This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Saturation Incomplete!

*Have water savings opportunities been left behind?*

John Koeller, P.E.
Koeller and Company

*Las Vegas, October 2017*
What is ‘saturation’?

• What it is NOT

• Definitions of ‘saturate’:
  – “to furnish (a market) with goods to its full purchasing capacity”
  – “to fill, soak, or imbue totally”

• For our purposes, we are attempting to define what % of a geographic area is equipped with a water-efficient product.
Why do we do saturation studies??

• Demand forecasting

• Budgeting
  – Water utility operations
  – Conservation programs

• Set conservation program direction/priorities

• Inform regulators and legislative bodies

• Tracking and reporting
Different approaches to saturation studies...

• “Bottom up”
  ✓ Customer/public canvassing
    ▪ Mail surveys
    ▪ Phone surveys
    ▪ On-premise visits & inspections
  ✓ Low error rate (with proper structure)
  ✓ Expensive & usually time consuming

• “Top down”
  ✓ No customer surveys – use available data
    ✓ e.g., market data, permitting data, demographics
  ✓ Moderate error rate
  ✓ Inexpensive and fast turnaround
Plumbing products – saturation history

• Los Angeles – 1996
  ✓ By MWDSC for City of L.A.
  ✓ Saturation study of residential toilets
  ✓ For each ZIP code (several hundred)
  ✓ PURPOSE? Conservation program targeting
  ✓ “Top-down” structure

• California – 2005
  ✓ CUWCC saturation study of plumbing fixtures
  ✓ Statewide
  ✓ Residential & CII
  ✓ Toilets & urinals
  ✓ “Top-down” structure
Plumbing products – saturation history

• 5-State study - 2017
  ✓ AWE study of “non-efficient” toilets
  ✓ Residential only
  ✓ PURPOSE? Inform regulators/legislators
  ✓ Arizona, California, Colorado, Georgia, Texas
  ✓ “Top-down” structure
AWE 2017 Saturation Study – Details

• “Non-efficient” residential toilets
  ✓ Installed base – 3.5 gpf (13Lpf) or greater
  ✓ Arizona, Calif, Colorado, Georgia, Texas

• Sources
  ✓ U.S. Census data
    ▪ Population & Housing Demographics
    ▪ American Housing Surveys - regional
      ▪ Bathroom counts
      ▪ Occupancies
  ✓ State data
    ▪ Demographics
    ▪ Demand forecasts
    ▪ Saturation studies
  ✓ Water utility program history
The graph illustrates the installed base of residential toilets (in millions) for different states, comparing the total installed base to the remaining non-efficient toilets as of 2015. The states included are Arizona, California, Colorado, Georgia, and Texas. California has the highest installed base, significantly higher than the other states, with Arizona, Colorado, Georgia, and Texas following in descending order.
Percent saturation of non-efficient residential toilets - 2015

- Arizona
- California
- Colorado
- Georgia
- Texas
- 5-STATE TOTAL
Potential annual water use reduction
(at 100%)

Thousands of acre-feet

Arizona: 49
California: 196
Colorado: 36
Georgia: 69
Texas: 171
5-STATE TOTAL: 521
Conclusions

• 13.3 million non-efficient residential toilets remain in the 5 states

• Represent 170 BILLION gallons (520,000 AF) of potential annual water savings (at 100%)
Conclusions

• **Question**: Is replacing these aging, non-efficient fixtures more expeditious and productive than engaging in continued administrative attempts to mandate lower water consumption standards in view of:
  - Drainline and sewer flow issues
  - Health & safety issues

• **Answer**: Yes
Thank you...

John Koeller, P.E.
Koeller & Company
Yorba Linda, California

Tel. (714) 777-2744
koeller@earthlink.net
www.map-testing.com