

# Best Practices for Managing Water Use

Jonah Schein, WaterSense



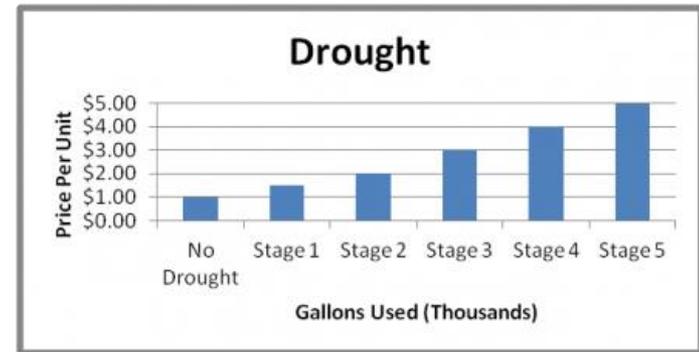
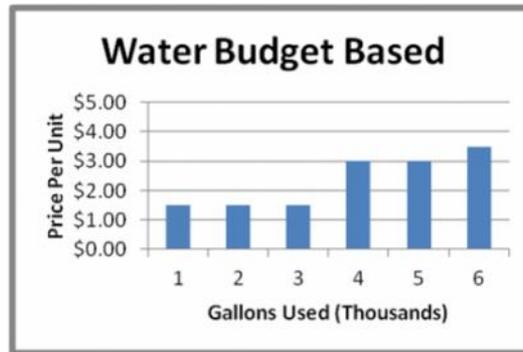
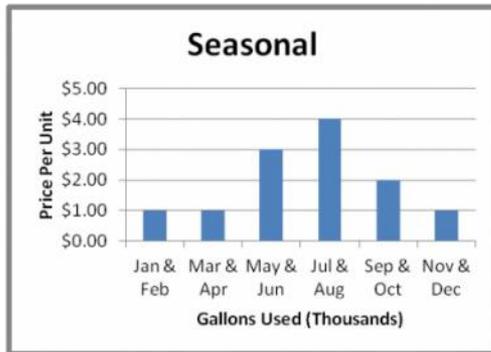
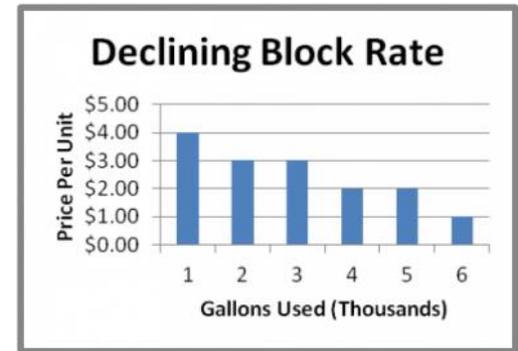
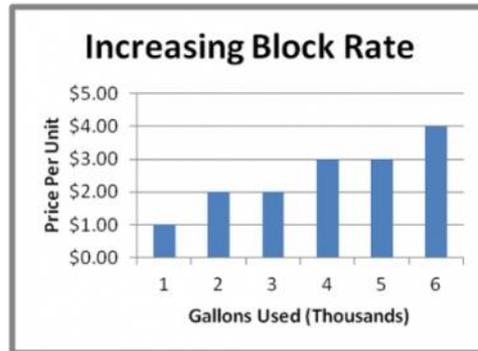
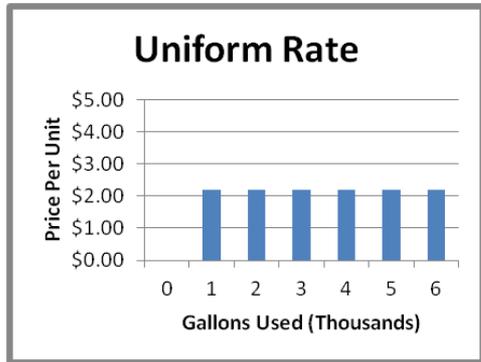
# Why Water Matters

- The largest proportion of energy consumption associated with water often occurs after water has been delivered to the end user
  - Water heating account for 8% of total energy use in commercial buildings and nearly 18% in residential buildings
- Facilities can significantly reduce costs by maximizing efficiency in all systems to reduce water and energy use
- Water use and availability is increasingly an issue when obtaining entitled, developable land

