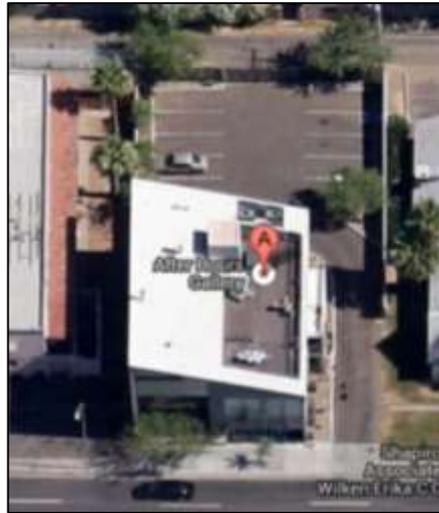


# Phoenix ICI Water Study

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David Keen  
Principal

Keen Independent Research LLC  
100 Fillmore St., 5<sup>th</sup> Floor  
Denver CO 80206

172 N. Washington St.  
Wickenburg AZ 85390

303-385-8515

[dkeen@keenindependent.com](mailto:dkeen@keenindependent.com)



# 1. Introduction

- Investigated industrial, commercial, and institutional (ICI) water use to better understand current trends
- Used gallons per 1,000 developed square feet per day (g/ksf/d) as a unit of measurement that allows direct comparison among different sectors
- Different consulting teams examined a sector or end use
- Keen Independent studied office, retail and warehouse properties, which account for 21% of total Phoenix ICI water use
- Created both bottom-up and top-down estimates of end-use water
- Sources included:
  - Previously published research
  - Water use data from the Phoenix Water Department
  - Land use data from the Maricopa County Assessor's Office
  - Aerial images
  - Interviews with stakeholders and experts

## 2. Bottom-up estimate of water use in 2012

in g/ksf/d, scaled to the average water use for each property

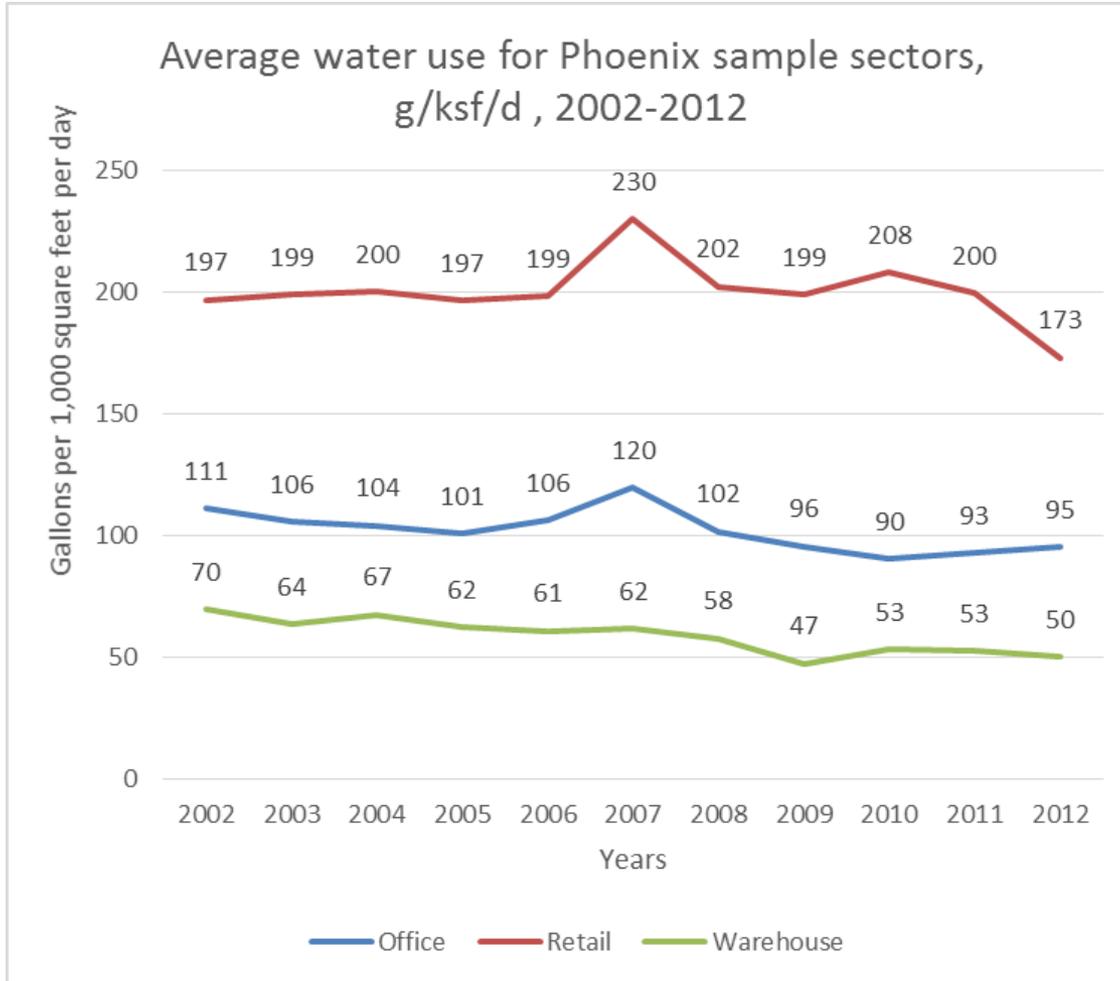
Sector	Estimated outdoor water use	Estimated cooling water use	Estimated restroom water use	Estimated "other" water use	Average total water use for all properties
Office	26	25	34	9	94
Retail	19	50	35	18	122
Warehouse	27	18	12	6	63

