



VALOR WATER  
ANALYTICS

Effectiveness of data science technology in reducing apparent loss caused by meter under-registration

Janani Mohanakrishnan

\* Big Data in Water: we are half blind

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**BLURRY**  
**VISION**  
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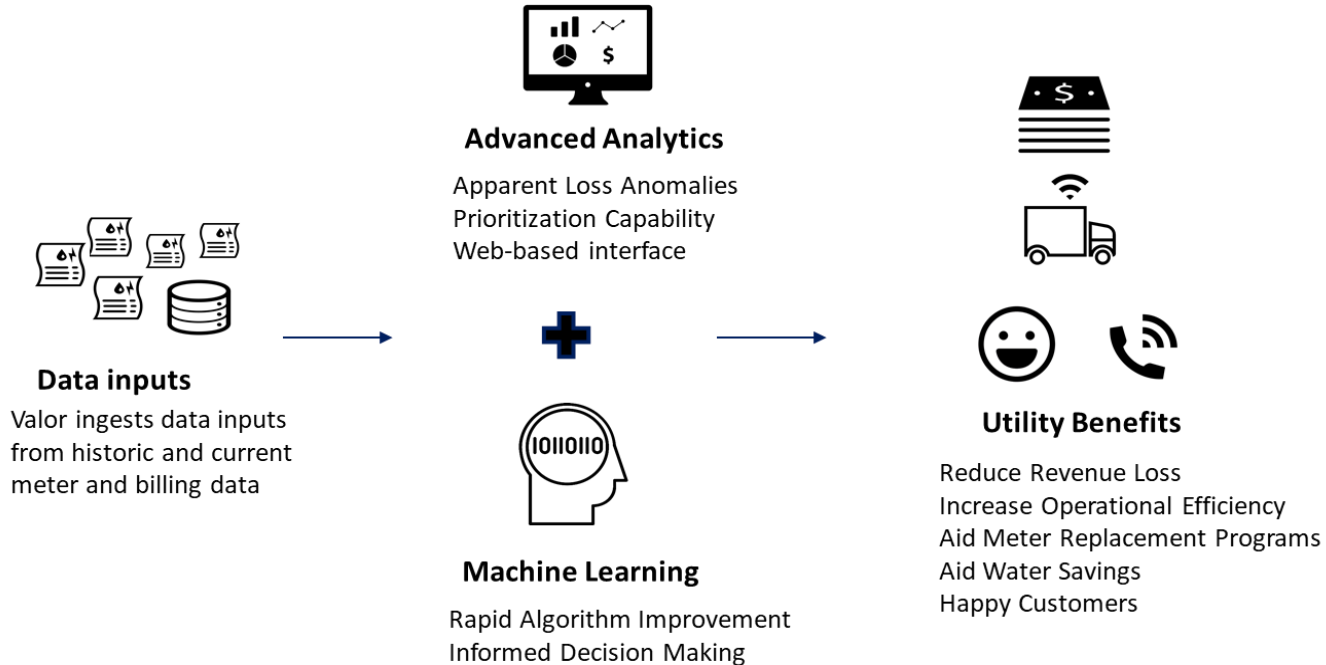
**B**  
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# \* Valor's Apparent Loss Management Solution

- Hidden Revenue Locator modules & Programmatic Approach to Delivery



# \* Meter Under-registration

- Detects meters whose accuracy is decreasing over time, causing the meters to register less water than is flowing through them
- Current State:
  - Length of service program (15-20 years)
  - No meter replacement till meter is broken
  - Focus on large water users
  - Organic meter issue detection
- Impact:
  - Significant revenue loss
  - Inefficient meter replacement - costly



# \* Meter Under-registration Issues Dashboard

## ONGOING FLAGS

[LEARN MORE ABOUT OUR INDICATORS]

<b>Choose An Indicator...</b> <input type="radio"/> Meter Over-Sizing <input checked="" type="radio"/> Meter Under-Registration <input type="radio"/> Meter Under-Sizing	<b>Service Area</b> <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5	<b>Meter Size (inches)</b> <input checked="" type="checkbox"/> 0.75 <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 1.5 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4	<b>Customer Type</b> <input checked="" type="checkbox"/> Commercial <input checked="" type="checkbox"/> Healthcare <input checked="" type="checkbox"/> Industrial <input checked="" type="checkbox"/> Motel or Hotel <input checked="" type="checkbox"/> Multi Family Residential <input checked="" type="checkbox"/> Single Family Residential
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199 ongoing flags

