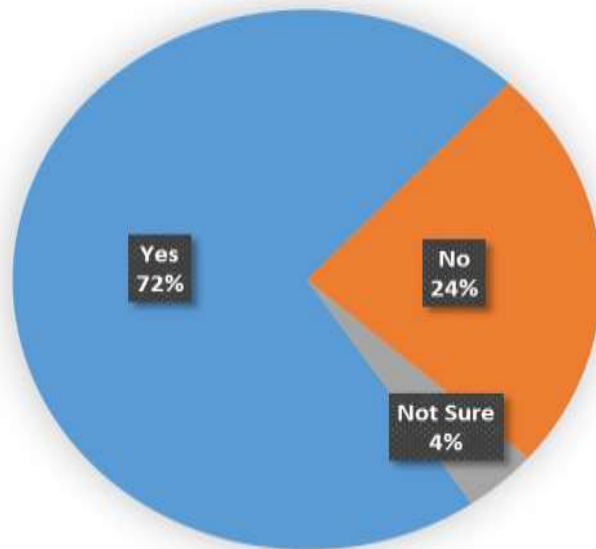
Water Demand Forecasting in Uncertain Times: Isolating the Effects of the Great Recession (4458)

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

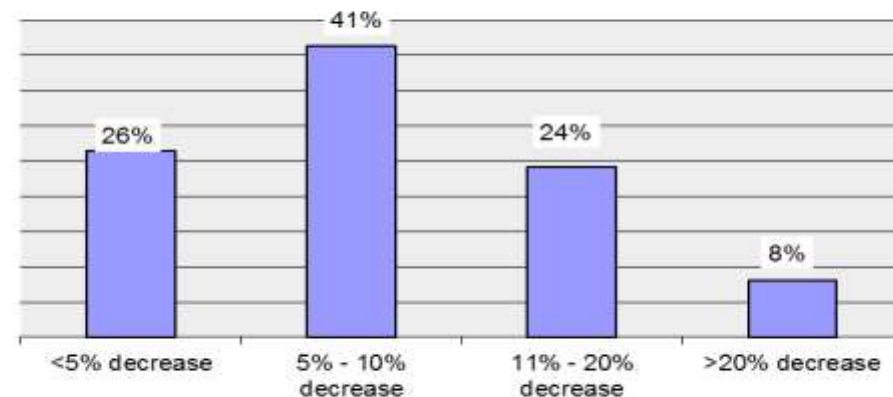
Interim results - survey & white paper on
WRF website

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)



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



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.

Expert judgment	76%
Per customer use coefficient	72%
Demographic	55%
Weather	53%
Water rates	36%
Economic	34%

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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