



# SMARTER WATER: FINDING REVENUE WITH GIS



Graham Symmonds  
Global Water FATHOM

Esri User Conference 2014

July 2014

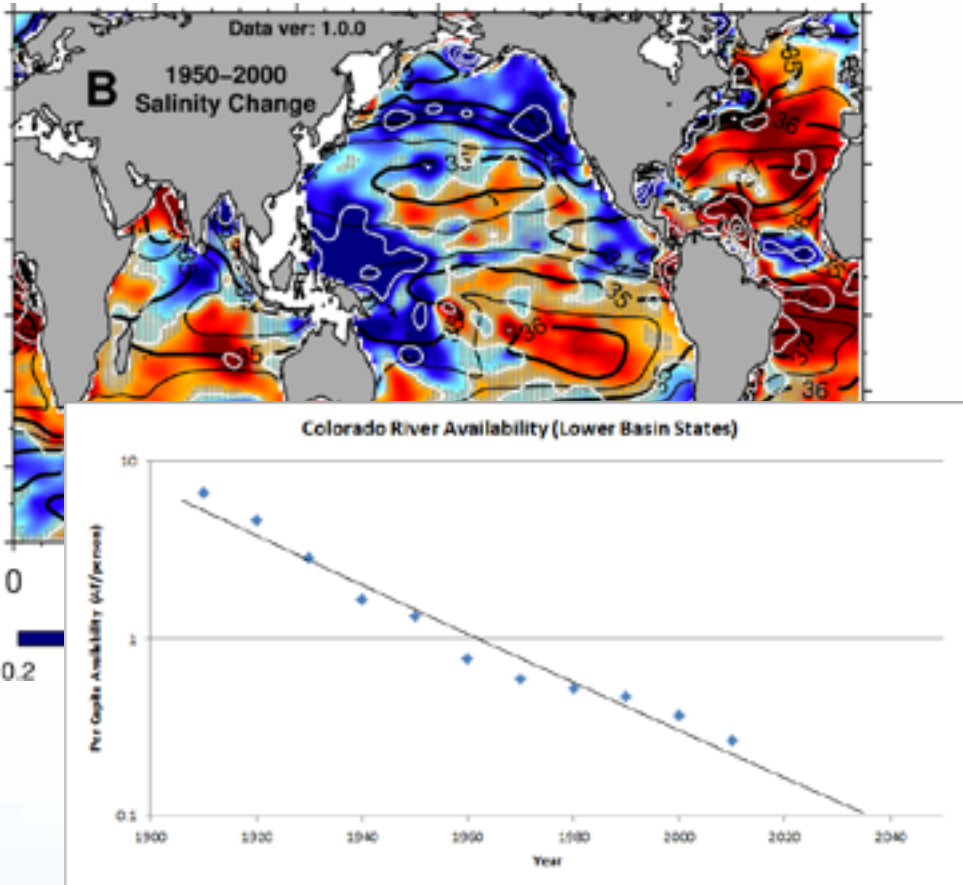
# Utilities are in our DNA



Regulated Utilities

Utility Operating Systems

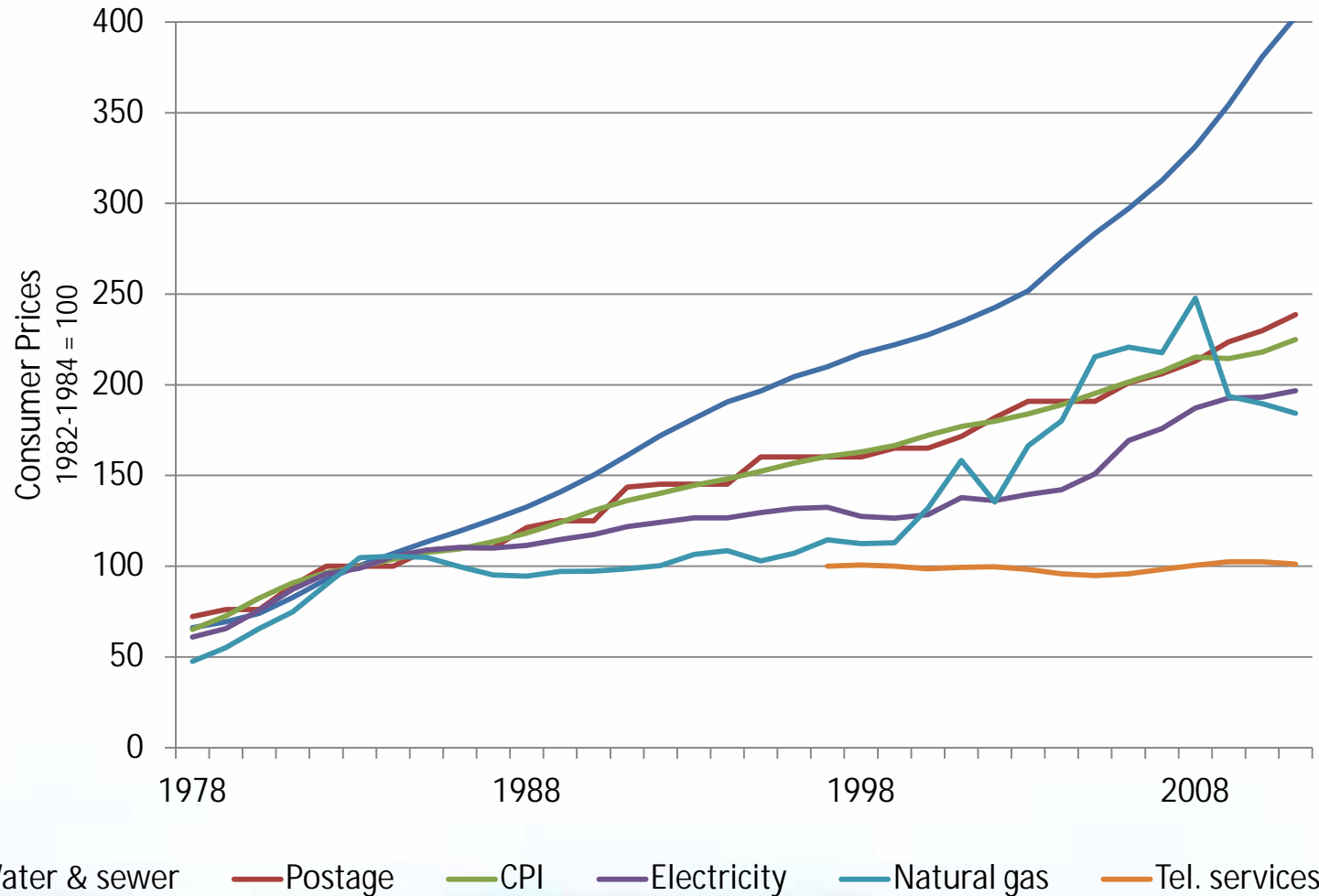
# Increasing Volatility



- World-wide water scarcity is increasing
- Water resources are becoming increasingly more volatile
- Supply-side solutions take years to permit and develop
- Changing behavior is cheaper than building supply
- Utilities need **DATA** to change behavior