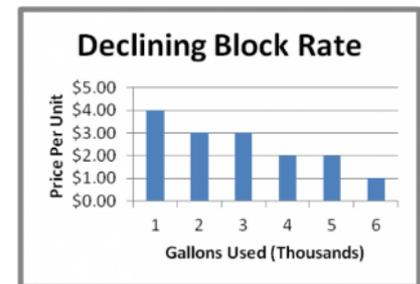
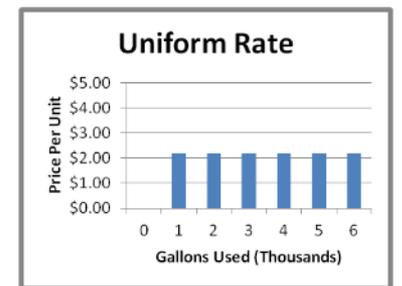
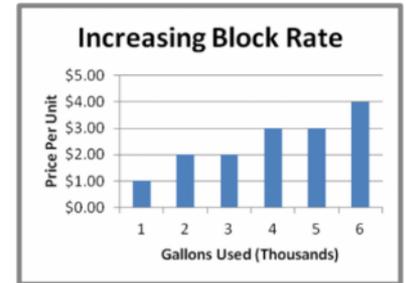
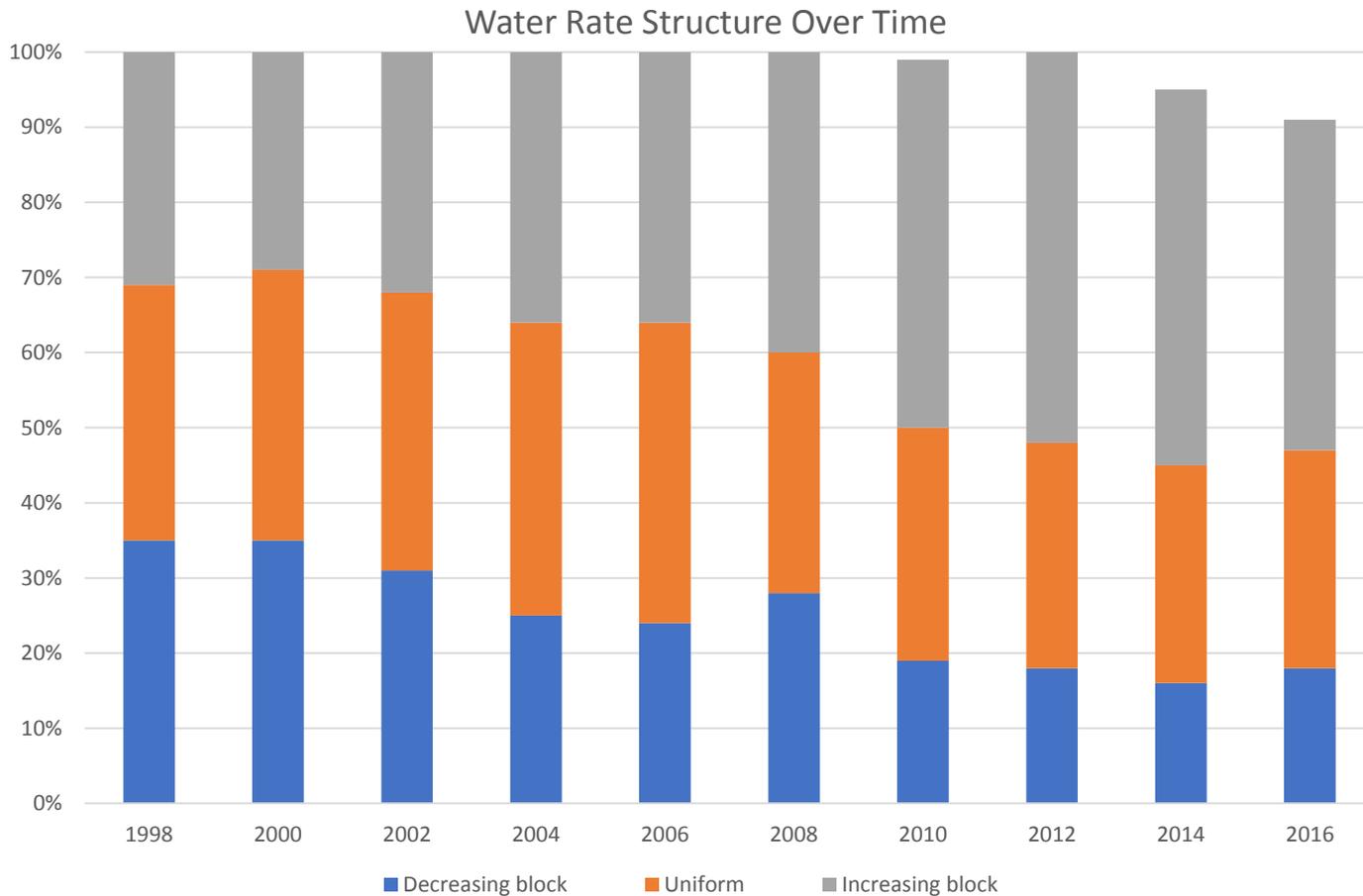
EPA's ENERGY STAR and WaterSense programs collaborate to bring solutions to the market



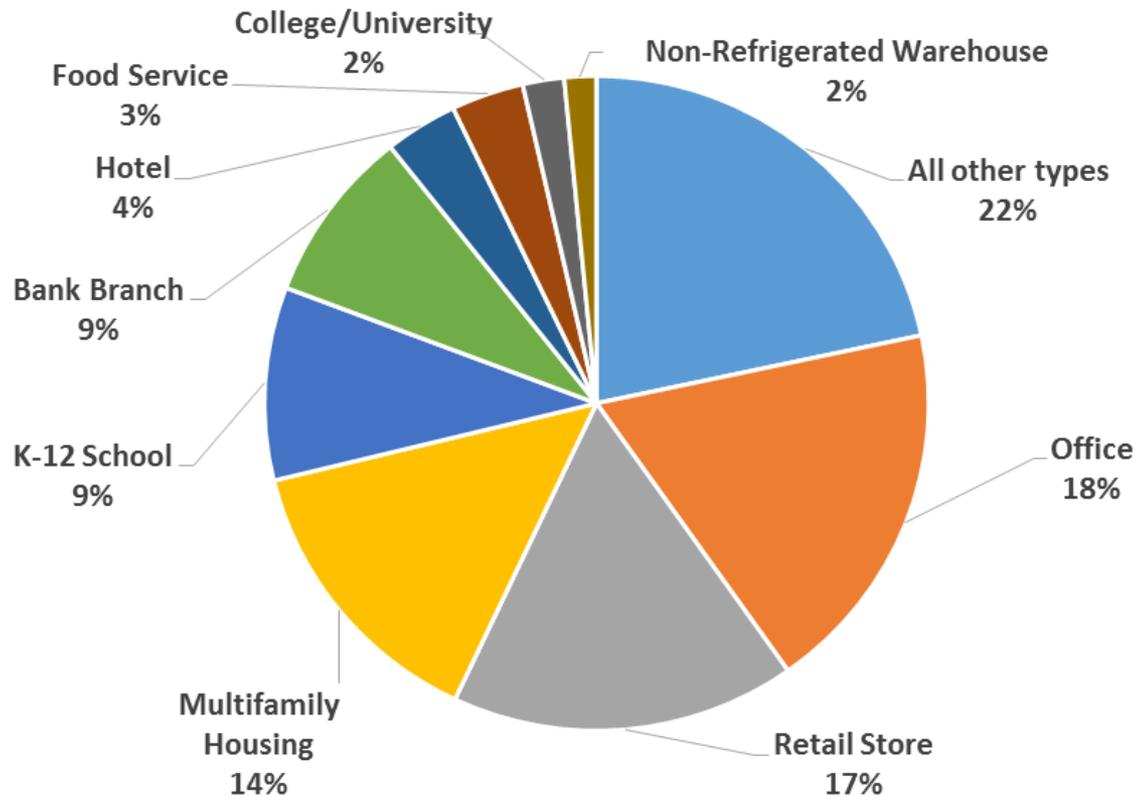
# How Are You Being Charged for Water?