### 3. Projected end uses in g/ksf/d, 2032

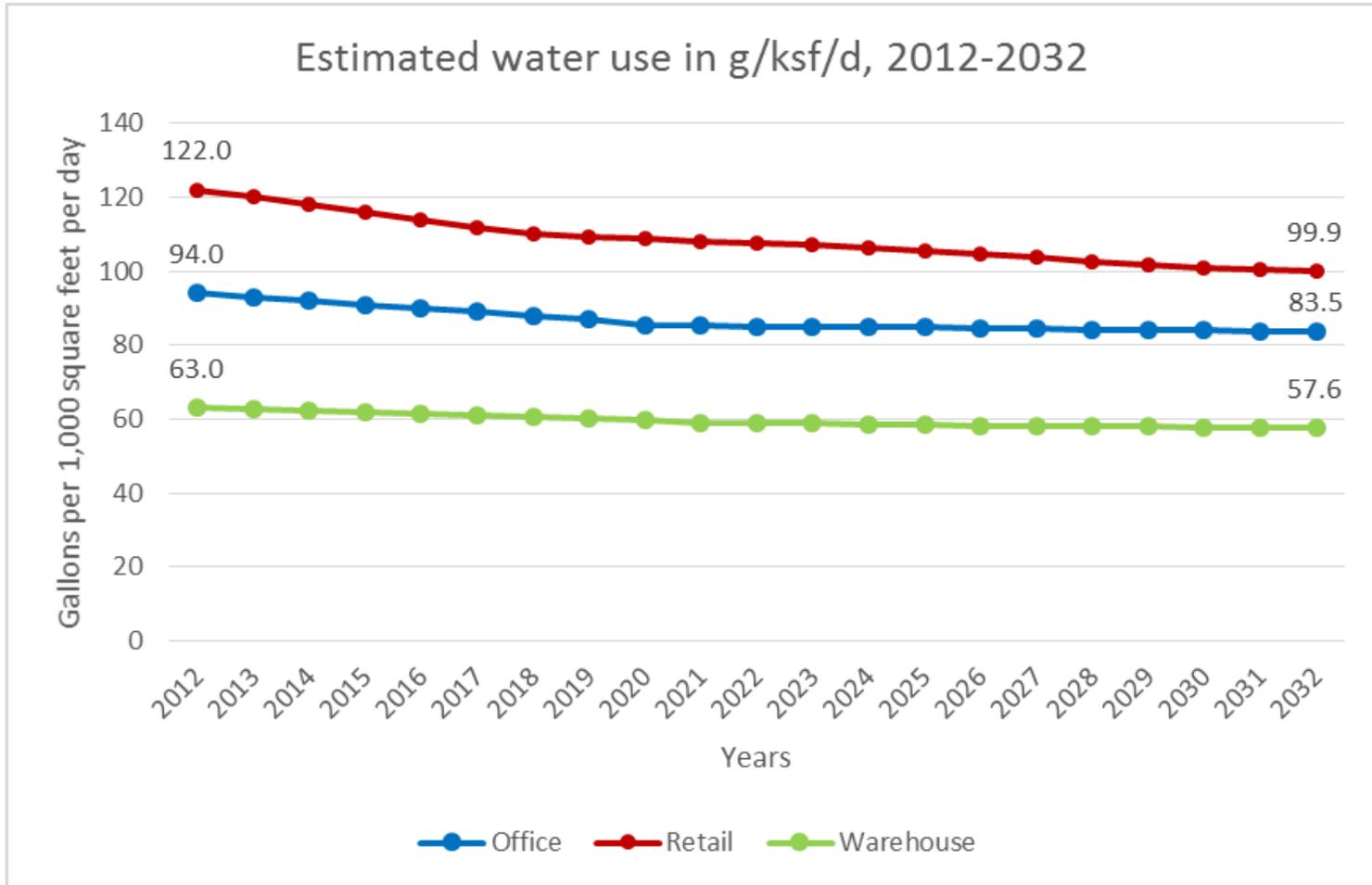
Sector	Estimated outdoor water use	Estimated cooling water use	Estimated restroom water use	Estimated "other" water use	Average total water use for all properties
Office	26	25	23	9	84
Retail	19	50	13	18	100
Warehouse	27	18	7	6	58

- Changes due to installation of low water landscaping has largely occurred
- Assumed no change in water use for cooling
- Replacement of existing restroom fixtures will gradually lower use - 14% decline
- Yearly decreases will slow as fewer inefficient toilets are left to be replaced

## 4. Historical changes



## 5. “Middle” projections for retail, office, warehouse use



## 6. Future directions

- Some ICI properties use large amount of water that cannot be explained by typical end-uses
- Occupancy rates and intensity of use may be very important
- Subsets of property types (e.g., retail includes both clothing stores and grocery stores) may be better analyzed separately
- Further research into how quickly different ICI segments are adopting new fixtures would improve forecasting