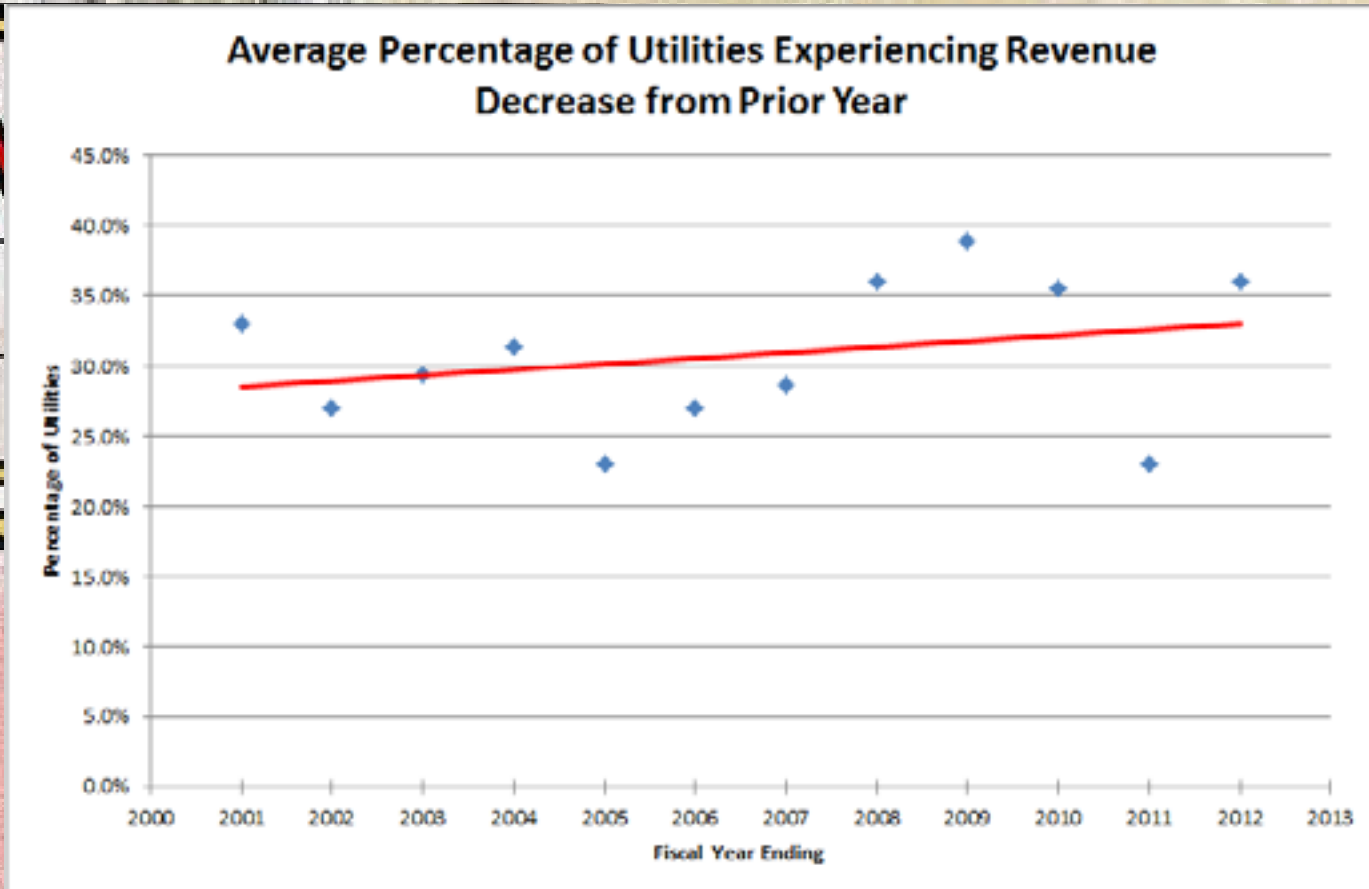
Sources: Durack & Wijffels, Journal of Climate, 2010 (CSIRO), US BoR, US Census Bureau

# Rapidly Increasing Water Prices



Source: J. Beecher, "Trends in Consumer Prices (CPI) for Utilities through 2011", Institute of Public Utilities, Michigan State University, 2012

# Utility Revenue is Declining



Source: Shadi Eskaf, "Are operating revenues declining for local government-owned water utilities? Evidence from six states", 2013, Environmental Finance Center at the University of North Carolina. (<http://tinyurl.com/crd2rpt>)