Total Revenue Discrepancy Estimate: **\$2,289K**

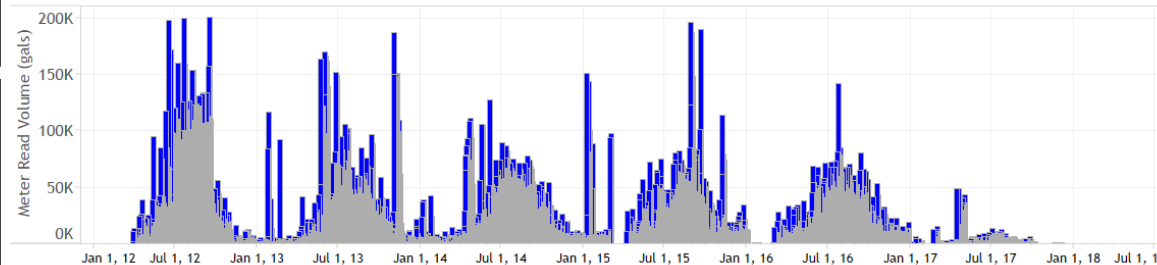
Total Volume Discrepancy Estimate: **416,012K gals**

### Individual Customers with Meter Under-Registration

Premise Id	Meter Number	Certainty	Customer Type	Meter Size	Service Area	Meter Address	Flag Start	Monthly Risk Estimate	Total Volume Discrepancy	Total Revenue Discrepancy
		MEDIUM	Commercial	1.5	1		5/31/2011 2:28:00 AM	\$1-100	439,232 gal	\$7,699
		MEDIUM	Industrial	3	1		4/30/2012 1:03:00 AM	\$1000-2500	16,114,451 gal	\$87,887
		MEDIUM	Multi Family Residential	0.75	2		9/29/2010 6:14:00 AM	\$1-100	228,665 gal	\$1,181
		MEDIUM	Multi Family	0.75	2		2/28/2010	\$1-100		

Click a row of the table above to see the usage graph for that flag

[Click here for a satellite map of the selected premise](#)



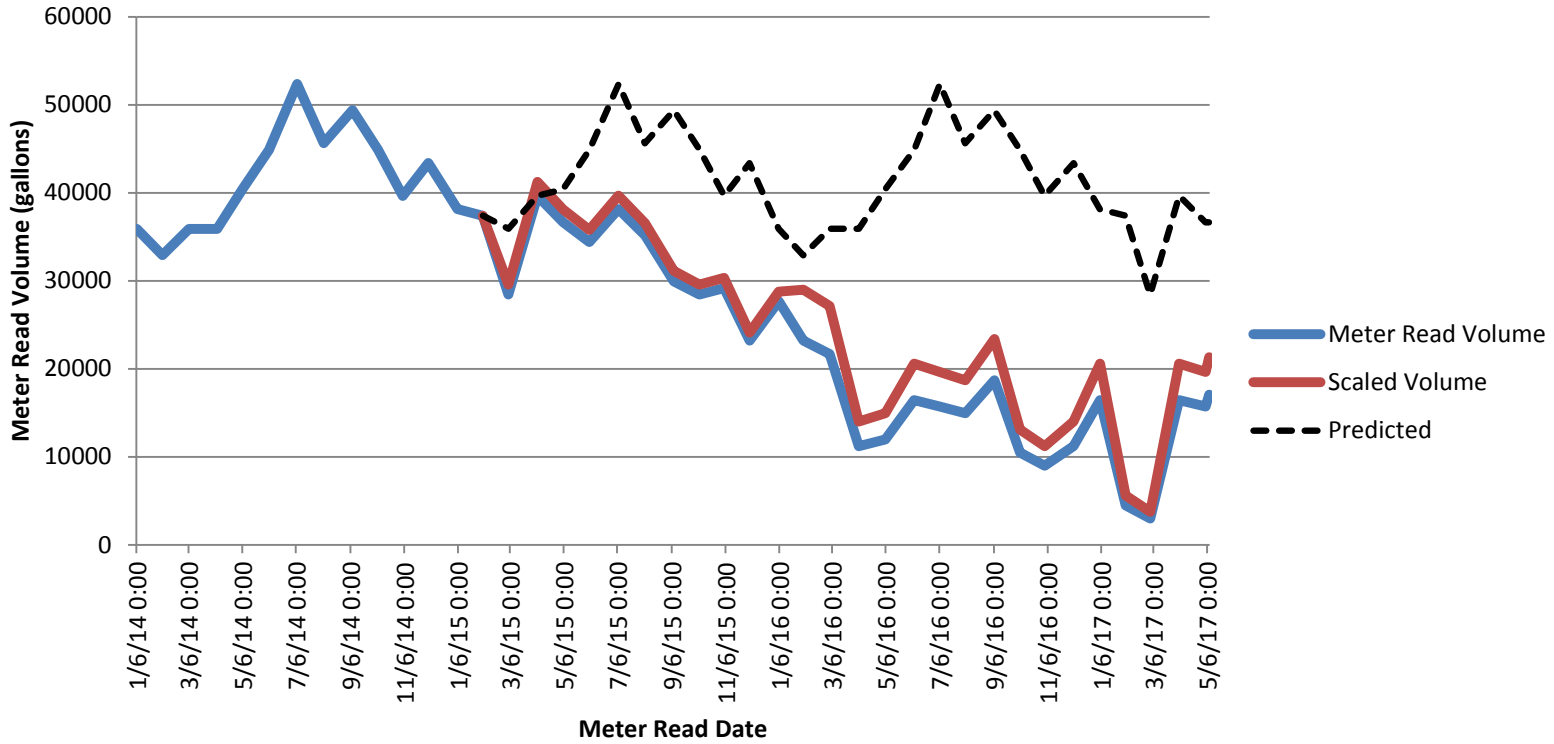
Latest AMI Meter Read: April 5, 2018 3 AM



