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California's codes & standards for indoor water efficiency – good or bad?

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watersmart INNOVATIONS '15

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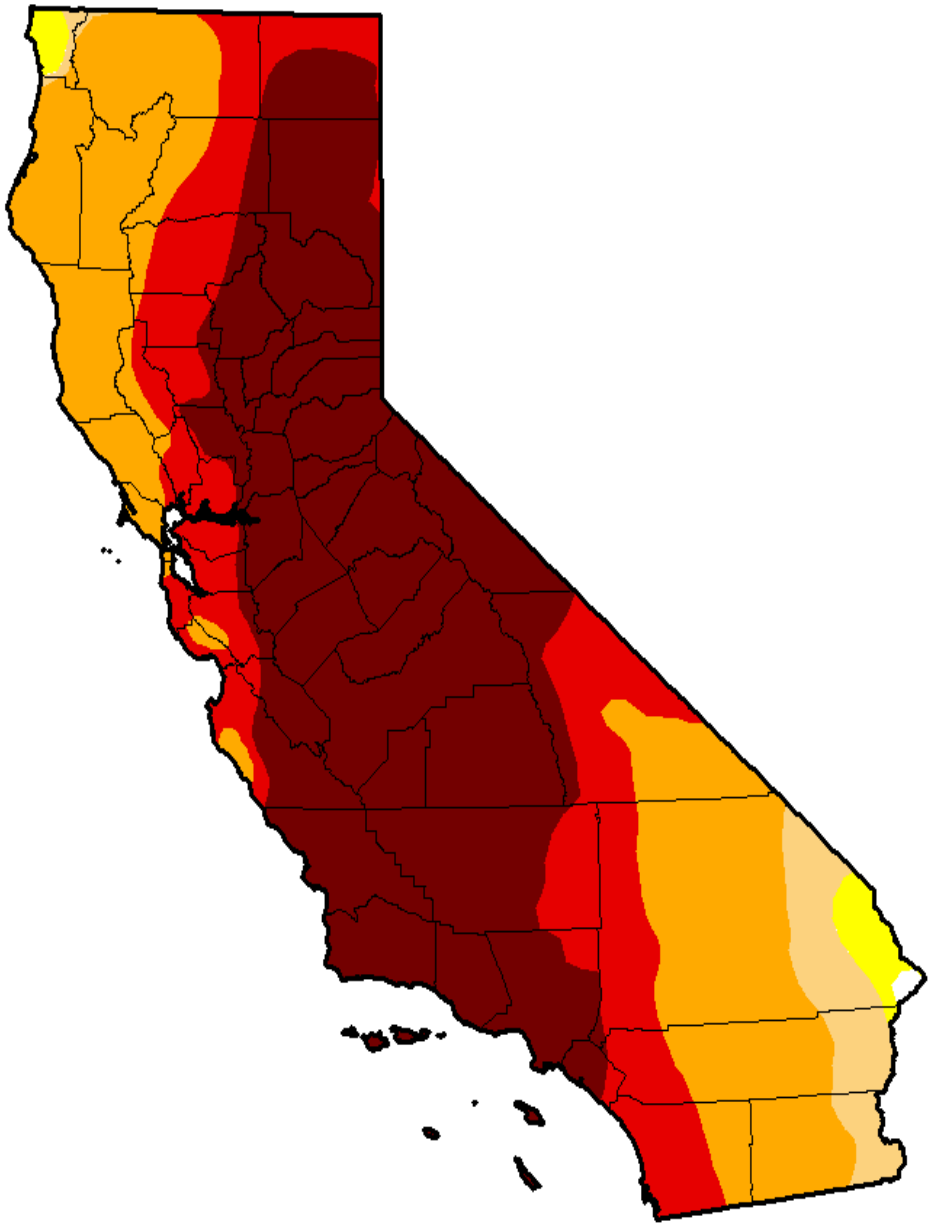
30+ years of significant reductions!!