# Divergence of Assets

Physical Assets



Logical Assets

Revenue systems do not locate dollars in space-time

# Non-Revenue Water

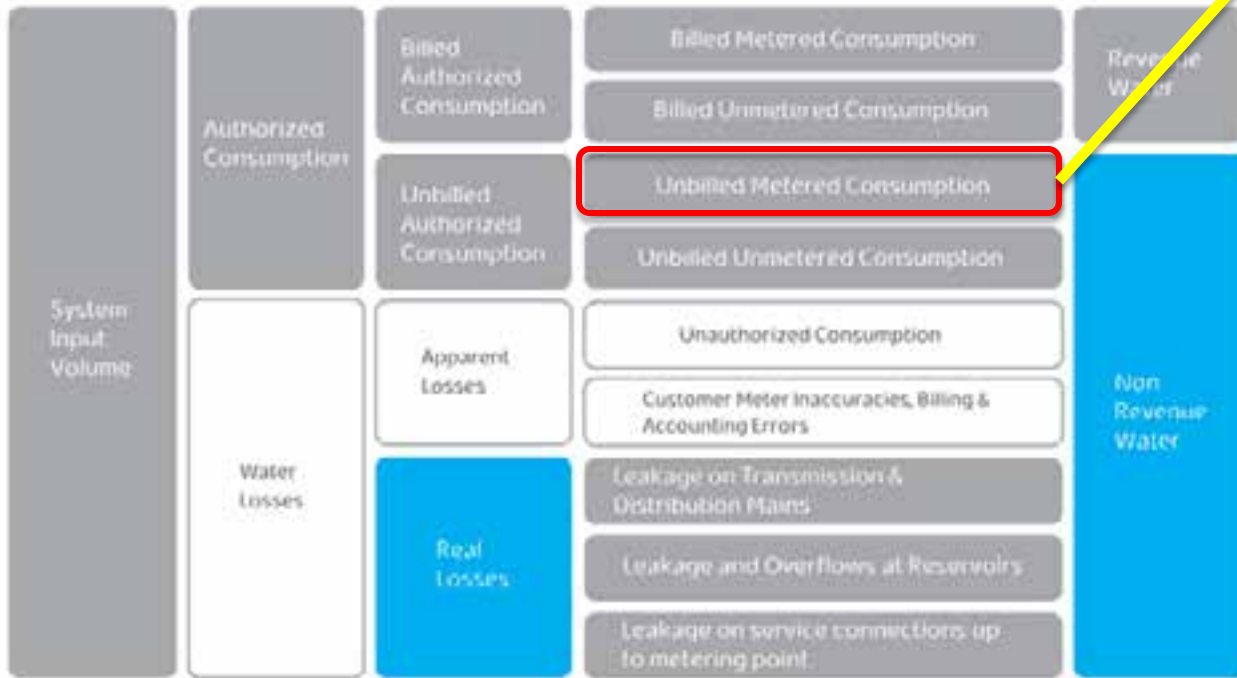


Apparent Losses = 2 x Real Losses

## LEAKING DATA

Source: Mattar, R., "Kahramaa's vision for non-revenue water reduction", Water Utility 21, April 2013

# Non-Revenue Water



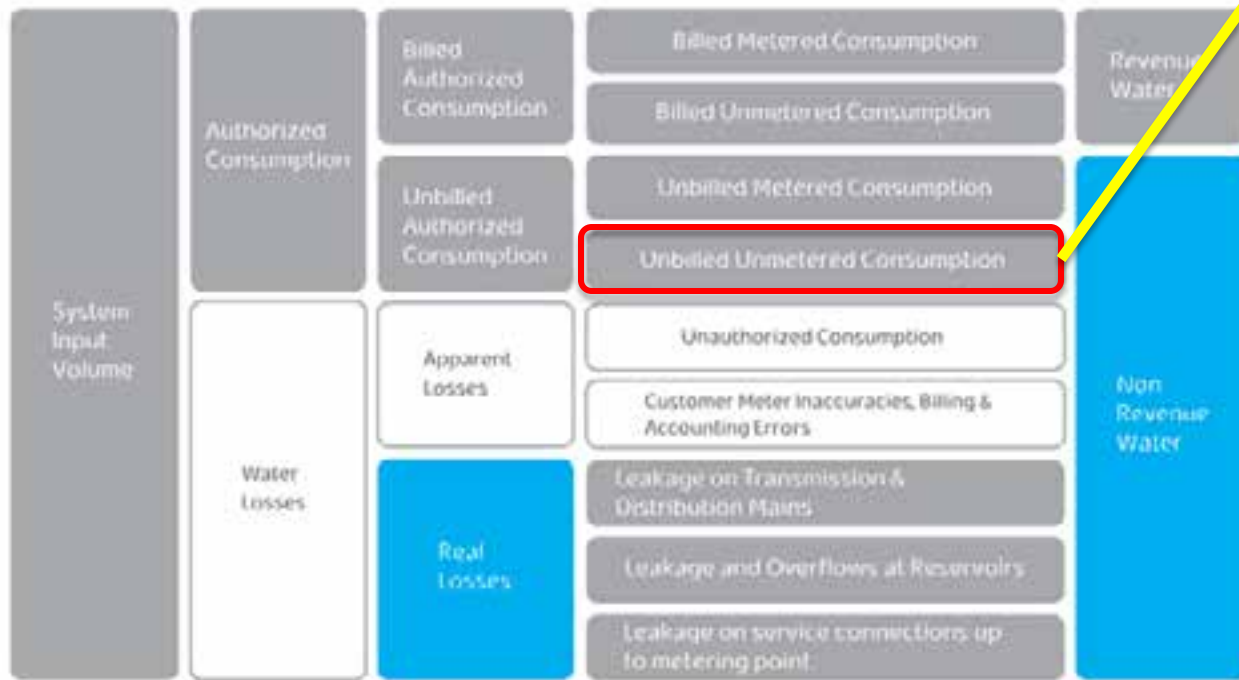
Geo-located meters ensure all meters are billed all the time.

GIS-enabled audit technologies ensure all meters are in the billing platform.

Highly granular meter data can be used to ensure accuracy of meter readings.



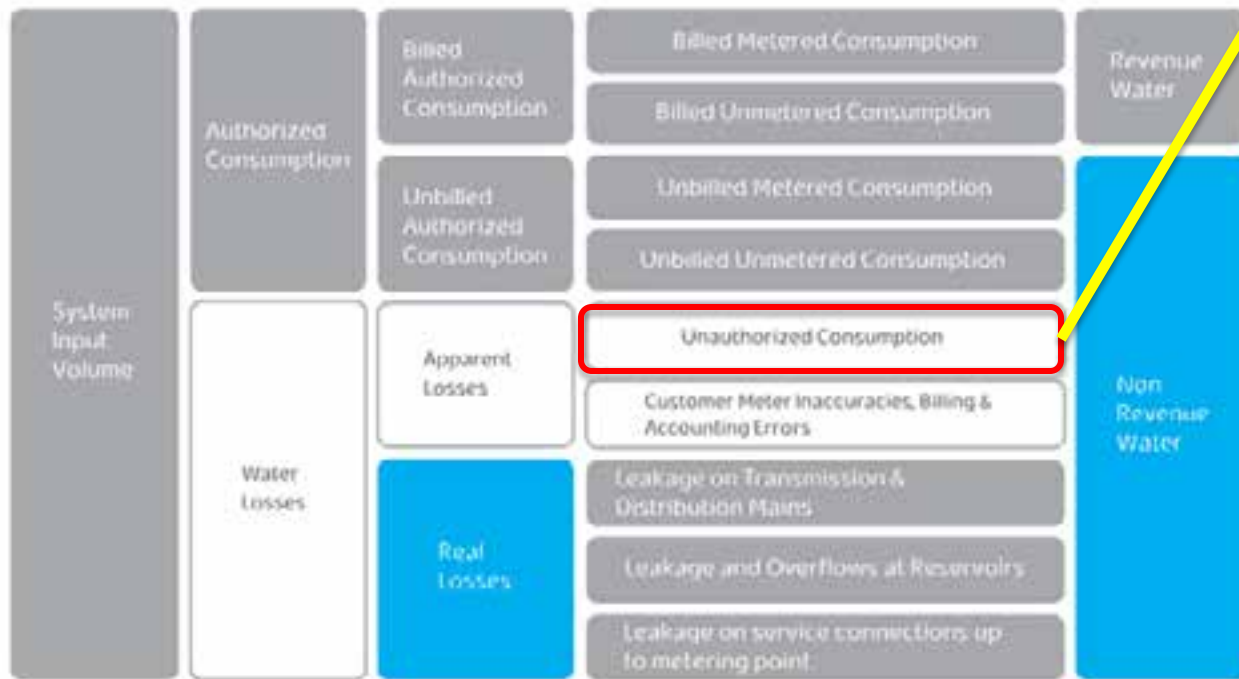
# Non-Revenue Water



Real-time pumped-vs-billed analysis ensures highly accurate understanding of non-metered use.