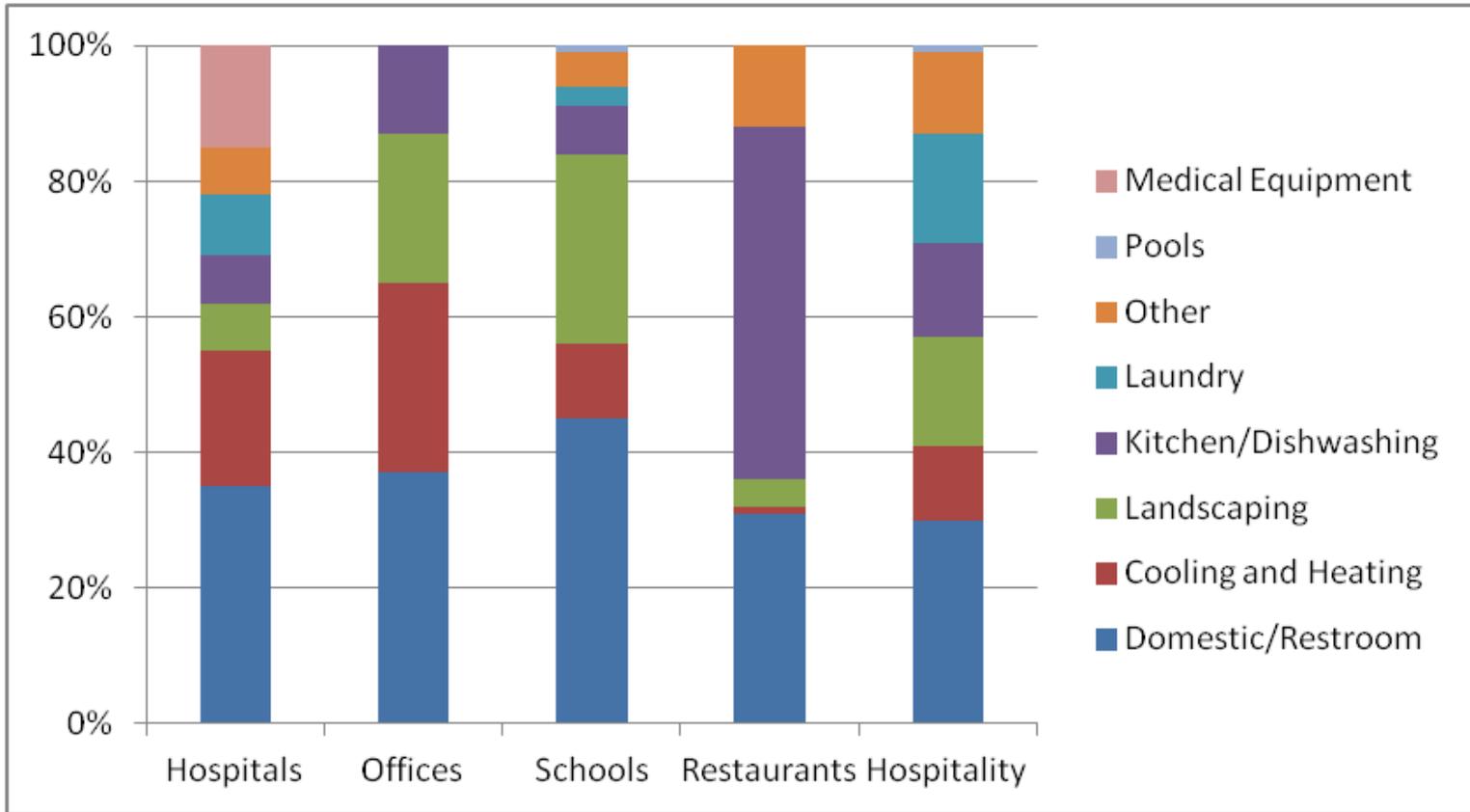
# Be Careful... It Could Change!



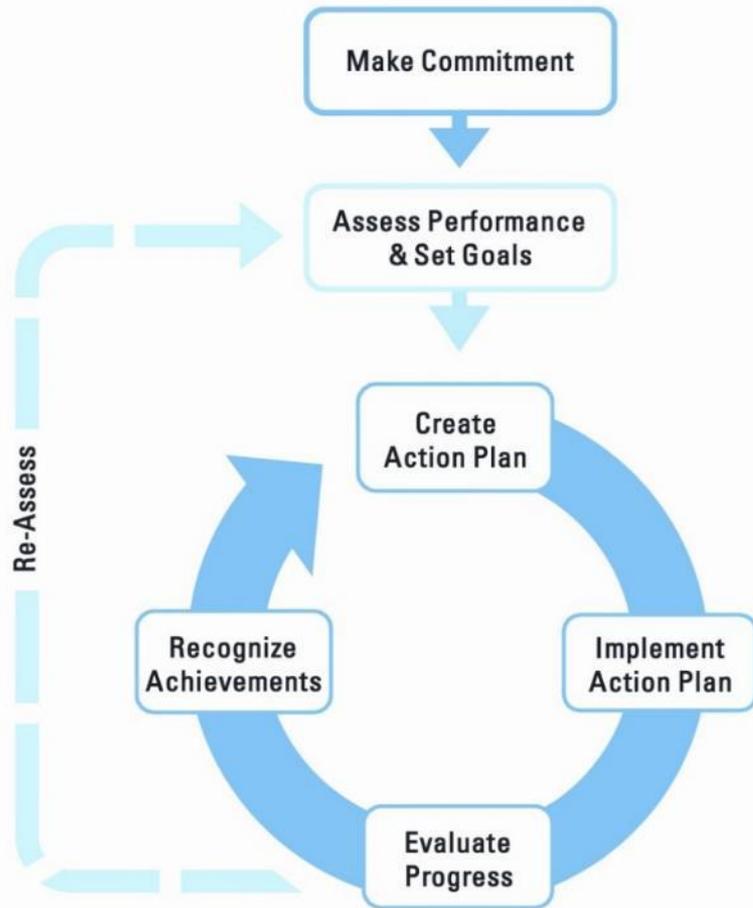
# Over 100,000 Properties are Benchmarking Water Use



# How Do Property's Use Water?



# Efficiency in Buildings



Step 1: Track

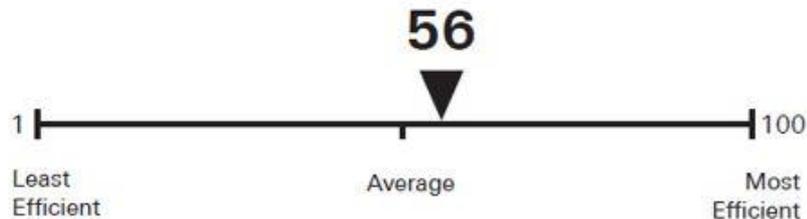
Step 2: Compare

Step 3: Analyze



# EPA's 1-100 Water Score for Multifamily Buildings

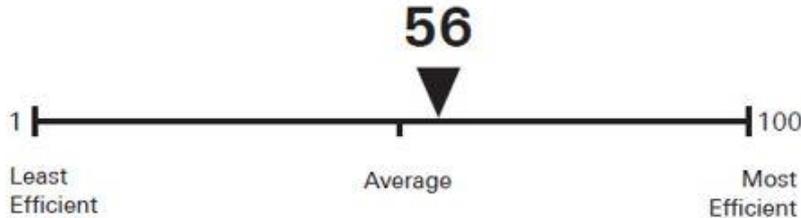
What's similar to  
**ENERGY STAR**  
score approach?