TABLE 2-A. WATER CONSUMPTION BY WATER-USING PLUMBING PRODUCTS AND APPLIANCES – 1980 TO 2012

Water-using Fixture or Appliance	1980s Water Use	1990 Requirement	EPAct 1992 Requirement	2009 Baseline Plumbing Code	2012 'Green Code' Requirement	% Reduction in avg water use since 1980s
Residential Bathroom Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	2.2 gpm	1.5 gpm	57%
Showerhead	3.5+ gpm	3.5 gpm	2.5 gpm	2.5 gpm	2.0 gpm	43%
Toilet – Residential	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.28 gpf	74%
Toilet - Commercial	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.6 gpf[1]	68%
Urinal	1.5 to 3.0+ gpf	1.5 to 3.0 gpf	1.0 gpf	1.0 gpf	0.5 gpf	67%
Commercial Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	0.5 gpm	0.5 gpm	86%
Food Service Pre-rinse Spray Valve	5.0+ gpm	No requirement	1.6 gpm (EPAct 2005)	No requirement	1.3 gpm	74%
Residential Clothes Washer	51 gallons/load	No requirement	26 gallons/load (2012 standard)	No requirement	16 gallons/load	67%
Residential Dishwasher	14 gallons/ cycle	No requirement	6.5 gallons/cycle (2012 standard)	No requirement	5.0 gallons/cycle (ASHRAE S191P)	64%

gpm: gallons per minute
gpf: gallons per flush

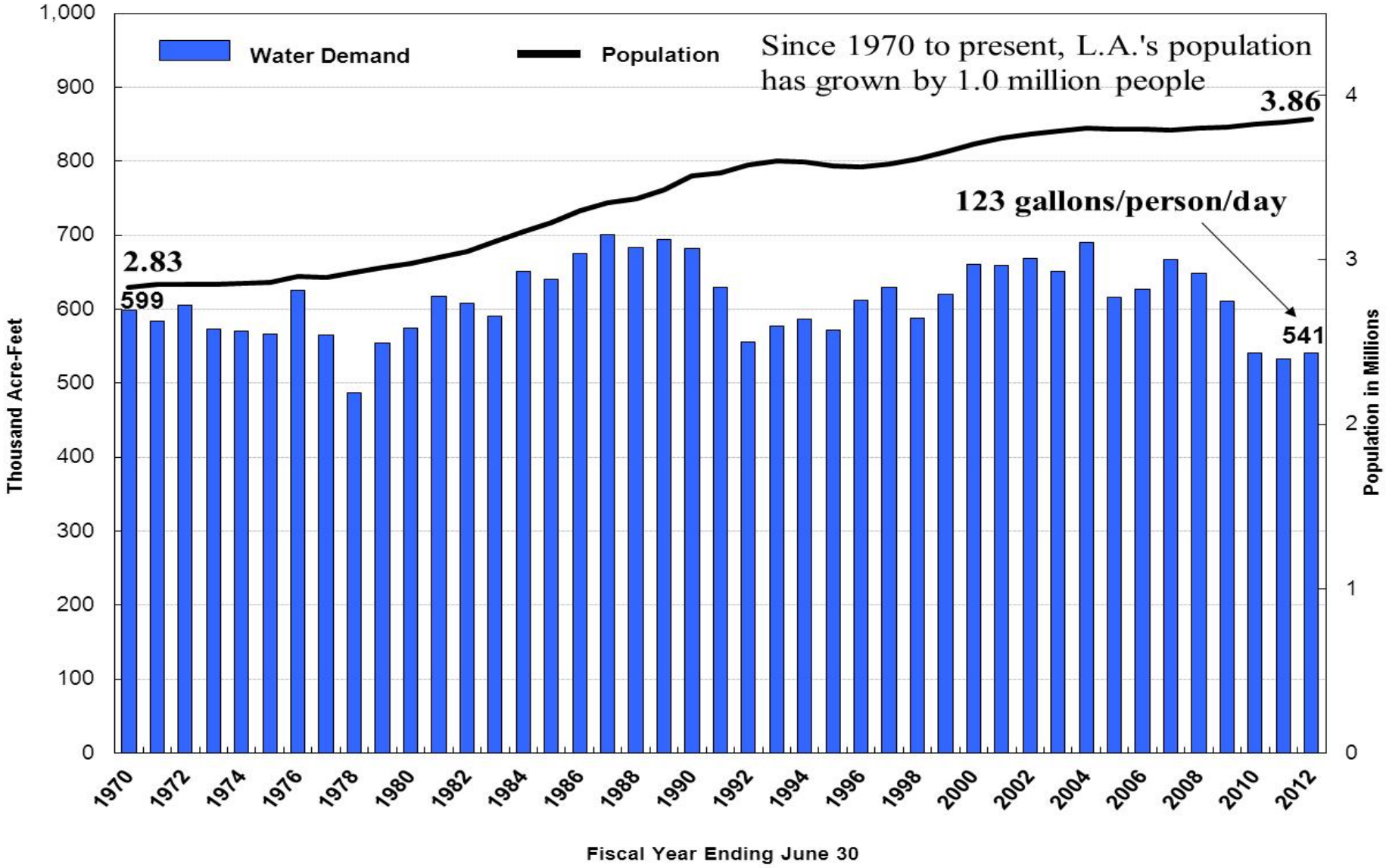


California's drought response thru indoor codes & stds

California's own 'problem'

- Drought could be more serious than public understands…worst may be yet to come!
- Over the past 20+ yrs, great strides have been made in reducing per capita water use in California, *BUT…*
- Governor's Exec Order of April 1 required even more reductions: 25% from 2013 levels!