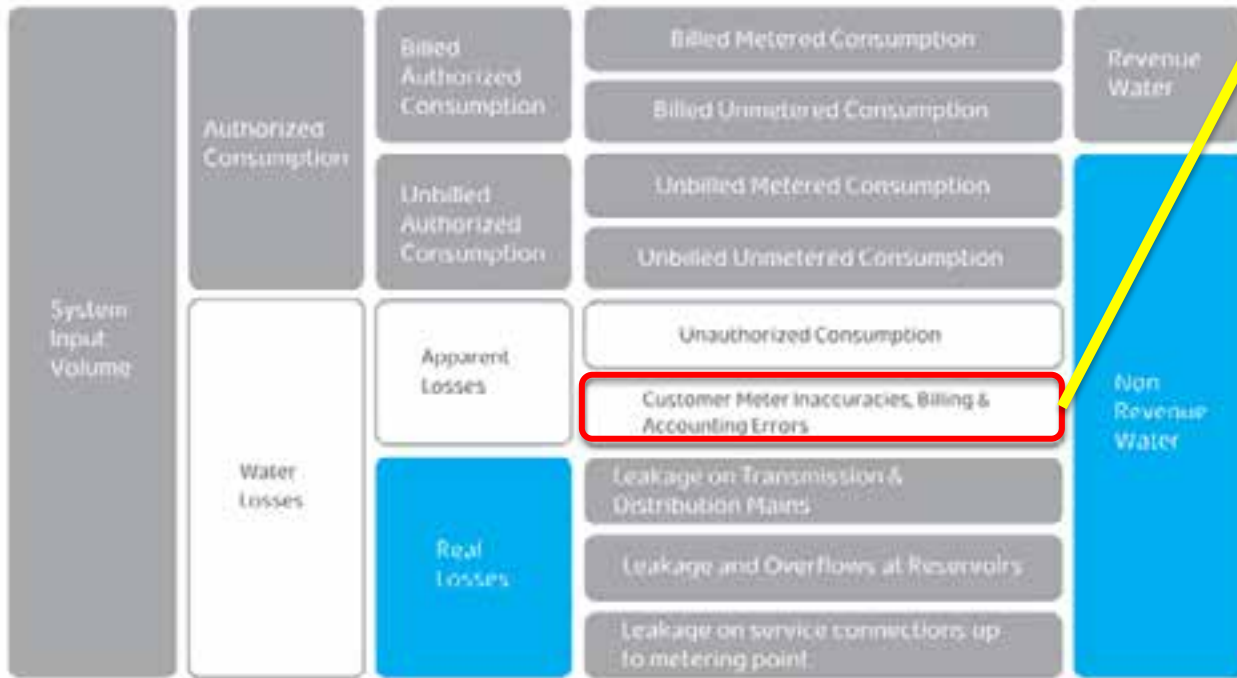
Combined with real-time hydraulic models unmetered use can be pinpointed.

# Non-Revenue Water



Combining GIS + CIS + AMI data finds water theft by disconnected customers.

# Non-Revenue Water

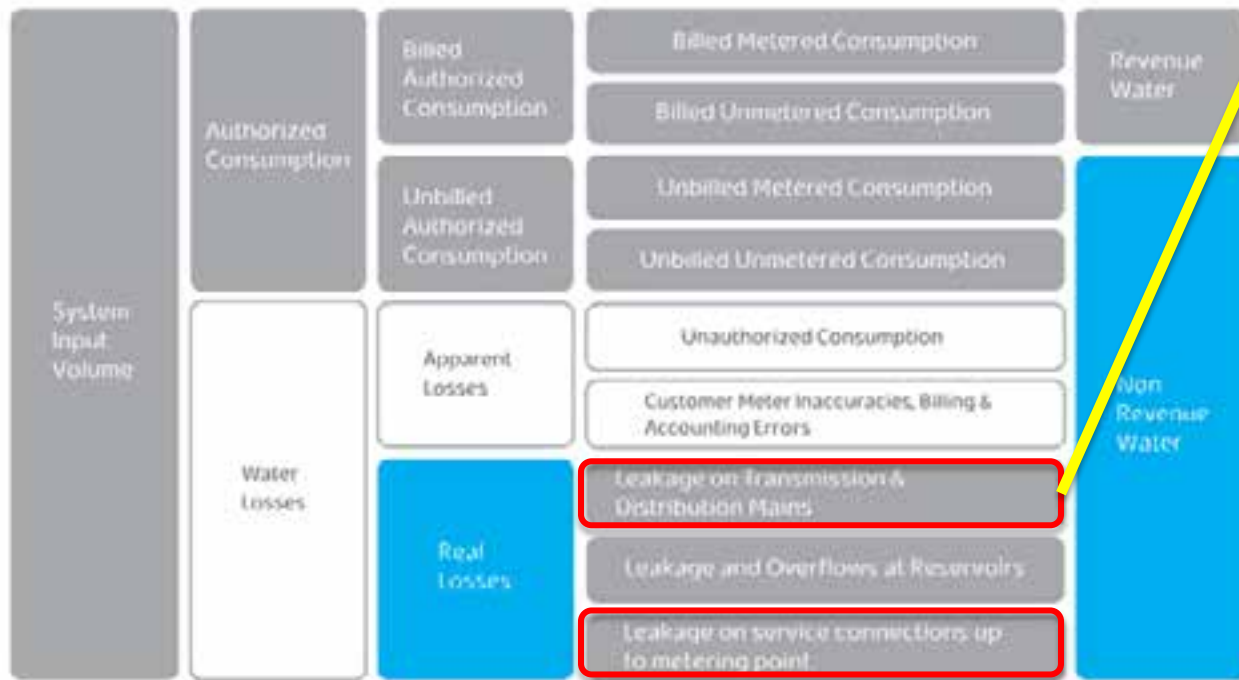


GIS-based Field and Paper Audits find data voids.

Validating infrastructure vs relying on old data eliminates errors.

GIS-enabled best practices and Data Validation tools built into systems maintain the integrity of the data.

# Non-Revenue Water



Real-time demand data + hydraulic modeling + geospatial location finds real leakage.

This “first-principles” approach validates flows and does not rely on established baselines – can identify pre-existing leaks which can be hidden in baseline acoustic or analytics methods.