- Available for existing multifamily buildings with 20 or more units
- Approach consistent with the ENERGY STAR Score
  - Statistical evaluation of measured whole building resource (water) use
  - Normalize for weather and operation
  - Provide a meaningful peer comparison
  - Drive reductions in resource (water) use

# EPA's 1-100 Water Score for Multifamily Buildings

What's different from  
**ENERGY STAR**  
score approach ?



- Inputs Adjusted Appropriately for Water
  - Include all water use (indoor and outdoor)
  - Focus on water intensity:
    - Total water use divided by building square foot
  - Assess normalization factors in the context of water
    - Operation is assessed through inputs like unit density
    - Measures of weather capture outdoor water needs
    - Irrigated Area is important factor (like building square foot)
- No EPA certification based on the Water Score



# How the score works – Example 1

Variables	Multifamily A	Multifamily B
Size	150,000	150,000
Number of Units	220	200
Number of Bedrooms	280	200
Irrigated Area	300	300
Climate	Wet & Cool	Wet & Cool
Expected WUI (gal/ft <sup>2</sup> )	61	48
Actual WUI (gal/ft <sup>2</sup> )	56	56
EPA Water Score	50	29



# How the score works – Example 1

## What is the Same?

- Size
- Climate
- Irrigated area
- Water Use**

## What is Different?

- Number of Units
- Number of Bedrooms
- Score**

Variables	Multifamily A	Multifamily B
Size	150,000	150,000
Number of Units	220	200
Number of Bedrooms	280	200
Irrigated Area	300	300
Climate	Wet & Cool	Wet & Cool
Expected WUI (gal/ft2)	61	48
Actual WUI (gal/ft2)	56	56
EPA Water Score	50	29
<b>Gal/unit</b>	<b>38k</b>	<b>42k</b>

**Why?** → Multifamily A is expected to use more water due to

- Higher unit density
- More bedrooms per unit



# How the score works – Example 2

Variables	Multifamily A	Multifamily B
Size	150,000	150,000
Number of Units	220	220
Number of Bedrooms	280	280
Irrigated Area	50,000	300
Climate	Dry & Hot	Wet & Cool
Expected WUI (gal/ft <sup>2</sup> )	82	61
Actual WUI (gal/ft <sup>2</sup> )	56	56
EPA Water Score	74	50



# How the score works – Example 2

## What is the Same?

- Size
- Number of Units
- Number of Bedrooms
- Water Use**

## What is Different?

- Climate
- Irrigated Area
- Score**

Variables	Multifamily A	Multifamily B
Size	150,000	150,000
Number of Units	220	220
Number of Bedrooms	280	280
Irrigated Area	50,000	300
Climate	Dry & Hot	Wet & Cool
Expected WUI (gal/ft2)	82	61
Actual WUI (gal/ft2)	56	56
EPA Water Score	74	50
<b>Gal/unit</b>	<b>38k</b>	<b>38k</b>

Why?



Multifamily A is expected to use more water due to

- Climate
- Irrigated Area



# What Do You Need to get the Score?

- Required inputs for a buildings of 20 units or more:
  - 12 months of water use
  - Building location
  - Building size
    - floor area
    - number of units
    - total number of bedrooms
  - Irrigated area
    - Critical field that many people need to add before a score will be calculated



# Add Irrigated Area



Welcome LeslieStaging: [Account Settings](#) | [Notifications](#) | [Contacts](#) | [Help](#) | [Sign Out](#)

MyPortfolio

Sharing

Reporting

Recognition

## Water Score MF

1000 Overbrook Rd, Silver Lake, OH 44224 | [Map It](#)

Portfolio Manager Property ID: 16497084

Year Built: 2014

[Edit](#)

 [Not eligible to apply for ENERGY STAR Certification](#)

**Weather-Normalized Source EUI (kBtu/ft<sup>2</sup>)** Why not score?

**Current EUI:** 235.4  
(0.1% better than median.)

**Baseline EUI:** 227.2  
(3.6% better than median.)

Summary

Details

Energy

Water

Waste & Materials

Goals

Design

### Basic Information

#### Construction Status:

Existing property that is one single building

#### Property GFA - Self-Reported:

20,000 Sq. Ft.

#### Occupancy:

100%

[Edit](#)

### Property Uses and Use Details

 [View as Diagram](#)

Add Another Type of Use  [Add](#)

Name	Property Use Type	Gross Floor Area	Action
▶ Building Use	Multifamily Housing	20,000 ft <sup>2</sup>	I want to...
Property GFA (Buildings):		20,000	<a href="#">(used to calculate EUI)</a>
Property GFA (Parking):		0	

# Add Irrigated Area con't

Construction Status: \*  Existing  
 Design  
 Test

Year Built: \* 2014

Gross Floor Area: \* 20,000 Sq. Ft. ▾  
Gross Floor Area (GFA) is the total property floor area, measured from the outside surface of the exterior walls of the building(s). Do not including parking. [Details on what to include.](#)

**Irrigated Area:**  Sq. Ft. ▾

Occupancy: \* 100 ▾ %

**Additional Information**

Is this property's data maintained by a Service and Product Provider?  No  
 Yes

Is this a Federal Property (owned by any country?)  No  
 Yes

**Update Property** [Cancel](#)



# What is Irrigated Area?

- Outdoor water use can represent a significant portion of a multifamily property's overall water use - the irrigated area of a property is the outdoor vegetated area that is regularly supplied water
- Note - in the water score, this value is capped at a one to one ratio with floor space

Include	Maybe	Exclude
<ul style="list-style-type: none"><li>• Areas irrigated with in-ground or automatic irrigation system</li><li>• Areas regularly watered by hand</li></ul>	<ul style="list-style-type: none"><li>• Areas landscaped to require no supplemental water (e.g. xeriscaped)</li></ul>	<ul style="list-style-type: none"><li>• Patios</li><li>• Decks</li><li>• Driveways</li><li>• Parking lots</li><li>• Other hardscapes</li></ul>