Los Angeles - Using Less Water Than 40 Years Ago Despite Population Increase of 1 Million



Governor's Executive Order

- 412 public water providers (utilities, cities, etc.) in California
- 94 providers ordered by State to immediately reduce their water use by 36% (i.e., beginning June 2015!)
  - 54 more at 32%
  - 100's of others at 20, 24, 28% levels

At Local Level

- Results?
  - SUCCESS!! Most residential customers respond with water use reductions
  - Utility revenues drop precipitously
  - Significant rate increases underway
    - Because: 36% reduction in revenue, whereas 50-70% of costs are fixed!
  - Many outdoor watering regulations
  - Gallons/capita/day targets
  - Fines & surcharges for non-compliant customers (up to $10,000/day possible)

At Local Level

- Observed Consequences
  - Brown lawns
  - 'Spy on your neighbor'
  - Public backlash against rate increases
  - Commercial-industrial process impacts varied
  - BUT, opportunities exist for new water-saving products & technologies

California Energy Commission (CEC)

- Set new max. thresholds for California…
  - Lavatory faucets (residential):
    - Current = 2.2 gpm (existing national std)
    - Mfg between Sept 1, 2015 & July 1, 2016 = 1.5 gpm
    - Mfg after July 1, 2016 = 1.2 gpm
  - Lavatory faucets (public, i.e., commercial)
    - Current = 2.2 gpm (national product standard is 0.5 gpm)
    - After January 1, 2016 = 0.5 gpm
  - Kitchen faucets (resid vs. comm'l: no distinction)
    - Current = 2.2 gpm (existing national std)
    - After January 1, 2016 = 1.8 gpm
    - Temporary physical override = 2.2 gpm

BUT, what *IS* a lavatory sink?

- DEFINITION: A sink exclusively within the confinements of a toilet room/bathroom/restroom (nomenclature for rooms containing toilets and urinals), used for the sole purpose of hygiene (inclusive of hands, arms, face and mouth), and requiring minimum water supply flows and minimum drainage outlets.
- IT IS NOT: A janitor's sink, make-up sink, kitchen sink, hand sink, laundry sink, clinical sink, locker room sink, bar sink

California Energy Commission (cont'd)

- Set new max. thresholds for California…
  - Wall-mounted urinals
    - Current = 0.5 gpf (existing national std is 1.0 gpf)
    - After January 1, 2016 = 0.125 gpf (1 pint)
  - Floor-mounted urinals
    - Current = 0.5 gpf (national standard is 1.0 gpf)
    - No change to requirements
  - Showerheads
    - Current = 2.5 gpm (same as national standard)
    - Mfg between July 1, 2016 & July 1, 2018 = 2.0 gpm
    - Mfg after July 1, 2018 = 1.8 gpm

California Energy Commission (cont'd)

- Confirmed existing thresholds (i.e., no change)
  - Water closets (toilets) ≤ 1.28 gpf
    - Compliance with 2013 ASME/CSA ANSI standard which contains WaterSense criteria
  - Metering faucets ≤ 0.25 gal per cycle (1 quart)
    - Volumetric rather than a flowing measure
    - NO maximum flow rate….ONLY maximum volume
    - Possible application:
      - Therefore, a 1.0 gpm flow for 15 seconds complies!
      - OR, a 1.5 gpm flow for 10 seconds complies!
  - Tub spout diverters
    - When new, max leakage ≤ 0.01 gpm (std ≤ 0.1 gpm)
    - After 15,000 cycles ≤ 0.05 gpm

Consequences of CEC – Lav faucets

- Residential lav faucets
  - CEC says “800 faucet models meet our requirement”
  - Truth: Only 10 models in the CEC database comply!
- U.S. EPA’s WaterSense Program
  - 9,000 residential lav faucets certified to WS spec
  - Few comply with the CEC requirement
  - Must be removed from the retail shelf by July 1, 2016
- OTHER consequences exist!
  - Both intended and unintended

California Legislature

- Senate Bill 407
  - Signed into law in 2009
  - Requires replacement of non-efficient toilets & urinals (>1.6 gpf & >1.0 gpf)
  - Important milestones:
    - Written disclosure on resale
    - Jan 1, 2017 – All single-family must be efficient
    - Jan 1, 2019 – All multi-family must be efficient
    - Jan 1, 2019 – All commercial-industrial must be efficient
  - 2017-2019? 1-pint & waterless urinals & 1.28 gpf toilets are the only things available
  - Concern – What impact on 60+ year old buildings?