For assistance or questions, contact us at support@valorwater.com for 24 hour assistance or via phone at 844-80-VALOR x700 (9-5 PM PT)



# \* Revenue Calculation Example



# \* Two Pilots: Ongoing Meter Under-registration Detection

Utility 1	Utility 2
Private Utility, Water & Wastewater	Investor Owned Public Utility, Water
>180,000 customer accounts	>80,000 customer accounts
Pilot Program Metering & Billing: <ul style="list-style-type: none"><li>• AMR monthly</li><li>• Meters installed in early 2000s</li><li>• Approx. 1,200 accounts</li><li>• Predominantly residential customers</li></ul>	Pilot Program Metering & Billing: <ul style="list-style-type: none"><li>• Manual monthly meter reads</li><li>• Meters installed in early 2000s</li><li>• Approx. 500 accounts</li><li>• Predominantly residential customers</li></ul>
Pilot Program Duration: 12 months (late 2016 start)	Pilot Program Duration: 12 months (early 2017 start)



## \* Results: Ongoing Meter Under-registration Detection

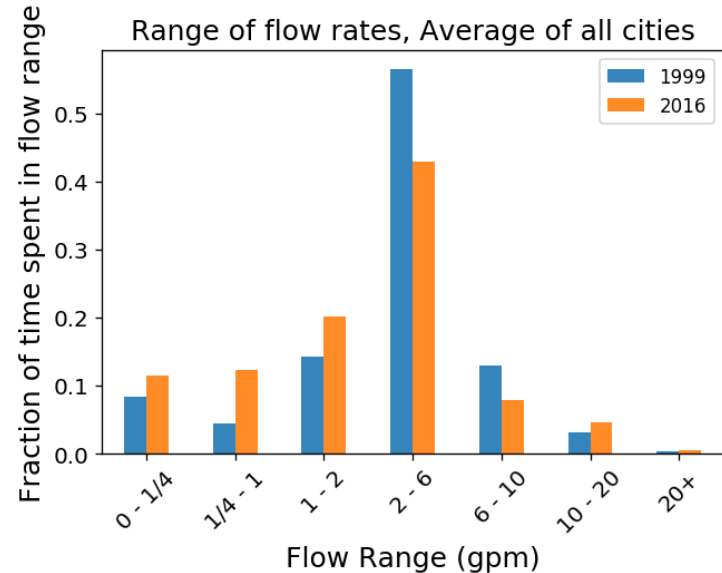
Utility 1	Utility 2
2.2% of meters analyzed	2.6% of meters analyzed
49 potential issues; 26 Correct <ul style="list-style-type: none"><li>• <b>53%</b> Hit Rate (compared to status quo of 6%)</li></ul>	13 potential issues, 12 Correct <ul style="list-style-type: none"><li>• <b>92%</b> Hit Rate (compared to status quo of 6%)</li></ul>
<b>\$600/meter</b> average annual revenue loss plugged	<b>\$400/meter</b> average annual revenue loss plugged
<b>133,000 gallons (492 cu.m)/meter</b> of unbilled water on annually – undetected in water audits!	<b>96,000 gallons (355 cu.m)/meter</b> of unbilled water on annually – undetected in water audits!





# \* Take-away Messages

- Data-science approach enhances the quality of outcomes
  - More value for same cost and effort
- Low flow failures common
  - Usage profiles have changed
- For quick short-term gains, focus on large meters
- Staff programs adequately
- Rethink meter replacement programs
  - Leverage your data!



*Residential Water Use Patterns in North America,  
Craig Hannah and Jonathan Gunn, ACE 2017*



# \* Next Steps

- Valor-Utility 1 and Valor-Utility 2:
  - Wider deployment
  - Part of operational workflow
  - Operations & General Managers empowered:
    - Prioritize meter issues
    - Optimize meter replacement
    - Achieve Revenue Enhancement goals
- The future is here!

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E X T R A O  
R D I N A R Y**

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## \* Questions?



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# \* Hidden Revenue Locator Deployment Process