# Layers

- Base Maps
- Taxation Data
- Utility Infrastructure Data
- Meter Location
- Customer Information System Data
- Remote Sensing/Aerial Data

# Geospatial CIS

The screenshot displays the FATHOM U<sub>2</sub>U Global Water Utility Administration Portal. The browser address bar shows the URL <http://dev-entgtd.10101.com/entgtd/entgtd.aspx>. The page header includes the logo for GLOBAL WATER and the text "FATHOM U<sub>2</sub>U GLOBAL WATER UTILITY ADMINISTRATION PORTAL". Navigation tabs include CUSTOMER CARE, ANALYTICS, ACCOUNTING, REVIEW, REPORTING, and WORK ORDERS.

The main content area is split into two panels. The left panel, titled "NEW SEARCH", contains a "Summary" section with the following data:

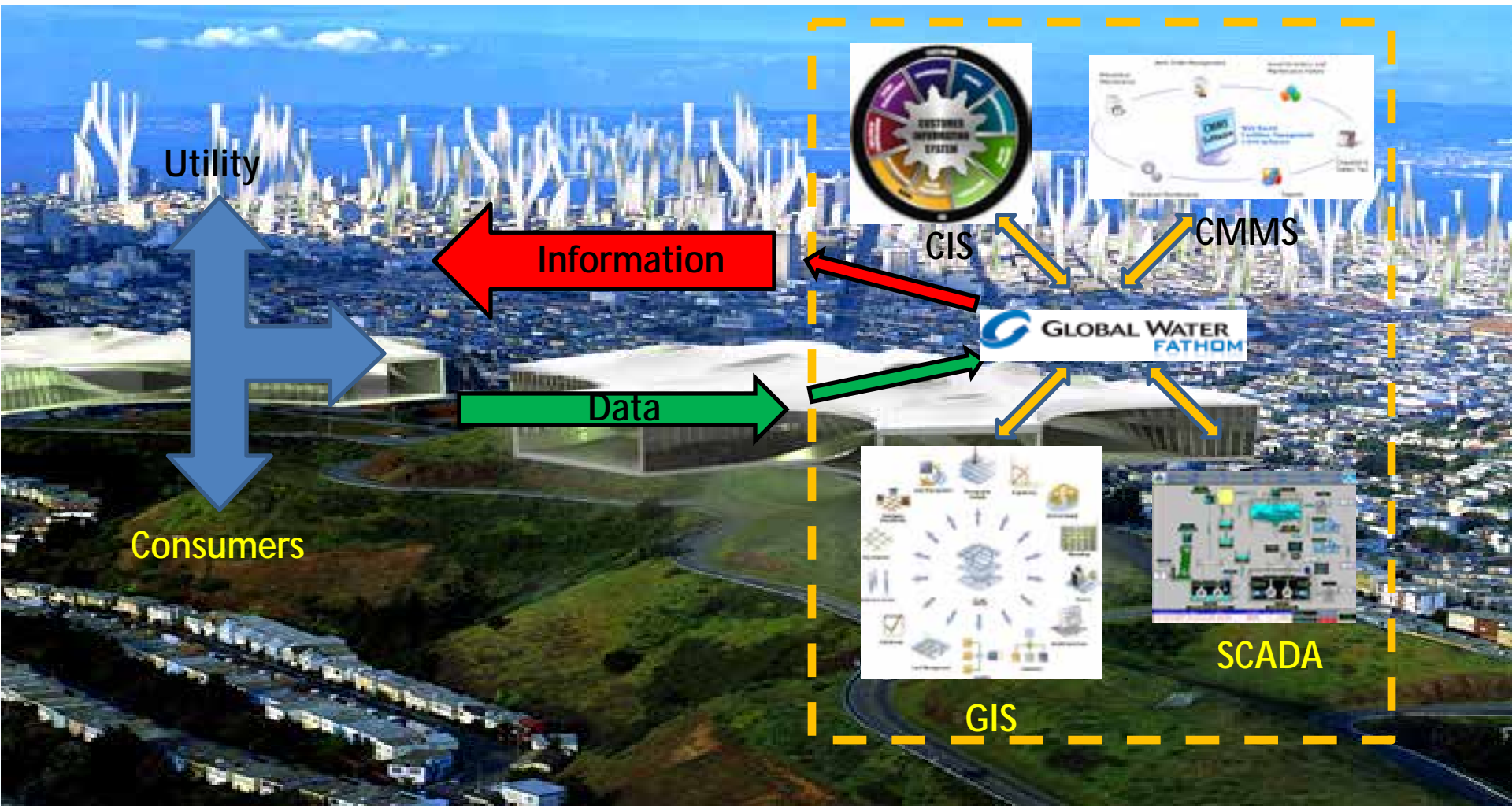
Service Address	44664 W WINDROSIE DR MARIKOPA, AZ 85138
Occupant Type	Owner
Move-In Date	03/14/2010
Current Balance	\$0.00
Past Due Balance	\$0.00
Collection Status	Collection Notice Sent

Below the summary is the "Customer Information" section:

