Knowing Your Customers’ Water Ways

**Mining Water Billing Data to Inform Pricing, Policy and Communication Strategies**

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Dedicated to enhancing the ability of governments and organizations to provide environmental programs and services in fair, effective and financially sustainable ways
What data do you have in your billing records?

**Basic**
- Customer number
- Bill date
- Meter reading (volume)
- Charge(s)
- Bill code

**Additional**
- Meter number
- Block
- Customer type
- Last meter read date
- Due date
- Adjustment
- Late
- Disconnect/re-connect
- Address
- Payment method
- etc.
How do you use this data?

- Calculate and send bills
- Calculate gallon per capita per day
- Generate bill summaries
- Calculate average use per customer
- Calculate other customer-specific metrics
- Target programming and messaging
- Evaluate programming and messaging
- Evaluate and design rate structures
- Tailor rate structures
Boyle, Eskaf, Tiger & Hughes
Journal AWWA
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103:11
p.45-58

Mining water billing data to inform policy and communication strategies

Water utilities in the United States struggle over how to set policies, design rate structures, and implement communication procedures that are effective and appropriate to their customer base. Adding to the complexity of these tasks is that water management requires local planning, and cookie-cutter strategies often fail to consider that customer characteristics and water demand vary from one town to the next, even within the same state or geographic region. For example, the same conservation initiative that succeeds at one utility may fail to reach its conservation goals or costs much more at a neighboring utility, solely because customers in the two communities have different water use patterns. Consequently, the revenue effects of the conservation initiative will be vastly different for the two utilities.

Without reliable data, it is difficult for water providers to customize their demand management and communication strategies to their customer base. However, the reality is that utilities already collect much of the information they need to inform such decisions, but most, if not all, utilities do not use this valuable data set to its fullest potential. This article proposes that customer billing data offer a valuable tool—one that is readily available to water utilities—that can facilitate a new understanding of customer water use, inform...
SLICE ‘N DICE:
Analytical Techniques For Customer Water Use
Data To Evaluate Efficiencies And Identify
Water Savings Potential

June 10, 2012

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Author, *Handbook of Water Use and Conservation*
(WaterPlow Press)
Amherst, MA
MINING CUSTOMER DATA TO BETTER INFORM UTILITY DECISION-MAKING: A GUIDE TO CUSTOMER WATER USE METRICS

An AWWA-sponsored collaboration between Amy Vickers & Associates, Inc. and the Environmental Finance Center
AWWA TEC: Vickers Inc. & EFC Project

- Collaborate on shared water use metrics research, experience, and findings
- Identify best practices for core analytical techniques that go beyond simple averages, e.g., gpcd
- Identify baseline metrics for water utilities
- Provide guidance for interpretation of results
Project Scope

• Tentative list of baseline customer water use metrics:
  – Percentile analysis
  – Rank analysis
  – Zero/Low use accounts
  – Demand seasonality
  – Maximum demand
  – Baseline demand
  – Peaking matrix
  – “Hidden” irrigation
  – Program evaluation
  – Late payments/Cutoffs
Percentile and Rank: Residential

Distribution of Residential Water Use by Number of Accounts, Dallas Water Utilities, Feb08-Jan09

- Top 1% SF accounts = 11% SF use
- Top 10% SF accounts = 38% SF use
- Top 50% SF accounts = 84% SF use
- Bottom 50% SF accounts = 16% SF use

Percentile and Rank: ICI

Distribution of ICI Water Use by Number of Accounts, Feb08-Jan09, *Dallas Water Utilities*

- **Top 1% ICI accounts** = 44% use
- **Top 10% ICI accounts** = 80% use
- **Top 50% ICI accounts** = 98% use
- **Bottom 50% ICI accounts** = 2%

Maximum Demand
Baseline Demand

Cumulative Percentage of Households' Baseline Demand
(Average of Lowest 3 Non-Zero bills in a FY)

Baseline Demand (1,000 gallons monthly)
Peaking Patterns

**High - peaking**
(Avg. high use/Avg. low use: More than 2.0)

- **Q1: Low users, High peakers**
  - 10,000 Households in FY10
  - 15,000 Households in FY07
  - 39% 38%

- **Q2: High users, High peakers**
  - 4,500 Households in FY10
  - 4,000 Households in FY07
  - 10% 12%

- **Low volume baseline user**
  - Baseline average up to 4k gallons per month
  - 35% 30%

- **High volume baseline user**
  - Baseline average above 4k gallons per month
  - 17% 20%

**Low-peaking**
(Avg. high use/Avg. low use: Less than 2.0)

- **Q3: Low users, Low peakers**
  - 22,000 Households in FY10
  - 12,000 Households in FY07

- **Q4: High users, Low peakers**
  - 7,500 Households in FY10
  - 8,000 Households in FY07
  - 17% 20%
“Hidden” Irrigation*

*Refers to standard-meter irrigation, not unmetered private irrigation wells.
Changing household water use: at the utility level ("bill-level")

<table>
<thead>
<tr>
<th>Utility</th>
<th>Average household water use</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FY07</td>
<td>FY08</td>
</tr>
<tr>
<td>Utility B</td>
<td>4,980</td>
<td>5,410</td>
</tr>
</tbody>
</table>

"Bill-level"
versus Changes in Customer Water Use

![Chart showing changes in water use by households with varying levels of usage in FY07.](chart.png)

**Percent change in water use**

- Increased more than 50%
- Increased between 25% and 50%
- Increased between 5% and 25%
- Maintained within 5%
- Decreased between 5% and 25%
- Decreased between 25% and 50%
- Decreased more than 50%

**Household types based on their average water use in FY07**

- Low users: up to 5 kGPM (n=36599)
- Medium users: 6-10 kGPM (n=21707)
- High users: 11-20 kGPM (n=5662)
- Super high users: >20 kGPM (n=701)
Capabilities and opportunities of customer-level analysis

- Informed price setting and infrastructure planning
- More accurate demand and revenue forecasts
- Targeted conservation (and other) programming
  - Identify customers with most and least savings potential
  - Trim conservation program budget
Acknowledgements

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Next steps

AWWA Guidebook on the
Methods, Metrics, and Mobilization
of Customer Analytics

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