# How Do I Determine Irrigated Area?

- Review existing designs and installation/service contracts
  - The size of the landscape will often be written into a service contract for maintaining landscape or included in the original design
- Deduct the footprint of the building and hardscape (pavements and parking area) from the total property area
  - Lot size is commonly available from tax records and municipal/county records may also include building footprint
- Use an online mapping tool
  - One free example: [www.freemaptools.com/area-calculator.htm](http://www.freemaptools.com/area-calculator.htm)





# WATER SCORECARD

# 56

out of 100

## Uptown Lofts

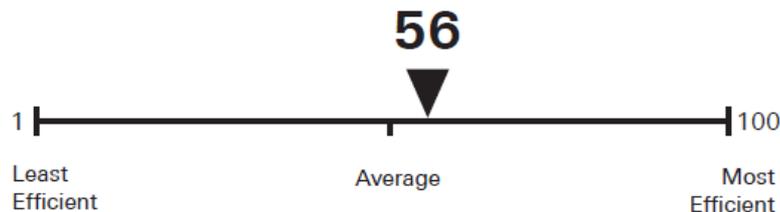
Primary Function: Multifamily  
Gross Floor Area (ft<sup>2</sup>): 14,800  
Built: 1960

Property Address:  
123 Main Street  
Anytown, CA 12345

For Year Ending: April 30, 2015

Date Generated: June 30, 2017

For the year ending May 2017, this building used 198 gallons of water per square foot. Here's how that compares to similar buildings nationwide:



### About this Score

The U.S. Environmental Protection Agency's (EPA) Water Score is generated by the ENERGY STAR® Portfolio Manager® tool and supported by WaterSense. The Score offers a 1 - 100 measurement of how efficiently this property uses water, compared to similar properties nationwide, when normalized for climate and operational characteristics. Learn more at [www.epa.gov/WaterSense](http://www.epa.gov/WaterSense).



Supported by EPA's  
WaterSense program



This scorecard was generated from EPA's  
ENERGY STAR Portfolio Manager tool.

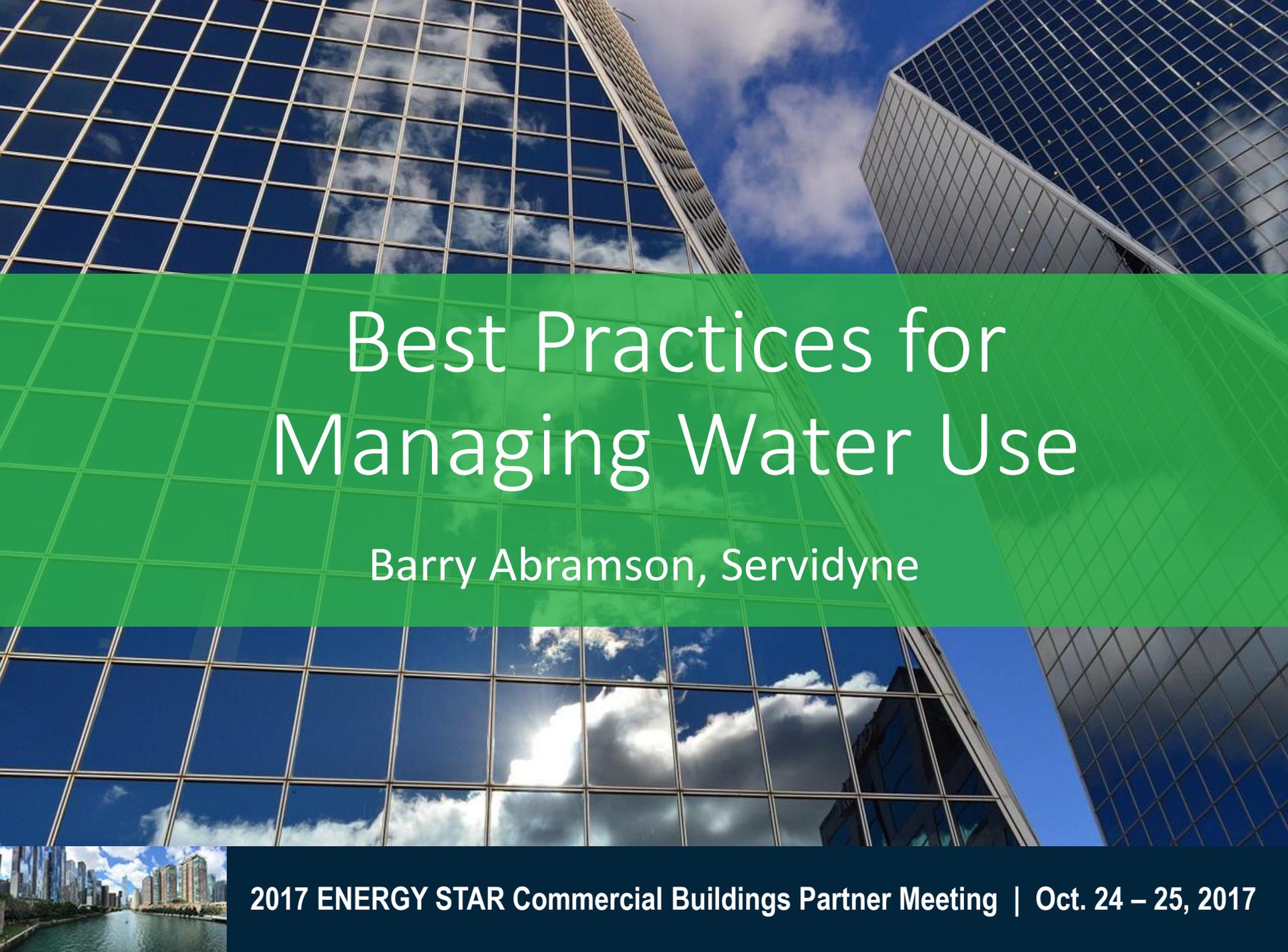
### VERIFICATION (Optional)

I, \_\_\_\_\_, verify that the information regarding water use and property use details is true and correct to the best of my knowledge.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