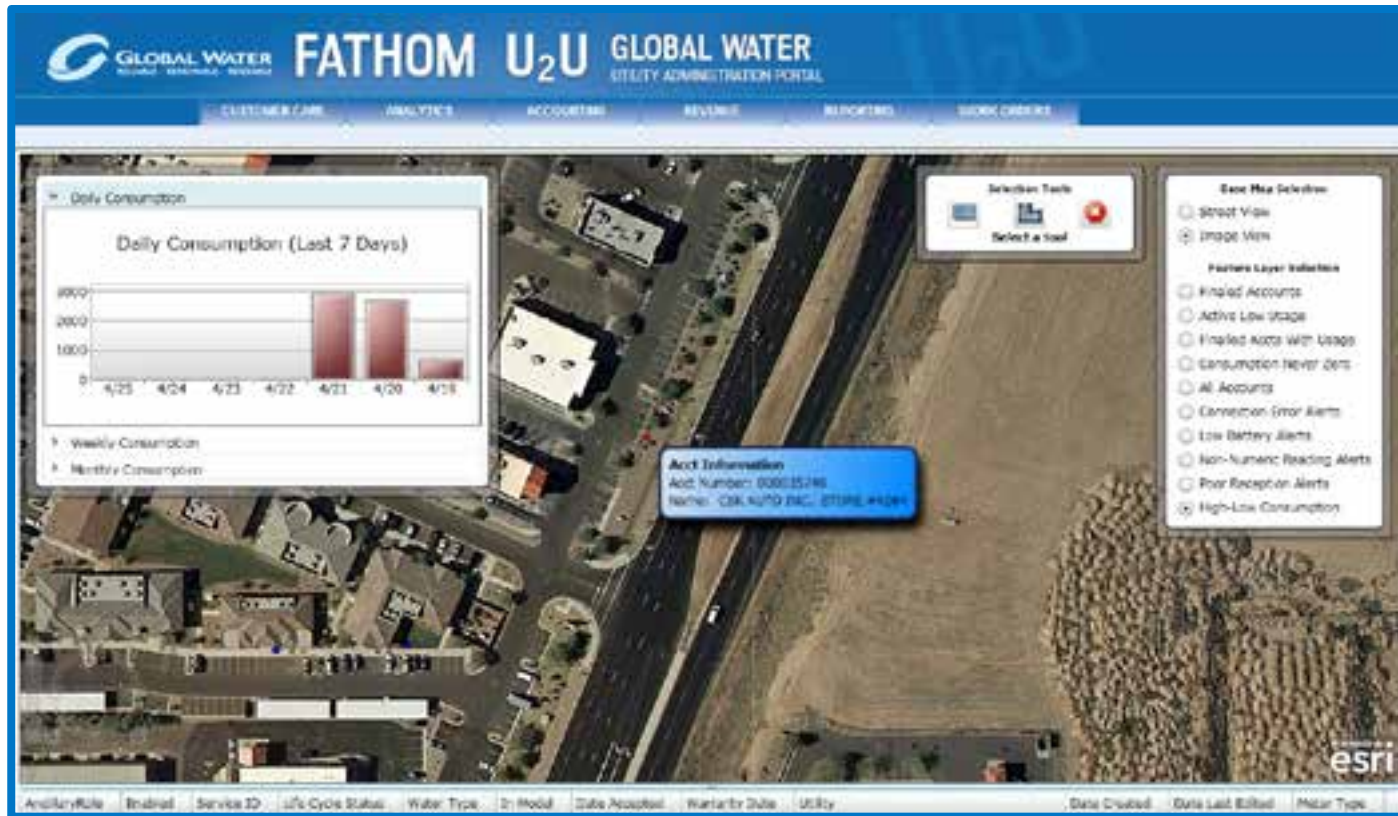
Customer Number	582803
First Name	TAMMY
Last Name	GAMES
Trade Name	
Home Email	AMG

The right panel, titled "MAP", features tabs for WATER BUDGETING, WORK ORDERS, PAYMENTS, and BILLING. It displays a map with various utility assets overlaid. A legend identifies symbols for Meter Orders, Hydrant Poles, Service Orders, and Fire Hydrant. A "Basic Map Selection" box offers "Image View" and "Street View" options. Below the map, the "Customer Notes" section displays a red alert: "ACCOUNT ALERT: CASH ONLY CUSTOMER".