Toilet and Urinal Fixtures in the California Codes (applicable to pre-1994 property)

Condition, Activity, or Event	AB 715 (2007)	SB 407 (2009)	CalGreen
Sale of toilet and urinal fixtures through retail or other outlets	All fixtures sold or install-led after Jan 1, 2014 must be HETs or HEUs[3]	Not addressed	Not addressed
Existing[1] single family residential (SFR)			
Resale	Not addressed	As of Jan 1, 2017, requires written disclosure by Buyer to Seller of non-compliant fixtures in property	Not addressed
Renovation[2]	All fixtures installed after Jan 1, 2014 must be HETs or HEUs[3]	Renovated SFR must be 1.6 max (toilets) or 1.0 max (urinals) on or after Jan 1, 2014 to obtain bldg or occupancy permit. However, under AB715, only 1.28 gal toilets and 0.5 gal urinals are available in Calif.	1.28 maximum[3] IF prescriptive path is chosen (per 4.303.1) – Jan 1, 2011
All other SFR	Not addressed	ALL SFR must be 1.6/1.0 max by Jan 1, 2017	
Existing[1] multi-family residential (MFR)			
Resale	Not addressed	As of Jan 1, 2019, requires written disclosure by Buyer to Seller of non-compliant fixtures in property	Not addressed
Renovation[2, 4]	All fixtures installed after Jan 1, 2014 must be HETs or HEUs[3]	Renovated MFR must be 1.6 max (toilets) or 1.0 max (urinals) on or after Jan 1, 2014 to obtain bldg or occupancy permit. However, under AB715, only 1.28 gal toilets and 0.5 gal urinals are available in Calif.	1.28 maximum[3] IF prescriptive path is chosen (per 4.303.1) – Jan 1, 2011
All other MFR	Not addressed	ALL MFR must be 1.6/1.0 max toilets by Jan 1, 2019[6]. If non-compliant, fixtures must be replaced with then-compliant product (1.28 or less)	
Existing[1] commercial			
Resale	Not addressed	As of Jan 1, 2019, requires written disclosure by Buyer to Seller of non-compliant fixtures in property	Not addressed
Renovation[2, 4]	All fixtures installed after Jan 1, 2014 must be HETs or HEUs[5]	Renovated Comm'l must be 1.6 max (toilets) or 1.0 max (urinals) on or after Jan 1, 2014 to obtain bldg or occupancy permit. However, under AB715, only 1.28 gallon toilets and 0.5 gallon urinals are available in Calif.	1.28 max (toilets) and 0.125 max (urinals)[3] IF prescriptive path is chosen (per 5.303.2) – Jan 1, 2011
All other Commercial	Not addressed	ALL Commercial must be 1.6 gpf max toilets and 1.0 gpf max urinals on or after Jan 1, 2019[6]. If higher, they must be replaced with then-compliant toilets and urinals (1.28 and 0.125 gpf, respectively).	
New residential	All fixtures installed after Jan 1, 2014 must be HETs or HEUs[3]	Not addressed	1.28 max (toilets) and 0.125 max (urinals)[3] Exception available for comm'l (per 5.303.2)
New commercial		Not addressed	

[1] Existing as of the effective date of the provision
[2] Alterations or improvements
[3] Toilet effective flush volume of 1.28 gallons, where dual flush toilets are measured as the average of one full flush and two reduced flushes. Urinal flush volume reduced to 0.125 gpf by California Energy Commission and adopted into CalGreen.
[4] SB407 applies only where building additions increase total building size by more than 10 percent OR for building alterations or improvements, where the total construction cost estimated in the building permit exceeds $150,000
[5] Maximum urinal flush volume as set by the California Energy Commission of 0.125 gallons per flush, effective 2016.
[6] Places continuing responsibility on the owner of rental property to guarantee that the toilet "shall be operating at the manufacturer's rated water consumption at the time that the tenant takes possession."

Some of those consequences…

- 'Dry Drains & sewers' - starving for water
- Wastewater treatment – dilution of inflows
- Public health – increased flushing of water supply systems reqd (buildings & municipal)
- Pathogen growth & transmission
- Public safety – shower dangers + Legionella
- Fixture retrofit/replacement/maint. expenses
- Significant increases in water & sewer rates
- Social impact – "neighbor vs. neighbor"

FOR MORE, SEE NEXT PRESENTATION!!!

Thank you…

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