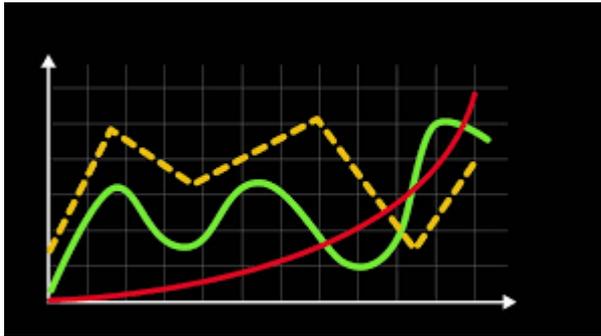


# Best Practices for Managing Water Use

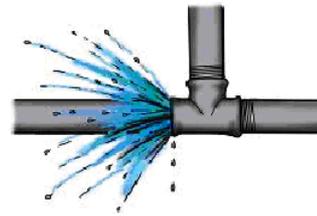
Barry Abramson, Servidyne

# Water vs. Energy Tracking

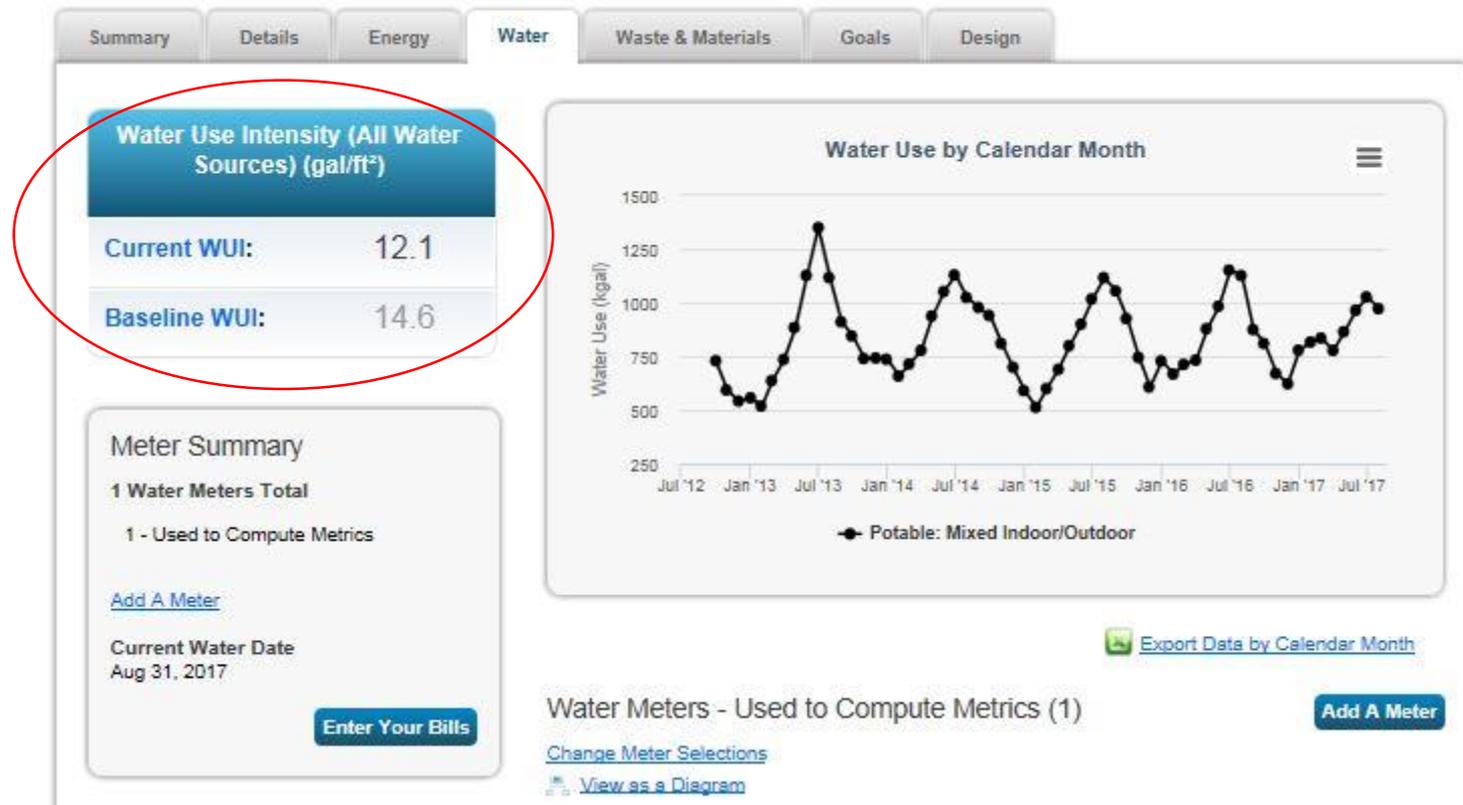
- Monthly/Seasonal Usage Profile
- Long Term Usage Trends
- Savings Verification



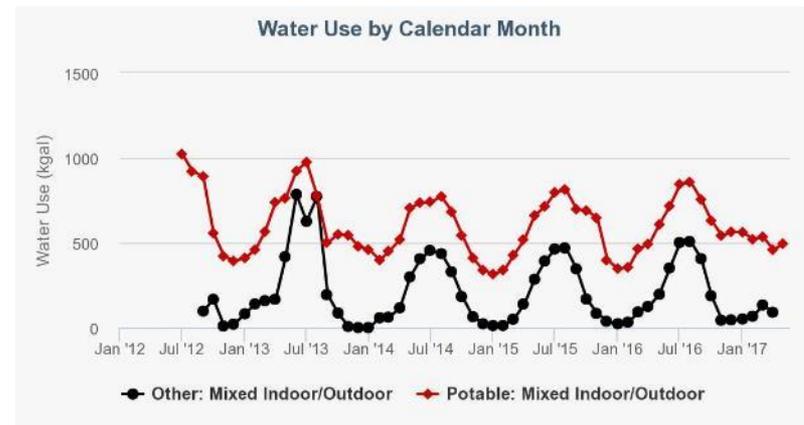
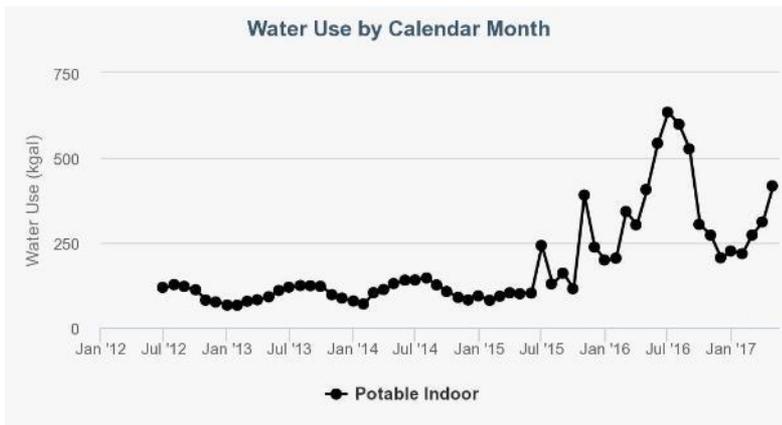
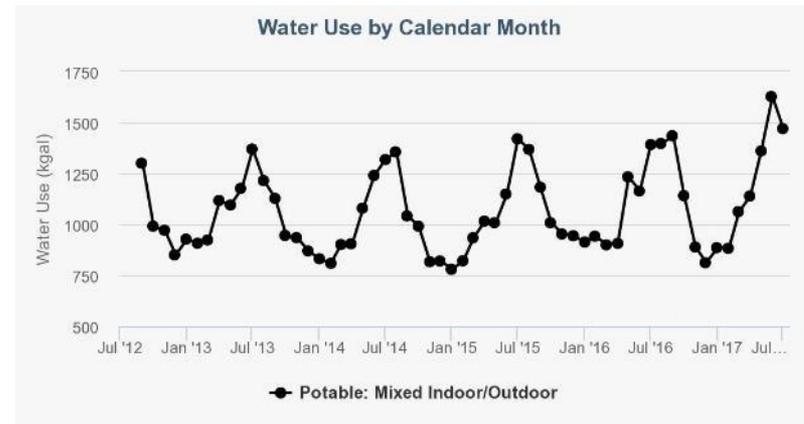
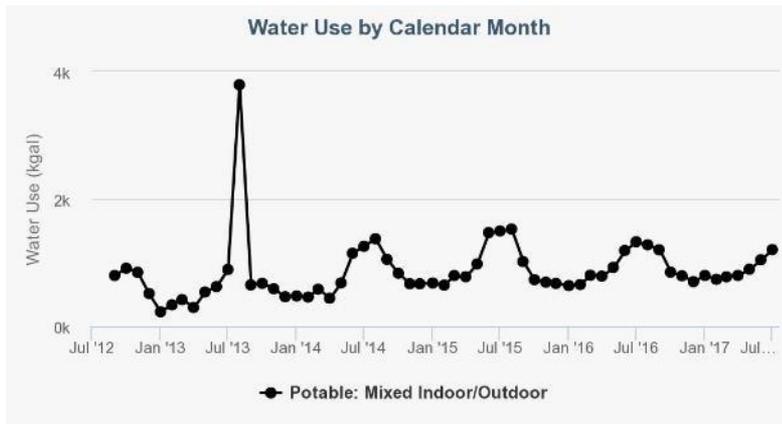
- Identification of Leaks
- Billing Anomalies