# The Smart Grid for Water

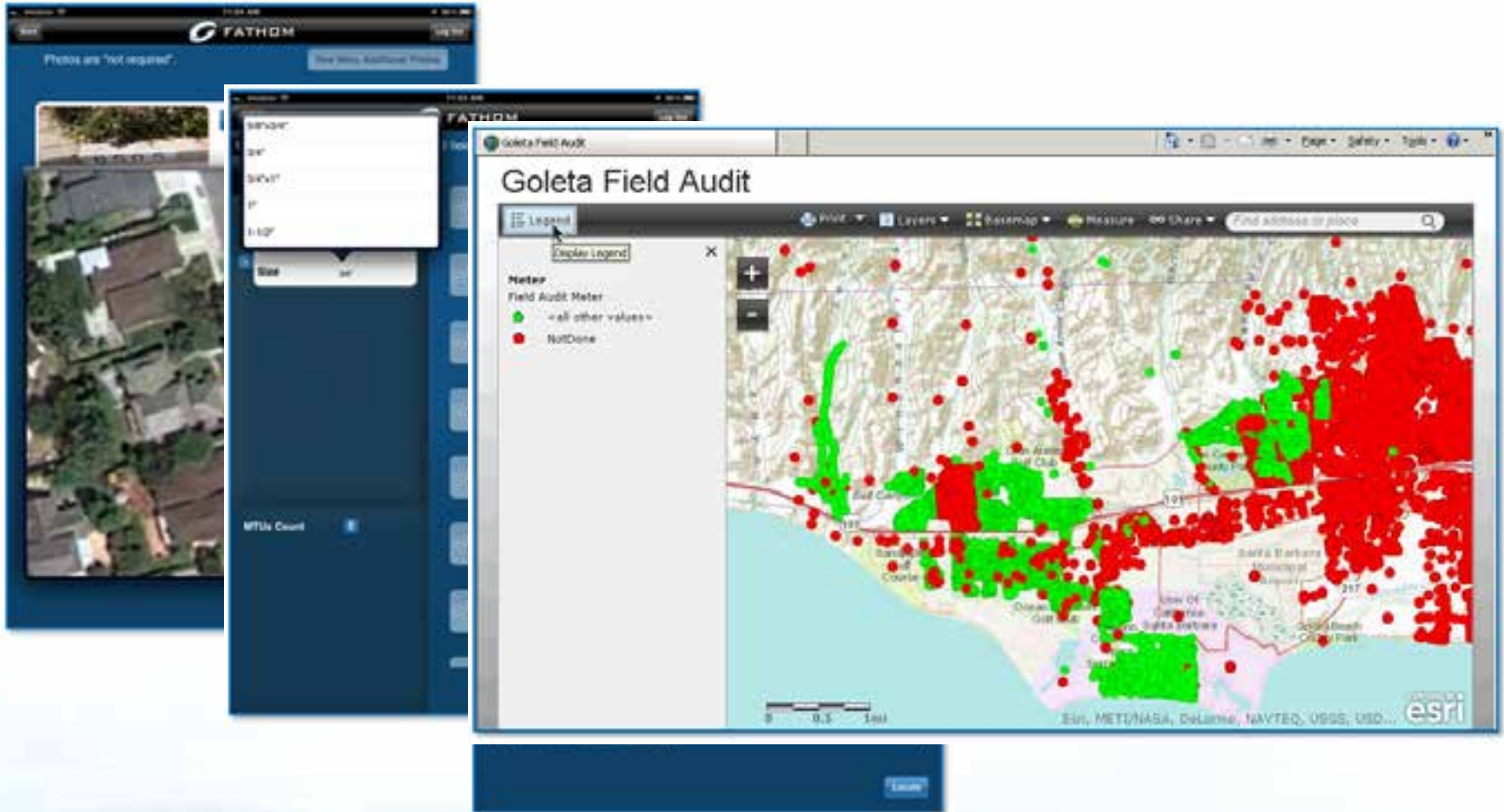


# Integrating data Systems

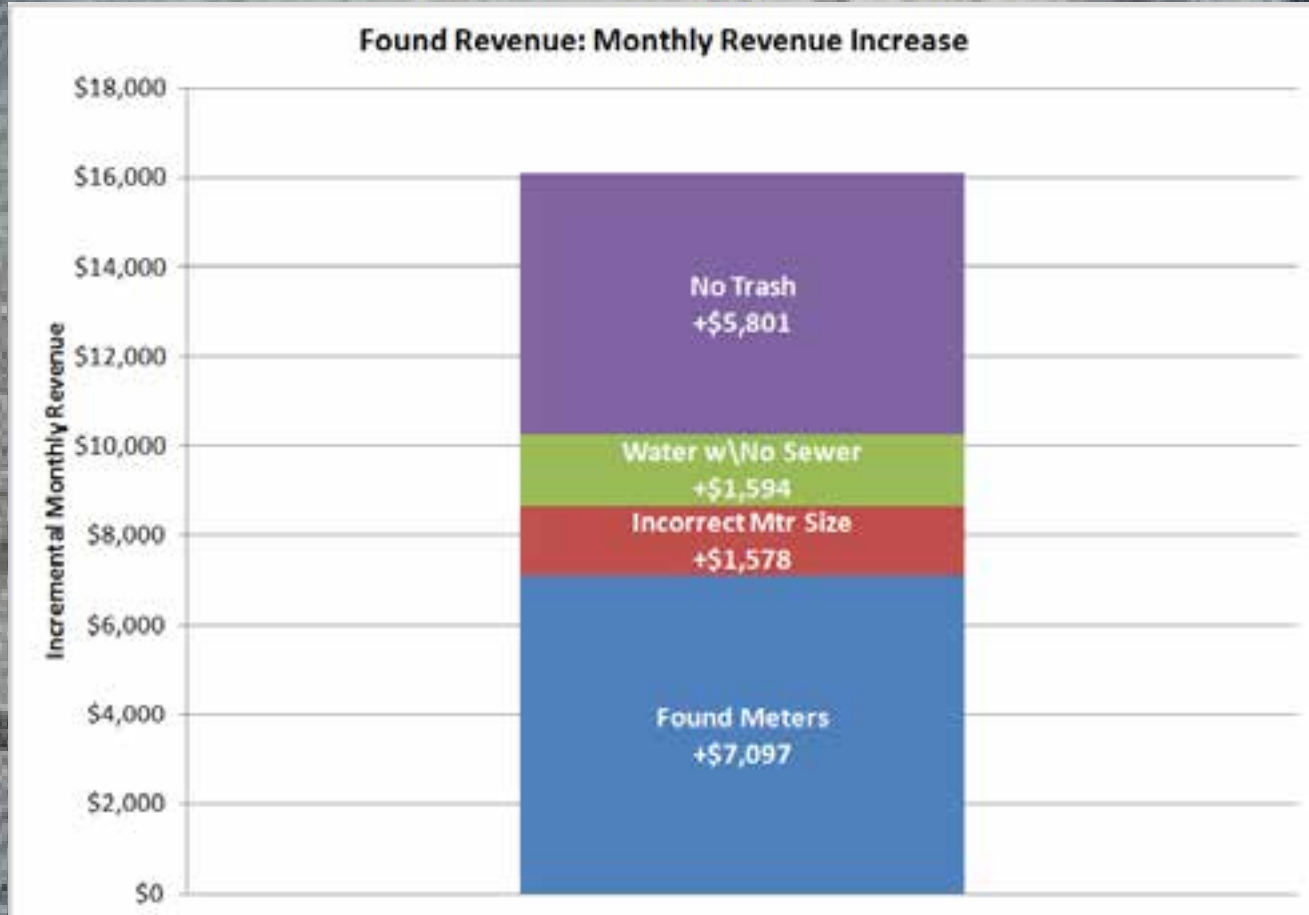




# Validating Data

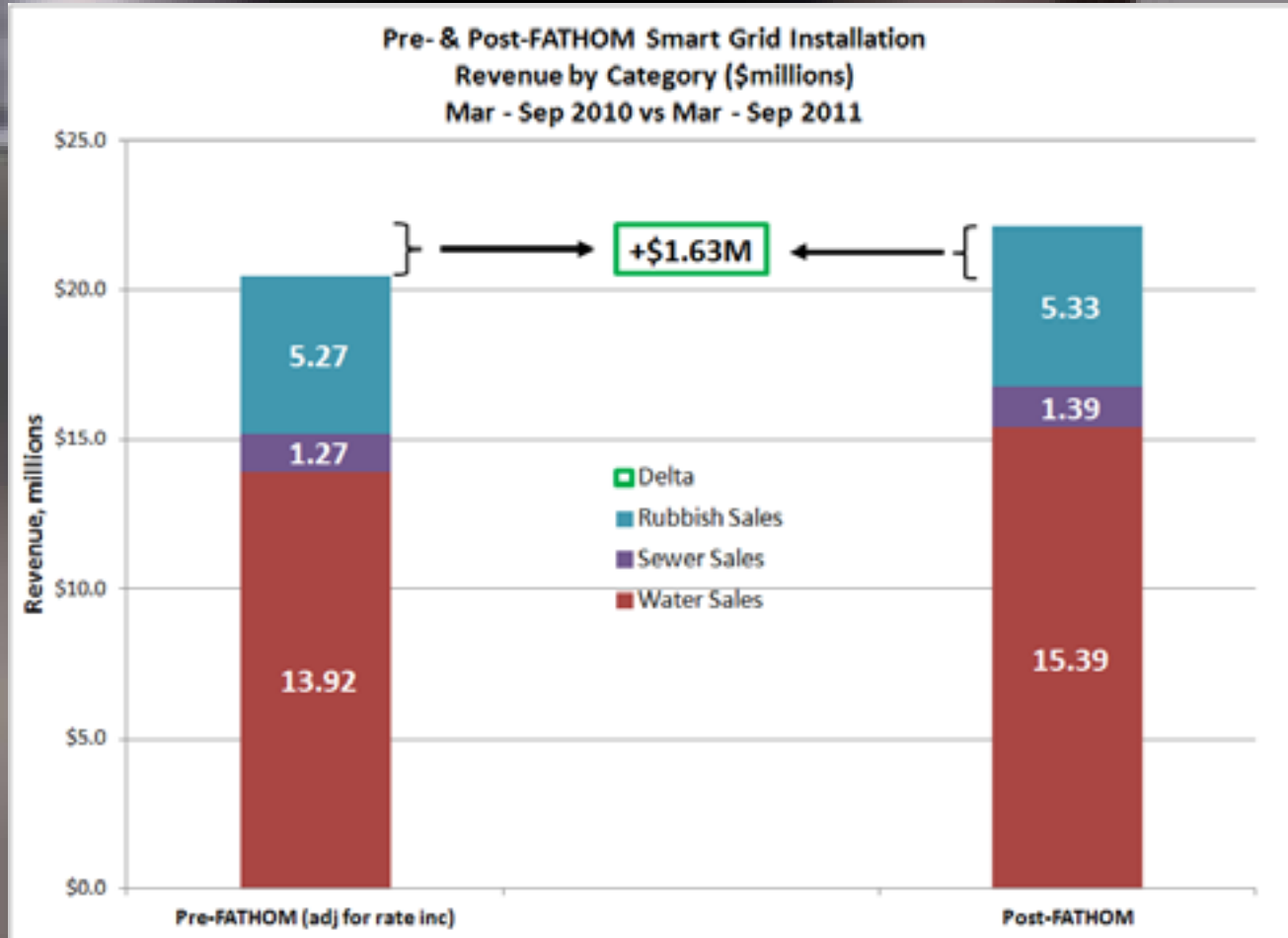


# Finding Dollars in the Data



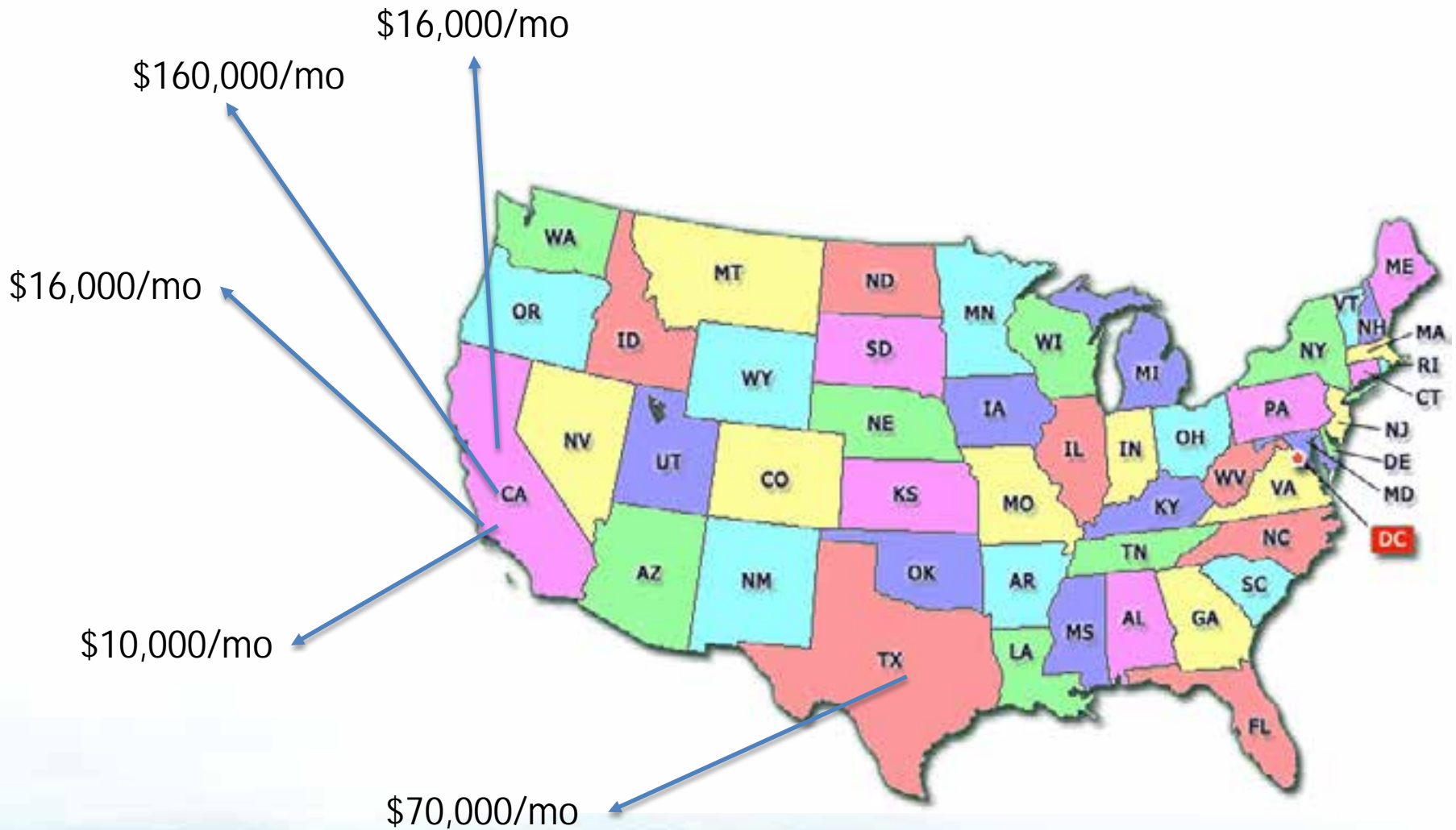
Source: Symmonds, G., "Get Smart!", UIM, Jan/Feb 2012

# Finding Dollars in the Data



Source: Symmonds, G., "Get Smart!", UIM, Jan/Feb 2012

# Turning Revenue Geospatial



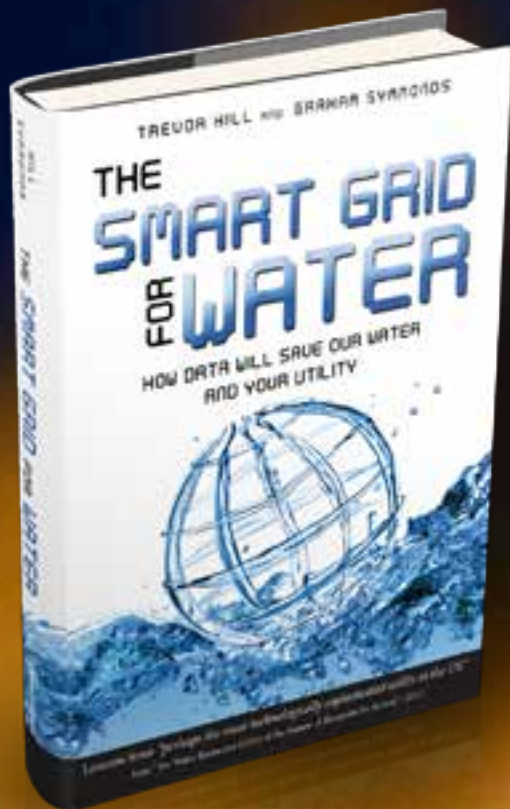
# Data

“A key to improving efficiency is understanding where, when, and why we use water.”



Source: Gleick, P., "Roadmap for sustainable water resources in southwestern North America," PNAS, 14 Dec 2010

# Questions?



- Increase Revenue
- Decrease Costs
- Delight Customers
- Preserve Our Most Vital Resource

FATHOM

[www.gwfathom.com](http://www.gwfathom.com)

[www.TheSmartGridForWater.com](http://www.TheSmartGridForWater.com)