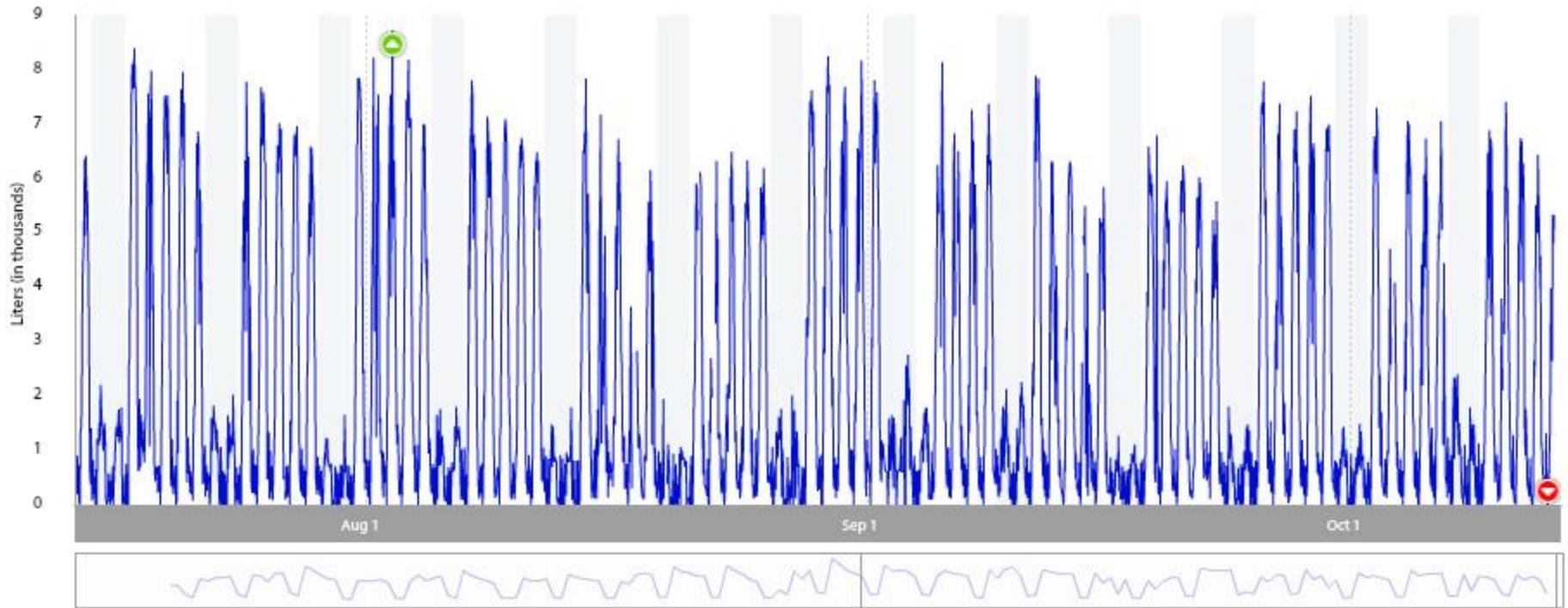
# Portfolio Manager Water Tracking



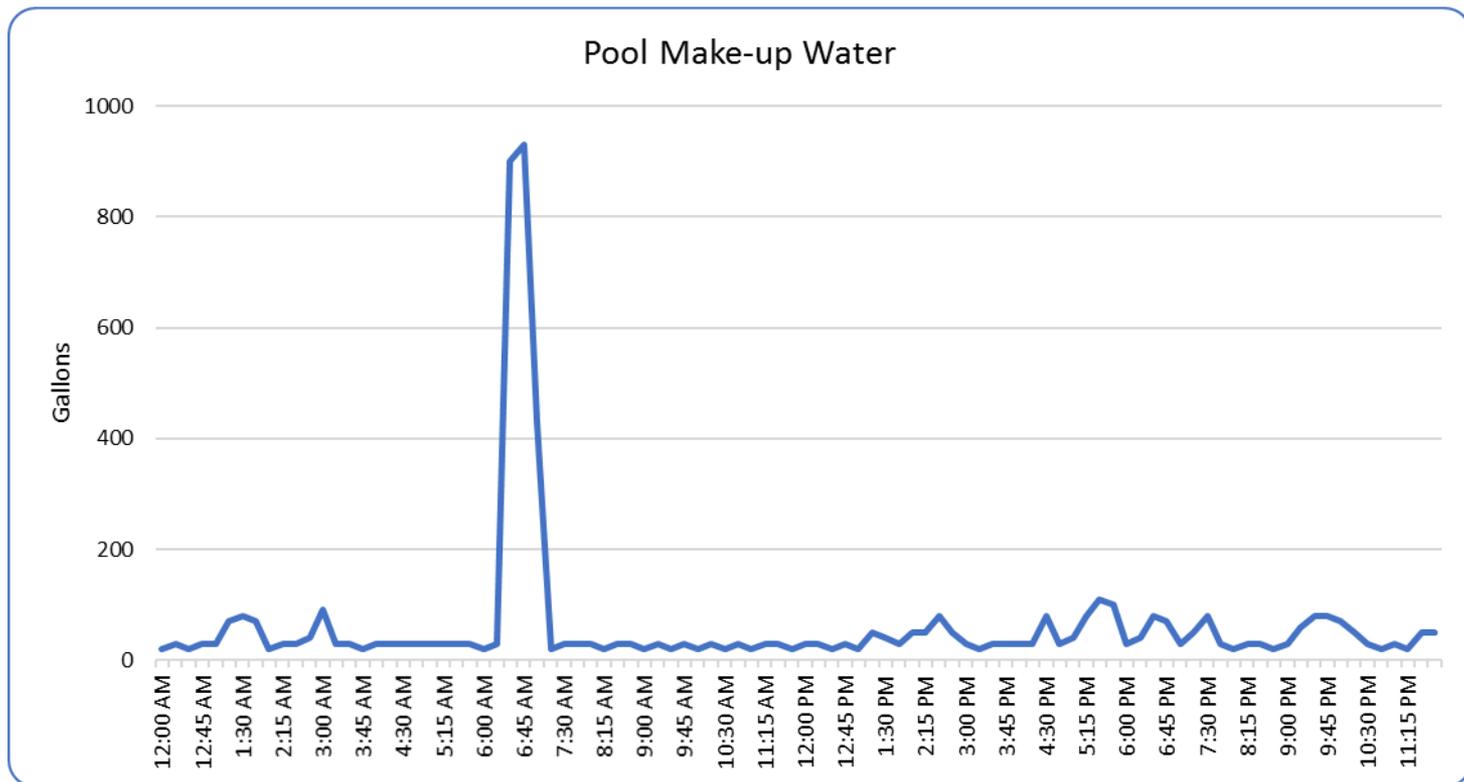
# Portfolio Manager Water Tracking



# Interval Data



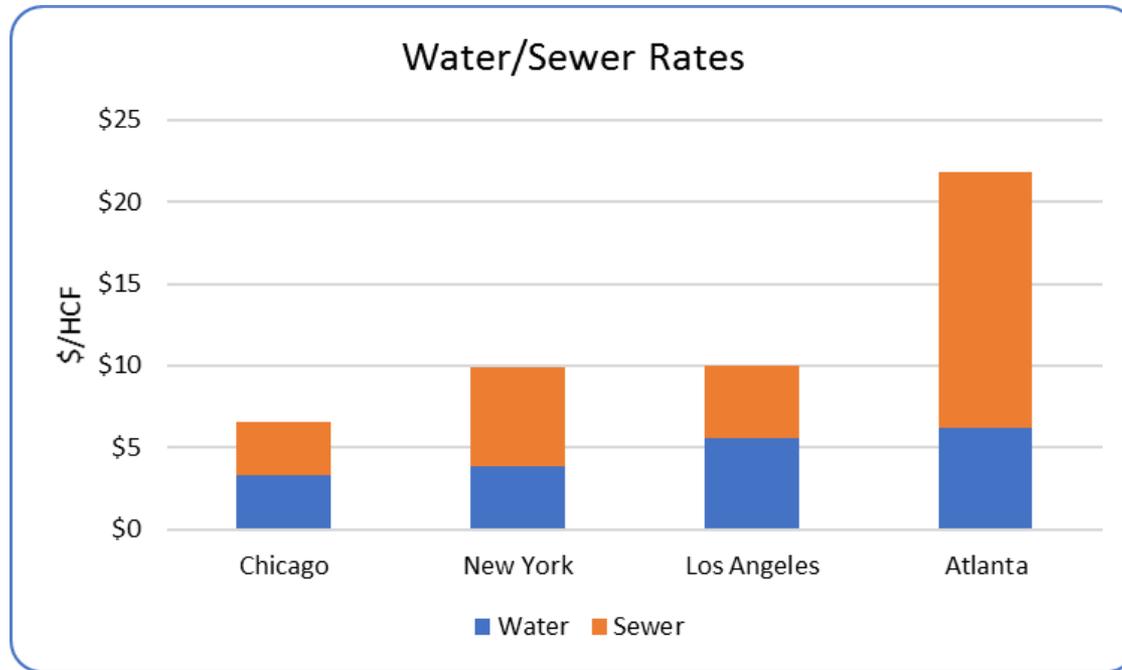
# Swimming Pool Interval Data: What's Wrong with this Picture?



# Irrigation Interval Data: What's Wrong with this Picture?

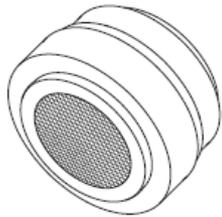


# Water/Sewer Rate Variation

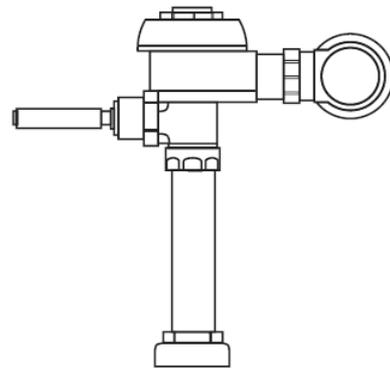


# Example Retrofit Savings per Year

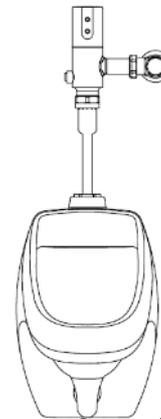
Retrofit	Chicago	New York	LA	Atlanta
Faucet Aerator	\$19	\$28	\$29	\$63
Urinal Flush Valve	\$32	\$47	\$48	\$104
New Urinal	\$87	\$130	\$131	\$287
New Toilet	\$93	\$139	\$141	\$309



0.5 gpm



1.28 gpf



1.0 gpf



0.125 gpf

